

Service
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Service Manual



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Published by SL 0301 Service Audio Printed in The Netherlands Subject to modification



3140 785 32400

Version 1.0



PHILIPS

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable
 Mains frequency : 50/60Hz
 Power consumption : < 35W Active
 < 15W at Standby with Clock on
 Clock accuracy : < 4 seconds per day
 Dimension centre unit : 265 x 310 x 365mm

TUNER:

FM

Tuning range : 87.5-108MHz
 Grid : 50kHz
 100kHz(switchable)
 IF frequency : 10.7MHz ± 20kHz
 Aerial input : 75Ω coaxial
 Sensitivity at 26dB S/N : < 22µV
 Selectivity at 600kHz bandwidth : > 25dB
 IF rejection : > 60dB
 Image rejection : > 25dB
 Distortion at RF=1mV, dev. 75kHz : < 3%
 -3dB Limiting point : < 23.5dBf
 Crosstalk at RF=1mV, dev. 40kHz : > 18dB

MW

Tuning range : 531-1602kHz or
 530-1700kHz
 Grid : 9kHz or
 10kHz
 IF frequency : 450kHz ± 1kHz
 Aerial input : Frame aerial 18.1µH
 Sensitivity at 26dB S/N : < 4.4mV/M
 Selectivity at 18kHz bandwidth : > 18dB
 IF rejection : > 45dB
 Image rejection : > 28dB
 Distortion at RF=50mV, m=80% : < 5%

AMPLIFIER:

Output power : 2 x 20W ¹⁾ RMS
 Frequency response within -3dB : 60Hz-16kHz
 Dynamic Bass Boost : DBB Off, DBB 1, DBB 2, DBB 3 ²⁾
 Digital Sound Control : Jazz, Techno, Optimal, Rock ²⁾
 Headphone output, R_{LOAD} = 32Ω : 15 mW ± 2dB
 Input sensitivity, R_S = 600Ω
 Aux / CDR : 500mV / 1.0V
 Mic : 3.5mV

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
 Tape speed : 4.76 cm/sec +2.5/-1.5%
 Wow and flutter : < 0.4% DIN
 Fast-wind/rewind time C60 : 130 sec
 Bias system : 78kHz ± 10kHz
 Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
 Signal to noise ratio Type I : > 48dBA

VCD/COMPACT DISC:

Audio Performance:

Measurement done at output conn. of the 3CDC module.
 Frequency response within ± 3dB : 20Hz - 20kHz
 Output level (in Vrms) : 500mV ± 1.5dB, R_{out} = 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)

MPEG 1 Layer 3 (MP3-CD) : MPEG AUDIO
 MP3-CD bit rate : 56-256 kbps
 MP3-CD sampling frequencies : 32kHz, 44.1kHz,
 48kHz

Recording Format : ISO 9660
 UDF format not supported.

Video Performance :

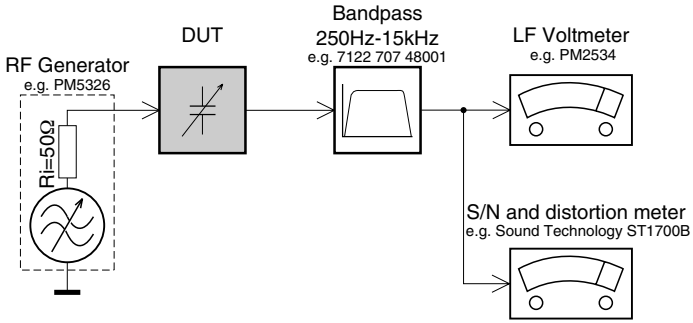
Video output level : 1.0V ± 0.2Vpp
 Luminance non-linear distortion : < 0 ± 5%
 Luminance S/N ratio : > 50dB

¹⁾ 6Ω, 1kHz, 10% THD

²⁾ Frequency response in each setting is software controlled.

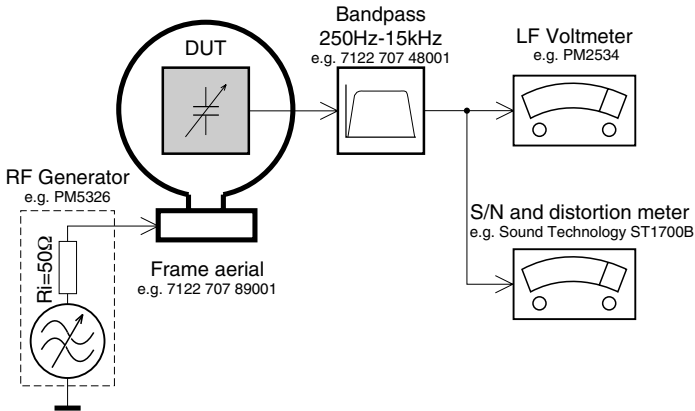
MEASUREMENT SETUP

Tuner FM



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

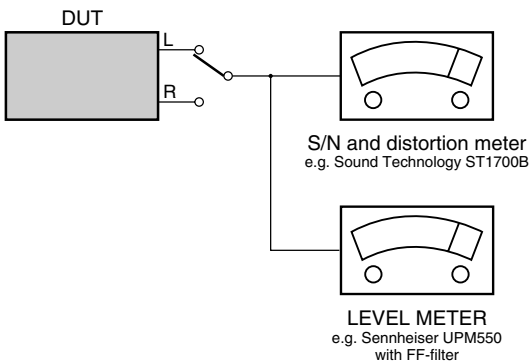
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage. Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

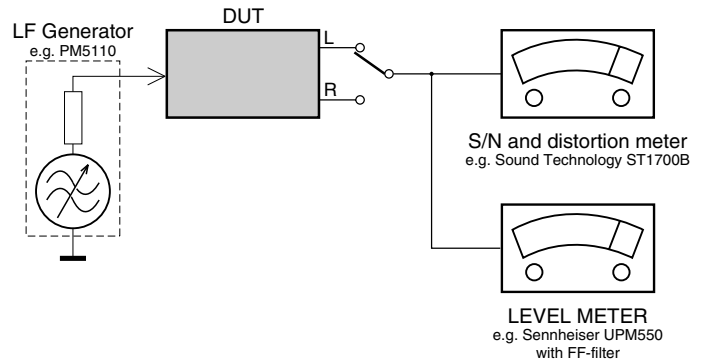
CD

Use Audio Signal Disc SBC429 4822 397 30184 (replaces test disc 3)



Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069 or Universal Test Cassette **Fe** SBC420 4822 397 30071



SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

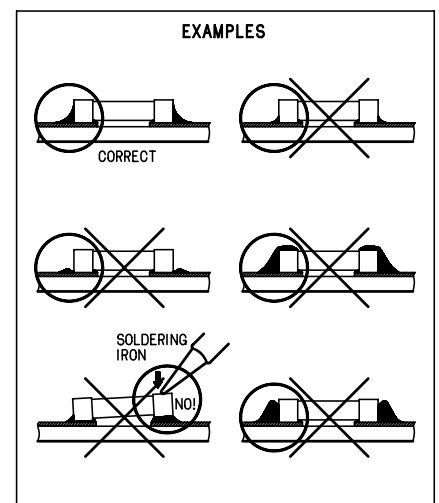
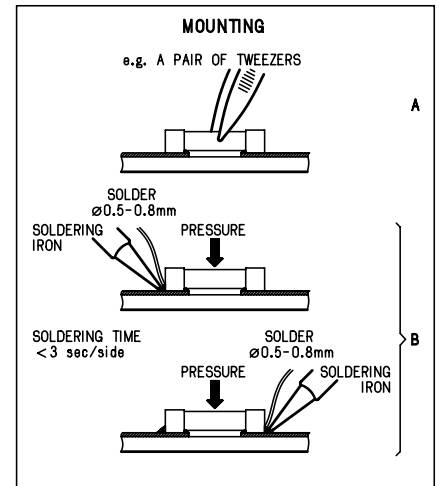
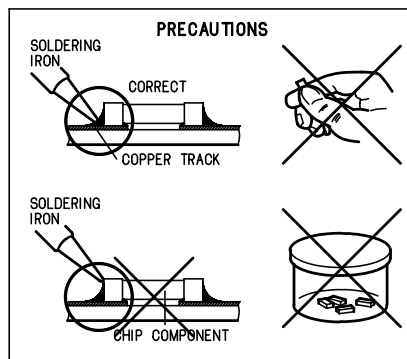
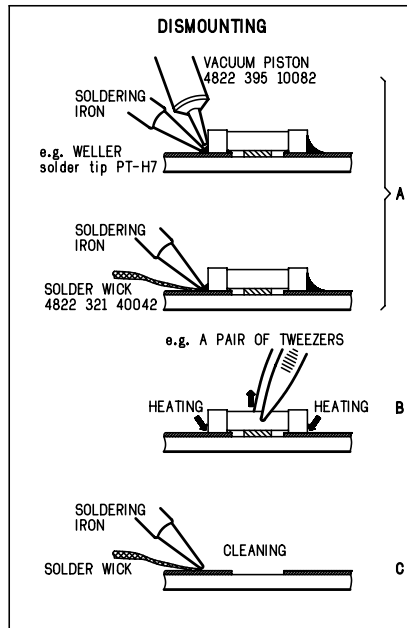
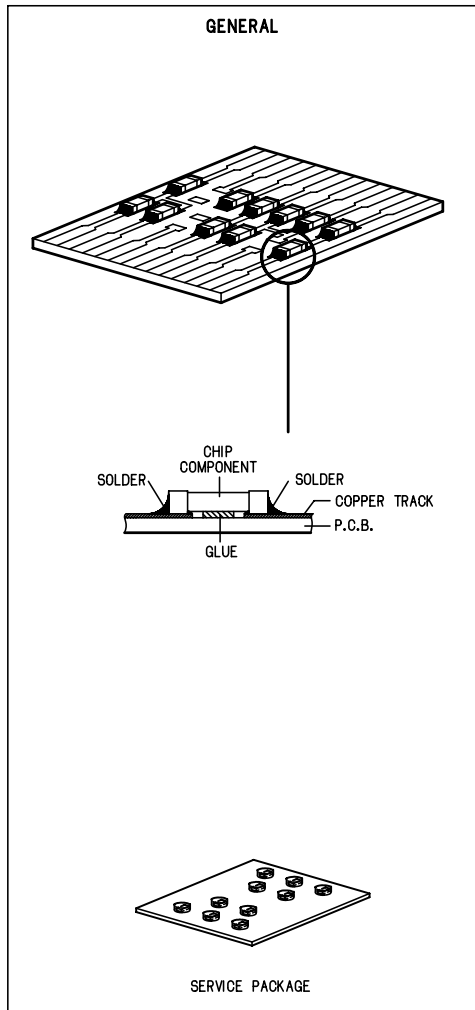
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm ...	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1M Ω)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS



(GB) WARNING

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

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

Keep components and tools also at this potential.

ESD**(NL) WAARSCHUWING**

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

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

Houd componenten en hulpmiddelen ook op 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 elektrostatistischen 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 !

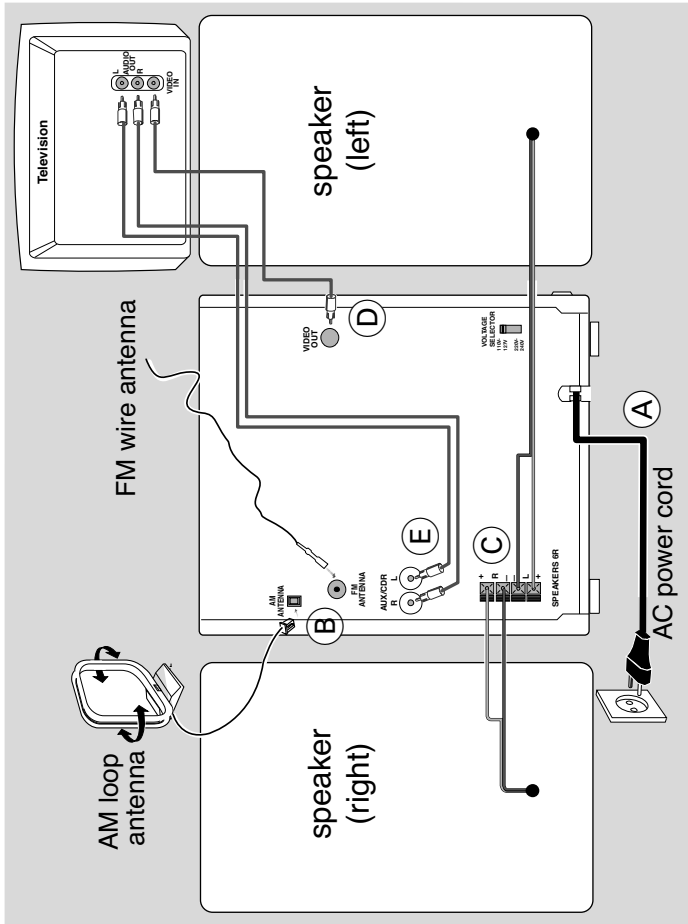
Avatussa laitteessa ja suojaletyksen ohitettaessa olet alltiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

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

PREPARATIONS AND CONTROLS

Preparations



Rear connections

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

(A) Power

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



WARNING!

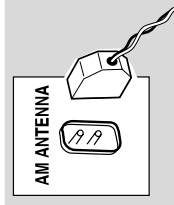
- For optimal performance, use only the original power cable.
- Never make or change any connections with the power switched on.

(B) Antennas Connection

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.



FM Antenna

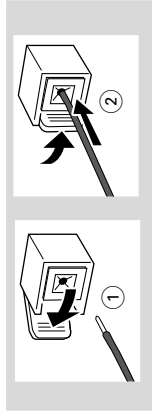
For better FM stereo reception, connect an outdoor FM antenna to the FM ANTENNA terminal.



(C) Speakers Connection

Front Speakers

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



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

Notes:

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

(D) Video Out Connection

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

Note:

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

Preparations

(E) Connecting other equipment to your system

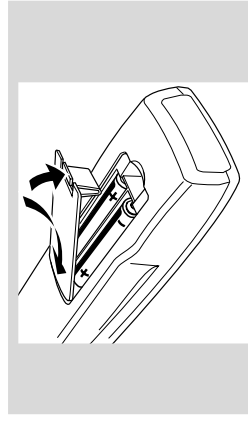
Use a cinch cable to connect AUX/CDR IN to the analogue audio out terminals of an external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder).

Note:

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

Inserting batteries into the remote control

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



CAUTION!

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

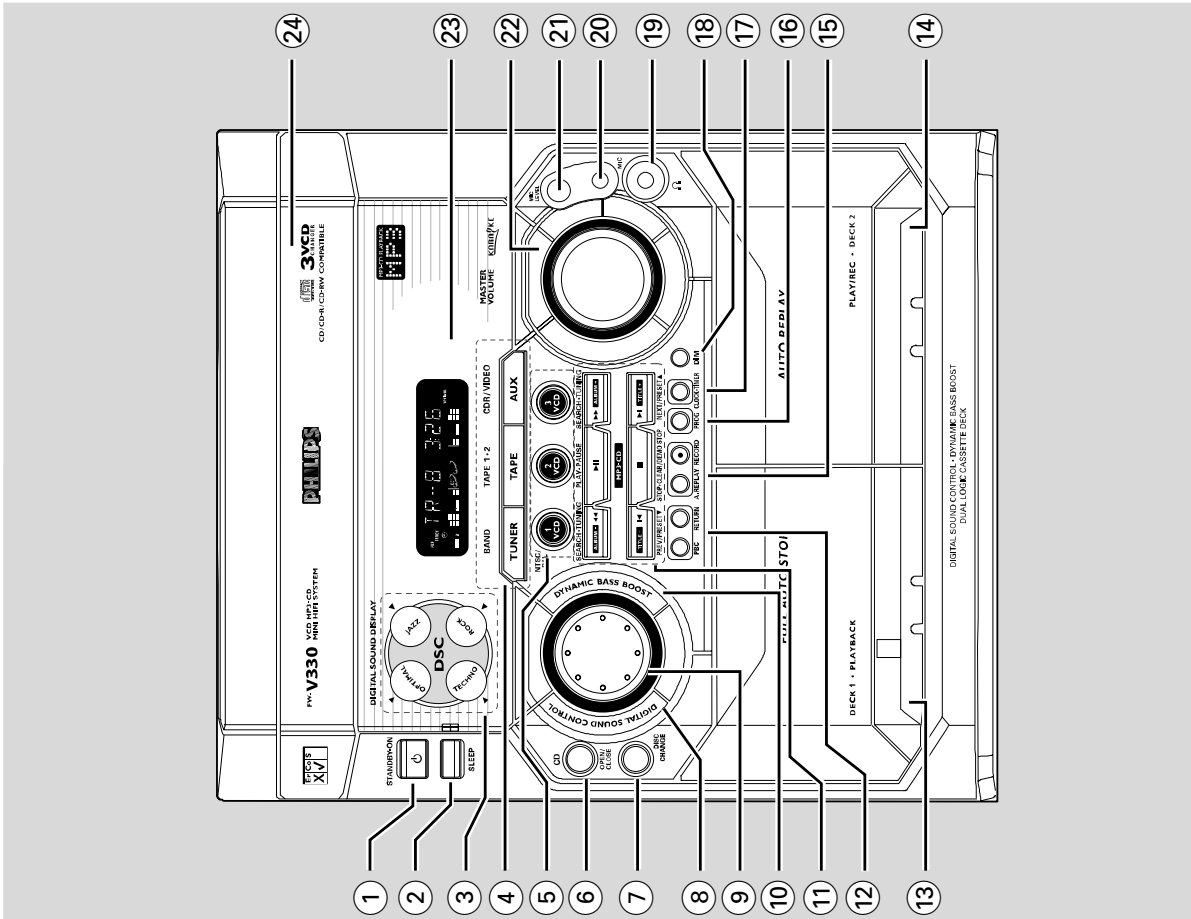
Controls

Controls on the system and remote control

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

Mode Selection

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



PREPARATIONS AND CONTROLS

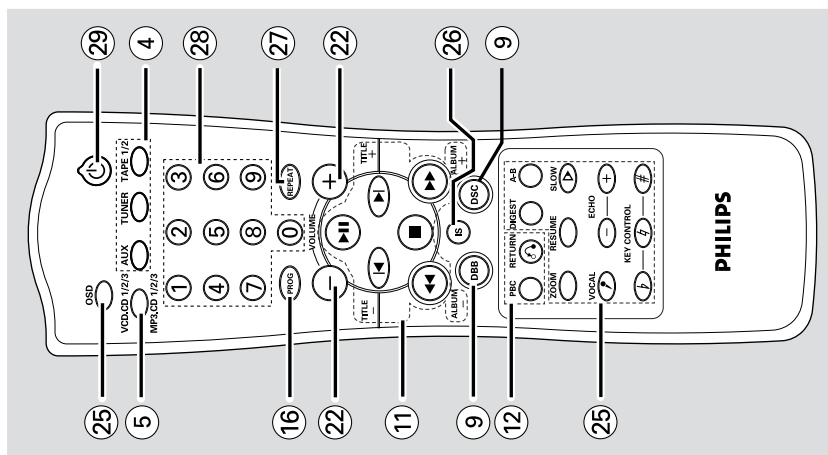
Controls

- ⑲ **REPEAT**
 - to playback track/disc/programme repeatedly.
- ⑳ **Numeric keys (0 - 9)**
 - (numbers consisting more than two figures must be keyed in within 2 seconds.)
 - to direct key in a track number for CD/VCD/MP3-CD.
- ㉑ **⏻**
 - to switch the system to standby mode.

Controls

- ⑲ **Display screen**
 - to view the current status of the system.
- ㉒ **Disc tray**
- ⑳ **VCD operations (on remote control only)**
- ㉓ **OSD**
 - to switch on or off the On Screen Display on the TV.
- ㉔ **ZOOM**
 - to enlarge a still picture of the VCD on the TV screen.
- ㉕ **RESUME**
 - to continue playback again from where you have stopped (for-VCD with PBC switched off).
- ㉖ **VOCAL**
 - to fade out the original vocal from a Karaoke VCD or to switch between mono or stereo mode during audio disc playback.
- ㉗ **KEY CONTROL (b h #)**
 - to change the VCD key tone level to suit your vocal range.
 - b to decrease the key tone level.
 - h to restore the key tone level to original setting.
 - # to increase the key tone level.
- ㉘ **ECHO - / +**
 - to adjust the VCD echo level for karaoke after inserted the microphone.
- ㉙ **SLOW ▷**
 - to watch the VCD at a slower speed.
- ㉚ **A - B**
 - to playback a certain scene or passage of a CD/VCD repeatedly.
- ㉛ **DIGEST**
 - to scan through a VCD or a specific track.
- ㉜ **IS (not functional for this model)**

- ⑲ **VCD operations (for VCD version 2.0 only)**
- ㉕ **PBC**
 - to switch on or off the playback control mode.
- ㉖ **RETURN**
 - to return to the previous menu level during playback (for VCD with PBC switched on).
- ⑲ **Tape deck 1**
- ㉗ **Tape deck 2**
- ⑲ **Tape deck operations**
- ㉘ **A. REPLAY**
 - to select continuous playback in either AUTO REPLAY or ONCE mode only.
- ㉙ **RECORD**
 - to start recording on tape deck 2.
- ⑲ **PROG**
 - for CD/VCD/MP3-CD...to programme disc tracks.
 - for Tunerto programme preset radio stations.
 - for Clockto select 12- or 24-hour clock mode.
- ⑲ **CLOCK-TIMER**
 - to view the clock, set the clock or set the timer.
- ⑲ **DIM**
 - to select different brightness for the display screen : DIM 1, DIM 2, DIM 3 or DIM OFF.
- ⑲ **⏻**
 - to connect headphones.
- ⑲ **MIC**
 - to connect microphone jack.
- ⑲ **MIC LEVEL**
 - to adjust the mixing level for karaoke or microphone recording.
- ⑲ **MASTER VOLUME (VOLUME + / -)**
 - to increase or decrease the volume.



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

MAINTENANCE AND TROUBLESHOOTING

Troubleshooting

WARNING

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

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

Problem

Solution

CD OPERATION

"UNRECOVERABLE DISC" is displayed.

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

"NO DISC" is displayed.

- Insert a disc.

No picture on TV screen.

- Connect the cable betw en the system and TV.

No colour on TV screen.

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

Cannot adjust the TV system to PAL or NTSC.

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

RADIO RECEPTION

Radio reception is poor

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

TAPE OPERATION/RECORDING

Recording or playback cannot be made.

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

The tape deck door cannot open.

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

GENERAL

The system does not react when buttons are pressed.

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

Sound cannot be heard or is of poor quality.

- Adjust the volume.
- Disconnect the headphones.
- Check that the speakers are connected correctly.
- Check if the stripped speaker wire is clamped.
- Make sure the MP3 disc was recorded within 32-256 kbps bit rate with sampling frequencies at 48 kHz, 44,1 kHz or 32 kHz.

The left and right sound outputs are reversed.

- Check the speaker connections and location.

The remote control does not function properly.

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

The timer is not working.

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

The Clock/Timer setting is erased.

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

The system displays features automatically.

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

DISMANTLING INSTRUCTIONS

Dismantling the 3CDC Module

- 1) Loosen the 4 screws, slide Cover top (pos 255) towards the rear and remove it upwards.
- 2) Loosen 3 screws slide the Panel right (pos 254) towards the rear and remove it outwards. Do likewise for the Panel left (pos 253).
- 3) Push the gear slowly towards the front as shown in figure 2 until the CDC tray starts to move out of the Front Cabinet (pos 101). The CDC tray is now disengage and can be pulled out completely.

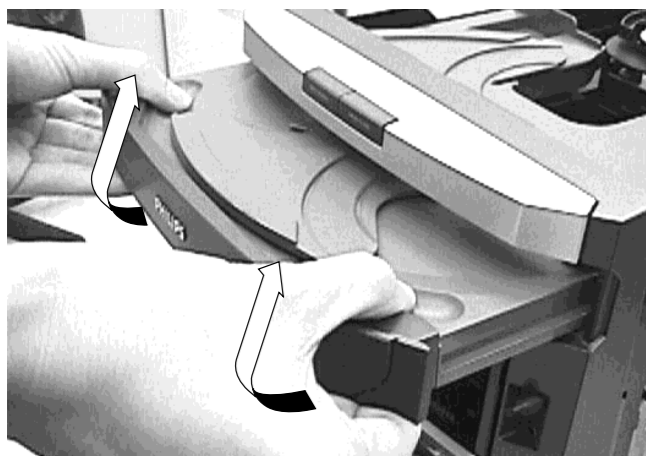


Figure 1

- 4) Remove the Cover Tray (pos 106) as shown in figure 1.
- 5) Loosen 4 screws A to remove the 3CDC-LC-VCD Module (pos 1104) as shown in figure 2.

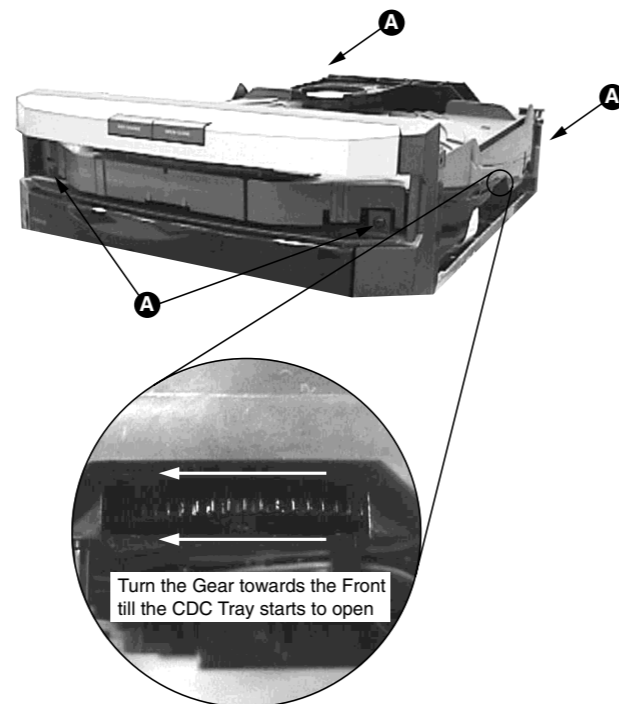


Figure 2

Dismantling of the Volume & Jog Rotary knobs

- 1) Cut a piece of packaging tape approximately 5cm width by 12cm length and tape its narrow side on to the top and bottom side of the Volume knob (pos 139) as shown in figure 3.



Figure 3

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

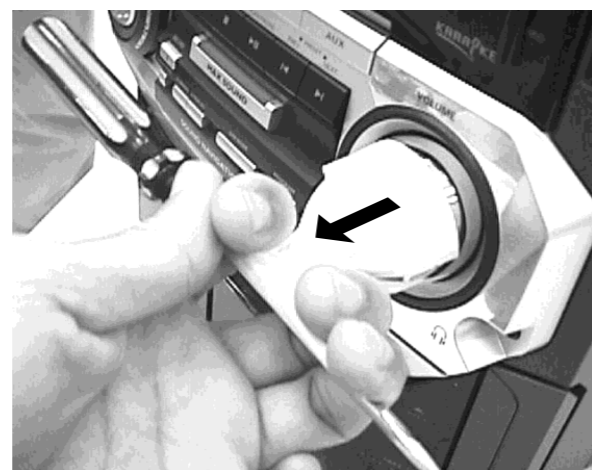


Figure 4

Dismantling of the Front Panel assembly

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

- 4) Loosen 8 screws B to remove the Front board as shown in Figure 5.
- 5) Loosen 6 screws C and eject both cassette doors to remove the Tape mechanism (pos 1103) as shown in figure 6.

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

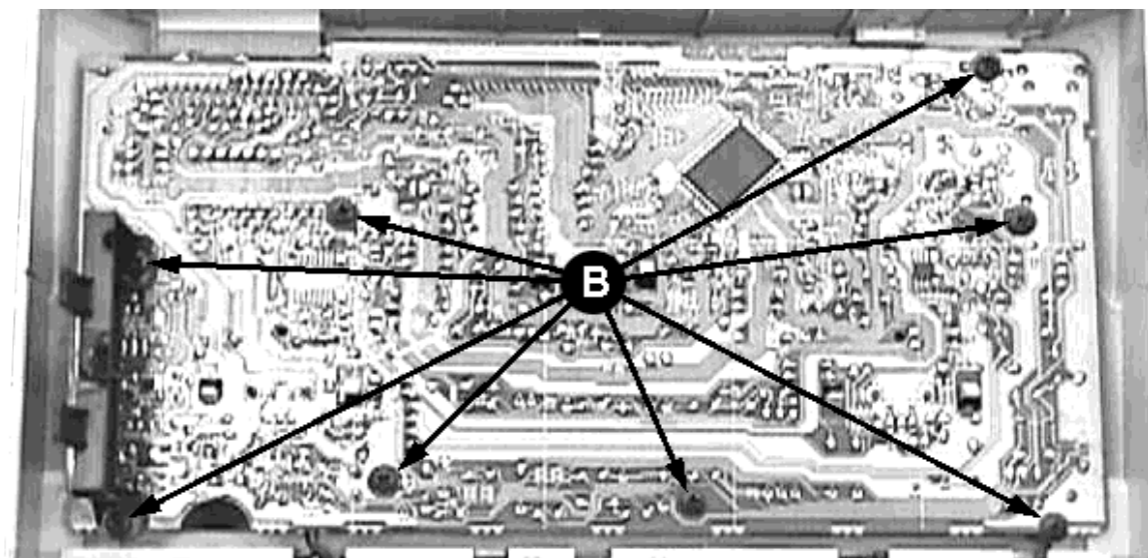


Figure 5

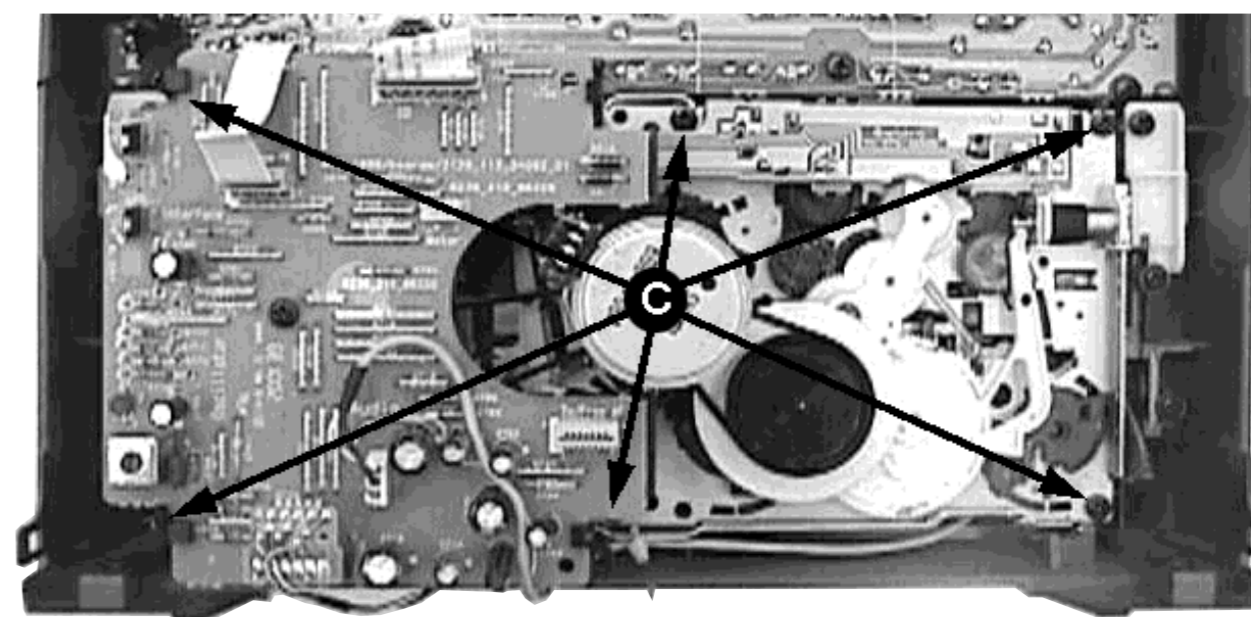


Figure 6

Dismantling of the Bottom & Rear Panel assembly

- 1) Loosen 6 screws D mounting the Combi board to the Rear Panel (pos 256) as shown in figure 7.
- 2) Loosen 3 screws E and release the 2 catches on the sides of the Rear Panel to separate it from the Bottom plate (pos 265).
- 3) Loosen 4 screws G to remove the Mains Transformer as shown in figure 8.
- 4) Loosen 2 screws F to remove the Combi Board.

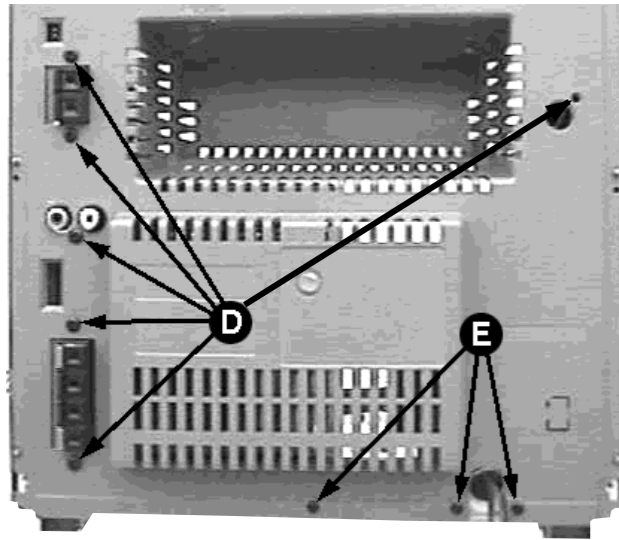


Figure 7

Separating the MPEG and 3CDC-LC-VCD Module

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

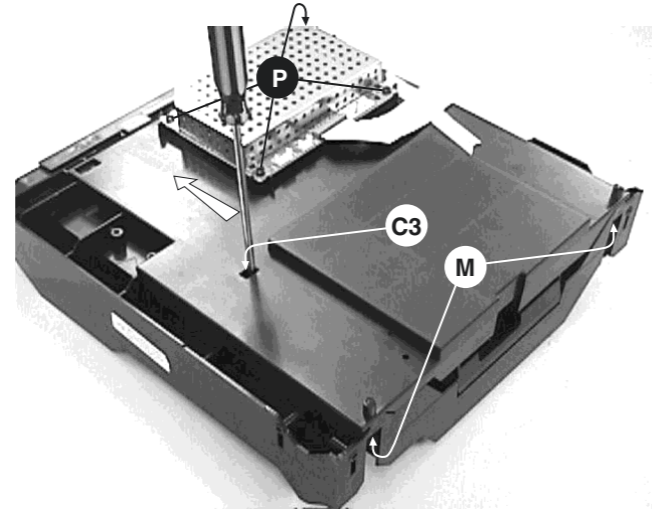
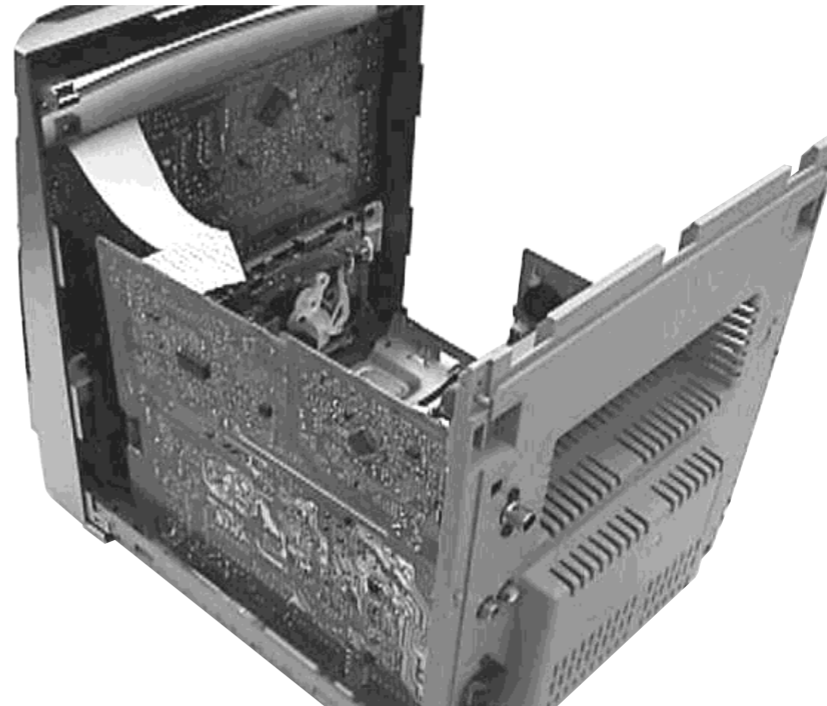


Figure 9

Service pos B



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

The 3CDC-LC-VCD Module can be complete detached while repairing the other portion of the set.

Service pos A

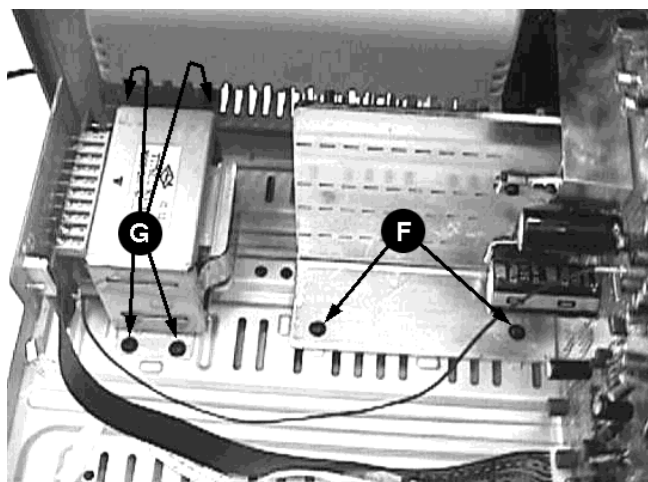
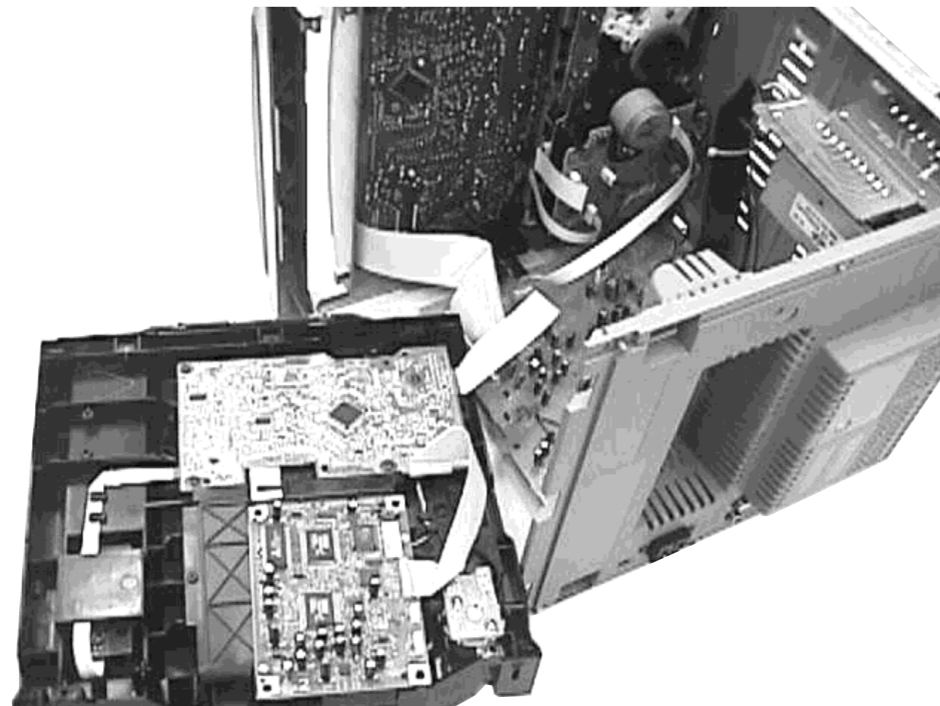
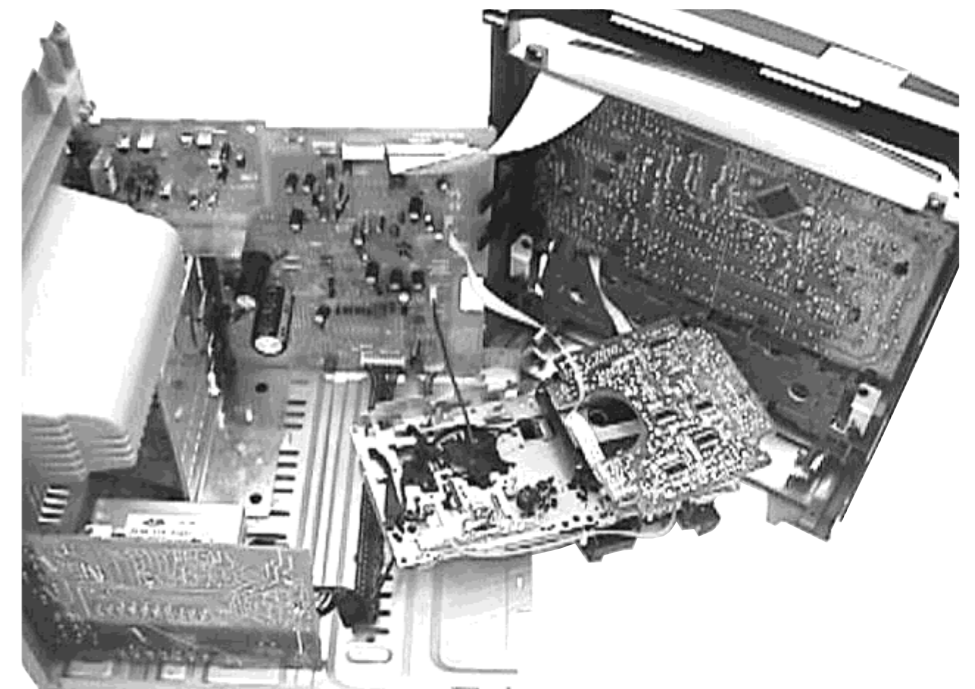


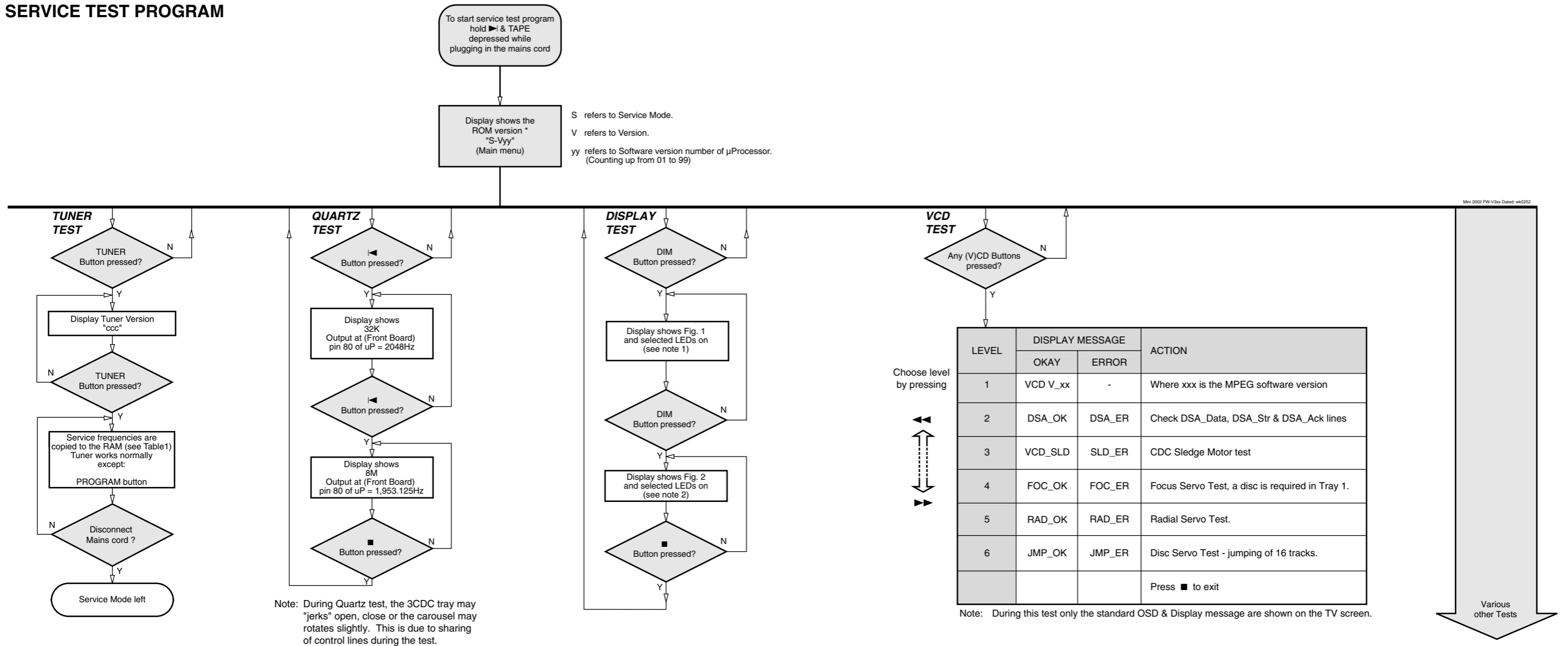
Figure 8



Service pos C



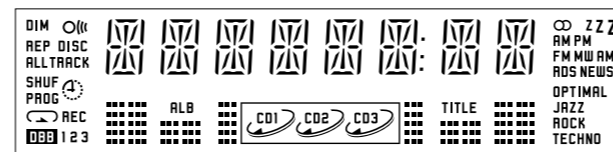
SERVICE TEST PROGRAM



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	87.5MHz	558kHz	87.5MHz	98MHz	98/87.5MHz*
8	87.5MHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	87.5MHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	87.5MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	98MHz	65.81MHz	98MHz	87.5MHz	87.5/98MHz*

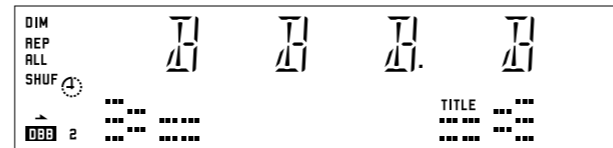
Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz)
By holding the TUNER and <Left> 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.



note 1 : JAZZ & TECHNO are on while OPTIMAL is off, other LEDs status are not important (applicable only for sets with LEDs)

Figure 1

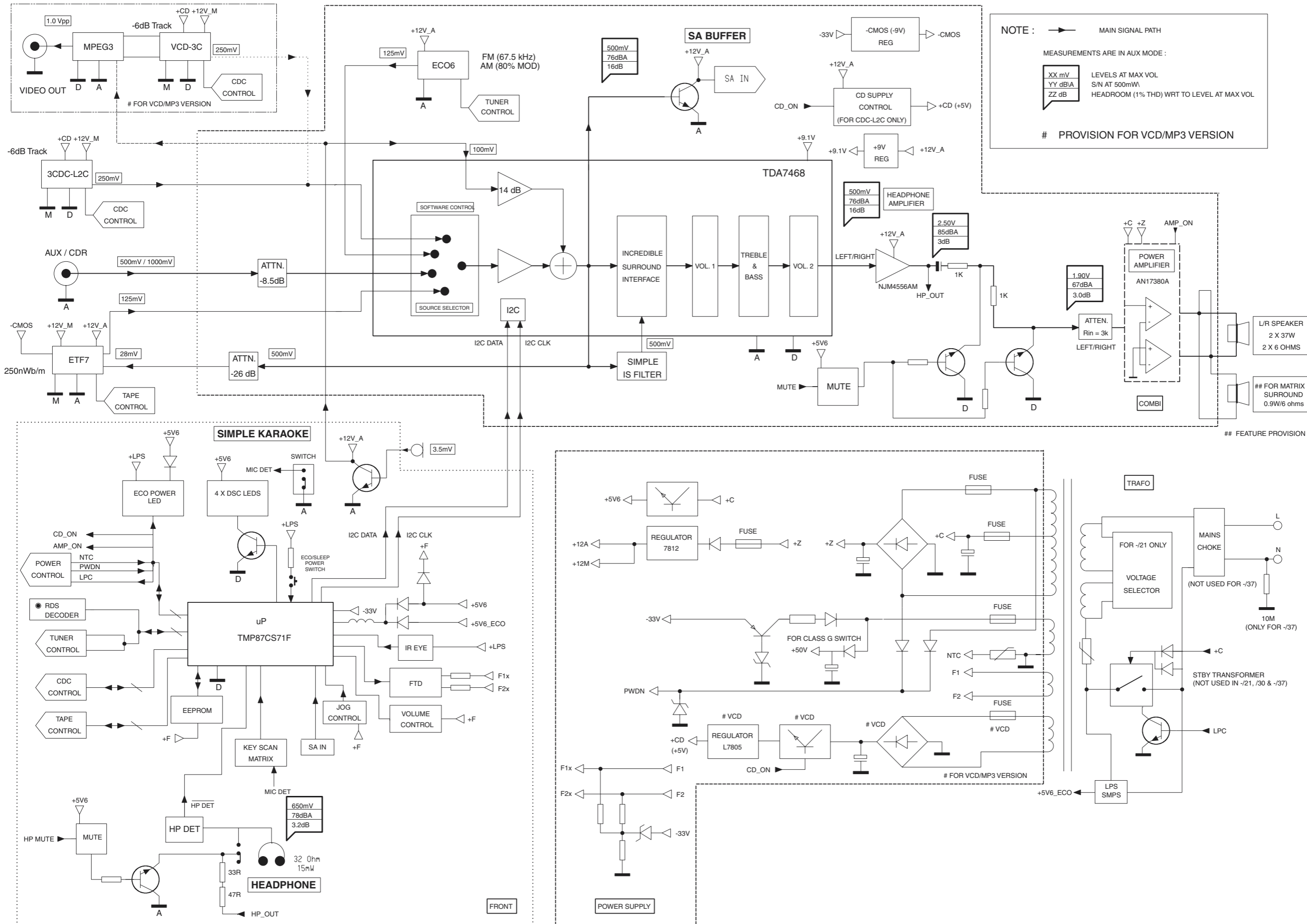


note 2 : OPTIMAL is on while JAZZ & TECHNO are off, other LEDs status are not important (applicable only for sets with LEDs)

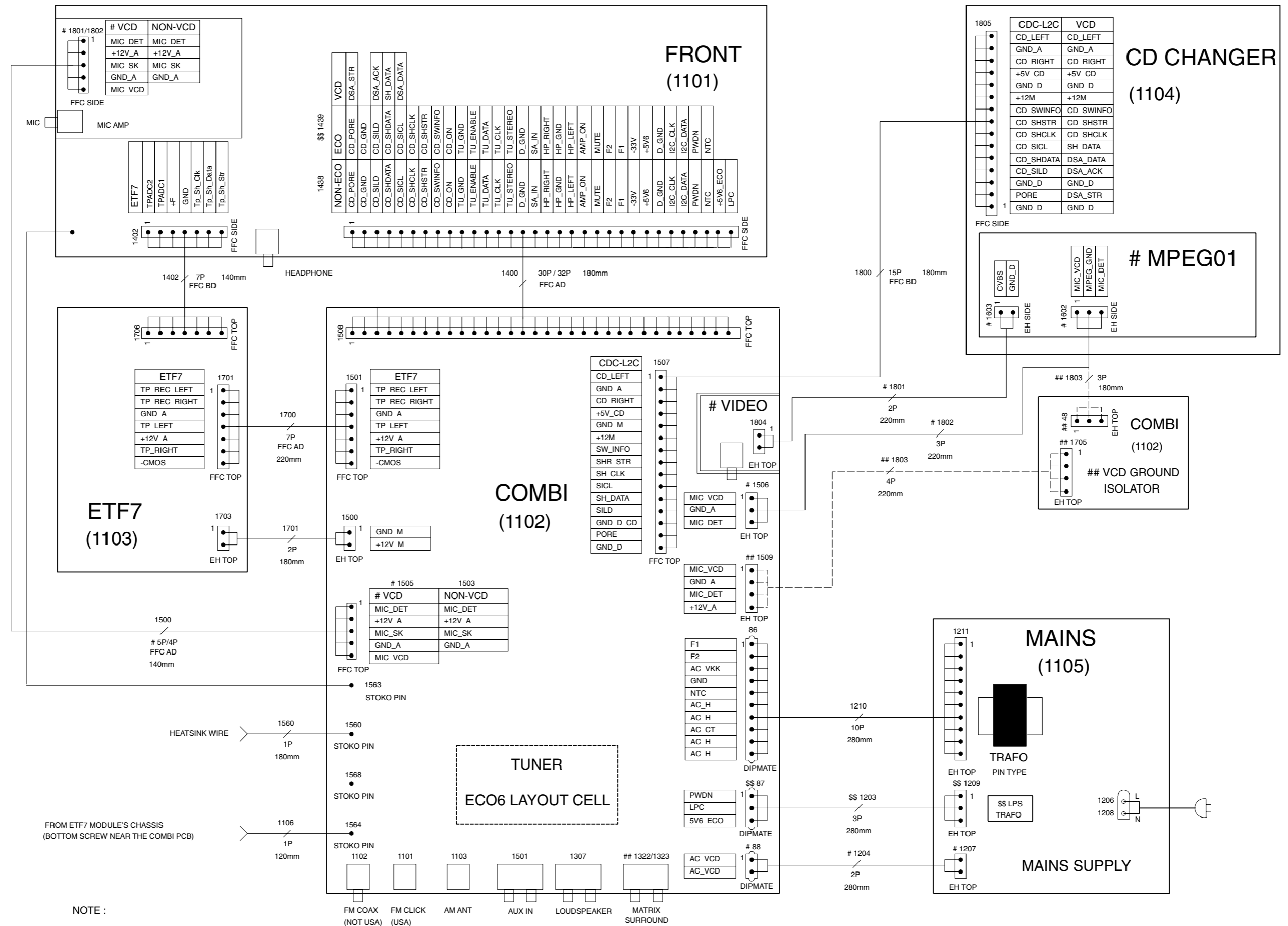
Figure 2

TEST	Activated with	ACTION
EEPROM TEST	<Right> ■ 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	<Left>	Load default data. Display shows "NEW" for 1 second. Caution! All presets from the customer will be lost!!
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.
DEMO	DBB	DEMO will toggle on or off. The message: "DEMO ON" or "DEMO OFF" will scroll across the display to show the new status of the set.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

SET BLOCK DIAGRAM



SET WIRING DIAGRAM



NOTE :

- # - PROVISION FOR SETS WITH VCD/MP3 FEATURE .
- ## - PROVISION FOR SETS WITH MATRIX SURROUND & VCD GROUND ISOLATOR .
- \$\$ - PROVISION FOR SETS WITH ECO FEATURE (ONLY FOR -/22/34 VER.) .

