

Service Service Service



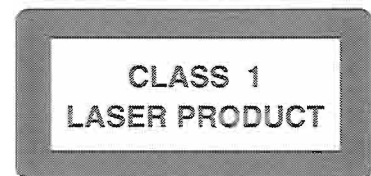
Manual #1860
FW316C3701 / FW318C3701

Service Manual



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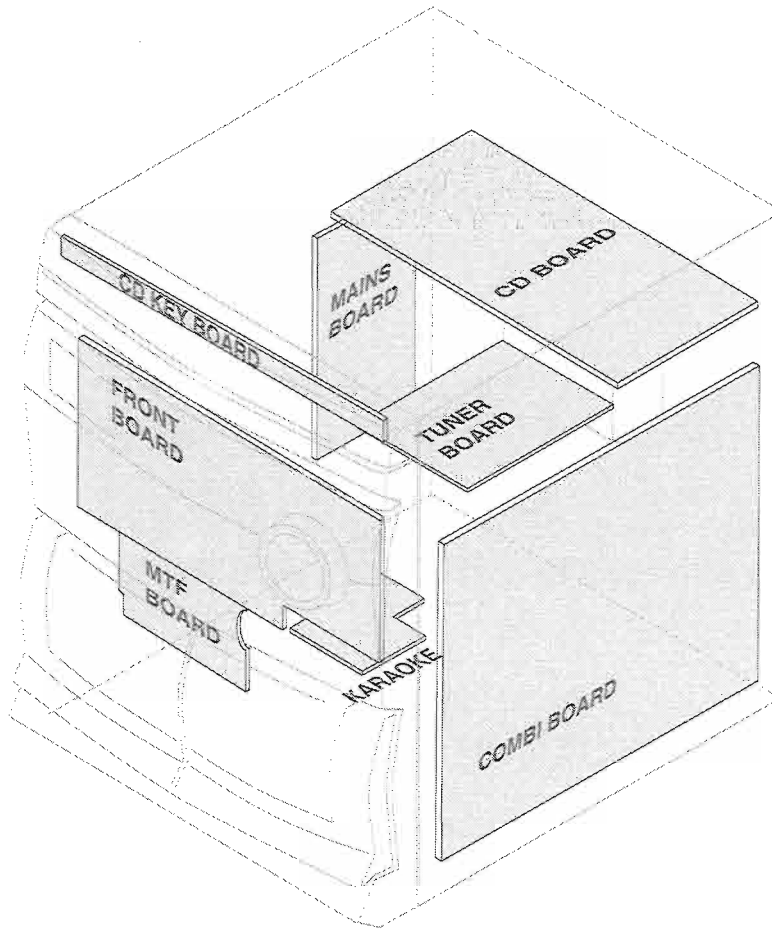
4822 725 25788

PCS 96 958



PHILIPS

LOCATION OF PC BOARDS



VERSION VARIATIONS:

Features & Board in used:	Type /Versions:		FW316C				FW318C	
	/21	/21M	/22	/37			/37	
Aux Input	x	x	x	x			x	
Line Output								
Subwoofer Output								
Surround Output								
Digital Output								
Dolby B								
RDS								
Incredible Surround							x	
Karaoke Feature	x	x						
Tuner board - ECO5 Sys	x	x		x			x	
Tuner board - Tuner 95			x					
Remote Control RC0799/01			x					
Remote Control RC0799/04				x				
Remote Control RC0799/01							x	

SPECIFICATIONS**GENERAL:**

Mains voltage : 100V for /26
 110-127V/220-240V Switchable for /21
 120V for /37
 220V for /33
 220-230V for /22/34
 230V for /25
 230-240V for /30

Mains frequency : 50/60Hz

Power consumption : < 10 W at power mode "OFF"
 < 18 W at 1/8 rated power out

Clock accuracy : < 4 seconds per day

Dimension centre unit : 265 x 310 x 300mm

TUNER:**FM**

Tuning range : 87.5-108MHz
 65.81-74MHz for /34

Grid : 50kHz (& 30kHz for /34)
 100kHz for /37

IF frequency : 10.7MHz \pm 25kHz

Aerial input : 75ohm coaxial
 300ohm click fit for /37

Sensitivity at 26dB S/N : < 7 μ V

Selectivity at 600kHz bandwidth : > 50dB

Image rejection : > 25dB [> 75dB]

Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]

-3dB Limiting point : < 7 μ V

Crosstalk at RF=1mV, dev. 40kHz : > 18dB [> 26dB]

MW

Tuning range : 531-1602kHz
 530-1700kHz for /21/37

Grid : 9kHz
 10kHz for /21/37

IF frequency : 450kHz \pm 1kHz

Aerial input : Frame aerial

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

Selectivity at 18kHz bandwidth : > 18dB

IF rejection : > 45dB

Image rejection : > 28dB

Distortion at RF=50mV, m=80% : < 5% [< 7%]

LW

Tuning range : 153-279kHz

Grid : 3kHz

IF frequency : 450kHz \pm 1kHz

Aerial input : Frame aerial

Sensitivity at 26dB S/N : [< 7.0mV/M]

Selectivity at 18kHz bandwidth : [> 24dB]

IF rejection : [> 26dB]

Image rejection : [> 35dB]

Distortion at RF=50mV, m=80% : [< 7%]

AMPLIFIER:

Output power (3ohm, 1 kHz, 10% THD) : 2 x 5W \pm 1dB

Frequency response within -3dB : 50Hz-15kHz

Dynamic Bass Boost : DBB ON, DBB Off ¹⁾

Digital Sound Control : Jazz, Techno, Optimal, Rock

Incredible Surround : IS ON, IS Off ¹⁾

Headphone output at 32 ohm : 16.5mW

Input sensitivity
 Aux/Line-in : 700mV \pm 2dB at 600ohm
 Mic : 2.5mV \pm 2dB at 600ohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo

Tape speed : 4.76 cm/sec \pm 2%
 1.7 x 4.76 cm/sec

Wow and flutter : < 0.4% DIN

Fast-wind/rewind time C60 : 110 sec

Bias system : 75kHz \pm 5kHz

Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz

Signal to noise ratio : > 43dB

COMPACT DISC:

Measurement done at output conn. of the CDC module.

Frequency response within \pm 1.5dB : 20Hz - 20kHz

Output level (in Vrms) : 550mV \pm 1dB unloaded

Signal/Noise ratio (A-weighted) : > 80dBA

Distortion at 1kHz : < 0.5%

Channel difference at 1kHz : < 1dB

Channel crosstalk at 1kHz : > 45dB

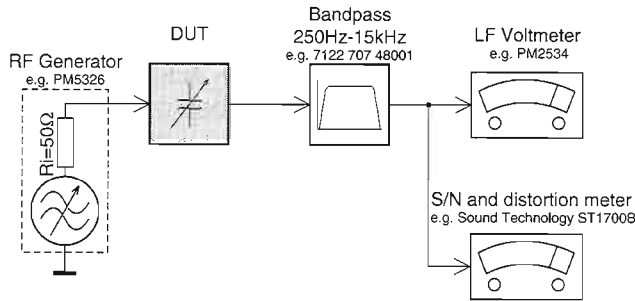
De-emphasis : 0 or 15/50 mS (Switched by subcode
 on the disc)

[...] Values indicated are for "Tuner 95 Board" only

¹⁾ Frequency response in each setting is software controlled.

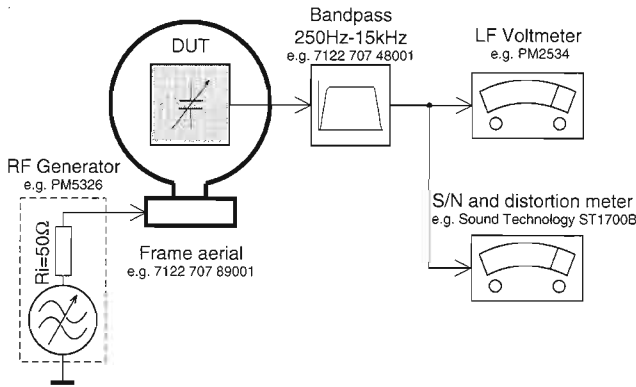
MEASUREMENT SETUP

Tuner FM



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

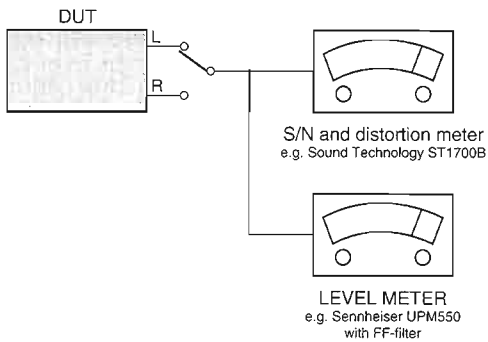
Tuner AM (MW,LW)



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).

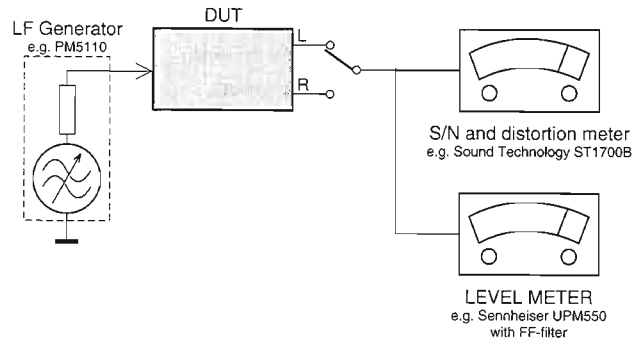
CD

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

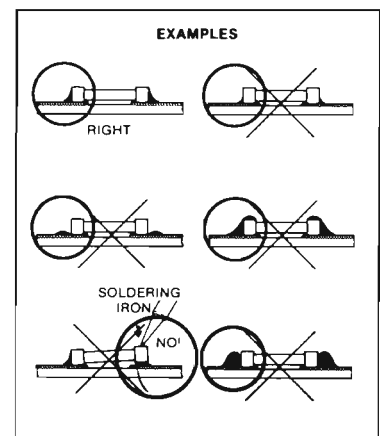
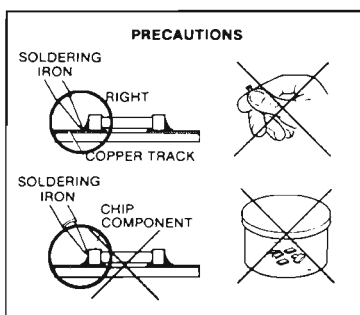
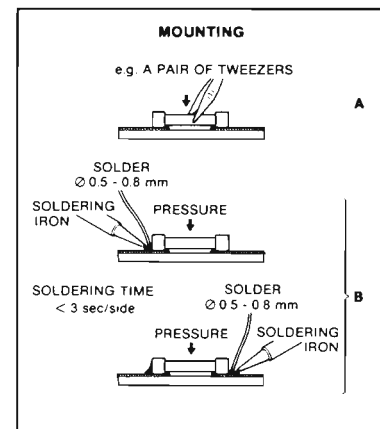
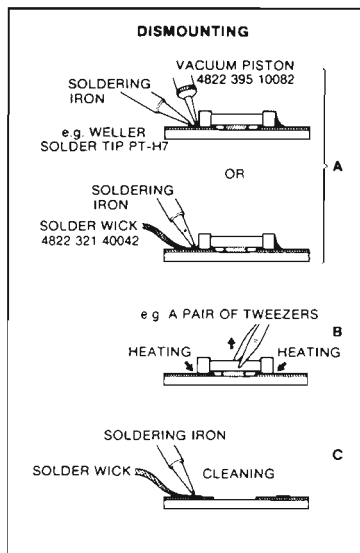
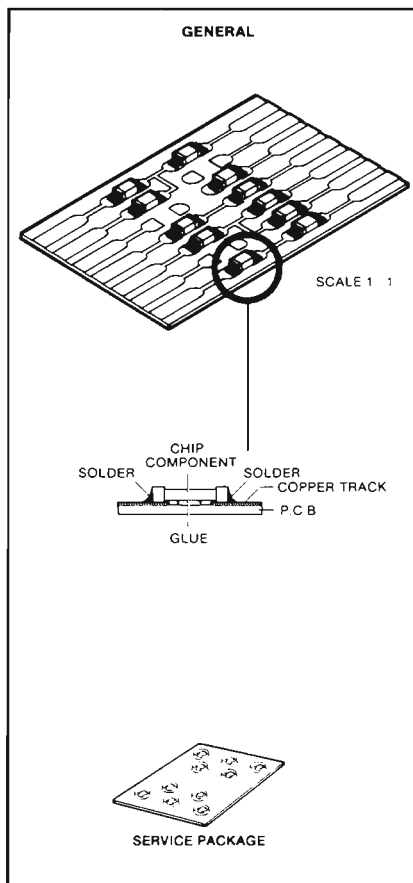
Compact Disc:

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



27 012C12

(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 enfiler le bracelet serti d'une résistance de sécurité. Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD). Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren. Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes. Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD). La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione. Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza. Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

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

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

(NL)

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

(F)

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

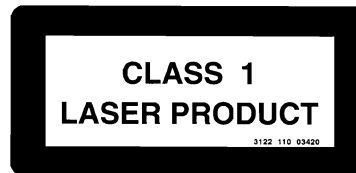
(D)

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 spårren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

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

(DK) Advarsel !

Usynlig laserstrålning ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for strålning.

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GENERAL INFORMATION

General Information

- The type plate (which contains the serial number) is located at the rear of the system.
- Recording is permissible if copyright or other rights of third parties are not infringed.
- This product complies with the radio interference requirements of the European Community.

Environmental Information

All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easily separable into three mono-materials: cardboard (box), polystyrene foam (buffer) and polythene (bags, protective foam sheet).

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

Accessories (Supplied)

- Remote control
- Batteries (2 x AAA size) for remote control
- AM loop antenna
- FM antenna wire
- AC power cord

SAFETY INFORMATION

Safety Information

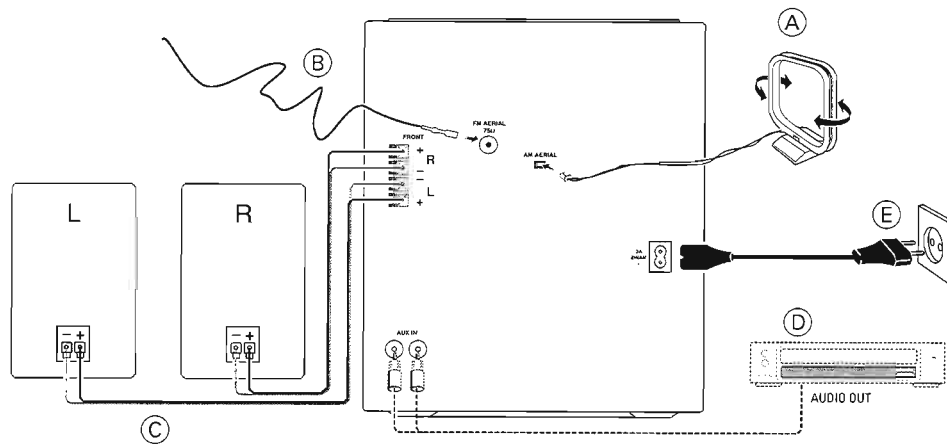
- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The type plate is located at the rear of your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

English

PREPARATION

Rear Connections

English



PREPARATION

English

(A) AM Antenna Connection

Connect the supplied loop antenna to the AM AERIAL terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

(B) FM Wire Antenna Connection

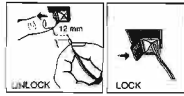
Connect the supplied FM wire antenna to the FM 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna

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

(C) Speaker Connections

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



(D) Connecting other equipment to your system

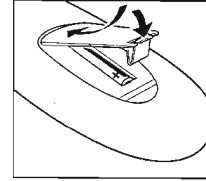
You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc or DVD player to the AUX IN terminals at the rear of the system.

(E) AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

Inserting batteries into the Remote Control

- Insert the batteries (Type R03 or AAA) into the remote control as shown in the battery compartment.

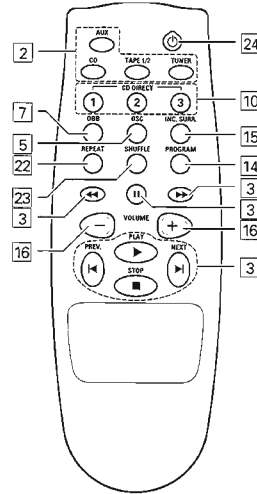
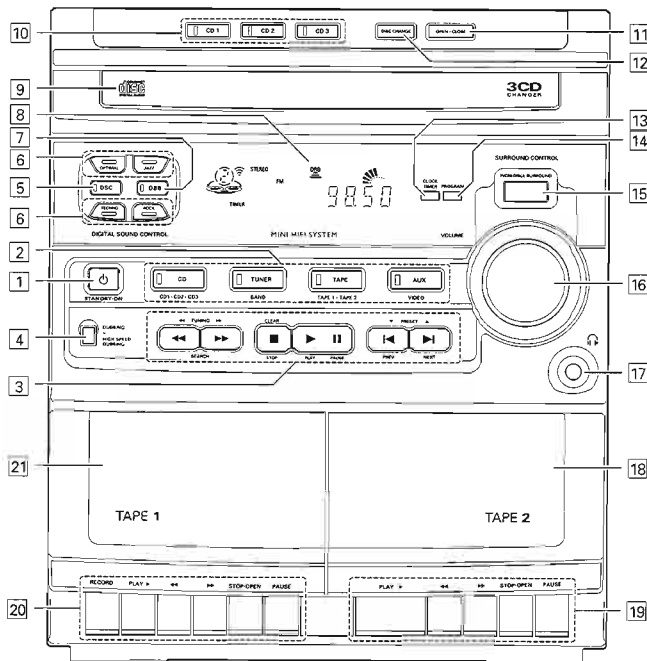


- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R03 or AAA batteries.

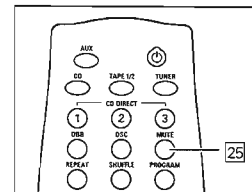
7

CONTROLS

English



FW 339C




FW 316C

8

Controls on the system and remote control

- 1** **STANDBY-ON**
 - to switch the system on or to standby mode.
 - to store radio stations automatically by pressing and holding for 2 seconds.
- 2** **SOURCE** : to select the following.
CD / (CD 1•2•3)
 - to select CD mode. When CD in stop mode; to select the respective disc tray.
TUNER / (BAND)
 - to select Tuner mode. When in tuner mode; to select the waveband: FM, MW or LW.
TAPE / (TAPE 1•2)
 - to select Tape mode.
AUX / (VIDEO)
 - to select sound from an external source (e.g. TV, Laser Disc, DVD or VCR player).
- 3** **MODE SELECTION**
SEARCH ◀▶ (TUNING ◀▶)
 for CD to search backward/forward.
 for TUNER to tune to a lower or higher radio frequency.
STOP ■ (CLEAR)
 for CD to stop CD playback or clear a program.
 for TUNER to stop programming.
PLAY PAUSE ▶ II
 for CD to start or interrupt playback.
PREV ◀ / NEXT ▶ (PRESET ▲ ▼)
 for CD to skip to the beginning of the current or previous/next track.
 for TUNER to select a preset station in memory.
- 4** **DUBBING**
 - to dub a tape in normal or high speed.
- 5** **DIGITAL SOUND CONTROL (DSC)**
 - to select the desired sound effect : OPTIMAL, JAZZ, ROCK or TECHNO.
- 6** **DIGITAL SOUND CONTROL DISPLAY PANEL**
 - to view the selected DSC display.
- 7** **DYNAMIC BASS BOOST (DBB)**
 - to switch on bass boost to enhance bass response or to switch off bass boost.
- 8** **DISPLAY**
 - to view the current setting of the system.
- 9** **CD CAROUSEL TRAY**
- 10** **3 CD DIRECT PLAY**
 - to select a CD tray for playback.
- 11** **OPEN•CLOSE**
 - to open or close the CD carousel tray.
- 12** **DISC CHANGE**
 - to change CD(s).
- 13** **CLOCK•TIMER**
 - to view clock, set clock or timer.
- 14** **PROGRAM**
 - to program CD tracks in CD mode or preset radio stations in tuner mode.
- 15** **INCREDIBLE SURROUND (available in model FW339C only)**
 - to switch on or off the surround sound effect.
- 16** **VOLUME**
 - to adjust the volume level.
- 17** **HEADPHONES** 
 - to connect headphones.
- 18** **TAPE DECK 2**

- 19** **TAPE DECK 2 OPERATION**
PLAY ▶ to start playback.
◀ to rewind the tape.
▶▶ to fast forward the tape.
STOP•OPEN to stop playback or to open the tape door.
PAUSE to interrupt playback.
- 20** **TAPE DECK 1 OPERATION**
RECORD to start recording.
PLAY ▶ to start playback.
◀ to rewind the tape.
▶▶ to fast forward the tape.
STOP•OPEN to stop playback/recording or to open the tape door.
PAUSE to interrupt playback or recording.
- 21** **TAPE DECK 1**
- 22** **REPEAT**
 - to repeat a CD track.
- 23** **SHUFFLE**
 - to play all the available discs and their tracks in random order.
- 24** 
 - to switch the system to standby mode.
- 25** **MUTE (available in model FW316C only)**
 - to switch off the sound temporarily.

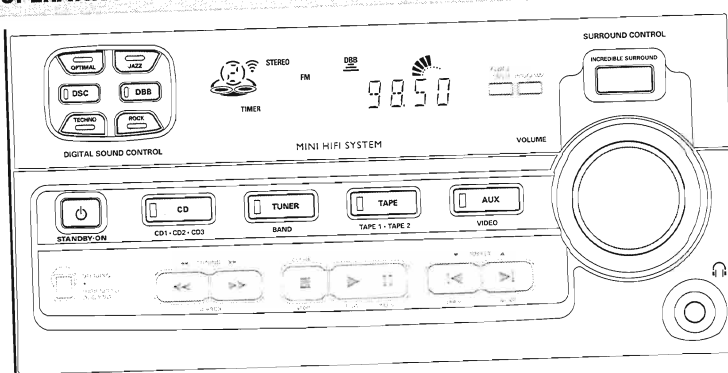
Notes for remote control:

- First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, TAPE 1/2 or AUX).
- Then select the desired function (PLAY, NEXT, etc.).

9

OPERATING THE SYSTEM

English



Important:
 Before you begin operating the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. **Whenever the system is switched on from the wall socket, the demonstration mode will start automatically.**

Notes:

- During demonstration mode, if you press any source (or standby-on) button, the system will switch to the respective (or standby) mode.
- When the system is switched to standby mode, 5 seconds later, the demonstration mode will resume.

To cancel demonstration mode

- Press and hold **STOP ■** (on the system only) for **3 seconds** to stop the demonstration.
 → The demonstration mode will be switched off permanently.
 → The system will switch to standby mode.

Easy Set

EASY SET allows you to store all available radio stations in a particular band (FM, MW or LW) automatically.

- Press and hold **STANDBY•ON** (on the system only) for 2 seconds; when the system is in standby or demonstration mode.
 → "EASY SET" will be displayed and followed by "TUNER".
 → EASY SET will start with the last active band.

- All available radio stations with sufficient signal strength will be stored or until 40 presets are filled.

Notes :

- When EASY SET is used, all previously stored stations will be erased.
- The last preset station will appear on the display when EASY SET is completed.

Switching the system ON

- Press **STANDBY•ON** (on the system only), **CD**, **TUNER**, **TAPE** or **AUX**.

You can also switch on the system by pressing any one of the 3 CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY•ON** again.
 → The system will switch to standby mode.

Selecting the Source

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

Note:

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


10

Sound Control

Volume Adjustment

Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening

Connect the headphones plug to the  socket at the front of the system. The speakers will be muted.

Digital Sound Control (DSC)

The DSC feature enables you to enjoy special sound effects that have preset equalizer settings, providing the best music reproduction.

- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, JAZZ, ROCK or TECHNO.
 - The Digital Sound Control display panel will light up respectively.
 - "OPTIMAL", "JAZZ", "ROCK" or "TECHNO" will be displayed.

Automatic DSC-DBB selection

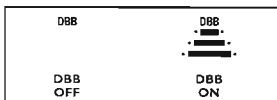
The best setting for the DBB is automatically generated for the respective DSC selection. You can manually select the DBB setting that best suits your listening environment.

DSC Selection	DBB On/Off
Optimal	On
Techno	On
Rock	Off
Jazz	Off

Dynamic Bass Boost (DBB)

The DBB mode enhances the bass response.

- Press **DBB** to switch on bass response.
 - The DBB button lights up.
 - "DBB ON" will be displayed.



To switch off DBB

- Press **DBB** again.
 - The DBB button light is switched off.
 - "DBB OFF" will be displayed.

Note:

Some CDs or tapes might be recorded in high modulation. It may cause a distortion at high volume. If this occurs, switch off Incredible Surround (if available), DBB level or reduce the volume.

Incredible Surround (available in model FW339C only)

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

- Press **INCREDIBLE SURROUND** to switch on.
 - The INCREDIBLE SURROUND button lights up.
 - "IS" will be displayed.

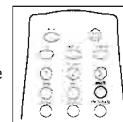
To switch off Incredible Surround

- Press **INCREDIBLE SURROUND** again.
 - The INCREDIBLE SURROUND button light is switched off.
 - "IS OFF" will be displayed.

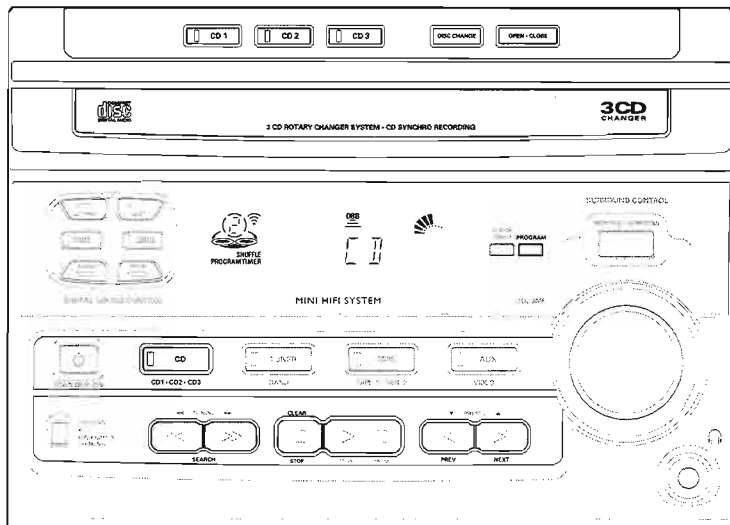
Mute (available in model FW316C remote control only)

This feature allows you to temporarily switch off the sound of the system without switching off the system when you require a moment of silence.

- Press **MUTE** on the remote control to switch off the sound.
 - "MUTE" will be displayed.
- Press **MUTE** again on the remote control or increase the **VOLUME** level to switch on the sound.



CD



Loading the CD Changer

- 1 Press **CD** to select CD mode.
- 2 Press **OPEN-CLOSE**.
 - The CD compartment slides out.
- 3 Load a CD with the printed side up in the right tray.
 - You can load another disc in the left tray.
 - To load the third disc, press the **DISC CHANGE** button.
 - The CD changer carousel will rotate until the empty tray is at the right hand side and is ready for loading.
 - Playback will always start with the disc in the outer right disc tray.
- 4 Press **OPEN-CLOSE** to close the CD compartment.
 - The total number of tracks and playing time of the last selected disc appear on the display.

3 CD Direct Play

You can play a CD directly by pressing the **3 CD DIRECT PLAY (1 - 3)** buttons. The CD player will stop at the end of playback of the selected disc.

- When the button is lighted, it indicates that there is a disc loaded in the disc tray.

Warning!

- 1) This system is designed for conventional CDs. Do not use any accessories like disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.
- 2) Do not load more than one disc into each tray.
- 3) When the CD changer is loaded with CD(s), do not turn over or shake the system. This may jam the changer.

You can load up to three discs in the CD changer for continuous playback without interruption.

Playing a CD

- 1 Press **PLAY** ► to start playback.
 - The disc tray, track number and elapsed playing time of the current track appear on the display.
- To interrupt playback, press **PAUSE** II.
 - The playing time flashes.
- To resume playback, press **PLAY** ► again.
- 2 To stop playback, press **STOP** ■.

Note:

→ All the available discs will play once, then stop. When the CD has stopped playing, the system will switch to the standby mode after 15 minutes if no button is pressed.

Disc Change

You can change the outer 2 discs while the third inner disc is at the stop or playing mode.

- 1 Press **DISC CHANGE**.
 - The CD compartment slides out.
- 2 Replaced the discs in the left and right disc trays.
 - If you press **DISC CHANGE** again during playback, the CD will stop playing.
 - The CD carousel tray will rotate until the inner tray is at the right hand side and is ready for changing.
- 3 Press **OPEN•CLOSE** to close the CD compartment.

Selecting a desired track

Selecting a desired track at the stop mode

- 1 Press **PREV** ◀ or **NEXT** ▶ until the desired track appears on the display.
- 2 Press **PLAY** ► to start playback.
 - The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

- 1 Press **PREV** ◀ or **NEXT** ▶ until the desired track appears on the display.
 - The selected track number and elapsed playing time appear on the display.
- If you press **PREV** ◀ once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
 - The volume will be reduced.
- Play returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is possible in the stop mode. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "PROGRAM FULL".

- 1 Load the desired discs in the disc trays.
- 2 Press **PROGRAM** to start programming.
 - The PROGRAM flag starts flashing.
- 3 Press the **CD 1•2•3** button to select the disc.
- 4 Press **PREV** ◀ or **NEXT** ▶ to select the desired track.
- 5 Press **PROGRAM** to store the track.
 - Repeat steps 3 to 5 to store other discs and tracks.
- 6 Press **STOP** ■ once to end programming mode.
 - The total number of tracks programmed and total playing time appear on the display.

Notes:

- If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "----" appears in the display instead of the total playing time.
- During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.

CD

Playing the program

- 1 Press **PLAY** ► to start program playback.
 - "PLAY PROGRAM" appears on the display.
 - The track number and elapsed playing time of the current track will appear on the display.
- If you press **REPEAT** during program playback, the current track will be played repeatedly.
 - The REPEAT and PROGRAM flags will be displayed.
- 2 Press **STOP** ■ to stop program playback.

Note:

→ If you press any of the 3 CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM flag will also temporarily disappear from the display and then reappear when the playback for the selected disc ends.

Reviewing the program

Reviewing of the program is only possible in the stop mode.

- Press **PREV** ◀ or **NEXT** ▶ repeatedly to review the programmed tracks.
- Press **STOP** ■ to exit review mode.

Erasing the program (in the stop mode)

- Press **CLEAR** on the system.
 - "PROGRAM CLEAR" will be displayed.

Note:

→ The program will be erased when the system is disconnected from the power supply. If the CD carousel is opened, the tracks belonging to the outer

two trays will be erased and the display will show "CLEAR".

Shuffle (only on remote control)

It will play all the available discs and their tracks in random order. Shuffle may also be used when tracks are programmed.

To shuffle all the discs and tracks

- 1 Press **SHUFFLE**.
 - "SHUFFLE" will be displayed.
 - The SHUFFLE flag, the disc and the track selected at random appear on the display.
- The discs and the tracks will now be played in random order until you press **STOP** ■.
- If you press **REPEAT** during shuffling, the current track will be played repeatedly.
 - The REPEAT and SHUFFLE flags will be displayed.
- 2 Press **SHUFFLE** again to resume normal playback.
 - The SHUFFLE flag disappears from the display.

Repeat (only on remote control)

It will play the current track repeatedly.

- 1 Press **REPEAT** during CD playback.
 - "REPEAT TRACK" will be displayed.
 - The REPEAT flag appears on the display.
- The track will now be played repeatedly until you press **STOP** ■.
- 2 Press **REPEAT** again to resume normal playback.
 - The REPEAT flag disappears from the display.

TUNER

Easy Set

EASY SET allows you to store all available radio stations in a particular band (FM, MW or LW) automatically.

- Press and hold **STANDBY•ON** (on the system only) for 2 seconds; when the system is in standby or demonstration mode.
 - "EASY SET" will be displayed and followed by "TUNER".
 - EASY SET will start with the last active band.
 - All available radio stations with sufficient signal strength will be stored or until 40 presets are filled.

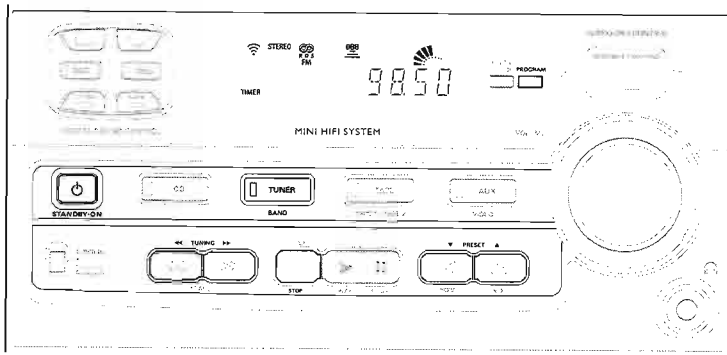
Notes:

- When EASY SET is used, all previously stored radio stations will be erased.
- The last preset radio station will appear on the display when EASY SET is completed.

Tuning to radio stations

- 1 Press **TUNER** to select TUNER mode.
 - "TUNER" will be displayed.
 - A few seconds later, the current frequency or the radio station name if available will be displayed.
- 2 Press **TUNER (BAND)** again to select the desired waveband: FM, MW or LW.
- 3 Press **TUNING** ◀◀ or ▶▶ for more than one second, then release.
 - The display will show "SEARCH" until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired station is reached.

TUNER



- To tune to a weak station, briefly press **TUNING** ◀◀ or ▶▶ until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

- 1 Press **TUNER**.
- 2 Press **TUNER (BAND)** again to select the desired waveband : FM, MW or LW.
- 3 Press **PROGRAM** for more than one second.
 - PROGRAM flag starts flashing and "AUTO" will be displayed.

- Every available station for the selected waveband will be stored automatically. The frequency and preset number will be displayed briefly.
- The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
- The system will remain tuned to the last stored preset radio station.

- Repeat the above procedure to store other preset radio stations for the other waveband. Remember to select the next available preset number before proceeding. If not, some of the preset radio stations may be erased.

Notes:

- You can cancel the automatic programming by pressing **PROGRAM** or **STOP** ■ on the system only.

- If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming: now only the preset numbers 10 to 40 will be programmed.

Manual programming

- 1 Press **TUNER**.
 - 2 Press **TUNER (BAND)** to select the desired waveband : FM, MW or LW.
 - 3 Press **PROGRAM** for less than one second.
 - PROGRAM flag, the frequency and preset number start flashing.
 - The next available preset number will be displayed for selection.
 - 4 Press **TUNING** ◀◀ or ▶▶ to tune to the desired frequency.
 - If you wish to store the radio station to another preset number, press **PRESET** ▼ or ▲ to select the desired preset number.
 - 5 Press **PROGRAM** again.
 - PROGRAM flag will stop flashing, and the radio station will be stored.
- Repeat the above procedure to store other preset radio stations.

Notes:

- When 40 radio stations are stored and you attempt to store another radio station, the display will show "PROGRAM FULL". If you want to change an existing preset number; repeat steps 4 and 5.
- You can cancel manual programming by pressing **STOP** ■ on the system only.
- During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.

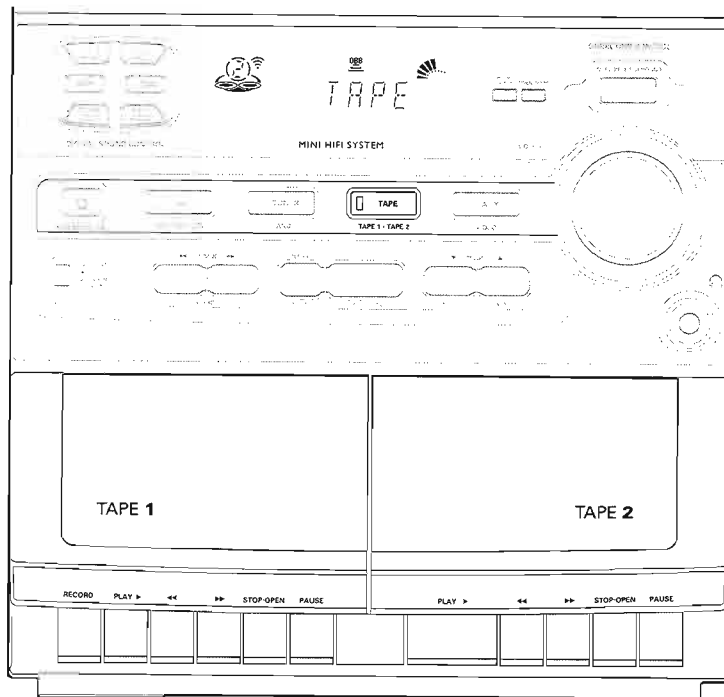
English

TUNER

Tuning to Preset Radio Stations

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

TAPE

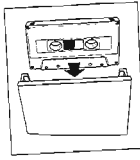


English

TAPE

Loading a tape

- Press **STOP•OPEN**.
- The tape deck door opens.
- Load the tape with the open side downward and the full spool to the left.
- Close the tape deck door.



Tape Playback

- 1 Press **TAPE** to select TAPE mode.
 - "TAPE" will be displayed.
- 2 Load the tape into the selected tape deck.
- 3 Press **PLAY ▶** to start playback.
 - To interrupt playback, press **PAUSE**.
 - To resume playback, press **PAUSE** again.
- 4 Press **STOP•OPEN** to end playback.

Rewind/Fast Forward

At the stop mode

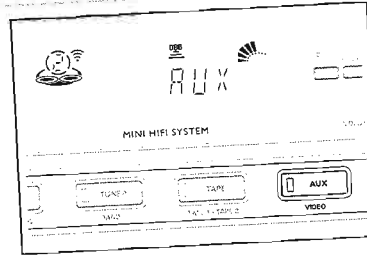
- 1 You can rewind or fast forward a tape by pressing ◀◀ or ▶▶ respectively.
 - The tape will stop automatically at the end of rewinding or fast forwarding.
- 2 Press **STOP•OPEN** to stop rewinding or fast forwarding.

Continuous Playback From Tape Deck 2 to Tape Deck 1

- 1 Press **TAPE** to select TAPE mode.
- 2 Load the tapes in **tape deck 1** and **2**.
- 3 Press **PLAY ▶** on **tape deck 2**.
- 4 Press **PAUSE** on **tape deck 1**.
- 5 Press **PLAY ▶** on **tape deck 1**.
 - Playback will begin with tape deck 2 and will continue with tape deck 1 when playback on tape deck 2 ends.
- 6 Press **STOP•OPEN** if you want to stop playback before the end of the tape in **tape deck 1** or **tape deck 2**.

Notes:

- During rewinding or fast forwarding of a tape, it is also possible to select another source mode (e.g. CD, TUNER or AUX mode).
- Check and tighten slack tape before use with a pencil. Slack tape may get jammed or may burst in the mechanism.
- C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.
- Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV or loudspeaker boxes).



Selecting External Equipment

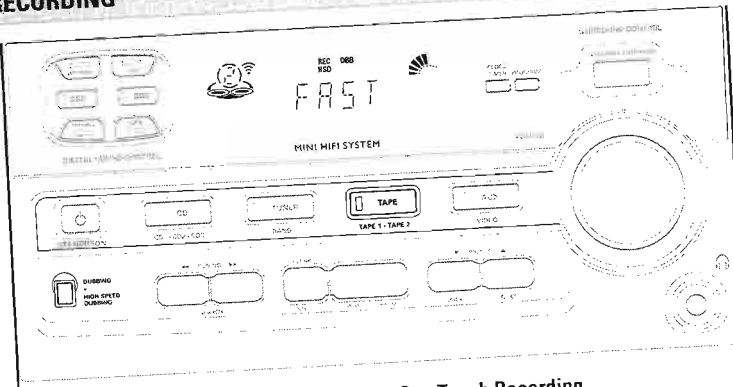
If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals, you can hear the enhanced sound from the system.

- Press **AUX** to select the external mode.
 - "AUX" will be displayed.

Note:

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

RECORDING



Notes:

- For recording, use only tape of IEC type I (normal tape).
- The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.
- The recording level is set automatically, regardless of the position of VOLUME, DBB or Incredible Surround (if available).
- To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.

One Touch Recording

- For One Touch Recording, as soon as you press **RECORD**, the current source will be recorded on tape deck 1.
- 1 Load a blank tape in tape deck 1.
 - 2 Press **RECORD** on tape deck 1 to start recording.
 - The REC flag starts flashing.
 - 3 Press **PAUSE** to interrupt recording.
 - 4 Press **STOP•OPEN** on tape deck 1 to stop recording.

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

- 1 Load the prerecorded tape into tape deck 2 and a blank tape into tape deck 1.
 - Make sure that both tapes have their full spool to the left.
- 2 Press **DUBBING** to switch between normal and high speed dubbing.
 - "NORMAL" (normal speed) or "FAST" (high speed) will be displayed.
 - HSD flag appears on the display for high speed dubbing.
- 3 Press **PAUSE** on tape deck 1.
- 4 Press **RECORD** on tape deck 1.
- 5 Press **PLAY** on tape deck 2.
 - Recording will start automatically.
 - The REC flag starts flashing.
- 6 Press **STOP•OPEN** on tape deck 1 and tape deck 2 to stop dubbing.

Notes:

- At the end of side A, flip the tapes to side B and repeat the procedure.
- Dubbing of tapes is only possible from tape deck 2 to tape deck 1.
- To ensure good dubbing, use tapes of the same length.
- During high speed dubbing in Tape mode, the sound is reduced to a low volume.

RECORDING

CD Synchro Start Recording

During CD synchro start recording,

- It is not advisable to fast forward/rewind your tape in tape deck 2.
- It is not possible to listen to another source.

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

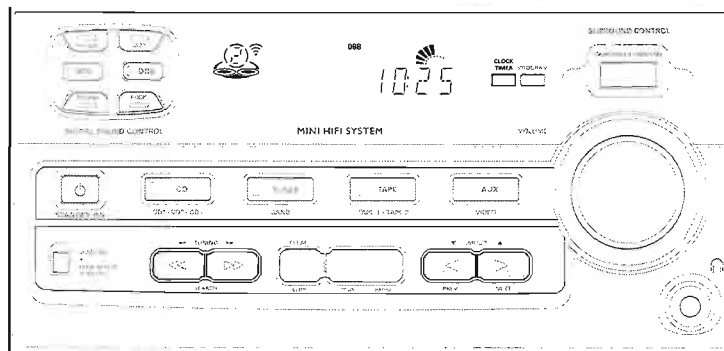
Recording from other sources (only on tape deck 1)

- 1 Load a blank tape into tape deck 1.
- 2 Press **CD, TUNER, TAPE** or **AUX**.
 - Start playback of the selected source.
- 3 Press **RECORD** on tape deck 1 to start recording.
 - The REC flag is flashing.
- 4 Press **PAUSE** to interrupt recording.
- 5 Press **STOP•OPEN** on tape deck 1 to stop recording.

Note:

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

CLOCK



View Clock

You can view the clock (if it is set) at standby or any source mode. It will be displayed for about 7 seconds.

- Press **CLOCK•TIMER** briefly.
 - "10:25" (the current time) will be displayed.
 - "----" will be displayed if the clock is not set.

Clock Setting

The clock is set in 24-hour mode, e.g. "00:00" or "23:59". Before setting the clock, you must be in the View Clock mode.

- 1 Press **CLOCK•TIMER** to select clock mode.
 - "00:00" or the current time starts flashing.
 - "**◀▶**, **◀▶**, **◀▶**, **■** light up (for model FW339C only).
 - 2 Set the hour with **◀▶** or **▶▶**.
 - 3 Set the minute with **◀▶** or **▶▶**.
 - 4 Press **CLOCK•TIMER** again to store the setting.
 - The clock starts running.
- To exit without storing the setting, press **STOP ■**.

Notes:

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

TIMER

Timer Setting

- The system can switch on to CD or TUNER mode automatically at a preset time. It can serve as an alarm to wake you up. After half an hour from the preset time, the system will return to the standby mode if no button is pressed.
- Before setting the timer, make sure the clock is set correctly.
- The timer has to be reset or start again for each subsequent preset time.
- **The volume of the timer will be at the last setting before the set is switched to standby mode.**

- 1 Press and hold **CLOCK•TIMER** for more than 2 seconds to select timer mode.
 - "00:00:00" or the last set timer starts flashing. The TIMER flag flashes.
 - The last selected source is lighted while other available sources are flashing.
 - "**◀▶**, **◀▶**, **◀▶**, **■** light up (for model FW339C only).
 - 2 Press **CD** or **TUNER** to select the desired source.
 - 3 Press **◀▶** or **▶▶** to set the hour for the timer to start.
 - 4 Press **◀▶** or **▶▶** to set the minute for the timer to start.
 - 5 Press **CLOCK•TIMER** to store the start time.
 - The TIMER is now set.
 - The TIMER flag remains on the display.
- To exit without storing the setting, press **STOP ■**.
 - At the preset time, the TIMER will be activated.
 - The selected source will be played.
 - The TIMER flag disappears from the display.

Notes:

- During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.
- If the source selected is TUNER, the last tuned frequency will be switched on.
- If the source selected is CD, playback will begin with the first track of the last selected disc. If the CD trays are empty, the TUNER will be selected instead.

To cancel the TIMER

- 1 Press **CLOCK•TIMER** for more than 2 seconds.
- 2 Press **PAUSE ■** to cancel the timer.
 - "CANCEL" will be displayed.
 - The TIMER flag disappears from the display.

To start the TIMER again (for the same time)

- 1 Press **CLOCK•TIMER** for more than 2 seconds.
- 2 Press **CLOCK•TIMER** again to store the start time and the selected source.

MAINTENANCE

Maintenance

Cleaning the Cabinet

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

Cleaning Discs

- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the CD lens

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

Cleaning the Heads and the Tape Paths

- To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the heads by playing a cleaning tape through once.

Demagnetizing the heads

- Use a demagnetizing tape available at your dealer.

TROUBLESHOOTING

Warning! Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty.

- If a fault occurs, check the points listed below before taking the system for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

CD Player Operation

"NO DISC" is displayed.

- The disc is inserted upside down.
- Place CD with printed side up.
- Moisture condensation at the lens.
- Wait until lens has adjusted to normal room temperature.
- There is no disc in the CD tray.
- Insert a CD.
- The CD is dirty, badly scratched or warped.
- Clean or replace the CD.
- The CD lens is dirty or dusty
- See section under Maintenance.

Radio Reception

Poor radio reception

- The signal strength is too weak.
- Adjust the antenna.
- The TV or VCR is too close to the stereo system.
- Separate the stereo system from the TV or VCR.
- Connect an external antenna for better reception.

Tape Deck Operation

"RECORDING ACTIVE" is displayed.

- A recording is in progress.
- Stop the recording or wait until it is finished.

"TAPE BUBBLING ONLY" is displayed.

- Tape dubbing is only possible in tape mode.
- Switch source to tape mode.

Recording or playback cannot be made or there is a decrease in audio level.

- Dirty tape heads, capstans or pressure rollers.
- See section on tape deck maintenance.
- Magnetic build-up in the record/playback head.
- Use demagnetizing tape.

General

System does not react when any button is pressed.

- Electrostatic discharge.
- Press **STANDBY-ON** to switch the system off. Remove the AC power plug from the wall outlet, then reconnect and switch on the system again.

No or poor sound.

- Volume is not turned up.
- Adjust **VOLUME**.
- The headphones are connected.
- Disconnect the headphones.
- Speakers are not connected or are connected wrongly.
- Check that the speakers are connected correctly.
- Make sure that the stripped speaker wire is clamped.

Reversed left and right sound.

- Speakers are connected wrongly.
- Check the speaker connections and location.

Lack of bass sound or apparently imprecise physical location of musical instruments.

- Speakers are connected wrongly.
- Check the speaker connection for proper phasing, red/black wires to red/black terminals.

Remote control has no effect on the system.

- The distance to the system is too large.
- Reduce the distance.
- Batteries are inserted incorrectly.
- Insert the batteries with their polarities (+/- signs) as indicated.
- Batteries are exhausted.
- Replace the batteries.
- Wrong source is selected.
- Select the source (CD, TUNER, etc.) before pressing the function button, (PLAY, PREV/NEXT, etc.).

Timer not working.

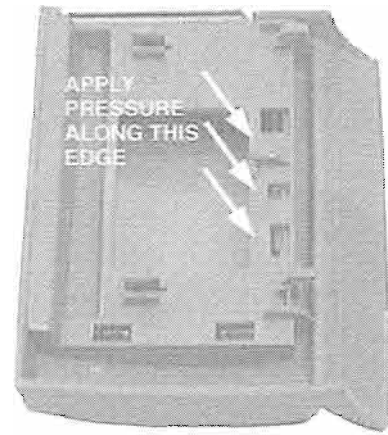
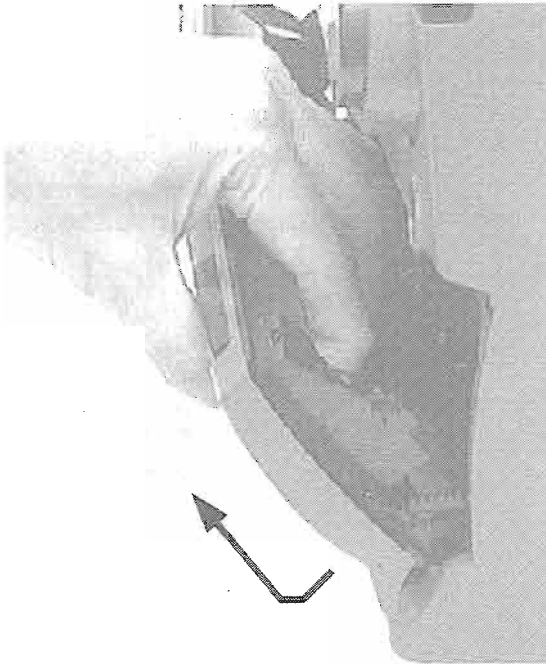
- Timer is not switched on.
- Press **CLOCK • TIMER** to switch on the timer.
- Dubbing/recording is in progress.
- Stop dubbing/recording.

System displays features automatically; buttons flash continuously.

- Demo mode is switched on.
- Press and hold **STOP** ■ for 3 seconds to switch off the demonstration.

DISMANTLING INSTRUCTIONS

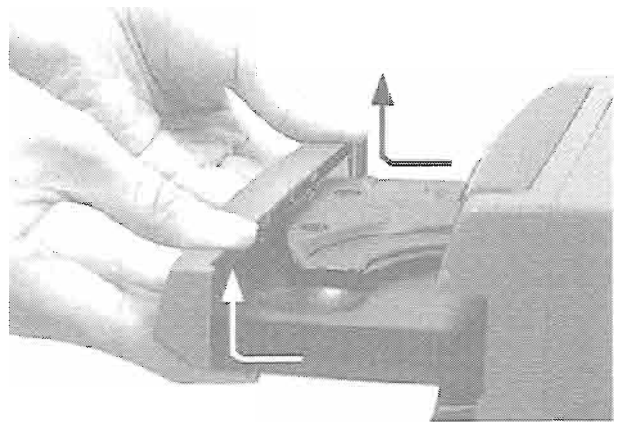
Dismantling of the Cassette Cover



Cassette door

Dismantling of the Front Panel

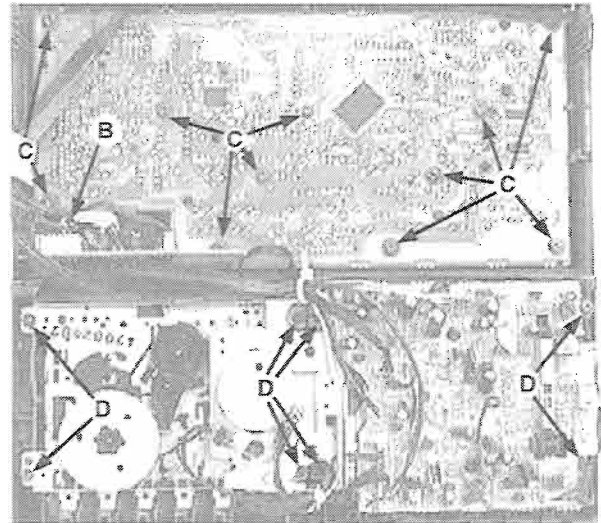
- 1) Slide out the tray and remove the CDC front cover as indicated.
- 2) Loosen the 8 screws to separate the Front Panel from the rear portion.
 - 2 screws A on the front
 - 2 screws each on the left & right side
 - 2 screws at the bottom



Front CDC Portion

Dismantling of Assemblies on the Front Panel

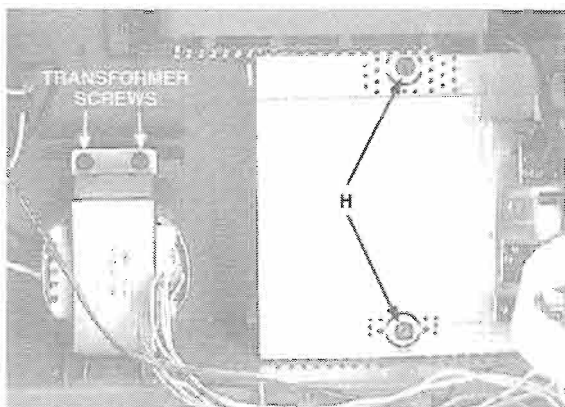
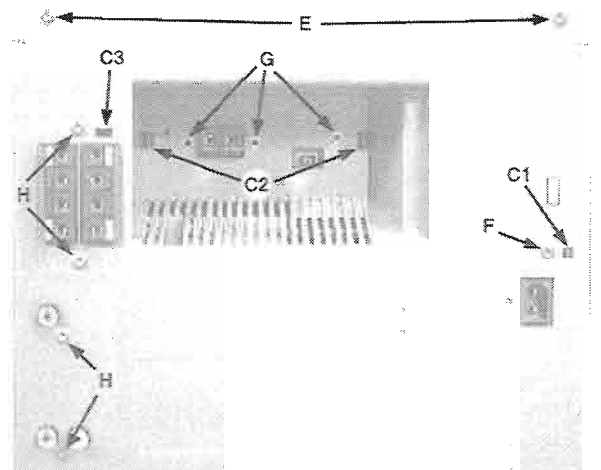
- 1) Remove 1 screw B to loosen the Karaoke board.
- 2) Remove 11 screws C as indicated to loosen the Front board.
- 3) Remove 8 screws D to loosen the MTF Module



Dismantling of Rear Portion

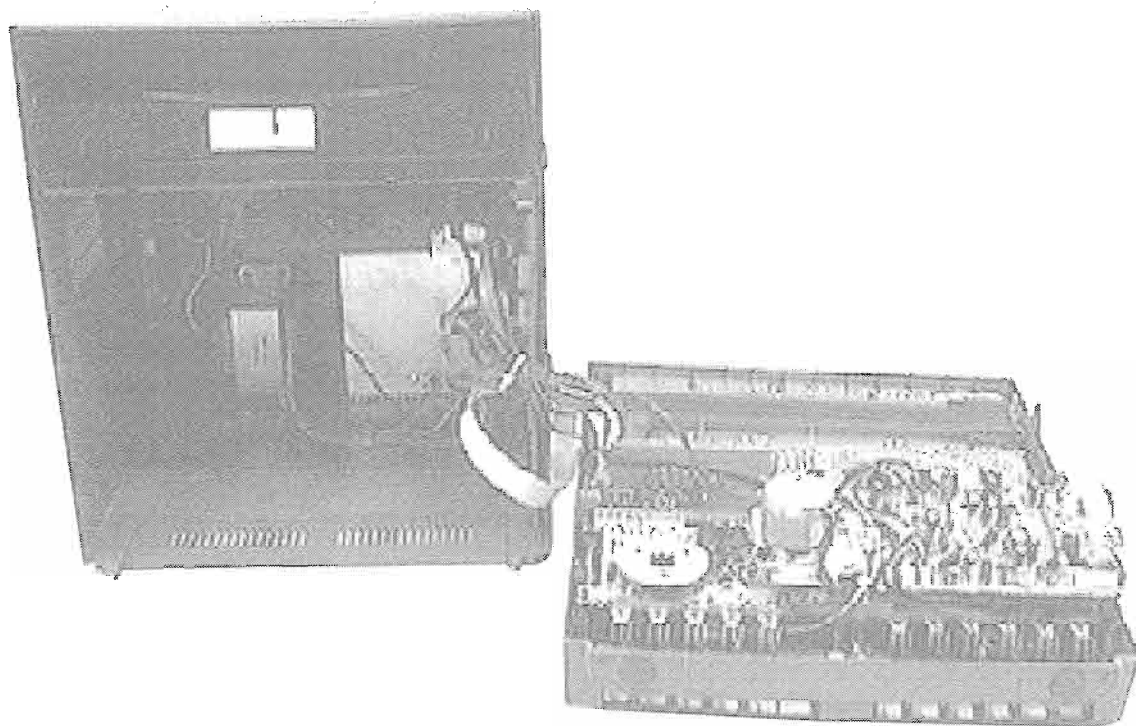
- 1) Remove 2 screws E to loosen the 3CDC Module.
- 2) Remove 1 screw F & uncatch C1 to loosen the Mains socket pc board.
- 3) Remove 3 screws G & uncatch C2 to loosen the Tuner pc board assembly.
- 4) Remove 6 screws* (4x screw H and 2x screw on the heatsink) & uncatch C3 to loosen the Combi board (Main part).

* Some versions may have less screws

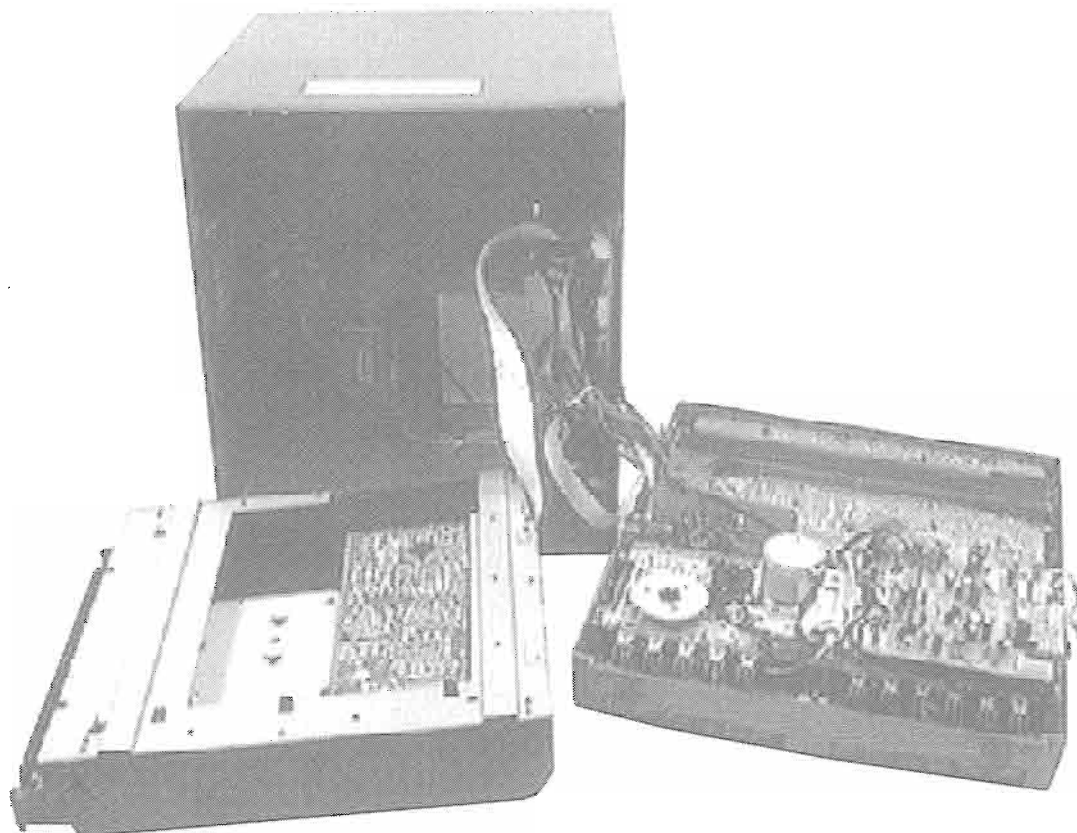


Service pos A

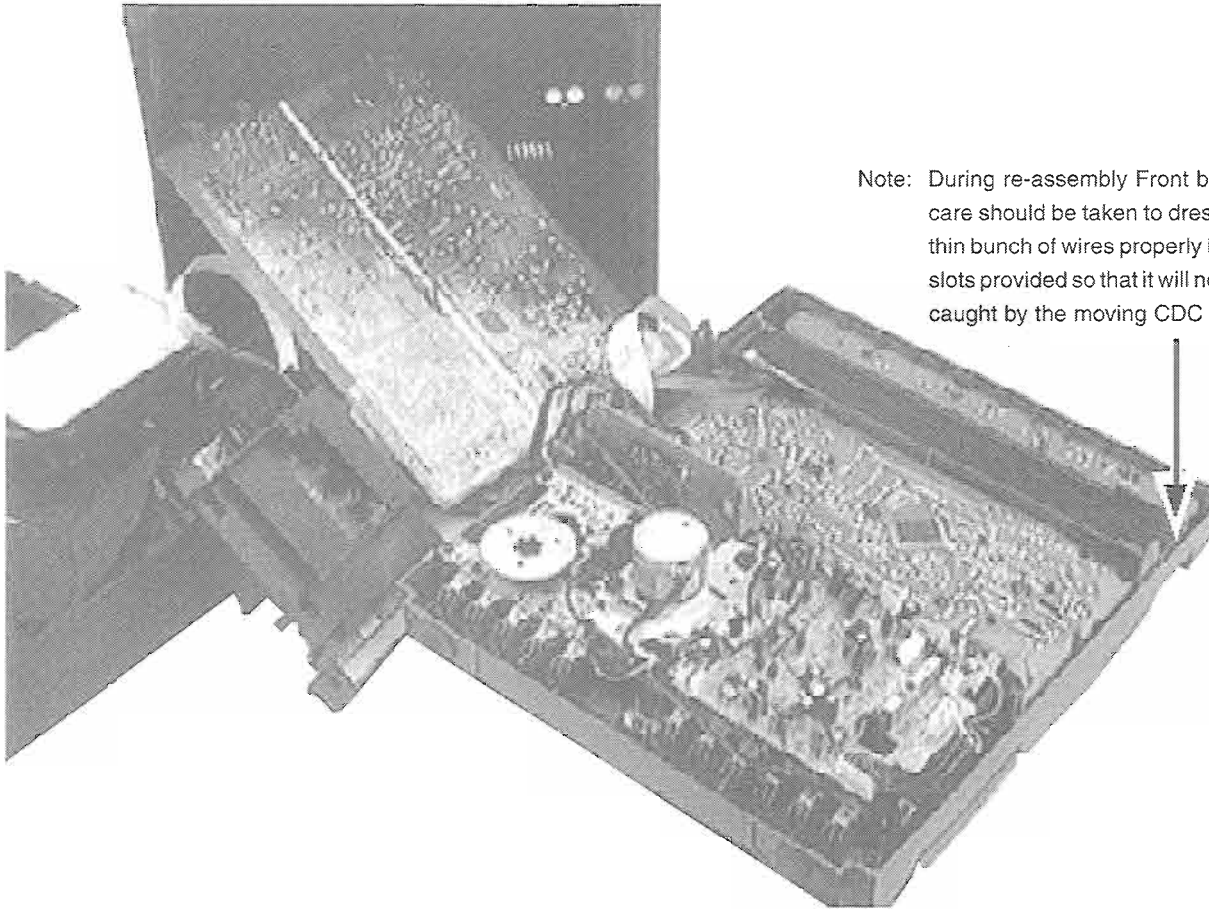
Service pr



Service pos B



Service pos C



Note: During re-assembly Front board, care should be taken to dress the thin bunch of wires properly in the slots provided so that it will not get caught by the moving CDC tray.