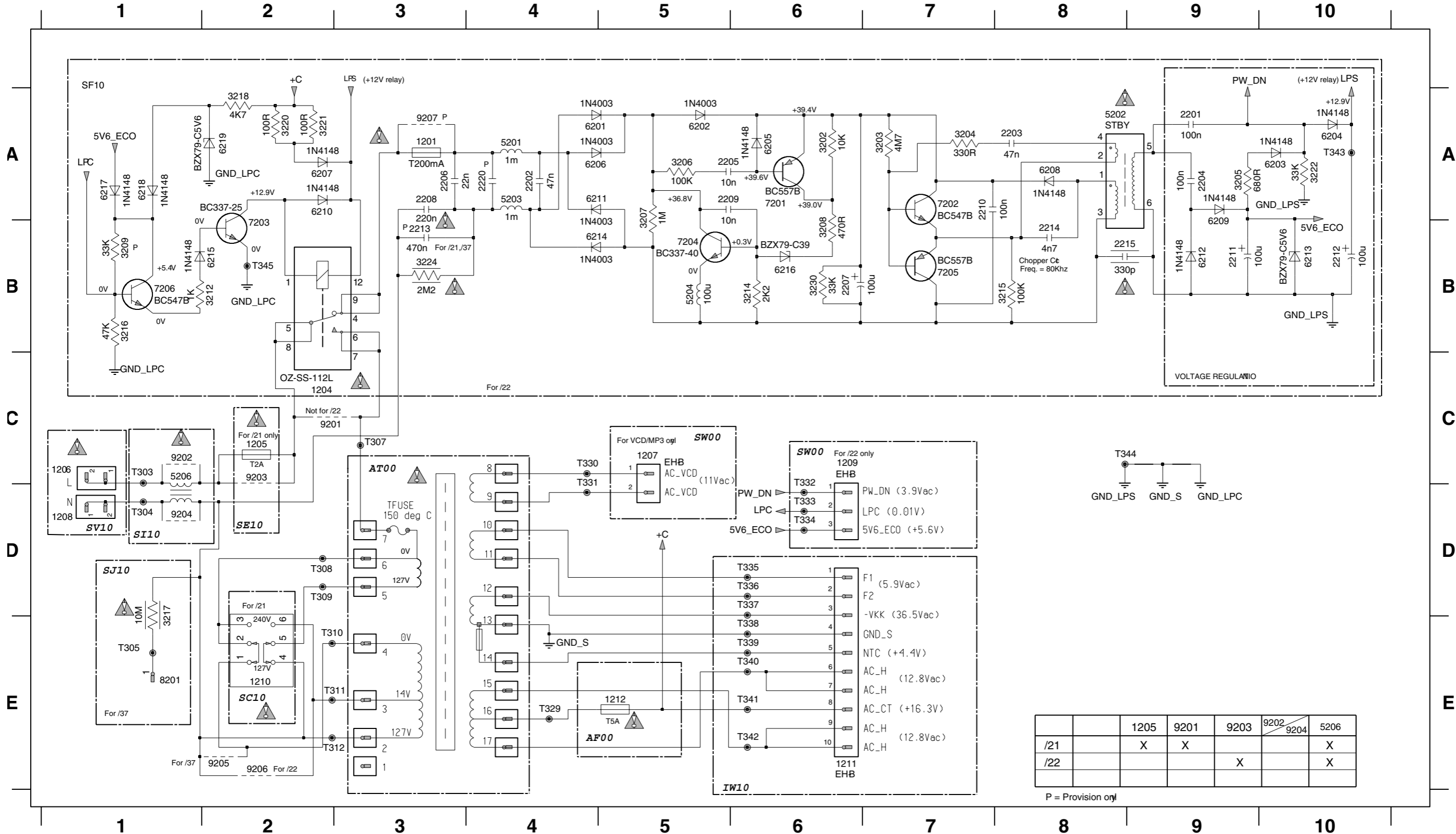
MAINS BOARD

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MAINS CIRCUIT

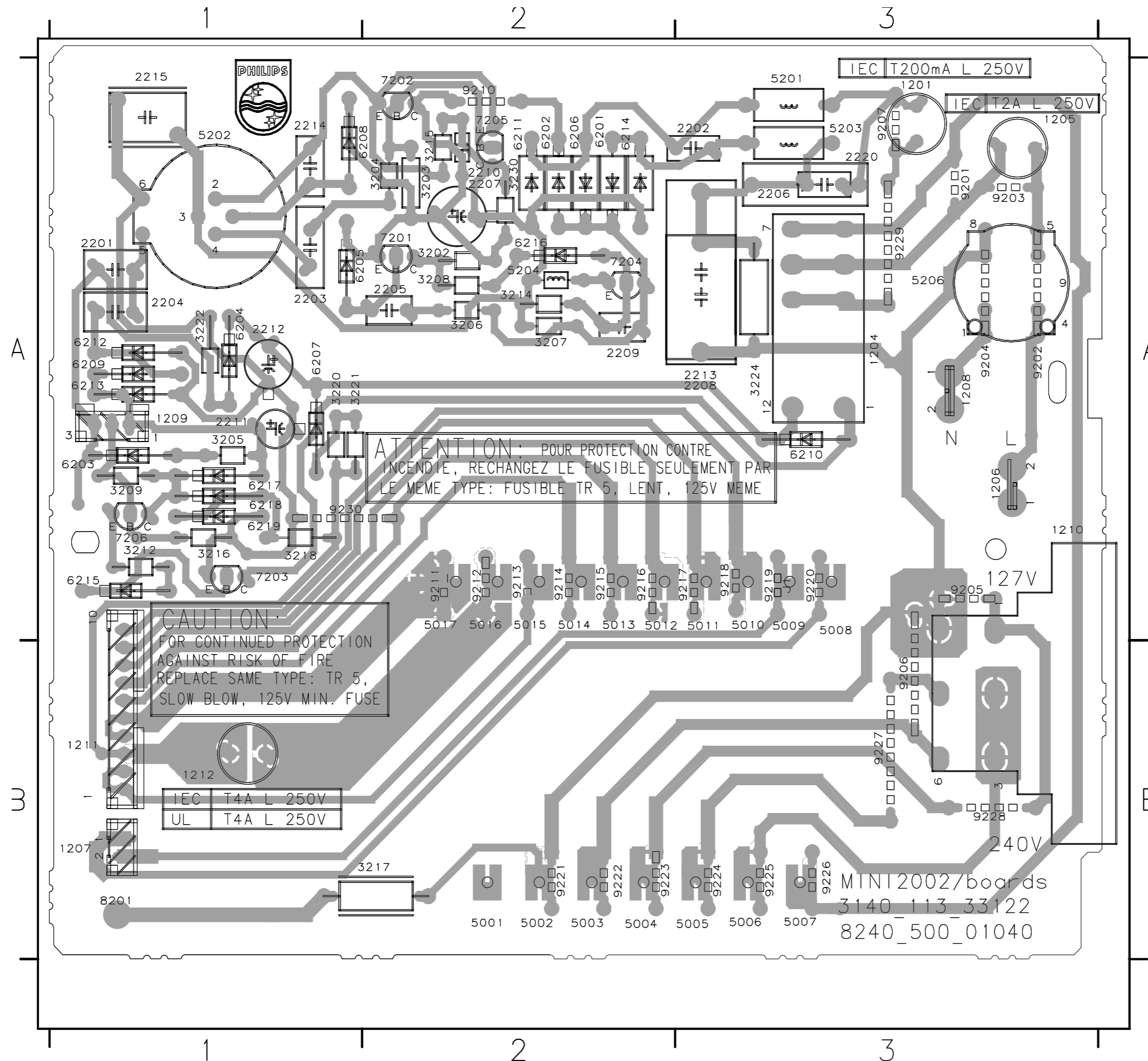
- | | | | | | | | | | | | | | | | | | | | | | |
|---------|---------|---------|---------|----------|---------|---------|---------|----------|---------|----------|---------|----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| 1201 A3 | 1208 D1 | 2201 A9 | 2206 A3 | 2211 B9 | 2220 A4 | 3206 A5 | 3214 B6 | 3220 A2 | 5201 A4 | 6201 A4 | 6206 A4 | 6211 A4 | 6216 B6 | 7202 A7 | 8201 E1 | 9205 E2 | T305 E1 | T311 E3 | T332 D6 | T337 D6 | T342 E6 |
| 1204 C2 | 1209 C6 | 2202 A4 | 2207 B6 | 2212 B10 | 3202 A6 | 3207 A5 | 3215 B8 | 3221 A2 | 5202 A8 | 6202 A5 | 6207 A2 | 6212 B9 | 6217 A1 | 7203 B2 | 9201 C2 | 9206 E2 | T307 C3 | T312 E2 | T333 D6 | T338 E6 | T343 A10 |
| 1205 C2 | 1210 E2 | 2203 A8 | 2208 A3 | 2213 B3 | 3203 A7 | 3208 B6 | 3216 B1 | 3222 A10 | 5203 A4 | 6203 A10 | 6208 A8 | 6213 B10 | 6218 A1 | 7204 B5 | 9202 C1 | 9207 A3 | T308 D2 | T329 E4 | T334 D6 | T339 E6 | T344 C8 |
| 1206 C1 | 1211 E6 | 2204 A9 | 2209 A5 | 2214 B8 | 3204 A7 | 3209 B1 | 3217 D1 | 3224 B3 | 5204 B5 | 6204 A10 | 6209 A9 | 6214 B4 | 6219 A2 | 7205 B7 | 9203 C2 | T303 C1 | T309 D2 | T330 C4 | T335 D6 | T340 E6 | T345 B2 |
| 1207 C5 | 1212 E5 | 2205 A5 | 2210 A7 | 2215 B8 | 3205 A9 | 3212 B2 | 3218 A2 | 3230 B6 | 5206 C1 | 6205 A6 | 6210 A2 | 6215 B2 | 7201 A6 | 7206 B1 | 9204 D1 | T304 D1 | T310 E2 | T331 D4 | T336 D6 | T341 E6 | |



	1205	9201	9203	9202/9204	5206
/21	X	X			X
/22			X		X

P = Provision only

COMPONENT LAYOUT



J1	A3	6201	A2
1201	A3	6202	A2
1204	A3	6203	A1
1205	A3	6204	A1
1206	A3	6205	A1
1207	B1	6206	A2
1208	A3	6207	A1
1209	A1	6208	A2
1210	A3	6209	A1
1211	B1	6210	A3
1212	B1	6211	A2
2201	A1	6212	A1
2202	A3	6213	A1
2203	A1	6214	A2
2204	A1	6215	A1
2205	A2	6216	A2
2206	A3	6217	A1
2207	A2	6218	A1
2208	A3	6219	A1
2209	A2	7201	A2
2210	A2	7202	A2
2211	A1	7203	A1
2212	A1	7204	A2
2213	A3	7205	A2
2214	A1	7206	A1
2215	A1	8201	B1
2220	A3	9201	A3
3202	A2	9202	A3
3203	A2	9203	A3
3204	A2	9204	A3
3205	A1	9205	A3
3206	A2	9206	B3
3207	A2	9207	A3
3208	A2	9210	A2
3209	A1	9211	A2
3212	A1	9212	A2
3214	A2	9213	A2
3215	A2	9214	A2
3216	A1	9215	A2
3217	B2	9216	A2
3218	A1	9217	A3
3220	A1	9218	A3
3221	A1	9219	A3
3222	A1	9220	A3
3224	A3	9221	B2
3230	A2	9222	B2
5001	B2	9223	B2
5002	B2	9224	B3
5003	B2	9225	B3
5004	B2	9226	B3
5005	B3	9227	B3
5006	B3	9228	B3
5007	B3	9229	A3
5008	A3	9230	A1
5009	A3		
5010	A3		
5011	A3		
5012	A2		
5013	A2		
5014	A2		
5015	A2		
5016	A2		
5017	A2		
5201	A3		
5202	A1		
5203	A3		
5204	A2		
5206	A3		

ELECTRICAL PARTSLIST - MAINS BOARD**- MISCELLANEOUS -**

1201 Δ 4822 071 52001 FUSE 19372(200MA) /22/34
 1204 Δ 2422 132 07519 RELAY 1P 12V 16A /22/34
 1205 Δ 9965 000 07788 FUSE RAD T2A IEC UL250V /21M
 1210 Δ 2422 129 16478 VOLTSEL 2P 5A /21M
 1212 Δ 9965 000 07786 FUSE RAD T4.0A IEC UL250V

5202 Δ 2422 549 45157 TRAFO STANDBY /22/34
 5206 4822 157 11832 400UH 3A

- CAPACITORS -

2201 5322 121 42386 100NF 5% 63V /22/34
 2202 4822 121 43526 47NF 5% 250V /22/34
 2203 4822 126 14559 47NF -80/+20% 50V /22/34
 2204 5322 121 42386 100NF 5% 63V /22/34
 2205 4822 122 30043 10NF 80% 63V /22/34

 2206 4822 121 41856 22NF 5% 250V /22/34
 2207 4822 124 40255 100UF 20% 63V /22/34
 2208 4822 121 10512 275V 220N 20% /22/34
 2209 4822 122 30043 10NF 80% 63V /22/34
 2210 2020 561 90365 CER2 Y5V 50V 100N /22/34

 2211 4822 124 41584 100UF 20% 10V /22/34
 2212 4822 124 40207 100UF 20% 25V /22/34
 2214 5322 122 32261 4,7NF 10% X7R 100V /22/34
 2215 Δ 2020 554 90168 CERSAF 250V 330P 10% /22/34

- RESISTORS -

3202 4822 050 21003 10K00 1% 0,6W /22/34
 3203 4822 050 24705 4M70 1% 0,6W /22/34
 3204 4822 116 52219 330E 5% 0,5W /22/34
 3205 4822 116 52228 680E 5% 0,5W /22/34
 3206 4822 116 52234 100K 5% 0,5W /22/34

 3207 4822 116 83866 1M 5% 0,5W /22/34
 3208 4822 116 83883 470R 5% 0,5W /22/34
 3212 4822 050 11002 1K00 1% 0,4W /22/34
 3214 4822 116 52256 2K2 5% 0,5W /22/34
 3215 4822 116 52234 100K 5% 0,5W /22/34

 3216 4822 116 83884 47K 5% 0,5W /22/34
 3218 4822 116 52283 4K7 5% 0,5W /22/34
 3220 4822 116 52175 100E 5% 0,5W /22/34
 3221 4822 116 52175 100E 5% 0,5W /22/34
 3222 4822 050 23303 33K00 1% 0,6W /22/34

 3224 Δ 4822 053 21225 2M20 5% 0,5W /22/34
 3230 4822 050 23303 33K00 1% 0,6W /22/34

- COILS & FILTERS -

5201 4822 157 53473 1000UH 10% 4X9,8 /22/34

- COILS & FILTERS -

5203 4822 157 53473 1000UH 10% 4X9,8 /22/34
 5204 4822 157 11228 100UH LAN02TB101J 5% /22/34
 5206 4822 157 11832 400UH 3A /22/34

- DIODES -

6201 4822 130 31878 1N4003G /22/34
 6202 4822 130 31878 1N4003G /22/34
 6203 4822 130 30621 1N4148 /22/34
 6204 4822 130 30621 1N4148 /22/34
 6205 4822 130 30621 1N4148 /22/34

 6206 4822 130 31878 1N4003G /22/34
 6207 4822 130 30621 1N4148 /22/34
 6208 4822 130 30621 1N4148 /22/34
 6209 4822 130 30621 1N4148 /22/34
 6210 4822 130 30621 1N4148 /22/34

 6211 4822 130 31878 1N4003G /22/34
 6212 4822 130 30621 1N4148 /22/34
 6213 4822 130 34173 BZX79-C5V6 /22/34
 6214 4822 130 31878 1N4003G /22/34
 6215 4822 130 30621 1N4148 /22/34

 6216 4822 130 34145 BZX79-B39 /22/34
 6217 4822 130 30621 1N4148 /22/34
 6218 4822 130 30621 1N4148 /22/34
 6219 4822 130 34173 BZX79-C5V6 /22/34

- IC & TRANSISTORS -

7201 4822 130 44568 BC557B /22/34
 7202 4822 130 40959 BC547B /22/34
 7203 4822 130 40981 BC337-25 /22/34
 7204 4822 130 40855 BC337 /22/34
 7205 4822 130 44568 BC557B /22/34

 7206 4822 130 40959 BC547B /22/34

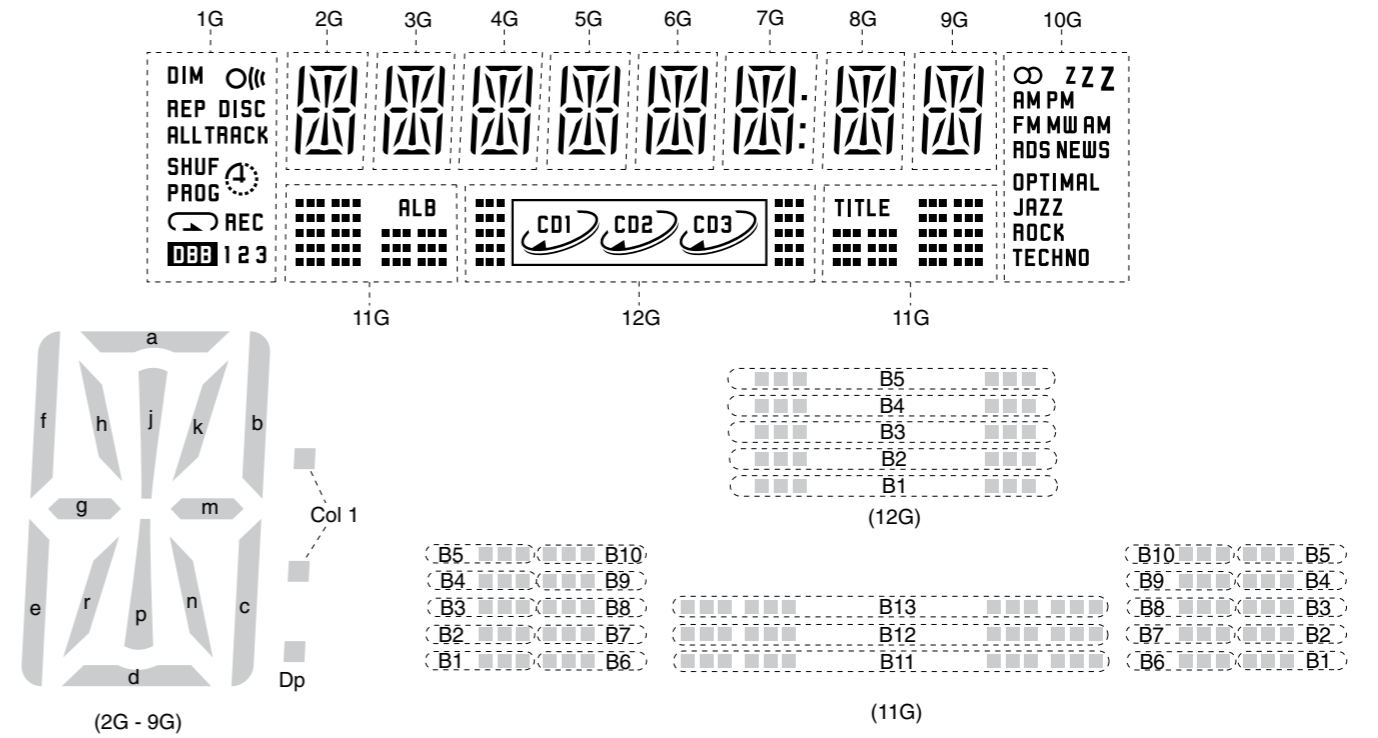
Note : Only these parts mentioned in this list are normal service parts.

FRONT BOARD

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 Chip Layout 6-7
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FTD DISPLAY PIN CONNECTIONS



	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	B1	B1	∞	a	a	a	a	a	a	a	a	DIM
P2	B2	B2	Z _(Left)	h	h	h	h	h	h	h	h	⊖
P3	B3	B3	Z _(Middle)	j, p	j, p	j, p	j, p	j, p	j, p	j, p	j, p	REP
P4	B4	B4	Z _(Right)	k	k	k	k	k	k	k	k	DISC
P5	B5	B5	AM _(Up)	b	b	b	b	b	b	b	b	ALL
P6	CD1	B6	PM	f	f	f	f	f	f	f	f	TRACK
P7	CD2	B7	FM	m	m	m	m	m	m	m	m	SHUF
P8	CD3	B8	MW	g	g	g	g	g	g	g	g	PROG
P9		B9	AM _(Low)	c	c	c	c	c	c	c	c	
P10		B10	RDS	e	e	e	e	e	e	e	e	
P11		B11	NEWS	r	r	r	r	r	r	r	r	
P12		B12	OPTIMAL	n	n	n	n	n	n	n	n	REC
P13	-	B13	JAZZ	d	d	d	d	d	d	d	d	DBB
P14	-	ALB	ROCK	-	-	Col	-	-	-	-	-	1
P15	-	TITLE	TECHNO	-	-	Dp	-	-	-	-	-	2
P16	-	-	-	-	-	-	-	-	-	-	-	3

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

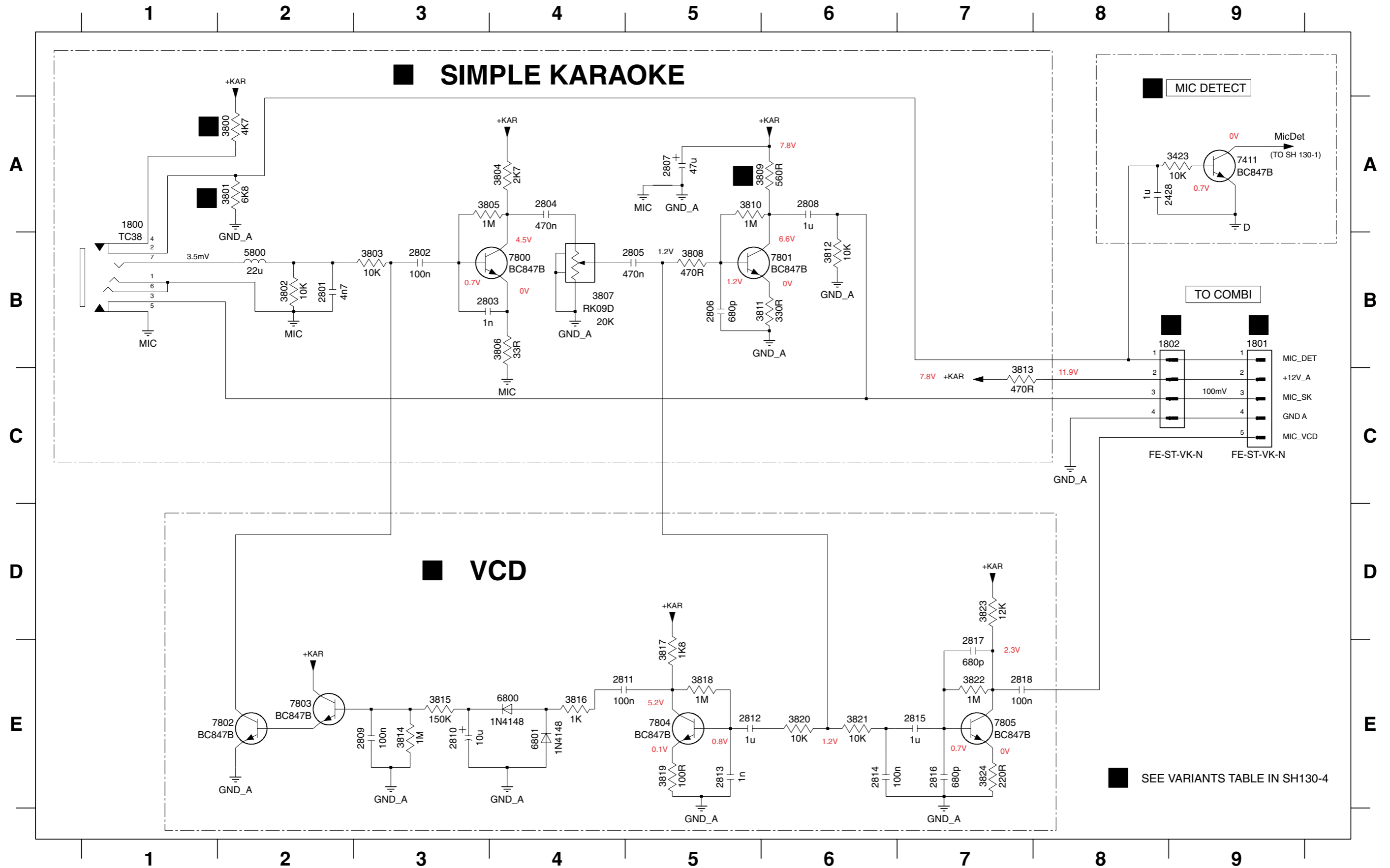
FEATURES:	FW-V330/21M				
Karaoke / Mic Detect	x				
VCD	x				
RDS	-				
ECO Power LED	-				

ITEM NO.	FW-V330/21M				Functions
1427	x				REC
1428	AUTO				
1432	PBC				
1433	RETURN				
1438	-				with LPC
1439	x				without LPC
1801	x				VCD & KARAOKE
1802	-				KARAOKE
3529	330R				P01
3546	10k				RDCLK
3548	10k				RDS DAT
3549	10k				RESET
3565	4R7				FTD Filament
3566	-				FTD Filament
3567	4R7				FTD Filament
3568	-				FTD Filament
3569	10k				LPC
3570	-				RESET
3800	1k				KARAOKE
3801	1k2				KARAOKE
3809	680R				KARAOKE
4408	-				CDSICL
4409	x				+5V6
4410	x				SH_DATA
4411	-				HP_GND
4414	x				DLPC
4416	-				# AUTO
4417	x				AUTO
4419	x				RESET
4459	-				+5V6_ECO
4490	x				+5V6
4491	-				# REC
6401	-				+5V6_ECO
6417	x				P01
6429	x				KARAOKE
6430	-				ECO Power
9401	x				FTD Filament
9402	x				FTD Filament
9410	x				DSA_DATA
9411	-				+LPS
9416	-				CDSHDATA
9488	-				LPC
9506	-				+5V6_ECO
9514	-				+5V6_ECO

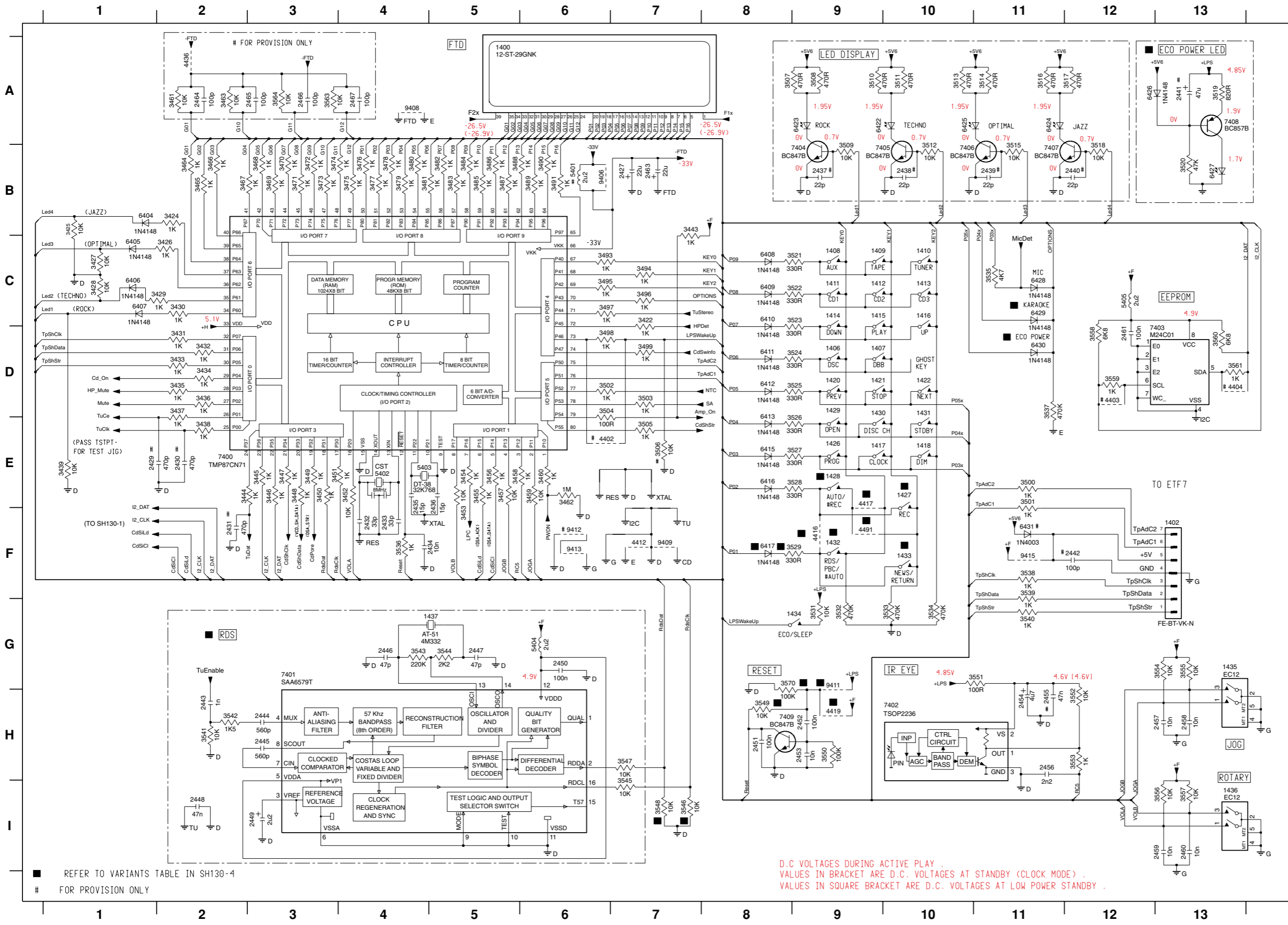
x = Item in use.

CIRCUIT DIAGRAM - KARAOKE PART

1800 A1	2428 A8	2803 B3	2806 B5	2809 E3	2812 E5	2815 E7	2818 E7	3801 A2	3804 A4	3807 B4	3810 A5	3813 C7	3816 E4	3819 E5	3822 E7	5800 B2	7411 A9	7802 E2	7805 E7
1801 B9	2801 B2	2804 A4	2807 A5	2810 E3	2813 E5	2816 E7	3423 A9	3802 B2	3805 A3	3808 B5	3811 B6	3814 E3	3817 E5	3820 E6	3823 D7	6800 E4	7800 B4	7803 E2	
1802 B8	2802 B3	2805 B5	2808 A6	2811 E4	2814 E6	2817 E7	3800 A2	3803 B3	3806 B4	3809 A6	3812 B6	3815 E3	3818 E5	3821 E6	3824 E7	6801 E4	7801 B6	7804 E5	



CIRCUIT DIAGRAM - MICROPROCESSOR PART



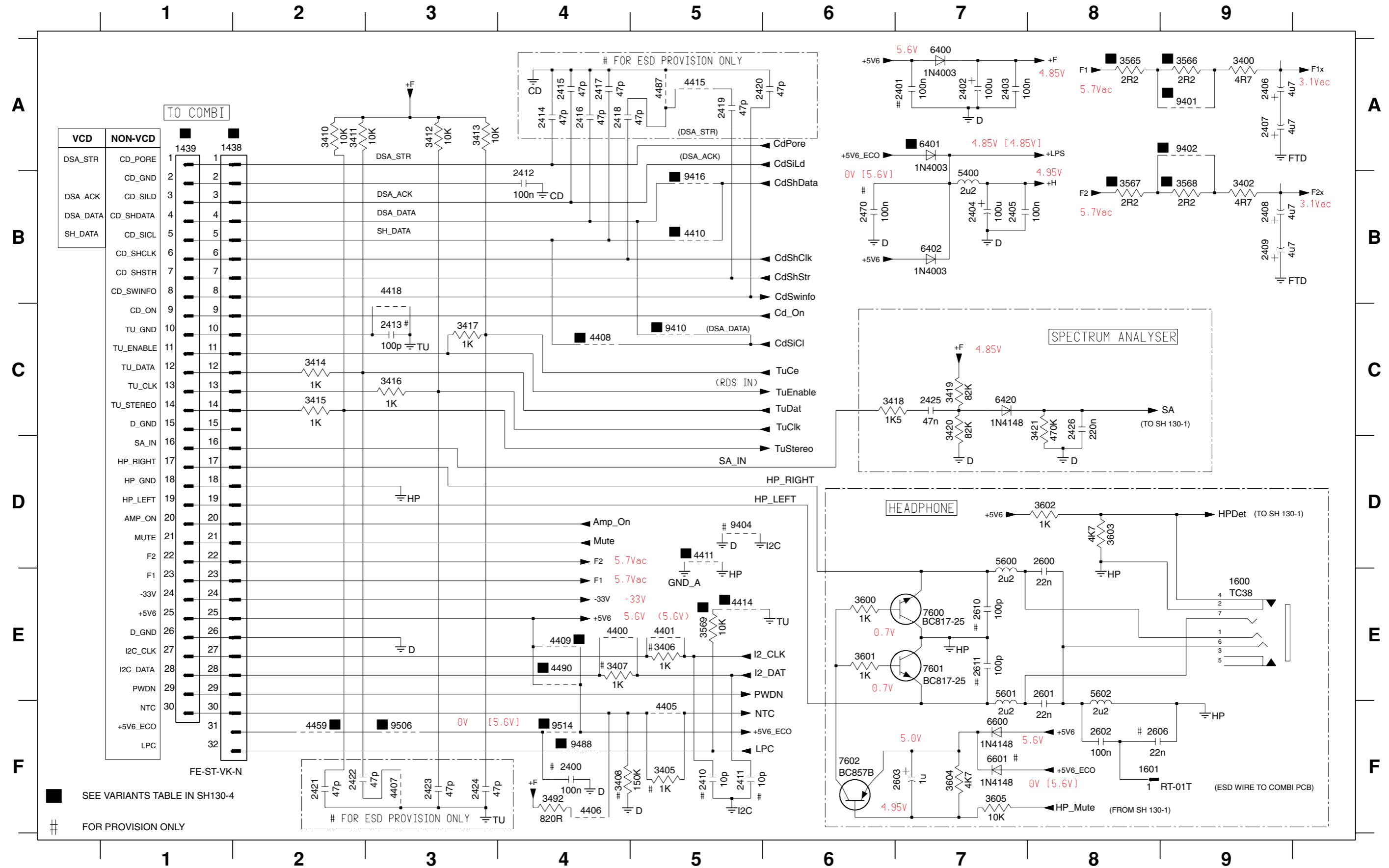
1400 A5	3472 B3	6415 E8
1402 F13	3473 B3	6416 E8
1406 D9	3474 B3	6417 F8
1407 D9	3475 B4	6422 A9
1408 C9	3476 B4	6423 A9
1409 C9	3477 B4	6424 A11
1410 C10	3478 B4	6425 A10
1411 C9	3479 B4	6426 A12
1412 C9	3480 B4	6427 B13
1413 C10	3481 B4	6428 C11
1414 C9	3482 B5	6429 C11
1415 C9	3483 B5	6430 D11
1416 C10	3484 B5	6431 F11
1417 E9	3485 B5	7402 H10
1418 E10	3486 B5	7403 D12
1420 D9	3487 B5	7404 B9
1421 D9	3488 B5	7405 B10
1422 D10	3489 B6	7406 B11
1426 E9	3490 B6	7407 B11
1427 E10	3491 B6	7408 A13
1428 E9	3493 C6	7409 H9
1429 D9	3494 C7	9406 B6
1430 D9	3495 C6	9408 A4
1431 D10	3496 C7	9409 F7
1432 F9	3497 C6	9411 G9
1433 F10	3498 D6	9412 F6
1434 G9	3499 D7	9413 F6
1435 G13	3500 E11	9415 F11
1436 H13	3501 E11	
1437 G5	3502 D6	
2427 B7	3503 D7	
2429 E1	3504 D6	
2430 E2	3505 E7	
2431 F2	3506 E7	
2432 F4	3507 A8	
2433 F4	3508 A9	
2434 F4	3509 B9	
2435 E4	3510 A9	
2436 E5	3511 A10	
2437 B9	3512 B10	
2438 B10	3513 A10	
2439 B11	3514 A11	
2440 B12	3515 B11	
2441 A13	3516 A11	
2442 F12	3517 A12	
2443 H2	3518 B12	
2444 H3	3519 A13	
2445 H3	3520 B13	
2446 G4	3521 C9	
2447 G5	3522 C9	
2448 I2	3523 C9	
2449 I3	3524 D9	
2450 G6	3525 D9	
2451 H8	3526 E9	
2452 H9	3527 E9	
2453 H9	3528 E9	
2454 H11	3529 F9	
2455 H11	3531 G9	
2456 H11	3532 G9	
2457 H13	3533 G10	
2458 H13	3534 G10	
2459 H13	3535 C11	
2460 H13	3536 F4	
2461 D12	3537 D11	
2463 B7	3538 F11	
2464 A2	3539 F11	
2465 A3	3540 G11	
2466 A3	3541 H2	
2467 A4	3542 H2	
2422 C7	3543 G4	
2424 B2	3544 G5	
3425 B1	3545 I7	
3426 C2	3546 I7	
3427 C1	3547 H7	
3428 C1	3548 I7	
3429 C2	3549 H8	
3430 C2	3550 H9	
3431 D2	3551 G11	
3432 D2	3552 H12	
3433 D2	3553 H12	
3434 D2	3554 G13	
3435 D2	3555 G13	
3436 D2	3556 H13	
3437 D2	3557 H13	
3438 E2	3558 D12	
3439 E1	3559 D12	
3443 B7	3560 D13	
3444 E2	3561 D13	
3445 E3	3563 A3	
3446 E3	3564 A3	
3447 E3	3570 G8	
3448 E3	4402 E6	
3449 E3	4403 D12	
3453 E3	4404 D13	
3451 E3	4412 F7	
3452 E4	4416 F9	
3453 F5	4417 E9	
3454 E5	4419 H9	
3455 E5	4436 A2	
3456 E5	4491 F9	
3457 E5	5401 B6	
3458 E5	5402 E4	
3459 E6	5403 E4	
3461 A2	5405 C12	
3462 E6	6404 B1	
3463 A2	6405 C1	
3464 B2	6406 C1	
3465 B2	6407 C1	
3466 B2	6408 C8	
3467 B2	6409 C8	
3468 B3	6410 C8	
3469 B3	6411 D8	
3470 B3	6412 D8	
3471 B3	6413 E8	

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 .

■ REFER TO VARIANTS TABLE IN SH130-4
 # FOR PROVISION ONLY

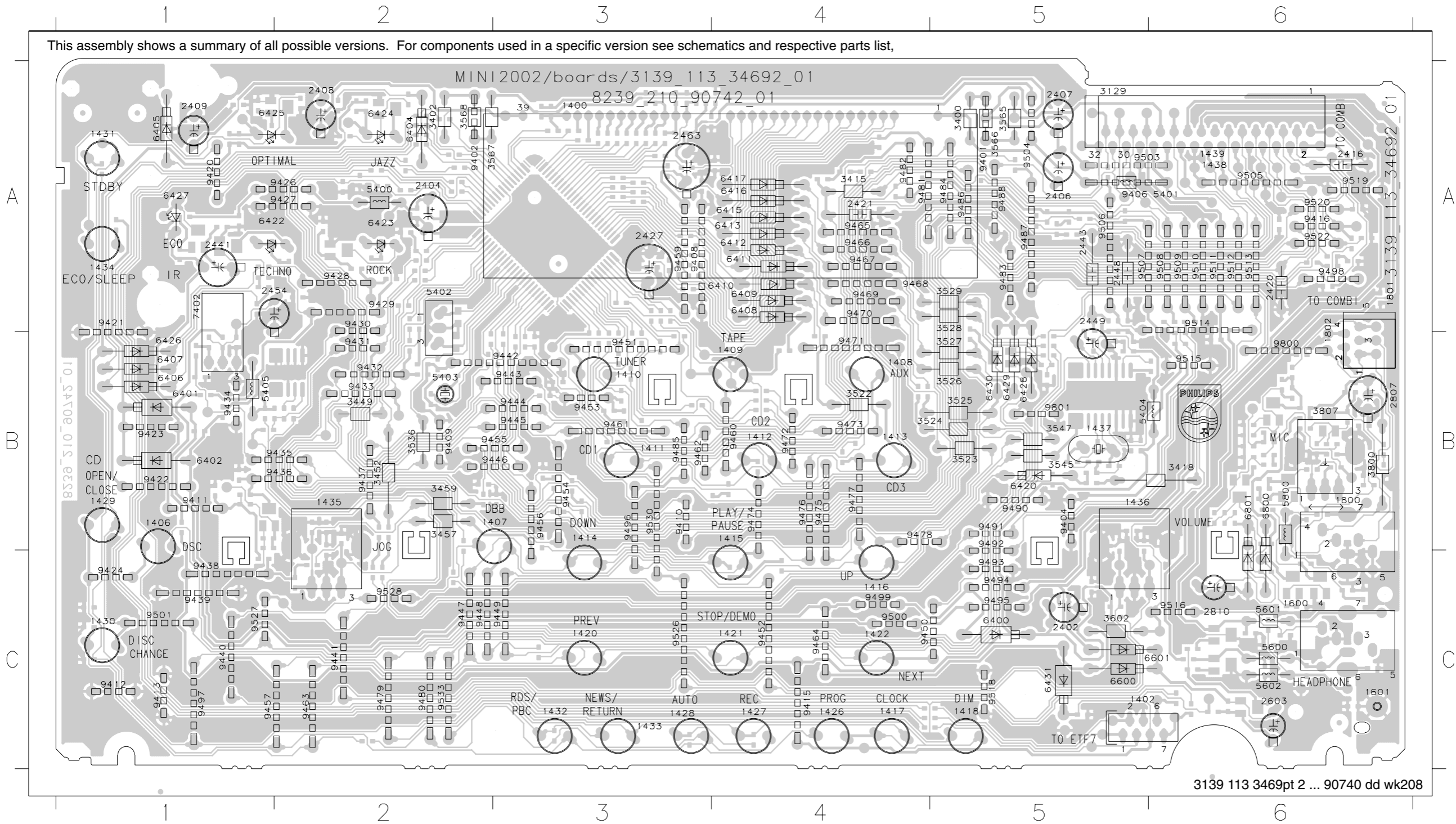
CIRCUIT DIAGRAM - HEADPHONE / MISCELLANEOUS PART

1438 A1	2400 F4	2404 B7	2408 B9	2412 B4	2416 A4	2420 A5	2424 F3	2600 D8	2606 F8	3402 B9	3408 F4	3413 A3	3417 C3	3421 C8	3567 B8	3601 E6	3605 F7	4406 F4	4410 B5	4418 B3	5400 B7	6400 A7	6600 F7	7602 F6	9410 C5	9514 F4
1439 A1	2401 A7	2405 B7	2409 B9	2413 C3	2417 A4	2421 F2	2425 C7	2601 E8	2610 E7	3405 F5	3410 A2	3414 C2	3418 C6	3492 F4	3568 B9	3602 D8	4400 E4	4407 F3	4411 D5	4459 F2	5600 D7	6401 A7	6601 F7	9401 A9	9416 B5	
1600 E9	2402 A7	2406 A9	2410 F5	2414 A4	2418 A4	2422 F2	2426 C8	2602 F8	2611 E7	3406 E5	3411 A2	3415 C2	3419 C7	3565 A8	3569 E5	3603 D8	4401 E5	4408 C4	4414 E5	4487 A5	5601 E7	6402 B7	7600 E7	9402 A9	9488 F4	
1601 F8	2403 A7	2407 A9	2411 F5	2415 A4	2419 A5	2423 F3	2470 B6	2603 F7	3400 A9	3407 E4	3412 A3	3416 C3	3420 C7	3566 A9	3600 E6	3604 F7	4405 F5	4409 E4	4415 A5	4490 E4	5602 E8	6420 C7	7601 E7	9404 D5	9506 F3	



COMPONENT LAYOUT

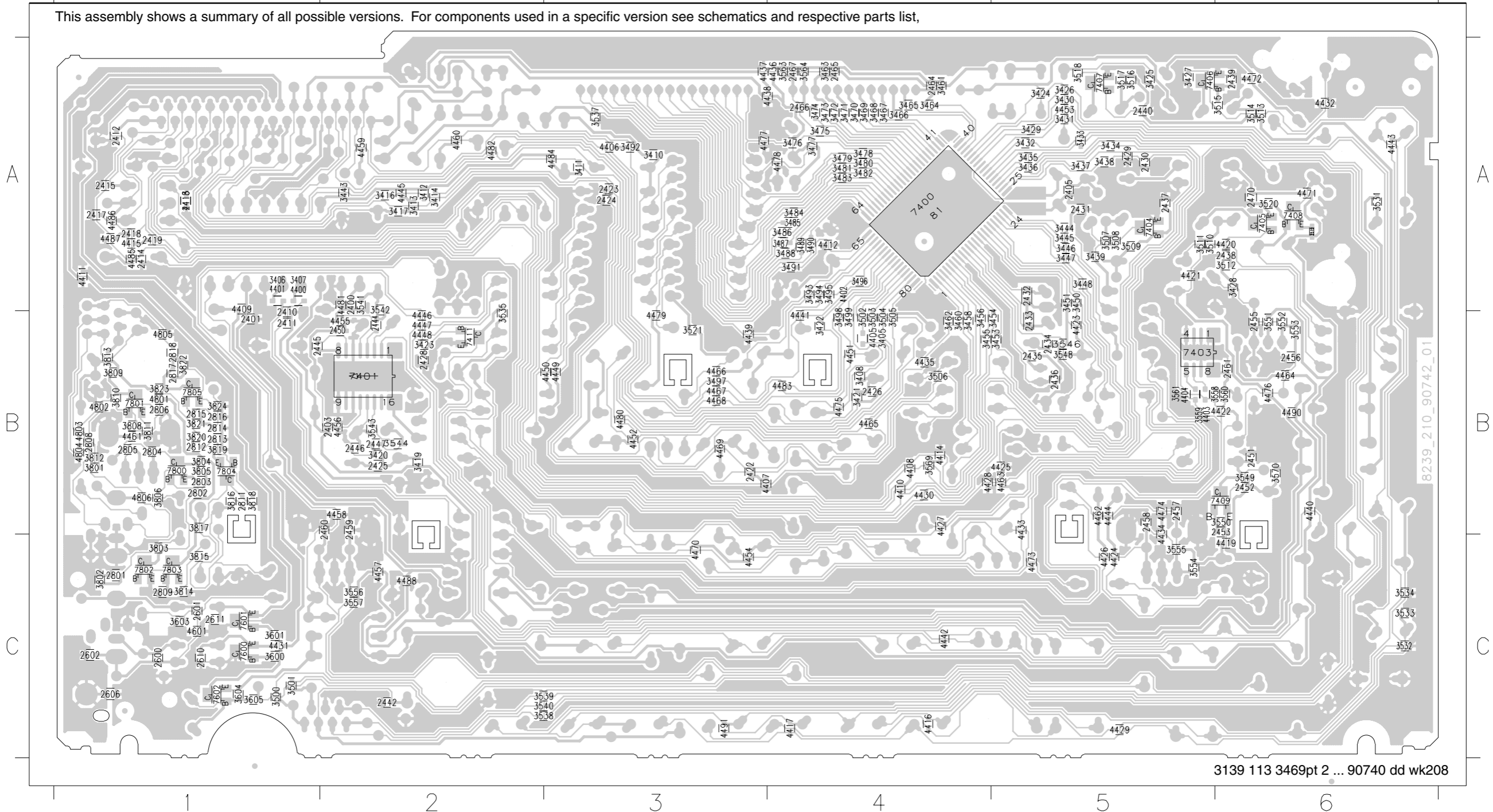
1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491	1492	1493	1494	1495	1496	1497	1498	1499	1500	1501	1502	1503	1504	1505	1506	1507	1508	1509	1510	1511	1512	1513	1514	1515	1516	1517	1518	1519	1520	1521	1522	1523	1524	1525	1526	1527	1528	1529	1530	1531	1532	1533	1534	1535	1536	1537	1538	1539	1540	1541	1542	1543	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1557	1558	1559	1560	1561	1562	1563	1564	1565	1566	1567	1568	1569	1570	1571	1572	1573	1574	1575	1576	1577	1578	1579	1580	1581	1582	1583	1584	1585	1586	1587	1588	1589	1590	1591	1592	1593	1594	1595	1596	1597	1598	1599	1600	1601	1602	1603	1604	1605	1606	1607	1608	1609	1610	1611	1612	1613	1614	1615	1616	1617	1618	1619	1620	1621	1622	1623	1624	1625	1626	1627	1628	1629	1630	1631	1632	1633	1634	1635	1636	1637	1638	1639	1640	1641	1642	1643	1644	1645	1646	1647	1648	1649	1650	1651	1652	1653	1654	1655	1656	1657	1658	1659	1660	1661	1662	1663	1664	1665	1666	1667	1668	1669	1670	1671	1672	1673	1674	1675	1676	1677	1678	1679	1680	1681	1682	1683	1684	1685	1686	1687	1688	1689	1690	1691	1692	1693	1694	1695	1696	1697	1698	1699	1700	1701	1702	1703	1704	1705	1706	1707	1708	1709	1710	1711	1712	1713	1714	1715	1716	1717	1718	1719	1720	1721	1722	1723	1724	1725	1726	1727	1728	1729	1730	1731	1732	1733	1734	1735	1736	1737	1738	1739	1740	1741	1742	1743	1744	1745	1746	1747	1748	1749	1750	1751	1752	1753	1754	1755	1756	1757	1758	1759	1760	1761	1762	1763	1764	1765	1766	1767	1768	1769	1770	1771	1772	1773	1774	1775	1776	1777	1778	1779	1780	1781	1782	1783	1784	1785	1786	1787	1788	1789	1790	1791	1792	1793	1794	1795	1796	1797	1798	1799	1800	1801	1802	1803	1804	1805	1806	1807	1808	1809	1810	1811	1812	1813	1814	1815	1816	1817	1818	1819	1820	1821	1822	1823	1824	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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CHIP LAYOUT

2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500
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This assembly shows a summary of all possible versions. For components used in a specific version see schematics and respective parts list,



ELECTRICAL PARTS LIST - FRONT BOARD**MISCELLANEOUS**

1400	3139 110 52850	FTD Display 12-ST-29GNK	2434	5322 126 11583	10nF 10% 50V
1402	4822 267 10953	Flex Socket 7pin Vert.	2435	4822 122 33752	15pF 5% 50V
1406	2422 128 02917	Tact Switch	2436	4822 122 33752	15pF 5% 50V
1407	2422 128 02917	Tact Switch	2443	4822 122 33197	1nF 10% 50V
1408	2422 128 02917	Tact Switch	2444	4822 126 14249	560pF 10% 50V
1409	2422 128 02917	Tact Switch	2445	4822 126 14249	560pF 10% 50V
1410	2422 128 02917	Tact Switch	2446	4822 122 33777	47pF 5% 63V
1411	2422 128 02917	Tact Switch	2447	4822 122 33777	47pF 5% 63V
1412	2422 128 02917	Tact Switch	2448	4822 126 12785	47nF +80/-20% 50V
1413	2422 128 02917	Tact Switch	2449	4822 124 22652	2,2µF 20% 50V
1414	2422 128 02917	Tact Switch	2450	2238 586 59812	100nF +80/-20% 50V
1415	2422 128 02917	Tact Switch	2451	2238 586 59812	100nF +80/-20% 50V
1416	2422 128 02917	Tact Switch	2452	2238 586 59812	100nF +80/-20% 50V
1417	2422 128 02917	Tact Switch	2453	5322 126 11583	10nF 10% 50V
1418	2422 128 02917	Tact Switch	2454	4822 124 12032	4,7µF 20% 50V
1420	2422 128 02917	Tact Switch	2456	4822 126 14238	2,2nF 50V
1421	2422 128 02917	Tact Switch	2457	5322 126 11583	10nF 10% 50V
1422	2422 128 02917	Tact Switch	2458	5322 126 11583	10nF 10% 50V
1426	2422 128 02917	Tact Switch	2459	5322 126 11583	10nF 10% 50V
1427	2422 128 02917	Tact Switch	2460	5322 126 11583	10nF 10% 50V
1428	2422 128 02917	Tact Switch	2461	2238 586 59812	100nF +80/-20% 50V
1429	2422 128 02917	Tact Switch	2463	3198 028 52290	22µF 20% 50V
1430	2422 128 02917	Tact Switch	2600	4822 126 14494	22nF 10% 25V
1431	2422 128 02917	Tact Switch	2601	4822 126 14494	22nF 10% 25V
1432	2422 128 02917	Tact Switch	2602	2238 586 59812	100nF +80/-20% 50V
1433	2422 128 02917	Tact Switch	2603	4822 124 22651	1µF 20% 50V
1434	2422 128 02917	Tact Switch	2801	4822 126 13193	4,7nF 10% 63V
1435	2422 129 16707	Rotary Encoder 24P	2802	2238 586 59812	100nF +80/-20% 50V
1436	2422 129 16708	Rotary Encoder 24P	2803	5322 126 11578	1nF 10% 50V
1437	4822 242 11033	X'tal Resonator 4,332MHz	2804	3198 017 44740	470nF 10V
1438	2422 025 17413	Flex Socket 32pin Hort.	2805	3198 017 44740	470nF 10V
1439	2422 025 17414	Flex Socket 30pin Hort.	2806	4822 126 13909	680pF 10% 50V
1600	2422 026 05059	Headphone Socket	2807	4822 124 81286	47µF 20% 16V
1800	2422 026 05059	Mic Socket /21M	2808	3198 017 41050	1µF 10V
1801	4822 267 10958	Flex Socket 5pin Hort.	2809	2238 586 59812	100nF +80/-20% 50V

CAPACITORS

2402	4822 124 23432	100µF 20% 10V	2810	4822 124 11947	10µF 20% 16V
2403	2238 586 59812	100nF +80/-20% 50V	2811	2238 586 59812	100nF +80/-20% 50V
2404	4822 124 23432	100µF 20% 10V	2812	3198 017 41050	1µF 10V
2405	2238 586 59812	100nF +80/-20% 50V	2813	5322 126 11578	1nF 10% 50V
2406	4822 124 12032	4,7µF 20% 50V	2814	2238 586 59812	100nF +80/-20% 50V
2407	4822 124 12032	4,7µF 20% 50V	2815	3198 017 41050	1µF 10V
2408	4822 124 12032	4,7µF 20% 50V	2816	4822 126 13909	680pF 10% 50V
2409	4822 124 12032	4,7µF 20% 50V	2817	4822 126 13909	680pF 10% 50V
2412	2238 586 59812	100nF +80/-20% 50V	2818	2238 586 59812	100nF +80/-20% 50V
2425	3198 017 34730	47nF 16V			
2426	4822 126 13879	220nF +80/-20% 16V			
2427	3198 028 52290	22µF 20% 50V			
2428	3198 017 41050	1µF 10V			
2432	2222 867 15339	33pF 5% 50V			
2433	2222 867 15339	33pF 5% 50V			