SERVICE TEST PROGRAM I

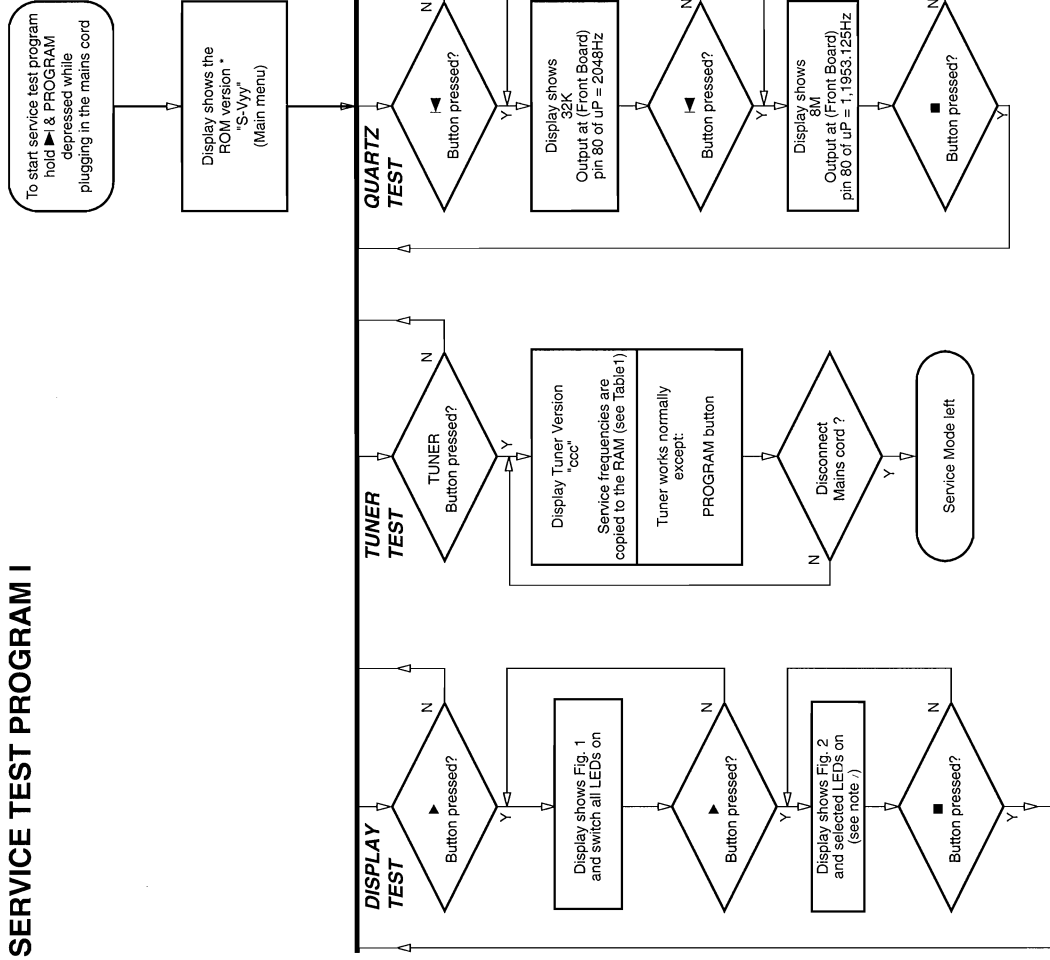


Table 1

PRESET	Europe "EUR"	East Eur. 3-band "EAS"	East Eur. 2-band "EAS"	USA "USA"	Oversea "OSE"	Korea "KOR"	Japan "JAP"
1	87.5MHz	65.81MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz	76MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz	108MHz	CH3 107.75MHz
3	531kHz	74MHz	74MHz	530kHz	531/530kHz	531kHz	90MHz
4	1602kHz	87.5MHz	87.5MHz	1700kHz	1602/1700kHz	1602kHz	CH1 95.75MHz
5	558kHz	531kHz	531kHz	560kHz	558/560kHz	558kHz	CH2 101.75MHz
6	1494kHz	1602kHz	1602kHz	1500kHz	1494/1500kHz	1494kHz	531kHz
7	153kHz	558kHz	558kHz	98MHz	87.5MHz	87.5MHz	1602kHz
8	279kHz	1494kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz	558kHz
9	198kHz	153kHz	98MHz	87.5MHz	87.5MHz	87.5MHz	1494kHz
10	98MHz	279kHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz	80MHz
11	87.5MHz	198kHz	65.81MHz	87.5MHz	98MHz	98MHz	76MHz

East Europe TUNER IF offset correction

- 1) Input a reference frequency 87.5MHz from the generator.
- 2) Proceed to the Tuner Test Mode
- 3) Hold TUNER button down for > 3 seconds
- 4) The set will self-calibrate automatically and display "OFS-xx" when calibration is successful, otherwise it will display "00E".
xx : offset value between -3 to +3

Note: This has to be done whenever the Eeprom, Microprocessor or the components in the oscillator circuitry are replaced.

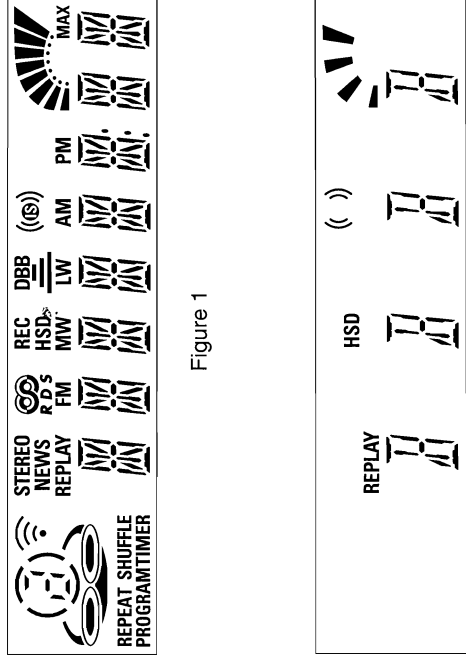


Figure 1

note / : CDC1, CDC3, Tuner, Optimal, Rock, ◀, ▶, and ◀.

Figure 2

TEST	Activated with	ACTION
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERR" will be displayed.
EEPROM FORMAT	◀◀	Load default data. Display shows "NEW" for 1 second. Caution! All presets from the customer will be lost!!
KEY TEST	▶ ■ to Exit	Key numbers according table 3 are shown on the display. (see Chapter 3-4)
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
VOLUME TEST	Volume Knob	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

SERVICE TEST PROGRAM II

Error code	Type	Error Description
E1000	W	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	W	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	W	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed. Inner-switch or sledge motor problem.
E1003	W	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	W	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	W	Subcode Error (no subcode within time) Triggered when a new subcode was missing for a certain time during play.
E1007	W	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	W	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	F	Focus Search Error The focus point has not been found within a certain time.
E1070	W	The carousel switch is not open within time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	W	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	W	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.
E2020	F	Head Movement Error Deck 1 Generated if the head does not reach the desired position within a certain time.
E2021	F	Head Movement Error Deck 2 Generated if the head does not reach the desired position within a certain time.

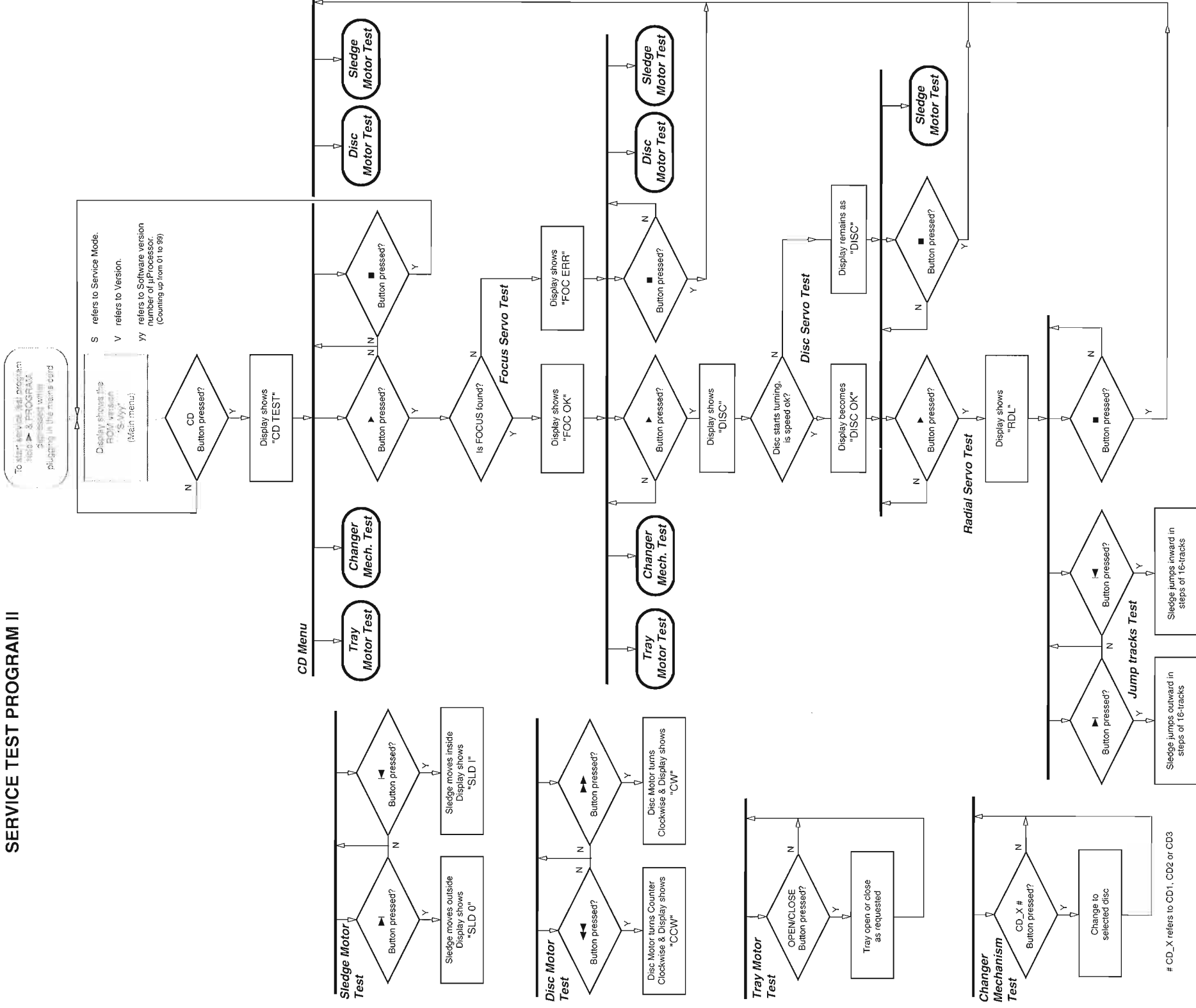
F = Fatal error & the set stop play function W = Warning

Table 2

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No Key pressed	--	CLOCK/TIMER	10	RECORD *	21
Any Remote control key	RC	PROGRAM	11	REPLAY *	22
CD1 *	1	INCR/SURROUND *	12	◀▶	23
CD2 *	2	VOLUME UP *	13	▶▶	24
CD3 *	3	VOLUME DOWN *	14	■	Exit
CHANGE CD	4	STANDBY - ON	15	▶▶▶	26
OPEN / CLOSE	5	CO	16	◀▶	27
DSC	6	TUNER	17	▶▶	28
DBB	7	TAPE	18		
RDS *	8	AUX	19		
NEWS *	9	HSD	20		

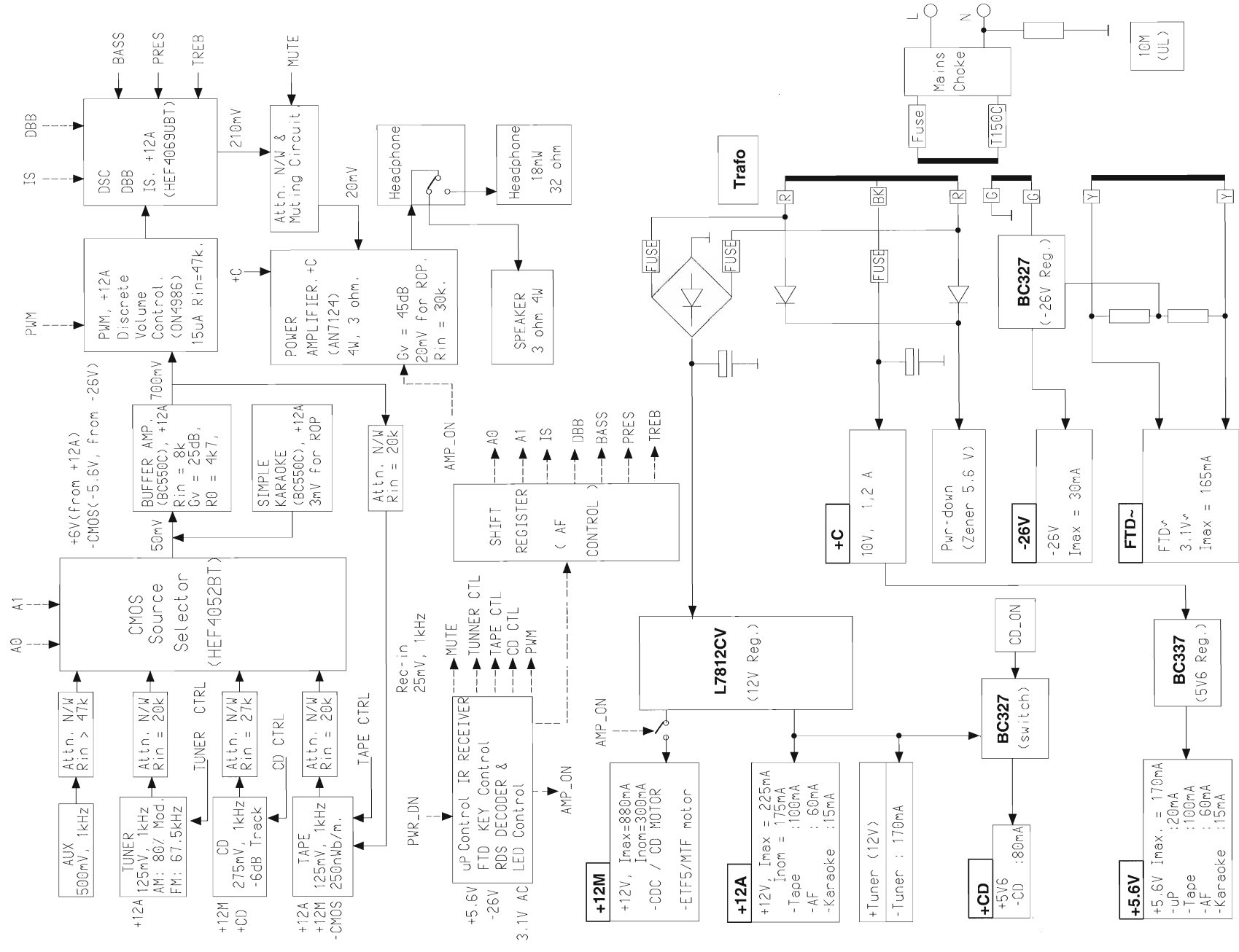
* Not for all type/version

Table 3

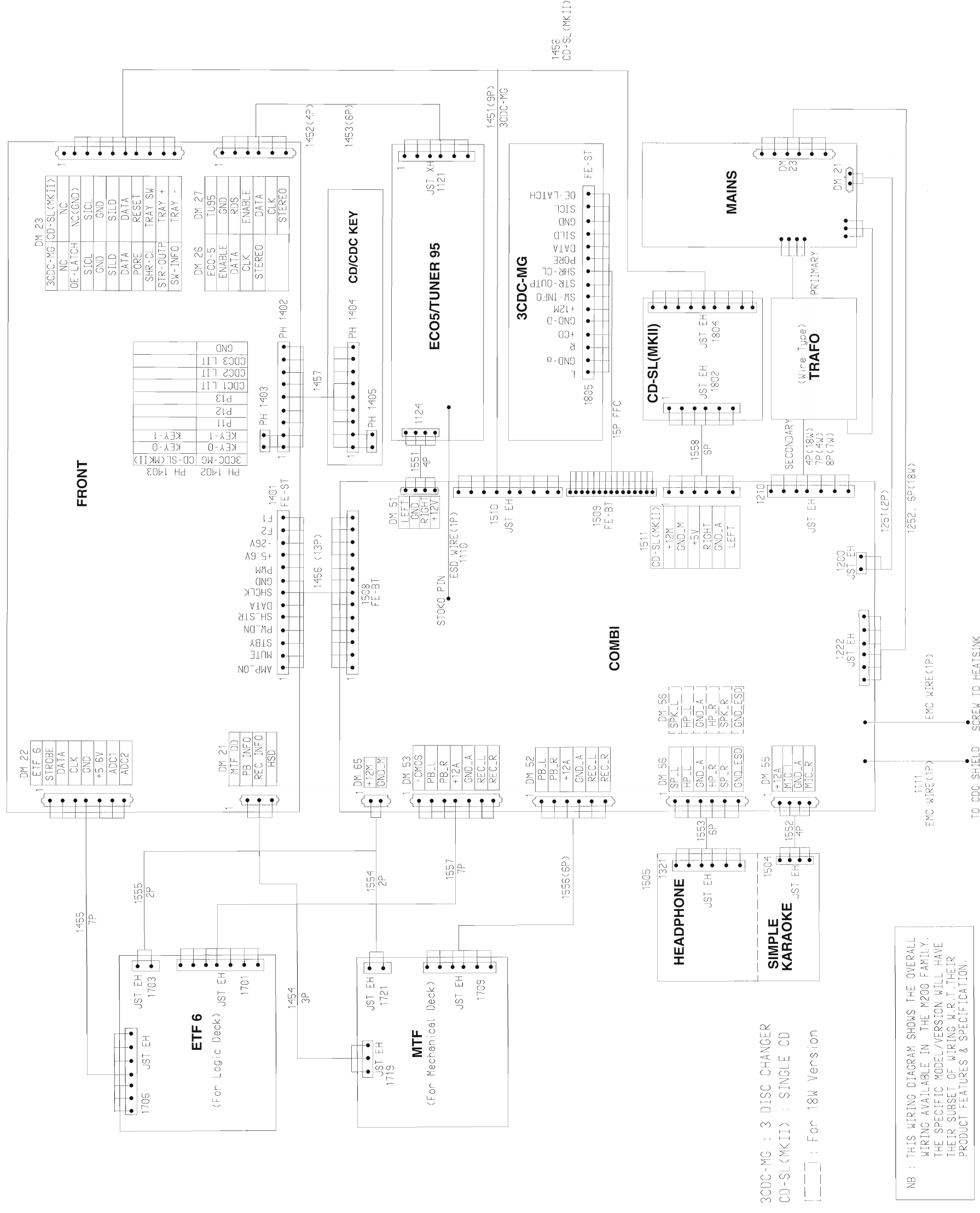


SET BLOCK DIAGRAM

NOTES:



SET WIRING DIAGRAM

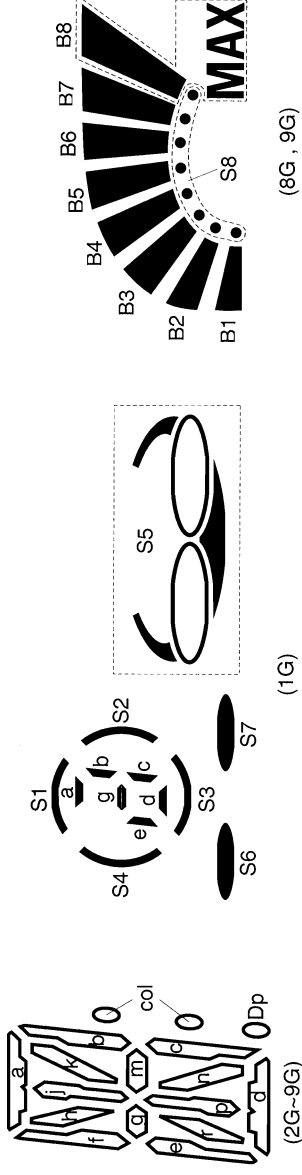
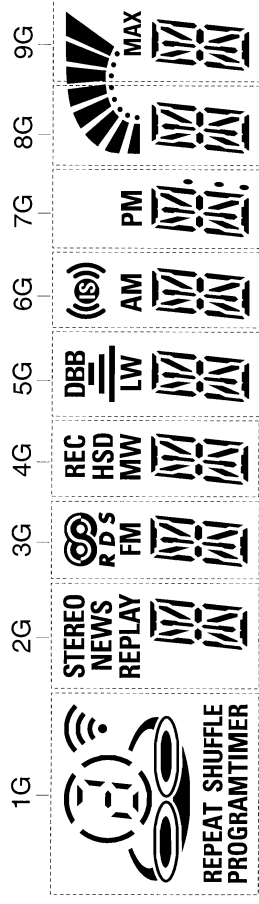


3CDC-MG : 3 DISC CHANGER
 CD-SL (MKII) : SINGLE CD
 [] : For 18W Version

NB : THIS WIRING DIAGRAM SHOWS THE OVERALL WIRING AVAILABLE IN THE M200 FAMILY. THE SPECIFIC MODEL/VERSION WILL HAVE THEIR SUBSET OF WIRING W.R.T. THEIR PRODUCT FEATURES & SPECIFICATION.

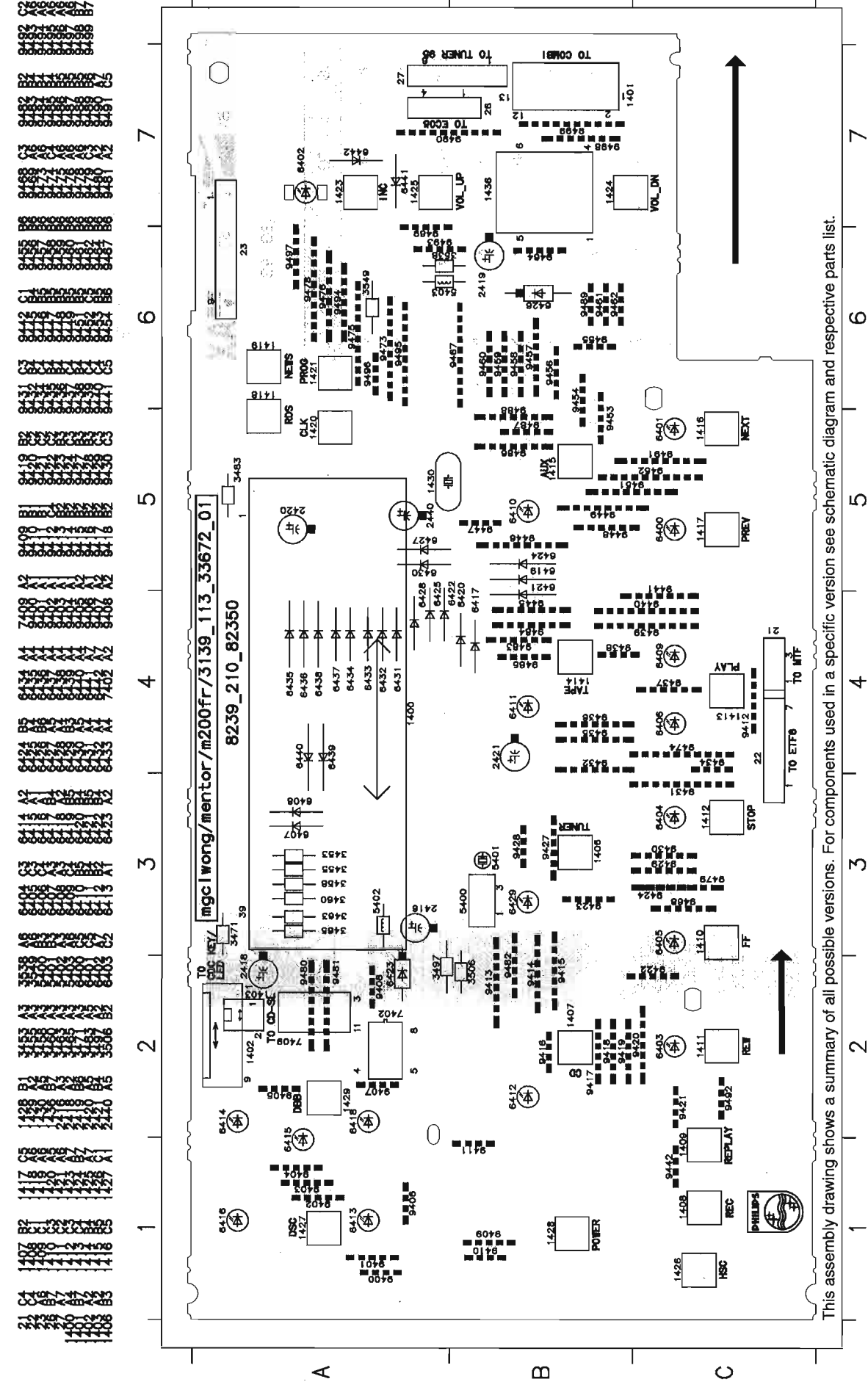
LCD DISPLAY PIN CONNECTIONS

NOTES:



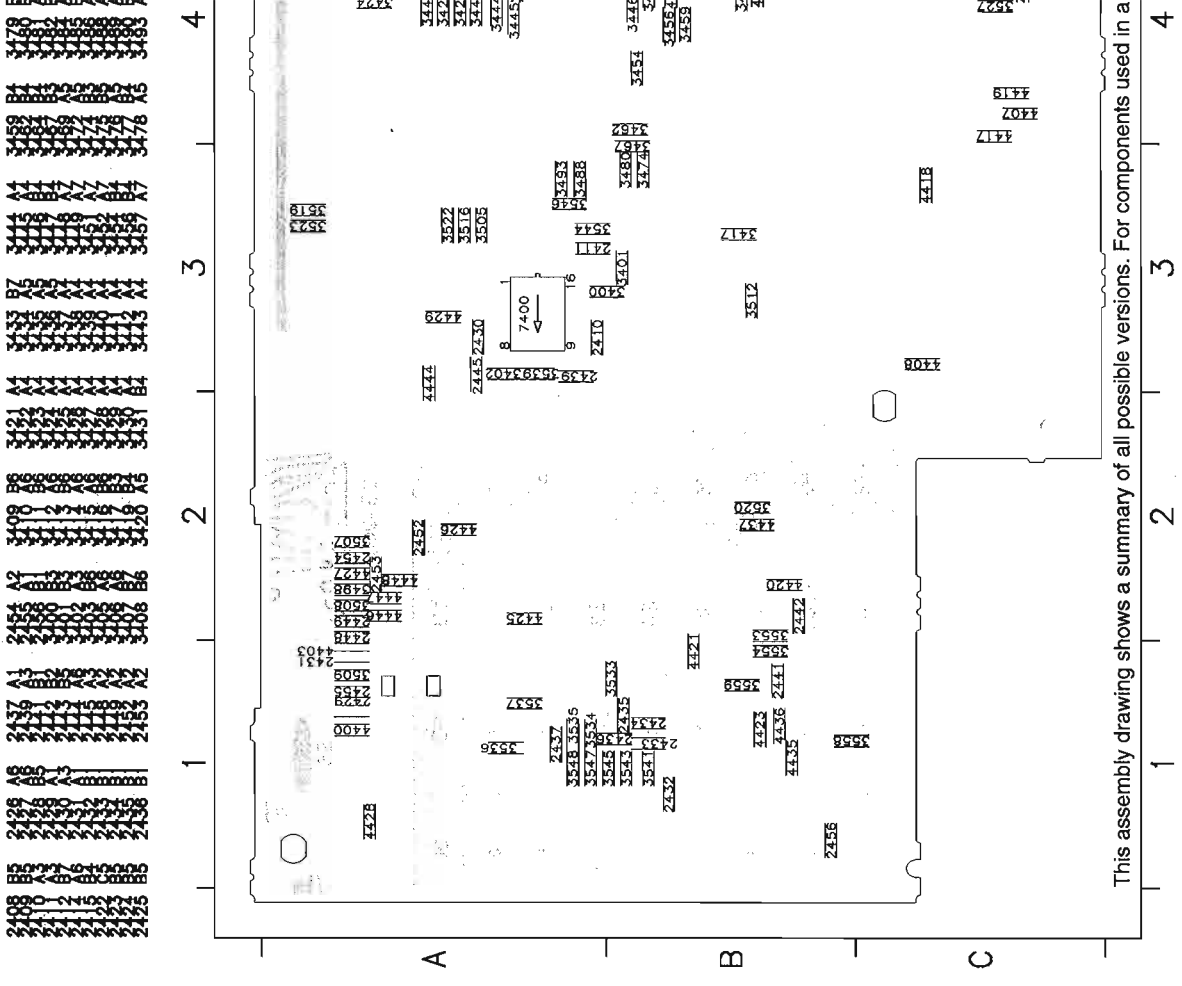
	1G	2G	3G	4G	5G	6G	7G	8G	9G
P1	S1	a	a	a	a	a	a	a	a
P2	S2	h	h	h	h	h	h	h	h
P3	S3	j,p	j,p	j,p	j,p	j,p	j,p	j,p	j,p
P4	S4	k	k	k	k	k	k	k	k
P5	b	b	b	b	b	b	b	b	b
P6	c	f	f	f	f	f	f	f	f
P7	a,d,g	m	m	m	m	m	m	m	m
P8	e	g	g	g	g	g	g	g	g
P9	S5	c	c	c	c	c	c	c	c
P10	S6	e	e	e	e	e	e	e	e
P11	S7	r	r	r	r	r	r	r	r
P12	SHUFFLE	n	n	n	n	n	n	n	n
P13	REPEAT	d	d	d	d	d	d	d	d
P14	TIMER	STEREO	RDS	REC	DBB	(S)	PM	S8	S8
P15	PROGRAM	REPLAY	FM	HSD	LW	(())	col	B5	B5
P16	NEWS	NEWS	-	MW	LW	AM	Dp	B6	B6
P17	-	-	-	-	-	-	-	B1	-
P18	-	-	-	-	-	-	-	B2	-
P19	-	-	-	-	-	-	-	B3	-
P20	-	-	-	-	-	-	-	B4	-
P21	-	-	-	-	-	-	-	-	B7
P22	-	-	-	-	-	-	-	-	B8

COMPONENT LAYOUT



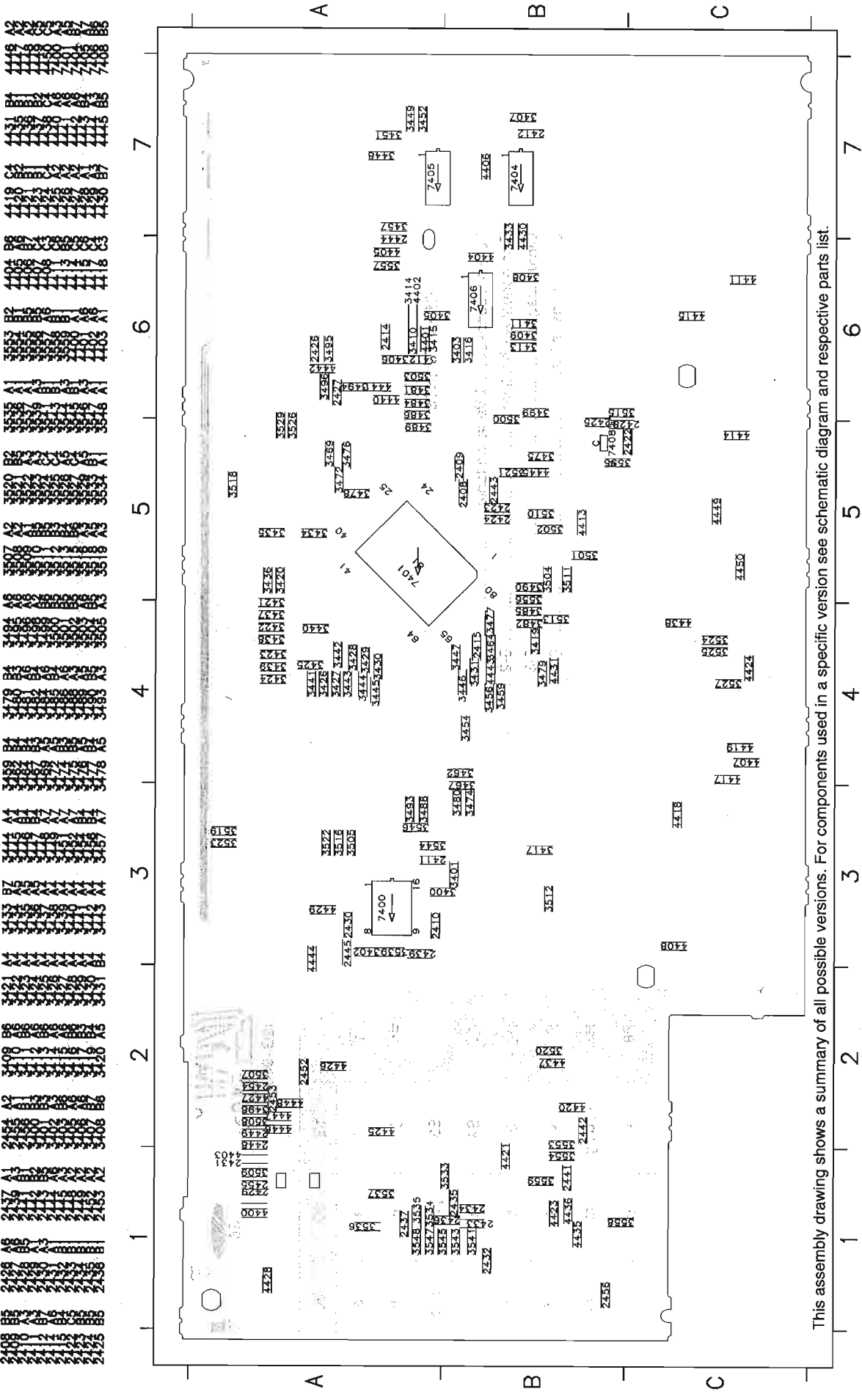
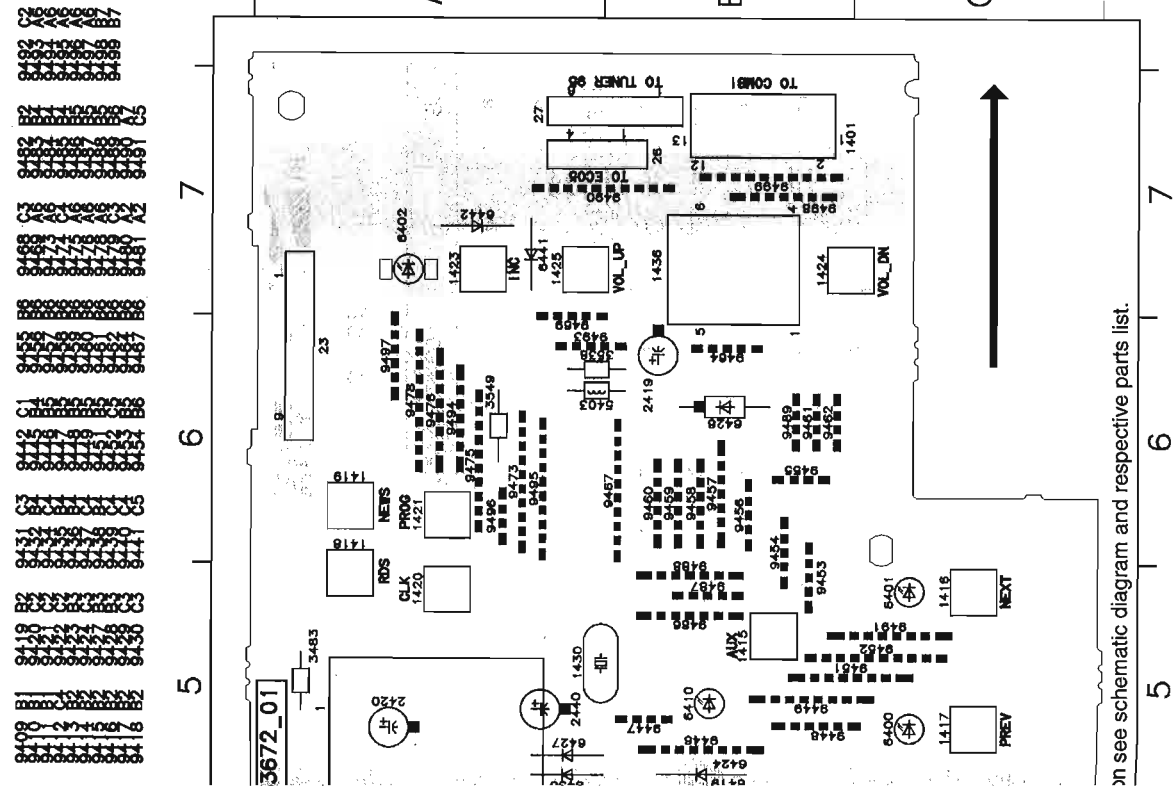
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CHIP LAYOUT

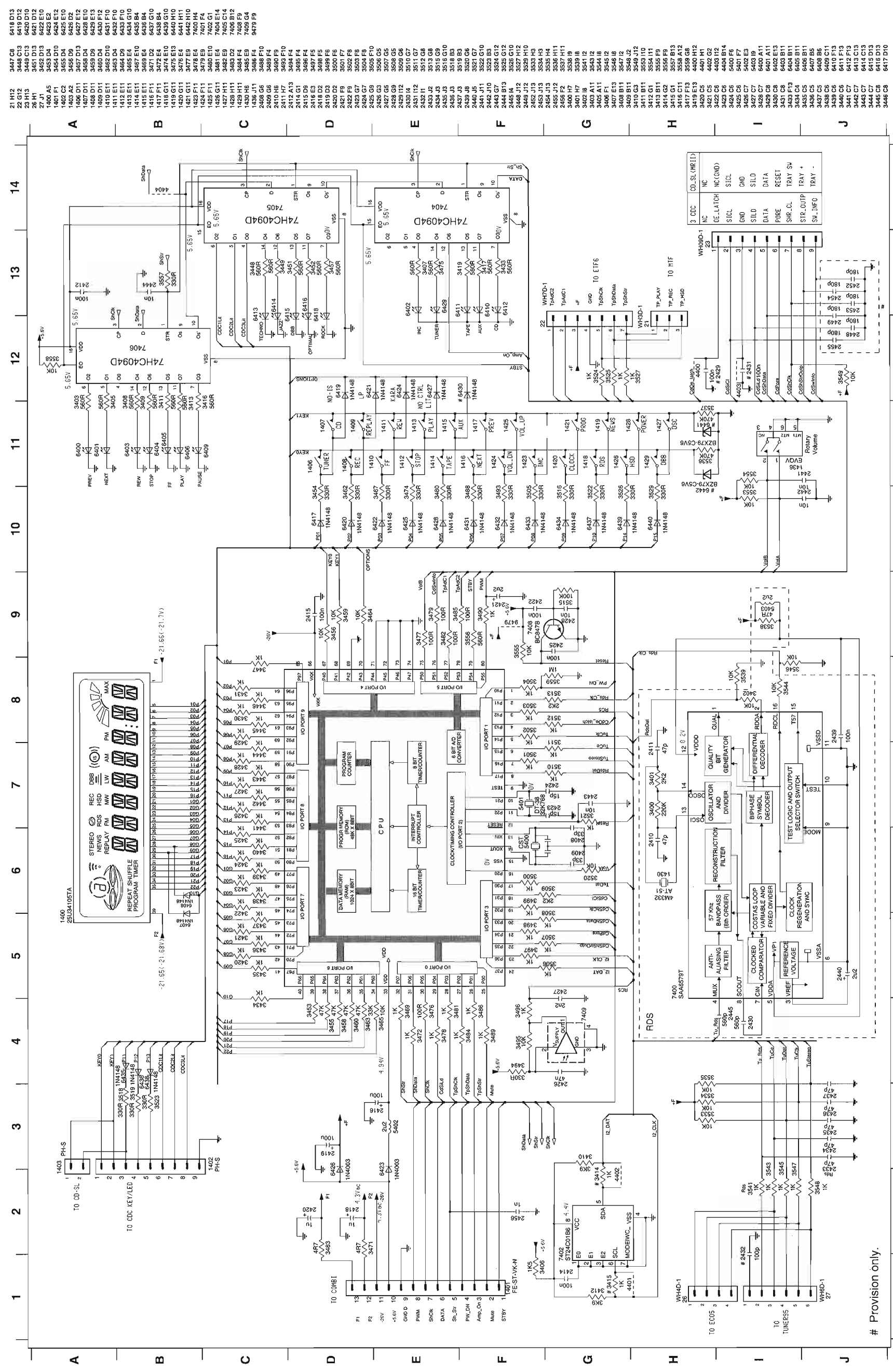


This assembly drawing shows a summary of all possible versions. For components used in a

CHIP LAYOUT



CIRCUIT DIAGRAM



Provision only.

D.C. VOLTAGES DURING ACTIVE PLAY
VALUES IN BRACKET ARE D.C. VOLTAGES AT STANDBY.

21 H12	3477 C8	6418 D13
22 H13	3478 C9	6419 D14
23 H14	3479 C10	6420 D15
24 H15	3480 C11	6421 D16
25 H16	3481 C12	6422 D17
26 H17	3482 C13	6423 D18
27 J1	3483 D1	6424 E1
1400 AS	3484 D2	6425 E2
1401 F1	3485 D3	6426 E3
1402 G1	3486 D4	6427 E4
1403 H1	3487 D5	6428 E5
1404 I1	3488 D6	6429 E6
1405 J1	3489 D7	6430 E7
1406 D11	3490 D8	6431 E8
1407 D12	3491 D9	6432 E9
1408 D13	3492 D10	6433 E10
1409 D14	3493 D11	6434 E11
1410 E11	3494 D12	6435 E12
1411 E12	3495 D13	6436 E13
1412 E13	3496 D14	6437 E14
1413 E14	3497 E1	6438 E15
1414 E15	3498 E2	6439 E16
1415 E16	3499 E3	6440 E17
1416 F1	3500 E4	6441 E18
1417 F2	3501 E5	6442 E19
1418 G1	3502 E6	6443 E20
1419 G2	3503 E7	6444 E21
1420 G3	3504 E8	6445 E22
1421 G4	3505 E9	6446 E23
1422 G5	3506 E10	6447 E24
1423 F11	3507 E11	6448 E25
1424 F12	3508 E12	6449 E26
1425 F13	3509 E13	6450 E27
1426 G11	3510 E14	6451 E28
1427 G12	3511 E15	6452 E29
1428 H11	3512 E16	6453 E30
1429 H12	3513 E17	6454 E31
1430 H13	3514 E18	6455 E32
1431 H14	3515 E19	6456 E33
1432 H15	3516 E20	6457 E34
1433 H16	3517 E21	6458 E35
1434 H17	3518 E22	6459 E36
1435 H18	3519 E23	6460 E37
1436 H19	3520 E24	6461 E38
1437 H20	3521 E25	6462 E39
1438 H21	3522 E26	6463 E40
1439 H22	3523 E27	6464 E41
1440 H23	3524 E28	6465 E42
1441 H24	3525 E29	6466 E43
1442 H25	3526 E30	6467 E44
1443 H26	3527 E31	6468 E45
1444 H27	3528 E32	6469 E46
1445 H28	3529 E33	6470 E47
1446 H29	3530 E34	6471 E48
1447 H30	3531 E35	6472 E49
1448 H31	3532 E36	6473 E50
1449 H32	3533 E37	6474 E51
1450 H33	3534 E38	6475 E52
1451 H34	3535 E39	6476 E53
1452 H35	3536 E40	6477 E54
1453 H36	3537 E41	6478 E55
1454 H37	3538 E42	6479 E56
1455 H38	3539 E43	6480 E57
1456 H39	3540 E44	6481 E58
1457 H40	3541 E45	6482 E59
1458 H41	3542 E46	6483 E60
1459 H42	3543 E47	6484 E61
1460 H43	3544 E48	6485 E62
1461 H44	3545 E49	6486 E63
1462 H45	3546 E50	6487 E64
1463 H46	3547 E51	6488 E65
1464 H47	3548 E52	6489 E66
1465 H48	3549 E53	6490 E67
1466 H49	3550 E54	6491 E68
1467 H50	3551 E55	6492 E69
1468 H51	3552 E56	6493 E70
1469 H52	3553 E57	6494 E71
1470 H53	3554 E58	6495 E72
1471 H54	3555 E59	6496 E73
1472 H55	3556 E60	6497 E74
1473 H56	3557 E61	6498 E75
1474 H57	3558 E62	6499 E76
1475 H58	3559 E63	6500 E77
1476 H59	3560 E64	6501 E78
1477 H60	3561 E65	6502 E79
1478 H61	3562 E66	6503 E80
1479 H62	3563 E67	6504 E81
1480 H63	3564 E68	6505 E82
1481 H64	3565 E69	6506 E83
1482 H65	3566 E70	6507 E84
1483 H66	3567 E71	6508 E85
1484 H67	3568 E72	6509 E86
1485 H68	3569 E73	6510 E87
1486 H69	3570 E74	6511 E88
1487 H70	3571 E75	6512 E89
1488 H71	3572 E76	6513 E90
1489 H72	3573 E77	6514 E91
1490 H73	3574 E78	6515 E92
1491 H74	3575 E79	6516 E93
1492 H75	3576 E80	6517 E94
1493 H76	3577 E81	6518 E95
1494 H77	3578 E82	6519 E96
1495 H78	3579 E83	6520 E97
1496 H79	3580 E84	6521 E98
1497 H80	3581 E85	6522 E99
1498 H81	3582 E86	6523 E100
1499 H82	3583 E87	6524 E101
1500 H83	3584 E88	6525 E102

ELECTRICAL PARTS LIST - FRONT BOARDELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1400	4822 135 00171	FTD Display	560R 5% 0,1W	3407	4822 051 20561			
1401	4822 267 10756	Flex Connector 13pin	3K9 5% 0,1W	3410	4822 051 20392			
1406	4822 276 13114	Tact Switch	3K9 5% 0,1W	3412	4822 051 20392			
1407	4822 276 13114	Tact Switch	560R 5% 0,1W	3417	4822 051 20561			
1410	4822 276 13114	Tact Switch	560R 5% 0,1W	3419	4822 051 20561			
1411	4822 276 13114	Tact Switch	1k 2% 0,25W	3420	4822 051 10102			
1412	4822 276 13114	Tact Switch	1k 2% 0,25W	3421	4822 051 10102			
1413	4822 276 13114	Tact Switch	1k 2% 0,25W	3422	4822 051 10102			
1414	4822 276 13114	Tact Switch	1k 2% 0,25W	3423	4822 051 10102			
1415	4822 276 13114	Tact Switch	1k 2% 0,25W	3424	4822 051 10102			
1416	4822 276 13114	Tact Switch	1k 2% 0,25W	3425	4822 051 10102			
1417	4822 276 13114	Tact Switch	1k 2% 0,25W	3426	4822 051 10102			
1420	4822 276 13114	Tact Switch	1k 2% 0,25W	3427	4822 051 10102			
1421	4822 276 13114	Tact Switch	1k 2% 0,25W	3428	4822 051 10102			
1423	4822 276 13114	Tact Switch	1k 2% 0,25W	3429	4822 051 10102			
1424	4822 276 13114	Tact Switch	1k 2% 0,25W	3430	4822 051 10102			
1425	4822 276 13114	Tact Switch	1k 2% 0,25W	3431	4822 051 10102			
1426	4822 276 13114	Tact Switch	560R 5% 0,1W	3433	4822 051 20561			
1427	4822 276 13114	Tact Switch	1k 2% 0,25W	3434	4822 051 10102			
1428	4822 276 13114	Tact Switch	1k 2% 0,25W	3435	4822 051 10102			
1429	4822 276 13114	Tact Switch	1k 2% 0,25W	3436	4822 051 10102			
			1k 2% 0,25W	3437	4822 051 10102			
			1k 2% 0,25W	3438	4822 051 10102			
			1k 2% 0,25W	3439	4822 051 10102			
			1k 2% 0,25W	3440	4822 051 10102			
			1k 2% 0,25W	3441	4822 051 10102			
			1k 2% 0,25W	3442	4822 051 10102			
			1k 2% 0,25W	3443	4822 051 10102			
			1k 2% 0,25W	3444	4822 051 10102			
			1k 2% 0,25W	3445	4822 051 10102			
			1k 2% 0,25W	3446	4822 051 10102			
			1k 2% 0,25W	3447	4822 051 10102			
			560R 5% 0,1W	3448	4822 051 20561			
			560R 5% 0,1W	3449	4822 051 20561			
			560R 5% 0,1W	3451	4822 051 20561			
			560R 5% 0,1W	3452	4822 051 20561			
			47k 5% 0,5W	3453	4822 116 83884			
			330R 5% 0,1W	3454	4822 051 20331			
			47k 5% 0,5W	3455	4822 116 83884			
			10k 1% 0,1W	3456	4822 117 10833			
			560R 5% 0,1W	3457	4822 051 20561			
			47k 5% 0,5W	3458	4822 116 83884			
			10k 1% 0,1W	3459	4822 117 10833			
			47k 5% 0,5W	3460	4822 116 83884			
			330R 5% 0,1W	3462	4822 051 20331			
			33k 5% 0,5W	3463	4822 116 52271			
			10k 1% 0,1W	3464	4822 117 10833			
			10k 5% 0,5W	3465	4822 116 83864			
			330R 5% 0,1W	3467	4822 051 20331			
			1k 2% 0,25W	3469	4822 051 10102			
			4R7 1% 0,6W	3471	4822 050 24708			
			1k 2% 0,25W	3472	4822 051 10102			

CAPACITORS

2408	5322 122 32659	33pF 5% 50V	3408	4822 051 20331	330R 5% 0,1W	3535	4822 117 10833	10k 1% 0,1W
2409	5322 122 32659	33pF 5% 50V	3475	4822 051 20561	560R 5% 0,1W	3536	4822 051 20474	470k 5% 0,1W
2412	4822 126 10002	100nF 20% 25V	3476	4822 051 20101	100R 5% 0,1W	3537	4822 051 20474	470k 5% 0,1W
2414	4822 126 10002	100nF 20% 25V	3477	4822 051 20101	100R 5% 0,1W	3539	4822 117 10833	10k 1% 0,1W
2415	4822 126 10002	100nF 20% 25V	3478	4822 051 10102	1k 2% 0,25W	3543	4822 051 10102	1k 2% 0,25W
2416	4822 124 42446	100µF 20% 10V	3479	4822 051 20101	100R 5% 0,1W	3545	4822 051 10102	1k 2% 0,25W
2418	4822 124 22651	1,0µF 20% 50V	3480	4822 051 20331	330R 5% 0,1W	3546	4822 117 10833	10k 1% 0,1W
2419	4822 124 42446	100µF 20% 10V	3481	4822 051 10102	1k 2% 0,25W	3547	4822 051 10102	1k 2% 0,25W
2420	4822 124 22651	1,0µF 20% 50V	3482	4822 051 10102	100R 5% 0,1W	3548	4822 051 10102	1k 2% 0,25W
2421	4822 124 22652	2,2µF 20% 50V	3483	4822 050 24708	4R7 1% 0,6W	3549	4822 116 83864	10k 5% 0,5W
2422	4822 126 10002	100nF 20% 25V	3484	4822 051 10102	1k 2% 0,25W	3553	4822 117 10833	10k 1% 0,1W
2423	4822 122 32504	15pF 2% 50V	3485	4822 051 20101	100R 5% 0,1W	3554	4822 117 10833	10k 1% 0,1W
2424	4822 122 32504	15pF 2% 50V	3486	4822 051 10102	1k 2% 0,25W	3555	4822 117 10833	10k 1% 0,1W
2425	4822 126 10002	100nF 20% 25V	3488	4822 051 20331	330R 5% 0,1W	3556	4822 051 20561	560R 5% 0,1W
2426	4822 126 12944	47nF 10% 50V	3489	4822 051 10102	1k 2% 0,25W	3557	4822 051 20331	330R 5% 0,1W
2427	4822 122 33175	2,2nF 20% 50V	3490	4822 051 10102	1k 2% 0,25W	3558	4822 117 10833	10k 1% 0,1W
2428	4822 122 33177	10nF 20% 50V	3493	4822 051 20331	330R 5% 0,1W	3559	4822 051 20105	1M 5% 0,1W
2434	4822 126 13692	47pF 1% 63V	3494	4822 051 20331	330R 5% 0,1W	4400	4822 051 20008	OR Jumper 0805
2435	4822 126 13692	47pF 1% 63V	3495	4822 117 10833	10k 1% 0,1W	4401	4822 051 20008	OR Jumper 0805
2436	4822 126 13692	47pF 1% 63V	3496	4822 051 10102	1k 2% 0,25W	4402	4822 051 20008	OR Jumper 0805
2437	4822 126 13692	47pF 1% 63V	3497	4822 050 11002	1k 1% 0,4W	4403	4822 051 20008	OR Jumper 0805
2441	4822 122 33177	10nF 20% 50V	3498	4822 051 10102	1k 2% 0,25W	4404	4822 051 20008	OR Jumper 0805
2442	4822 122 33177	10nF 20% 50V	3499	4822 051 10102	1k 2% 0,25W	4405	4822 051 20008	OR Jumper 0805
2443	4822 122 33177	10nF 20% 50V	3500	4822 051 10102	1k 2% 0,25W	4406	4822 051 20008	OR Jumper 0805
2444	4822 122 33177	10nF 20% 50V	3501	4822 051 10102	1k 2% 0,25W	4411	4822 051 20008	OR Jumper 0805
2456	5322 122 34123	1nF 10% 50V	3502	4822 051 10102	1k 2% 0,25W	4413	4822 051 20008	OR Jumper 0805
			3503	4822 051 10102	1k 2% 0,25W	4414	4822 051 20008	OR Jumper 0805
			3504	4822 051 10102	1k 2% 0,25W	4415	4822 051 20008	OR Jumper 0805
			3505	4822 051 20331	330R 5% 0,1W	4416	4822 051 20008	OR Jumper 0805
			3506	4822 050 11002	1k 1% 0,4W	4417	4822 051 20008	OR Jumper 0805
			3507	4822 051 10102	1k 2% 0,25W	4418	4822 051 20008	OR Jumper 0805
			3508	4822 051 10102	1k 2% 0,25W	4419	4822 051 20008	OR Jumper 0805
			3509	4822 117 11449	2k2 1% 0,1W	4420	4822 051 20008	OR Jumper 0805
			3510	4822 051 10102	1k 2% 0,25W	4421	4822 051 20008	OR Jumper 0805
			3511	4822 051 10102	1k 2% 0,25W	4423	4822 051 20008	OR Jumper 0805
			3512	4822 051 10102	1k 2% 0,25W	4424	4822 051 20008	OR Jumper 0805
			3513	4822 117 11449	2k2 1% 0,1W	4425	4822 051 20008	OR Jumper 0805
			3515	4822 051 20104	100k 5% 0,1W	4426	4822 051 20008	OR Jumper 0805
			3516	4822 051 20331	330R 5% 0,1W	4427	4822 051 20008	OR Jumper 0805
			3518	4822 051 20331	330R 5% 0,1W	4428	4822 051 20008	OR Jumper 0805
			3519	4822 051 20331	330R 5% 0,1W	4429	4822 051 20008	OR Jumper 0805
			3520	4822 117 10833	10k 1% 0,1W	4430	4822 051 20008	OR Jumper 0805
			3521	4822 051 10102	1k 2% 0,25W	4431	4822 051 20008	OR Jumper 0805
			3522	4822 051 20331	330R 5% 0,1W	4435	4822 051 20008	OR Jumper 0805
			3523	4822 051 20331	330R 5% 0,1W	4436	4822 051 20008	OR Jumper 0805
			3524	4822 051 10102	1k 2% 0,25W	4437	4822 051 20008	OR Jumper 0805
			3525	4822 051 10102	1k 2% 0,25W	4438	4822 051 20008	OR Jumper 0805
			3526	4822 051 20331	330R 5% 0,1W	4440	4822 051 20008	OR Jumper 0805
			3527	4822 051 10102	1k 2% 0,25W	4441	4822 051 20008	OR Jumper 0805
			3529	4822 051 20331	330R 5% 0,1W	4442	4822 051 20008	OR Jumper 0805
			3533	4822 117 10833	10k 1% 0,1W	4443	4822 051 20008	OR Jumper 0805
			3534	4822 117 10833	10k 1% 0,1W	4444	4822 051 20008	OR Jumper 0805

RESISTORS

3406	4822 117 11139	1k5 1% 0,1W						
------	----------------	-------------	--	--	--	--	--	--

ELECTRICAL PARTS LIST - FRONT BOARD**RESISTORS**

4445	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5400	4822 242 72066	Ceram Resonator 8MHz
5401	4822 242 70938	X'tal Resonator 32,768kHz
5402	4822 157 11477	Coil 2,2 μ H 5%

DIODES

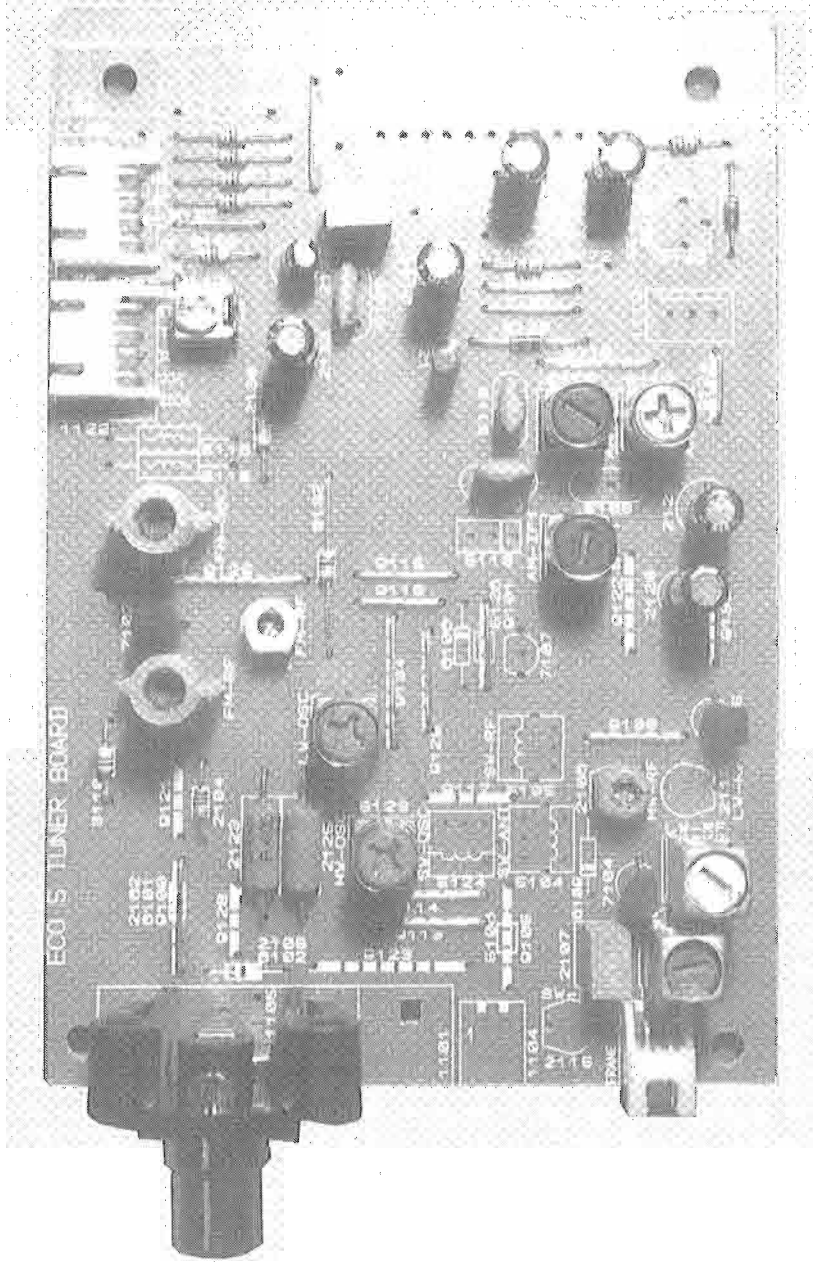
6402	4822 130 10791	LTL-1CHGE
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6410	4822 130 10792	LTL-1CHPE
6411	4822 130 10792	LTL-1CHPE
6412	4822 130 10792	LTL-1CHPE
6413	4822 130 10792	LTL-1CHPE
6414	4822 130 10792	LTL-1CHPE
6415	4822 130 10791	LTL-1CHGE
6416	4822 130 10792	LTL-1CHPE
6417	4822 130 30621	1N4148
6418	4822 130 10792	LTL-1CHPE
6419	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6421	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6423	4822 130 31878	1N4003G
6425	4822 130 30621	1N4148
6426	4822 130 31878	1N4003G
6427	4822 130 30621	1N4148
6428	4822 130 30621	1N4148
6429	4822 130 10792	LTL-1CHPE
6431	4822 130 30621	1N4148
6432	4822 130 30621	1N4148
6433	4822 130 30621	1N4148
6434	4822 130 30621	1N4148
6435	4822 130 30621	1N4148
6436	4822 130 30621	1N4148
6437	4822 130 30621	1N4148
6438	4822 130 30621	1N4148
6439	4822 130 30621	1N4148
6440	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