RESISTORS

3400	4822 050 24708	4R7 1% 0,6W
3402	4822 050 24708	4R7 1% 0,6W
3410	4822 051 30103	10k 5% 0,062W
3411	4822 051 30103	10k 5% 0,062W
3412	4822 051 30103	10k 5% 0,062W
3413	4822 051 30103	10k 5% 0,062W

ELECTRICAL PARTS LIST - FRONT BOARD

3414	4822 051 30102	1k 5% 0,062W	3471	4822 051 30102	1k 5% 0,062W
3415	4822 050 11002	1k 1% 0,4W	3472	4822 051 30102	1k 5% 0,062W
3416	4822 051 30102	1k 5% 0,062W	3473	4822 051 30102	1k 5% 0,062W
3417	4822 051 30102	1k 5% 0,062W	3474	4822 051 30102	1k 5% 0,062W
3418	4822 116 52243	1k5 5% 0,5W	3475	4822 051 30102	1k 5% 0,062W
3419	4822 117 12864	82k 5% 0,062W	3476	4822 051 30102	1k 5% 0,062W
3420	4822 117 12864	82k 5% 0,062W	3477	4822 051 30102	1k 5% 0,062W
3421	4822 051 30474	470k 5% 0,062W	3478	4822 051 30102	1k 5% 0,062W
3422	4822 051 30102	1k 5% 0,062W	3479	4822 051 30102	1k 5% 0,062W
3423	4822 051 30103	10k 5% 0,062W	3480	4822 051 30102	1k 5% 0,062W
3424	4822 051 30102	1k 5% 0,062W	3481	4822 051 30102	1k 5% 0,062W
3425	4822 051 30103	10k 5% 0,062W	3482	4822 051 30102	1k 5% 0,062W
3426	4822 051 30102	1k 5% 0,062W	3483	4822 051 30102	1k 5% 0,062W
3427	4822 051 30103	10k 5% 0,062W	3484	4822 051 30102	1k 5% 0,062W
3428	4822 051 30103	10k 5% 0,062W	3485	4822 051 30102	1k 5% 0,062W
3429	4822 051 30102	1k 5% 0,062W	3486	4822 051 30102	1k 5% 0,062W
3430	4822 051 30102	1k 5% 0,062W	3487	4822 051 30102	1k 5% 0,062W
3431	4822 051 30102	1k 5% 0,062W	3488	4822 051 30102	1k 5% 0,062W
3432	4822 051 30102	1k 5% 0,062W	3489	4822 051 30102	1k 5% 0,062W
3433	4822 051 30102	1k 5% 0,062W	3490	4822 051 30102	1k 5% 0,062W
3434	4822 051 30102	1k 5% 0,062W	3491	4822 051 30102	1k 5% 0,062W
3435	4822 051 30102	1k 5% 0,062W	3492	4822 117 12968	820R 5% 0,062W
3436	4822 051 30102	1k 5% 0,062W	3493	4822 051 30102	1k 5% 0,062W
3437	4822 051 30102	1k 5% 0,062W	3494	4822 051 30102	1k 5% 0,062W
3438	4822 051 30102	1k 5% 0,062W	3495	4822 051 30102	1k 5% 0,062W
3439	4822 051 30103	10k 5% 0,062W	3496	4822 051 30102	1k 5% 0,062W
3443	4822 051 30102	1k 5% 0,062W	3497	4822 051 30102	1k 5% 0,062W
3444	4822 051 30102	1k 5% 0,062W	3498	4822 051 30102	1k 5% 0,062W
3445	4822 051 30102	1k 5% 0,062W	3499	4822 051 30102	1k 5% 0,062W
3446	4822 051 30102	1k 5% 0,062W	3500	4822 051 30102	1k 5% 0,062W
3447	4822 051 30102	1k 5% 0,062W	3501	4822 051 30102	1k 5% 0,062W
3448	4822 051 30102	1k 5% 0,062W	3502	4822 051 30102	1k 5% 0,062W
3449	4822 050 11002	1k 1% 0,4W	3503	4822 051 30102	1k 5% 0,062W
3450	4822 051 30102	1k 5% 0,062W	3504	4822 051 30101	100R 5% 0,062W
3451	4822 051 30102	1k 5% 0,062W	3505	4822 051 30102	1k 5% 0,062W
3452	4822 050 21003	10k 1% 0,6W	3507	4822 051 30471	470R 5% 0,062W
3453	4822 051 30103	10k 5% 0,062W	3508	4822 051 30471	470R 5% 0,062W
3454	4822 051 30102	1k 5% 0,062W	3509	4822 051 30103	10k 5% 0,062W
3455	4822 051 30102	1k 5% 0,062W	3510	4822 051 30471	470R 5% 0,062W
3456	4822 051 30102	1k 5% 0,062W	3511	4822 051 30471	470R 5% 0,062W
3457	4822 050 21003	10k 1% 0,6W	3512	4822 051 30103	10k 5% 0,062W
3458	4822 051 30102	1k 5% 0,062W	3513	4822 051 30471	470R 5% 0,062W
3459	4822 050 21003	10k 1% 0,6W	3514	4822 051 30471	470R 5% 0,062W
3460	4822 051 30102	1k 5% 0,062W	3515	4822 051 30103	10k 5% 0,062W
3462	4822 051 30105	1M 5% 0,062W	3516	4822 051 30471	470R 5% 0,062W
3464	4822 051 30102	1k 5% 0,062W	3517	4822 051 30471	470R 5% 0,062W
3465	4822 051 30102	1k 5% 0,062W	3518	4822 051 30103	10k 5% 0,062W
3466	4822 051 30102	1k 5% 0,062W	3519	4822 117 12968	820R 5% 0,062W
3467	4822 051 30102	1k 5% 0,062W	3520	4822 117 12925	47k 5% 0,062W
3468	4822 051 30102	1k 5% 0,062W	3521	4822 051 30331	330R 5% 0,062W
3469	4822 051 30102	1k 5% 0,062W	3522	4822 116 52219	330R 5% 0,5W
3470	4822 051 30102	1k 5% 0,062W	3523	4822 116 52219	330R 5% 0,5W

ELECTRICAL PARTS LIST - FRONT BOARD**RESISTORS**

3524	4822 116 52219	330R 5% 0,5W	3801	4822 117 11817	1k2 1% 1/16W
3525	4822 116 52219	330R 5% 0,5W	3802	4822 051 30103	10k 5% 0,062W
3526	4822 116 52219	330R 5% 0,5W	3803	4822 051 30103	10k 5% 0,062W
3527	4822 116 52219	330R 5% 0,5W	3804	4822 051 30272	2k7 5% 0,062W
3528	4822 116 52219	330R 5% 0,5W	3805	4822 051 30105	1M 5% 0,062W
3529	4822 116 52219	330R 5% 0,5W	3806	4822 051 30339	33R 5% 0,062W
3531	4822 051 30103	10k 5% 0,062W	3807	2120 366 90292	Potm Rotary 20K
3532	4822 051 30474	470k 5% 0,062W	3808	4822 051 30471	470R 5% 0,062W
3533	4822 051 30474	470k 5% 0,062W	3809	4822 051 30681	680R 5% 0,062W
3534	4822 051 30474	470k 5% 0,062W	3810	4822 051 30105	1M 5% 0,062W
3535	4822 051 30472	4k7 5% 0,062W	3811	4822 051 30331	330R 5% 0,062W
3536	4822 050 11002	1k 1% 0,4W	3812	4822 051 30103	10k 5% 0,062W
3537	4822 051 30474	470k 5% 0,062W	3813	4822 051 30471	470R 5% 0,062W
3538	4822 051 30102	1k 5% 0,062W	3814	4822 051 30105	1M 5% 0,062W
3539	4822 051 30102	1k 5% 0,062W	3815	4822 051 30154	150k 5% 0,062W
3540	4822 051 30102	1k 5% 0,062W	3816	4822 051 30102	1k 5% 0,062W
3541	4822 051 30103	10k 5% 0,062W	3817	4822 117 12903	1k8 1% 0,062W
3542	4822 051 30152	1k5 5% 0,062W	3818	4822 051 30105	1M 5% 0,062W
3543	4822 117 12891	220k 1% 0,062W	3819	4822 051 30101	100R 5% 0,062W
3544	4822 051 30222	2k2 5% 0,062W	3820	4822 051 30103	10k 5% 0,062W
3545	4822 050 21003	10k 1% 0,6W	3821	4822 051 30103	10k 5% 0,062W
3546	4822 051 30103	10k 5% 0,062W	3822	4822 051 30105	1M 5% 0,062W
3547	4822 050 21003	10k 1% 0,6W	3823	4822 051 30123	12k 5% 0,062W
3548	4822 051 30103	10k 5% 0,062W	3824	4822 051 30221	220R 5% 0,062W
3549	4822 051 30103	10k 5% 0,062W	4400	4822 051 30008	OR Jumper 0603
3550	4822 117 13632	100k 1% 0,062W	4401	4822 051 30008	OR Jumper 0603
3551	4822 051 30101	100R 5% 0,062W	4405	4822 051 30008	OR Jumper 0603
3552	4822 051 30103	10k 5% 0,062W	4406	4822 051 30008	OR Jumper 0603
3553	4822 051 30102	1k 5% 0,062W	4409	4822 051 30008	OR Jumper 0603
3554	4822 051 30103	10k 5% 0,062W	4410	4822 051 30008	OR Jumper 0603
3555	4822 051 30103	10k 5% 0,062W	4411	4822 051 30008	OR Jumper 0603
3556	4822 051 30103	10k 5% 0,062W	4412	4822 051 30008	OR Jumper 0603
3557	4822 051 30103	10k 5% 0,062W	4414	4822 051 30008	OR Jumper 0603
3558	4822 051 30682	6k8 5% 0,062W	4417	4822 051 30008	OR Jumper 0603
3559	4822 051 30102	1k 5% 0,062W	4418	4822 051 30008	OR Jumper 0603
3560	4822 051 30682	6k8 5% 0,062W	4419	4822 051 30008	OR Jumper 0603
3561	4822 051 30102	1k 5% 0,062W	4420	4822 051 30008	OR Jumper 0603
3565	4822 050 24708	4R7 1% 0,6W /21M	4421	4822 051 30008	OR Jumper 0603
3565	4822 116 81154	2R2 5% 0,5W /22	4422	4822 051 30008	OR Jumper 0603
3566	4822 116 81154	2R2 5% 0,5W /22	4423	4822 051 30008	OR Jumper 0603
3567	4822 050 24708	4R7 1% 0,6W	4424	4822 051 30008	OR Jumper 0603
3567	4822 116 81154	2R2 5% 0,5W /22	4425	4822 051 30008	OR Jumper 0603
3568	4822 116 81154	2R2 5% 0,5W /22	4426	4822 051 30008	OR Jumper 0603
3569	4822 051 30103	10k 5% 0,062W	4427	4822 051 30008	OR Jumper 0603
3570	4822 117 13632	100k 1% 0,062W	4428	4822 051 30008	OR Jumper 0603
3600	4822 051 30102	1k 5% 0,062W	4429	4822 051 30008	OR Jumper 0603
3601	4822 051 30102	1k 5% 0,062W	4430	4822 051 30008	OR Jumper 0603
3602	4822 050 11002	1k 1% 0,4W	4431	4822 051 30008	OR Jumper 0603
3603	4822 051 30472	4k7 5% 0,062W	4432	4822 051 30008	OR Jumper 0603
3604	4822 051 30472	4k7 5% 0,062W	4433	4822 051 30008	OR Jumper 0603
3605	4822 051 30103	10k 5% 0,062W	4434	4822 051 30008	OR Jumper 0603
3800	4822 050 11002	1k 1% 0,4W	4435	4822 051 30008	OR Jumper 0603

ELECTRICAL PARTS LIST - FRONT BOARD

4437	4822 051 30008	OR Jumper 0603	4491	4822 051 30008	OR Jumper 0603
4438	4822 051 30008	OR Jumper 0603	4601	4822 051 30008	OR Jumper 0603
4439	4822 051 30008	OR Jumper 0603	4801	4822 051 30008	OR Jumper 0603
4440	4822 051 30008	OR Jumper 0603	4802	4822 051 30008	OR Jumper 0603
4441	4822 051 30008	OR Jumper 0603	4803	4822 051 30008	OR Jumper 0603
4442	4822 051 30008	OR Jumper 0603	4804	4822 051 30008	OR Jumper 0603
4443	4822 051 30008	OR Jumper 0603	4805	4822 051 30008	OR Jumper 0603
4444	4822 051 30008	OR Jumper 0603	4806	4822 051 30008	OR Jumper 0603
4445	4822 051 30008	OR Jumper 0603			
4446	4822 051 30008	OR Jumper 0603			
4447	4822 051 30008	OR Jumper 0603			
4448	4822 051 30008	OR Jumper 0603			
4449	4822 051 30008	OR Jumper 0603			
4450	4822 051 30008	OR Jumper 0603			
4451	4822 051 30008	OR Jumper 0603			
4452	4822 051 30008	OR Jumper 0603			
4453	4822 051 30008	OR Jumper 0603			
4454	4822 051 30008	OR Jumper 0603			
4455	4822 051 30008	OR Jumper 0603			
4456	4822 051 30008	OR Jumper 0603			
4457	4822 051 30008	OR Jumper 0603			
4458	4822 051 30008	OR Jumper 0603			
4459	4822 051 30008	OR Jumper 0603			
4460	4822 051 30008	OR Jumper 0603			
4461	4822 051 30008	OR Jumper 0603			
4462	4822 051 30008	OR Jumper 0603			
4463	4822 051 30008	OR Jumper 0603			
4464	4822 051 30008	OR Jumper 0603			
4465	4822 051 30008	OR Jumper 0603			
4466	4822 051 30008	OR Jumper 0603			
4467	4822 051 30008	OR Jumper 0603			
4468	4822 051 30008	OR Jumper 0603			
4469	4822 051 30008	OR Jumper 0603			
4470	4822 051 30008	OR Jumper 0603			
4471	4822 051 30008	OR Jumper 0603			
4472	4822 051 30008	OR Jumper 0603			
4473	4822 051 30008	OR Jumper 0603			
4474	4822 051 30008	OR Jumper 0603			
4475	4822 051 30008	OR Jumper 0603			
4476	4822 051 30008	OR Jumper 0603			
4477	4822 051 30008	OR Jumper 0603			
4478	4822 051 30008	OR Jumper 0603			
4479	4822 051 30008	OR Jumper 0603			
4480	4822 051 30008	OR Jumper 0603			
4481	4822 051 30008	OR Jumper 0603			
4482	4822 051 30008	OR Jumper 0603			
4483	4822 051 30008	OR Jumper 0603			
4484	4822 051 30008	OR Jumper 0603			
4485	4822 051 30008	OR Jumper 0603			
4486	4822 051 30008	OR Jumper 0603			
4488	4822 051 30008	OR Jumper 0603			
4490	4822 051 30008	OR Jumper 0603			

COILS & FILTERS

5400	4822 157 62552	Coil 2,2uH 5%
5402	4822 242 72066	Ceram Resonator 8MHz
5403	2422 543 01069	X'tal Resonator 32,768kHz
5404	4822 157 62552	Coil 2,2uH 5%
5405	4822 157 62552	Coil 2,2uH 5%
5600	4822 157 62552	Coil 2,2uH 5%
5601	4822 157 62552	Coil 2,2uH 5%
5602	4822 157 62552	Coil 2,2uH 5%
5800	4822 157 11235	Coil 22uH 5%

DIODES

6400	4822 130 31878	1N4003G
6401	4822 130 31878	1N4003G
6402	4822 130 31878	1N4003G
6404	4822 130 30621	1N4148
6405	4822 130 30621	1N4148
6406	4822 130 30621	1N4148
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6409	4822 130 30621	1N4148
6410	4822 130 30621	1N4148
6411	4822 130 30621	1N4148
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6417	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6422	9322 178 15676	LTL-8166FTNN
6423	9322 178 15676	LTL-8166FTNN
6424	9322 178 15676	LTL-8166FTNN
6425	9322 178 15676	LTL-8166FTNN
6426	4822 130 30621	1N4148
6427	9322 179 76676	LTL-816EELC
6428	4822 130 30621	1N4148
6429	4822 130 30621	1N4148
6430	4822 130 30621	1N4148
6600	4822 130 30621	1N4148
6800	4822 130 30621	1N4148
6801	4822 130 30621	1N4148

ELECTRICAL PARTS LIST - FRONT BOARD

TRANSISTORS & INTEGRATED CIRCUITS

7400	3139	110	52961	TMP87CS71F "V355S52961" for FW-V355/21M
7400	3139	110	53141	TMP87CS71F "M355S53141" for FW-M355/22
7401	9352	679	67118	SAA6579T/V1/M4
7402	9322	155	82667	IR Reciver TSOP2236ZC1
7403	9965	000	04931	M24C01-WMN6
7404	4822	130	60511	BC847B
7405	4822	130	60511	BC847B
7406	4822	130	60511	BC847B
7407	4822	130	60511	BC847B
7408	4822	130	60373	BC857B
7409	4822	130	60511	BC847B
7411	4822	130	60511	BC847B
7600	4822	130	42804	BC817-25
7601	4822	130	42804	BC817-25
7602	4822	130	60373	BC857B
7800	4822	130	60511	BC847B
7801	4822	130	60511	BC847B
7802	4822	130	60511	BC847B
7803	4822	130	60511	BC847B
7804	4822	130	60511	BC847B
7805	4822	130	60511	BC847B

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

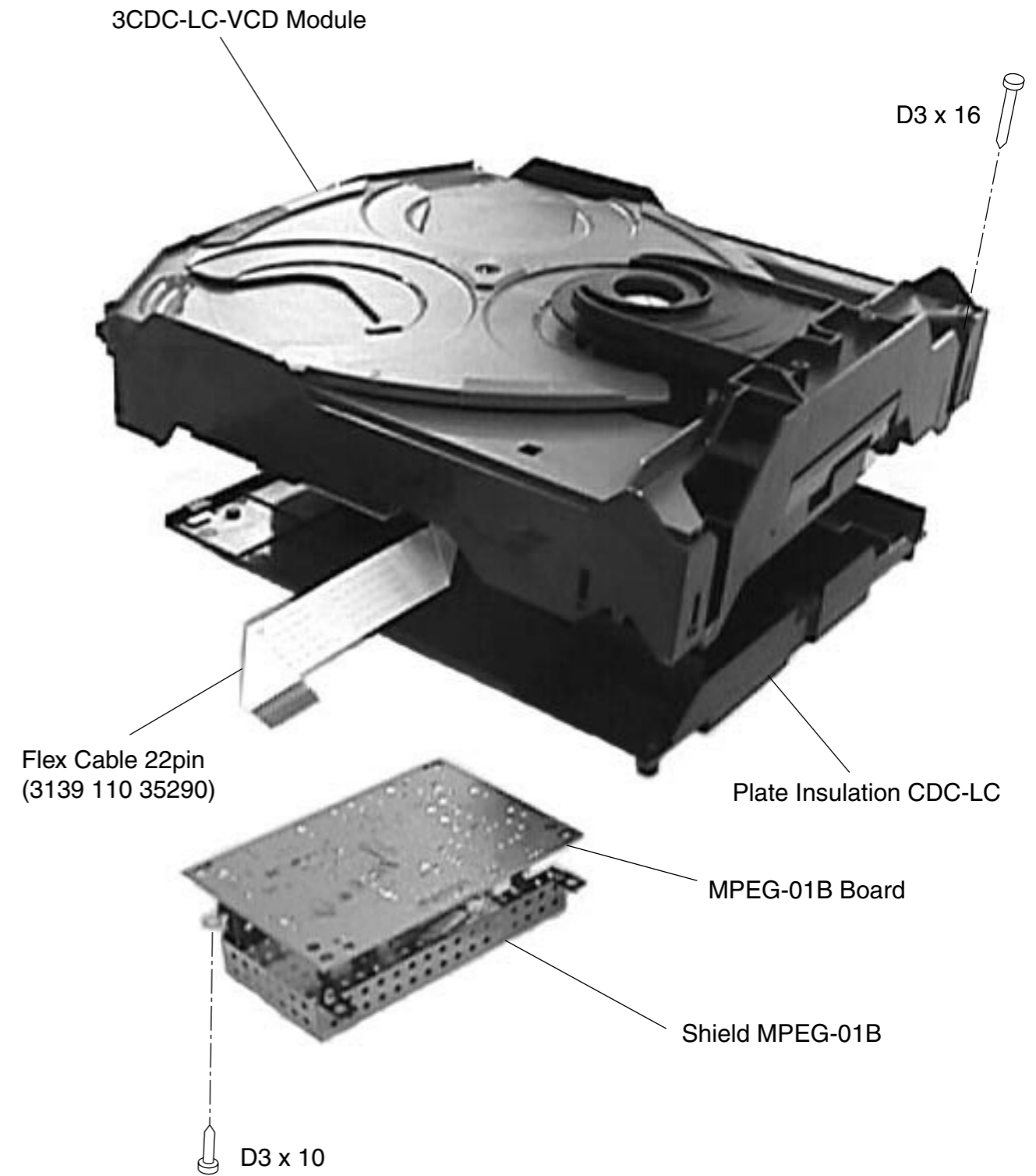
VCD - MPEG-01B MODULE

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

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EXPLODED VIEW OF MODULE



NOTES:***Brief Introduction on the MPEG***

1. When VCD source is selected the MPEG_RESET line will go positive triggering the following:
 - DRST pulse to reset 8-bit microcontroller IC 7212
 - RSTOUT# pulse to reset IC 7201 ES3880
 - IC7212 sends CD10_RST to reset Signal Processor IC 7802 on the CD Board.

2. Communication will establish as follows:
 - DSA_ACK, DSA_STB and DSA_DAT between μ Processor IC 7401 on the Front Board and IC 7201 ES3880.
 - DSA_STB to IC7204 ES3883 to select between NTSC (Lo) or PALS (Hi)
 - DSA_A, DSA_D and DSA_S between IC 7201 ES3880 and microcontroller IC7212
 - SILD, SICL, RAB and SDA between microcontroller IC7212 and Signal Processor IC7802 on the CD Board.

3. Other activities between IC7201 ES3880 and Eprom IC7202, Dram IC7203 and IC7204 ES3883 will follows resulting in the OSD display on the TV set connected to the Video out socket.

4. When play button is activated the I²S signal (IIS_SCLK, IIS_WCLK and IIS_DATA) from the CD Board will enter IC7201 ES3880 which will work closely with the Eprom IC7202 and Dram IC7203. Inverter IC7205 74HC04D serves to reconstruct the Digital signal & level required by IC7201 ES3880.

5. Digital Audio information (AUDIOCLK, AUDA and BCLK) will be send to DAC (Digital to Analog Converter) of IC7204 ES3883.

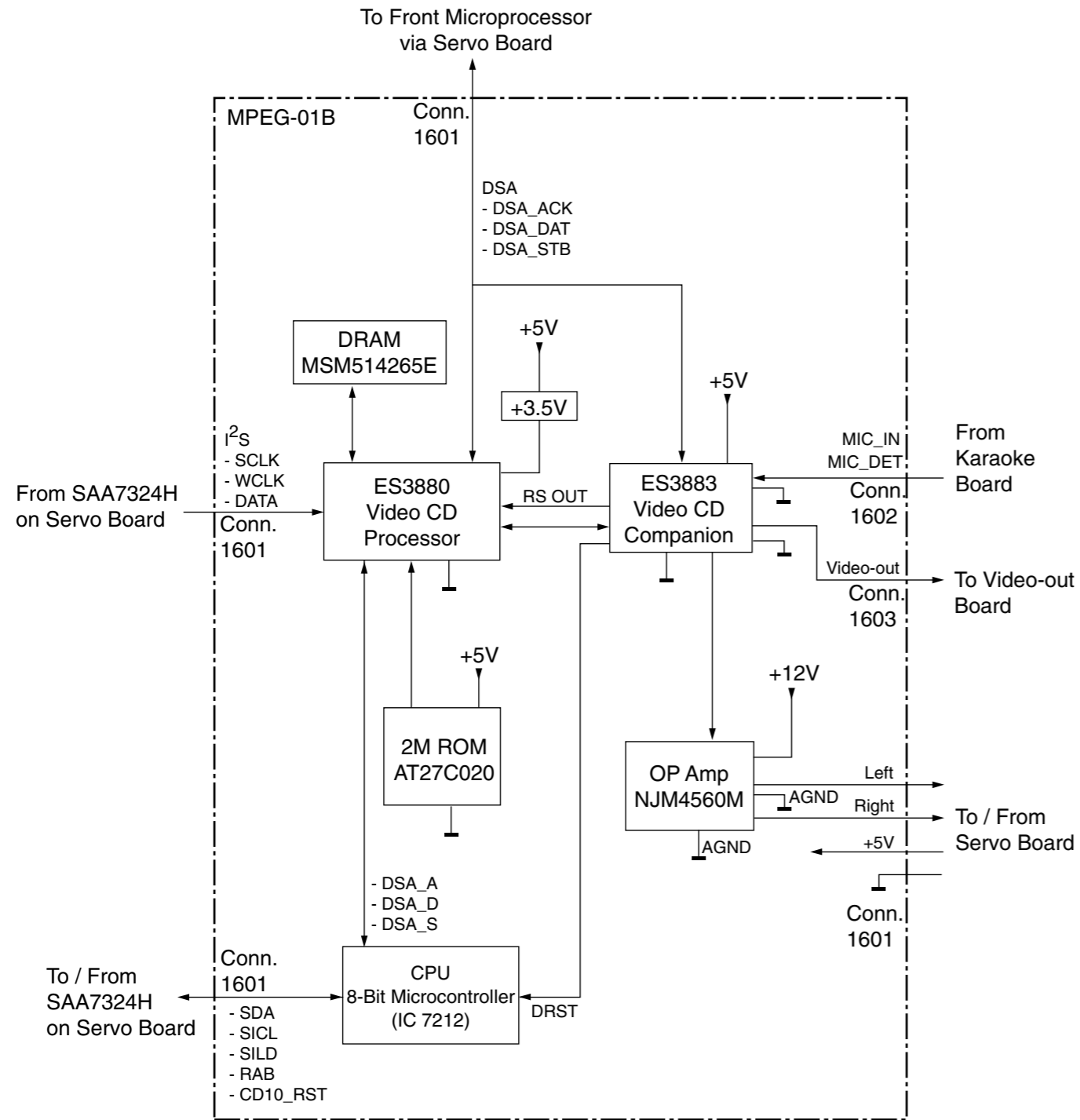
6. Analog output (AOL+, AOL-, AOR+ and AOR-) is amplified by the differential Op. Amplifier IC7207 NJM4560M.

7. Digital Video information YUV(0....7) will be send to the Video processing part of IC7204 ES3883 and out to the Video out socket.

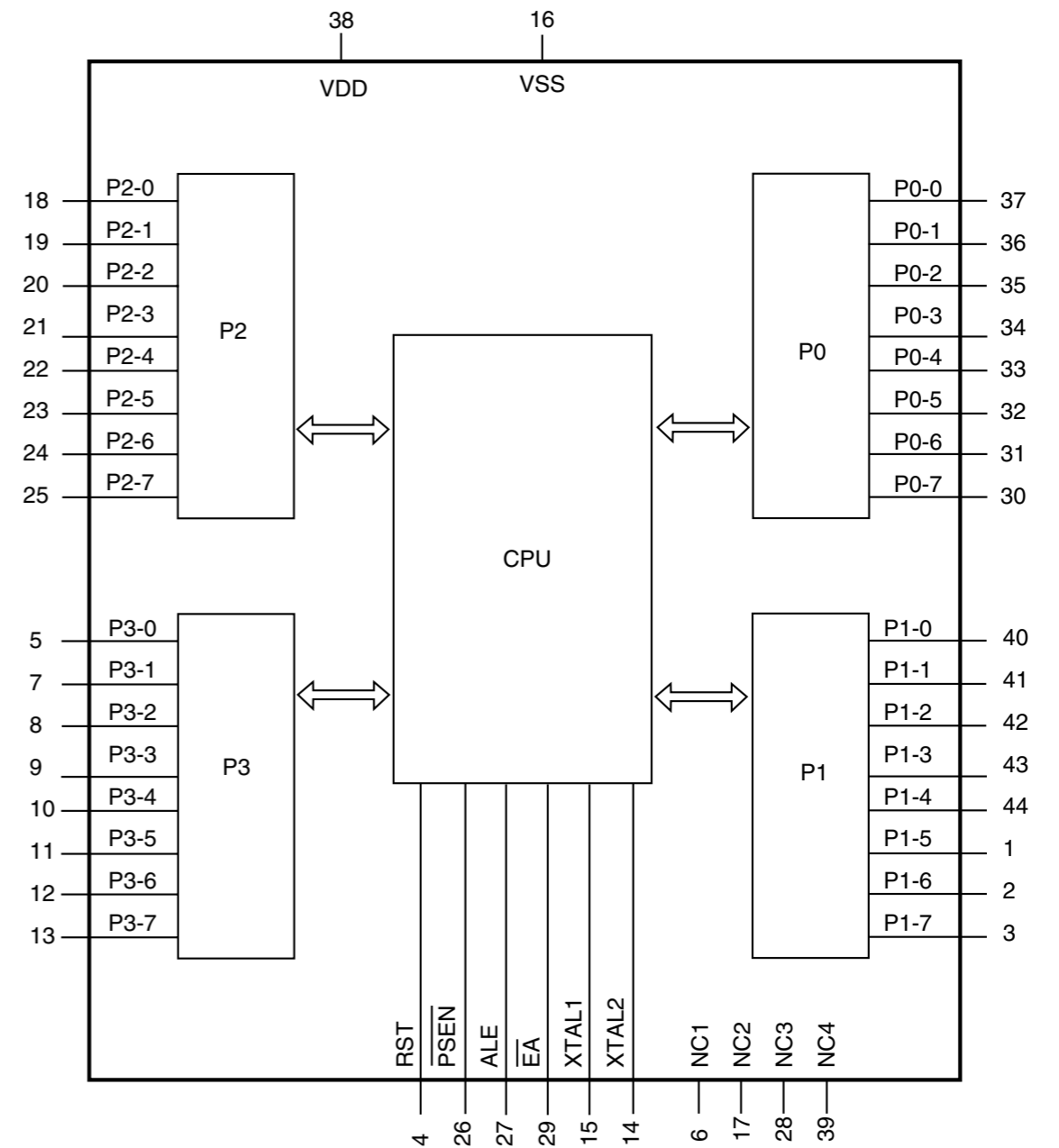
8. The HSYNC & VSYNC from IC7204 ES3883 to IC7201 ES3880 are to synchronize the Digital Video Information.

9. Mic Echo Input into IC7204 ES3883 is converted to digital signal (ARCLK, AIN and ARFS) for IC7201 ES3880 to combine into the Digital Audio Information.

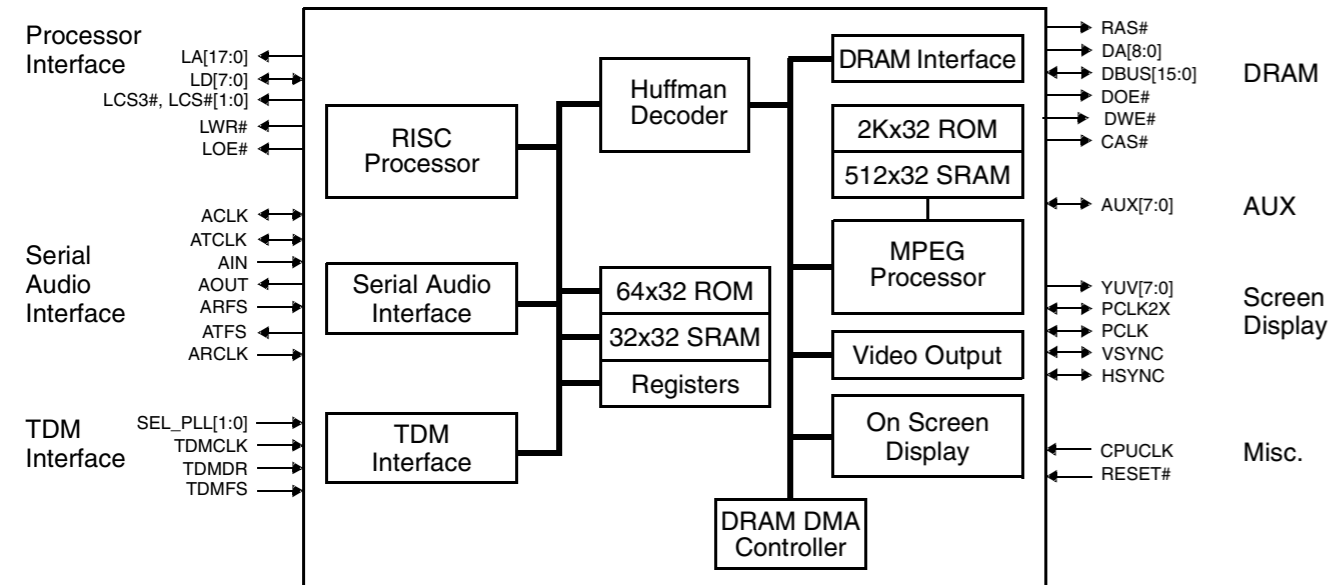
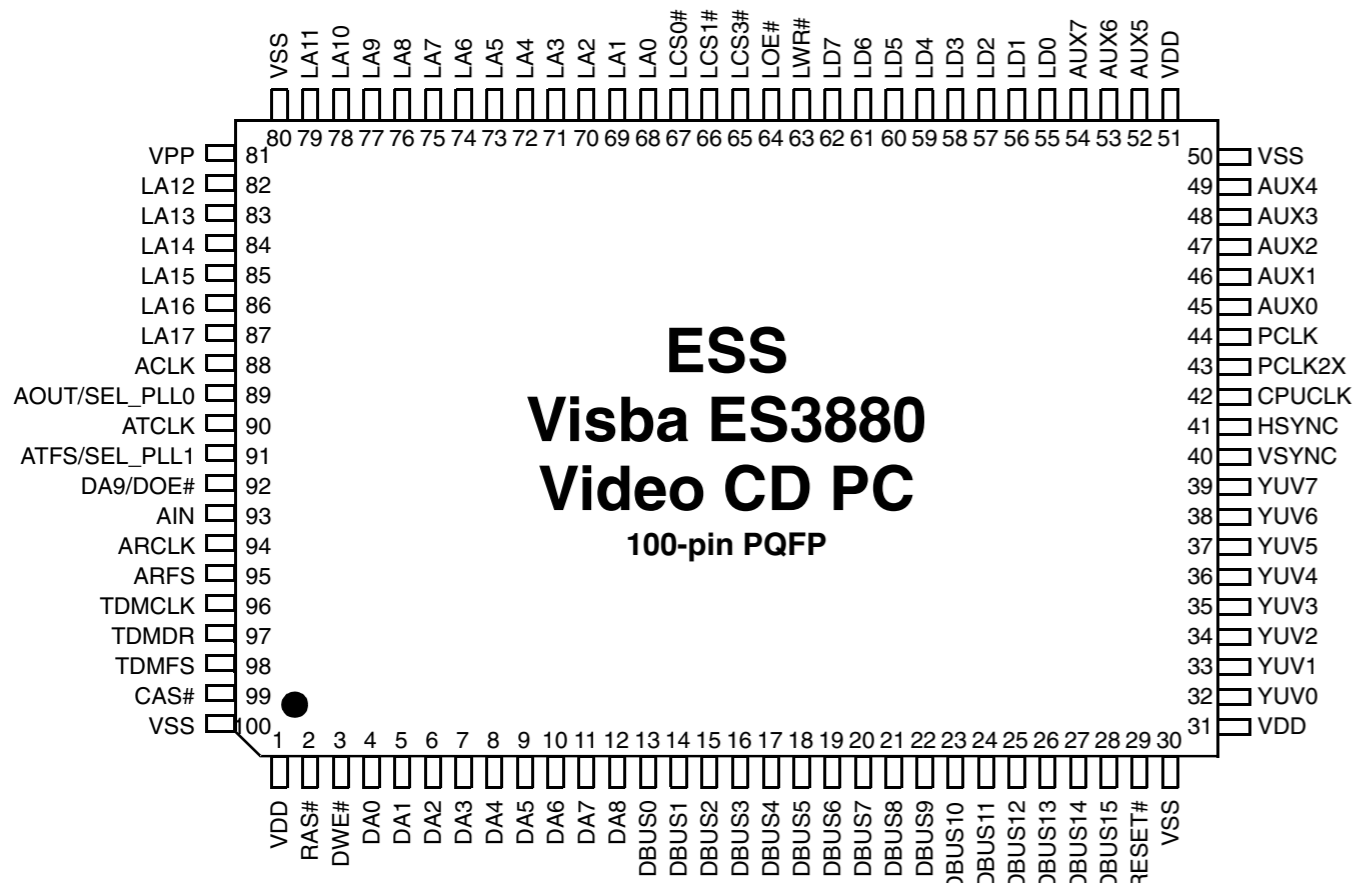
MPEG-01B BLOCK DIAGRAM



8-BIT MICROCONTROLLER (IC 7212) INTERNAL BLOCK



ES3880 VIDEO CD PROCESSOR CHIP

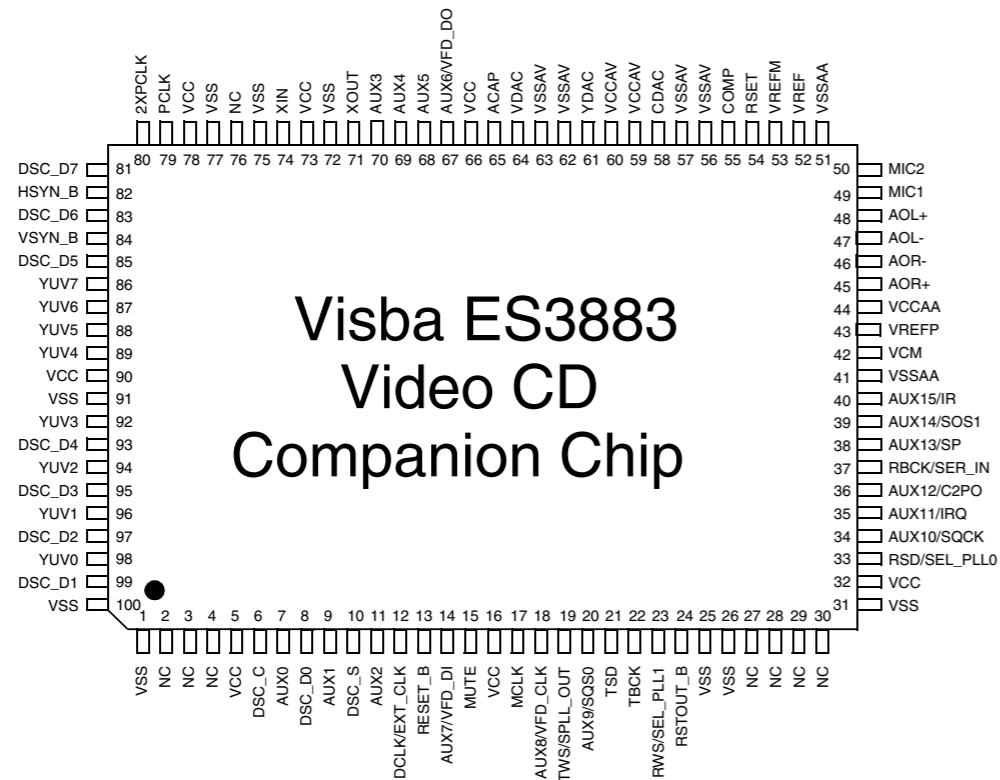


Visba Video CD PC Block Diagram

VISBA VIDEO PC PROCESSOR CHIP PIN DESCRIPTION

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

ES3883 VIDEO CD COMPANION CHIP

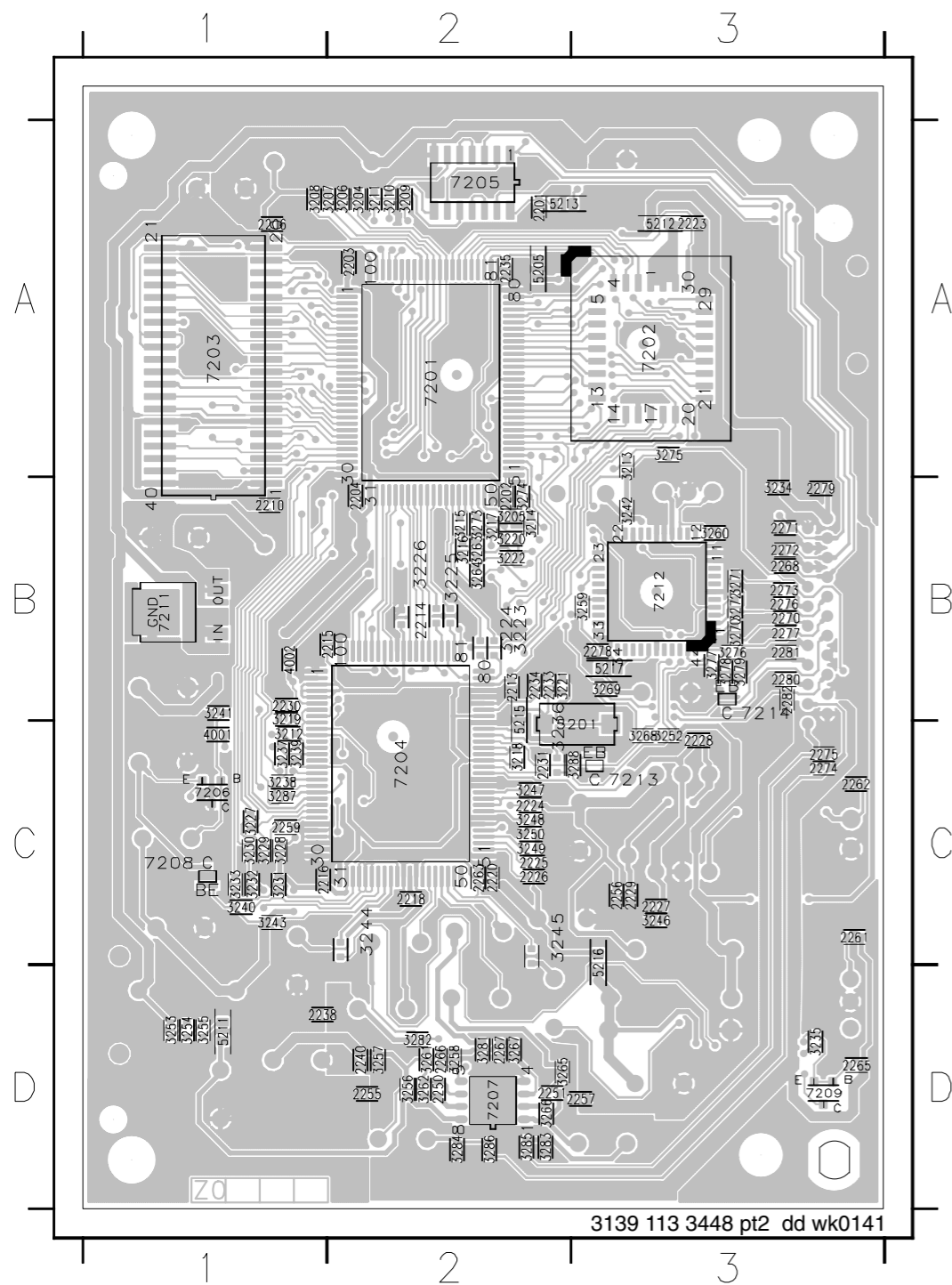


PIN DESCRIPTION

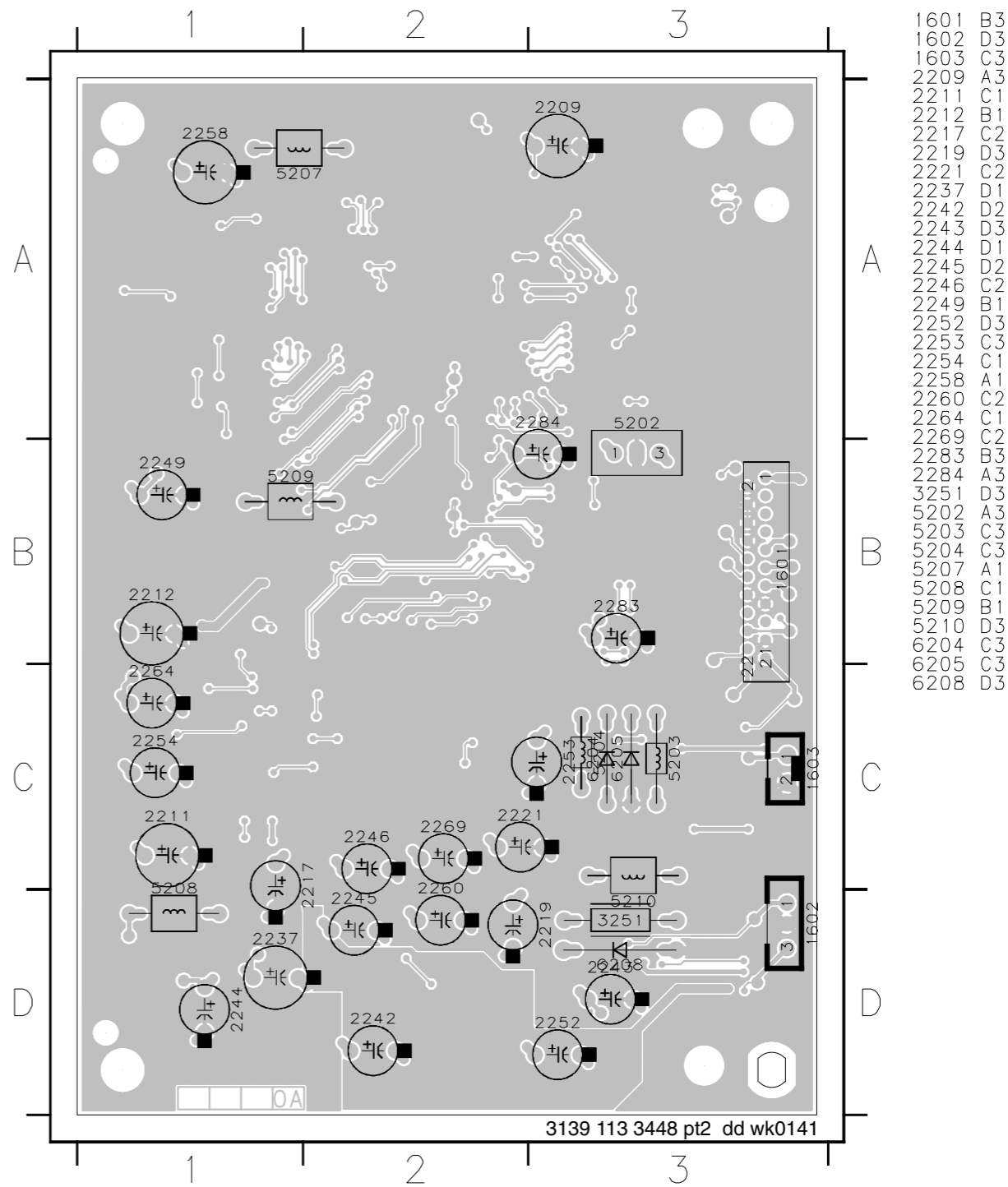
Name	Number	I/O	Definition
VSS	1,25,26,31,72,75,77,91,100	I	Ground.
VCC	5,16,32,66,73,78,90	I	Voltage supply, 5 V.
DSC_C	6	I	Clock for programming to access internal registers.
AUX0	7	I/O	Servo Forward or Control Pin.
AUX1	9	I/O	Servo Reverse or Control Pin.
AUX2	11	I/O	Servo LDON or Control Pin.
AUX3	70	I/O	Servo CW/Limit or Control Pin.
AUX4	69	I/O	Servo CCW/Close or Control Pin.
AUX5	68	I/O	Servo Data or Control Pin.
AUX6	67	I/O	Servo XLAT or Control Pin/VFD_DO.
AUX7	14	I/O	Servo BRKM/Sense or Control Pin/VFD_DI.
AUX8	18	I/O	Servo Mute/Open or Control Pin/VFD_CLK.
AUX9	20	I/O	Servo SQS0 or Control Pin.
AUX10	34	I/O	Servo SQCK or Control Pin.
AUX11	35	I/O	3880 IRQ or Interrupt Output or Control Pin.
AUX12	36	I/O	CD C2PO or Interrupt Input or Control Pin.
AUX13	38	I/O	Serial Interrupt/CD-Mute or Control Pin.
AUX14	39	I/O	Servo SCOR (S0S1) or Interrupt Input or Control Pin.
AUX15	40	I/O	Interrupt Input or Control Pin.
DSC_D[7:0]	81,83,85,93,95,97,99,8	I/O	Data for programming to access internal registers.
DSC_S	10	I	Strobe for programming to access internal registers.
DCLK	12	O	Dual-purpose pin DCLK is the MPEG decoder clock.
EXT_CLK		I	EXT_CLK is the external clock EXT_CLK is an input during bypass PLL mode.
RESET_B	13	I	Video reset (active-low).
MUTE	15	O	Audio mute.
MCLK	17	I	Audio master clock.
TWS	19	I	Dual-purpose pin TWS is the transmit audio frame sync.
SPLL_OUT		O	SPLL_OUT is the select PLL output.

Name	Number	I/O	Definition																
TSD	21	I	Transmit audio data input.																
TBCK	22	I	Transmit audio bit clock.																
RWS	23	O	Dual-purpose pin RWS is the receive audio frame sync.																
SEL_PLL1		I	Pins SEL_PLL[1:0] select the PLL clock frequency for the DCLK output.																
				<table border="1"> <thead> <tr> <th>SEL_PLL1</th> <th>SEL_PLL0</th> <th>DCLK</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>Bypass PLL (input mode)</td> </tr> <tr> <td>0</td> <td>1</td> <td>27 MHz (output mode)</td> </tr> <tr> <td>1</td> <td>0</td> <td>32.4 MHz (output mode)</td> </tr> <tr> <td>1</td> <td>1</td> <td>40.5 MHz (output mode)</td> </tr> </tbody> </table>	SEL_PLL1	SEL_PLL0	DCLK	0	0	Bypass PLL (input mode)	0	1	27 MHz (output mode)	1	0	32.4 MHz (output mode)	1	1	40.5 MHz (output mode)
SEL_PLL1		SEL_PLL0	DCLK																
0	0	Bypass PLL (input mode)																	
0	1	27 MHz (output mode)																	
1	0	32.4 MHz (output mode)																	
1	1	40.5 MHz (output mode)																	
RSTOUT_B	24	O	Reset output (active-low).																
NC	2:4,27:30,76		No connect. Do not connect to these pins.																
RSD	33	O	Dual-purpose pin. RSD is the receive audio data input.																
SEL_PLL0		I	SEL_PLL0 along with SEL_PLL1 select the PLL clock frequency for the DCLK output. See the table for pin number 23.																
RBCK	37	O	Dual-purpose pin. RBCK is the receive audio bit clock.																
SER_IN		I	SER_IN is the serial input DSC mode. 0 - Parallel DSC mode. 1 - Serial DSC mode.																
VSSAA	41,51	I	Audio Analog Ground.																
VCM	42	I	ADC Common Mode Reference (CMR) buffer output. CMR is approximately 2.25 V. Bypass to analog ground with 47 nF electrolytic in parallel with 0.1 nF.																
VREFP	43	I	DAC and ADC maximum reference. Bypass to VCMR with 10 nF in parallel with 0.1 nF.																
VCCAA	44	I	Analog VCC, 5 V.																
AOR+, AOR-	45:46	O	Right channel output.																
AOL-, AOL+	47:48	O	Left channel output.																
MIC1	49	I	Microphone input 1.																
MIC2	50	I	Microphone input 2.																
VREF	52	I	Internal resistor divider generates Common Mode Reference (CMR) voltage. Bypass to analog ground with 0.1 nF.																
VREFM	53	I	DAC and ADC minimum reference. Bypass to VCMR with 10 nF in parallel with 0.1 nF.																
RSET	54	I	Full scale DAC current adjustment.																
COMP	55	I	Compensation pin.																
VSSAV	56:57,62:63	I	Video Analog Ground																
CDAC	58	O	Modulated chrominance output.																
VCCAV	59,60	I	Video VCC, 5 V																
YDAC	61	O	Y luminance data bus for screen video port.																
VDAC	64	O	Composite video output.																
ACAP	65	I	Audio CAP																
XOUT	71	O	Crystal output.																
XIN	74	I	27 MHz crystal input.																
PCLK	79	I/O	13.5 MHz pixel clock.																
2XPCLK	80	I/O	27 MHz (2 times pixel clock).																
HSYN_B	82	O	Horizontal sync (active-low).																
VSYN_B	84	O	Vertical sync (active-low).																
YUV[7:0]	86:89,92,94,96,98	I	YUV data bus for screen video port.																

MPEG-01B BOARD LAYOUT



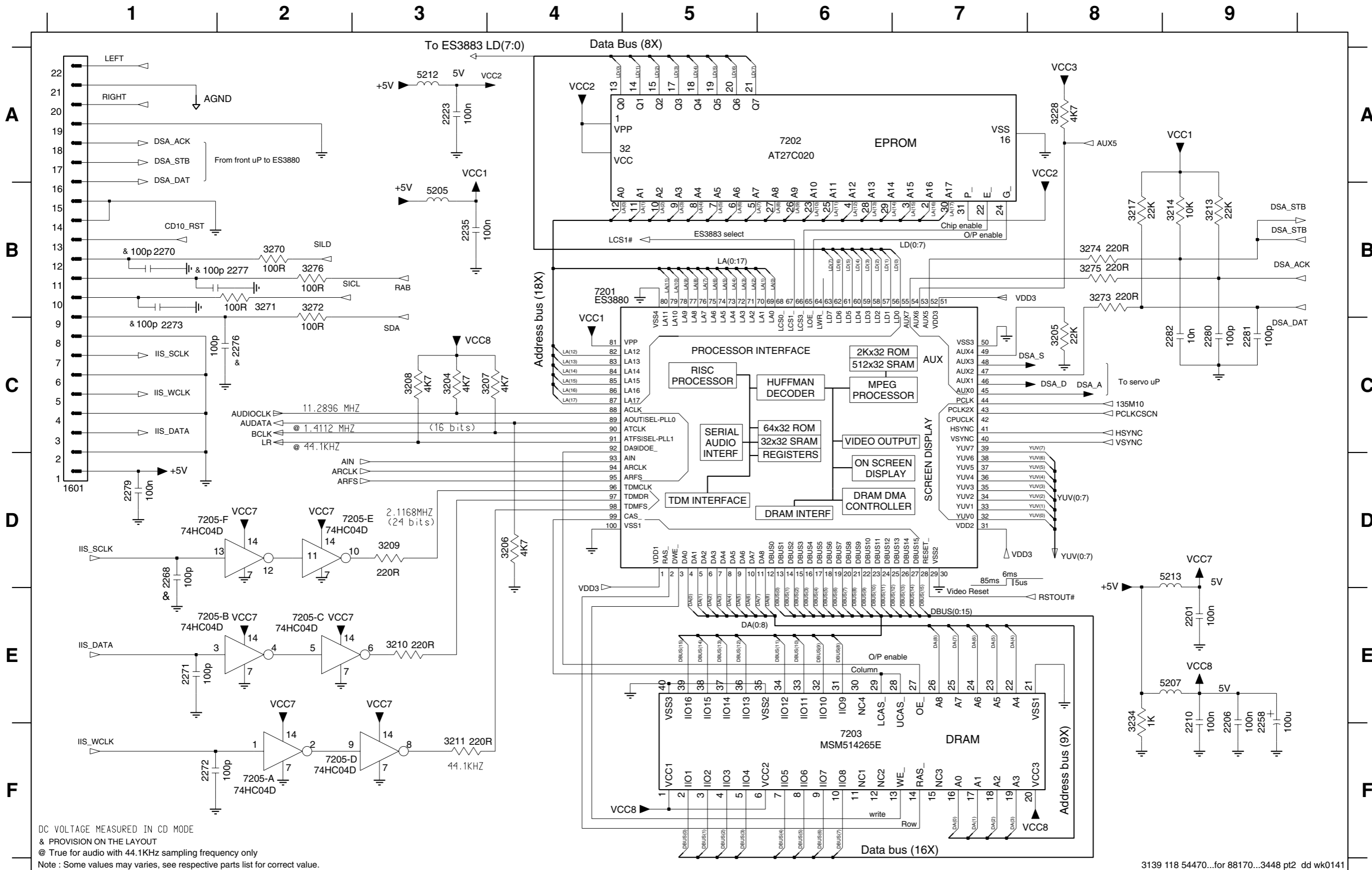
2201	A2	3211	A2	3271	B3
2202	B2	3212	C1	3272	B3
2203	A2	3213	A3	3273	B2
2204	B2	3214	B2	3274	B2
2206	A1	3215	B2	3275	A3
2210	B1	3216	B2	3276	B3
2213	B2	3217	B2	3277	B3
2214	B2	3218	C2	3278	B3
2215	B2	3219	B1	3279	B3
2216	C1	3220	B2	3281	D2
2218	C2	3221	B2	3282	D2
2220	C2	3222	B2	3283	D2
2223	A3	3223	B2	3284	D2
2224	C2	3224	B2	3285	D2
2225	C2	3225	B2	3286	D2
2226	C2	3226	B2	3287	C1
2227	C3	3227	C1	3288	C3
2228	C3	3228	C1	4001	C1
2229	C3	3229	C1	4002	B1
2230	B1	3230	C1	5201	C3
2231	C2	3231	C1	5205	A2
2233	B2	3232	C1	5211	D1
2234	B2	3233	C1	5212	A3
2235	A2	3234	B3	5213	A2
2238	D1	3235	D3	5215	B2
2240	D2	3236	C2	5216	C3
2250	D2	3237	C1	5217	B3
2251	D2	3238	C1	7201	A2
2255	D2	3239	C1	7202	A3
2256	C3	3240	C1	7203	A1
2257	D3	3241	B1	7204	C2
2259	C1	3242	B3	7205	A2
2261	C3	3243	C1	7206	C1
2262	C3	3244	C2	7207	D2
2263	C2	3245	C2	7208	C1
2265	D3	3246	C3	7209	D3
2266	D2	3247	C2	7211	B1
2267	D2	3248	C2	7212	B3
2268	B3	3249	C2	7213	C3
2270	B3	3250	C2	7214	B3
2271	B3	3252	C3		
2272	B3	3253	D1		
2273	B3	3254	D1		
2274	C3	3255	D1		
2275	C3	3256	D2		
2276	B3	3257	D2		
2277	B3	3258	D2		
2278	B3	3259	B3		
2279	B3	3260	B3		
2280	B3	3261	D2		
2281	B3	3262	D2		
2282	B3	3263	B2		
3204	A2	3264	B2		
3205	B2	3265	D2		
3206	A2	3266	D2		
3207	A2	3267	D2		
3208	A1	3268	C3		
3209	A2	3269	B3		
3210	A2	3270	B3		



1601	B3
1602	D3
1603	C3
2209	A3
2211	C1
2212	B1
2217	C2
2219	D3
2221	C2
2237	D1
2242	D2
2243	D3
2244	D1
2245	D2
2246	C2
2249	B1
2252	D3
2253	C3
2254	C1
2258	A1
2260	C2
2264	C1
2269	C2
2283	B3
2284	A3
3251	D3
5202	A3
5203	C3
5204	C3
5207	A1
5208	C1
5209	B1
5210	D3
6204	C3
6205	C3
6208	D3

ES3880 CIRCUIT

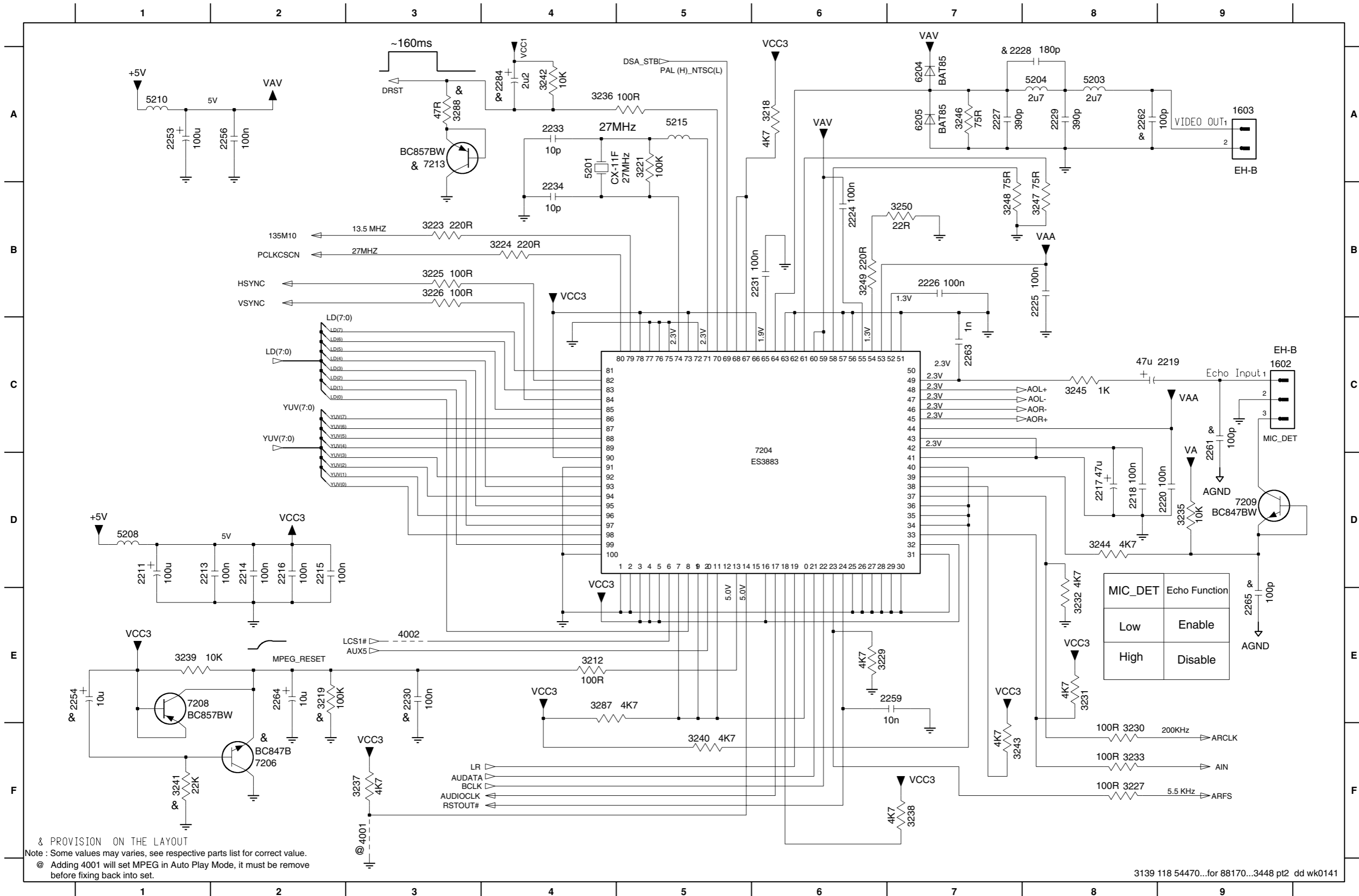
1601 D1	2210 E9	2258 E9	2271 E1	2276 C2	2280 C9	3204 C3	3207 C4	3210 E3	3214 B9	3234 E8	3272 B2	3275 B8	5207 E9	7201 B4	7205-A F2	7205-D F2
2201 E9	2223 A3	2268 D1	2272 F1	2277 B2	2281 C9	3205 C8	3208 C3	3211 F3	3217 B8	3270 B2	3273 B8	3276 B2	5212 A3	7202 A6	7205-B E1	7205-E D2
2206 E9	2235 B3	2270 B1	2273 C1	2279 D1	2282 C9	3206 D4	3209 D3	3213 B9	3228 A8	3271 B2	3274 B8	5205 B3	5213 D9	7203 F6	7205-C E2	7205-F D1



DC VOLTAGE MEASURED IN CD MODE
 & PROVISION ON THE LAYOUT
 © True for audio with 44.1KHz sampling frequency only
 Note : Some values may varies, see respective parts list for correct value.

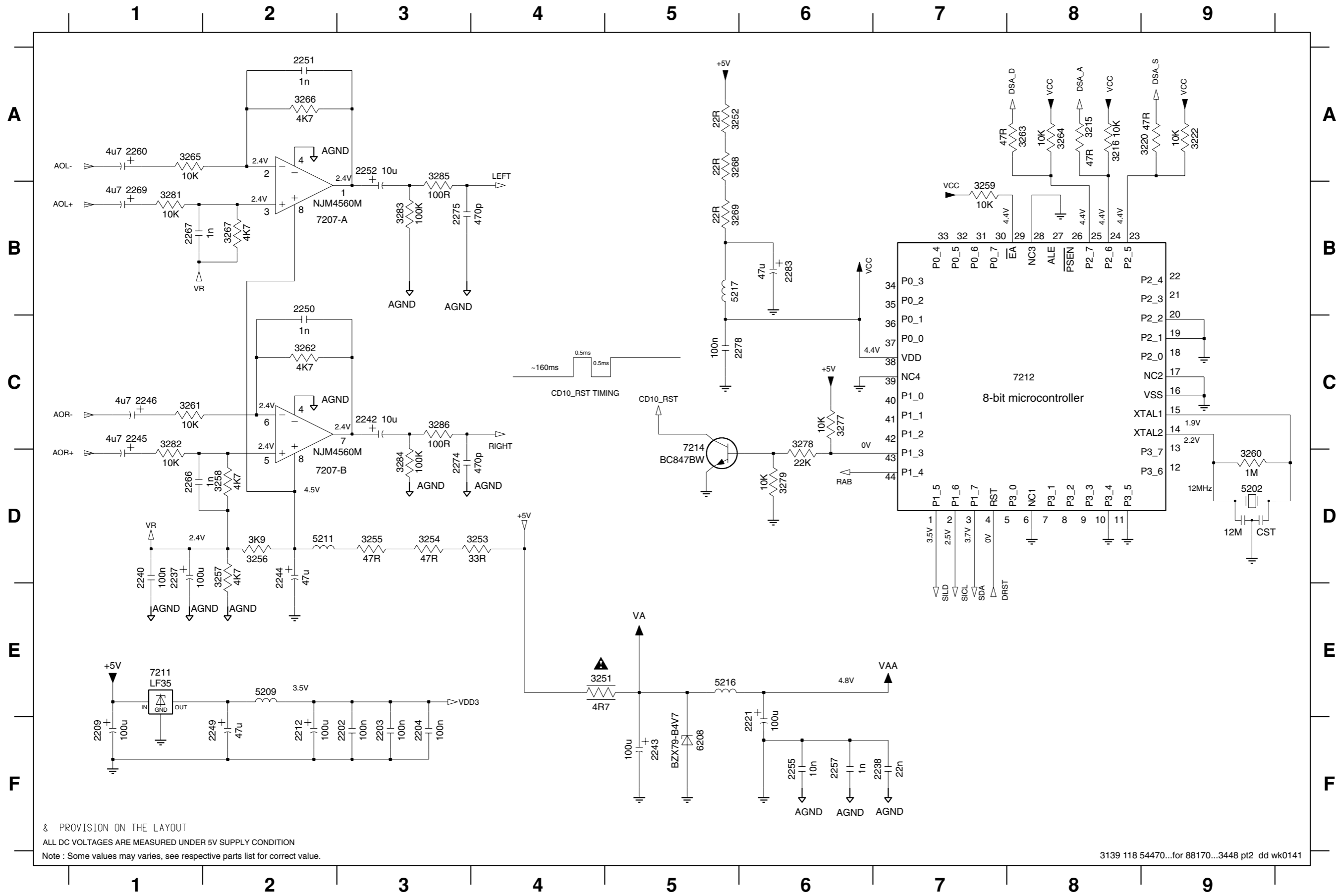
ES3883 CIRCUIT

- | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1602 C9 | 2213 D1 | 2216 D2 | 2219 C9 | 2225 B8 | 2228 A7 | 2231 B6 | 2253 A1 | 2259 E7 | 2263 C7 | 2284 A4 | 3219 E2 | 3224 B4 | 3227 F8 | 3231 E8 | 3235 D9 | 3238 F7 | 3241 F1 | 3244 D8 | 3247 B8 | 3250 B7 | 4001 F3 | 5203 A8 | 5210 A1 | 6205 A7 | 7208 E1 |
| 1603 A9 | 2214 D2 | 2217 D8 | 2220 D9 | 2226 B7 | 2229 A8 | 2233 A4 | 2254 E1 | 2261 C9 | 2264 E2 | 3212 E4 | 3221 A5 | 3225 B3 | 3229 E6 | 3232 E8 | 3236 A4 | 3239 E1 | 3242 A4 | 3245 C8 | 3248 B7 | 3287 E4 | 4002 E3 | 5204 A8 | 5215 A5 | 7204 D6 | 7209 D9 |
| 2211 D1 | 2215 D2 | 2218 D8 | 2224 B6 | 2227 A7 | 2230 E3 | 2234 B4 | 2256 A2 | 2262 A8 | 2265 E9 | 3218 A6 | 3223 B3 | 3226 B3 | 3230 F8 | 3233 F8 | 3237 F3 | 3240 F5 | 3243 F7 | 3246 A7 | 3249 B6 | 3288 A3 | 5201 A4 | 5208 D1 | 6204 A7 | 7206 F2 | 7213 A3 |



& PROVISION ON THE LAYOUT
 Note : Some values may varies, see respective parts list for correct value.
 @ Adding 4001 will set MPEG in Auto Play Mode, it must be remove before fixing back into set.

AUDIO CIRCUIT



- 2202 F3
- 2203 F3
- 2204 F3
- 2209 F1
- 2212 F2
- 2221 F6
- 2237 D1
- 2238 F7
- 2240 D1
- 2242 C3
- 2243 F5
- 2244 D2
- 2245 C1
- 2246 C1
- 2249 F2
- 2250 B2
- 2251 A2
- 2252 A3
- 2255 F6
- 2257 F6
- 2260 A1
- 2266 D1
- 2267 B1
- 2269 B1
- 2274 D3
- 2275 B3
- 2278 C5
- 2283 B6
- 3215 A8
- 3216 A8
- 3220 A8
- 3222 A9
- 3251 E4
- 3252 A5
- 3253 D4
- 3254 D3
- 3255 D3
- 3256 D2
- 3257 D2
- 3258 D2
- 3259 B7
- 3260 D9
- 3261 C1
- 3263 A8
- 3264 A8
- 3265 A1
- 3266 A2
- 3267 B2
- 3268 A5
- 3269 B5
- 3277 C6
- 3278 C6
- 3279 D6
- 3281 B1
- 3282 C1
- 3283 B3
- 3284 D3
- 3285 A3
- 3286 C3
- 5202 D9
- 5209 E2
- 5211 D2
- 5216 E5
- 5217 B5
- 6208 F5
- 7207-A B2
- 7207-B D2
- 7211 E1
- 7212 C8
- 7214 D5

& PROVISION ON THE LAYOUT
 ALL DC VOLTAGES ARE MEASURED UNDER 5V SUPPLY CONDITION
 Note : Some values may varies, see respective parts list for correct value.

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

1601 2422 025 16837 Flex Socket 22pin Hort.

CAPACITORS

2201 4822 126 14305 100nF 10% 16V
 2202 4822 126 14305 100nF 10% 16V
 2203 4822 126 14305 100nF 10% 16V
 2204 4822 126 14305 100nF 10% 16V
 2206 4822 126 14305 100nF 10% 16V
 2209 4822 124 40207 100µF 20% 25V
 2210 4822 126 14305 100nF 10% 16V
 2211 4822 124 40207 100µF 20% 25V
 2212 4822 124 40207 100µF 20% 25V
 2213 4822 126 14305 100nF 10% 16V
 2214 4822 126 14305 100nF 10% 16V
 2215 4822 126 14305 100nF 10% 16V
 2216 4822 126 14305 100nF 10% 16V
 2217 4822 124 40433 47µF 20% 25V
 2218 4822 126 14305 100nF 10% 16V
 2219 4822 124 40433 47µF 20% 25V
 2220 4822 126 14305 100nF 10% 16V
 2221 4822 124 41584 100µF 20% 10V
 2223 4822 126 14305 100nF 10% 16V
 2224 4822 126 14305 100nF 10% 16V
 2225 4822 126 14305 100nF 10% 16V
 2226 4822 126 14305 100nF 10% 16V
 2227 4822 126 14315 390pF 5% 50V
 2229 4822 126 14315 390pF 5% 50V
 2231 4822 126 14305 100nF 10% 16V
 2233 4822 122 33741 10pF 10% 50V
 2234 4822 122 33741 10pF 10% 50V
 2235 4822 126 14305 100nF 10% 16V
 2237 4822 124 40207 100µF 20% 25V
 2238 4822 126 14494 22nF 10% 25V
 2240 4822 126 14305 100nF 10% 16V
 2242 4822 124 40248 10µF 20% 63V
 2243 4822 124 41584 100µF 20% 10V
 2244 4822 124 40433 47µF 20% 25V
 2245 4822 124 40769 4,7µF 20% 100V
 2246 4822 124 40769 4,7µF 20% 100V
 2249 4822 124 40433 47µF 20% 25V
 2250 2020 552 94427 100pF 5% 50V
 2251 2020 552 94427 100pF 5% 50V
 2252 4822 124 40248 10µF 20% 63V
 2253 4822 124 41584 100µF 20% 10V
 2255 5322 126 11583 10nF 10% 50V
 2256 4822 126 14305 100nF 10% 16V
 2257 3198 016 31020 1nF 5% 25V
 2258 4822 124 40207 100µF 20% 25V
 2259 5322 126 11583 10nF 10% 50V
 2260 4822 124 40769 4,7µF 20% 100V
 2263 3198 016 31020 1nF 5% 25V
 2264 4822 124 40248 10µF 20% 63V

2266 2020 552 94427 100pF 5% 50V
 2267 2020 552 94427 100pF 5% 50V
 2269 4822 124 40769 4,7µF 20% 100V
 2271 4822 122 31765 100pF 2% 63V
 2272 4822 122 31765 100pF 2% 63V
 2274 4822 126 13881 470pF 5% 50V
 2275 4822 126 13881 470pF 5% 50V
 2278 4822 126 14305 100nF 10% 16V
 2279 4822 126 14305 100nF 10% 16V
 2280 4822 122 31765 100pF 2% 63V
 2281 4822 122 31765 100pF 2% 63V
 2282 5322 126 11583 10nF 10% 50V
 2283 4822 124 40433 47µF 20% 25V
 2286 4822 122 33761 22pF 50V

RESISTORS

3204 4822 051 30472 4k7 5% 0,062W
 3205 4822 051 30223 22k 5% 0,062W
 3206 4822 051 30472 4k7 5% 0,062W
 3207 4822 051 30472 4k7 5% 0,062W
 3208 4822 051 30472 4k7 5% 0,062W
 3209 4822 051 30221 220R 5% 0,062W
 3210 4822 051 30221 220R 5% 0,062W
 3211 4822 051 30221 220R 5% 0,062W
 3212 4822 051 30101 100R 5% 0,062W
 3213 4822 051 30223 22k 5% 0,062W
 3214 4822 051 30103 10k 5% 0,062W
 3215 4822 051 30479 47R 5% 0,062W
 3216 4822 051 30103 10k 5% 0,062W
 3217 4822 051 30223 22k 5% 0,062W
 3218 4822 051 30472 4k7 5% 0,062W
 3220 4822 051 30479 47R 5% 0,062W
 3221 4822 117 13632 100k 1% 0,062W
 3222 4822 051 30103 10k 5% 0,062W
 3223 4822 051 30221 220R 5% 0,062W
 3224 4822 051 30221 220R 5% 0,062W
 3225 4822 051 30101 100R 5% 0,062W
 3226 4822 051 30101 100R 5% 0,062W
 3227 4822 051 30101 100R 5% 0,062W
 3228 4822 051 30472 4k7 5% 0,062W
 3229 4822 051 30472 4k7 5% 0,062W
 3230 4822 051 30101 100R 5% 0,062W
 3231 4822 051 30472 4k7 5% 0,062W
 3232 4822 051 30472 4k7 5% 0,062W
 3233 4822 051 30101 100R 5% 0,062W
 3234 4822 051 30102 1k 5% 0,062W
 3235 4822 051 30103 10k 5% 0,062W
 3236 4822 051 30101 100R 5% 0,062W
 3237 4822 051 30472 4k7 5% 0,062W
 3238 4822 051 30472 4k7 5% 0,062W
 3239 4822 051 30103 10k 5% 0,062W
 3240 4822 051 30472 4k7 5% 0,062W
 3242 4822 051 30103 10k 5% 0,062W

ELECTRICAL PARTS LIST - MPEG-01B BOARD

3243 4822 051 30472 4k7 5% 0,062W
 3244 4822 051 30472 4k7 5% 0,062W
 3245 4822 051 30102 1k 5% 0,062W
 3246 4822 051 30759 75R 5% 0,062W
 3247 4822 051 30759 75R 5% 0,062W
 3248 4822 051 30759 75R 5% 0,062W
 3249 4822 051 30221 220R 5% 0,062W
 3250 4822 117 12139 22R 5% 0,062W
 3251 4822 052 10478 Δ 4R7 5% 0,33W
 3252 4822 117 12139 22R 5% 0,062W
 3253 4822 051 30339 33R 5% 0,062W
 3254 4822 051 30479 47R 5% 0,062W
 3255 4822 051 30479 47R 5% 0,062W
 3256 4822 051 30392 3k9 5% 0,062W
 3257 4822 051 30472 4k7 5% 0,062W
 3258 4822 051 30333 33k 5% 0,1W
 3259 4822 051 30103 10k 5% 0,062W
 3260 4822 051 30105 1M 5% 0,062W
 3261 4822 051 30563 56k 5% 0,1W
 3262 4822 051 30333 33k 5% 0,1W
 3263 4822 051 30479 47R 5% 0,062W
 3264 4822 051 30103 10k 5% 0,062W
 3265 4822 051 30563 56k 5% 0,1W
 3266 4822 051 30333 33k 5% 0,1W
 3267 4822 051 30333 33k 5% 0,1W
 3268 4822 117 12139 22R 5% 0,062W
 3269 4822 117 12139 22R 5% 0,062W
 3270 4822 051 30101 100R 5% 0,062W
 3271 4822 051 30101 100R 5% 0,062W
 3272 4822 051 30101 100R 5% 0,062W
 3273 4822 051 30221 220R 5% 0,062W
 3274 4822 051 30221 220R 5% 0,062W
 3275 4822 051 30221 220R 5% 0,062W
 3276 4822 051 30101 100R 5% 0,062W
 3277 4822 051 30103 10k 5% 0,062W
 3278 4822 051 30223 22k 5% 0,062W
 3279 4822 051 30103 10k 5% 0,062W
 3281 4822 051 30563 56k 5% 0,1W
 3282 4822 051 30563 56k 5% 0,1W
 3283 4822 117 13632 100k 1% 0,062W
 3284 4822 117 13632 100k 1% 0,062W
 3285 4822 051 30101 100R 5% 0,062W
 3286 4822 051 30101 100R 5% 0,062W
 3287 4822 051 30472 4k7 5% 0,062W
 4002 4822 051 30008 0R Jumper 0603

COILS & FILTERS

5201 2422 543 01137 X'tal Resonator 27MHz
 5202 5322 242 73686 Ceram Resonator 12MHz
 5203 4822 157 11868 Coil 2,7µH 5%
 5204 4822 157 11868 Coil 2,7µH 5%
 5205 4822 157 11506 Chip Ind. 120R 100MHz

5207 4822 526 10704 FE Bead 100MHz
 5208 4822 526 10704 FE Bead 100MHz
 5209 4822 526 10704 FE Bead 100MHz
 5210 4822 526 10704 FE Bead 100MHz
 5211 4822 157 11506 Chip Ind. 120R 100MHz
 5212 4822 157 11506 Chip Ind. 120R 100MHz
 5213 4822 157 11506 Chip Ind. 120R 100MHz
 5215 4822 157 11506 Chip Ind. 120R 100MHz
 5216 4822 157 11506 Chip Ind. 120R 100MHz
 5217 4822 157 11506 Chip Ind. 120R 100MHz

DIODES

6204 4822 130 31983 BAT85
 6205 4822 130 31983 BAT85
 6208 4822 130 34174 BZX79-B4V7

TRANSISTORS & INTEGRATED CIRCUITS

7201 9322 178 33671 ES3880FL
 7202 9965 000 08683 AT27C020-70JC
 7203 9322 164 13668 MSM514265E-60JS
 7204 9322 138 97671 ES3883
 7205 9337 142 60653 74HC04D
 7207 4822 209 83357 NJM4560M
 7208 5322 130 42756 BC857BW
 7209 3198 010 42310 BC847BW
 7211 9322 178 32668 LF27CDT
 7212 9352 701 41518 CV9210B-83C51RC+
 7214 3198 010 42310 BC847BW

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

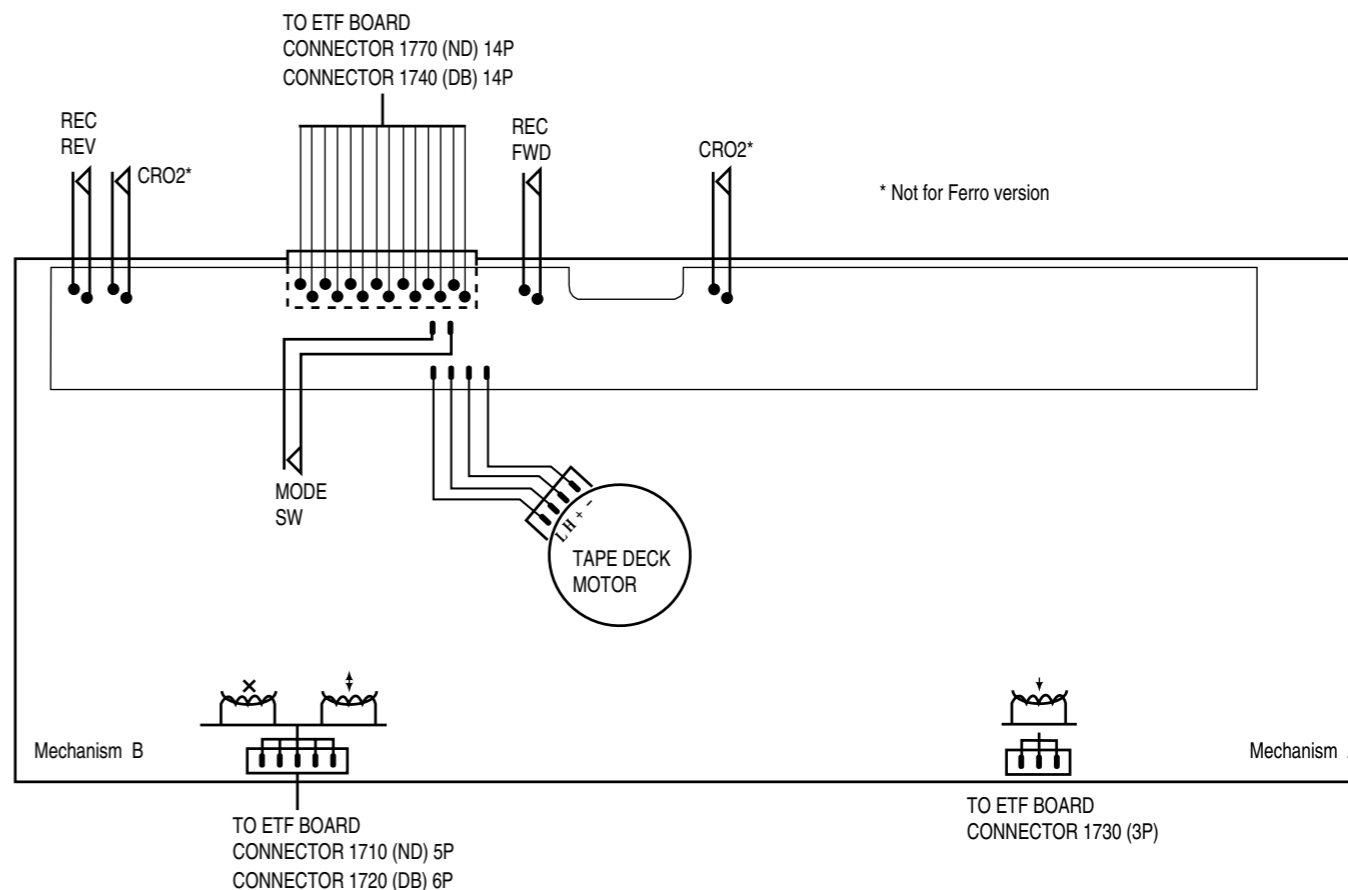
ETF7 TAPE MODULE

(Non-Dolby Version)

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 Servo Circuit diagram 9-8
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Tapedeck wiring (Double deck)

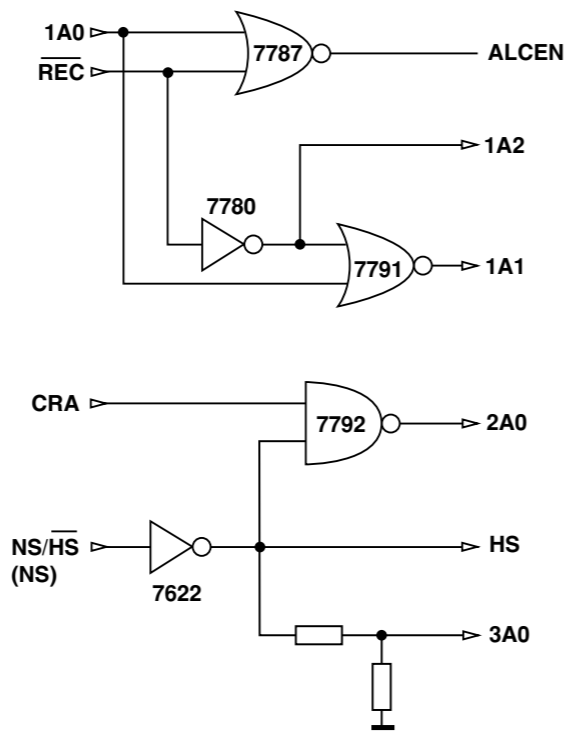
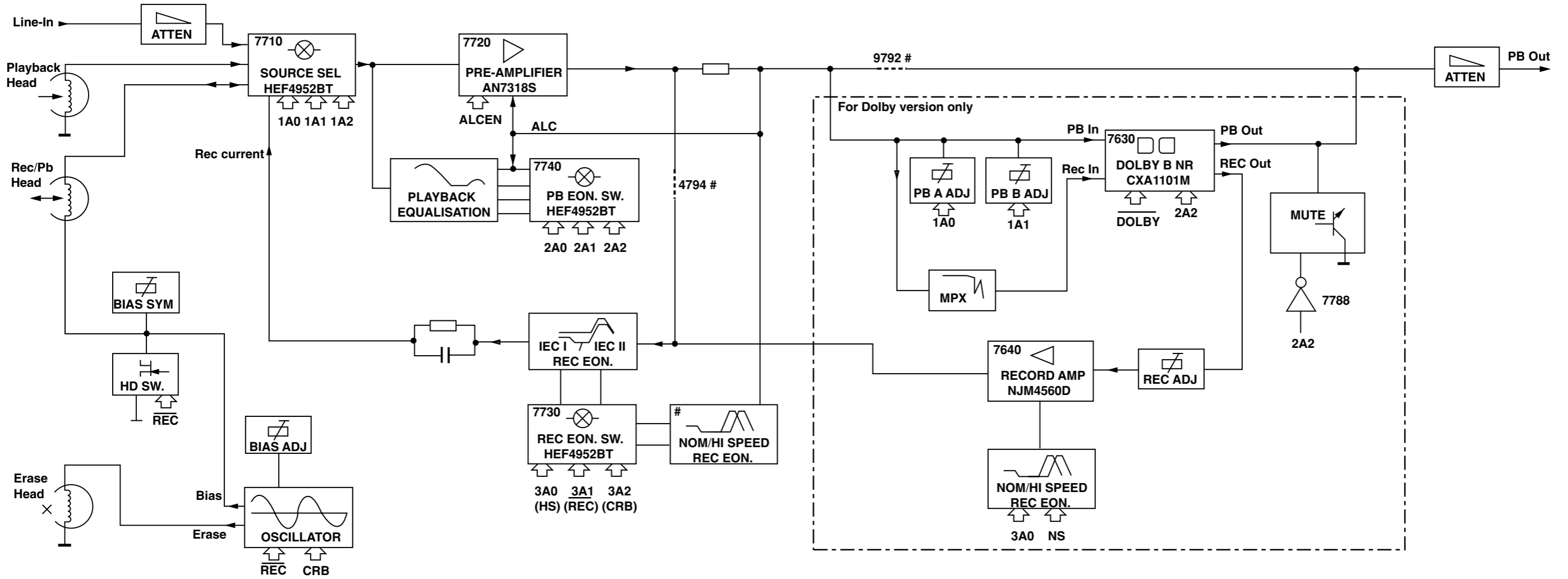


Variations table for Analog Circuit

	Autoreverse	Non-autoreverse	
	ND/DD/FR	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

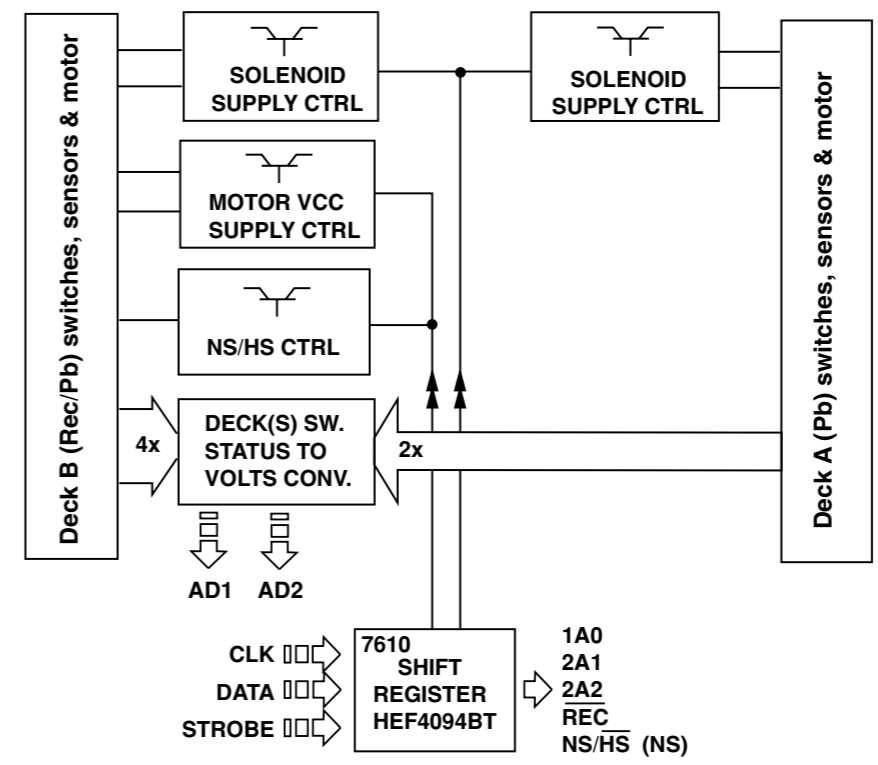
	Autoreverse	Non-autoreverse	
	ND/DD/FR	Chrome/Ferro	Ferro
3769	12k	8k2	8k2
3772	6k8	5k6	5k6
4785	-	-	0R jumper
3774	15k	8k2	8k2
6614	1N4148	-	-
7616	BC857B	-	-
7622	BC847B	-	-

BLOCK DIAGRAM



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

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



Brief introduction

General

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

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

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

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

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

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

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

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

CONNECTOR 1703 INTERCONNECTION TO AF BOARD

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

CONNECTOR 1706 INTERCONNECTION TO FRONT BOARD

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

CONNECTOR 1710 DECK B HEADS CONNECTON (For Non-Dolby version only)

○ 1	B R/P HD L+	R/P Head left channel positive
○ 2	GND A	R/P Head return ground
○ 3	B R/P HD R+	R/P Head right channel positive
○ 4	ERASE HEAD	Erase Head
○ 5	GND A	Erase Head ground

CONNECTOR 1720 DECK B HEADS CONNECTON (For Dolby B NR version only)

○ 1	B R/P HD L+	R/P Head left channel positive
○ 2	B R/P HD L-	R/P Head left channel negative
○ 3	B R/P HD R+	R/P Head right channel positive
○ 4	B R/P HD R-	R/P Head right channel negative
○ 5	ERASE HEAD	Erase Head
○ 6	GND A	Erase Head ground

CONNECTOR 1730 DECK A HEAD CONNECTIONS (For Double Deck versions only)

○ 1	A PB HD L+	Pb Head left channel positive
○ 2	GND A	Pb Head return ground shield
○ 3	A PB HD R+	Pb Head right channel positive

CONNECTOR 1740

○ 1	REC REW
○ 2	CrO2 B
○ 3	REC FWD
○ 4	PHOTO B
○ 5	SOL B
○ 6	Vcc
○ 7	MODE B
○ 8	GND M
○ 9	SOL A
○ 10	PHOTO A
○ 11	MODE A
○ 12	L
○ 13	CrO2 A
○ 14	H

CONNECTOR 1770

○ 1	REC REW
○ 2	CrO2 B
○ 3	REC FWD
○ 4	PHOTO B
○ 5	SOL B
○ 6	Vcc
○ 7	MODE B
○ 8	GND M
○ 9	SOL A
○ 10	PHOTO A
○ 11	MODE A
○ 12	L
○ 13	CrO2 A
○ 14	H

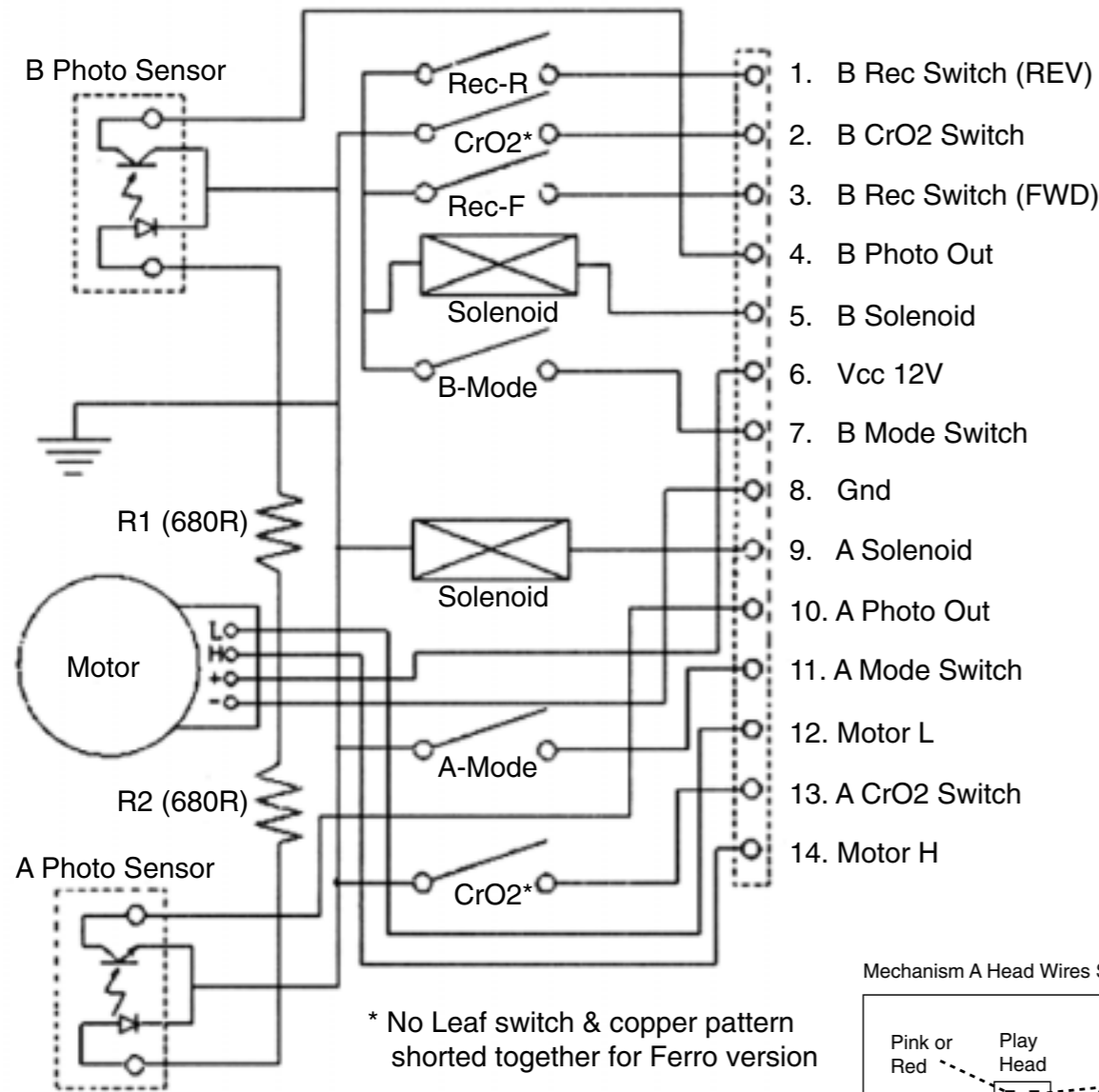
DECK A & B CONTROL INTERFACE (For Dolby B NR version only)

Record tab protection status switch (reverse)	[open=on: close=off]
Chrome tape detection switch deck B	[open=Cr: close=Fe]
Record tab protection status switch (forward)	[open=on: close=off]
Photo sensor output (tape movement indication)	
Solenoid supply for deck B	
Deck / Motor supply	
Mode switch (head engagement)	[open=off: close=engaged]
Deck / Motor ground	
Solenoid supply for deck A	
Photo sensor output (tape movement indication)	
Mode switch (head engagement)	[open=off: close=engaged]
L pin for motor	
Chrome tape detection switch deck A	[open=Cr: close=Fe]
H pin for motor	

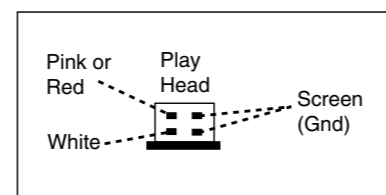
DECK A & B CONTROL INTERFACE (For Non-Dolby version only)

Record tab protection status switch (reverse)	[open=on: close=off]
Chrome tape detection switch deck B	[open=Cr: close=Fe]
Record tab protection status switch (forward)	[open=on: close=off]
Photo sensor output (tape movement indication)	
Solenoid supply for deck B	
Deck / Motor supply	
Mode switch (head engagement)	[open=off: close=engaged]
Deck / Motor ground	
Solenoid supply for deck A	
Photo sensor output (tape movement indication)	
Mode switch (head engagement)	[open=off: close=engaged]
L pin for motor	
Chrome tape detection switch deck A	[open=Cr: close=Fe]
H pin for motor	

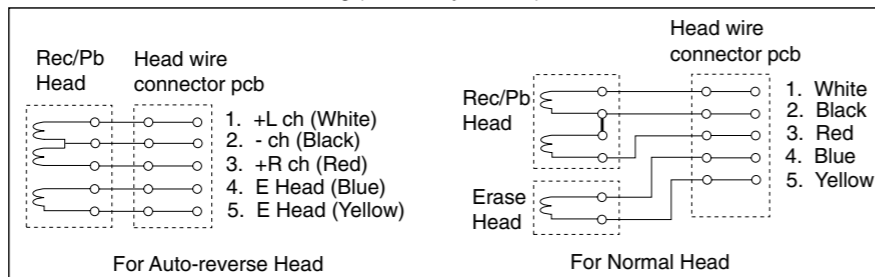
TAPE MECHANISM ELECTRONICS



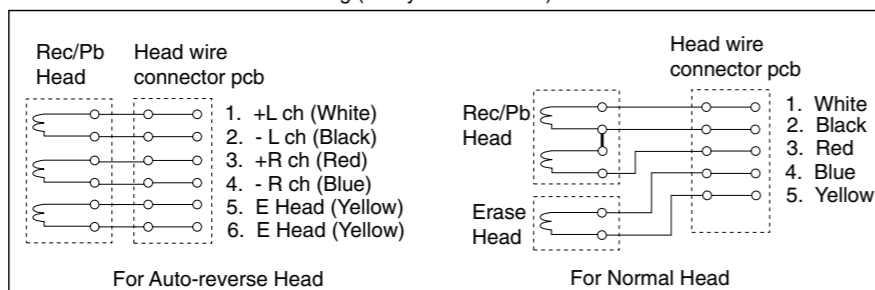
Mechanism A Head Wires Soldering



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)

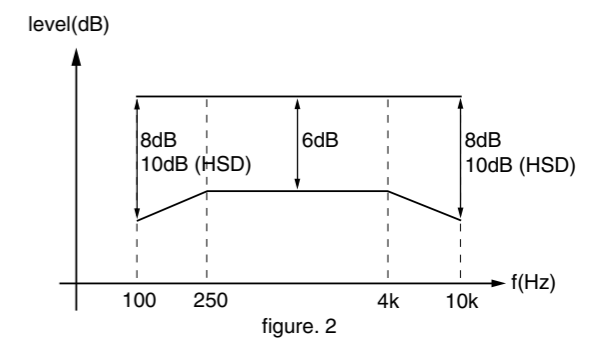
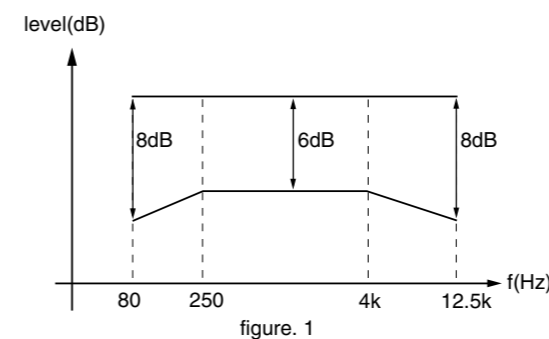


TAPE ADJUSTMENT & CHECK TABLE

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

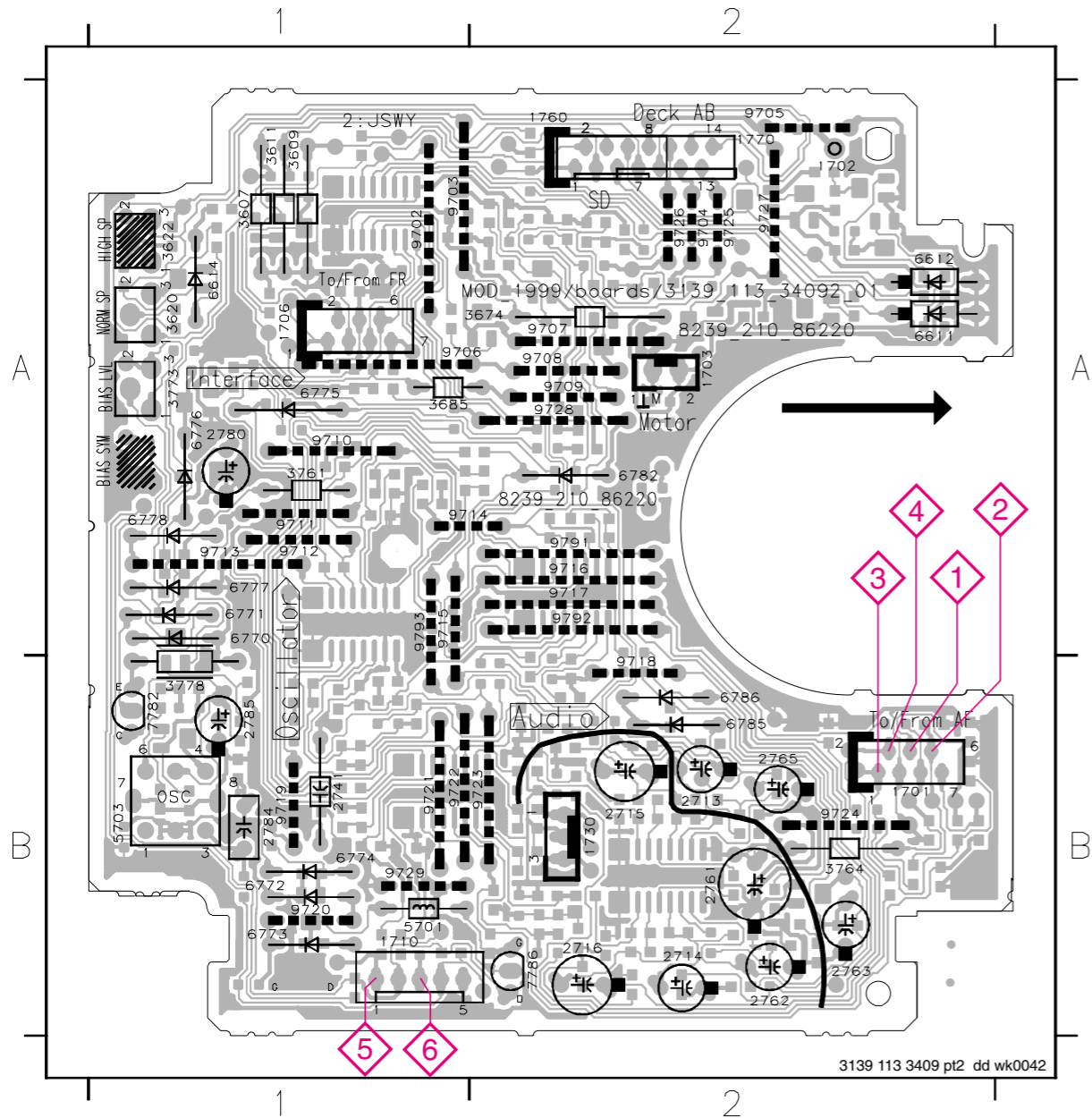
SBC419A^ : 4822 397 30069
 SBC420 : 4822 397 30071