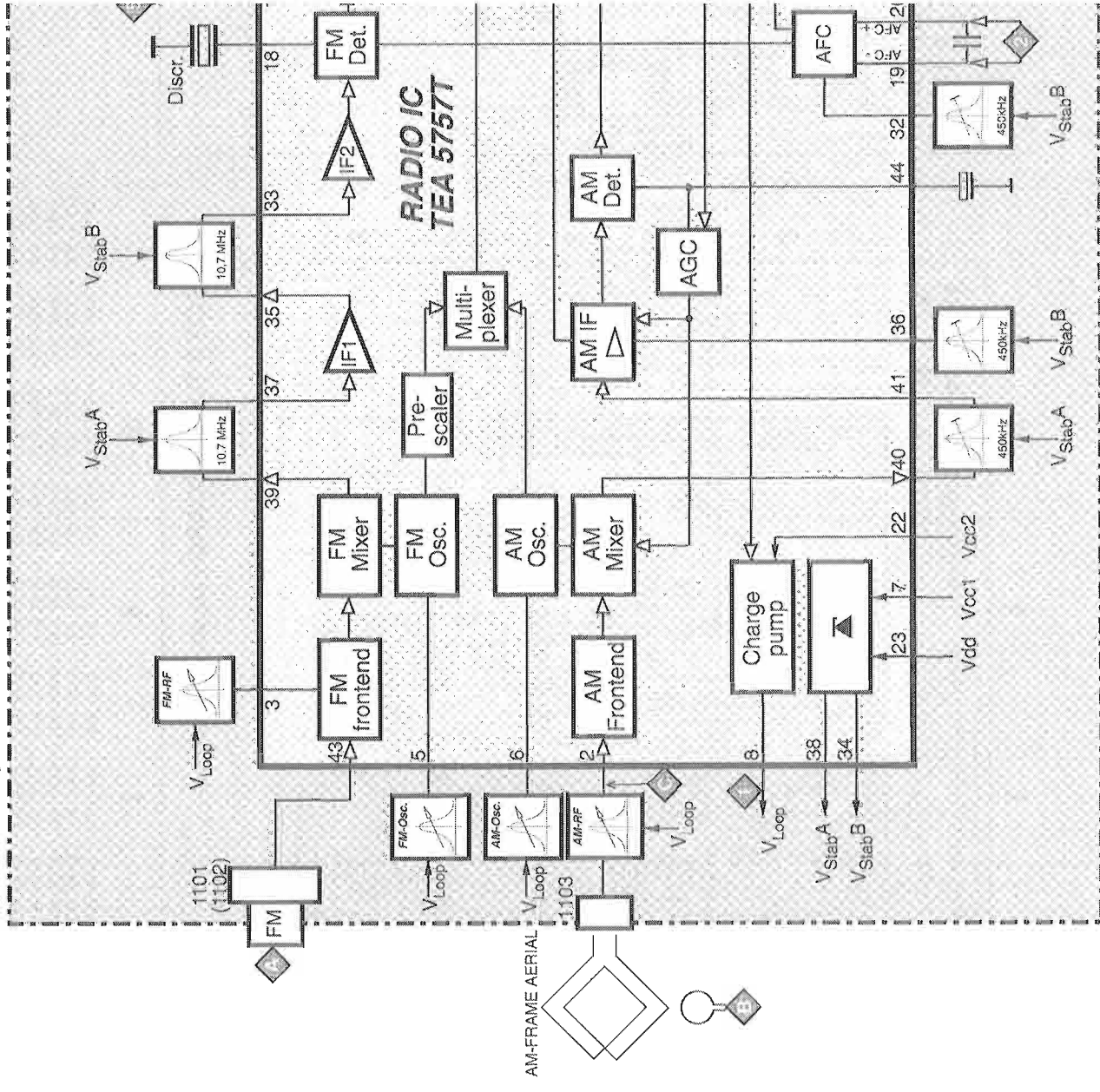
7401	4822 209 16222	TMP87CP71F
7402	4822 209 31508	ST24C01B1
7404	4822 209 15449	74HC4094D
7405	4822 209 15449	74HC4094D
7408	4822 130 60511	BC847B
7409	4822 130 10165	GP1U28XP

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

BLOCKDIAGRAM



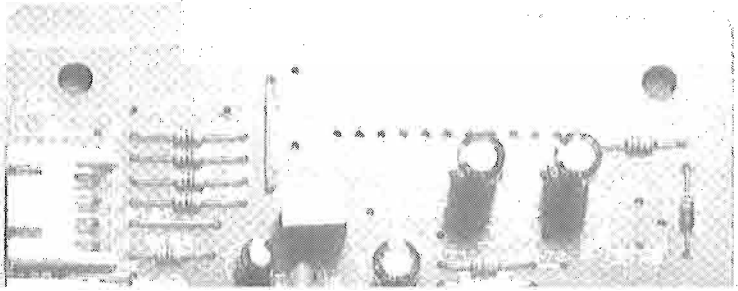
TUNER BOARD
ECO 5 systems



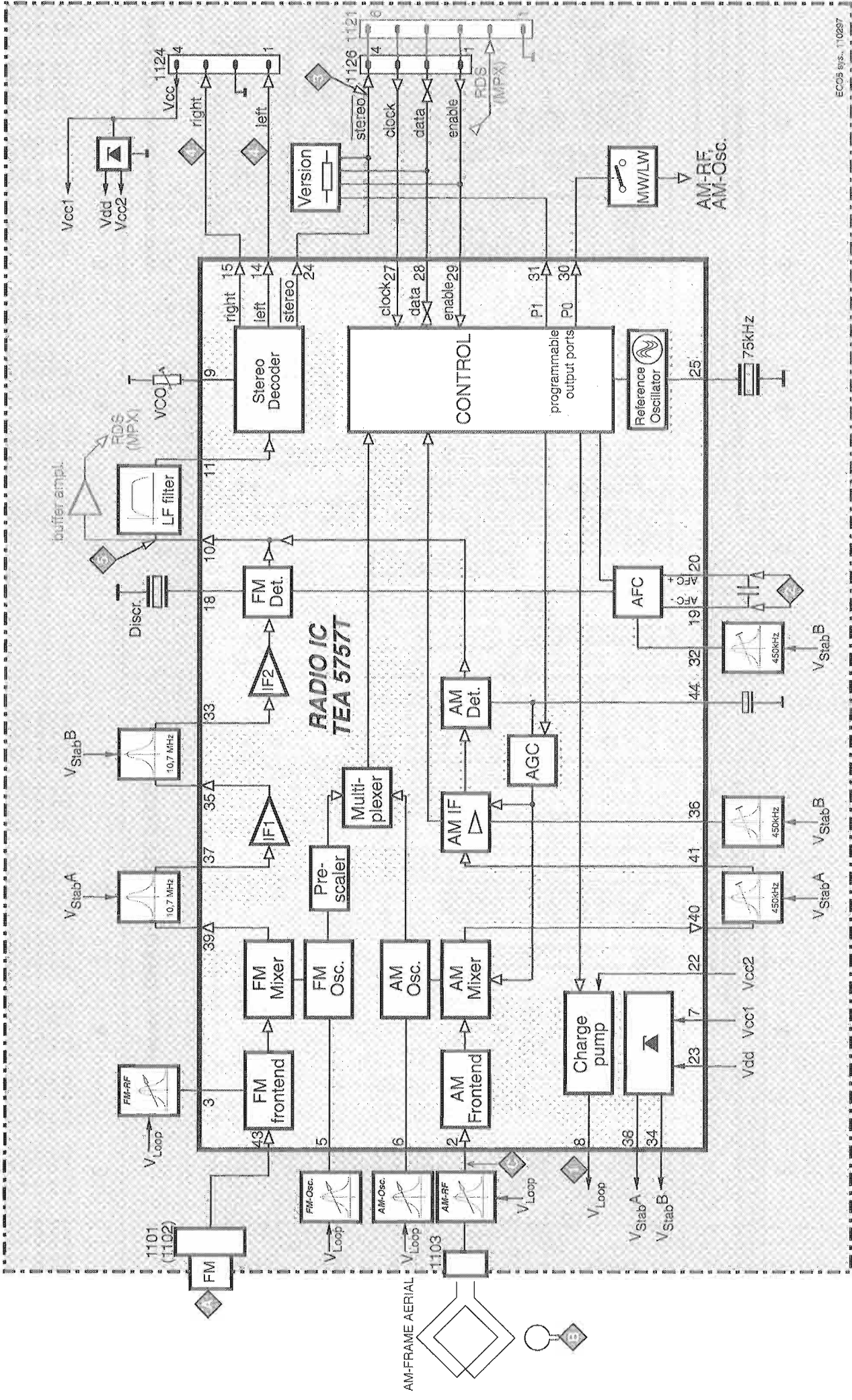
TUNER BOARD ECO5

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TUNER BOARD ECO 5 systems



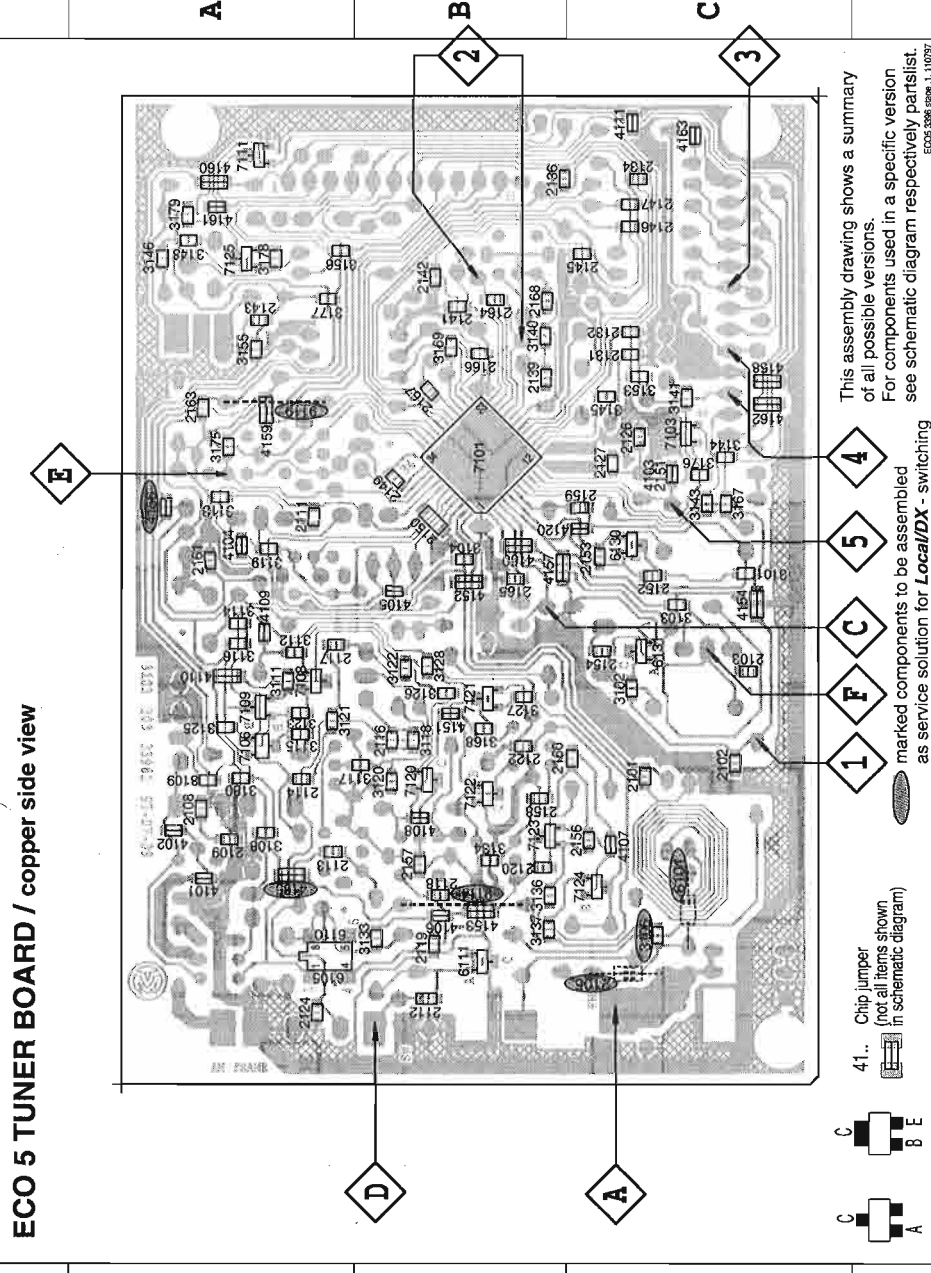
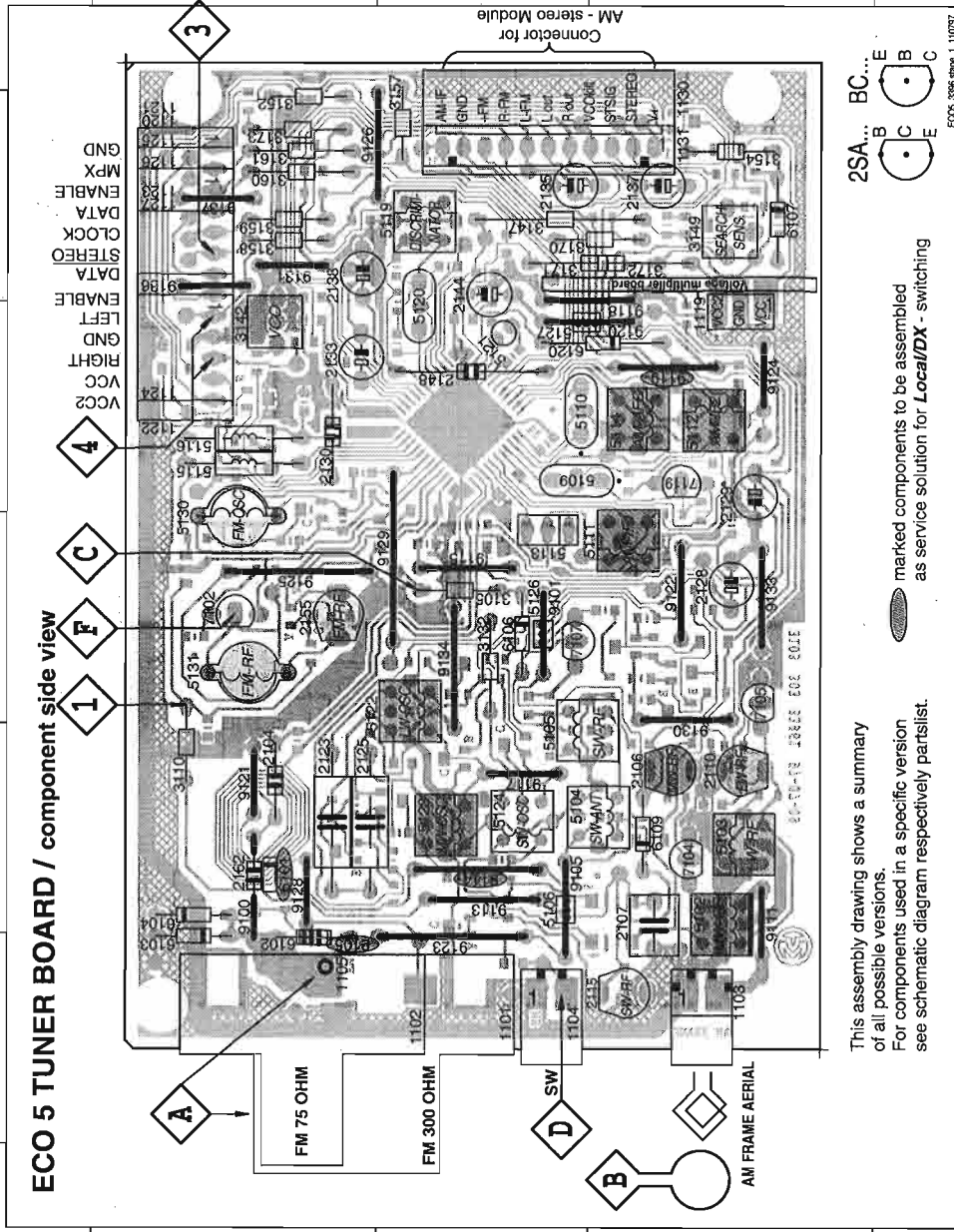
ECO5 813, 110287

TUNER ADJUSTMEN

Waverange	Input
VARIACAP ALIGNMENT	
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	
MW FM/AM-version, 10kHz grid 530 - 1700kHz	
FM/MW-version, 9kHz grid 531 - 1602kHz	
LW 153 - 279kHz	
MW FM/MW/LW-version, 9kHz grid 531 - 1602kHz	
FM IF	
FM	10.7 cont
FM RF	
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	
VCO	
FM	98 cont
AM IF	
MW	cont IC 71 with grc
AM AFC	
MW	
AM RF 3)	
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid)	
LW 531 - 1602kHz	
MW FM/AM-version, 10kHz grid 530 - 1700kHz	

Use service test program. By selecting:
 1) If sensitivity of frequency counter is
 (input signal: stereo left 90% + 9%, r
 3) For AM RF adjustments the original
 Repeat

- 2101 C4
- 2102 C4
- 2103 C3
- 2108 A4
- 2109 A4
- 2111 A2
- 2112 B5
- 2114 A4
- 2116 B3
- 2117 A3
- 2118 B4
- 2119 B4
- 2120 B4
- 2122 B3
- 2124 A5
- 2126 C2
- 2127 C2
- 2131 C2
- 2132 C1
- 2134 C1
- 2136 B1
- 2139 B2
- 2141 B1
- 2142 B1
- 2143 A1
- 2145 C1
- 2146 C1
- 2147 C1
- 2149 B2
- 2150 B2
- 2151 C2
- 2152 C3
- 2166 B2
- 2167 B2
- 2168 B1
- 2169 B4
- 2172 B3
- 2173 B3
- 2174 A5
- 2175 B5
- 2176 B1
- 2177 B1
- 2178 B3
- 2179 B3
- 2180 A1
- 2181 B3
- 2182 B3
- 2183 B1
- 2184 B2
- 2185 B3
- 2186 B1
- 2187 B2
- 2188 B1
- 2189 B4
- 2190 B4
- 2191 C3
- 2192 B3
- 2193 B3
- 2194 A2
- 2195 B2
- 2196 B3
- 2197 B1
- 2198 C4
- 2199 C4
- 2200 C4
- 2201 C4
- 2202 C4
- 2203 C4
- 2204 C4
- 2205 C4
- 2206 C4
- 2207 C4
- 2208 C4
- 2209 C4
- 2210 C4
- 2211 C4
- 2212 C4
- 2213 C4
- 2214 C4
- 2215 C4
- 2216 C4
- 2217 C4
- 2218 C4
- 2219 C4
- 2220 C4
- 2221 C4
- 2222 C4
- 2223 C4
- 2224 C4
- 2225 C4
- 2226 C4
- 2227 C4
- 2228 C4
- 2229 C4
- 2230 C4
- 2231 C4
- 2232 C4
- 2233 C4
- 2234 C4
- 2235 C4
- 2236 C4
- 2237 C4
- 2238 C4
- 2239 C4
- 2240 C4
- 2241 C4
- 2242 C4
- 2243 C4
- 2244 C4
- 2245 C4
- 2246 C4
- 2247 C4
- 2248 C4
- 2249 C4
- 2250 C4
- 2251 C4
- 2252 C4
- 2253 C4
- 2254 C4
- 2255 C4
- 2256 C4
- 2257 C4
- 2258 C4
- 2259 C4
- 2260 C4
- 2261 C4
- 2262 C4
- 2263 C4
- 2264 C4
- 2265 C4
- 2266 C4
- 2267 C4
- 2268 C4
- 2269 C4
- 2270 C4
- 2271 C4
- 2272 C4
- 2273 C4
- 2274 C4
- 2275 C4
- 2276 C4
- 2277 C4
- 2278 C4
- 2279 C4
- 2280 C4
- 2281 C4
- 2282 C4
- 2283 C4
- 2284 C4
- 2285 C4
- 2286 C4
- 2287 C4
- 2288 C4
- 2289 C4
- 2290 C4
- 2291 C4
- 2292 C4
- 2293 C4
- 2294 C4
- 2295 C4
- 2296 C4
- 2297 C4
- 2298 C4
- 2299 C4
- 2300 C4
- 2301 C4
- 2302 C4
- 2303 C4
- 2304 C4
- 2305 C4
- 2306 C4
- 2307 C4
- 2308 C4
- 2309 C4
- 2310 C4
- 2311 C4
- 2312 C4
- 2313 C4
- 2314 C4
- 2315 C4
- 2316 C4
- 2317 C4
- 2318 C4
- 2319 C4
- 2320 C4
- 2321 C4
- 2322 C4
- 2323 C4
- 2324 C4
- 2325 C4
- 2326 C4
- 2327 C4
- 2328 C4
- 2329 C4
- 2330 C4
- 2331 C4
- 2332 C4
- 2333 C4
- 2334 C4
- 2335 C4
- 2336 C4
- 2337 C4
- 2338 C4
- 2339 C4
- 2340 C4
- 2341 C4
- 2342 C4
- 2343 C4
- 2344 C4
- 2345 C4
- 2346 C4
- 2347 C4
- 2348 C4
- 2349 C4
- 2350 C4
- 2351 C4
- 2352 C4
- 2353 C4
- 2354 C4
- 2355 C4
- 2356 C4
- 2357 C4
- 2358 C4
- 2359 C4
- 2360 C4
- 2361 C4
- 2362 C4
- 2363 C4
- 2364 C4
- 2365 C4
- 2366 C4
- 2367 C4
- 2368 C4
- 2369 C4
- 2370 C4
- 2371 C4
- 2372 C4
- 2373 C4
- 2374 C4
- 2375 C4
- 2376 C4
- 2377 C4
- 2378 C4
- 2379 C4
- 2380 C4
- 2381 C4
- 2382 C4
- 2383 C4
- 2384 C4
- 2385 C4
- 2386 C4
- 2387 C4
- 2388 C4
- 2389 C4
- 2390 C4
- 2391 C4
- 2392 C4
- 2393 C4
- 2394 C4
- 2395 C4
- 2396 C4
- 2397 C4
- 2398 C4
- 2399 C4
- 2400 C4



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

Waverrange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz		108MHz	5130		8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1700kHz		1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz	1602kHz		1602kHz	5123	1	6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz	279kHz		279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW-version, 9kHz grid 531 - 1602kHz	1602kHz		1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	F	IC 7101 shortcircuit to block AFC	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)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz ¹⁾
AM IF						
MW	450kHz	C	IC 7101 36 100nF	5111	4	
			IC 7101 40 100nF see remark 2)	5112		
AM AFC	connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C		5114	2	0 ± 2 mV DC
AM RF³⁾						
MW ⁴⁾ FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B	1494kHz	2106	4	
			558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
			560kHz	5102		

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

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

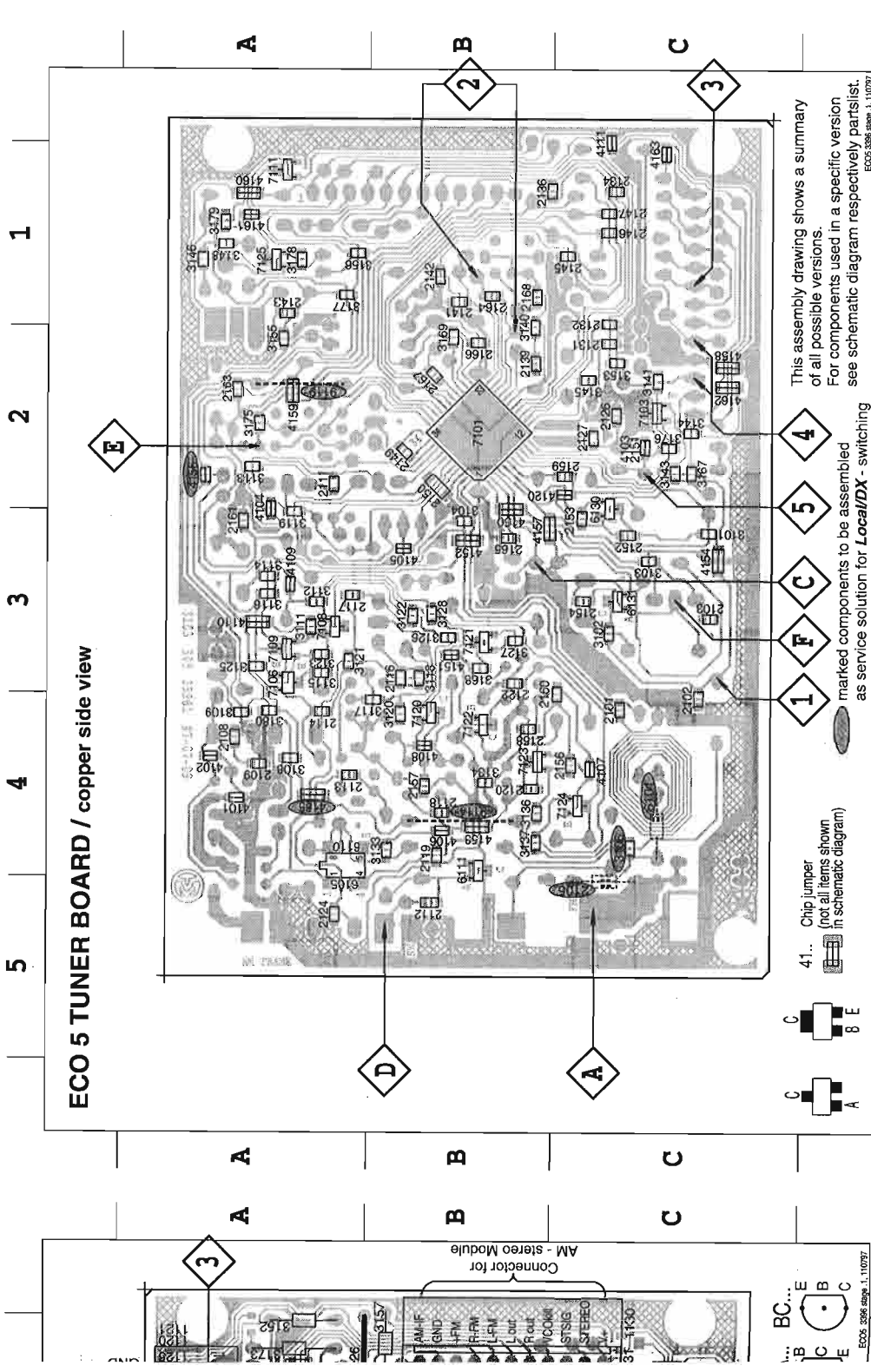
2) RC network serves for damping the IF-filter while adjusting the other one.

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

4) MW has to be aligned before LW.

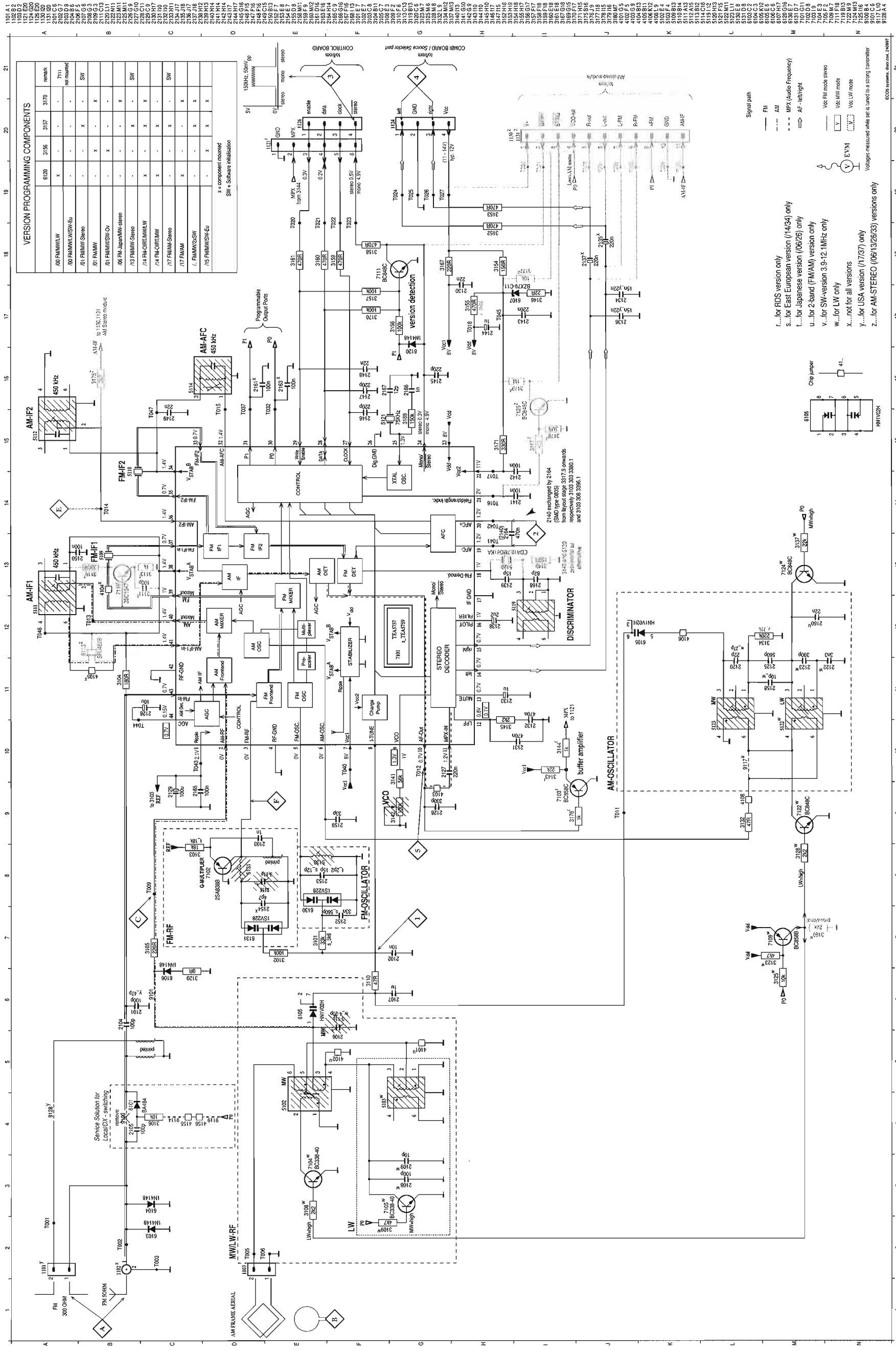
Repeat

- 29 B3
- 7121 B3
- 30 C3
- 6110 A4
- 31 A5
- 7122 B4
- 33 C3
- 6111 B4
- 34 B3
- 7123 B4
- 37 A5
- 7124 C4
- 7125 A1



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist. ECO5-208-001-1.10797

TUNER BOARD ECO5 / Systems



VERSION PROGRAMMING COMPONENTS

Part	Value	Remark
R1	3156	3170
R2	3157	3171
R3	3158	3172
R4	3159	3173
R5	3160	3174
R6	3161	3175
R7	3162	3176
R8	3163	3177
R9	3164	3178
R10	3165	3179
R11	3166	3180
R12	3167	3181
R13	3168	3182
R14	3169	3183
R15	3170	3184
R16	3171	3185
R17	3172	3186
R18	3173	3187
R19	3174	3188
R20	3175	3189
R21	3176	3190
R22	3177	3191
R23	3178	3192
R24	3179	3193
R25	3180	3194
R26	3181	3195
R27	3182	3196
R28	3183	3197
R29	3184	3198
R30	3185	3199
R31	3186	3200
R32	3187	3201
R33	3188	3202
R34	3189	3203
R35	3190	3204
R36	3191	3205
R37	3192	3206
R38	3193	3207
R39	3194	3208
R40	3195	3209
R41	3196	3210
R42	3197	3211
R43	3198	3212
R44	3199	3213
R45	3200	3214
R46	3201	3215
R47	3202	3216
R48	3203	3217
R49	3204	3218
R50	3205	3219
R51	3206	3220
R52	3207	3221
R53	3208	3222
R54	3209	3223
R55	3210	3224
R56	3211	3225
R57	3212	3226
R58	3213	3227
R59	3214	3228
R60	3215	3229
R61	3216	3230
R62	3217	3231
R63	3218	3232
R64	3219	3233
R65	3220	3234
R66	3221	3235
R67	3222	3236
R68	3223	3237
R69	3224	3238
R70	3225	3239
R71	3226	3240
R72	3227	3241
R73	3228	3242
R74	3229	3243
R75	3230	3244
R76	3231	3245
R77	3232	3246
R78	3233	3247
R79	3234	3248
R80	3235	3249
R81	3236	3250
R82	3237	3251
R83	3238	3252
R84	3239	3253
R85	3240	3254
R86	3241	3255
R87	3242	3256
R88	3243	3257
R89	3244	3258
R90	3245	3259
R91	3246	3260
R92	3247	3261
R93	3248	3262
R94	3249	3263
R95	3250	3264
R96	3251	3265
R97	3252	3266
R98	3253	3267
R99	3254	3268
R100	3255	3269

Signal path
 FM
 AM
 MPX (Audio Frequency)
 AF-Intlight
 Vcc FM mode stereo
 Vcc MW mode
 Vcc LW mode
 EVMI
 Voltages measured while set is used to a strong transmitter

r... for RDS version only
 s... for East European version (1/14/34) only
 t... for Japanese version (06/26) only
 u... for 2-band (FM/AM) version only
 v... for SW-version 3.9-12.1MHz only
 w... for LW only
 x... not for all versions
 y... for USA version (1/7/37) only
 z... for AM-STEREO (06/13/26/33) versions only

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	
CAPACITORS			
2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3.3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF +80/-20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/-20% 16V	
2132	4822 126 13482	470nF +80/-20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF +80/-20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

3176	4822 051 10102	1k 2% 0,25W	for RDS version	7103	4822 130 42513	BC858C	for RDS version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only	7104	5322 130 44779	BC338-40	for LW version
4102	4822 051 20008	0R Jumper 0805	for 2-Band only	7105	5322 130 44779	BC338-40	for LW version
4103	4822 051 20008	0R Jumper 0805		7109	5322 130 41983	BC858B	for LW version
4104	4822 051 20008	0R Jumper 0805		7111	5322 130 42136	BC848C	
4105	4822 051 20008	0R Jumper 0805		7122	5322 130 42136	BC848C	for LW version
4106	4822 051 20008	0R Jumper 0805		7124	5322 130 42136	BC848C	for LW version
4108	4822 051 20008	0R Jumper 0805					
4111	4822 051 20008	0R Jumper 0805					
4120	4822 051 20008	0R Jumper 0805					
4150	4822 051 10008	0R Jumper 1206					
4151	4822 051 20008	0R Jumper 0805					
4152	4822 051 10008	0R Jumper 1206					
4153	4822 051 10008	0R Jumper 1206					
4154	4822 051 10008	0R Jumper 1206					
4155	4822 051 10008	0R Jumper 1206					
4156	4822 051 20008	0R Jumper 0805					
4157	4822 051 10008	0R Jumper 1206					
4158	4822 051 10008	0R Jumper 1206					
4159	4822 051 10008	0R Jumper 1206					
4162	4822 051 10008	0R Jumper 1206					

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

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc. 10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

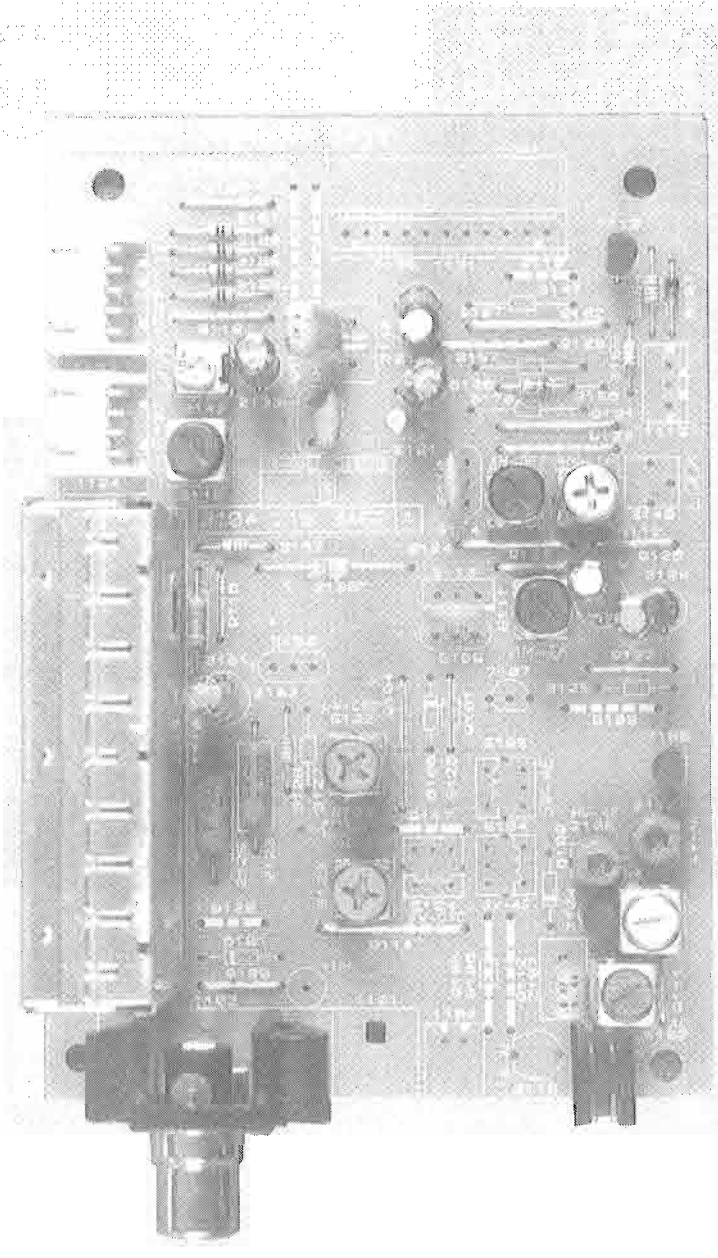
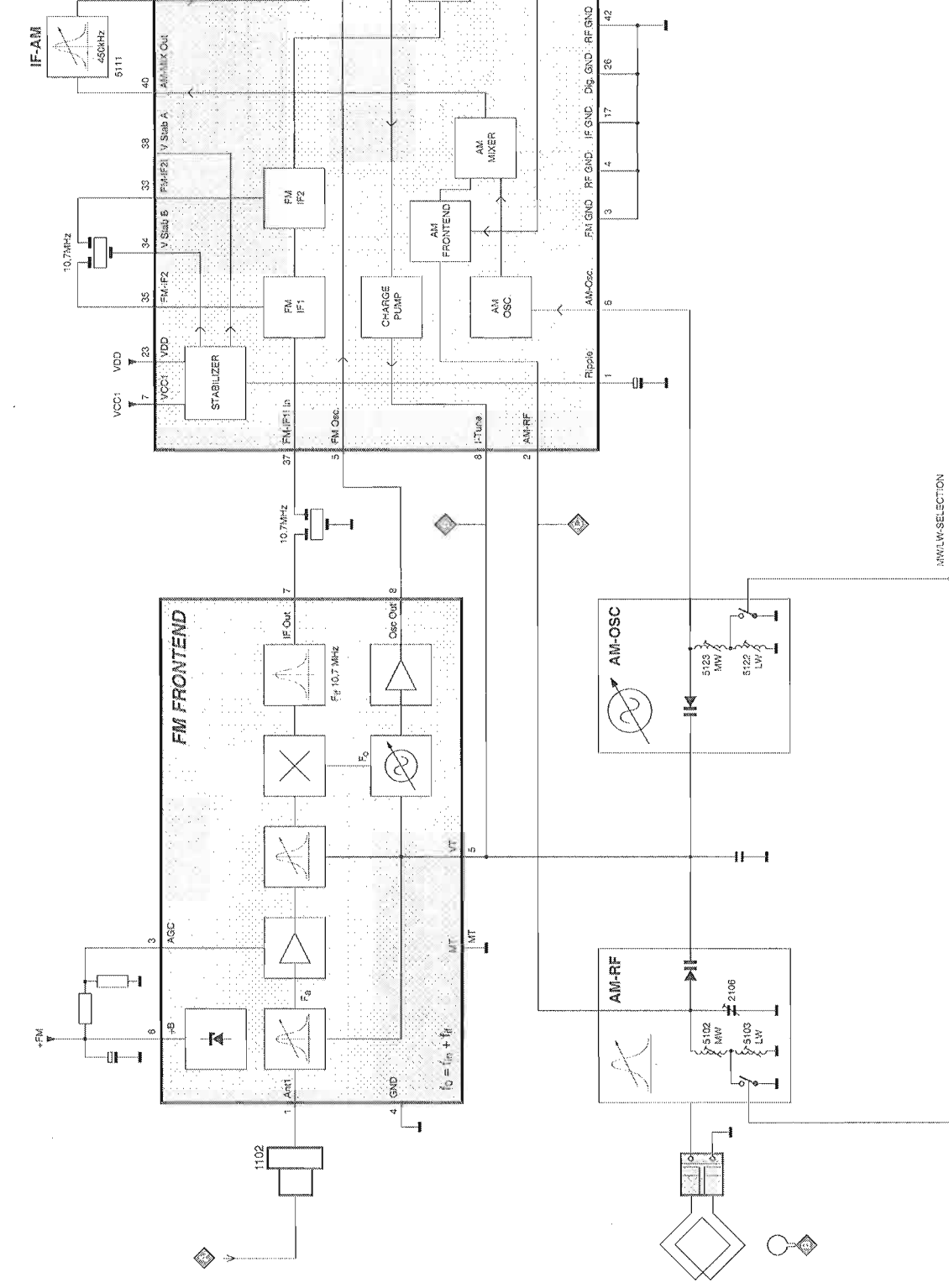
DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757HV1	
7102	4822 130 60093	2SA838B	

BLOCKDIAGRAM



TUNER 95 BOARD

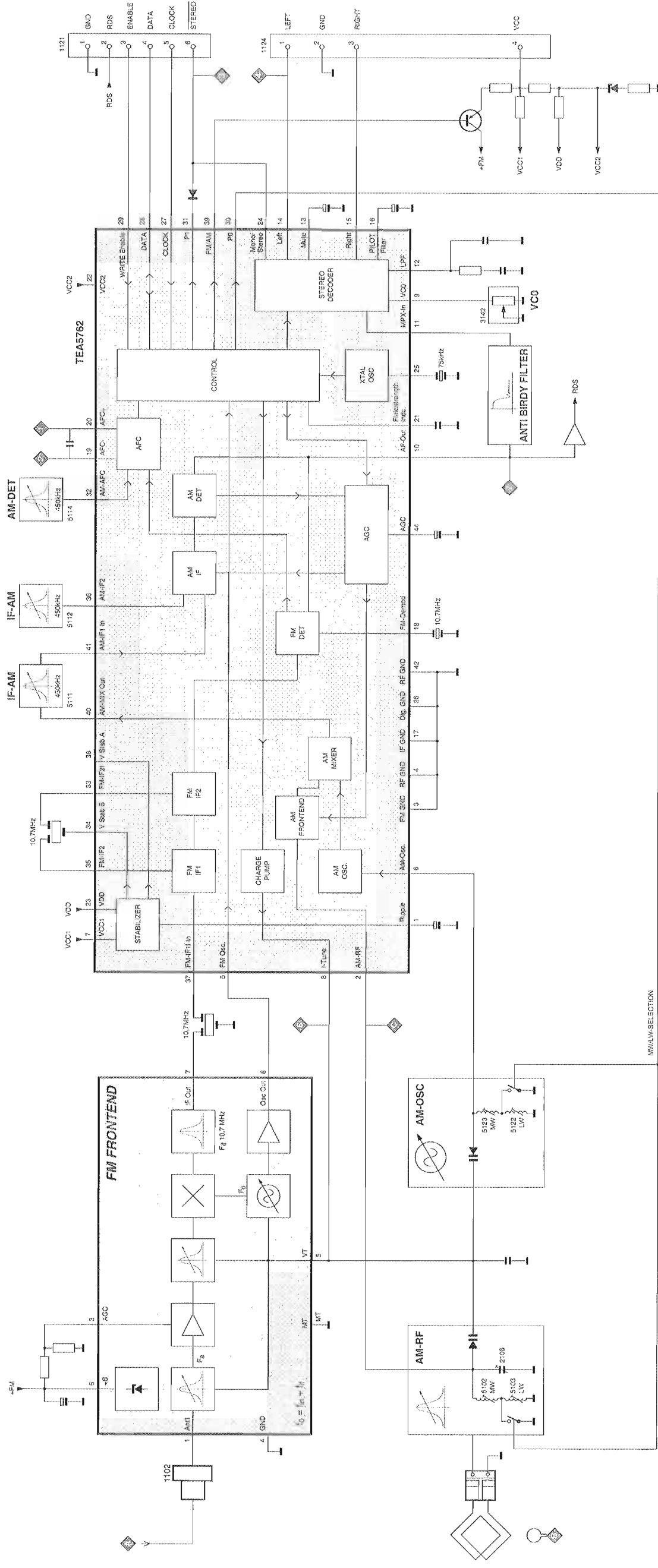
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BLOCKDIAGRAM

7D-1

7D-1



TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

Wavrange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)	108 MHz		108 MHz	check		7 ... 9V
	87.5 - 108 MHz		87.5 MHz	check		1.3 ... 2V
MW (9)	1602 kHz		1602 kHz	5123	6	8.3V ± 0.2V
	531 - 1602 kHz		531 kHz	check		1V ± 0.4V
LW (3)	279 kHz		279 kHz	5122		8.3V ± 0.2V
	153 - 279 kHz		153 kHz	check		1V ± 0.4V
FM - DETECTION						
FM	98 MHz 1mV continuous wave	A	98 MHz	5107	1 2	0mV ± 3mV
FM - VCO						
FM	98 MHz 1 mV continuous wave	A	98 MHz	3142	3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	A	98MHz	mixcoil inside Tuner 1110	4	Distortion minimum
AM - IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal	C	MW	5111	7	symmetrical and max. height
	450kHz continuous wave			5112		
AM - RF	558kHz Mod = 1kHz 30 % AM 1494 kHz	B	558kHz	5102	7	MAX
				1494kHz		
LW	198kHz mod = 1kHz 30 % AM	*	198kHz	5103		MAX

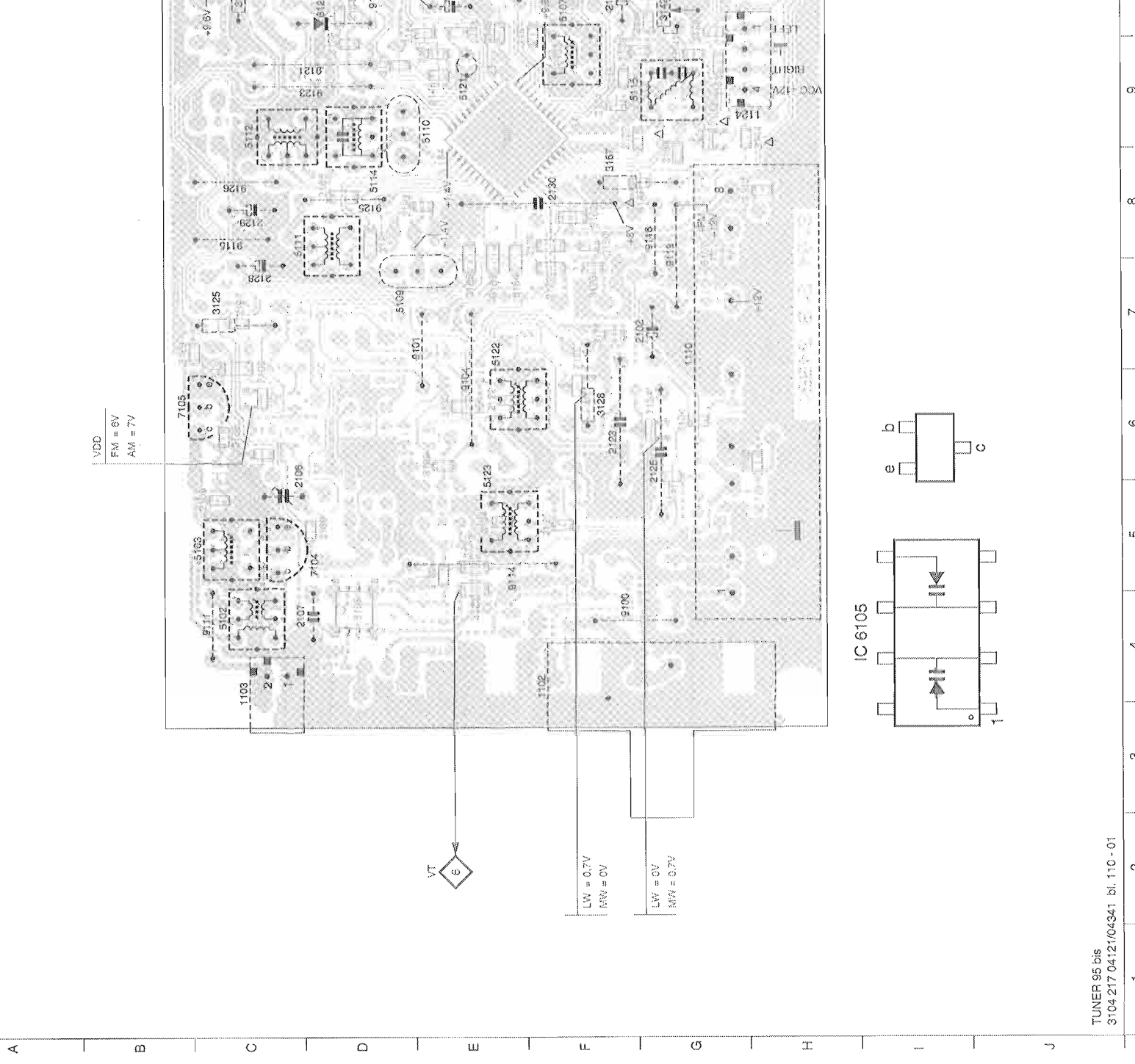
adjustable for 3104 217 04121/04341

* Signal send via a frame antenna
(..) = tuning grid in kHz

repeat

1102 F4	2107 C4	2128 C7	2108 G10	2145 G11	2161 G11	2166 E9	3124 E5	3137 G5	3145 F9	3158 G11	3167 F8	3183 E7	5103 C5	5121
1103 C3	2108 C6	2129 C8	2137 E11	2147 G11	2162 G11	3125 C7	3126 C7	3138 D9	3146 E10	3159 G11	3169 D5	3184 E7	5107 F10	5122
1110 G7	2109 C5	2130 F8	2138 E10	2148 E9	3103 H6	3128 F6	3129 F6	3139 F8	3150 C11	3160 G11	3171 D11	3185 E7	5109 D7	5123
1121 H11	2120 F5	2131 F9	2140 F10	2150 F8	3104 G6	3128 E6	3130 E6	3141 G9	3151 C10	3161 G11	3172 F7	3186 G8	5110 E9	5124
1124 H9	2122 E6	2132 F9	2141 E10	2151 F9	3107 G7	3130 E6	3131 C6	3142 G10	3153 G9	3162 D9	3173 F7	3188 G11	5111 C8	5125
1126 G10	2123 F6	2133 F10	2142 E9	2152 F9	3108 C6	3131 C6	3131 C6	3142 G10	3153 G9	3163 F8	3176 D9	3182 D8	5112 C9	5126
2102 G7	2125 G5	2134 G10	2143 C10	2158 D10	3109 B7	3132 E5	3132 E5	3143 G8	3154 C10	3164 C11	3177 F7	3197 C7	5114 D8	7101
2106 C5	2127 F9	2135 G11	2144 E10	2160 E9	3123 E4	3134 E5	3134 E5	3144 H8	3155 C10	3165 D8	3181 D8	5102 C4	5115 G9	7103

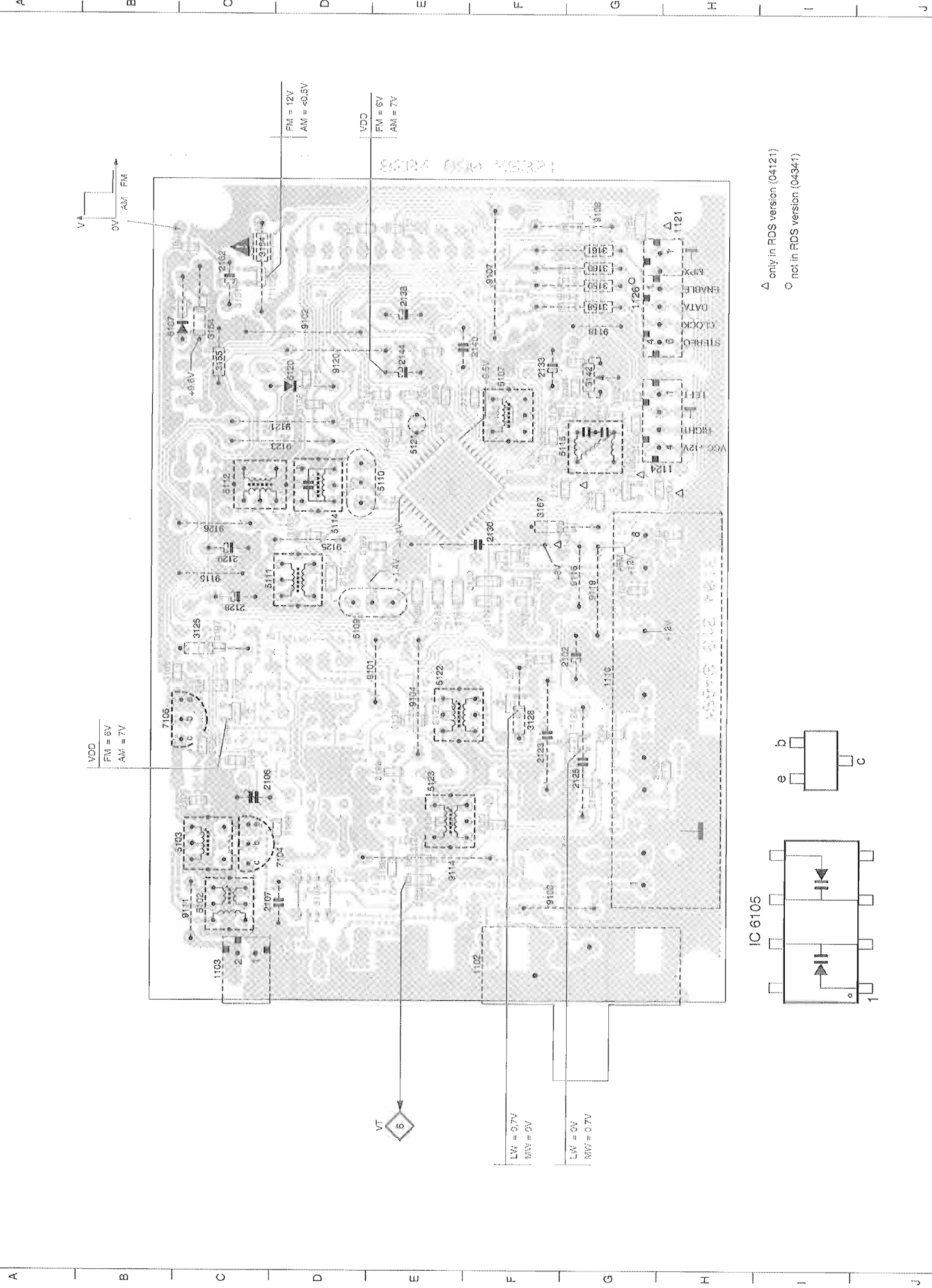
TUNER 95 bis Combi: Copper side view



TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

1102	F4	2107	C4	2128	C7	2136	G10	2145	G11	2161	E9	3124	E5	3137	G5	3145	F9	3168	G11	3167	F8	3183	E7	5103	C5	5121	E9	7104	D5	9102	D10	9118	G10
1103	C3	2106	C6	2129	C8	2137	E11	2147	G11	2162	C11	3125	C7	3138	D9	3146	B10	3169	D5	3184	D5	3184	E7	5107	F10	5122	E7	7105	B8	9104	E6	9119	G7
1110	G7	2109	C5	2130	F8	2138	E10	2148	E9	3103	H6	3126	F6	3139	F8	3150	C11	3160	C11	3171	D11	3185	E7	5109	D7	5123	E5	7109	C8	9107	F11	9120	D10
1121	H11	2120	F5	2131	F9	2140	F10	2150	F8	3104	G6	3129	E6	3140	H8	3151	C10	3161	G11	3172	F7	3186	G8	5110	E8	5125	D4	7110	D11	9108	G11	9121	D9
1124	H9	2122	E6	2132	F9	2141	E9	2151	F9	3107	G7	3130	E6	3141	G9	3152	G9	3162	D9	3173	F7	3188	G11	5111	C8	5127	F7	7122	F7	9111	C4	9123	D9
1126	G10	2123	F6	2133	F10	2142	E9	2152	F9	3108	G6	3131	C6	3142	G10	3153	G9	3163	D8	3175	D9	3192	D8	5112	C9	5120	D10	7124	C6	9114	E5	9125	D8
2102	G7	2125	G5	2134	G10	2143	C10	2158	D10	3109	B7	3132	E5	3143	G8	3154	C10	3164	C11	3177	F7	3197	C7	5114	D8	5121	E9	9100	F4	9115	C8	9126	C8
2106	C5	2127	F9	2135	G11	2144	E10	2160	E9	3123	E4	3134	E5	3144	H6	3155	C10	3165	D8	3177	F7	3197	C7	5102	C4	5115	G9	9101	E7	9116	G8	9128	C8

TUNER 95 bis Combi: Copper side view

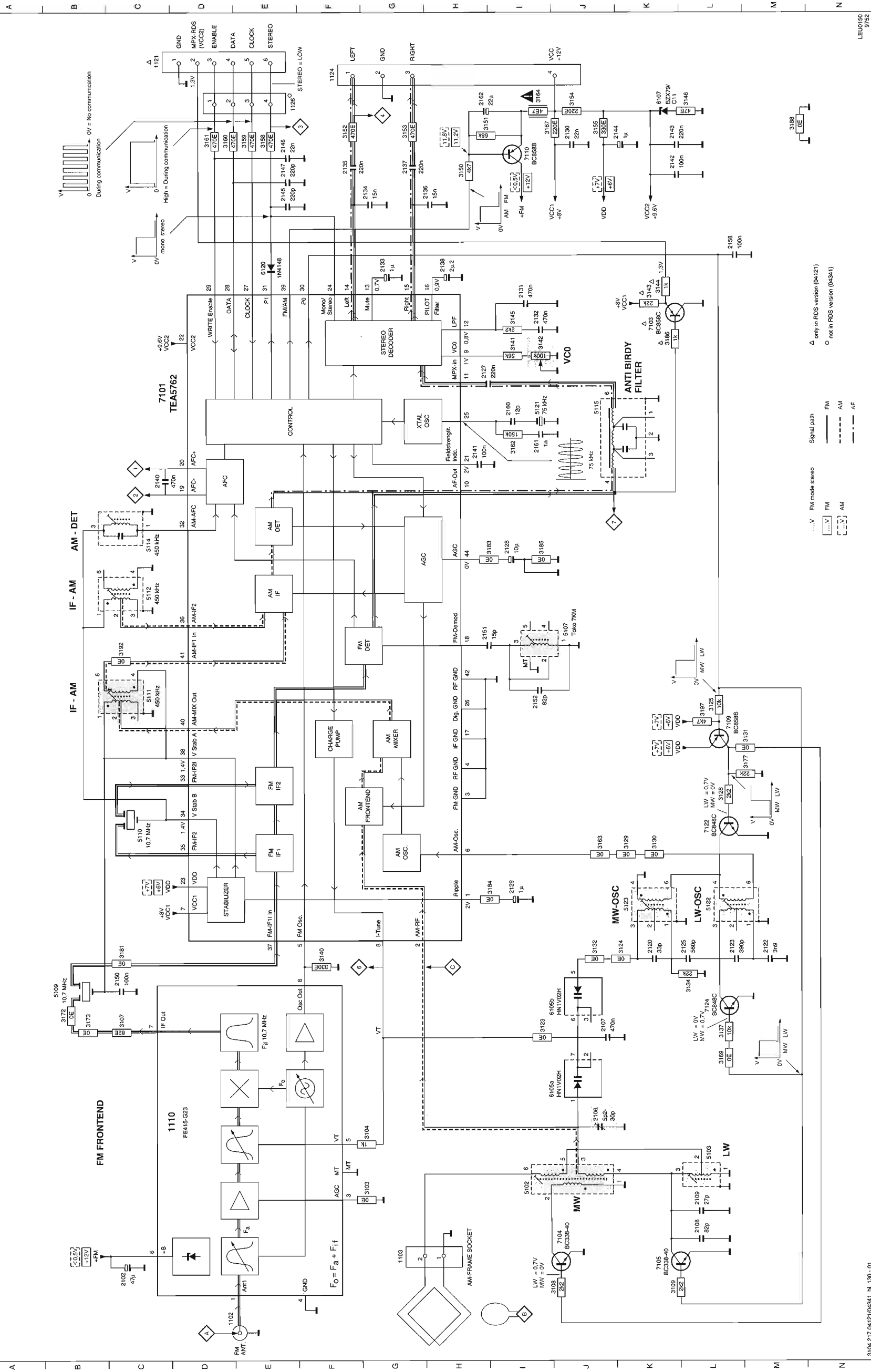


/ Voltmeter
7 ... 9V
3 ... 2V
V ± 0.2V
V ± 0.4V
V ± 0.2V
V ± 0.4V
V ± 3mV
Hz ± 1 kHz
istortion minimum
metrical and x. height
V ± 2mV
MAX
MAX

1217-04121R44

1102	D1	1124	F21	2107	J6	2122	M7	2128	I13	2132	I17	2136	H19	2141	H15	2145	E19	2151	H12	2161	H15	3107	C6	3124	K7	3130	K8	3137	L5	3143	K17	3150	H19	3154	J20	3160	D19	3164	I20	3173	B6	3184	I8	3192	C12	5107	J12	5112	C12	5118	L7	5122	L7	5126	L7	5130	K7	5134	K7	5138	K7	5142	K7	5146	K7	5150	J5	5154	J5	5158	J5	5162	L8	5166	L8	5170	C9	5174	C9	5178	C9	5182	L9	5186	K15	5190	C9	5194	C9	5198	L9	5202	C2	2108	L3	2112	L3	2116	L3	2120	K7	2124	H6	2128	H6	2132	L7	2136	L7	2140	C14	2144	C14	2148	K20	2152	E19	2156	E19	2160	C5	2164	C5	2168	H5	3104	G4	3108	K1	3112	J7	3116	L6	3120	L6	3124	K9	3128	K9	3132	J7	3136	L9	3140	F7	3144	K17	3148	L20	3152	J7	3156	L20	3160	D19	3164	I20	3168	I20	3172	B6	3176	B6	3180	I20	3184	I20	3188	M20	3192	C15	3196	C15	3200	E17	3204	E17	3208	K2	3212	K2	3216	K2	3220	L8	3224	L8	3228	L8	3232	L8	3236	L8	3240	L8	3244	L8	3248	L8	3252	L8	3256	L8	3260	L8	3264	L8	3268	L8	3272	L8	3276	L8	3280	L8	3284	L8	3288	L8	3292	L8	3296	L8	3300	L8	3304	L8	3308	L8	3312	L8	3316	L8	3320	L8	3324	L8	3328	L8	3332	L8	3336	L8	3340	L8	3344	L8	3348	L8	3352	L8	3356	L8	3360	L8	3364	L8	3368	L8	3372	L8	3376	L8	3380	L8	3384	L8	3388	L8	3392	L8	3396	L8	3400	L8	3404	L8	3408	L8	3412	L8	3416	L8	3420	L8	3424	L8	3428	L8	3432	L8	3436	L8	3440	L8	3444	L8	3448	L8	3452	L8	3456	L8	3460	L8	3464	L8	3468	L8	3472	L8	3476	L8	3480	L8	3484	L8	3488	L8	3492	L8	3496	L8	3500	L8	3504	L8	3508	L8	3512	L8	3516	L8	3520	L8	3524	L8	3528	L8	3532	L8	3536	L8	3540	L8	3544	L8	3548	L8	3552	L8	3556	L8	3560	L8	3564	L8	3568	L8	3572	L8	3576	L8	3580	L8	3584	L8	3588	L8	3592	L8	3596	L8	3600	L8	3604	L8	3608	L8	3612	L8	3616	L8	3620	L8	3624	L8	3628	L8	3632	L8	3636	L8	3640	L8	3644	L8	3648	L8	3652	L8	3656	L8	3660	L8	3664	L8	3668	L8	3672	L8	3676	L8	3680	L8	3684	L8	3688	L8	3692	L8	3696	L8	3700	L8	3704	L8	3708	L8	3712	L8	3716	L8	3720	L8	3724	L8	3728	L8	3732	L8	3736	L8	3740	L8	3744	L8	3748	L8	3752	L8	3756	L8	3760	L8	3764	L8	3768	L8	3772	L8	3776	L8	3780	L8	3784	L8	3788	L8	3792	L8	3796	L8	3800	L8	3804	L8	3808	L8	3812	L8	3816	L8	3820	L8	3824	L8	3828	L8	3832	L8	3836	L8	3840	L8	3844	L8	3848	L8	3852	L8	3856	L8	3860	L8	3864	L8	3868	L8	3872	L8	3876	L8	3880	L8	3884	L8	3888	L8	3892	L8	3896	L8	3900	L8	3904	L8	3908	L8	3912	L8	3916	L8	3920	L8	3924	L8	3928	L8	3932	L8	3936	L8	3940	L8	3944	L8	3948	L8	3952	L8	3956	L8	3960	L8	3964	L8	3968	L8	3972	L8	3976	L8	3980	L8	3984	L8	3988	L8	3992	L8	3996	L8	4000	L8
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TUNER 95 bis