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



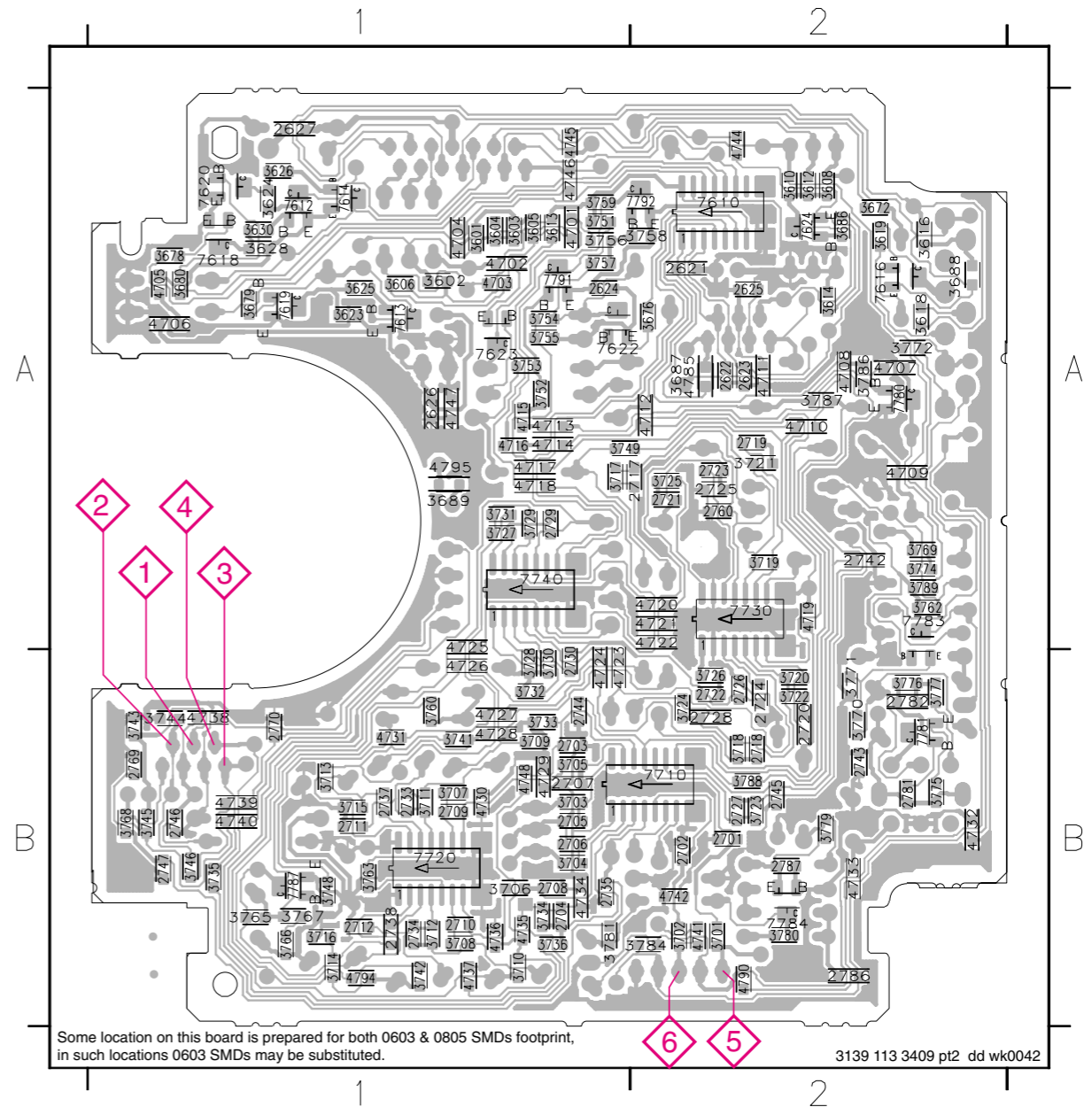
COMPONENT LAYOUT

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



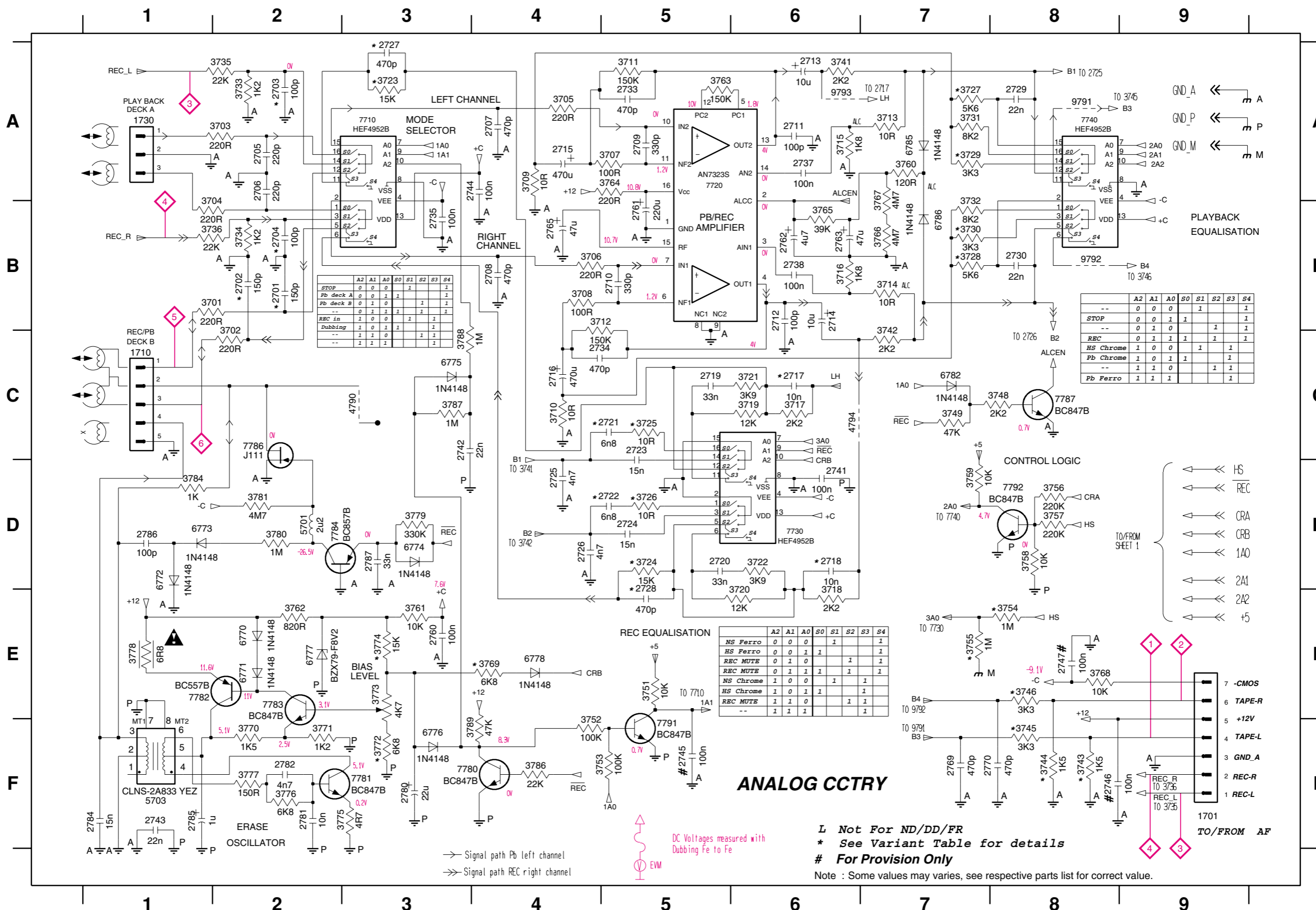
CHIP LAYOUT

2621 A2	2724 B2	3602 A1	3688 A2	3725 A2	3757 A1	4701 A1	4727 B1	7612 A1
2622 A2	2725 A2	3603 A1	3689 A1	3726 B2	3758 A2	4702 A1	4728 B1	7613 A1
2623 A2	2726 B2	3604 A1	3701 B2	3727 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	



ANALOG CIRCUIT

1701 F9	2705 A2	2712 B6	2719 C5	2726 D4	2735 B3	2745 F5	2765 B4	2785 F1	3705 A4	3712 B4	3719 C6	3726 D5	3733 A2	3744 F8	3753 F5	3760 A7	3767 A7	3774 E3	3781 D2	4794 C6	6774 D3	6786 B7	7782 E1	9791 A8
1710 C1	2706 A2	2713 A6	2720 D5	2727 A3	2737 A6	2746 F8	2769 F7	2786 D1	3706 B4	3713 A7	3720 E6	3727 A7	3734 B2	3745 F8	3754 E8	3761 E3	3768 E8	3775 F3	3784 D1	5701 D2	6775 C3	6788 B7	7783 E2	9792 B8
1730 A1	2707 A4	2714 B6	2721 C5	2728 E5	2738 B6	2747 E8	2770 F8	2787 D3	3707 A5	3714 B7	3721 C6	3728 B7	3735 A2	3746 E8	3755 E7	3762 E2	3769 E4	3776 F2	3786 F4	5703 F1	6776 F3	6789 B7	7784 D2	9793 A6
2701 B2	2708 B4	2715 A4	2722 D5	2729 A8	2741 D6	2760 E3	2780 F3	3701 B1	3708 B4	3715 A6	3722 D6	3729 A7	3736 B1	3748 C8	3756 D8	3763 A5	3770 F2	3777 F2	3787 C3	6770 E2	6777 E2	7730 D6	7786 C2	
2702 B2	2709 A5	2716 C4	2723 C5	2730 B8	2742 C3	2761 B5	2781 F2	3702 C2	3709 A4	3716 B6	3723 A3	3730 B7	3741 A6	3749 C7	3757 D8	3764 A5	3771 F2	3778 E1	3788 C3	6771 E2	6778 E4	7740 A8	7787 C8	
2703 A2	2710 B5	2717 C6	2724 D5	2733 A5	2743 F1	2762 B6	2782 F2	3703 A2	3710 C4	3717 C6	3724 D5	3731 A7	3742 C7	3751 E5	3758 D8	3765 B6	3772 F3	3779 D3	3789 F4	6772 D1	6782 C7	7780 F4	7791 F5	
2704 B2	2711 A6	2718 D6	2725 D4	2734 C4	2744 A4	2763 B6	2784 F1	3704 B1	3711 A5	3718 E6	3725 C5	3732 B7	3743 F8	3752 F4	3759 D7	3766 B7	3773 E3	3780 D2	4790 C3	6773 D1	6785 A7	7781 F3	7792 D8	



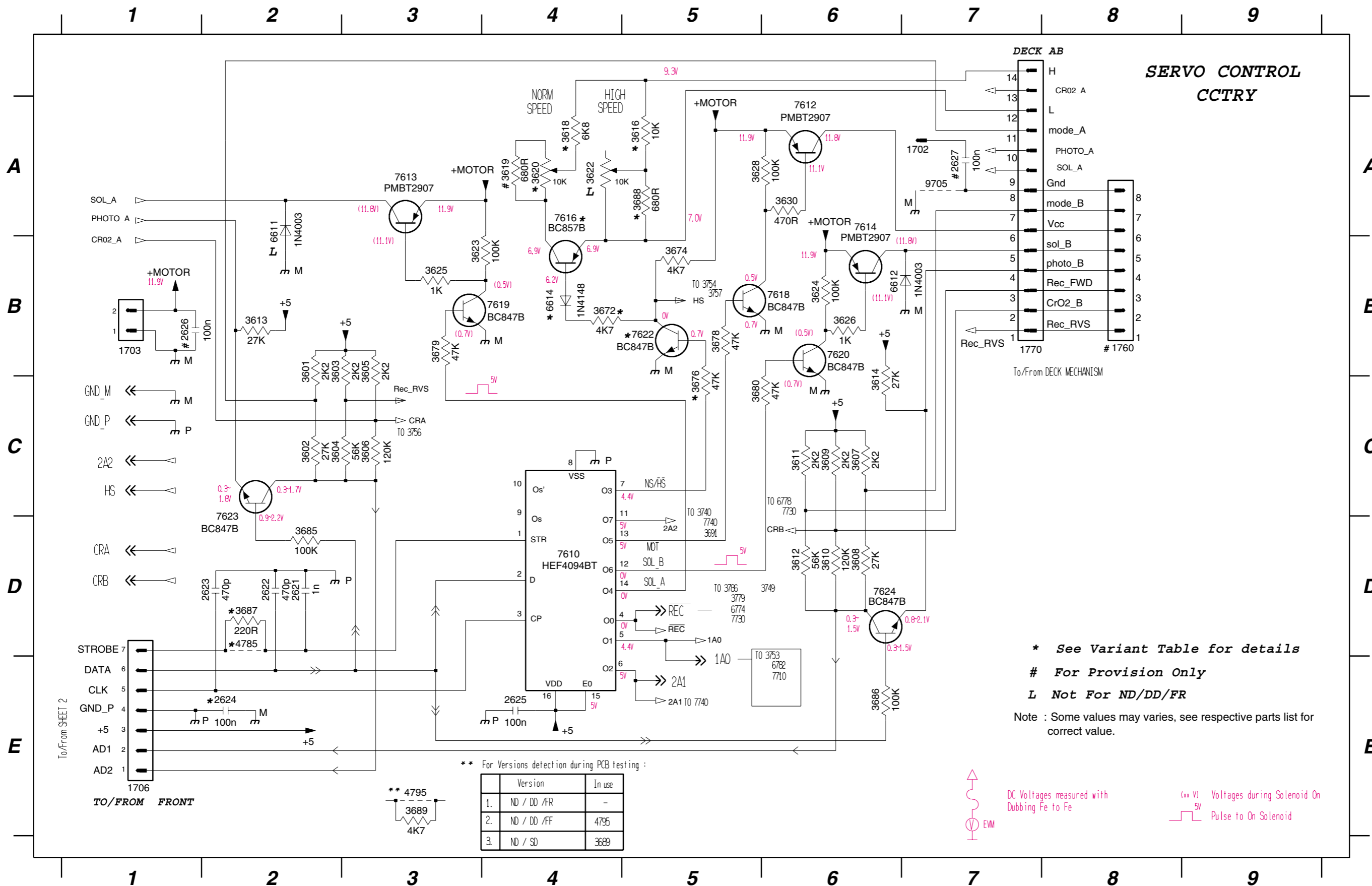
ANALOG CCTRY

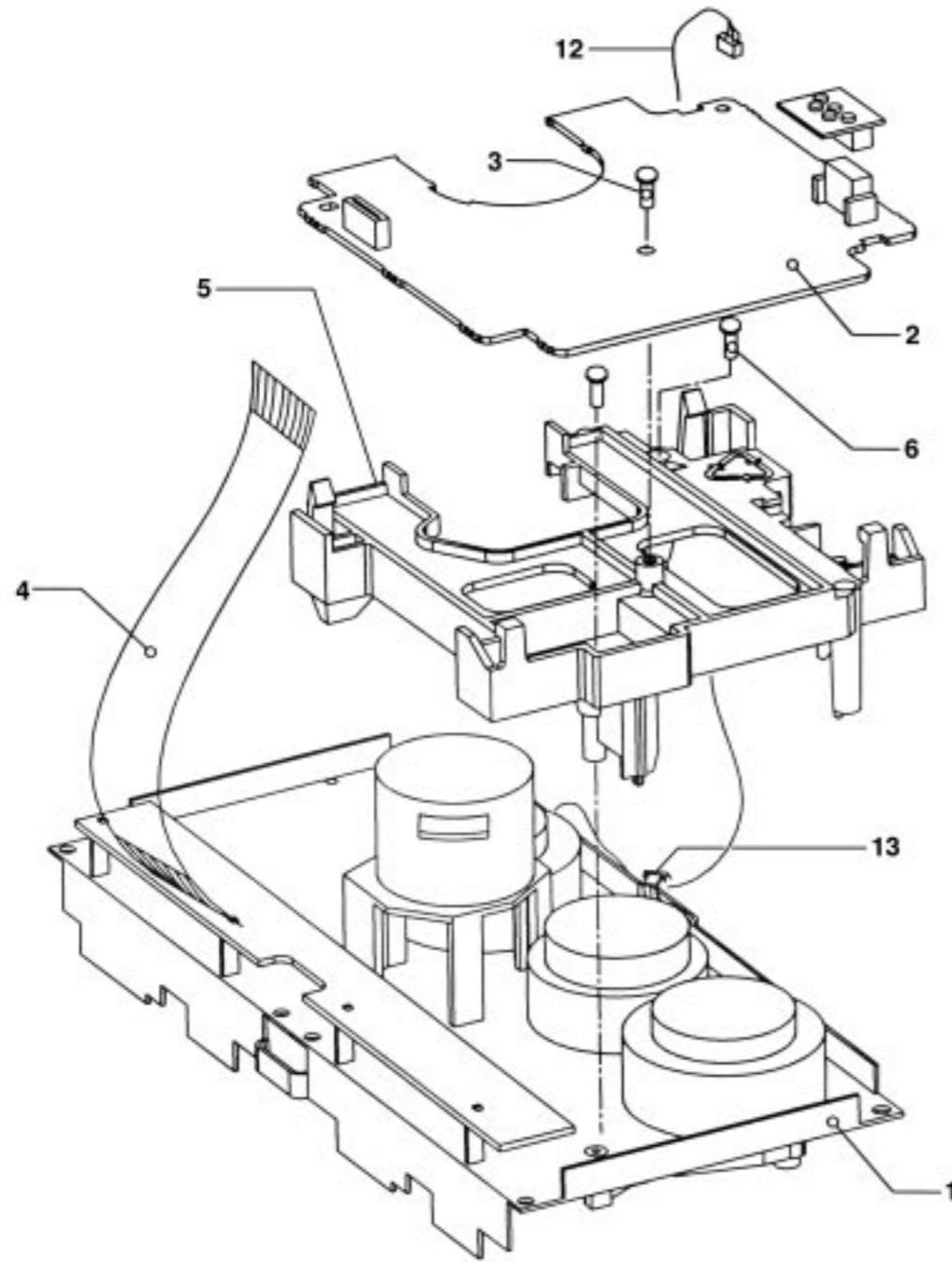
L Not For ND/DD/FR
 * See Variant Table for details
 # For Provision Only

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

SERVO CONTROL CIRCUIT

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



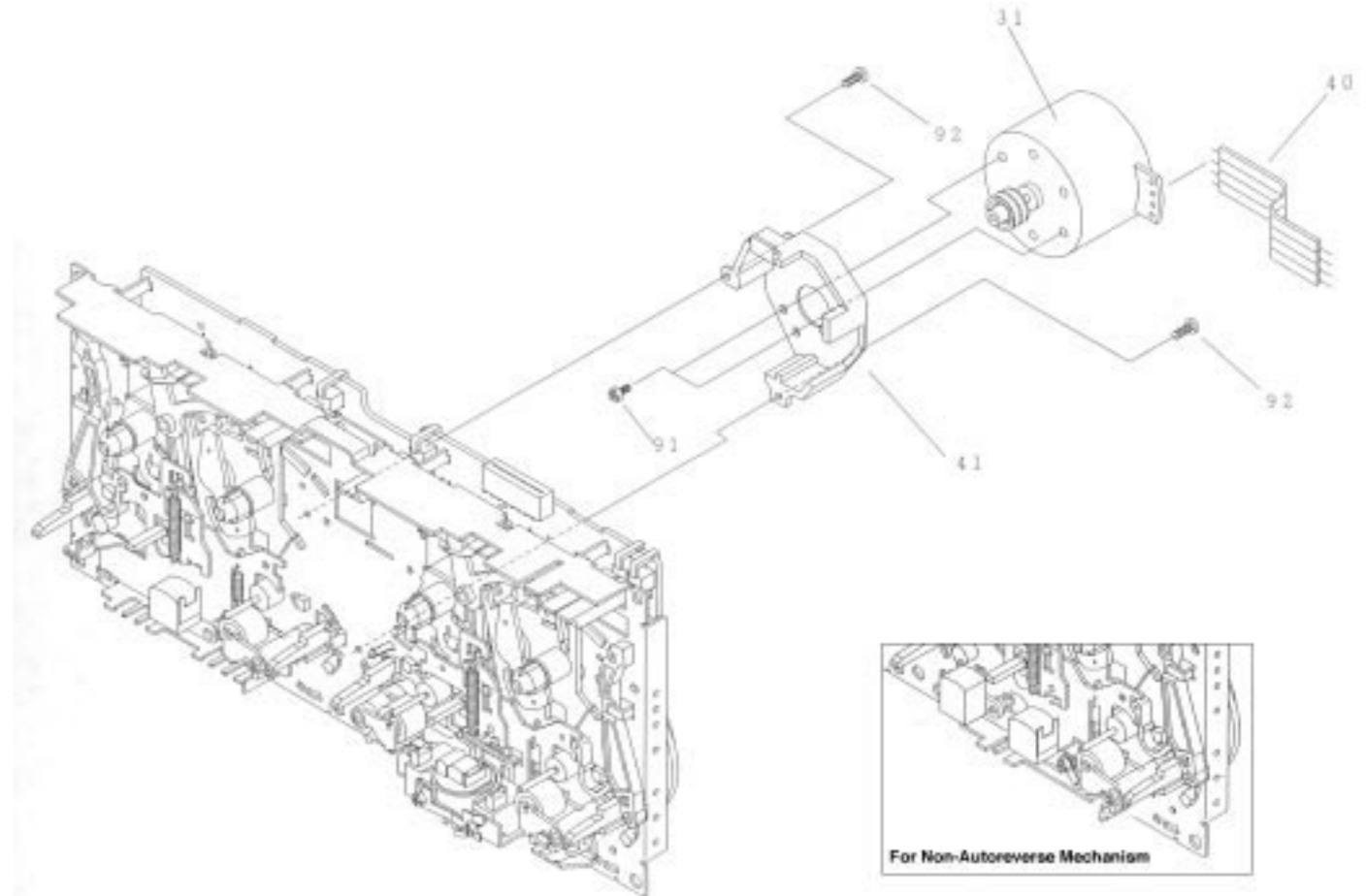


3139 118 77070 (incl. ...77080) dd wk926

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

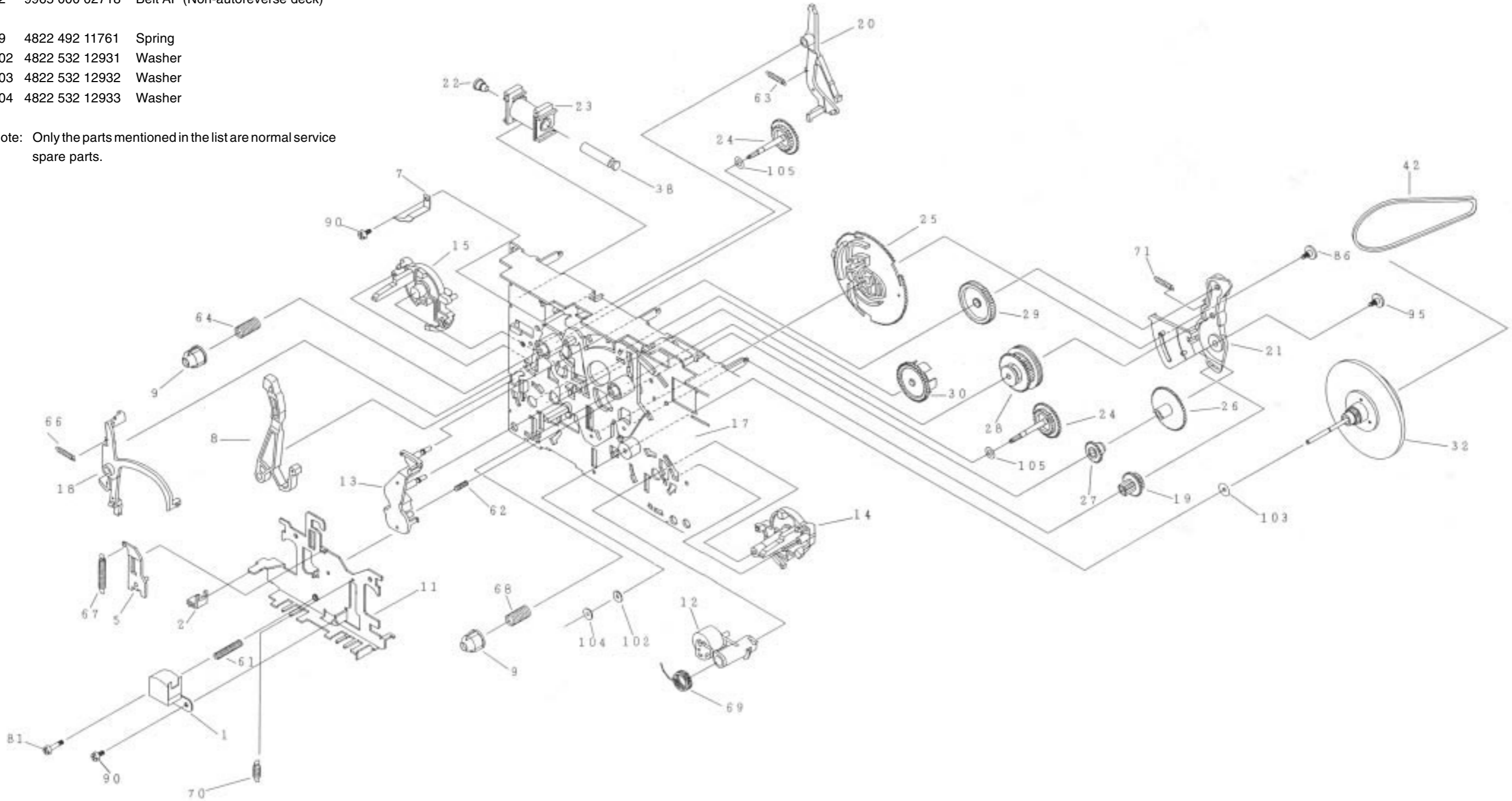
MECHANICAL PARTS - PLAY MECHANISM

- 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.

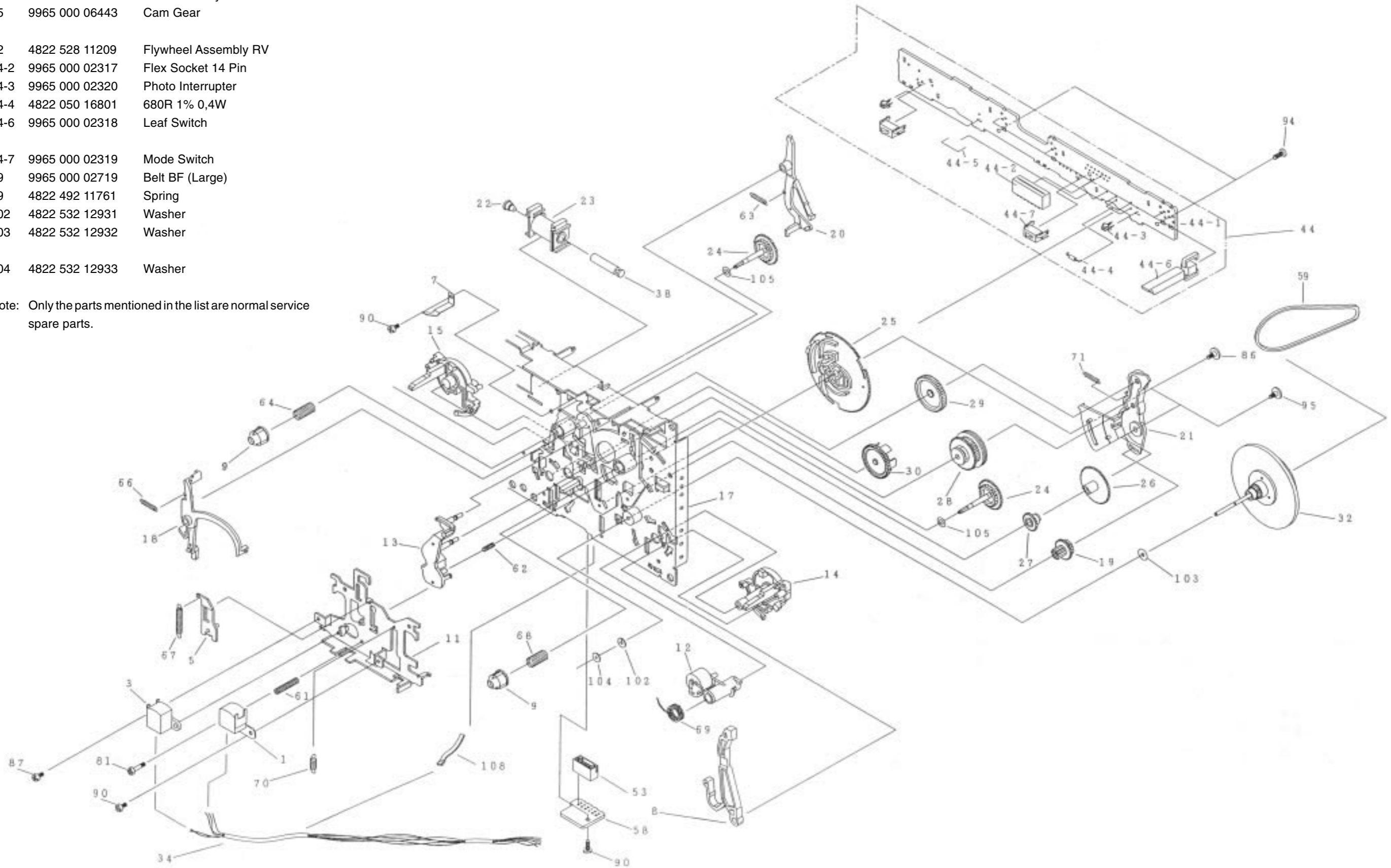


TAPE MECHANISM B - RECORD/PLAYBACK (Non-Autoreverse version)

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.

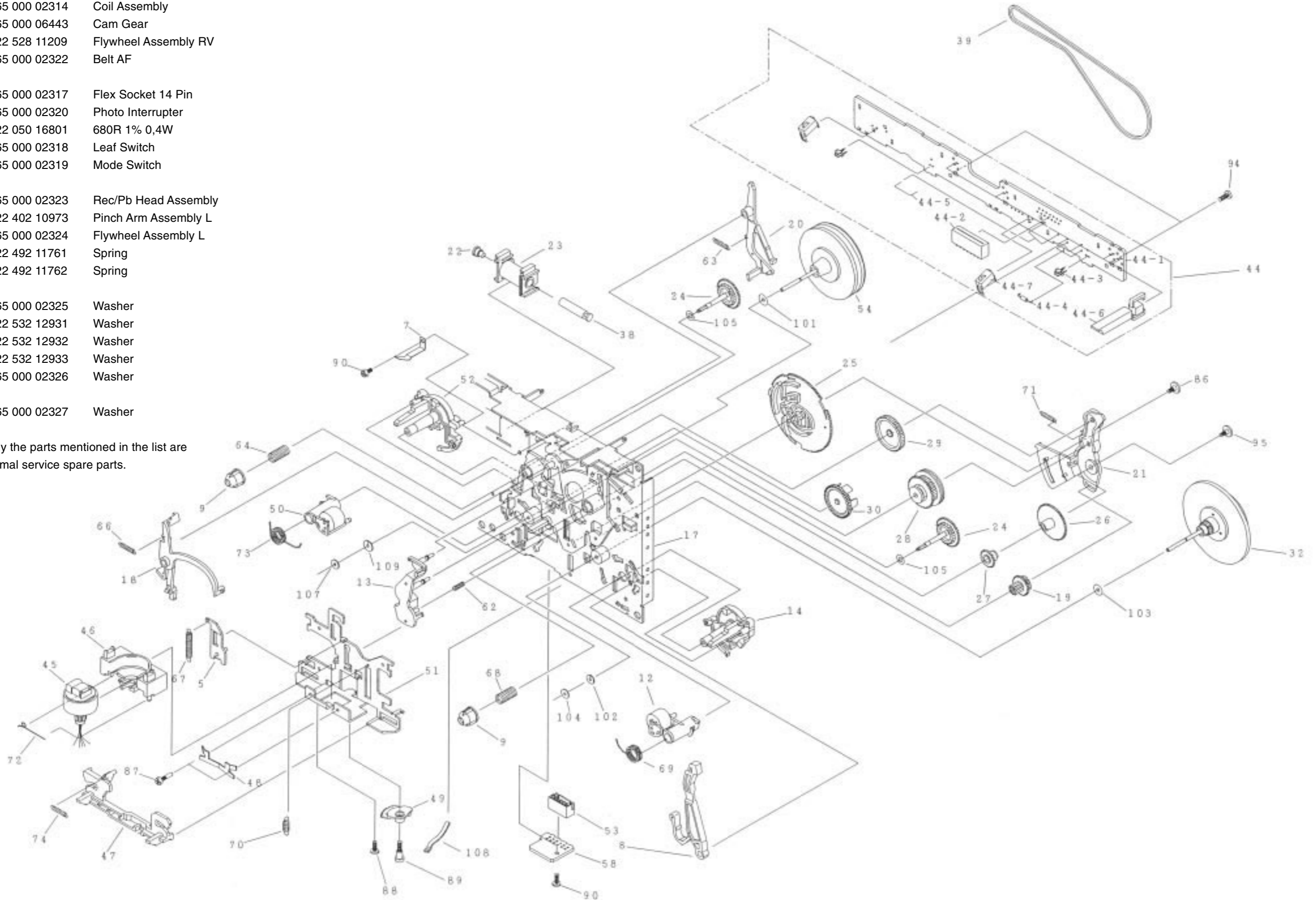


TAPE MECHANISM B - RECORD/PLAYBACK (Autoreverse version)

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

MISCELLANEOUS

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

CAPACITORS

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

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

RESISTORS

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

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

3685	482211652234	100k 5% 0,5W
3686	482211710837	100k 1% 0,1W
3687	482211711503	220R 1% 0,1W not for Ferro
3688	482211710361	680R 1% 0,1W Autoreverse
3701	482211711503	220R 1% 0,1W
3702	482211711503	220R 1% 0,1W
3703	482211711503	220R 1% 0,1W
3704	482211711503	220R 1% 0,1W
3705	482211711503	220R 1% 0,1W
3706	482211711503	220R 1% 0,1W
3707	482205120101	100R 5% 0,1W
3708	482205120101	100R 5% 0,1W
3709	482205120109	10R 5% 0,1W
3710	482205120109	10R 5% 0,1W
3711	482205120154	150k 5% 0,1W
3712	482205120154	150k 5% 0,1W
3713	482205120109	10R 5% 0,1W
3714	482205120109	10R 5% 0,1W
3715	482205120182	1k8 5% 0,1W
3716	482205120182	1k8 5% 0,1W
3717	482211711449	2k2 1% 0,1W
3718	482211711449	2k2 1% 0,1W
3719	482211711383	12k 1% 0,1W
3720	482211711383	12k 1% 0,1W
3721	482205120392	3k9 5% 0,1W
3722	482205120392	3k9 5% 0,1W
3723	482211683933	15k 1% 0,1W Autoreverse
3723	482211710965	18k 1% 0,1W Non-autoreverse
3724	482211683933	15k 1% 0,1W Autoreverse
3724	482211710965	18k 1% 0,1W Non-autoreverse
3725	482205120109	10R 5% 0,1W not for Ferro
3726	482205120109	10R 5% 0,1W not for Ferro
3727	482205120562	5k6 5% 0,1W Autoreverse
3727	482211711507	6k8 1% 0,1W Non-autoreverse
3728	482205120562	5k6 5% 0,1W Autoreverse
3728	482211711507	6k8 1% 0,1W Non-autoreverse
3729	482205120332	3k3 5% 0,1W Autoreverse
3729	482205120472	4k7 5% 0,1W Non-autoreverse
3730	482205120332	3k3 5% 0,1W Autoreverse
3730	482205120472	4k7 5% 0,1W Non-autoreverse
3731	482205120822	8k2 5% 0,1W
3732	482205120822	8k2 5% 0,1W
3733	482205120122	1k2 5% 0,1W
3734	482205120122	1k2 5% 0,1W
3735	482205120223	22k 5% 0,1W
3736	482205120223	22k 5% 0,1W
3741	482211711449	2k2 1% 0,1W
3742	482211711449	2k2 1% 0,1W
3743	482211711139	1k5 1% 0,1W Autoreverse
3743	482211711449	2k2 1% 0,1W Non-autoreverse
3744	482211711139	1k5 1% 0,1W Autoreverse
3744	482211711449	2k2 1% 0,1W Non-autoreverse
3745	482205120332	3k3 5% 0,1W Autoreverse
3745	482205120562	5k6 5% 0,1W Non-autoreverse
3746	482205120332	3k3 5% 0,1W Autoreverse
3746	482205120562	5k6 5% 0,1W Non-autoreverse
3748	482211711449	2k2 1% 0,1W
3749	482211710834	47k 1% 0,1W
3751	482211710833	10k 1% 0,1W
3752	482211710837	100k 1% 0,1W
3753	482211710837	100k 1% 0,1W
3754	482205120105	1M 5% 0,1W Autoreverse
3754	482205120479	47R 5% 0,1W Non-autoreverse
3755	482205120105	1M 5% 0,1W Autoreverse
3755	482205120479	47R 5% 0,1W Non-autoreverse
3756	482211713579	220k 1% 0,1W
3757	482211713579	220k 1% 0,1W
3758	482211710833	10k 1% 0,1W
3759	482211710833	10k 1% 0,1W
3760	482205120121	120R 5% 0,1W
3761	482205021003	10k 1% 0,6W
3762	482211711454	820R 1% 0,1W
3763	482205120154	150k 5% 0,1W
3764	482211683872	220R 5% 0,5W
3765	482205120393	39k 5% 0,1W
3766	482205120475	4M7 5% 0,1W
3767	482205120475	4M7 5% 0,1W
3768	482211710833	10k 1% 0,1W
3769	482211711383	12k 1% 0,1W Autoreverse
3769	482205120822	8k2 5% 0,1W Non-autoreverse
3770	482211711139	1k5 1% 0,1W
3771	482205120122	1k2 5% 0,1W
3772	482211711507	6k8 1% 0,1W Autoreverse
3772	482205120562	5k6 5% 0,1W Non-autoreverse
3773	482210012227	Trimmer 4k7 30% 0,1W
3774	482211683933	15k 1% 0,1W Autoreverse
3774	482205120822	8k2 5% 0,1W Non-autoreverse
3775	482205120478	4R7 5% 0,1W
3776	482211711507	6k8 1% 0,1W
3777	482211710353	150R 1% 0,1W
3778	482205210688	△ 6R8 5% 0,33W
3779	482205120334	330k 5% 0,1W
3780	482205120105	1M 5% 0,1W
3781	482205120475	4M7 5% 0,1W
3784	482205110102	1k 2% 0,25W
3786	482205120223	22k 5% 0,1W
3787	482205120105	1M 5% 0,1W
3788	482205120105	1M 5% 0,1W
3789	482211710834	47k 1% 0,1W
4701	482205120008	0R Jumper 0805
4702	482205120008	0R Jumper 0805
4703	482205120008	0R Jumper 0805
4704	482205120008	0R Jumper 0805
4705	482205120008	0R Jumper 0805

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

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

TRANSISTORS & INTEGRATED CIRCUITS

7610	532220911306	HEF4094BT			
7612	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-LC-VCD

(3 Disc Carousel Changer)

Layout stage .2

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Service hints

CAUTION

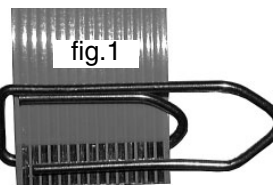
CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE

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

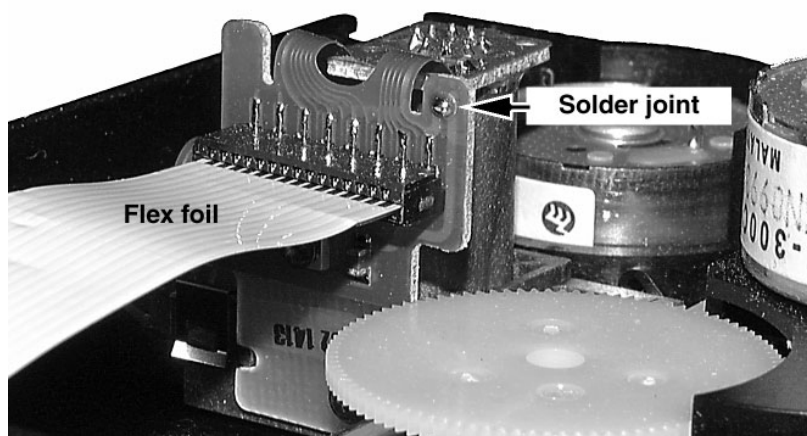
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

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

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



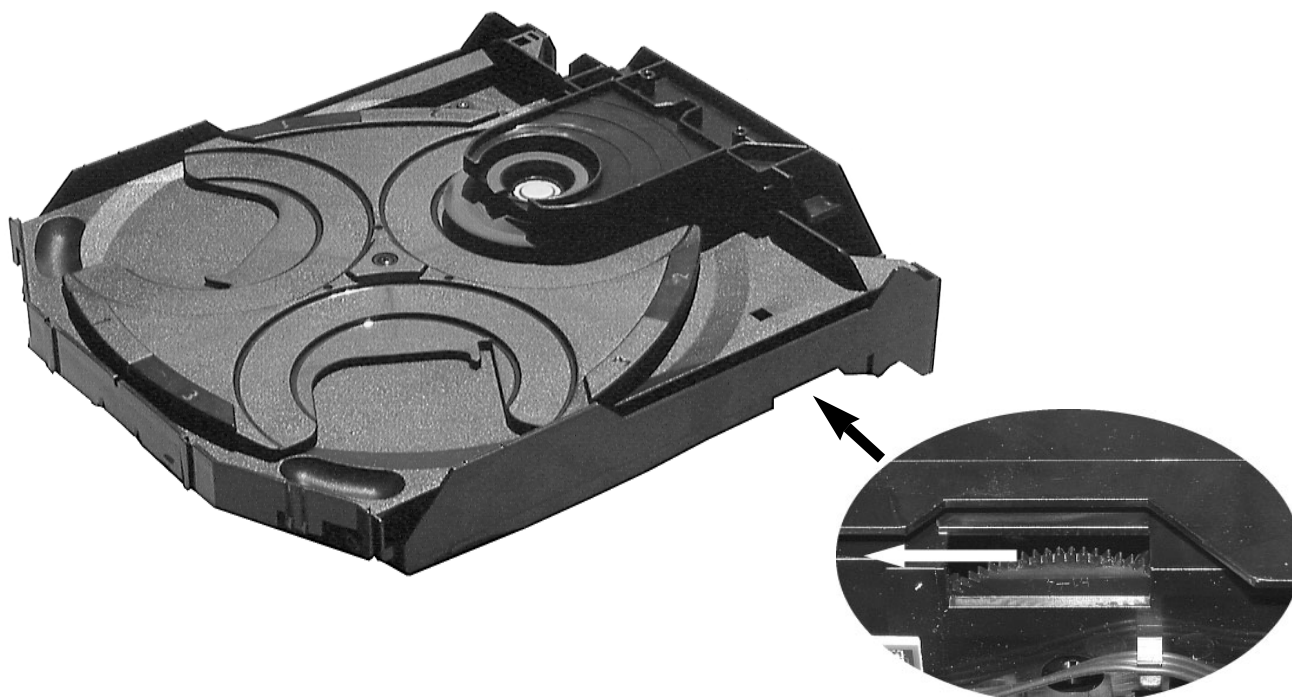
Attention: The laser diode of this CD drive is protected against ESD by a solder joint which short-circuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connecting the drive to the set.



Emergency open

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

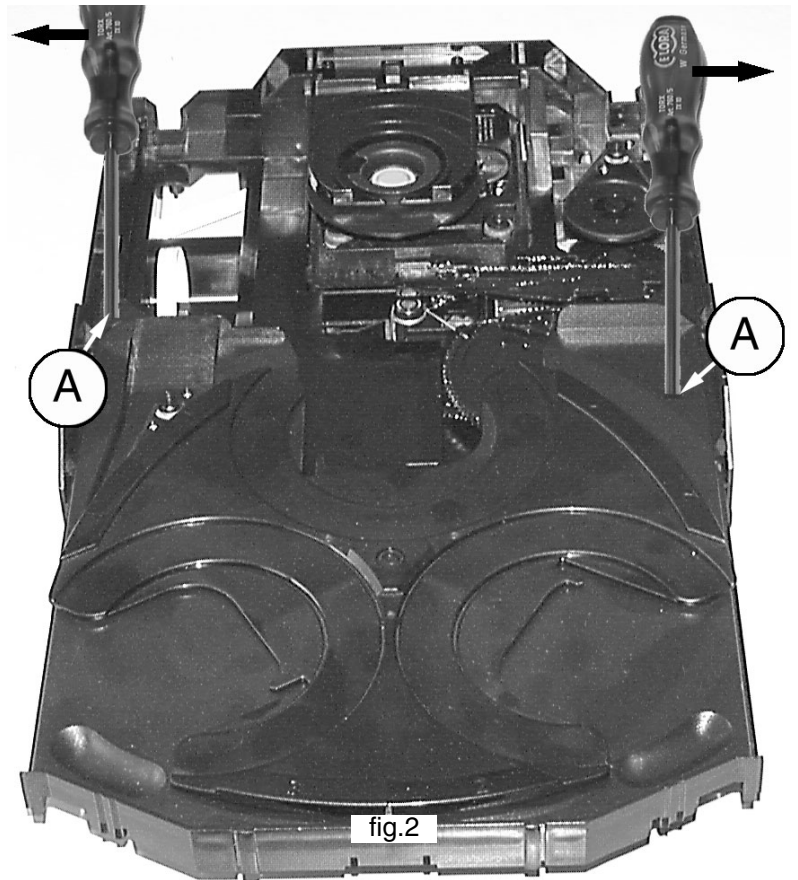
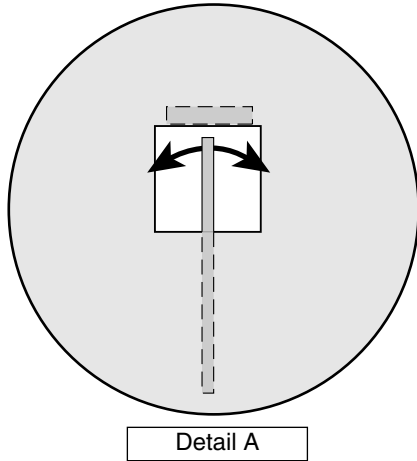
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



Service hints

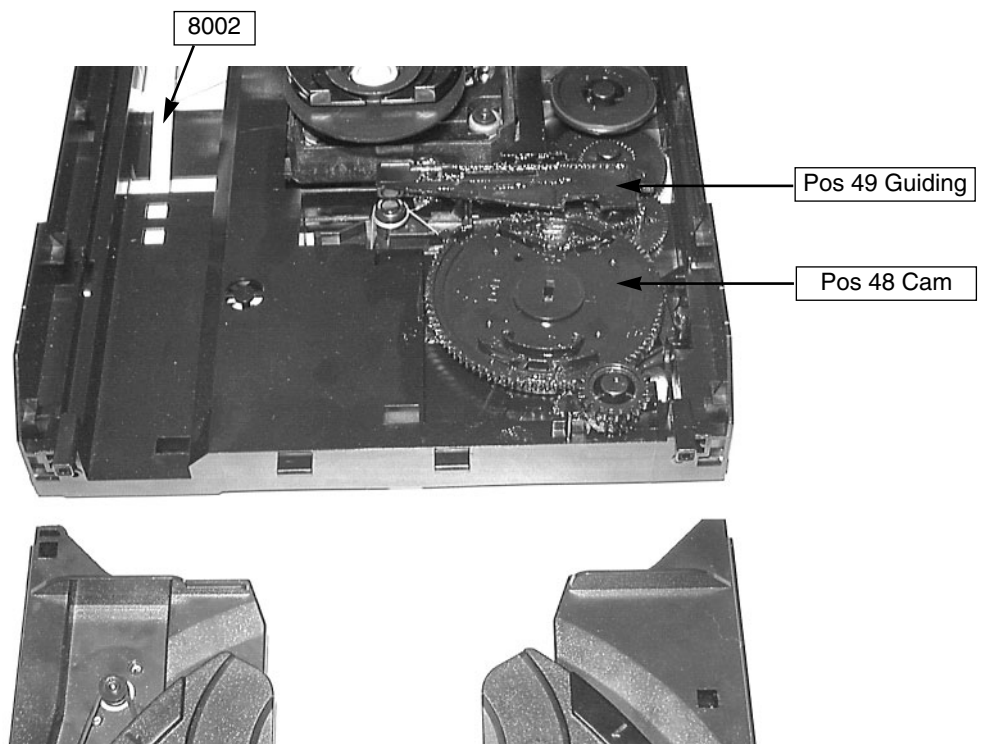
Dismantling of Tray

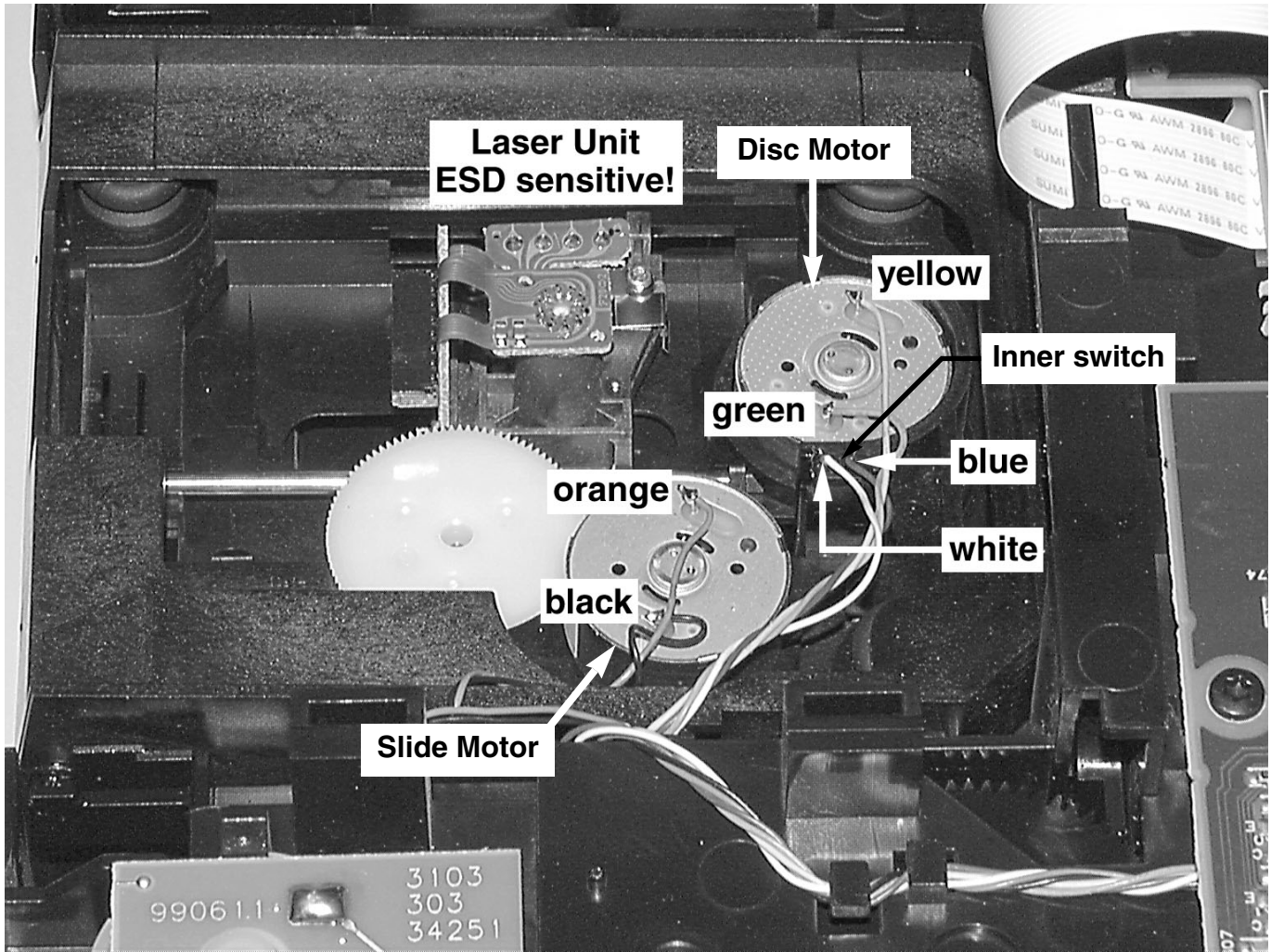
1. Open the tray.
2. Release 2x catch as shown in fig. 2 and Detail A
3. Pull tray out.



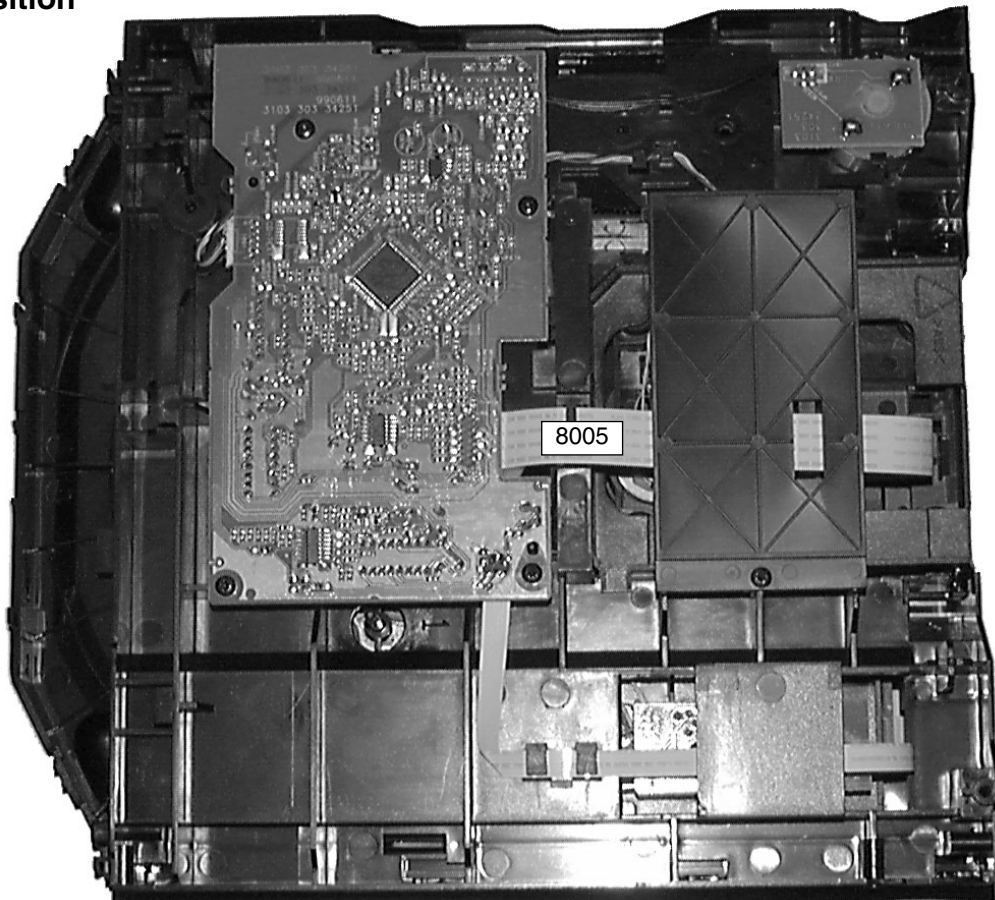
Assembling of Tray

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

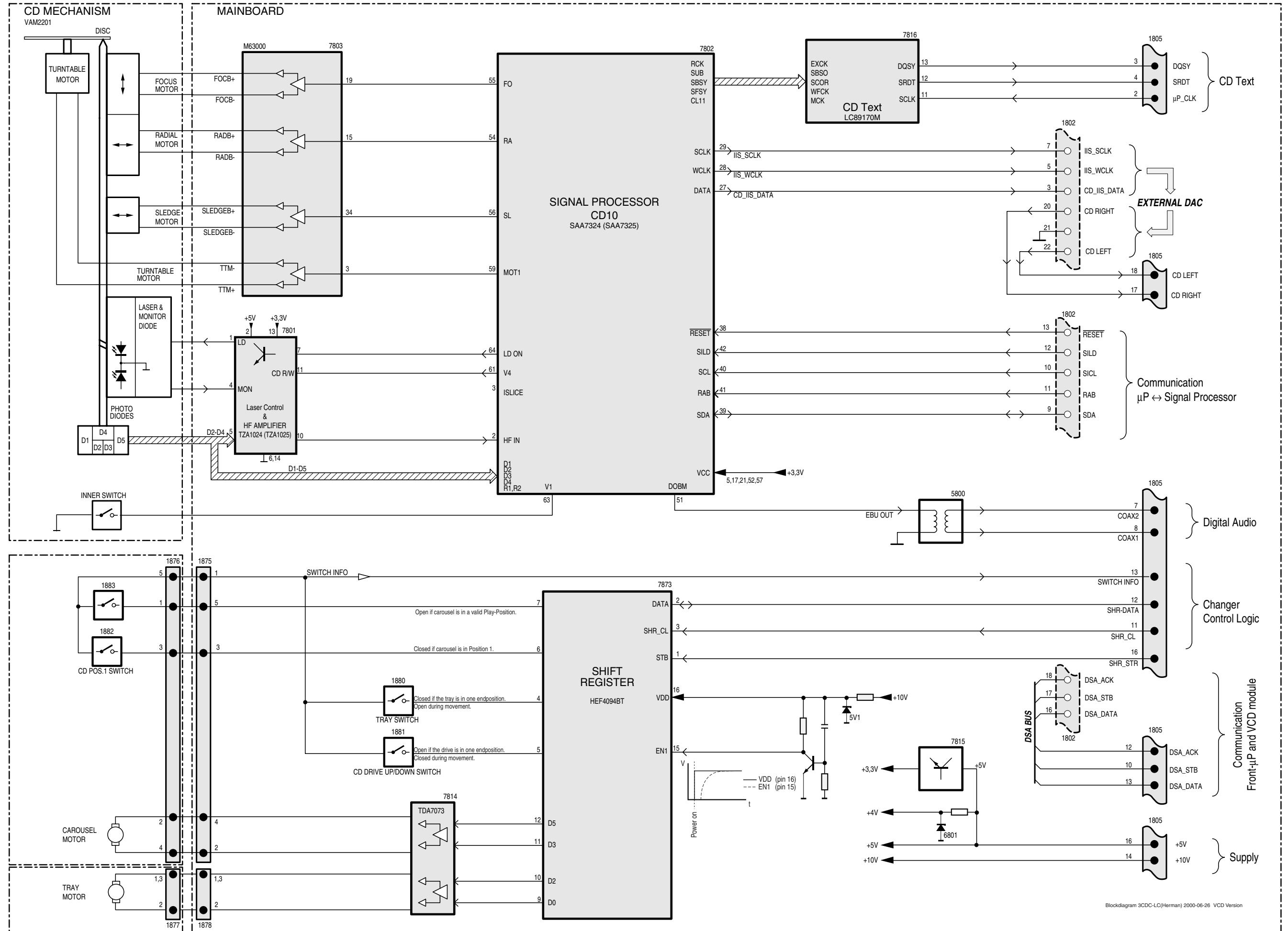




Service Position

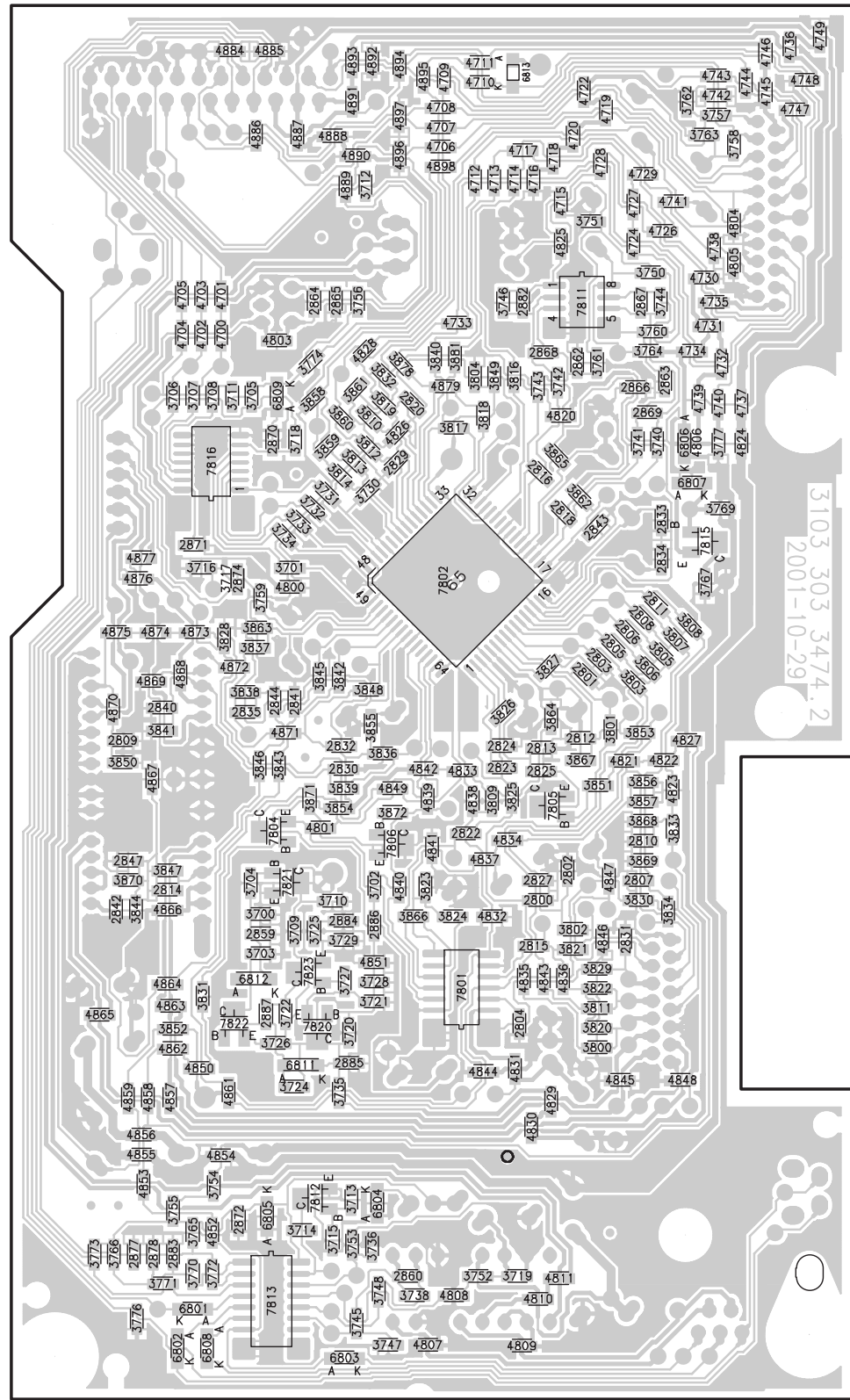


BLOCK DIAGRAM 3CDC-LC VCD Version



Mapping

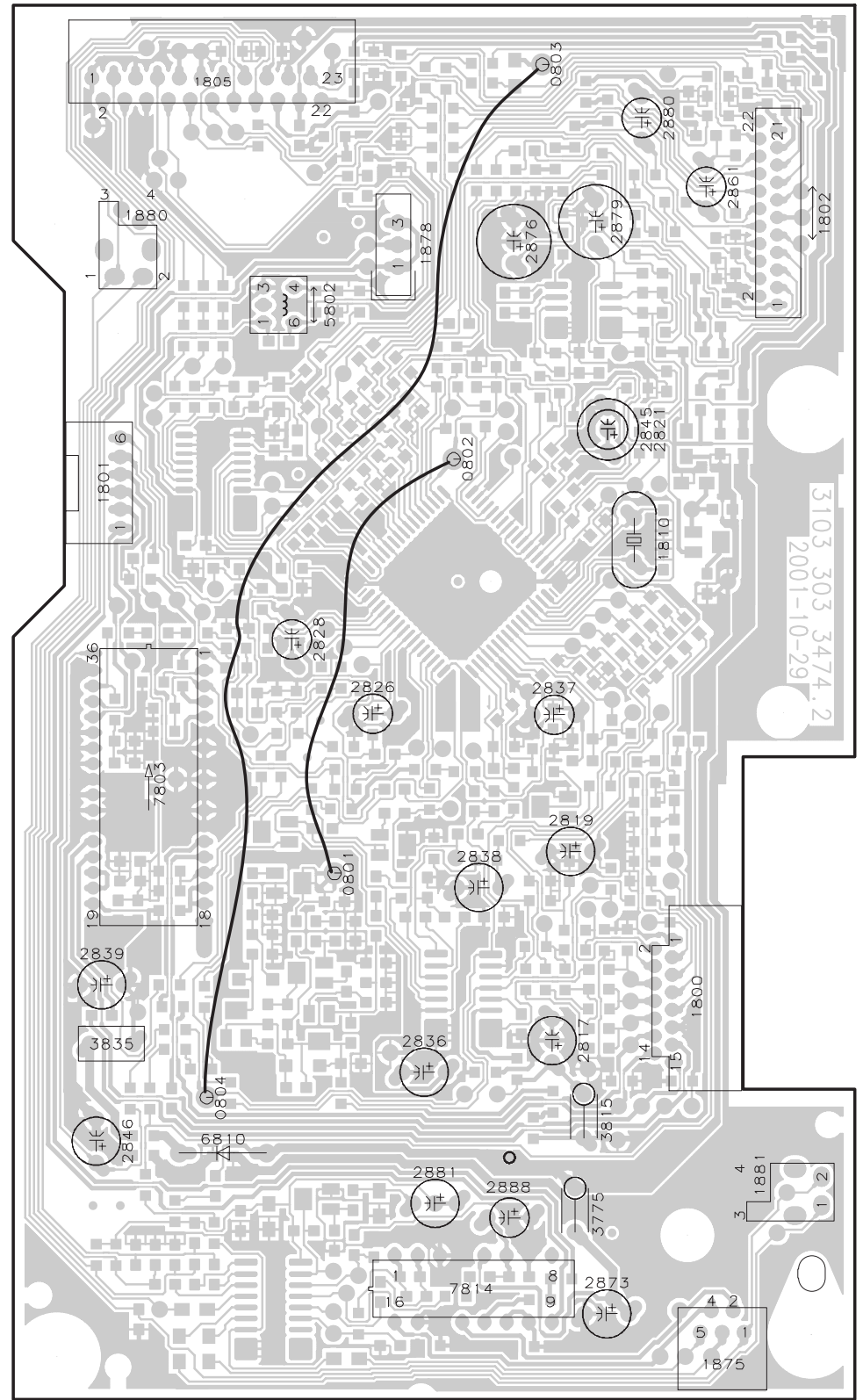
3CDC-LC (Herman) Copperside view



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

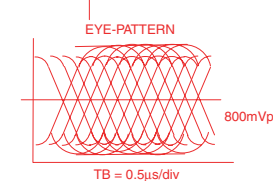
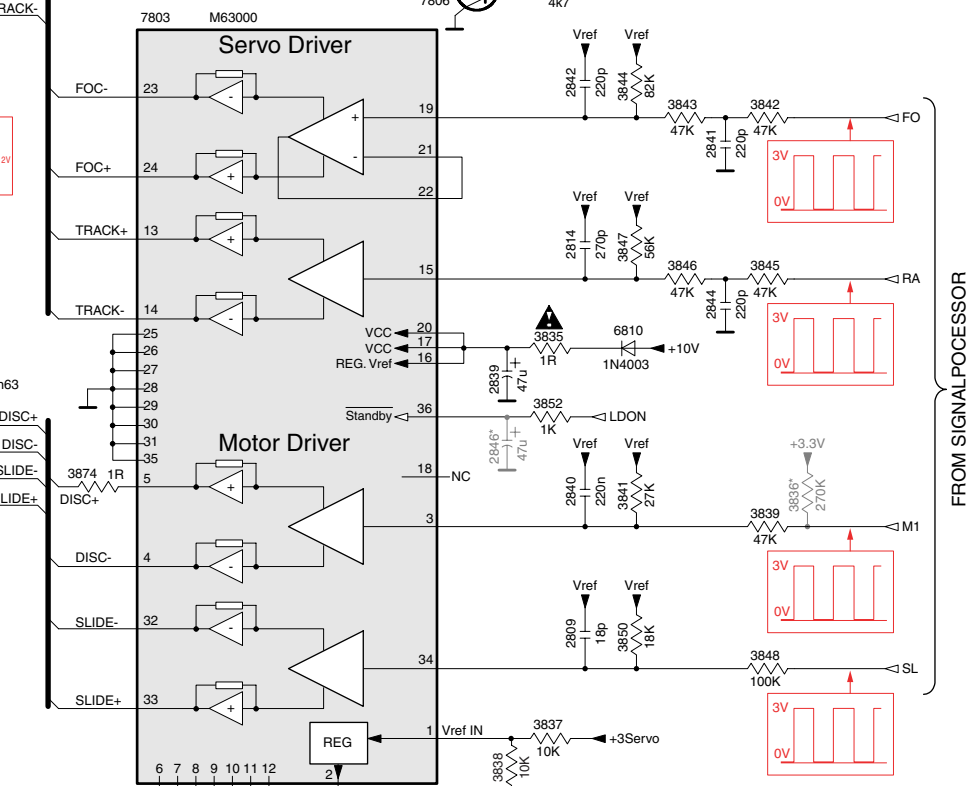
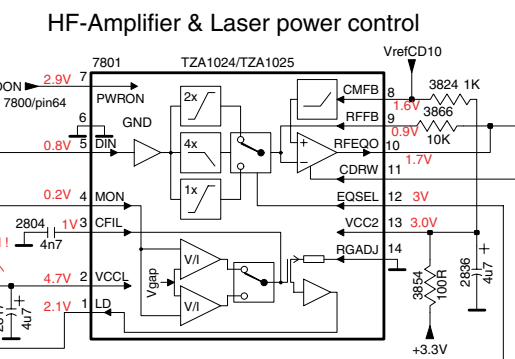
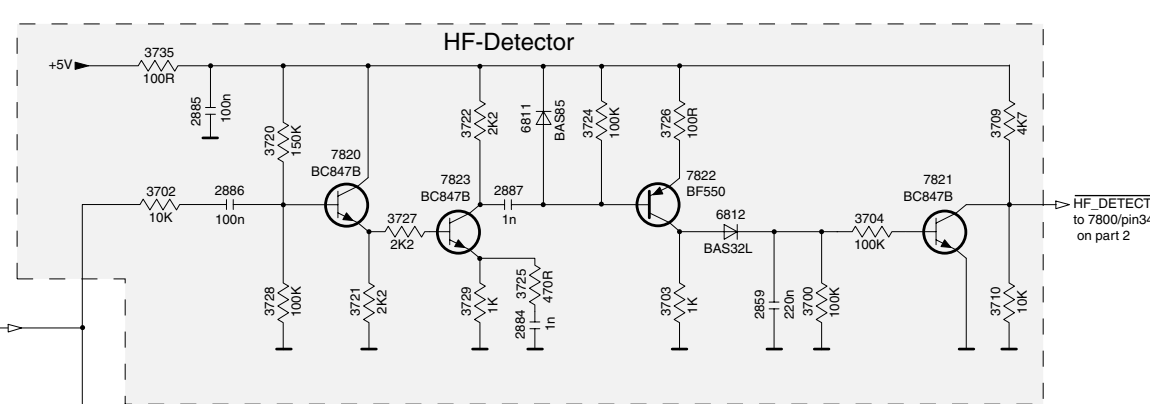
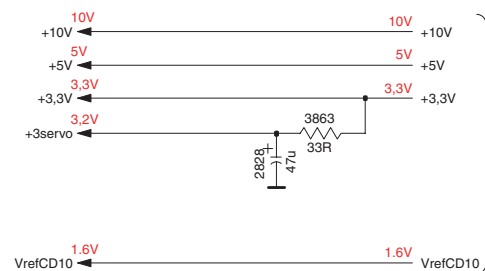
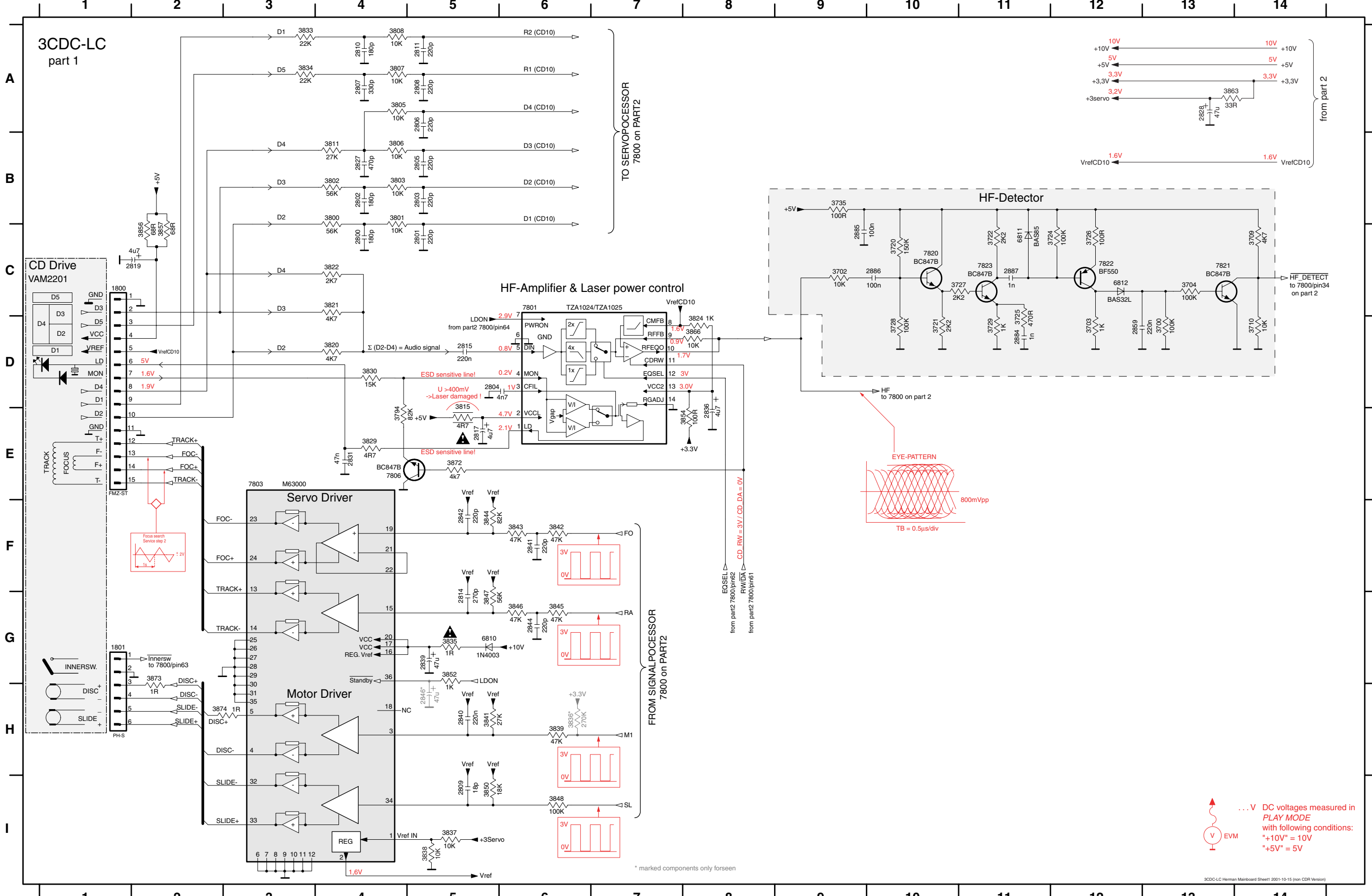
Copperside				Componentside			
2800 F4	3732 C2	3851 E4	4828 C3	7823 F2	0801 E2		
2801 D4	3733 C2	3852 F1	4829 G4		0802 C3		
2802 E4	3734 D2	3853 E4	4830 G3		0803 A4		
2803 D4	3735 G2	3854 E2	4831 G3		0804 G2		
2804 F3	3736 H3	3855 E3	4832 F3		1800 F4		
2805 D4	3738 H3	3856 E4	4833 E3		1801 C1		
2806 D4	3740 C4	3857 E4	4834 E3		1802 B5		
2807 F4	3741 C4	3858 C2	4835 F3		1805 A2		
2808 D4	3742 C4	3859 C2	4836 F4		1810 D4		
2809 E1	3743 C4	3860 C2	4837 E3		1875 H5		
2810 E4	3744 B4	3861 C2	4838 E3		1878 B3		
2811 D4	3745 H2	3862 C4	4839 E3		1880 B1		
2812 E4	3746 B3	3863 D2	4840 F3		1881 G5		
2813 F4	3747 H3	3864 F4	4841 E3		2817 F4		
2814 F1	3748 H3	3865 C4	4842 E3		2819 E4		
2815 F3	3750 B4	3866 F3	4843 F4		2821 C4		
2816 C4	3751 B4	3867 E4	4844 G3		2826 D3		
2818 C4	3752 H3	3868 E4	4845 G4		2828 D2		
2820 C3	3753 H2	3869 E4	4846 F4		2836 F3		
2822 E3	3754 G2	3870 F1	4847 F4		2837 D4		
2823 E3	3755 G1	3871 E2	4848 G4		2838 E3		
2824 E3	3756 B2	3872 E3	4849 E3		2839 F1		
2825 E4	3757 A5	3878 C3	4850 G2		2845 C4		
2827 F4	3758 A5	3881 C3	4851 F3		2846 G1		
2829 C3	3759 D2	4700 B2	4852 H2		2861 B5		
2830 E2	3760 B4	4701 B2	4853 G1		2873 H4		
2831 F4	3761 C4	4702 B2	4854 G2		2876 B3		
2832 E2	3762 A4	4703 B2	4855 G1		2879 B4		
2833 C4	3763 A4	4704 B1	4856 G1		2880 A4		
2834 D4	3764 C4	4705 B1	4857 G1		2881 G3		
2835 E2	3765 H2	4706 A3	4858 G1		2888 G3		
2840 E1	3766 H1	4707 A3	4859 G1		3775 G4		
2841 E2	3767 D4	4708 A3	4861 G2		3815 G4		
2842 F1	3769 C5	4709 A3	4862 F1		3835 F1		
2843 D4	3770 H2	4710 A3	4863 F1		5802 B2		
2844 E2	3771 H1	4711 A3	4864 F1		6810 E2		
2847 E1	3772 H2	4712 B3	4865 F1		7803 G1		
2859 F2	3773 H1	4713 B3	4866 F1		7814 H3		
2860 H3	3774 C2	4714 B3	4867 E1				
2862 C4	3776 H1	4715 B4	4868 D1				
2863 C4	3777 C5	4716 B3	4869 D1				
2864 B2	3800 F4	4717 A3	4870 E1				
2865 B2	3801 E4	4718 A4	4871 E2				
2866 C4	3802 F4	4719 A4	4872 D2				
2867 B4	3803 D4	4720 A4	4873 D2				
2868 C4	3804 C3	4722 A4	4874 D1				
2869 C4	3805 D4	4724 B4	4875 D1				
2870 C2	3806 D4	4726 B4	4876 D1				
2871 D2	3807 D4	4727 B4	4877 D1				
2872 G2	3808 D4	4728 A4	4879 C3				
2874 D2	3809 E3	4729 A4	4884 A2				
2877 H1	3810 C3	4730 B4	4885 A2				
2878 H1	3811 F4	4731 B4	4886 A2				
2882 B3	3812 C3	4732 C5	4887 A2				
2883 H1	3813 C2	4733 B3	4888 A2				
2884 F2	3814 C2	4734 C4	4889 B2				
2885 G2	3816 C3	4735 B5	4890 A2				
2886 F3	3817 C3	4736 A5	4891 A2				
2887 F2	3818 C3	4737 C5	4892 A3				
3700 F2	3819 C3	4738 B5	4893 A2				
3701 D2	3820 F4	4739 C4	4894 A3				
3702 F3	3821 F4	4740 C5	4895 A3				
3703 F2	3822 F4	4741 B4	4896 A3				
3704 F2	3823 F3	4742 A5	4897 A3				
3705 C2	3824 F3	4743 A5	4898 A3				
3706 C1	3825 E3	4744 A5	6801 H2				
3707 C2	3826 E3	4745 A5	6802 H1				
3708 C2	3827 D4	4746 A5	6803 H2				
3709 F2	3828 D2	4747 A5	6804 G3				
3710 F2	3829 F4	4748 A5	6805 G2				
3711 C2	3830 F4	4749 A5	6806 C4				
3712 B3	3831 F2	4800 D2	6807 C4				
3713 G2	3832 C3	4801 E2	6808 H2				
3714 H2	3833 E4	4803 B2	6809 C2				
3715 H2	3834 F4	4804 B5	6811 G2				
3716 D2	3836 E3	4805 B5	6812 F2				
3717 D2	3837 D2	4806 C4	6813 A3				
3718 C2	3838 D2	4807 H3	7801 F3				
3719 H3	3839 E2	4808 H3	7802 D3				
3720 F2	3840 C3	4809 H3	7804 E2				
3721 F3	3841 E1	4810 H4	7805 E4				
3722 F2	3842 D2	4811 H4	7806 E3				
3724 G2	3843 E2	4820 C4	7811 B4				
3725 F2	3844 F1	4821 E4	7812 G2				
3726 F2	3845 D2	4822 E4	7813 H2				
3727 F2	3846 E2	4823 E4	7815 D4				
3728 F3	3847 E1	4824 C5	7816 C2				
3729 F2	3848 D3	4825 B4	7820 F2				
3730 C3	3849 C3	4826 C3	7821 F2				
3731 C2	3850 E1	4827 E4	7822 F2				

3CDC-LC (Herman) Components seen from Copperside



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

1800	C1	2803	B5	2808	A5	2815	D5	2830	H6	2839	G5	2848	H5	2886	C10	3704	C13	3722	C11	3728	D10	3802	B4	3808	A4	3822	C4	3834	A3	3839	H6	3845	G6	3852	H5	3866	D8	3874	H2	7801	D6	7822	C12		
1801	G1	2804	D6	2809	I5	2817	E5	2831	E4	2840	H5	2859	D13	2887	C11	3709	C14	3724	C12	3729	D11	3803	B4	3811	B4	3824	D8	3835	G5	3841	H5	3846	G6	3854	E8	3868	A4	3886	A10	7803	E3	7823	C13		
2800	C4	2805	B5	2810	A4	2819	C2	2832	I6	2841	F6	2860	A9	3700	D13	3710	D14	3725	D11	3735	B9	3805	A4	3815	E5	3829	E4	3836	H6	3842	F6	3847	G5	3856	C2	3869	A4	4801	E8	7806	E5				
2801	C5	2806	A5	2811	A5	2827	B4	2835	I5	2842	F5	2884	D11	3702	C9	3720	C10	3726	C12	3800	B4	3806	B4	3820	D4	3830	D4	3837	I5	3843	F6	3848	I6	3857	C2	3872	E5	6811	C11	7820	C10				
2802	B4	2807	A4	2814	G5	2828	A13	2836	E8	2844	G6	2885	C9	3703	D12	3721	D10	3727	C11	3801	B4	3807	A4	3821	C4	3833	A3	3838	I5	3844	F5	3850	I5	3863	G2	3873	G2	6812	C12	7821	C13				

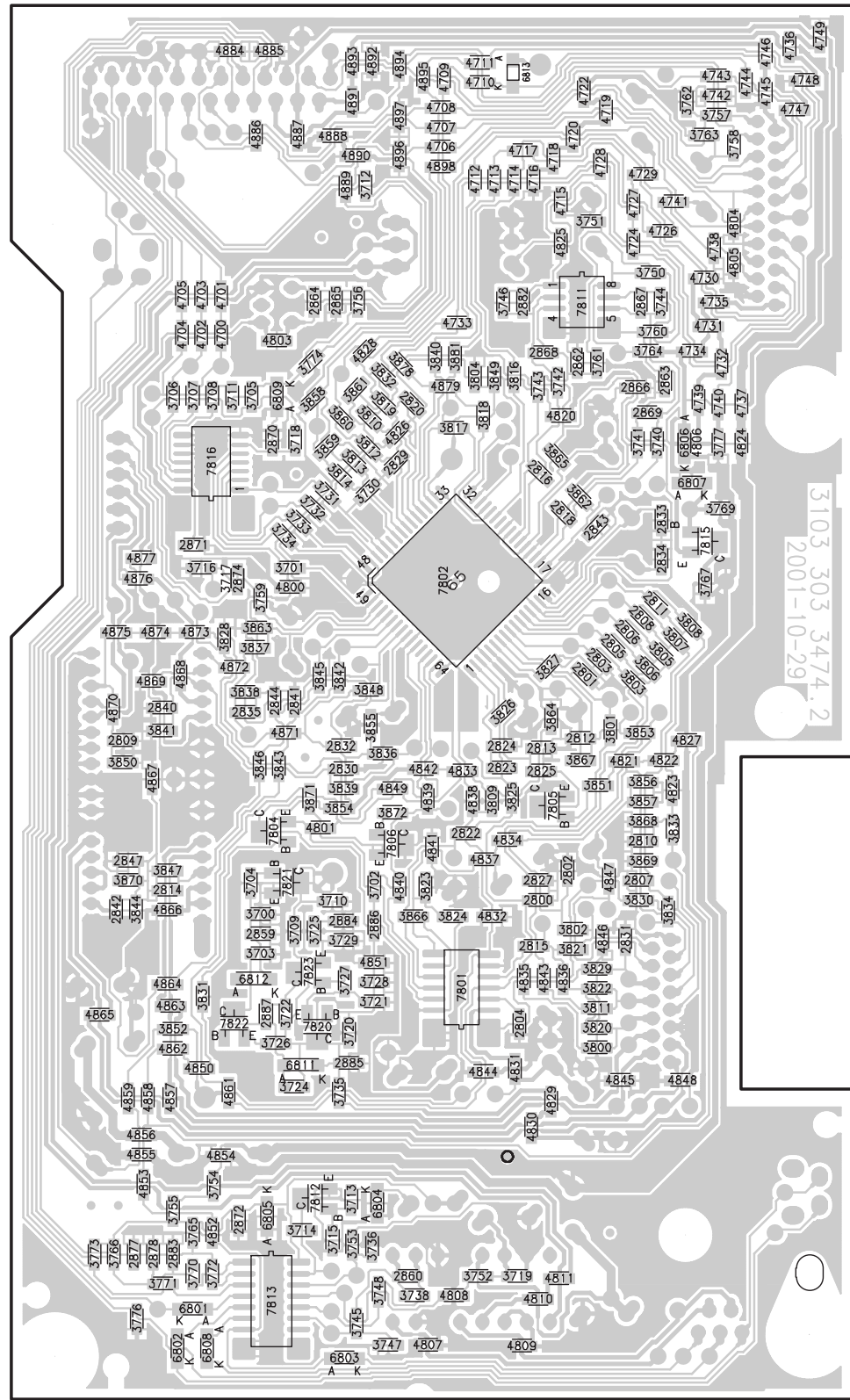


... V DC voltages measured in PLAY MODE with following conditions: "+10V" = 10V "+5V" = 5V

* marked components only forseen

Mapping

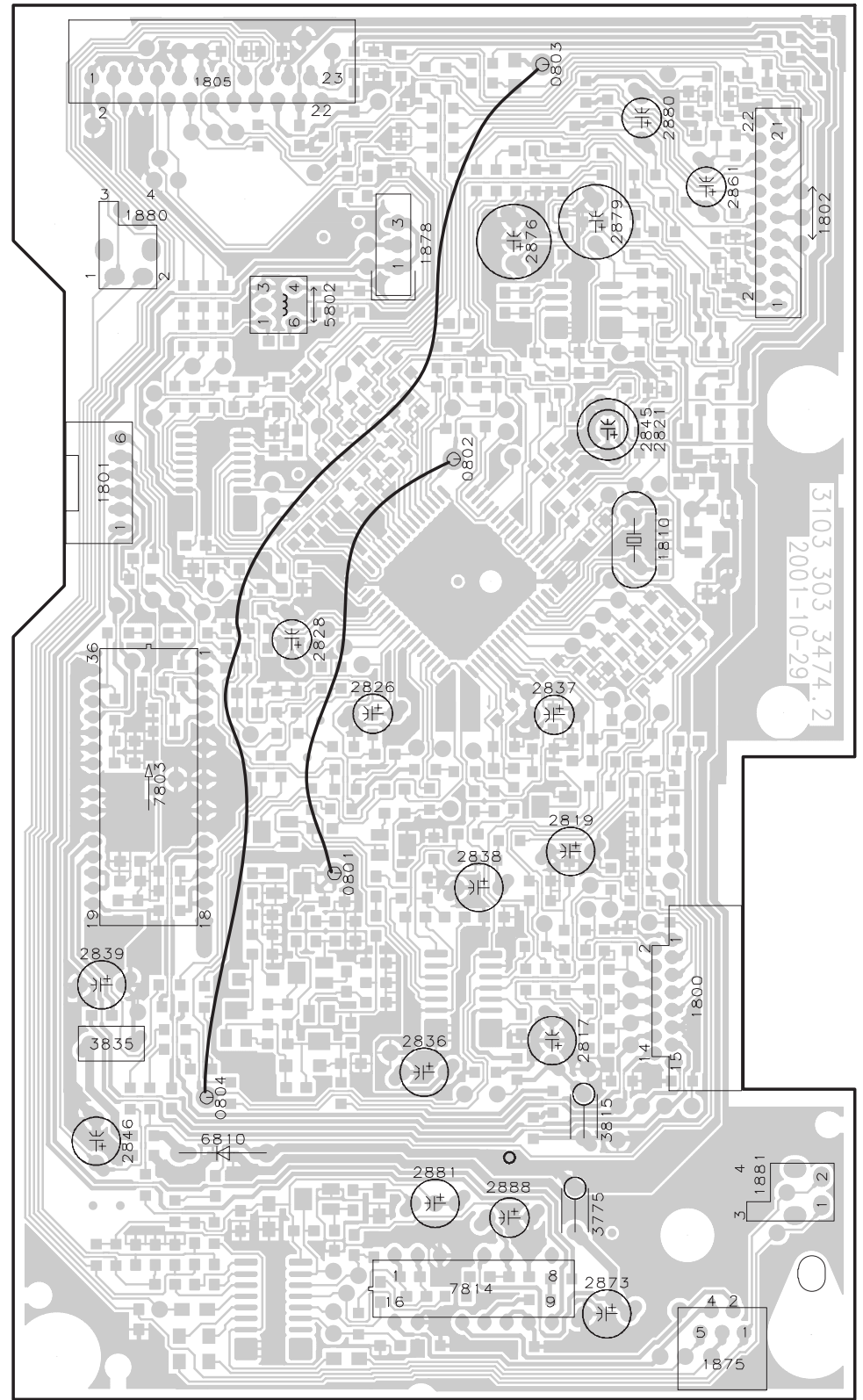
3CDC-LC (Herman) Copperside view



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

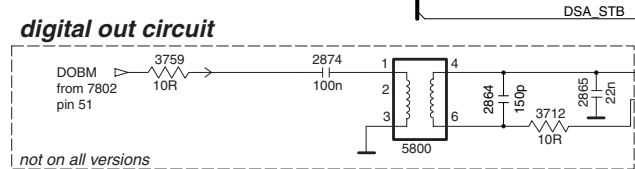
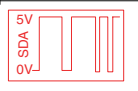
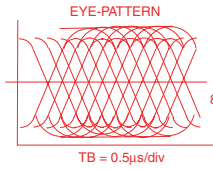
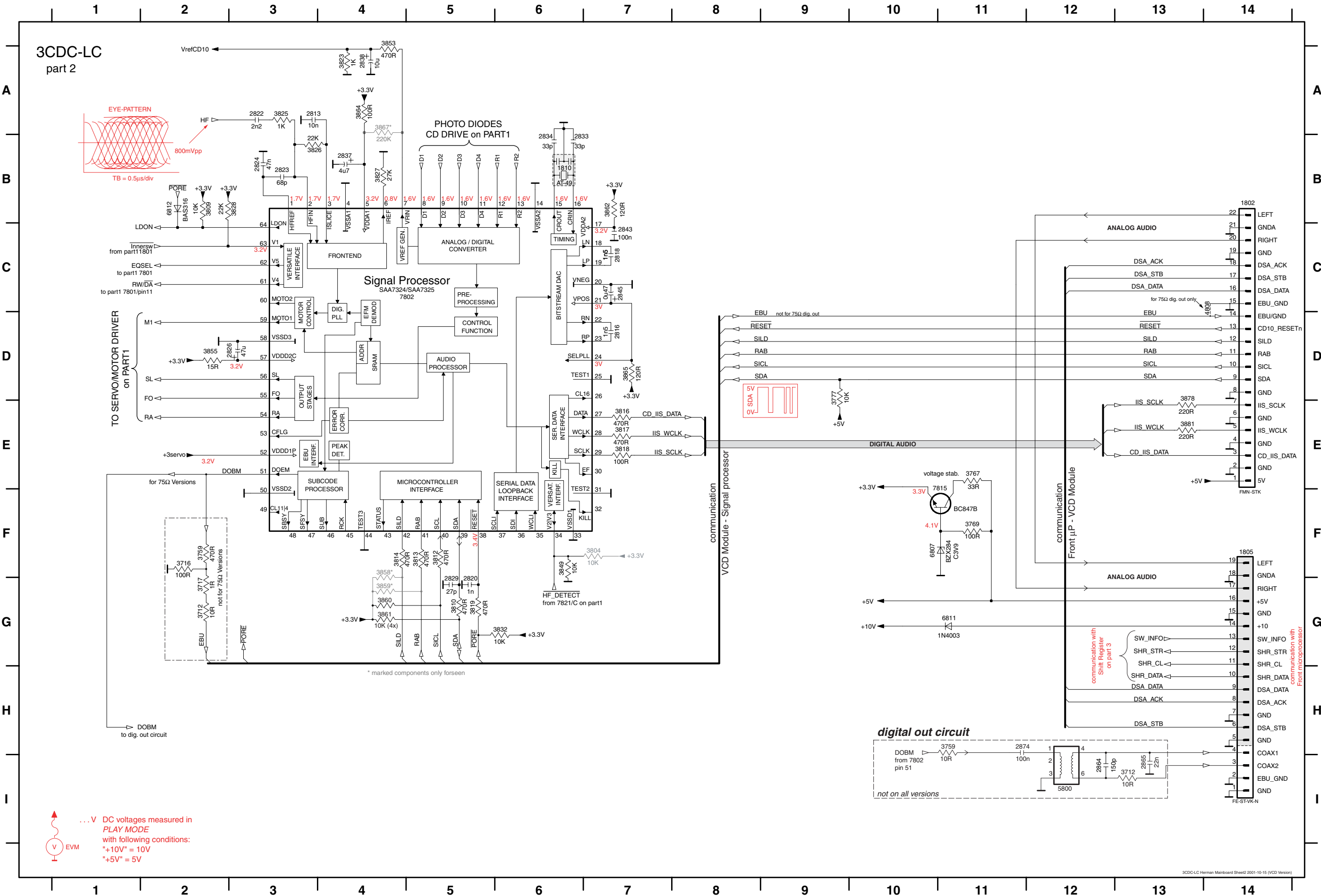
Copperside				Componentside	
2800 F4	3732 C2	3851 E4	4828 C3	7823 F2	0801 E2
2801 D4	3733 C2	3852 F1	4829 G4		0802 C3
2802 E4	3734 D2	3853 E4	4830 G3		0803 A4
2803 D4	3735 G2	3854 E2	4831 G3		0804 G2
2804 F3	3736 H3	3855 E3	4832 F3		1800 F4
2805 D4	3738 H3	3856 E4	4833 E3		1801 C1
2806 D4	3740 C4	3857 E4	4834 E3		1802 B5
2807 F4	3741 C4	3858 C2	4835 F3		1805 A2
2808 D4	3742 C4	3859 C2	4836 F4		1810 D4
2809 E1	3743 C4	3860 C2	4837 E3		1875 H5
2810 E4	3744 B4	3861 C2	4838 E3		1878 B3
2811 D4	3745 H2	3862 C4	4839 E3		1880 B1
2812 E4	3746 B3	3863 D2	4840 F3		1881 G5
2813 F4	3747 H3	3864 F4	4841 E3		2817 F4
2814 F1	3748 H3	3865 C4	4842 E3		2819 E4
2815 F3	3750 B4	3866 F3	4843 F4		2821 C4
2816 C4	3751 B4	3867 E4	4844 G3		2826 D3
2818 C4	3752 H3	3868 E4	4845 G4		2828 D2
2820 C3	3753 H2	3869 E4	4846 F4		2836 F3
2822 E3	3754 G2	3870 F1	4847 F4		2837 D4
2823 E3	3755 G1	3871 E2	4848 G4		2838 E3
2824 E3	3756 B2	3872 E3	4849 E3		2839 F1
2825 E4	3757 A5	3878 C3	4850 G2		2845 C4
2827 F4	3758 A5	3881 C3	4851 F3		2846 G1
2829 C3	3759 D2	4700 B2	4852 H2		2861 B5
2830 E2	3760 B4	4701 B2	4853 G1		2873 H4
2831 F4	3761 C4	4702 B2	4854 G2		2876 B3
2832 E2	3762 A4	4703 B2	4855 G1		2879 B4
2833 C4	3763 A4	4704 B1	4856 G1		2880 A4
2834 D4	3764 C4	4705 B1	4857 G1		2881 G3
2835 E2	3765 H2	4706 A3	4858 G1		2888 G3
2840 E1	3766 H1	4707 A3	4859 G1		3775 G4
2841 E2	3767 D4	4708 A3	4861 G2		3815 G4
2842 F1	3769 C5	4709 A3	4862 F1		3835 F1
2843 D4	3770 H2	4710 A3	4863 F1		5802 B2
2844 E2	3771 H1	4711 A3	4864 F1		6810 E2
2847 E1	3772 H2	4712 B3	4865 F1		7803 G1
2859 F2	3773 H1	4713 B3	4866 F1		7814 H3
2860 H3	3774 C2	4714 B3	4867 E1		
2862 C4	3776 H1	4715 B4	4868 D1		
2863 C4	3777 C5	4716 B3	4869 D1		
2864 B2	3800 F4	4717 A3	4870 E1		
2865 B2	3801 E4	4718 A4	4871 E2		
2866 C4	3802 F4	4719 A4	4872 D2		
2867 B4	3803 D4	4720 A4	4873 D2		
2868 C4	3804 C3	4722 A4	4874 D1		
2869 C4	3805 D4	4724 B4	4875 D1		
2870 C2	3806 D4	4726 B4	4876 D1		
2871 D2	3807 D4	4727 B4	4877 D1		
2872 G2	3808 D4	4728 A4	4879 C3		
2874 D2	3809 E3	4729 A4	4884 A2		
2877 H1	3810 C3	4730 B4	4885 A2		
2878 H1	3811 F4	4731 B4	4886 A2		
2882 B3	3812 C3	4732 C5	4887 A2		
2883 H1	3813 C2	4733 B3	4888 A2		
2884 F2	3814 C2	4734 C4	4889 B2		
2885 G2	3816 C3	4735 B5	4890 A2		
2886 F3	3817 C3	4736 A5	4891 A2		
2887 F2	3818 C3	4737 C5	4892 A3		
3700 F2	3819 C3	4738 B5	4893 A2		
3701 D2	3820 F4	4739 C4	4894 A3		
3702 F3	3821 F4	4740 C5	4895 A3		
3703 F2	3822 F4	4741 B4	4896 A3		
3704 F2	3823 F3	4742 A5	4897 A3		
3705 C2	3824 F3	4743 A5	4898 A3		
3706 C1	3825 E3	4744 A5	6801 H2		
3707 C2	3826 E3	4745 A5	6802 H1		
3708 C2	3827 D4	4746 A5	6803 H2		
3709 F2	3828 D2	4747 A5	6804 G3		
3710 F2	3829 F4	4748 A5	6805 G2		
3711 C2	3830 F4	4749 A5	6806 C4		
3712 B3	3831 F2	4800 D2	6807 C4		
3713 G2	3832 C3	4801 E2	6808 H2		
3714 H2	3833 E4	4803 B2	6809 C2		
3715 H2	3834 F4	4804 B5	6811 G2		
3716 D2	3836 E3	4805 B5	6812 F2		
3717 D2	3837 D2	4806 C4	6813 A3		
3718 C2	3838 D2	4807 H3	7801 F3		
3719 H3	3839 E2	4808 H3	7802 D3		
3720 F2	3840 C3	4809 H3	7804 E2		
3721 F3	3841 E1	4810 H4	7805 E4		
3722 F2	3842 D2	4811 H4	7806 E3		
3724 G2	3843 E2	4820 C4	7811 B4		
3725 F2	3844 F1	4821 E4	7812 G2		
3726 F2	3845 D2	4822 E4	7813 H2		
3727 F2	3846 E2	4823 E4	7815 D4		
3728 F3	3847 E1	4824 C5	7816 C2		
3729 F2	3848 D3	4825 B4	7820 F2		
3730 C3	3849 C3	4826 C3	7821 F2		
3731 C2	3850 E1	4827 E4	7822 F2		

3CDC-LC (Herman) Components seen from Copperside



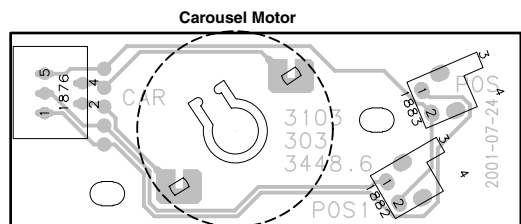
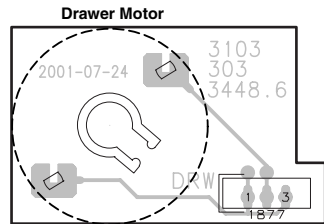
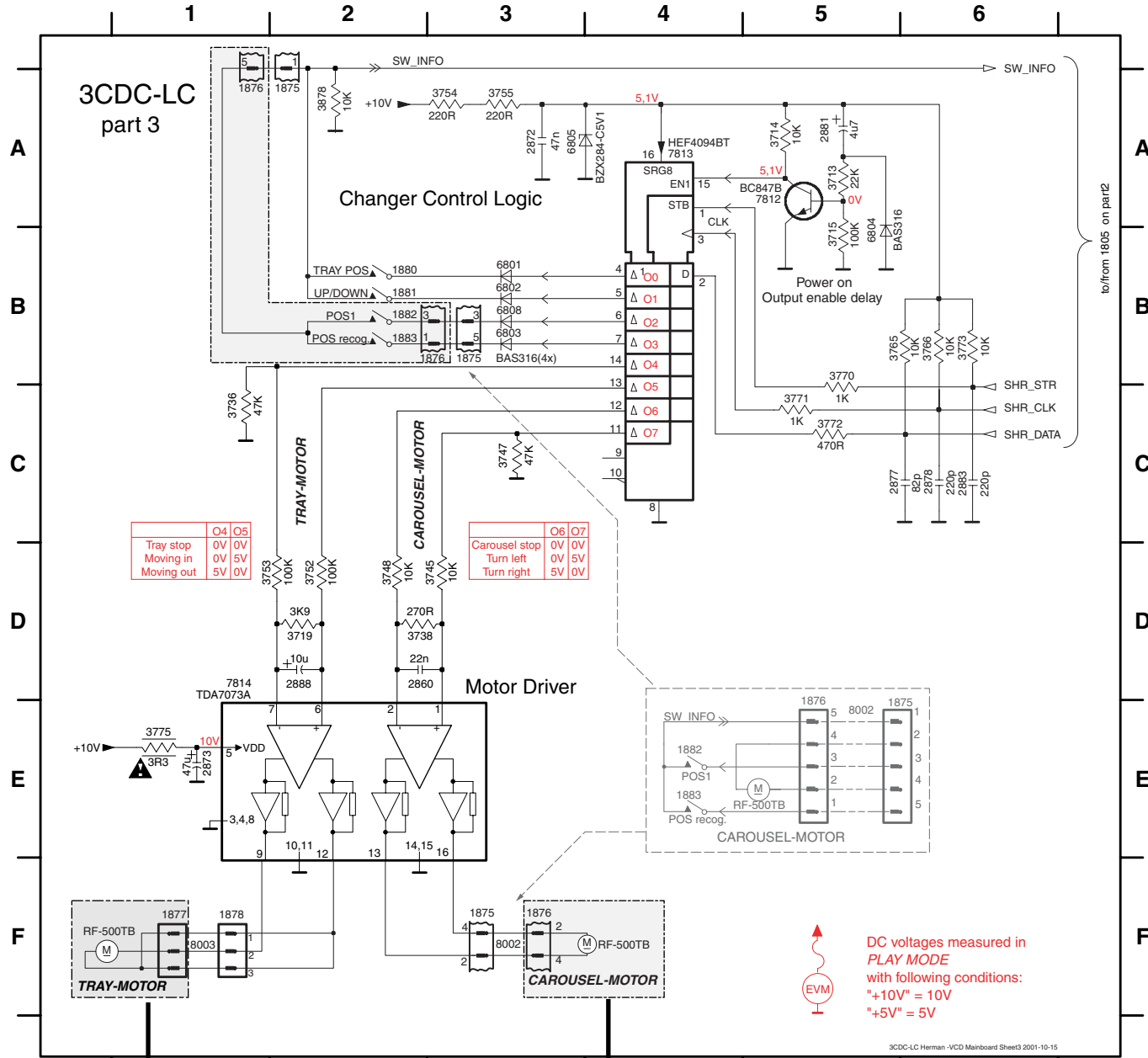
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

1802	B14	2816	D7	2823	B3	2833	B6	2843	C7	2870	I5	3705	H7	3712	G2	3718	H6	3733	I5	3767	E11	3804	F7	3812	F5	3817	E7	3825	A3	3832	G6	3858	G4	3862	B7	3878	E13	6807	F11	7802	C5
1805	F14	2818	C7	2824	B3	2834	B6	2845	C7	2871	H6	3706	I7	3712	I13	3730	I4	3734	I5	3769	F11	3808	I7	3813	F5	3818	E7	3826	B3	3849	F6	3859	G4	3864	A4	3881	E13	6809	H7	7815	F11
1810	B6	2820	G5	2826	D3	2837	B4	2854	I12	2874	H11	3707	I7	3716	F2	3731	I5	3759	F2	3774	H8	3809	B2	3814	F4	3819	G5	3827	B4	3853	A4	3860	G4	3865	D7	4808	C14	6811	G11	7816	I5
2813	A3	2822	A3	2829	G5	2838	A4	2865	I13	3701	I5	3711	I7	3717	G2	3732	I5	3759	H10	3777	D9	3810	G5	3816	E7	3823	A4	3828	B3	3855	D2	3861	G4	3867	A4	5800	I12	6812	B2		

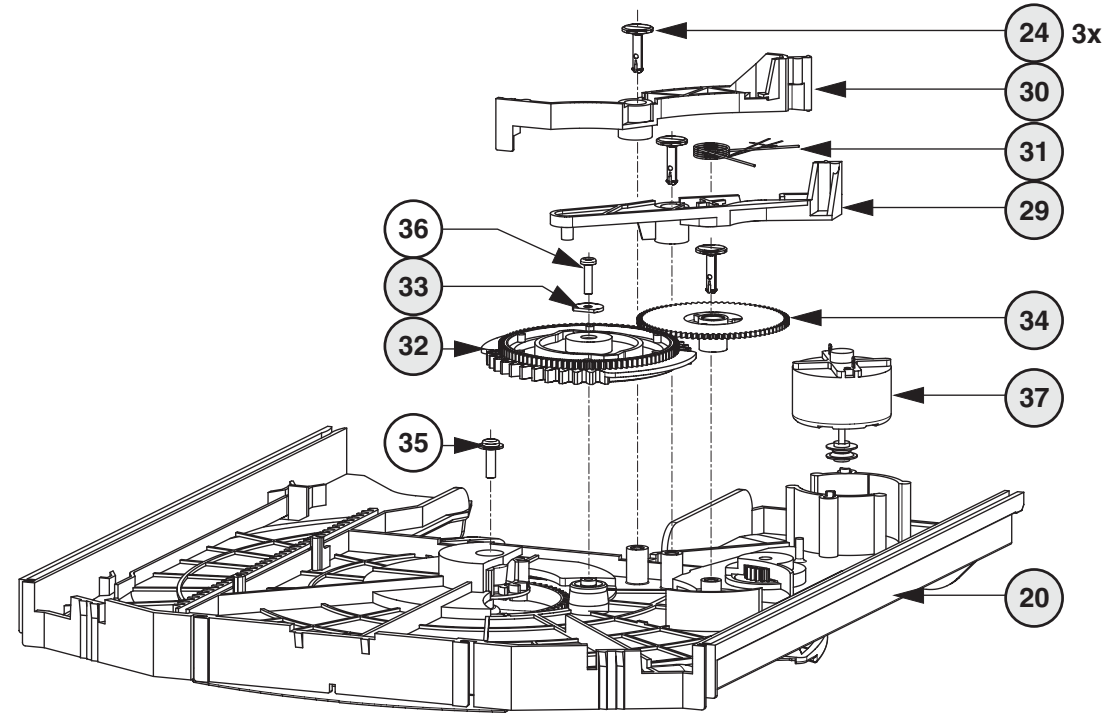


... V DC voltages measured in PLAY MODE with following conditions:
 "+10V" = 10V
 "+5V" = 5V

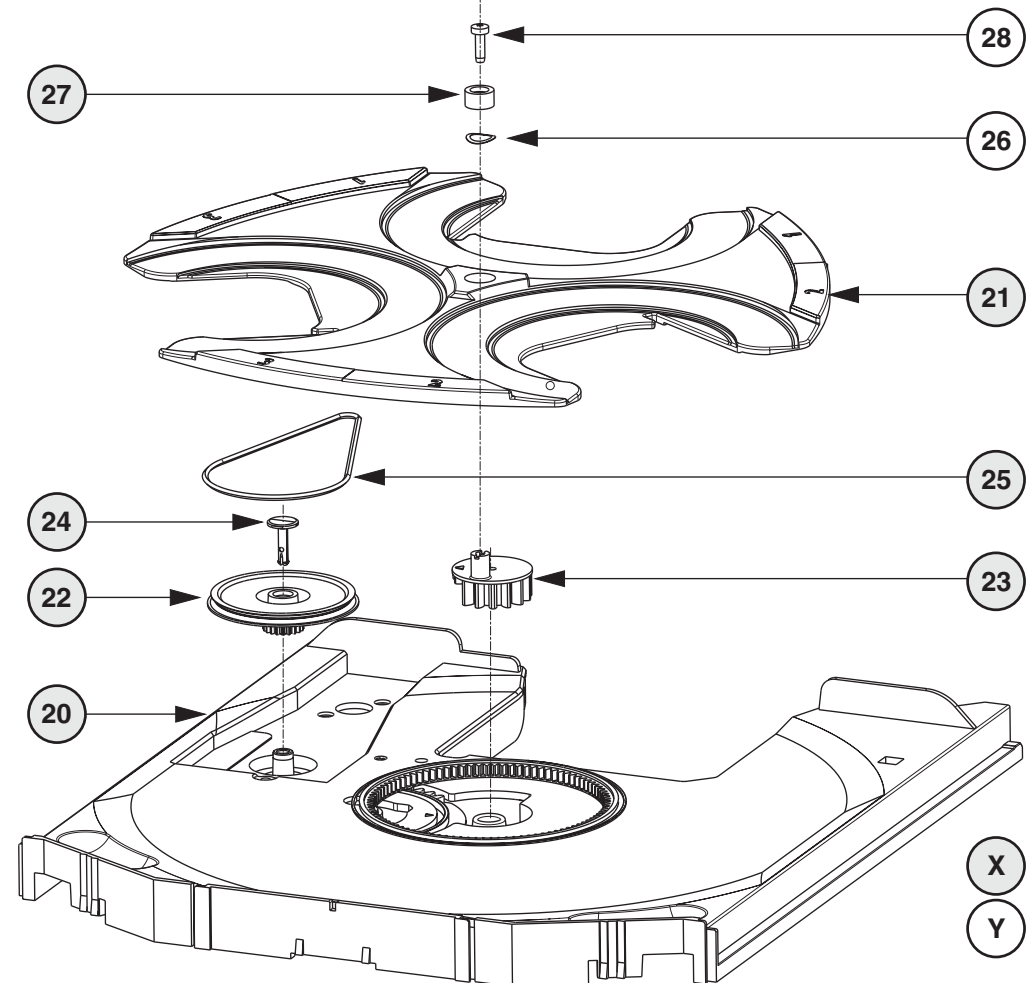
1875	F3	1876	B3	1880	B2	1883	E4	2878	C6	3714	A5	3745	D3	3754	A3	3771	C5	6801	B3	6808	B3	8003	F1
1875	E5	1876	F3	1881	B2	2860	D2	2881	A5	3715	B5	3747	C3	3755	A3	3772	C5	6802	B3	7812	A5		
1875	B3	1876	E5	1882	B2	2872	A3	2883	C6	3719	D2	3748	D2	3765	B6	3773	B6	6803	B3	7813	A4		
1875	A2	1877	F1	1882	E4	2873	E1	2888	D2	3736	C1	3752	D2	3766	B6	3775	E1	6804	B5	7814	E1		
1876	A1	1878	F1	1883	B2	2877	C6	3713	A5	3738	D2	3753	D2	3770	C5	3878	A2	6805	A4	8002	E5		