Δ only in RDS version (04121)
 ○ not in RDS version (04341)

..... V FM mode stereo
 [---] V FM
 [---] V AM
 [---] V AF

ELECTRICAL PARTS LIST - TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47µF 20% 25V	3130	4822 051 10008	0R 5% 0,25W
2106	4822 125 60102	Trimmer 5,2-30pF 100V	3131	4822 051 10008	0R 5% 0,25W
2107	4822 121 51252	470nF 5% 63V	3132	4822 051 20008	0R Jumper 0805
2108	4822 126 13695	82pF 1% 63V	3134	4822 051 20223	22k 5% 0,1W
2109	4822 126 13691	27pF 1% 63V	3137	4822 117 10833	10k 1% 0,1W
2120	5322 122 32659	33pF 5% 50V	3138	4822 051 20008	0R Jumper 0805
2122	5322 126 10465	3,9nF 10% 63V	3139	4822 051 10008	0R 5% 0,25W
2125	4822 121 10578	560P 1% 630V	3140	4822 051 20331	330R 5% 0,1W
2127	4822 122 32927	220nF +80/-20% 50V	3141	4822 051 20563	56k 5% 0,1W
2128	4822 124 41579	10µF 20% 50V	3142	4822 100 11163	Trimmer 100k 30% 0,1W
2129	4822 124 40242	1µF 20% 63V	3143	4822 051 20223	22k 5% 0,1W
2130	4822 126 11585	22nF +80/-20% 25V	3144	4822 051 10102	1k 2% 0,25W
2131	4822 122 33325	470nF 16V	3145	4822 117 11449	2k2 1% 0,1W
2132	4822 122 33325	470nF 16V	3146	4822 051 20479	47R 5% 0,1W
2133	4822 124 40242	1µF 20% 63V	3150	4822 051 20472	4k7 5% 0,1W
2134	4822 126 13188	15nF 5% 63V	3151	4822 051 20683	68k 5% 0,1W
2135	4822 122 32927	220nF +80/-20% 50V	3152	4822 051 20471	470R 5% 0,1W
2136	4822 126 13188	15nF 5% 63V	3153	4822 051 20471	470R 5% 0,1W
2137	4822 122 32927	220nF +80/-20% 50V	3154	4822 116 83872	220R 5% 0,5W
2138	4822 124 41576	2,2µF 20% 50V	3155	4822 116 52219	330R 5% 0,5W
2140	4822 121 51252	470nF 5% 63V	3158	4822 116 83883	470R 5% 0,5W
2141	4822 122 31947	100nF 20% 63V	3159	4822 116 83883	470R 5% 0,5W
2142	4822 122 31947	100nF 20% 63V	3160	4822 116 83883	470R 5% 0,5W
2143	4822 122 32927	220nF +80/-20% 50V	3161	4822 116 83883	470R 5% 0,5W
2144	4822 124 40242	1µF 20% 63V	3162	4822 051 20224	220k 5% 0,1W
2145	4822 122 33575	220pF 5% 50V	3163	4822 051 10008	0R 5% 0,25W
2147	4822 122 33575	220pF 5% 50V	3164	4822 052 10478	4R7 5% 0,33W
2148	4822 122 33809	22nF 20% 50V	3165	4822 051 10008	0R 5% 0,25W
2150	4822 122 31947	100nF 20% 63V	3167	4822 116 83872	220R 5% 0,5W
2151	4822 126 14236	50V 15pF 5%	3169	4822 051 20008	0R Jumper 0805
2152	4822 126 13695	82pF 1% 63V	3171	4822 051 20008	0R Jumper 0805
2158	4822 122 31947	100nF 20% 63V	3172	4822 051 10008	0R 5% 0,25W
2160	4822 122 32139	12pF 2% 63V	3173	4822 051 20008	0R Jumper 0805
2161	5322 122 34123	1nF 10% 50V	3176	4822 051 20008	0R Jumper 0805
2162	4822 124 81151	22µF 50V	3177	4822 051 20223	22k 5% 0,1W

RESISTORS

3103	4822 051 20008	0R Jumper 0805	3181	4822 051 10008	0R 5% 0,25W
3104	4822 051 10102	1k 2% 0,25W	3183	4822 051 10008	0R 5% 0,25W
3107	4822 051 20829	82R 5% 0,1W	3184	4822 051 10008	0R 5% 0,25W
3108	4822 117 11449	2k2 1% 0,1W	3185	4822 051 10008	0R 5% 0,25W
3109	4822 117 11449	2k2 1% 0,1W	3186	4822 051 10102	1k 2% 0,25W
3123	4822 051 10008	0R 5% 0,25W	3188	4822 051 10008	0R 5% 0,25W
3124	4822 051 10008	0R 5% 0,25W	3192	4822 051 20008	0R Jumper 0805
3125	4822 116 83864	10k 5% 0,5W	3197	4822 051 20472	4k7 5% 0,1W
3128	4822 116 52256	2k2 5% 0,5W			
3129	4822 051 20008	0R Jumper 0805			

COILS & FILTERS

5102	4822 157 71634	MW AERIAL
5103	4822 157 71635	LW AERIAL
5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz

ELECTRICAL PARTS LIST - TUNER 95 BOARD

5114	4822 157 70302	AM-IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHz
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

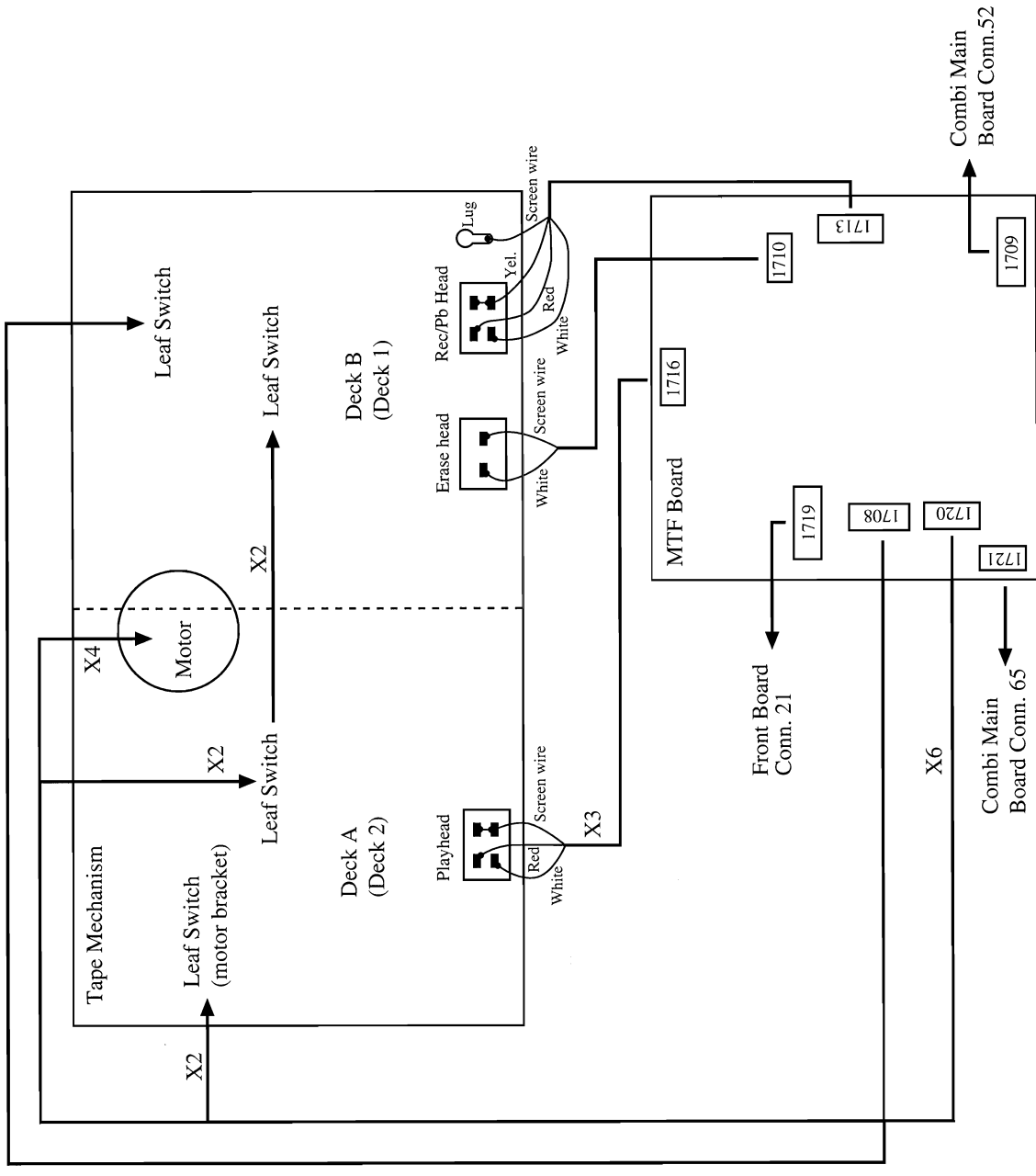
6105	4822 130 83075	HN1V02H-B
6107	4822 130 34488	BZX79-B11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

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

Tape Deck Wiring Diagram



MTF MODULE

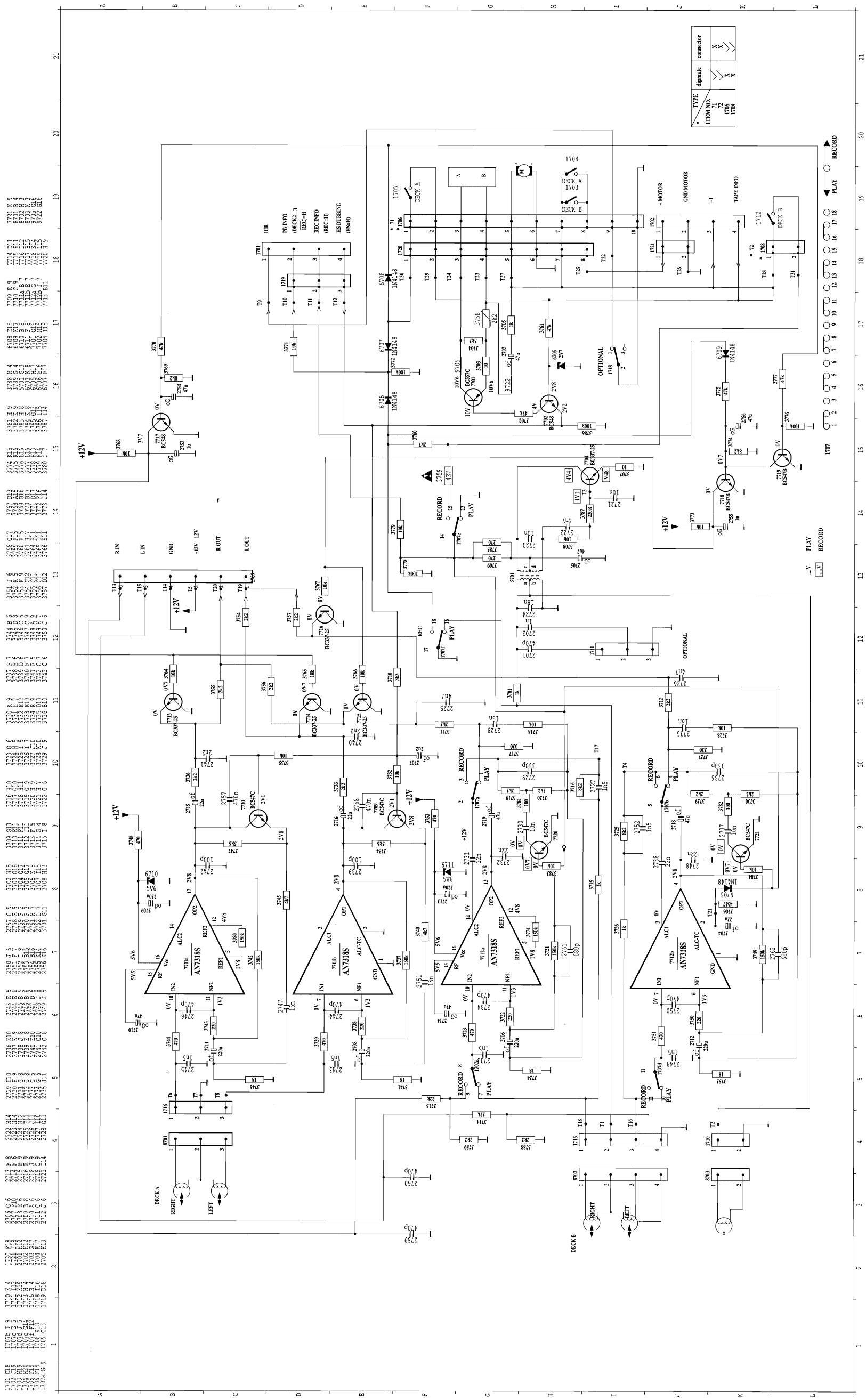
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TAPE MECHANISM ADJUSTMENT

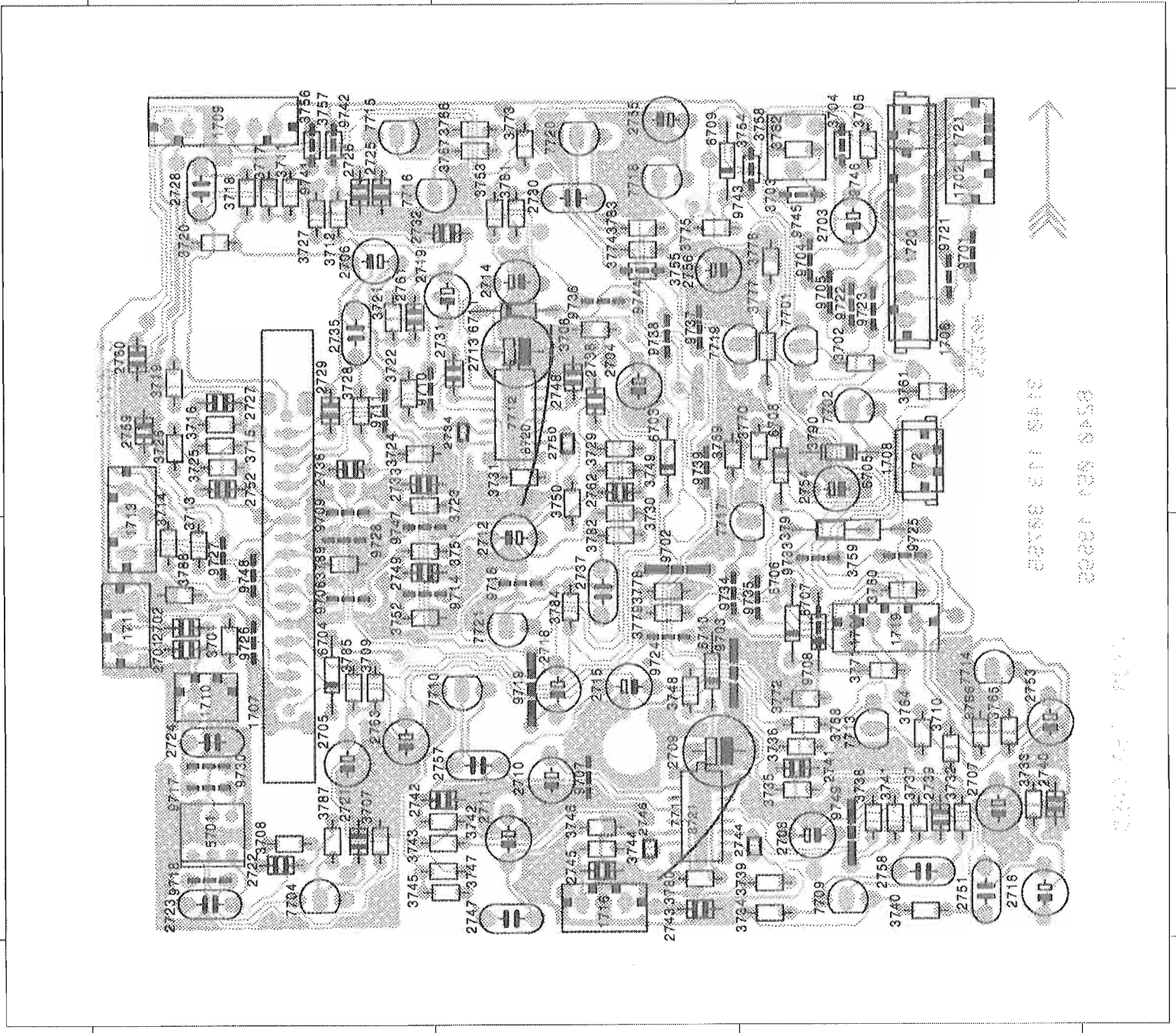
ADJUSTMENT	CASSETTE	DECK 1 (DECK B)	DECK 2 (DECK A)	MEASURE ON	READ ON	ADJUST WITH	ADJUST TO
Azimuth	10kHz	Play	-	L & R out T019/T020	mV-meter	Left hand screw of Play or R/P head	Maximum L = R
	SBC420*	-	Play				
Motor speed	3150Hz	Play	-	L & R out T019/T020	Wow and Flutter meter	3758	**a
	SBC420*	-	Play				

* SBC 420: 4822 397 30071
 **a: The maximum permissible speed deviation is +3/-2%.
 Moreover, the Wow & Flutter value can be read.
 This value should not exceed 0.4%.



2

1



A

B

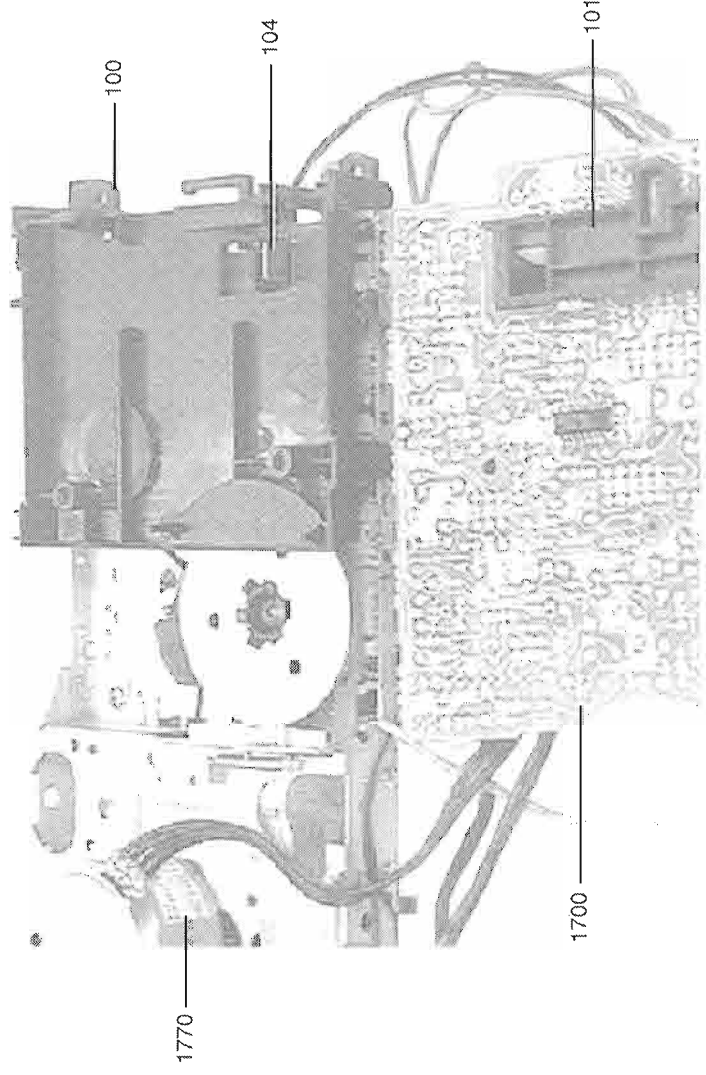
C

1

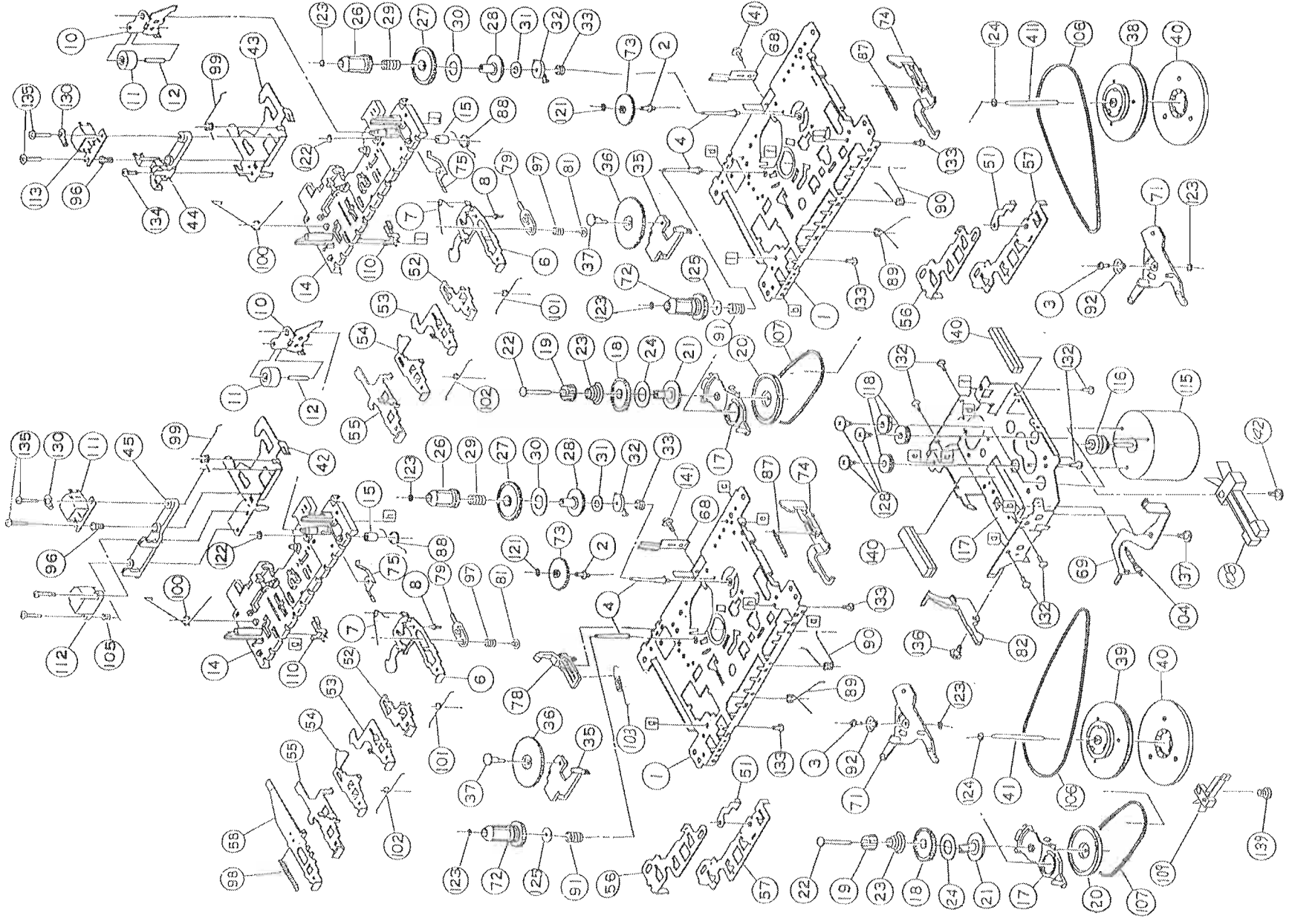
2

71 C 2	2744 C 1	3737 C 1	6704 A 1	9741 A 2
72 C 2	2745 B 1	3738 C 1	6705 C 2	9742 A 2
1701 C 1	2746 B 1	3739 C 1	6706 C 1	9743 C 2
1702 C 2	2747 B 1	3740 C 1	6707 C 1	9744 B 2
1706 C 2	2748 B 2	3741 C 1	6708 C 2	9745 C 2
1707 A 1	2749 A 1	3742 B 1	6709 B 2	9746 C 2
1708 C 2	2750 B 2	3743 B 1	6710 B 1	9747 A 1
1709 A 2	2751 C 1	3744 B 1	6711 B 2	9748 A 1
1710 A 1	2752 A 2	3745 B 1	7701 C 2	9749 C 1
1711 A 1	2753 C 1	3746 B 1	7702 C 2	
1713 A 1	2754 C 2	3747 B 1	7704 A 1	
1716 B 1	2755 B 2	3748 B 1	7709 C 1	
1719 C 1	2756 B 2	3749 B 2	7710 B 1	
1720 C 2	2757 B 1	3750 B 2	7711 B 1	
1721 C 2	2758 C 1	3751 A 1	7712 B 2	
2701 A 1	2759 A 2	3752 A 1	7713 C 1	
2702 A 1	2760 A 2	3753 B 2	7714 C 1	
2703 C 2	2761 A 2	3754 C 2	7715 A 2	
2704 B 2	2762 B 2	3755 B 2	7716 B 2	
2705 A 1	2763 A 1	3756 A 2	7717 C 1	
2706 A 2	3701 A 1	3757 A 2	7718 B 2	
2707 C 1	3702 C 2	3758 C 2	7719 C 2	
2708 C 1	3703 C 2	3759 C 1	7720 B 2	
2709 B 1	3704 C 2	3760 C 1	7721 B 1	
2710 B 1	3705 C 2	3761 C 2	9701 C 2	
2711 B 1	3706 B 2	3762 C 2	9702 B 1	
2712 B 1	3707 A 1	3764 C 1	9703 B 1	
2713 B 2	3708 A 1	3765 C 1	9704 C 2	
2714 B 2	3709 A 1	3766 B 2	9705 C 2	
2715 B 1	3710 C 1	3767 B 2	9706 A 1	
2716 C 1	3711 A 2	3768 C 1	9707 B 1	
2718 B 1	3712 A 2	3769 B 2	9708 C 1	
2719 B 2	3713 A 1	3770 C 2	9709 A 2	
2721 A 1	3714 A 1	3771 C 1	9710 A 2	
2722 A 1	3715 A 2	3772 C 1	9711 A 2	
2723 A 1	3716 A 2	3773 B 2	9714 A 1	
2724 A 1	3717 A 2	3774 B 2	9716 B 1	
2725 A 2	3718 A 2	3775 B 2	9717 A 1	
2726 A 2	3719 A 2	3776 C 2	9718 A 1	
2727 A 2	3720 A 2	3777 C 2	9719 B 1	
2728 A 2	3721 A 2	3778 B 1	9721 C 2	
2729 A 2	3722 A 2	3779 B 1	9722 C 2	
2730 B 2	3723 A 2	3780 B 1	9723 C 2	
2731 B 2	3724 A 2	3781 B 2	9724 B 1	
2732 B 2	3725 A 2	3782 B 1	9725 C 1	
2733 A 2	3726 A 2	3783 B 2	9726 A 1	
2734 B 2	3727 A 2	3784 B 1	9727 A 1	
2735 A 2	3728 A 2	3785 A 1	9728 A 1	
2736 A 2	3729 B 2	3786 C 1	9730 A 1	
2737 B 1	3730 B 2	3787 A 1	9733 C 1	
2738 B 2	3731 B 2	3788 A 1	9734 B 1	
2739 C 1	3732 C 1	3789 A 1	9735 C 1	
2740 C 1	3733 C 1	3790 C 2	9736 B 2	
2741 C 1	3734 C 1	3791 C 1	9737 B 2	
2742 B 1	3735 C 1	5701 A 1	9738 B 2	
2743 B 1	3736 C 1	6703 B 2	9739 B 2	

MTF MODULE PICTURE



TAPE MECHANISM



MECHANICAL PARTS LIST - MTF MODULE

MTF MODULE		TAPE MECHANISM	
101	4822 402 10126	10-12	4822 528 11189
	Lever Recording		Pinch Roller Assembly
104	4822 492 11061	17-24	4822 402 10966
	Spring Recording		FR Arm Assembly
1770	4822 691 10669	38-41	4822 528 11242
	Tape Mechanism CDS-83WPC		Flywheel (W) Assembly
		39-41	4822 528 11243
			Flywheel Assembly
		106	4822 558 31225
			Main Belt (W2) 1.1x59.5
		107	4822 558 31124
			Sub Belt
		108	4822 277 11753
			Leaf Switch
		109	4822 277 11754
			Leaf Switch
		110	4822 278 90663
			Leaf Switch
		111	4822 249 30218
			Rec/PB Head
		112	4822 249 10548
			Erase Head
		113	4822 249 30218
			Play Head
		115-116	4822 361 11053
			Motor Assembly
		118	4822 466 11787
			Motor Cushion
		122	4822 532 12937
			Washer PSW-S 1.6x3.5x0.4

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

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

ELECTRICAL PARTS LIST - MTF BOARD**MISCELLANEOUS**

1707	4822 277 11504	Recording Switch
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CAPACITORS

2703	4822 124 40433	47μF 20% 25V
2704	4822 124 81151	22μF 50V
2705	4822 124 40246	4,7μF 20% 63V
2706	4822 124 12068	220μF 20% 10V
2707	4822 124 41576	2,2μF 20% 50V
2708	4822 124 12068	220μF 20% 10V
2709	4822 124 80144	220μF 20% 25V
2710	4822 124 40433	47μF 20% 25V
2711	4822 124 12068	220μF 20% 10V
2712	4822 124 12068	220μF 20% 10V
2713	4822 124 80144	220μF 20% 25V
2714	4822 124 40433	47μF 20% 25V
2715	4822 124 81151	22μF 50V
2716	4822 124 81151	22μF 50V
2718	4822 124 40433	47μF 20% 25V
2719	4822 124 40433	47μF 20% 25V
2721	4822 121 51387	10nF 20% 16V
2722	4822 126 11714	4,7nF 20%
2723	4822 121 41857	10nF 5% 250V
2724	4822 121 51306	18nF 10% 50V
2725	4822 126 11714	4,7nF 20%
2726	4822 126 11714	4,7nF 20%
2727	4822 126 12878	1,5nF 10% 16V
2728	4822 121 51305	15nF 10% 50V
2729	4822 126 12787	330pF 10% 50V
2730	4822 121 51304	10nF 10% 50V
2731	4822 126 11585	22nF +80/-20% 25V
2732	4822 126 11585	22nF +80/-20% 25V
2733	4822 126 12878	1,5nF 10% 16V
2734	5322 122 32311	470pF 10% 100V
2735	4822 121 51305	15nF 10% 50V
2736	4822 126 12787	330pF 10% 50V
2737	4822 121 51304	10nF 10% 50V
2738	4822 126 11585	22nF +80/-20% 25V
2739	4822 122 33195	100pF 10% 50V
2740	4822 126 12339	2,2nF 10% Y5R
2741	4822 126 12339	2,2nF 10% Y5R
2742	4822 122 33195	100pF 10% 50V
2743	4822 126 12878	1,5nF 10% 16V
2744	5322 122 32311	470pF 10% 100V
2745	4822 126 12878	1,5nF 10% 16V
2746	5322 122 32311	470pF 10% 100V
2747	4822 121 51305	15nF 10% 50V
2748	4822 126 11585	22nF +80/-20% 25V
2749	4822 126 12878	1,5nF 10% 16V
2750	5322 122 32311	470pF 10% 100V
2751	4822 121 51305	15nF 10% 50V
2752	4822 126 12878	1,5nF 10% 16V
2753	4822 124 40242	1μF 20% 63V