Drawer bottom view



Drawer top view

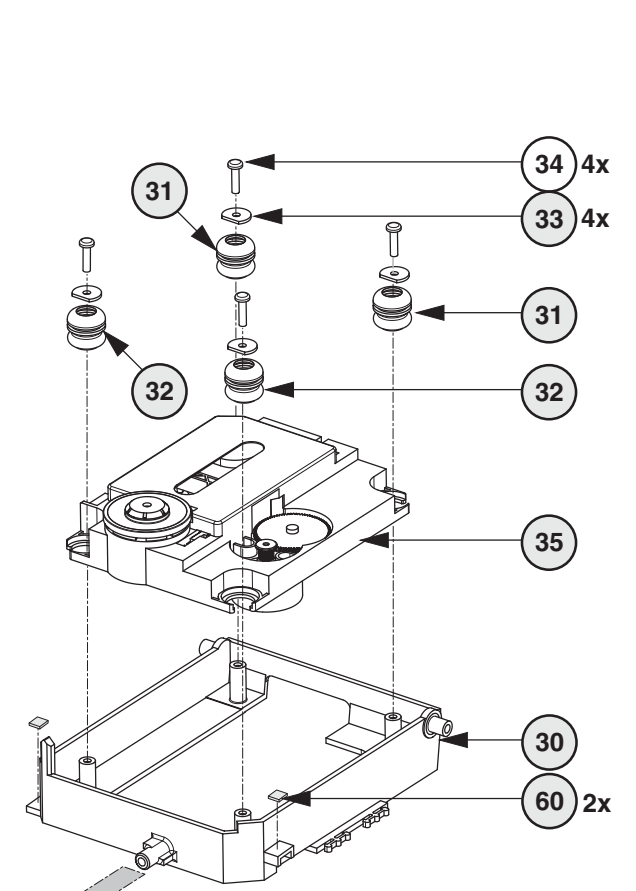
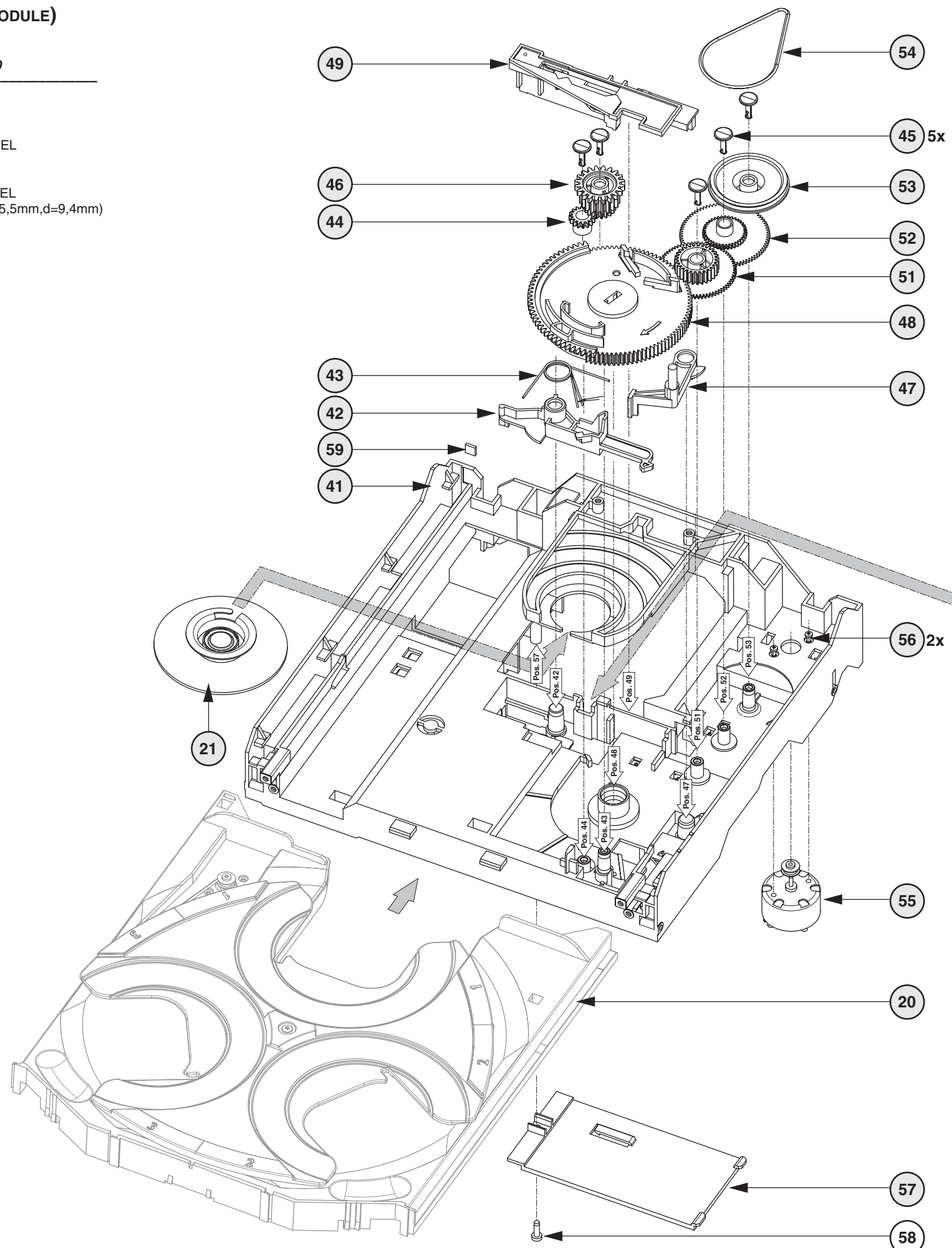


- X spare part
- Y non spare part

EXPLODED VIEW (3CDC-LC MODULE)

MECHANICAL PARTS *Drawer* → Chapter 10-10

20	3103 304 66500	DRAWER
21	3103 304 66490	CAROUSEL
22	3103 304 06860	PULLEY DRAWER
23	3103 304 06850	ECCENTRIC GEAR WHEEL
24	3103 304 06980	NAIL FIXATION
25	3103 304 66850	DRIVING BELT CAROUSEL
27	4822 532 12365	BUSH DRAWER (height=5,5mm,d=9,4mm)
29	3103 304 66550	BRACKET-DISC
30	3103 304 66520	TUMBLER
31	3103 301 06470	SPRING-DISC
32	3103 304 06920	CONTROL-DISC
33	3103 304 06970	WASHER
34	3103 304 06870	GEAR-1
37	4822 361 10753	CAROUSEL MOTOR



MECHANICAL PARTS *Loader* → this page

20	3103 304 66500	DRAWER
21	3140 117 58650	CLAMPER ASSY-VAM
30	3103 304 66560	SUPPORT
31	4822 529 10431	DAMPER - RUBBER (25DEG)
32	4822 529 10431	DAMPER - RUBBER (25DEG)
33	3103 304 06970	WASHER
35	9305 022 30107	CD Drive VAM2201/07
41	3103 304 66480	FRAME
42	3103 304 66540	BRACKET-GUIDING
43	3103 301 06460	SPRING-GUIDING
44	3103 304 06890	GEAR-3
45	3103 304 06980	NAIL FIXATION
46	3103 304 06880	GEAR-2
47	3103 304 66530	BRACKET-LOAD
48	3103 304 06910	CAM
49	3103 304 66510	GUIDING
51	3103 304 06900	GEAR-4
52	3103 304 06870	GEAR-1
53	3103 304 06960	PULLEY-FRAME
54	3103 304 66910	DRIVING-BELT-DRAWER
55	4822 361 10753	TRAY MOTOR
56	4822 502 12548	SCREW M2,6X3,5
57	3103 304 68890	COVER-VAM
59	4822 466 12146	RUBBER
60	3103 301 72260	RUBBER

ELECTRICAL PARTSLIST 3CDC-LC-VCD MODULE

MISCELLANEOUS

35	9305 022 30107	CD Drive VAM2201/07
37	4822 361 10753	CAROUSEL MOTOR
55	4822 361 10753	TRAY MOTOR
1800	4822 265 10925	FLEX FOIL CONNECTOR 15P
1802	2422 025 16837	FLEX FOIL CONNECTOR 22P
1805	4822 265 10979	FLEX FOIL CONNECTOR 15P
1805	4822 265 11545	FLEX FOIL CONNECTOR 19P <small>for digital out</small>
1875	4822 267 10958	FLEX FOIL CONNECTOR 5P
1876	2422 025 08332	FLEX FOIL CONNECTOR 5P
1880	4822 276 13503	SWITCH, Tray position
1881	4822 276 13503	SWITCH, Drive up/down
1882	4822 276 13503	SWITCH, Position 1 recognized
1883	4822 276 13503	SWITCH, valid position recognized
8002	3103 308 91990	FLEX FOIL CABLE 5P, 200mm
8005	3103 308 91980	FLEX FOIL CABLE 15P, 170mm
CAPACITORS		
2800	4822 126 10326	180pF 5% 50V
2801	4822 126 13883	220pF 5% 50V
2802	4822 126 14508	180pF 5% 50V
2803	4822 126 13883	220pF 5% 50V
2804	4822 126 13193	4,7nF 10% 63V
2805	4822 126 13883	220pF 5% 50V
2806	4822 126 13883	220pF 5% 50V
2807	5322 122 31863	330pF 5% 50V
2808	4822 126 13883	220pF 5% 50V
2809	4822 126 13879	220nF 20% 16V
2810	4822 126 10326	180pF 5% 50V
2811	4822 126 13883	220pF 5% 50V
2812	3198 017 34730	47nF 10% 16V
2813	4822 122 33177	10nF 20% 50V
2814	4822 122 33216	270pF 5% 50V
2815	4822 126 14076	220nF 20% 25V
2816	4822 126 13344	1,5nF 5% 63V
2817	4822 124 40769	4,7µF 20% 100V
2818	4822 126 13344	1,5nF 5% 63V
2819	4822 124 40769	4,7µF 20% 100V
2820	5322 126 11578	1nF 10% 63V
2822	2238 786 11554	2,2nF 5% 16V
2823	4822 126 13956	68pF 5% 63V
2824	4822 126 13751	47nF 10% 50V
2826	4822 124 12362	47µF 20% 4V
2827	5322 122 34099	470pF 10% 63V
2828	4822 124 12362	47µF 20% 4V
2829	4822 126 11669	27pF 10% 50V
2831	4822 126 13751	47nF 10% 50V
2833	4822 126 11671	33pF 5% 50V
2834	4822 126 11671	33pF 5% 50V
2835	3198 017 34730	47nF 10% 16V
2836	4822 124 40769	4,7µF 20% 100V
2837	4822 124 22726	4,7µF 20% 35V
2839	4822 124 40433	47µF 20% 25V
2840	4822 126 13751	47nF 10% 50V
2841	4822 122 33575	220pF 5% 50V
2842	4822 126 13883	220pF 5% 50V
2843	4822 126 14585	100nF 10% 50V
2844	5322 126 10794	220pF 10% 50V
2845	5322 124 41948	0,47µF 20% 50V
2846	5322 124 41948	0,47µF 20% 50V
2859	4822 126 14076	220nF 20% 25V
2860	4822 126 14494	22nF 10% 25V
2864	5322 122 33538	150pF 5% 63V
2865	5322 122 32654	22nF 10% 63V
2866	4822 126 13751	47nF 10% 50V
2872	3198 017 34730	47nF 10% 16V
2873	4822 124 80231	47µF 20% 16V
2874	4822 126 14305	100nF 10% 16V

CAPACITORS

2877	4822 126 14226	82pF 50V
2878	4822 126 13883	220pF 5% 50V
2881	4822 124 40769	4,7µF 20% 100V
2883	4822 126 13883	220pF 5% 50V
2884	5322 126 11578	1nF 10% 63V
2885	4822 126 14585	100nF 10% 50V
2886	4822 126 14585	100nF 10% 50V
2887	5322 126 11578	1nF 10% 63V
2888	4822 124 11947	10µF 20% 16V
RESISTORS		
3700	4822 117 10837	100kΩ 1% 0,1W
3702	4822 117 10833	10kΩ 1% 0,1W
3703	4822 051 10102	1kΩ 2% 0,25W
3704	4822 117 10837	100kΩ 1% 0,1W
3709	4822 051 20472	4,7kΩ 5% 0,1W
3710	4822 117 10833	10kΩ 1% 0,1W
3712	4822 051 30109	10Ω 5% 0,06W
3713	4822 051 30223	22kΩ 5% 0,06W
3714	4822 051 30103	10kΩ 5% 0,06W
3715	4822 117 13632	100kΩ 1% 0,06W
3716	4822 051 30101	100Ω 5% 0,06W
3717	4822 117 12917	1Ω 5% 0,06W
3719	4822 051 30392	3,9kΩ 5% 0,06W
3720	4822 051 20154	150kΩ 5% 0,1W
3721	4822 117 11449	2,2kΩ 1% 0,1W
3722	4822 117 11449	2,2kΩ 1% 0,1W
3724	4822 117 10837	100kΩ 1% 0,1W
3725	4822 051 20471	470Ω 5% 0,1W
3726	4822 117 11373	100Ω 1% 0,1W
3727	4822 117 11449	2,2kΩ 1% 0,1W
3728	4822 117 10837	100kΩ 1% 0,1W
3729	4822 051 20471	470Ω 5% 0,1W
3730	4822 051 20333	33kΩ 5% 0,1W
3735	4822 117 11373	100Ω 1% 0,1W
3736	4822 117 12925	47kΩ 1% 0,06W
3738	4822 051 30271	270Ω 5% 0,06W
3745	4822 117 10833	10kΩ 1% 0,1W
3747	4822 117 12925	47kΩ 1% 0,06W
3748	4822 051 30103	10kΩ 5% 0,06W
3752	4822 117 13632	100kΩ 1% 0,06W
3753	4822 117 13632	100kΩ 1% 0,06W
3754	4822 117 11503	220Ω 5% 0,1W
3755	4822 117 11503	220Ω 5% 0,1W
3759	4822 051 20109	10Ω 5% 0,1W
3765	4822 051 30103	10kΩ 5% 0,06W
3766	4822 117 10833	10kΩ 1% 0,1W
3767	4822 051 30339	33Ω 5% 0,06W
3769	4822 051 30101	100Ω 5% 0,06W
3770	4822 051 30102	1kΩ 5% 0,06W
3771	4822 051 30102	1kΩ 5% 0,06W
3772	4822 051 30471	470Ω 5% 0,06W
3773	4822 117 10833	10kΩ 1% 0,1W
3775	4822 052 10338	3,3Ω 5% NFR25
3776	4822 051 30103	10kΩ 5% 0,06W
3777	4822 051 30103	10kΩ 5% 0,06W
3800	4822 051 30563	56kΩ 5% 0,06W
3801	4822 051 30103	10kΩ 5% 0,06W
3802	4822 117 11148	56kΩ 1% 0,1W
3803	4822 117 10833	10kΩ 1% 0,1W
3804	4822 051 30103	10kΩ 5% 0,06W
3805	4822 051 30103	10kΩ 5% 0,06W
3806	4822 051 30103	10kΩ 5% 0,06W
3807	4822 051 30103	10kΩ 5% 0,06W
3808	4822 051 30103	10kΩ 5% 0,06W
3809	4822 051 30103	10kΩ 5% 0,06W

ELECTRICAL PARTSLIST 3CDC-LC-VCD MODULE

RESISTORS

3810	4822 051 30471	470Ω 5% 0,06W
3811	4822 051 20273	27kΩ 5% 0,1W
3812	4822 051 20471	470Ω 5% 0,1W
3813	4822 051 20471	470Ω 5% 0,1W
3814	4822 051 20471	470Ω 5% 0,1W
3815	4822 052 10478	4,7Ω 5% NFR25
3816	4822 051 20471	470Ω 5% 0,1W
3817	4822 051 30471	470Ω 5% 0,06W
3818	4822 051 30101	100Ω 5% 0,06W
3818	4822 051 30471	470Ω 5% 0,06W
3819	4822 051 20471	470Ω 5% 0,1W
3820	4822 051 30472	4,7kΩ 5% 0,06W
3821	4822 051 20472	4,7kΩ 5% 0,1W
3822	4822 051 30272	2,7kΩ 5% 0,06W
3823	4822 051 30102	1kΩ 5% 0,06W
3824	4822 051 30102	1kΩ 5% 0,06W
3825	4822 051 10102	1kΩ 2% 0,25W
3826	4822 051 20223	22kΩ 5% 0,1W
3827	4822 051 20273	27kΩ 5% 0,1W
3828	4822 051 30223	22kΩ 5% 0,06W
3829	4822 117 13608	4,7Ω 5% 0,06W
3830	4822 116 83933	15kΩ 1% 0,1W
3832	4822 117 10833	10kΩ 1% 0,1W
3833	4822 051 30223	22kΩ 5% 0,06W
3834	4822 051 20223	22kΩ 5% 0,1W
3835	4822 052 10108	1Ω 5% 0,33W
3837	4822 117 10833	10kΩ 1% 0,1W
3838	4822 051 30103	10kΩ 5% 0,06W
3839	4822 051 20273	27kΩ 5% 0,1W
3841	4822 051 20273	27kΩ 5% 0,1W
3842	4822 117 10834	47kΩ 1% 0,1W
3843	4822 117 10834	47kΩ 1% 0,1W
3844	4822 117 12864	82kΩ 5% 0,6W
3845	4822 117 10834	47kΩ 1% 0,1W
3846	4822 117 10834	47kΩ 1% 0,1W
3847	4822 117 11148	56kΩ 1% 0,1W
3848	4822 117 10837	100kΩ 1% 0,1W
3850	4822 051 30183	18kΩ 5% 0,06W
3852	4822 051 10102	1kΩ 2% 0,25W
3853	4822 051 20471	470Ω 5% 0,1W
3854	4822 051 30101	100Ω 5% 0,06W
3855	4822 117 12971	15Ω 5% 0,06W
3856	4822 117 12521	68Ω 1% 0,1W
3857	4822 117 12521	68Ω 1% 0,1W
3860	4822 117 10833	10kΩ 1% 0,1W
3862	4822 051 20121	120Ω 5% 0,1W
3863	4822 051 30339	33Ω 5% 0,06W
3864	4822 051 30101	100Ω 5% 0,06W
3865	4822 051 30121	120Ω 5% 0,06W
3866	4822 051 30103	10kΩ 5% 0,06W
3871	4822 117 11149	82kΩ 1% 0,1W
3872	4822 051 20472	4,7kΩ 5% 0,1W
3878	4822 117 11503	220Ω 5% 0,1W
3881	4822 117 11503	220Ω 5% 0,1W
4707	4822 051 20008	CHIP JUMPER 0805
4708	4822 051 20008	CHIP JUMPER 0805
4709	4822 051 20008	CHIP JUMPER 0805
4710	4822 051 20008	CHIP JUMPER 0805
4711	4822 051 20008	CHIP JUMPER 0805
4713	4822 051 20008	CHIP JUMPER 0805
4714	4822 051 20008	CHIP JUMPER 0805
4717	4822 051 30008	CHIP JUMPER 0603
4724	4822 051 20008	CHIP JUMPER 0805
4726	4822 051 20008	CHIP JUMPER 0805
4727	4822 051 20008	CHIP JUMPER 0805

RESISTORS

4728	4822 051 20008	CHIP JUMPER 0805
4729	4822 051 20008	CHIP JUMPER 0805
4730	4822 051 20008	CHIP JUMPER 0805
4731	4822 051 30008	CHIP JUMPER 0603
4732	4822 051 20008	CHIP JUMPER 0805
4733	4822 051 30008	CHIP JUMPER 0603
4734	4822 051 20008	CHIP JUMPER 0805
4735	4822 051 20008	CHIP JUMPER 0805
4736	4822 051 30008	CHIP JUMPER 0603
4737	4822 051 30008	CHIP JUMPER 0603
4738	4822 051 30008	CHIP JUMPER 0603
4739	4822 051 30008	CHIP JUMPER 0603
4740	4822 051 30008	CHIP JUMPER 0603
4743	4822 051 20008	CHIP JUMPER 0805
4744	4822 051 30008	CHIP JUMPER 0603
4745	4822 051 20008	CHIP JUMPER 0805
4746	4822 051 20008	CHIP JUMPER 0805
4747	4822 051 20008	CHIP JUMPER 0805
4748	4822 051 20008	CHIP JUMPER 0805
4749	4822 051 30008	CHIP JUMPER 0603
4800	4822 051 30008	CHIP JUMPER 0603
4801	4822 051 30008	CHIP JUMPER 0603
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
4820	4822 051 20008	CHIP JUMPER 0805
4823	4822 051 30008	CHIP JUMPER 0603
4824	4822 051 30008	CHIP JUMPER 0603

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

4868©	4822 051 20008	CHIP JUMPER 0805
4869©	4822 051 20008	CHIP JUMPER 0805
4870©	4822 051 20008	CHIP JUMPER 0805
4871©	4822 051 20008	CHIP JUMPER 0805
4872©	4822 051 20008	CHIP JUMPER 0805
4873©	4822 051 20008	CHIP JUMPER 0805
4874©	4822 051 20008	CHIP JUMPER 0805
4875©	4822 051 20008	CHIP JUMPER 0805
4876©	4822 051 20008	CHIP JUMPER 0805
4877©	4822 051 30008	CHIP JUMPER 0603
4879©	4822 051 20008	CHIP JUMPER 0805
4884©	4822 051 20008	CHIP JUMPER 0805
4885©	4822 051 20008	CHIP JUMPER 0805
4886©	4822 051 20008	CHIP JUMPER 0805
4887©	4822 051 30008	CHIP JUMPER 0603
4888©	4822 051 20008	CHIP JUMPER 0805
4889©	4822 051 20008	CHIP JUMPER 0805
4890©	4822 051 20008	CHIP JUMPER 0805
4891©	4822 051 30008	CHIP JUMPER 0603
4892©	4822 051 20008	CHIP JUMPER 0805
4893©	4822 051 20008	CHIP JUMPER 0805
4894©	4822 051 20008	CHIP JUMPER 0805
4895©	4822 051 20008	CHIP JUMPER 0805
4896©	4822 051 20008	CHIP JUMPER 0805
4897©	4822 051 20008	CHIP JUMPER 0805
4898©	4822 051 20008	CHIP JUMPER 0805

COILS

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

DIODES

6801©	4822 130 11397	BAS316
6802©	4822 130 11397	BAS316
6803©	4822 130 11397	BAS316
6804©	4822 130 11397	BAS316
6805©	4822 130 11383	BZX284-C5V1
6807©	4822 130 11366	BZX284-C3V9
6808©	4822 130 11397	BAS316
6810	4822 130 31878	1N4003G
6811©	4822 130 82334	BAS85
6812©	4822 130 80446	BAS32L
6813©	4822 130 11397	BAS316

TRANSISTORS

7806©	4822 130 60511	BC847B
7812©	4822 130 60511	BC847B
7815©	4822 130 60511	BC847B
7820©	4822 130 60511	BC847B
7821©	4822 130 60511	BC847B
7822	4822 130 42131	BF550
7823©	4822 130 60511	BC847B

INTEGRATED CIRCUITS

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

Technical remarks

COMBI BOARD

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Brief introduction of the Combi Board

A. TRANSFORMER PRIMARY PART

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

B. POWER SUPPLY PART

Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +LED, +12A, +12M, -32V, PWDN. The +C supply to the power amplifier is not regulated. F1-F2 is the ac supply voltage to the FTD Display filament.

C. SOURCE SELECT & AMPLIFIER PART

a) SHIFT REGISTER (AF CONTROL)

This shift register deliver commands from the μ P to control the AF functions which include source selection (A0 & A1 control lines), DSC modes, DBB, IS and CD_STBY. Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the μ P on the Front board.

b) SOURCE SELECTION

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

c) PWM VOLUME CONTROL

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

d) SOUND FEATURES

Sound Features include the DBB, IS and 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069UBT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

e) POWER AMPLIFIER

IC 7391 (AN7125) is used as power amplifier.

f) CD_STBY CONTROL

This Transistor 7401 (BC337-25) switches on the supply +CD supply (derived from +12A) to CD servo control, HF circuit and the laser light pen on the CD Module during the CD mode only.

g) MATRIX SURROUND OUTPUT

The matrix surround feature is provided on board. This feature is only optional on certain type version.

D. KARAOKE PART

This simple Karaoke consists of a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.

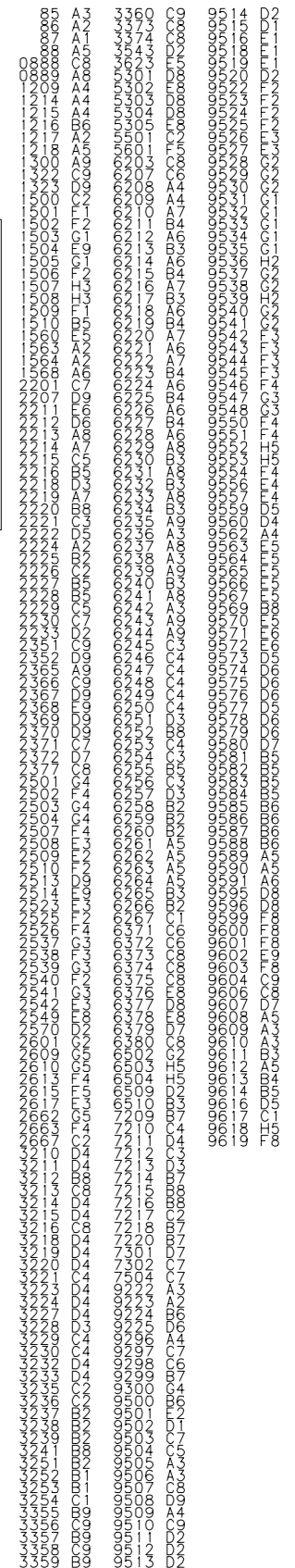
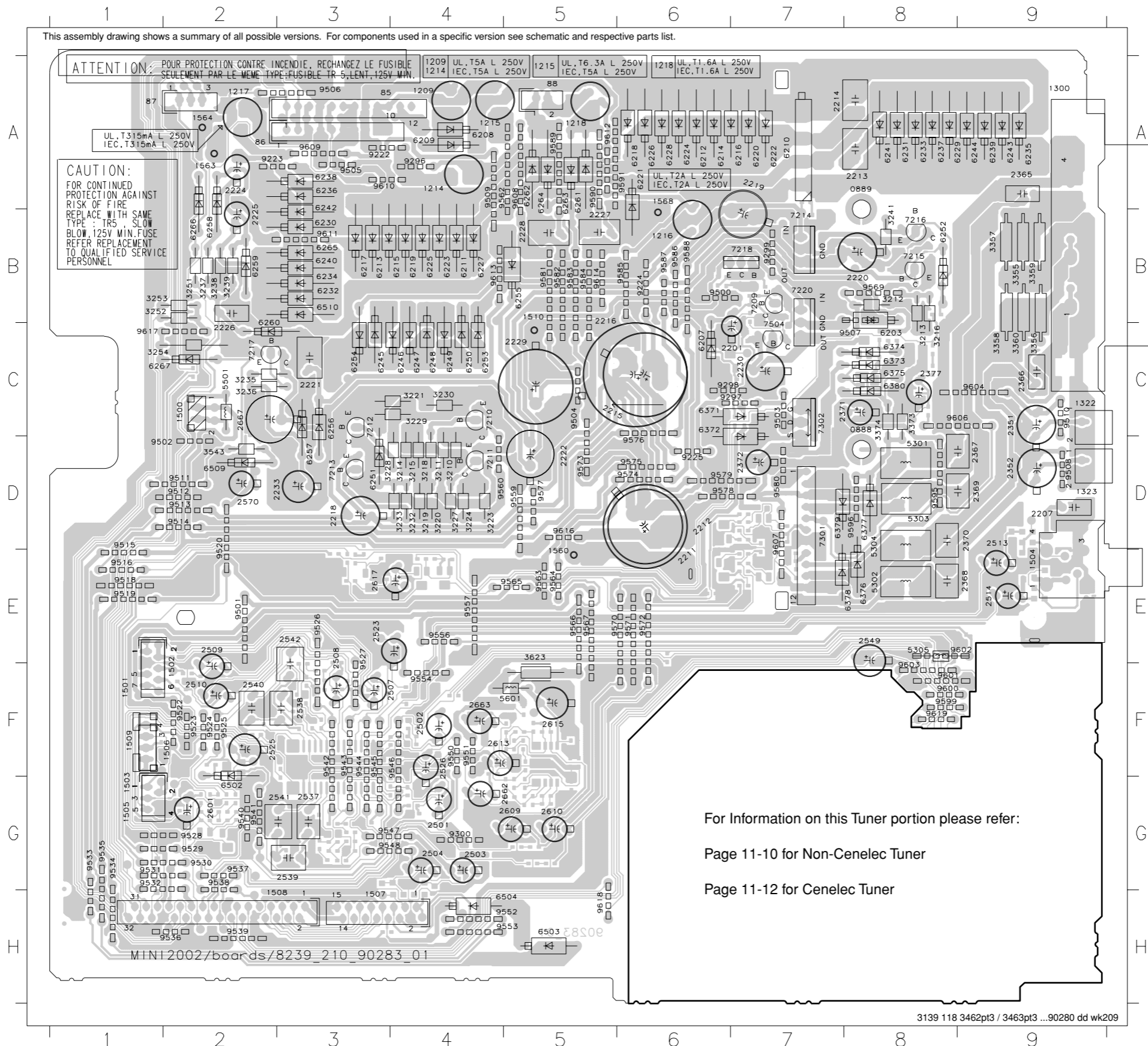
E. HEADPHONE PART

The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 18mW output power into a 32 ohm headphone.

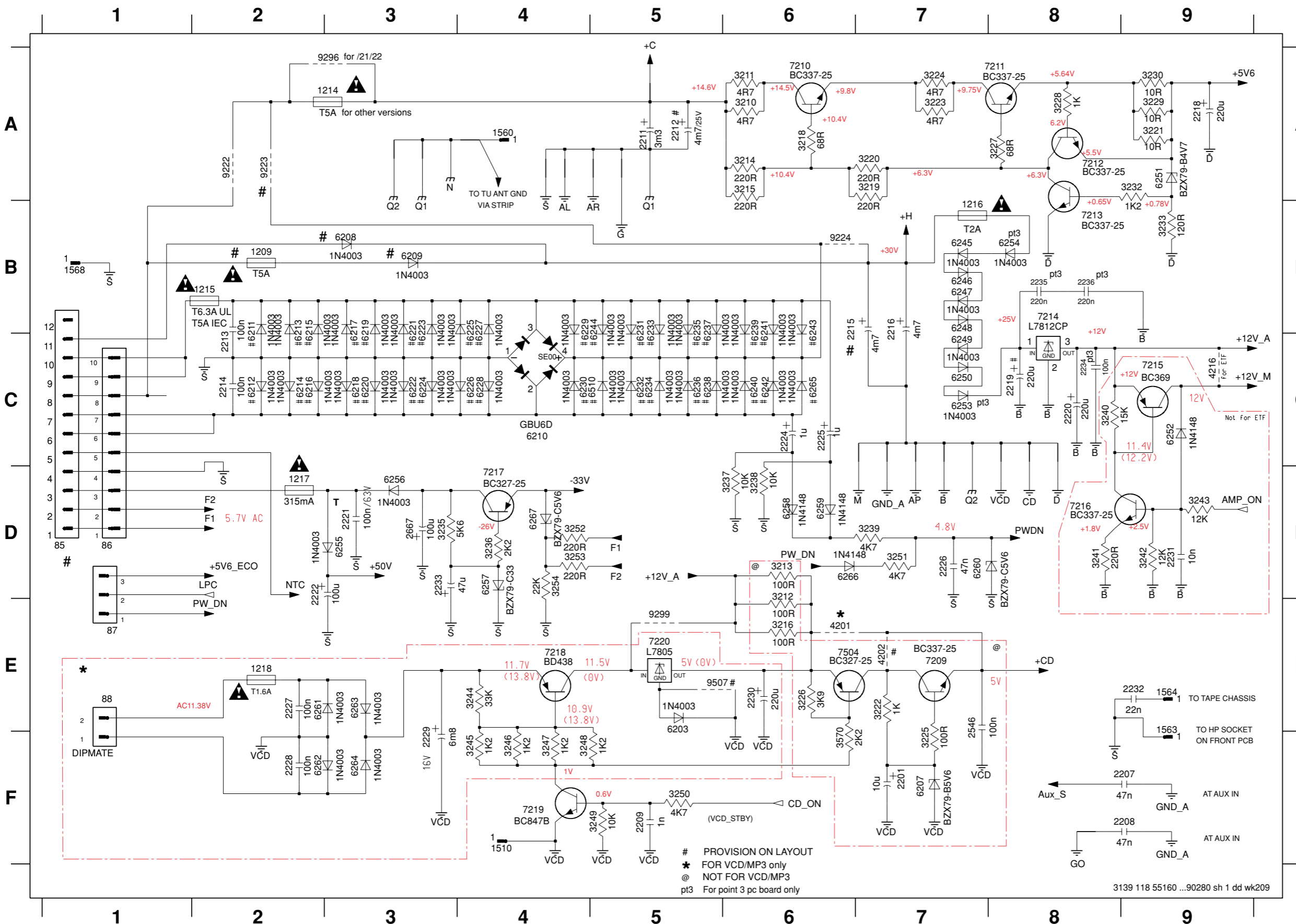
F. CDC KEY PART

The CDC key buttons and LEDs are provided on this board.

COMPONENT LAYOUT - MAIN PART (excluding the Tuner portion)



POWER SUPPLY CIRCUIT

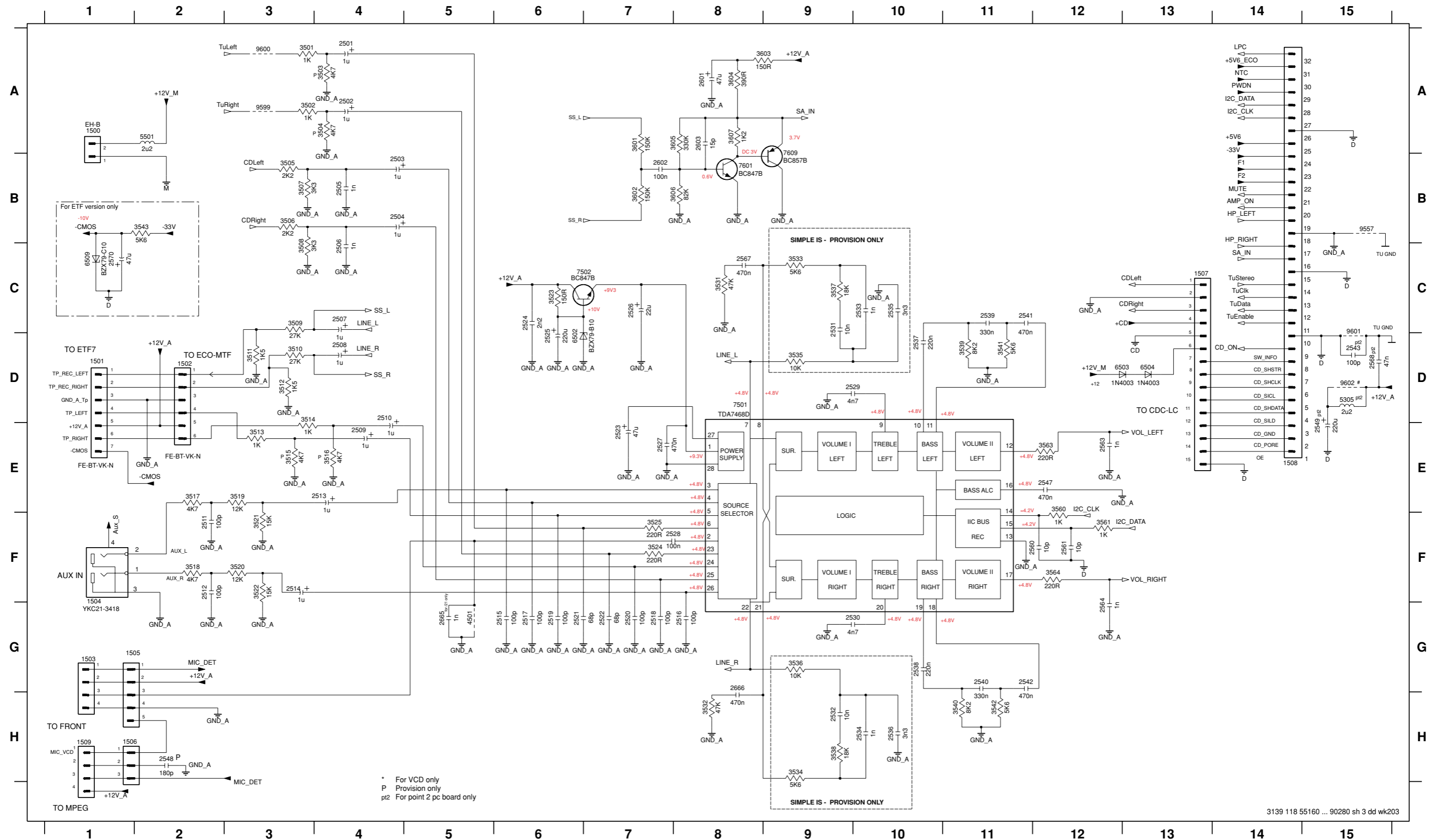


85 D1	3250 F5	7219 F4
86 D1	3251 D7	7220 E5
87 E1	3252 D4	7504 E6
88 E1	3253 D4	9222 A2
1209 B2	3254 D4	9223 A2
1214 A3	3570 F6	9224 B6
1215 B2	4201 E6	9296 A3
1216 B7	4202 E7	9299 E5
1217 D2	4216 C9	9507 E5
1218 E2	6203 E5	
1510 F4	6207 F7	
1560 A4	6208 B3	
1563 F9	6209 B3	
1564 E9	6210 C4	
1568 B1	6211 B2	
2201 F7	6212 C2	
2207 F9	6213 B2	
2208 F9	6214 C2	
2209 F5	6215 B2	
2211 A5	6216 C2	
2212 A5	6217 B3	
2213 B2	6218 C3	
2214 C2	6219 B3	
2215 B6	6220 C3	
2216 B7	6221 B3	
2218 A9	6222 C3	
2219 C8	6223 B3	
2220 C8	6224 C3	
2221 D3	6225 B4	
2222 D2	6226 C4	
2224 C6	6227 B4	
2225 C6	6228 C4	
2226 D7	6229 B4	
2227 E2	6230 C4	
2228 F2	6231 B5	
2229 F3	6232 C5	
2230 E6	6233 B5	
2231 D9	6234 C5	
2232 E9	6235 B5	
2233 D3	6236 C5	
2234 C8	6237 B5	
2235 B8	6238 C5	
2236 B8	6239 B6	
2546 E7	6240 C6	
2667 D3	6241 B6	
3210 A6	6242 C6	
3211 A6	6243 B6	
3212 E6	6244 B5	
3213 D6	6245 B7	
3214 A6	6246 B7	
3215 A6	6247 B7	
3216 E6	6248 B7	
3218 A6	6249 C7	
3219 A7	6250 C7	
3220 A7	6251 A9	
3221 A9	6252 C9	
3222 E7	6253 C7	
3223 A7	6254 B8	
3224 A7	6255 D3	
3225 F7	6256 D3	
3226 E6	6257 D4	
3227 A8	6258 D6	
3228 A8	6259 D6	
3229 A9	6260 D7	
3230 A9	6261 E2	
3232 A9	6262 F2	
3233 B9	6263 E3	
3235 D3	6264 F3	
3236 D4	6265 C6	
3237 D6	6266 D6	
3238 D6	6267 D4	
3239 D7	6510 C5	
3240 C8	7209 E7	
3241 D8	7210 A6	
3242 D9	7211 A7	
3243 D9	7212 A8	
3244 E4	7213 B8	
3245 F4	7214 B8	
3246 F4	7215 C9	
3247 F4	7216 D8	
3248 F4	7217 D4	
3249 F5	7218 E4	

PROVISION ON LAYOUT
 * FOR VCD/MP3 only
 @ NOT FOR VCD/MP3
 pt3 For point 3 pc board only

SOURCE SELECTION CIRCUIT

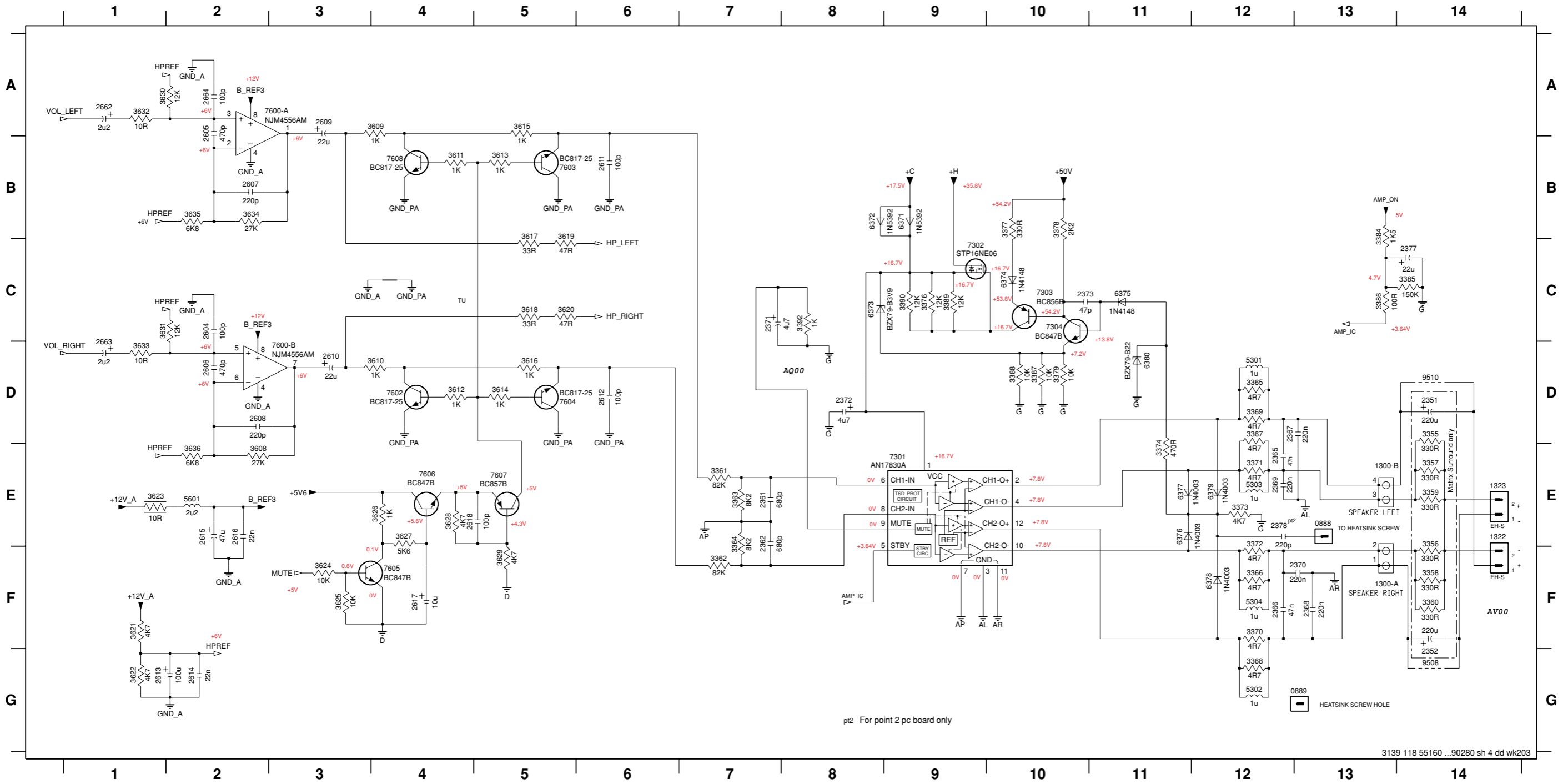
C3 E15	C10 C14	1501 D1	1507 C13	2504 B4	2510 D4	2516 G8	2522 G7	2528 F7	2534 H10	2540 G11	2549 E15	2568 D15	2665 G5	3505 B3	3511 D3	3517 E2	3523 C6	3534 H9	3540 H11	3563 E12	3605 A8	6502 D6	7601 B8	9602 D15
C4 E15	C11 A3	1502 D2	1508 E14	2505 B4	2511 F2	2517 G6	2523 E7	2529 D9	2535 C10	2541 C11	2560 F12	2570 C1	2666 G8	3506 B3	3512 D3	3518 F2	3524 F7	3535 D9	3541 D11	3564 F12	3606 B8	6503 D12	7609 B9	9603 E15
C5 E15	C13 A3	1503 G1	1509 H1	2506 C4	2512 F2	2518 G7	2524 C6	2530 G9	2536 H10	2542 G11	2561 F12	2570 C1	3501 A3	3507 B3	3513 E3	3519 E3	3525 F7	3536 D9	3542 H11	3561 A7	3607 A8	6504 D13	9557 B15	9604 A3
C6 C15	C14 C15	1504 F1	2501 A4	2507 C4	2513 E4	2519 G6	2525 D6	2531 C9	2537 D10	2543 D15	2563 E12	2601 A8	3502 A3	3508 C3	3514 D3	3520 F3	3531 C8	3537 C9	3543 B2	3602 B7	4501 G5	6509 C1	9599 A3	9605 A3
C7 C15	T_E D14	1505 G2	2502 A4	2508 D4	2514 F3	2520 G7	2526 C7	2532 H9	2538 G10	2547 E12	2564 G12	2602 B7	3503 C3	3509 C3	3515 E3	3521 F3	3532 H8	3538 H9	3545 E2	3603 A9	4505 D15	7501 D8	9600 A3	9606 A3
C8 C15	1500 A1	1506 H1	2503 B4	2509 E4	2515 G6	2521 G6	2527 E7	2533 C10	2539 C11	2548 H2	2567 C8	2603 A8	3504 A4	3510 D3	3516 E4	3522 F3	3533 C9	3539 D11	3561 F12	3604 A8	5501 A2	7502 C7	9601 D15	9607 D14



* For VCD only
 P Provision only
 pt2 For point 2 pc board only

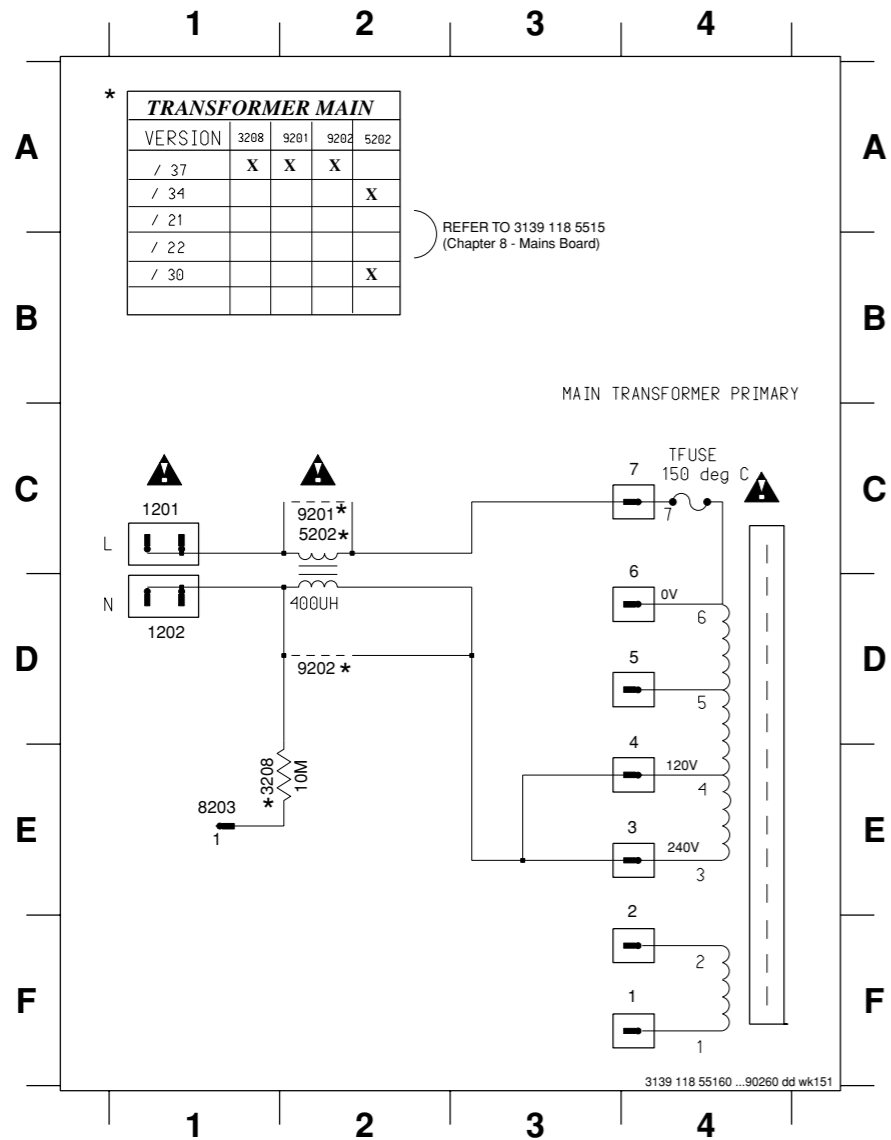
PRE- & POWER AMPLIFIER CIRCUIT

0888 E13	1323 E14	2365 E12	2370 F13	2378 E12	2608 D2	2613 G1	2618 E4	3356 E14	3361 E7	3366 F12	3371 E12	3377 B10	3386 C13	3392 C8	3612 D4	3617 B5	3622 G1	3627 E4	3632 A1	5301 D12	6371 B9	6376 E11	7301 E9	7600-B D3	7606 E4
0889 G13	2351 D14	2366 F12	2371 C7	2604 C2	2609 A3	2614 G2	2662 A1	3357 F14	3362 F7	3367 D12	3372 E12	3378 B10	3387 D10	3608 E2	3613 B5	3618 C5	3623 E1	3628 E4	3633 D1	5302 G12	6372 B8	6377 E11	7302 C9	7602 D4	7607 E5
1300-A F13	2352 F14	2367 D12	2372 D8	2605 A2	2610 D3	2615 E2	2663 D1	3358 E14	3363 E7	3368 G12	3373 E12	3379 D10	3388 D10	3609 A4	3614 D5	3619 B5	3624 F3	3629 F5	3634 B2	5303 E12	6373 C8	6378 F12	7303 C10	7603 B5	7608 B4
1300-B E13	2361 E7	2368 F13	2373 C10	2606 D2	2611 B6	2616 E2	2664 A2	3359 E14	3364 E7	3369 D12	3374 E11	3384 B13	3389 C9	3610 D4	3615 A5	3620 C5	3625 F3	3630 A1	3635 B2	5304 F12	6374 C10	6379 E12	7304 C10	7604 D5	7609 C14
1322 E14	2362 E7	2369 E12	2377 C14	2607 B2	2612 D6	2617 F4	3355 D14	3360 F14	3365 D12	3370 F12	3376 C9	3385 C14	3390 C9	3611 B4	3616 D5	3621 F1	3626 E4	3631 C1	3636 E2	5601 E2	6375 C11	6380 D11	7600-A A2	7605 F4	9510 D14

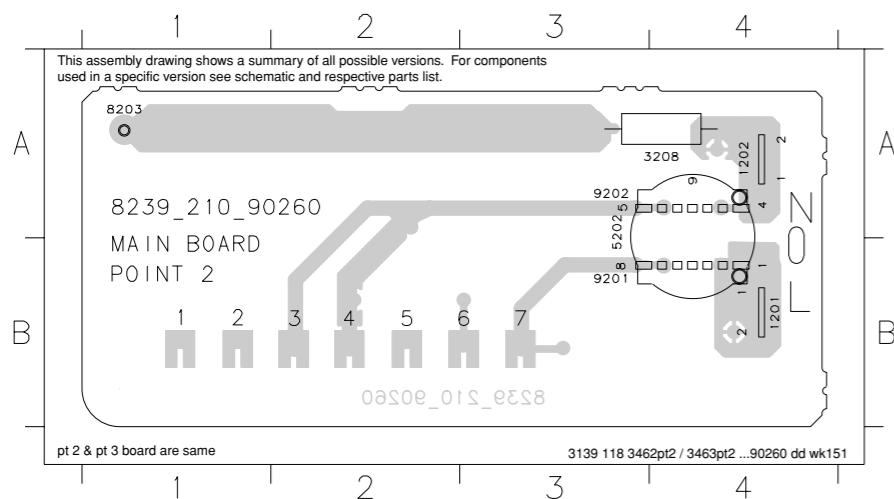


TRANSFORMER PRIMARY PART - CIRCUIT & LAYOUT (except /21/22 version)

- 1 F4 3 E4 5 D4 7 C4 1202 D1 5202 C2 9201 C2
- 2 E4 4 D4 6 C4 1201 C1 3208 E1 8203 E1 9202 D2



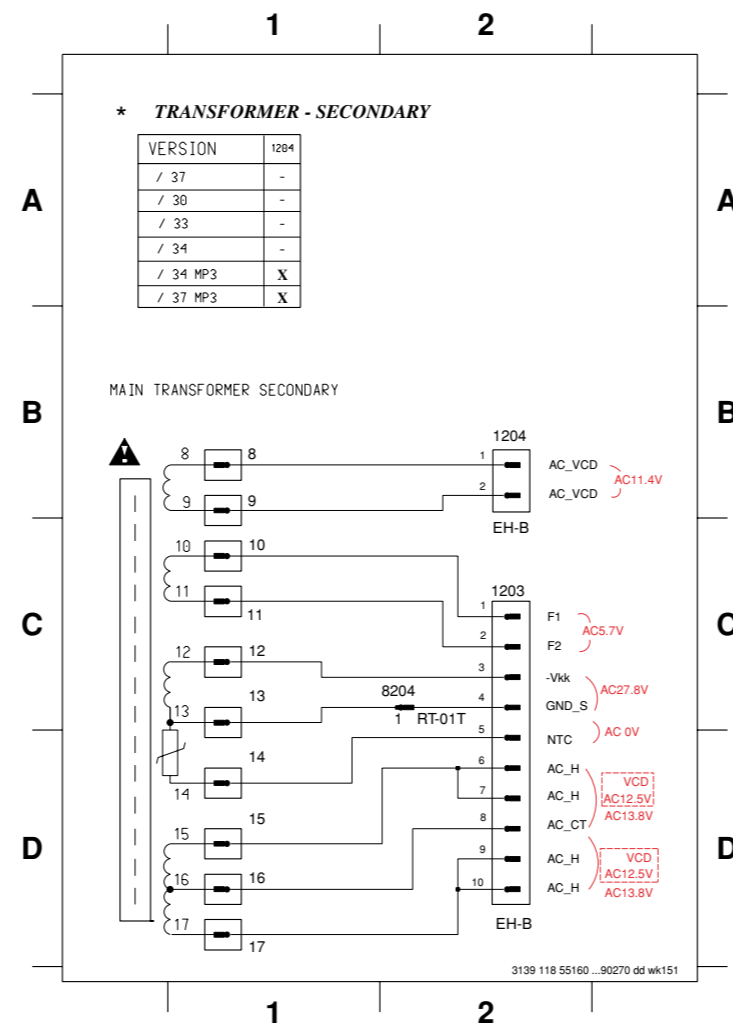
- 1 B1 3 B2 5 B3 1207 B3 1202 A4 5202 A3 9201 B3
- 2 B1 4 B2 6 B3 1201 B4 3208 A4 8203 A1 9202 A3



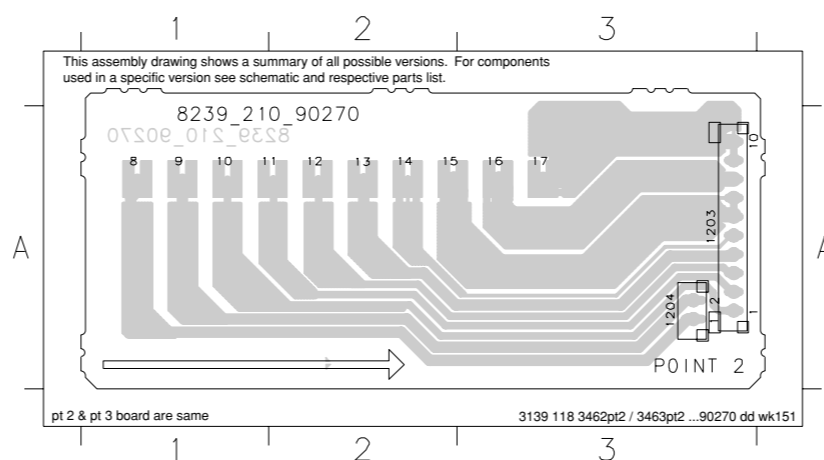
pt 2 & pt 3 board are same 3139 118 3462pt2 / 3463pt2 ...90260 dd wk151

TRANSFORMER SECONDARY PART - CIRCUIT & LAYOUT (except /21/22 version)

- 8 B1 10 C1 12 C1 14 D1 16 D1 1203 C2 8204 C2
- 9 B1 11 C1 13 C1 15 D1 17 D1 1204 B2



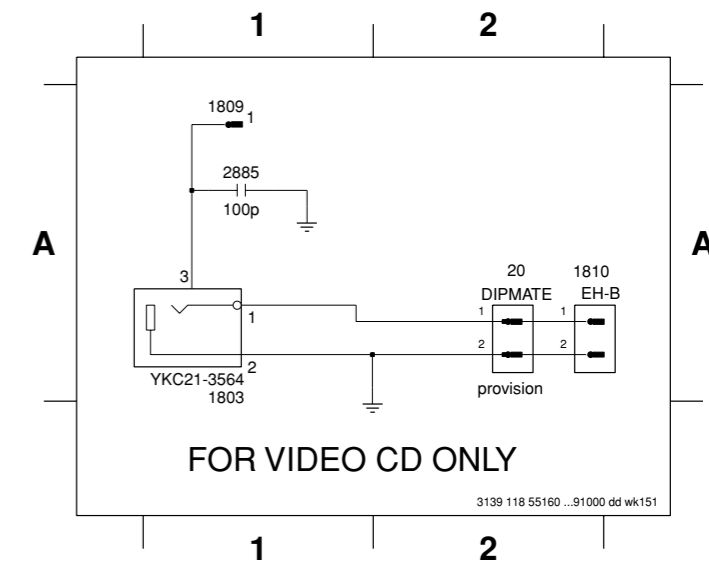
- 8 A1 10 A1 12 A2 14 A2 16 A3 1203 A3
- 9 A1 11 A1 13 A2 15 A2 17 A3 1204 A3



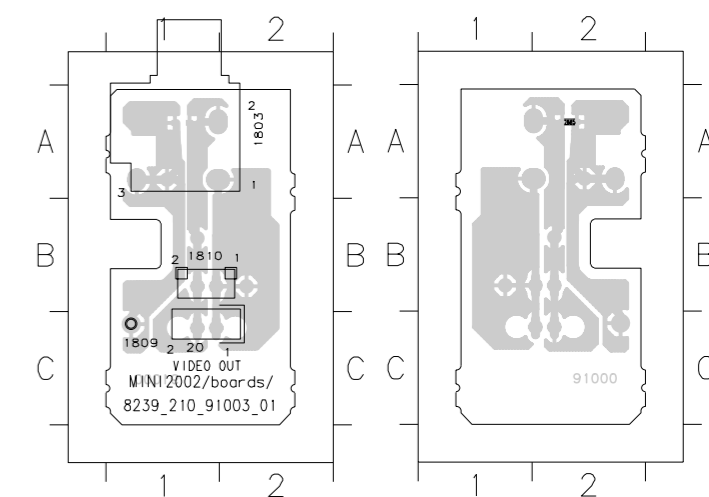
pt 2 & pt 3 board are same 3139 118 3462pt2 / 3463pt2 ...90270 dd wk151

VIDEO OUT PART - CIRCUIT & LAYOUT (for VCD version only)

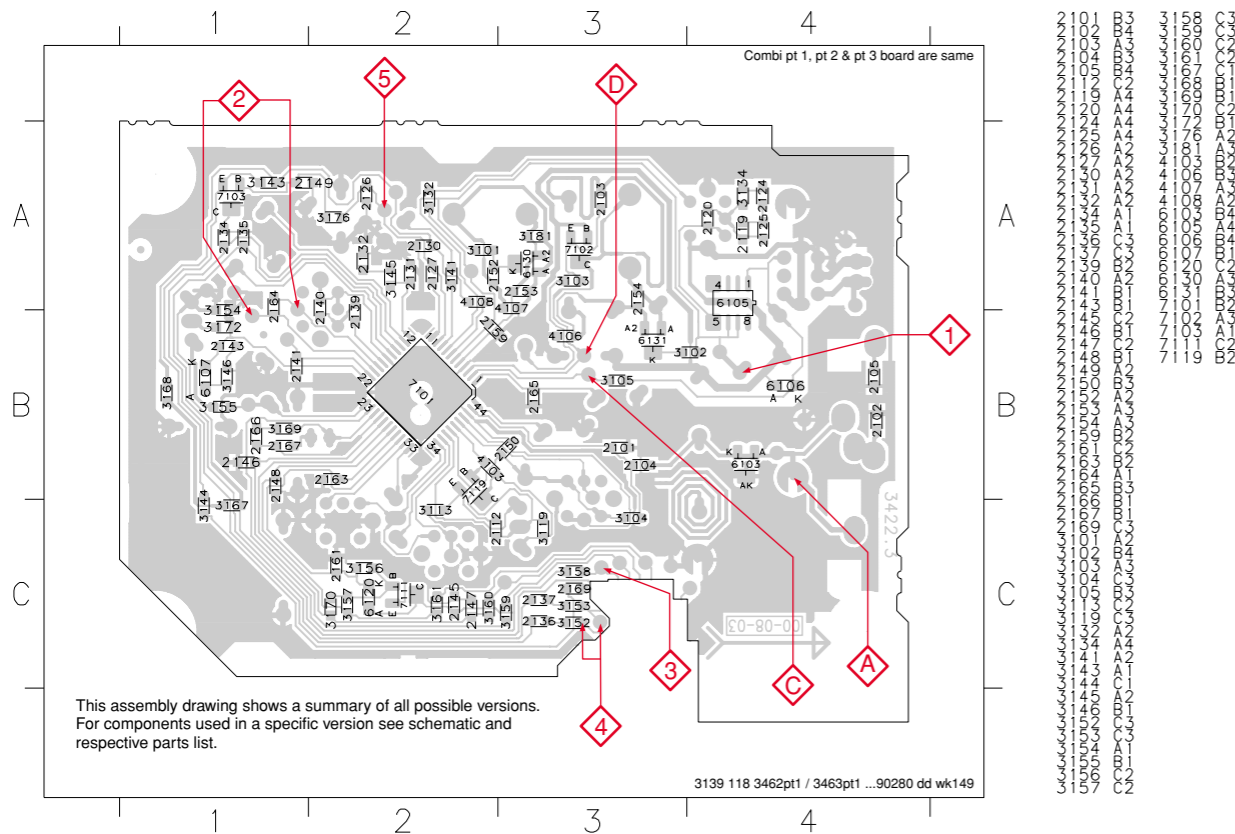
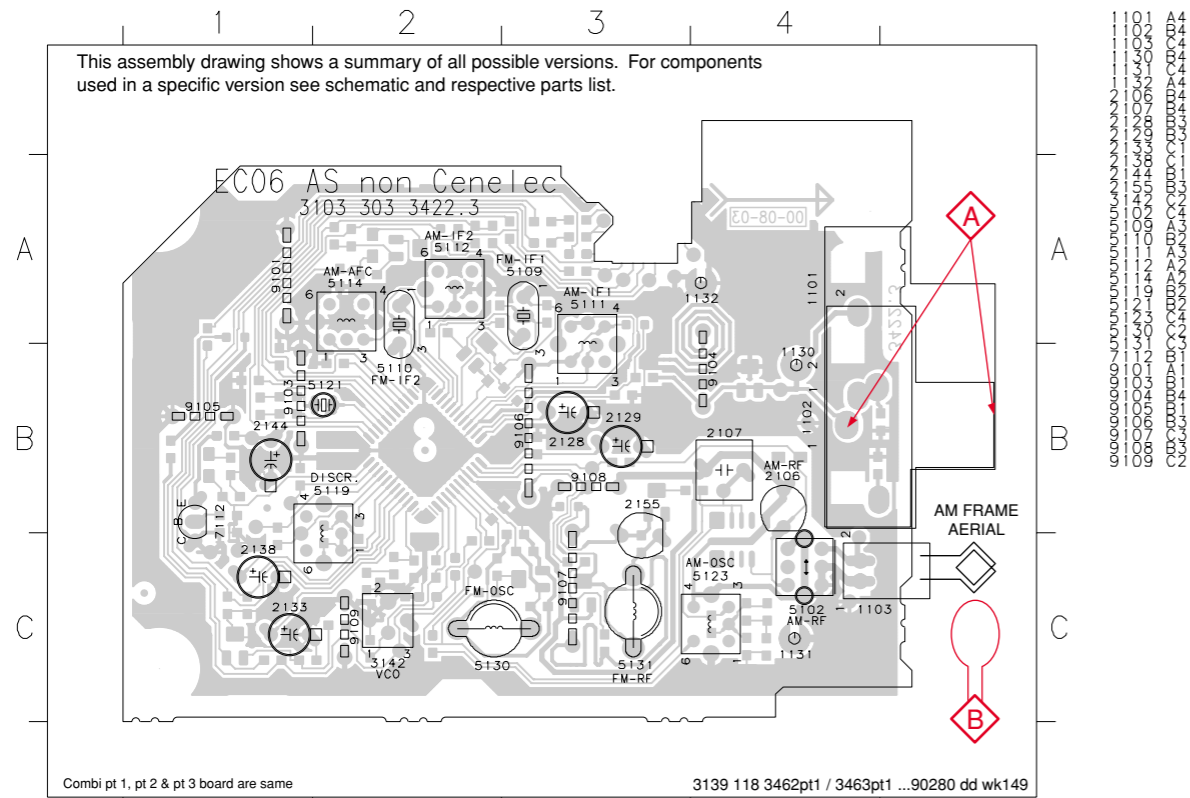
- 20 A2 1803 A1 1809 A1 1810 A2 2885 A1



- 20 C1 1803 A2 1809 C1 1810 B1 2885 A2



NON-CENELEC TUNER PORTION - COMPONENT & CHIP LAYOUTS



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

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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123	1	8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123	1	6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122	1	8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123	1	8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	D		5119	2	0 ± 3 mV DC
FM RF						
FM 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		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz ¹⁾
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C Δf=±10kHz V _{RF} = 0.5mV (as low as possible)		5111	5	
				5112		
AM AFC MW		C continuous wave V _{RF} = 2mV		5114	2	0 ± 2 mV DC
AM RF³⁾						
MW⁴⁾ FM/MW/LW- and FM/MW-version (9kHz grid)	1494kHz	B 	1494kHz	2106	5	
	531 - 1602kHz		558kHz	5102		
LW	198kHz		198kHz	5103	5	
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V _{RF} as low as possible	1500kHz	2106		
	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)

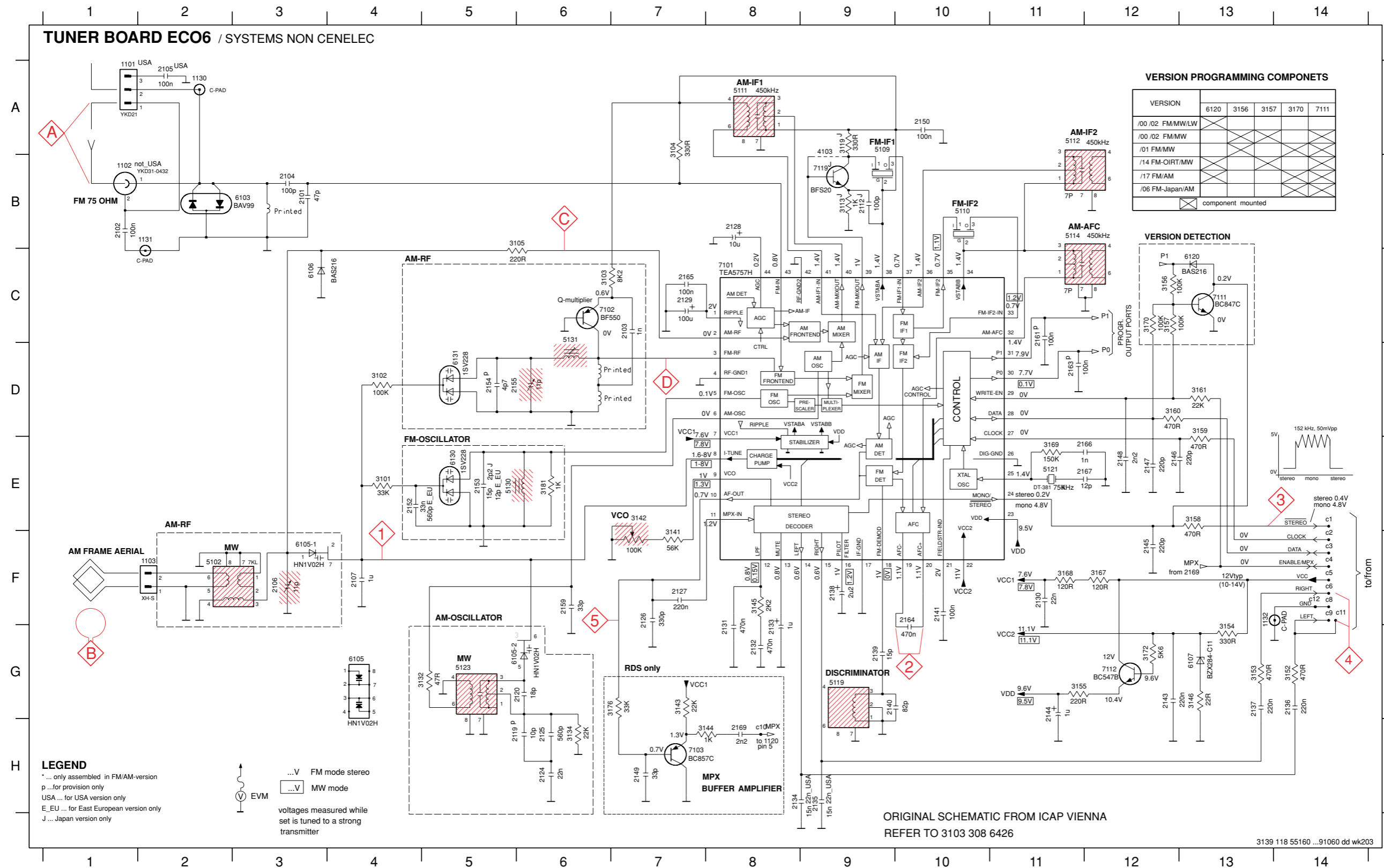
²⁾ RC network serves for damping the IF-filter while adjusting the other one.

³⁾ For AM RF adjustments the original frame antenna has to be used !

⁴⁾ MW has to be aligned before LW.

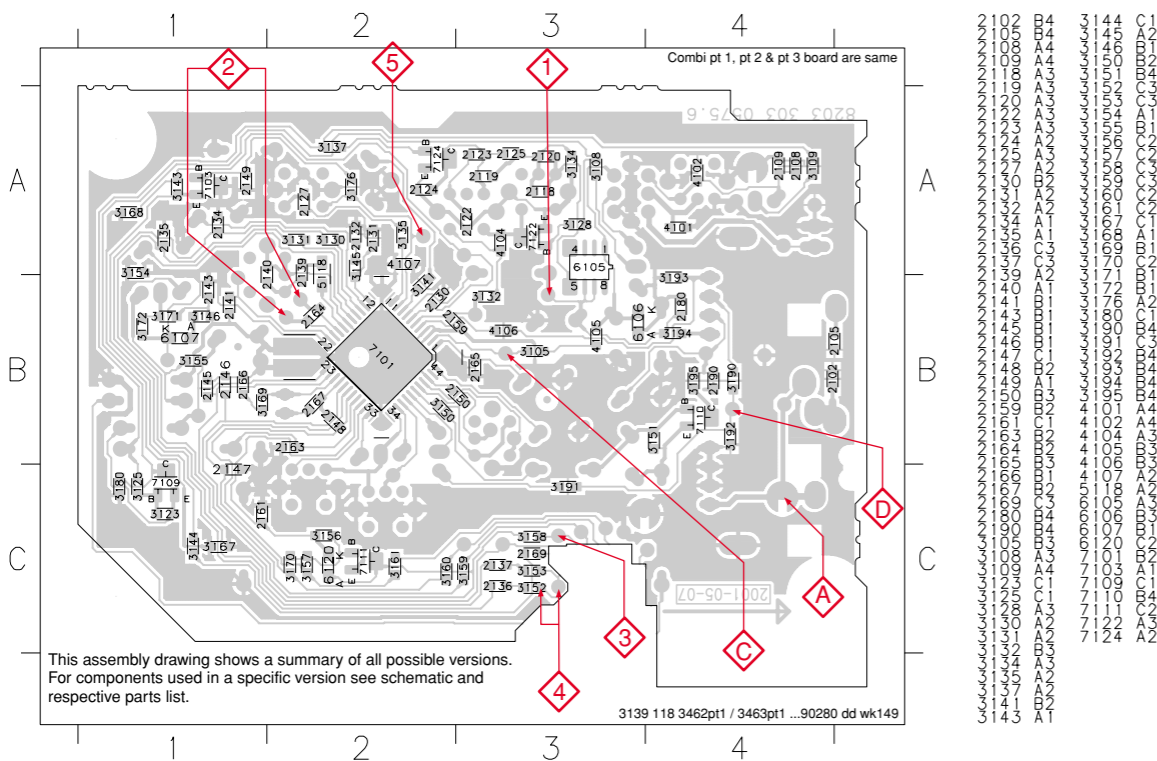
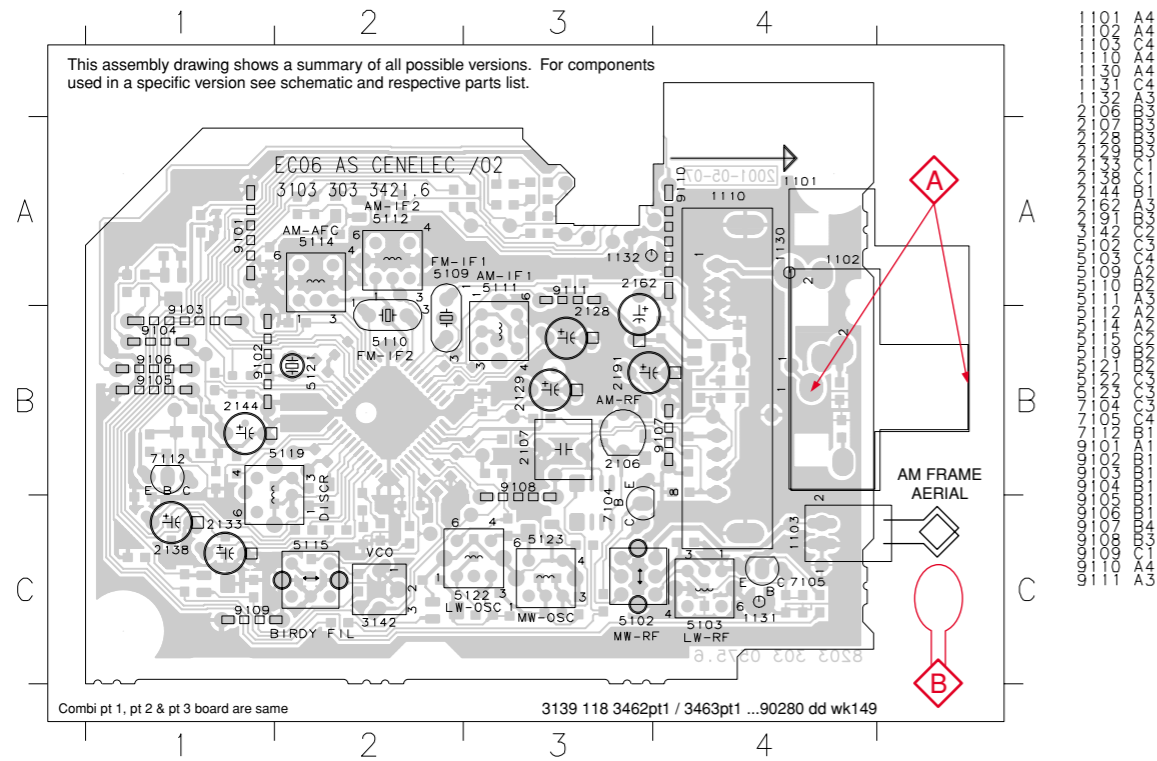
↑ Repeat

NON-CENELEC TUNER CIRCUIT

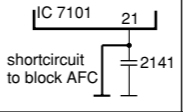
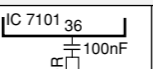
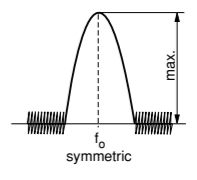
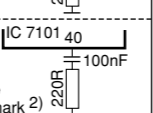
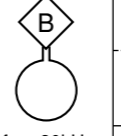
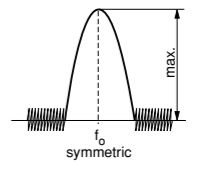


- c1 E14
- c2 F14
- c3 F14
- c4 F14
- c5 F14
- c6 F14
- c8 F14
- c9 F14
- c10 H8
- c11 F14
- c12 F14
- 1101 A1
- 1102 B1
- 1103 F2
- 1104 A2
- 1131 B2
- 1132 G13
- 2101 B3
- 2102 B1
- 2103 C7
- 2104 B3
- 2105 A2
- 2106 F3
- 2107 F4
- 2112 B9
- 2119 H6
- 2120 G6
- 2124 H6
- 2125 H6
- 2126 F7
- 2127 F7
- 2128 B8
- 2129 C7
- 2130 F11
- 2131 G8
- 2132 G8
- 2133 G8
- 2134 H8
- 2135 H9
- 2136 G14
- 2137 F13
- 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 D6
- 2159 F6
- 2161 C11
- 2163 D11
- 2164 F10
- 2165 C7
- 2166 E12
- 2167 E12
- 2169 H8
- 3101 E4
- 3102 D4
- 3103 C6
- 3104 A7
- 3105 B6
- 3113 B9
- 3119 A9
- 3132 G5
- 3134 H6
- 3141 F7
- 3142 E7
- 3143 G7
- 3144 H8
- 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
- 4103 A9
- 5102 F2
- 5109 A9
- 5110 B10
- 5111 A8
- 5112 A11
- 5114 B11
- 5119 G9
- 5121 E11
- 5123 G5
- 5130 E5
- 5131 C6
- 6103 B2
- 6105-1 F3
- 6106 C3
- 6107 G13
- 6120 C13
- 6130 E5
- 6131 D5
- 7101 C8
- 7102 C6
- 7103 H7
- 7111 C13
- 7112 G12
- 7119 B9

CENELEC TUNER PORTION - COMPONENT & CHIP LAYOUTS



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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<i>VARICAP ALIGNMENT</i>						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check		8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123	1	8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
<i>FM - IF</i>						
FM	10.7MHz, 45mV continuous wave	D		5119	2	0mV ±3mV
<i>FM - VCO</i>						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz ¹⁾
<i>FM RF (channel separation)</i> Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.						
FM	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	A	98MHz	IF coil inside FM frontend 1110	4	right channel min.
<i>AM IF</i>						
MW	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		
AM AFC MW		C continuous wave $V_{RF} = 2\text{mV}$		5114	2	0mV ±2mV
<i>AM RF ³⁾</i>						
MW	1494kHz	B 	1494kHz	2106	5	
	558kHz		558kHz	5102		
LW	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.

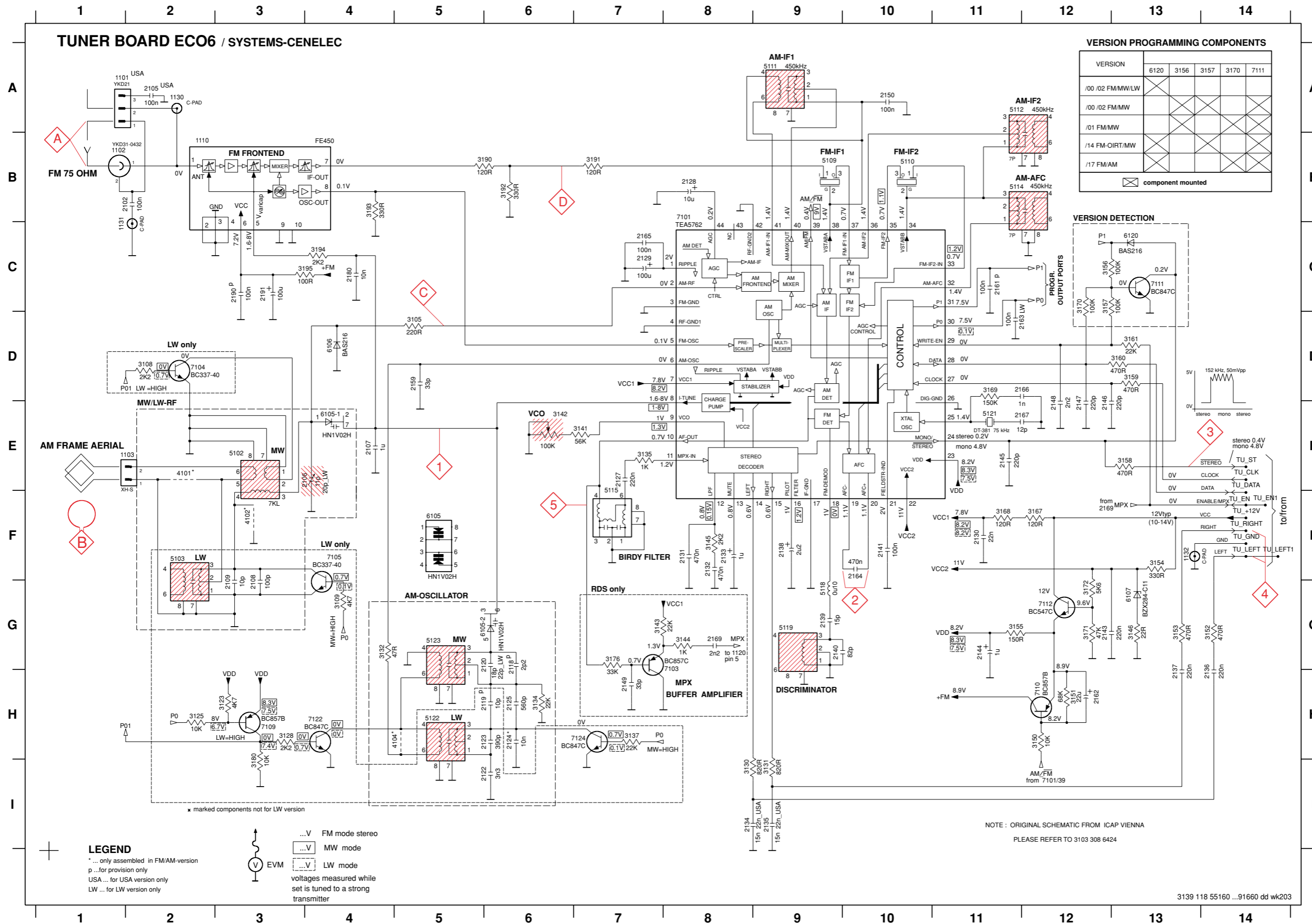
1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

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

CENELEC TUNER CIRCUIT



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

- AM G13
- FM G13
- 1101 A2
- 1102 B1
- 1103 E2
- 1110 B2
- 1130 A2
- 1131 C1
- 1132 F13
- 2102 B2
- 2105 A2
- 2106 E3
- 2107 E4
- 2108 G3
- 2109 G3
- 2118 G6
- 2119 H6
- 2120 G6
- 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 G11
- 2144 G11
- 2145 E11
- 2146 E12
- 2147 E12
- 2148 E12
- 2149 H7
- 2150 A10
- 2159 D5
- 2161 C11
- 2162 H12
- 2163 D11
- 2164 F10
- 2165 C7
- 2166 D12
- 2167 E12
- 2169 G8
- 2180 C4
- 2190 C3
- 2191 C3
- 3105 D5
- 3108 D2
- 3109 G4
- 3123 H3
- 3125 H2
- 3128 H3
- 3130 I8
- 3131 I9
- 3132 G4
- 3134 H6
- 3135 E7
- 3137 H7
- 3141 E7
- 3142 E6
- 3143 G7
- 3144 G8
- 3145 F8
- 3146 G13
- 3150 H12
- 3152 G14
- 3153 G13
- 3154 F13
- 3155 G11
- 3156 C12
- 3157 C12
- 3158 E13
- 3159 D13
- 3160 D13
- 3161 D13
- 3167 F12
- 3168 F11
- 3169 D11
- 3170 C12
- 3171 G12
- 3172 G12
- 3176 G7
- 3180 I3
- 3190 B6
- 3191 B7
- 3192 B6
- 3193 B4
- 3194 C4
- 3195 C4
- 4101 E2
- 4102 F3
- 4104 H5
- 5102 E3
- 5103 F2
- 5109 B9
- 5110 B10
- 5111 A9
- 5112 A11
- 5114 B11
- 5115 F7

NOTE : ORIGINAL SCHEMATIC FROM ICAP VIENNA
PLEASE REFER TO 3103 308 6424

ELECTRICAL PARTS LIST - COMBI BOARD (excluding Tuner portion)**MISCELLANEOUS**

1215	4822 071 55002	△ Fuse T5A 250V	2503	4822 124 22466	1uF 20% 50V
1216	9965 000 07788	△ Fuse T2A 250V	2504	4822 124 22466	1uF 20% 50V
1217	4822 071 53151	△ Fuse T315mA 250V	2505	3198 016 31020	1nF 25V
1218	4822 071 51602	△ Fuse T1,6A 250V	2506	3198 016 31020	1nF 25V
1300	4822 267 31176	Loudspeaker Socket 4P	2507	4822 124 22466	1uF 20% 50V
1501	4822 267 10953	Flex Socket 7pin Vert.	2508	4822 124 22466	1uF 20% 50V
1504	4822 265 20553	Cinch Socket, Aux-in	2509	4822 124 22466	1uF 20% 50V
1505	4822 267 10954	Flex Socket 5pin Vert. /21M	2510	4822 124 22466	1uF 20% 50V
1507	4822 265 10981	Flex Socket 15pin Vert.	2511	2020 552 94427	100pF 5% 50V
1508	2422 025 17411	Flex Socket 30pin Vert.	2512	2020 552 94427	100pF 5% 50V
1508	2422 025 17412	Flex Socket 32pin Vert. /22	2513	4822 124 22466	1uF 20% 50V
1803	4822 267 31996	Cinch Socket, Video-out /21M	2514	4822 124 22466	1uF 20% 50V

CAPACITORS

2207	4822 121 43526	47nF 5% 250V	2515	2020 552 94427	100pF 5% 50V
2208	3198 017 31040	100nF 16V	2516	2020 552 94427	100pF 5% 50V
2209	5322 126 11578	1nF 10% 50V	2517	2020 552 94427	100pF 5% 50V
2211	4822 124 81039	3300uF 20% 25V	2518	2020 552 94427	100pF 5% 50V
2213	5322 121 42386	100nF 5% 63V	2519	2020 552 94427	100pF 5% 50V
2214	5322 121 42386	100nF 5% 63V	2520	2020 552 94427	100pF 5% 50V
2216	4822 124 80415	4700uF 20% 50V	2521	4822 126 13956	68pF 5% 63V
2218	4822 124 80144	220uF 20% 25V	2522	4822 126 13956	68pF 5% 63V
2220	4822 124 80144	220uF 20% 25V	2523	4822 124 40433	47uF 20% 25V
2221	5322 121 42386	100nF 5% 63V	2524	4822 126 14238	2,2nF 50V
2222	2020 012 93547	100uF 20% 63V	2525	4822 124 40196	220uF 20% 16V
2224	4822 124 21913	1uF 20% 63V	2526	4822 124 81151	22uF 20% 50V
2225	4822 124 21913	1uF 20% 63V	2527	3198 017 44740	470nF 10V
2226	4822 121 43526	47nF 5% 250V	2528	2238 586 59812	100nF +80/-20% 50V
2227	5322 121 42386	100nF 5% 63V	2529	4822 126 13193	4,7nF 10% 63V
2228	5322 121 42386	100nF 5% 63V	2530	4822 126 13193	4,7nF 10% 63V
2229	4822 124 12328	6800uF 20% 25V	2537	4822 121 42408	220nF 5% 63V
2230	4822 124 80144	220uF 20% 25V	2538	4822 121 42408	220nF 5% 63V
2232	4822 126 14494	22nF 10% 25V	2539	5322 121 42661	330nF 5% 63V
2233	4822 124 41751	47uF 20% 50V	2540	5322 121 42661	330nF 5% 63V
2234	2238 586 59812	100nF 25V	2541	4822 121 51252	470nF 5% 63V
2235	4822 126 13879	220nF 16V	2542	4822 121 51252	470nF 5% 63V
2236	4822 126 13879	220nF 16V	2543	2020 552 94427	100pF 5% 50V
2361	3198 016 36810	680pF 25V	2547	3198 017 44740	470nF 10V
2362	3198 016 36810	680pF 25V	2549	4822 124 40196	220uF 20% 16V
2365	4822 121 43526	47nF 5% 250V	2560	4822 122 33741	10pF 10% 50V
2366	4822 121 43526	47nF 5% 250V	2561	4822 122 33741	10pF 10% 50V
2367	4822 121 42408	220nF 5% 63V	2563	3198 016 31020	1nF 25V
2368	4822 121 42408	220nF 5% 63V	2564	3198 016 31020	1nF 25V
2369	4822 121 42408	220nF 5% 63V	2567	3198 017 44740	470nF 10V
2370	4822 121 42408	220nF 5% 63V	2568	3198 017 34730	47nF 16V
2371	4822 124 40769	4,7uF 20% 100V	2570	4822 124 40433	47uF 20% 25V
2372	4822 124 40769	4,7uF 20% 100V	2601	4822 124 40433	47uF 20% 25V
2373	4822 122 33777	47pF 5% 63V	2602	2238 586 59812	100nF +80/-20% 50V
2377	4822 124 81151	22uF 50V	2603	4822 122 33752	15pF 5% 50V
2378	4822 126 13883	220pF 5% 50V	2604	2020 552 94427	100pF 5% 50V
2501	4822 124 22466	1uF 20% 50V	2605	4822 126 13881	470pF 5% 50V
2502	4822 124 22466	1uF 20% 50V	2606	4822 126 13881	470pF 5% 50V
			2607	4822 126 13883	220pF 5% 50V
			2608	4822 126 13883	220pF 5% 50V

ELECTRICAL PARTS LIST - COMBI BOARD (excluding Tuner portion)

2609	4822 124 81151	22uF 50V	3361	4822 117 12864	82k 5% 0,062W
2610	4822 124 81151	22uF 50V	3362	4822 117 12864	82k 5% 0,062W
2611	2020 552 94427	100pF 5% 50V	3363	4822 117 12902	8k2 1% 0,063W
2612	2020 552 94427	100pF 5% 50V	3364	4822 117 12902	8k2 1% 0,063W
2613	4822 124 41584	100uF 20% 10V	3365	4822 117 13608	4,7R 5% 0,062W
2614	4822 126 14494	22nF 10% 25V	3366	4822 117 13608	4,7R 5% 0,062W
2615	4822 124 41751	47uF 20% 50V	3367	4822 117 13608	4,7R 5% 0,062W
2616	4822 126 14494	22nF 10% 25V	3368	4822 117 13608	4,7R 5% 0,062W
2617	4822 124 40248	10uF 20% 63V	3369	4822 117 13608	4,7R 5% 0,062W
2618	2020 552 94427	100pF 5% 50V	3370	4822 117 13608	4,7R 5% 0,062W
2662	4822 124 22652	2,2uF 20% 50V	3371	4822 117 13608	4,7R 5% 0,062W
2663	4822 124 22652	2,2uF 20% 50V	3372	4822 117 13608	4,7R 5% 0,062W
2664	2020 552 94427	100pF 5% 50V	3373	4822 116 52283	4k7 5% 0,5W
2665	5322 126 11578	1nF 10% 50V /21M	3374	4822 116 83883	470R 5% 0,5W
2666	3198 017 44740	470nF 10V	3376	4822 051 30123	12k 5% 0,062W
2667	2020 012 93547	100uF 20% 63V	3377	4822 051 30331	330R 5% 0,062W
2885	3198 017 41050	1uF 5% 10V /21M	3378	4822 051 30222	2k2 5% 0,062W

RESISTORS

3208	4822 053 21106	10M 5% 0,5W /37	3384	4822 051 30152	1k5 5% 0,062W
3210	4822 050 24708	4R7 1% 0,6W	3385	4822 051 30154	150k 5% 0,062W
3211	4822 050 24708	4R7 1% 0,6W	3386	4822 051 30101	100R 5% 0,062W
3214	4822 116 83872	220R 5% 0,5W	3387	4822 051 30103	10k 5% 0,062W
3215	4822 116 83872	220R 5% 0,5W	3388	4822 051 30103	10k 5% 0,062W
3218	4822 116 52199	68R 5% 0,5W	3389	4822 051 30123	12k 5% 0,062W
3219	4822 116 83872	220R 5% 0,5W	3390	4822 051 30123	12k 5% 0,062W
3220	4822 116 83872	220R 5% 0,5W	3392	4822 051 30102	1k 5% 0,062W
3221	4822 116 52176	10R 5% 0,5W	3501	4822 051 30102	1k 5% 0,062W
3223	4822 050 24708	4R7 1% 0,6W	3502	4822 051 30102	1k 5% 0,062W
3224	4822 050 24708	4R7 1% 0,6W	3505	4822 051 30222	2k2 5% 0,062W
3227	4822 116 52199	68R 5% 0,5W	3506	4822 051 30222	2k2 5% 0,062W
3228	4822 050 11002	1k 1% 0,4W	3507	4822 051 30332	3k3 5% 0,062W
3229	4822 116 52176	10R 5% 0,5W	3508	4822 051 30332	3k3 5% 0,062W
3230	4822 116 52176	10R 5% 0,5W	3509	4822 051 30273	27k 5% 0,062W
3232	4822 116 52207	1k2 5% 0,5W	3510	4822 051 30273	27k 5% 0,062W
3233	4822 116 52206	120R 5% 0,5W	3511	4822 051 30152	1k5 5% 0,062W
3235	4822 116 52289	5k6 5% 0,5W	3512	4822 051 30152	1k5 5% 0,062W
3236	4822 116 52256	2k2 5% 0,5W	3513	4822 051 30102	1k 5% 0,062W
3237	4822 050 21003	10k 1% 0,6W	3514	4822 051 30102	1k 5% 0,062W
3238	4822 050 21003	10k 1% 0,6W	3517	4822 051 30472	4k7 5% 0,062W
3239	4822 116 52283	4k7 5% 0,5W	3518	4822 051 30472	4k7 5% 0,062W
3244	4822 051 30333	33k 5% 0,062W	3519	4822 051 30123	12k 5% 0,062W
3245	4822 117 11817	1k2 1% 1/16W	3520	4822 051 30123	12k 5% 0,062W
3246	4822 117 11817	1k2 1% 1/16W	3521	4822 051 30153	15k 5% 0,062W
3247	4822 117 11817	1k2 1% 1/16W	3522	4822 051 30153	15k 5% 0,062W
3248	4822 117 11817	1k2 1% 1/16W	3523	4822 051 30151	150R 5% 0,062W
3249	4822 051 30103	10k 5% 0,062W	3524	4822 051 30221	220R 5% 0,062W
3250	4822 051 30472	4k7 5% 0,062W	3525	4822 051 30221	220R 5% 0,062W
3251	4822 116 52283	4k7 5% 0,5W /22	3531	4822 117 12925	47k 1% 0,063W
3252	4822 116 83872	220R 5% 0,5W	3532	4822 117 12925	47k 1% 0,063W
3253	4822 116 83872	220R 5% 0,5W	3539	4822 117 12902	8k2 1% 0,063W
3254	4822 116 52257	22k 5% 0,5W	3540	4822 117 12902	8k2 1% 0,063W
			3541	4822 051 30562	5k6 5% 0,063W

ELECTRICAL PARTS LIST - COMBI BOARD (Non-Cenelec Tuner portion only)

MISCELLANEOUS			
1101	2422 015 19376	Socket 2P Clickfit	USA only
1102	4822 267 10283	Socket Coaxial 75R	not USA
1103	4822 265 31184	JST Connector 2P	
CAPACITORS			
2101	4822 126 11785	47pF 5% 50V	
2102	3198 017 41050	1uF 10V	
2103	5322 126 11578	1nF 10% 50V	
2104	2020 552 94427	100pF 5% 50V	
2105	2238 586 59812	100nF +80/-20% 50V	USA only
2106	2020 800 00191	Trimmer 3-11pF 100V	
2107	4822 121 51319	1μF 10% 63V	
2120	4822 126 14507	18pF 5% 50V	
2124	4822 126 14494	22nF 10% 25V	
2125	2238 861 18561	560pF 1% 50V	
2126	4822 126 14241	330pF 1% 50V	
2127	4822 126 13879	220nF +80/-20% 16V	
2128	4822 124 40248	10μF 20% 63V	
2129	4822 124 41584	100μF 20% 10V	
2130	4822 126 14494	22nF 10% 25V	
2131	3198 017 44740	470nF 10V	
2132	3198 017 44740	470nF 10V	
2133	4822 124 21913	1μF 20% 63V	
2134	3198 017 31530	15nF 50V	not USA
2134	4822 126 14494	22nF 10% 25V	USA only
2135	3198 017 31530	15nF 50V	not USA
2135	4822 126 14494	22nF 10% 25V	USA only
2136	4822 126 13879	220nF +80/-20% 16V	
2137	4822 126 13879	220nF +80/-20% 16V	
2138	4822 124 22652	2,2μF 20% 50V	
2139	4822 122 33752	15pF 5% 50V	
2140	4822 126 14226	82pF 5% 50V	
2141	2238 586 59812	100nF +80/-20% 50V	
2143	4822 126 13879	220nF +80/-20% 16V	
2144	4822 124 21913	1μF 20% 63V	
2145	4822 126 13883	220pF 5% 50V	
2146	4822 126 13883	220pF 5% 50V	
2147	4822 126 13883	220pF 5% 50V	
2148	4822 126 14238	2,2nF 50V	
2149	2222 867 15339	33pF 5% 50V	RDS only
2150	4822 126 14585	100nF 10% 50V	
2152	4822 126 14549	33nF 16V	not E Eur
2152	4822 126 14249	560pF 10% 63V	E Eur only
2153	4822 122 33752	15pF 5% 50V	not E Eur
2153	4822 126 11663	12pF 50V	E Eur only
2155	2020 800 00191	Trimmer 3-11pF 100V	
2159	2222 867 15339	33pF 5% 50V	
2164	3198 017 44740	470nF 10V	
2165	2238 586 59812	100nF +80/-20% 50V	
2166	5322 126 11578	1nF 10% 50V	
2167	4822 126 11663	12pF 50V	

2169 4822 126 14238 2,2nF 50V RDS only

RESISTORS

3101	4822 051 30333	33k 5% 0,062W	
3102	4822 117 13632	100k 1% 0,62W	
3103	4822 117 12902	8k2 1% 0,063W	
3104	4822 117 13577	330R 1% 0,1W	
3105	4822 051 30221	220R 5% 0,062W	
3132	4822 051 30479	47R 5% 0,062W	
3134	4822 051 30223	22k 5% 0,062W	
3141	4822 051 30563	56k 5% 0,062W	
3142	4822 100 12159	Trim-pot 100k 30%	
3143	4822 051 30223	22k 5% 0,062W	RDS only
3144	4822 051 30102	1k 5% 0,062W	RDS only
3145	4822 051 30222	2k2 5% 0,062W	
3146	4822 117 12139	22R 5% 0,062W	
3152	4822 051 30471	470R 5% 0,062W	
3153	4822 051 30471	470R 5% 0,062W	
3154	4822 051 30331	330R 5% 0,062W	
3155	4822 051 30221	220R 5% 0,062W	
3156	4822 117 13632	100k 1% 0,062W	
3157	4822 117 13632	100k 1% 0,062W	
3158	4822 051 30471	470R 5% 0,062W	
3159	4822 051 30471	470R 5% 0,062W	
3160	4822 051 30471	470R 5% 0,062W	
3161	4822 051 20223	22k 5% 0,1W	
3167	4822 051 20121	120R 5% 0,1W	
3168	4822 051 30121	120R 5% 0,062W	
3169	4822 051 30154	150k 5% 0,062W	
3170	4822 117 13632	100k 1% 0,62W	
3172	4822 051 30562	5k6 5% 0,063W	
3176	4822 051 30333	33k 5% 0,062W	RDS only
3181	4822 051 30102	1k 5% 0,062W	
4103	4822 051 30008	0R Jumper 0603	
4106	4822 051 20008	0R Jumper 0805	
4107	4822 051 30008	0R Jumper 0603	
4108	4822 051 30008	0R Jumper 0603	

COILS & FILTERS

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	

DIODES

6103	5322 130 34337	BAV99	
6105	4822 130 83075	HN1V02H-B	

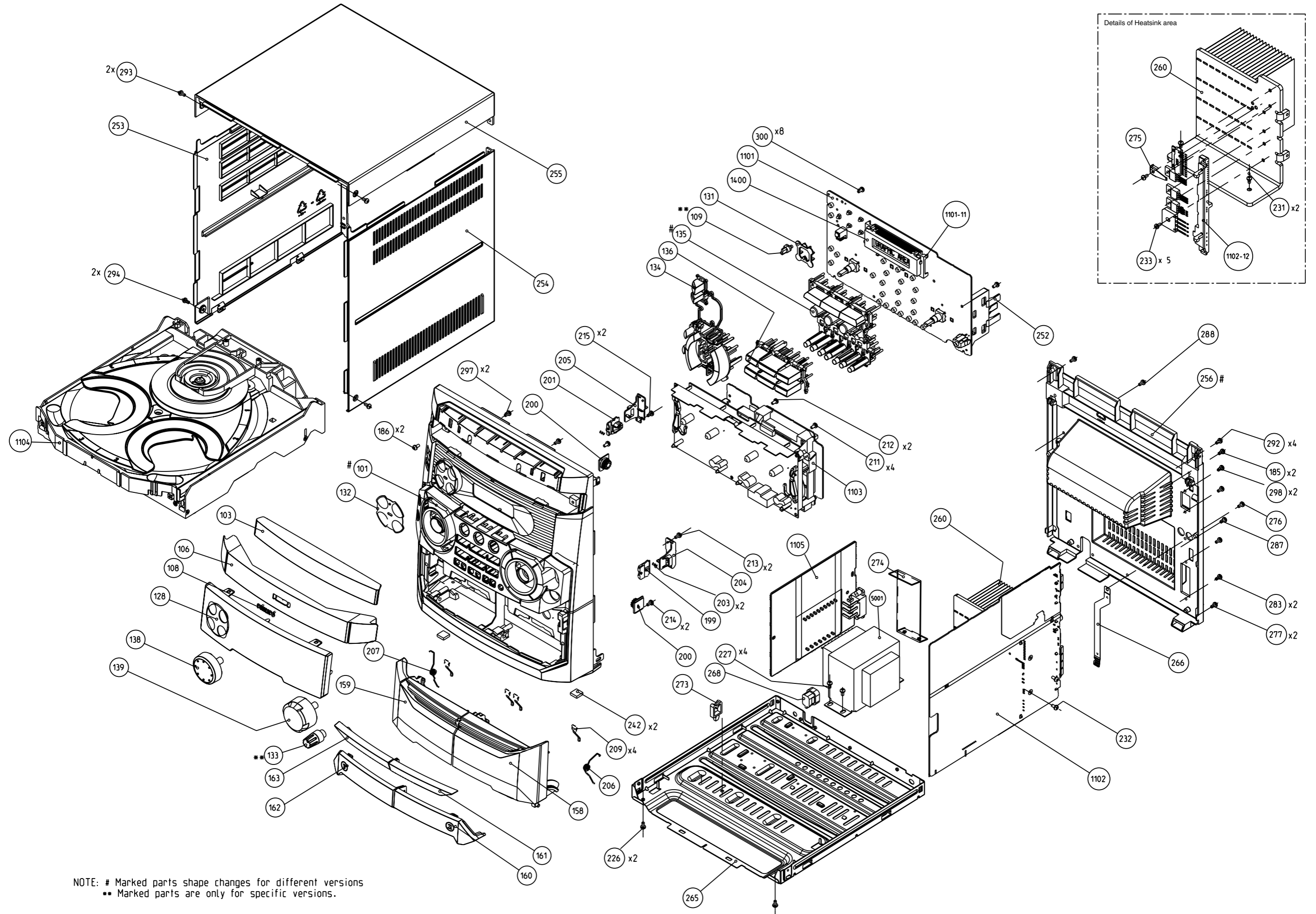
ELECTRICAL PARTS LIST - COMBI BOARD (Non-Cenelec Tuner portion only)

6106	9340 255 30115	BAS216	
6107	9340 386 90115	BZX284-C11	
6120	9340 255 30115	BAS216	
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	9351 740 80557	TEA5757H/V1	
7102	4822 130 42131	BF550	
7103	5322 130 42756	BC857C	RDS only
7111	5322 130 42755	BC847C	
7112	4822 130 40959	BC547B	

EXPLODED VIEW - MAIN UNIT



NOTE: # Marked parts shape changes for different versions
 ** Marked parts are only for specific versions.

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

101	3140 117 64140	CABINET FRONT
103	3140 117 64160	COVER CDC PANEL
106	3140 117 64180	COVER TRAY CDC
108	4822 454 13408	BADGE PHILIPS
118	3139 110 00150	BADGE CORRECTION
128	3140 117 64220	WINDOW DISPLAY
133	3140 117 65270	KNOB KARAOKE
134	3140 117 64230	BUTTON SET POWER
135	3140 117 65040	BUTTON SET SOURCE
136	3140 117 65050	BUTTON SET CONTROL
138	3140 117 64240	KNOB JOG ROT
139	3140 117 64250	KNOB VOL ROT
158	3140 117 64260	COVER CASS RIGHT
159	3140 117 64270	COVER CASS LEFT
160	3140 117 66370	LENS CASS RIGHT
162	3140 117 66380	LENS CASS LEFT
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 70231	SPRING
242	4822 462 40683	FOOT, RUBBER
253	3139 114 70930	PANEL LEFT
254	3139 114 70940	PANEL RIGHT
255	3139 114 70960	COVER TOP
268	3140 113 21880	MAINS CORD RELIEF
275	4822 492 11735	SPRING TRANS
385	△ 2422 070 98244	MAINS CORD
1400	3139 110 35940	FFC FOIL 30P/180/30P AD
1402	4822 320 12703	7P - 140MM
1500	3139 110 35690	FFC FOIL 05P/140/05P AD
1700	4822 320 12654	7P - 220MM
1800	3139 110 35880	FFC FOIL 15P/180/15P BD
5001	△ 3139 118 32610	POWER TRANSFORMER

350	3140 118 51240	BOX SPK ASSY
351	4822 303 50063	FM AERIAL
356	3139 228 85100	REMOTE CONTROL
384	2422 549 45067	ANT AM LOOP LAN-006 B
387	3140 115 29790	IFU FW-V330 /21M

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

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