2754	4822 124 40433	47μF 20% 25V
2755	4822 124 40242	1μF 20% 63V
2756	4822 124 40433	47μF 20% 25V
2757	4822 121 51252	470nF 5% 63V
2758	4822 121 51252	470nF 5% 63V
2759	4822 122 33519	470pF 10% 50V
2760	4822 122 33519	470pF 10% 50V
2761	4822 126 14316	680pF 10% 50V
2762	4822 126 14316	680pF 10% 50V

RESISTORS

3701	4822 050 21002	1k 1% 0,6W
3702	4822 116 83884	47k 5% 0,5W
3703	4822 050 11009	10R 1% 0,4W
3704	4822 050 13302	3k3 1% 0,4W
3705	4822 050 21002	1k 1% 0,6W
3706	4822 111 30893	4M7 5% 0,2W
3707	4822 116 52176	10R 5% 0,5W
3708	4822 050 11003	10k 1% 0,4W
3709	4822 111 20434	270R
3710	4822 116 52269	3k3 5% 0,5W
3711	4822 050 12202	2k2 1% 0,4W
3712	4822 050 12202	2k2 1% 0,4W
3713	4822 116 52257	22k 5% 0,5W
3714	4822 116 52257	22k 5% 0,5W
3715	4822 050 11002	1k 1% 0,4W
3716	4822 050 18202	8k2 1% 0,4W
3717	4822 116 52219	330R 5% 0,5W
3718	4822 050 11003	10k 1% 0,4W
3719	4822 050 12202	2k2 1% 0,4W
3720	4822 050 12202	2k2 1% 0,4W
3721	4822 116 52245	150k 5% 0,5W
3722	4822 116 83872	220R 5% 0,5W
3723	4822 116 83883	470R 5% 0,5W
3724	4822 116 52184	18R 5% 0,5W
3725	4822 050 18202	8k2 1% 0,4W
3726	4822 050 11002	1k 1% 0,4W
3727	4822 116 52219	330R 5% 0,5W
3728	4822 050 11003	10k 1% 0,4W
3729	4822 050 12202	2k2 1% 0,4W
3730	4822 050 12202	2k2 1% 0,4W
3731	4822 116 52245	150k 5% 0,5W
3732	4822 116 83864	10k 5% 0,5W
3733	4822 116 52256	2k2 5% 0,5W
3734	4822 050 15602	5k6 1% 0,4W
3735	4822 116 83864	10k 5% 0,5W
3736	4822 116 52256	2k2 5% 0,5W
3737	4822 116 52245	150k 5% 0,5W
3738	4822 116 83872	220R 5% 0,5W
3739	4822 116 83883	470R 5% 0,5W
3740	4822 116 52283	4k7 5% 0,5W
3741	4822 116 52184	18R 5% 0,5W

ELECTRICAL PARTS LIST - MTF BOARD**RESISTORS**

3742	4822 116 52245	150k 5% 0,5W
3743	4822 116 83872	220R 5% 0,5W
3744	4822 116 83883	470R 5% 0,5W
3745	4822 116 52283	4k7 5% 0,5W
3746	4822 116 52184	18R 5% 0,5W
3747	4822 050 15602	5k6 1% 0,4W
3748	4822 116 83883	470R 5% 0,5W
3749	4822 116 52245	150k 5% 0,5W
3750	4822 116 83872	220R 5% 0,5W
3751	4822 116 83883	470R 5% 0,5W
3752	4822 116 52184	18R 5% 0,5W
3753	4822 116 83883	470R 5% 0,5W
3754	4822 050 12202	2k2 1% 0,4W
3755	4822 050 12202	2k2 1% 0,4W
3756	4822 050 12202	2k2 1% 0,4W
3757	4822 050 12202	2k2 1% 0,4W
3758	4822 101 11166	Trimmer 2k2
3759	4822 052 10478	△ 4R7 5% 0,33W
3760	4822 050 12702	2k7 1% 0,4W
3761	4822 116 83884	47k 5% 0,5W
3764	4822 116 83864	10k 5% 0,5W
3765	4822 116 83864	10k 5% 0,5W
3766	4822 050 11003	10k 1% 0,4W
3767	4822 050 11003	10k 1% 0,4W
3768	4822 116 83864	10k 5% 0,5W
3769	4822 050 18202	8k2 1% 0,4W
3770	4822 116 83884	47k 5% 0,5W
3771	4822 116 83864	10k 5% 0,5W
3772	4822 116 52234	100k 5% 0,5W
3773	4822 050 11003	10k 1% 0,4W
3774	4822 050 18202	8k2 1% 0,4W
3775	4822 116 83884	47k 5% 0,5W
3776	4822 050 11004	100k 1% 0,4W
3777	4822 116 83884	47k 5% 0,5W
3778	4822 116 52234	100k 5% 0,5W
3779	4822 116 83864	10k 5% 0,5W
3780	4822 050 11504	150k 1% 0,4W
3781	4822 050 11001	100R 1% 0,4W
3782	4822 050 11001	100R 1% 0,4W
3783	4822 116 83864	10k 5% 0,5W
3784	4822 116 83864	10k 5% 0,5W
3785	4822 111 20434	270R
3786	4822 116 52234	100k 5% 0,5W
3787	4822 116 83872	220R 5% 0,5W
3788	4822 050 12202	2k2 1% 0,4W
3789	4822 050 12202	2k2 1% 0,4W

COILS

5701	4822 157 10371	Osc Coil 100kHz
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DIODES

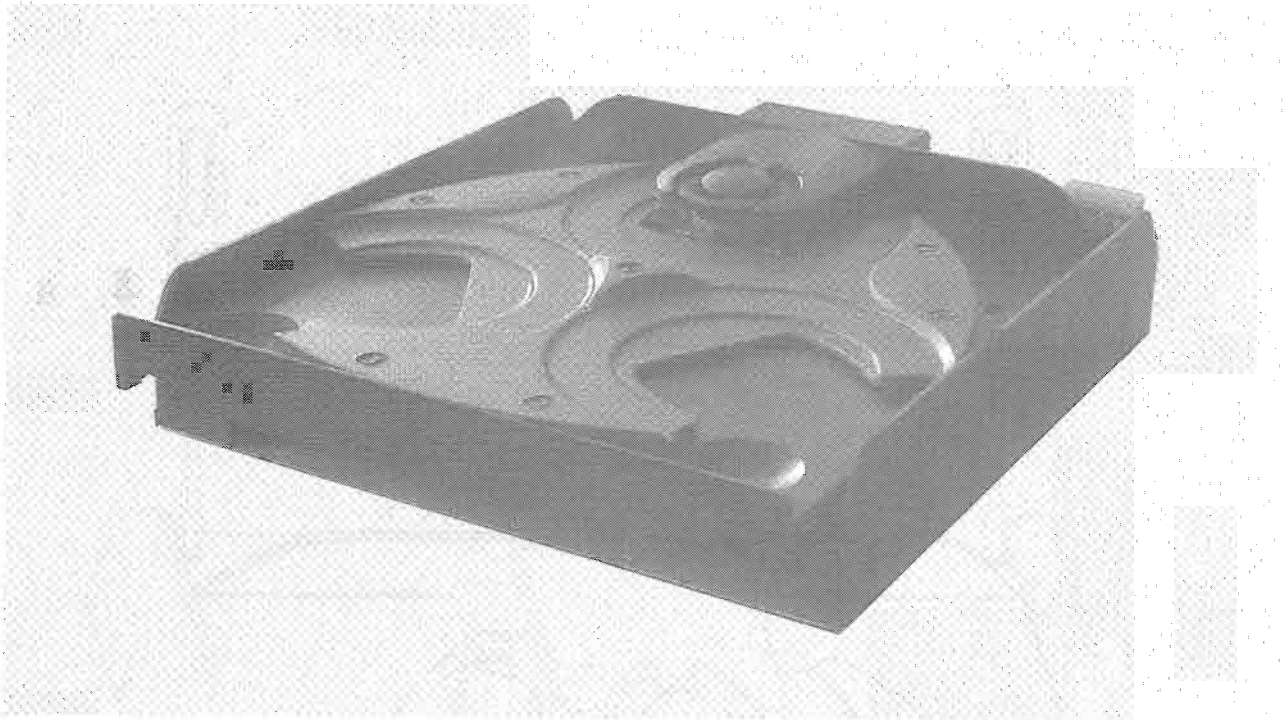
6703	4822 130 30621	1N4148
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6705	5322 130 34563	BZX79-C2V7
6706	4822 130 30621	1N4148
6707	4822 130 30621	1N4148
6708	4822 130 30621	1N4148
6709	4822 130 30621	1N4148
6710	4822 130 34173	BZX79-B5V6
6711	4822 130 34173	BZX79-B5V6

TRANSISTORS & INTEGRATED CIRCUITS

7701	4822 130 42231	BC557C
7702	4822 130 40938	BC548
7704	4822 130 40981	BC337-25
7709	4822 130 44503	BC547C
7710	4822 130 44503	BC547C
7711	4822 209 32918	AN7318S
7712	4822 209 32918	AN7318S
7713	4822 130 40981	BC337-25
7714	4822 130 40981	BC337-25
7715	4822 130 40981	BC337-25
7716	4822 130 40981	BC337-25
7717	4822 130 40938	BC548
7718	4822 130 40959	BC547B
7719	4822 130 40959	BC547B
7720	4822 130 44503	BC547C
7721	4822 130 44503	BC547C

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



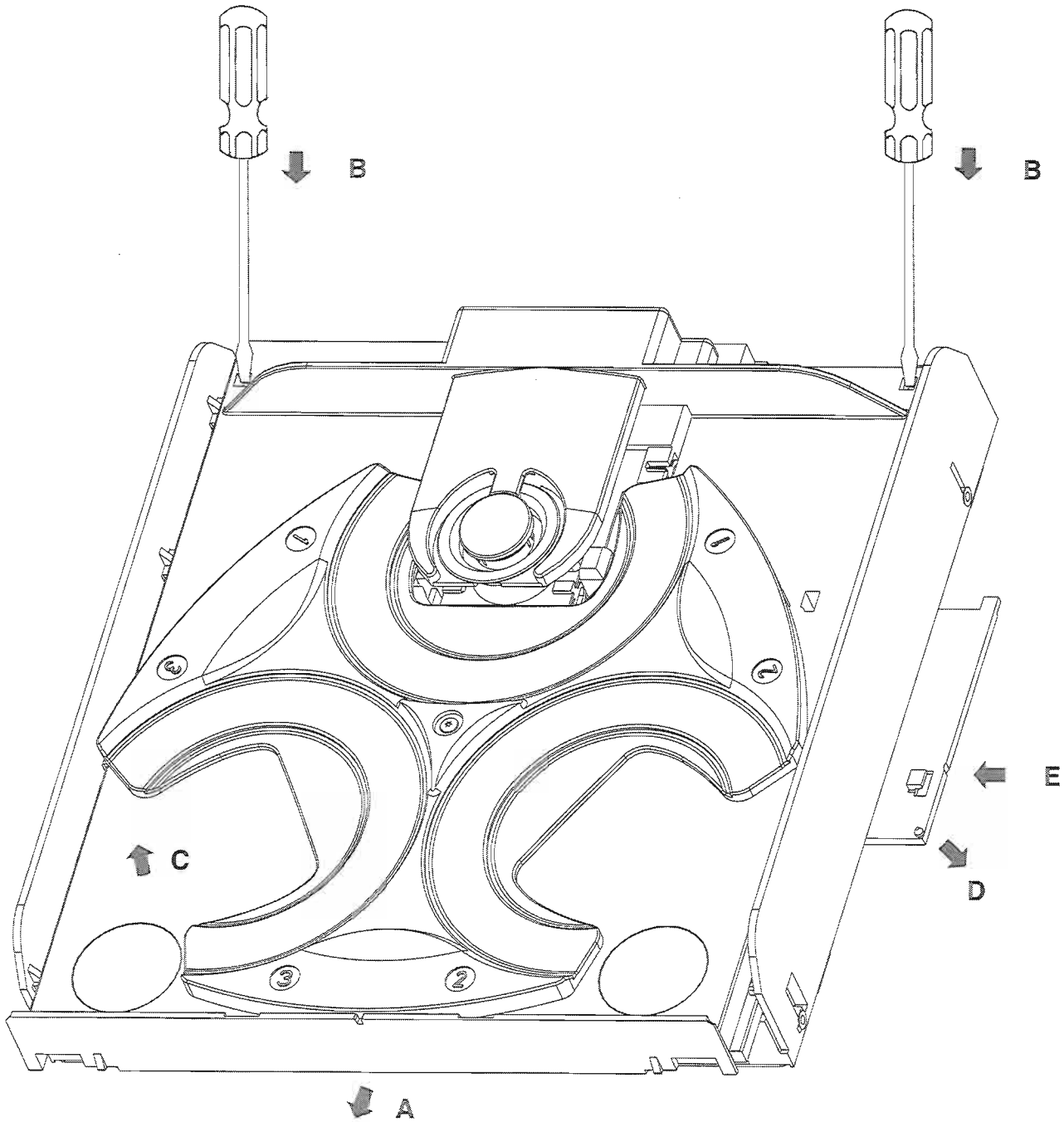
3CDC Module

(3 Disc Carousel Changer)

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Demounting Hints



Demounting of Drawer

- A Pull drawer outwards
- B Unlock drawer with screwdriver
- C Lift drawer to demount from chassis

Demounting of Flex Plate

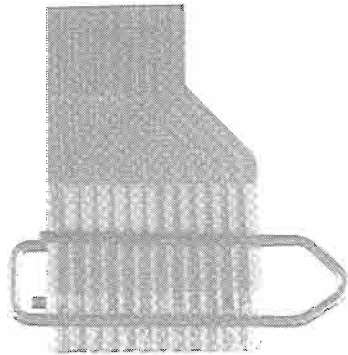
- D Lift plate to unlock pin from bottom plate
- E Move plate inwards to demount from bottom plate

Servicing Hints

Replacement of CD Drive

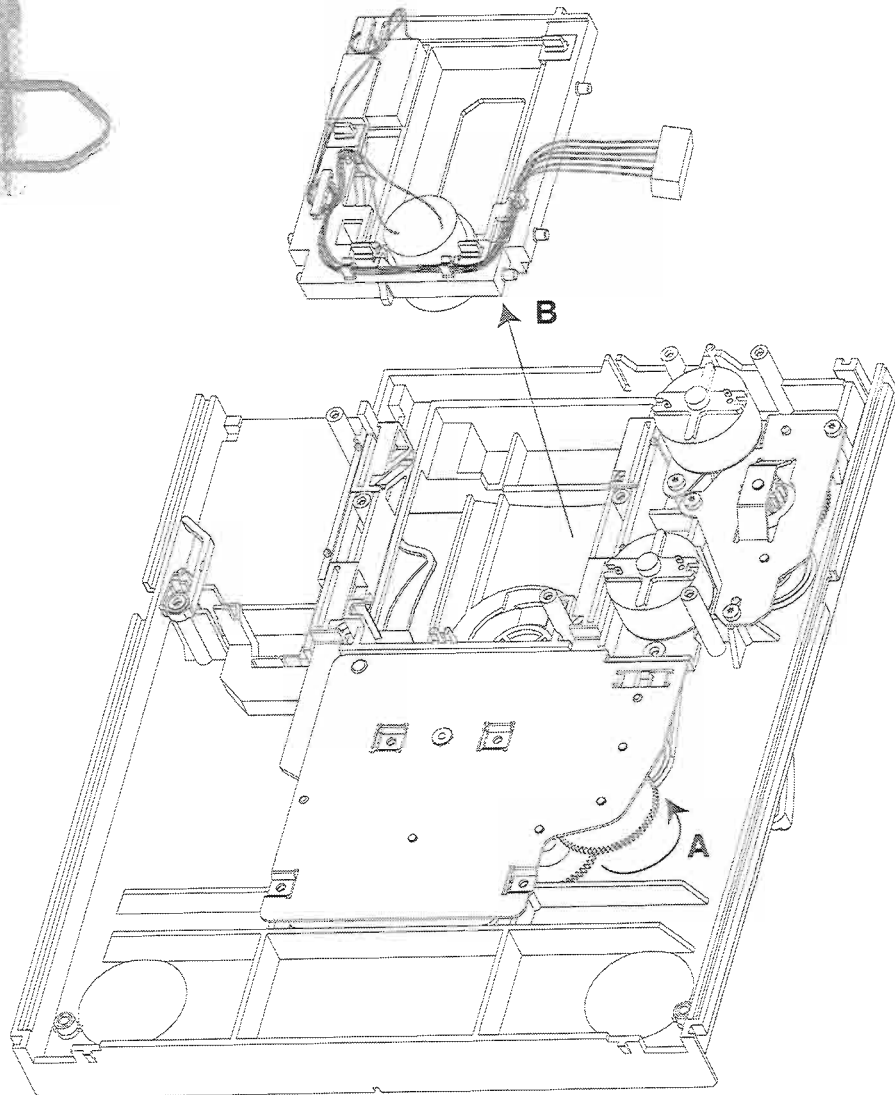
See also exploded view of changer mechanism.

1. Demount flex plate (pos 140).
2. Demount printed circuit board: remove 6 screws and desolder lips of tray motor and carousel motor.
3. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.



CD drive flex foil

4. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
5. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below (A).
6. Demount CD drive support (pos 95) (B).
7. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.

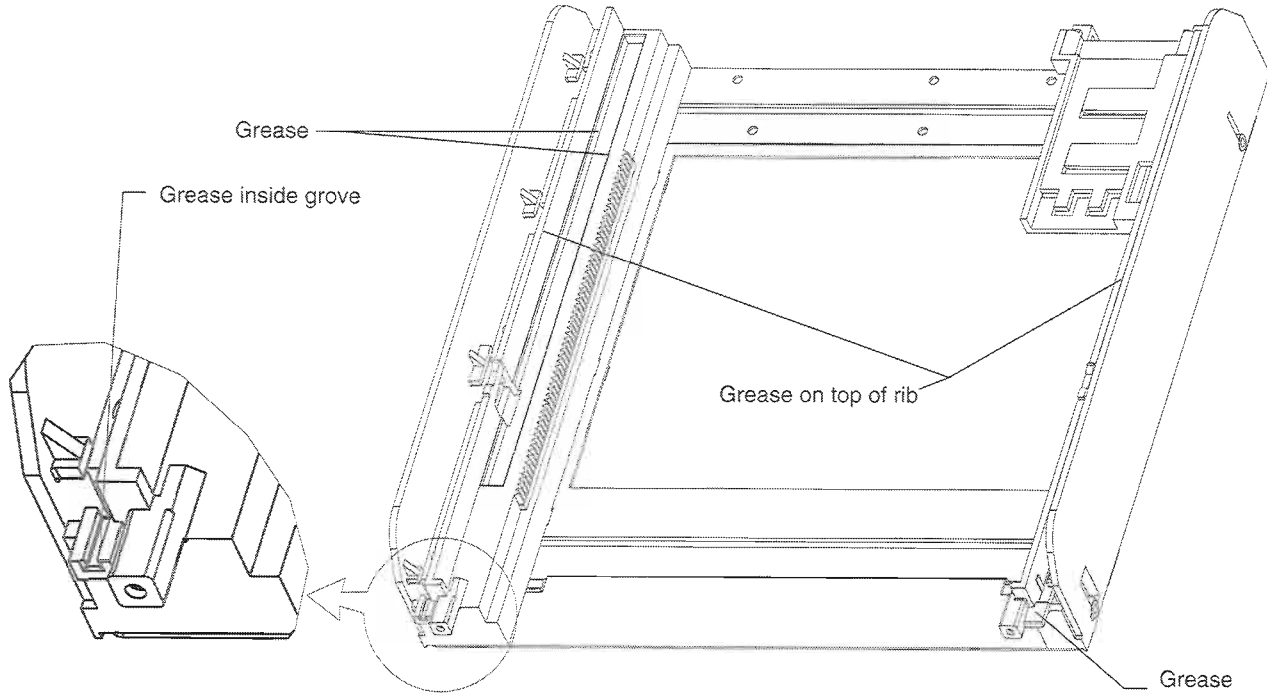


Mounting of Carrousel

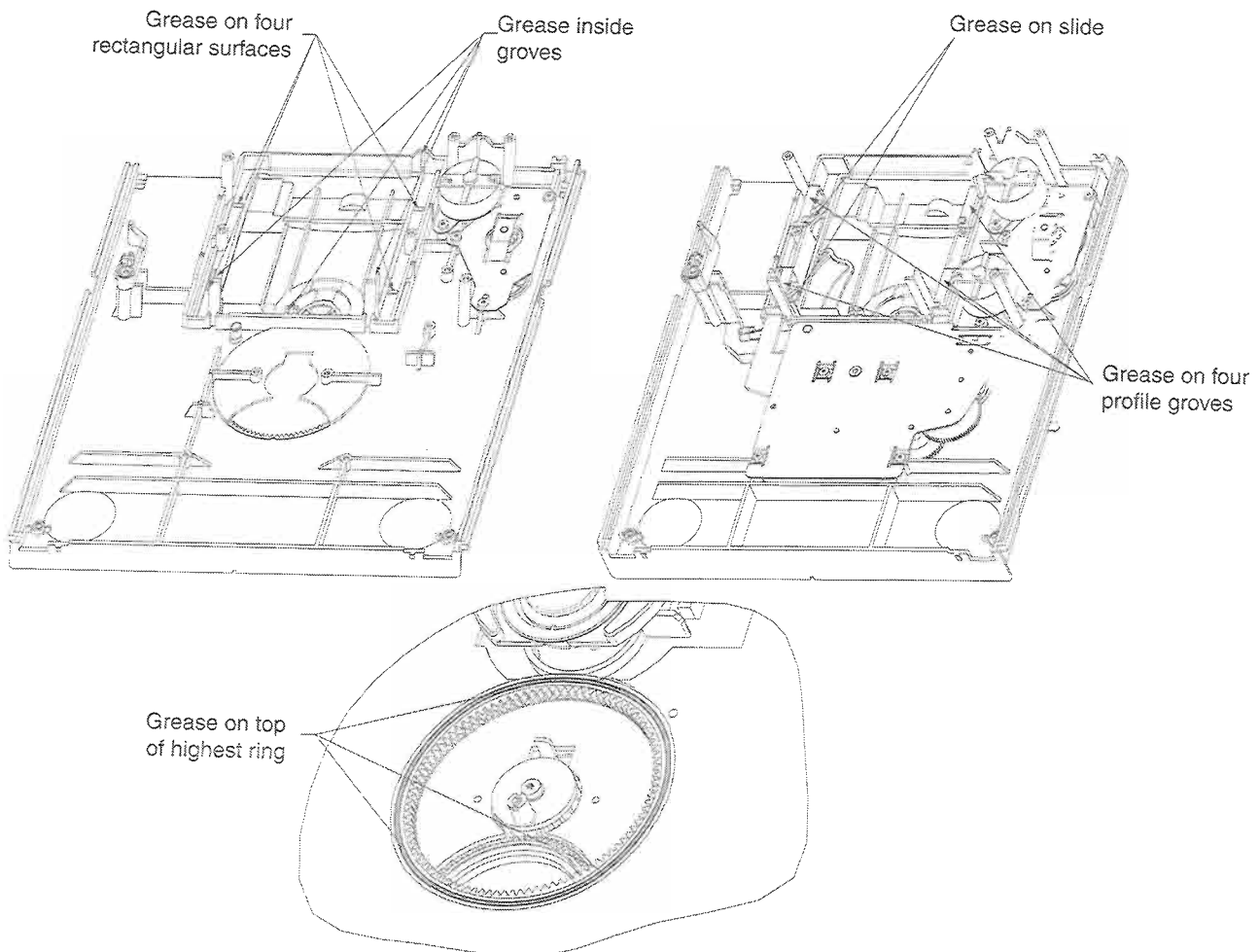
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn't matter.

Lubrication Instructions

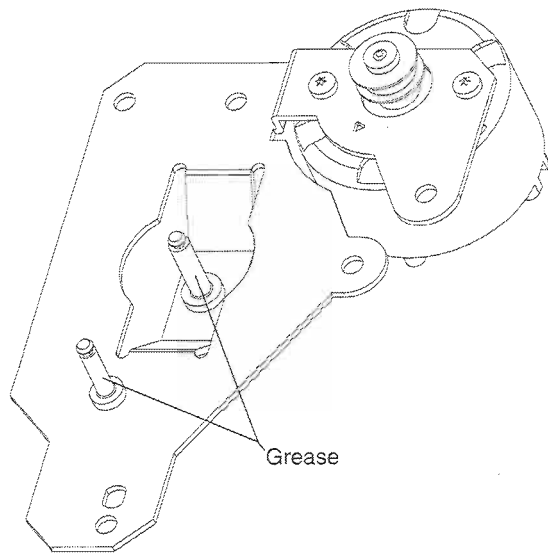
CHASSIS



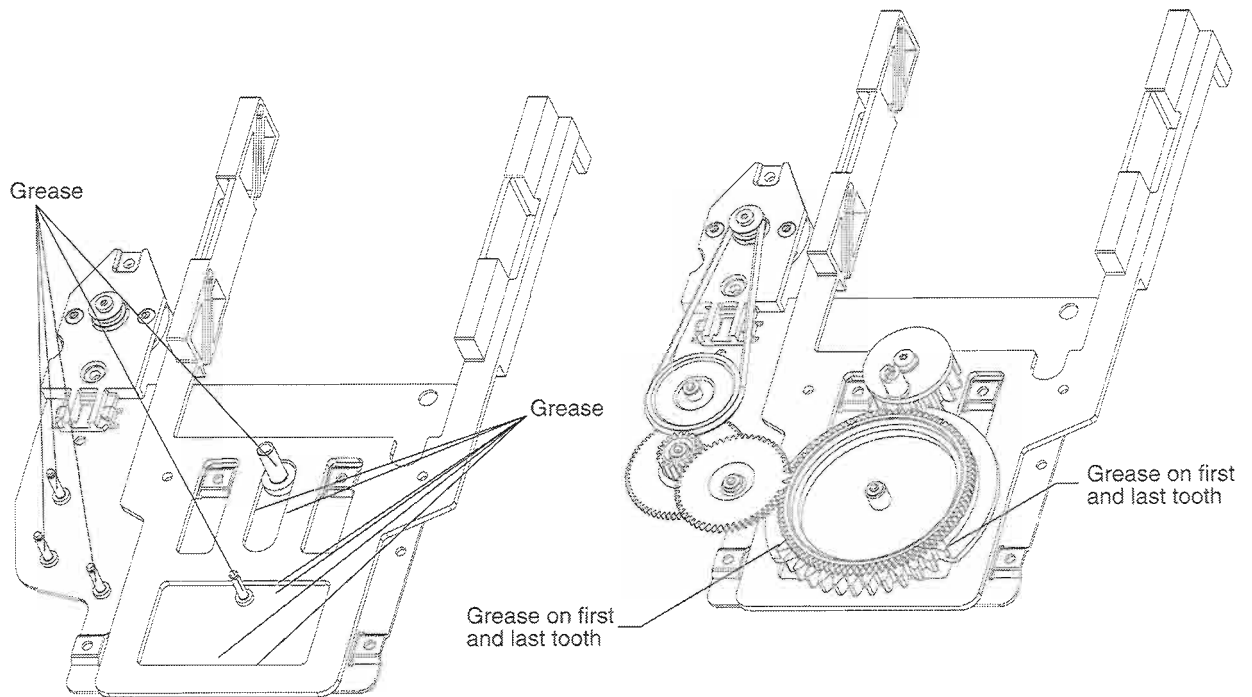
DRAWER



DRAWER MECHANISM



DISC CHANGE MECHANISM



Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

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

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

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

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

1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with brass-sheet (4822 321 11197) plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

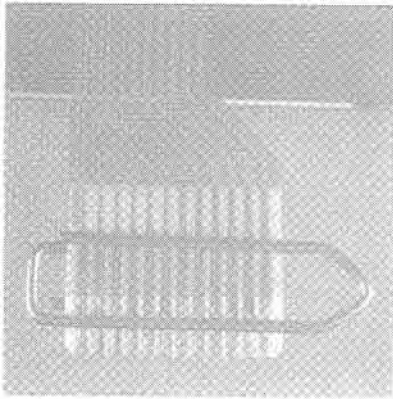


fig.1

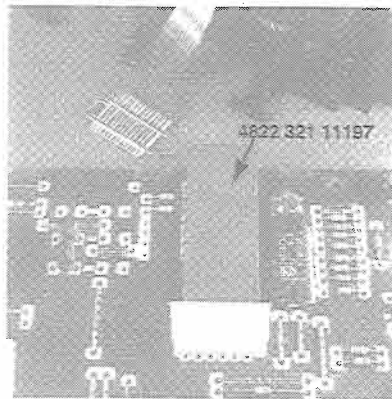
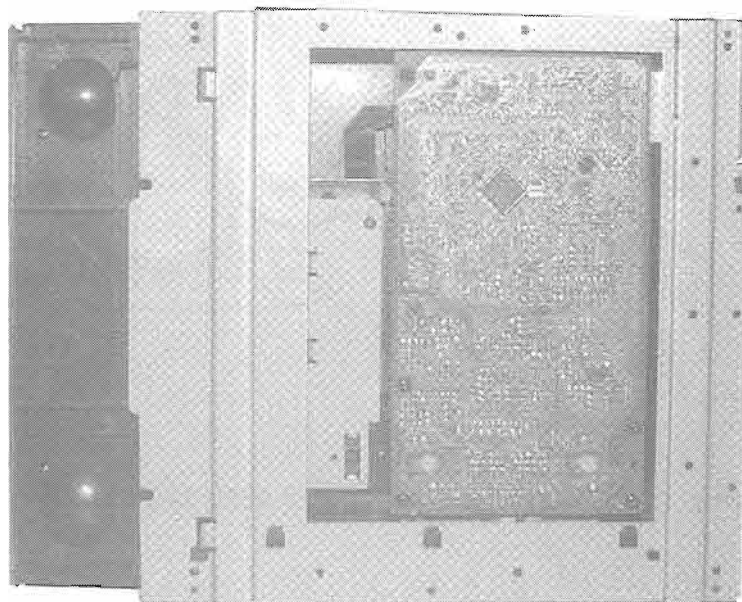


fig.2

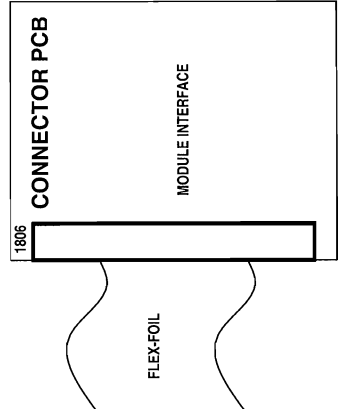
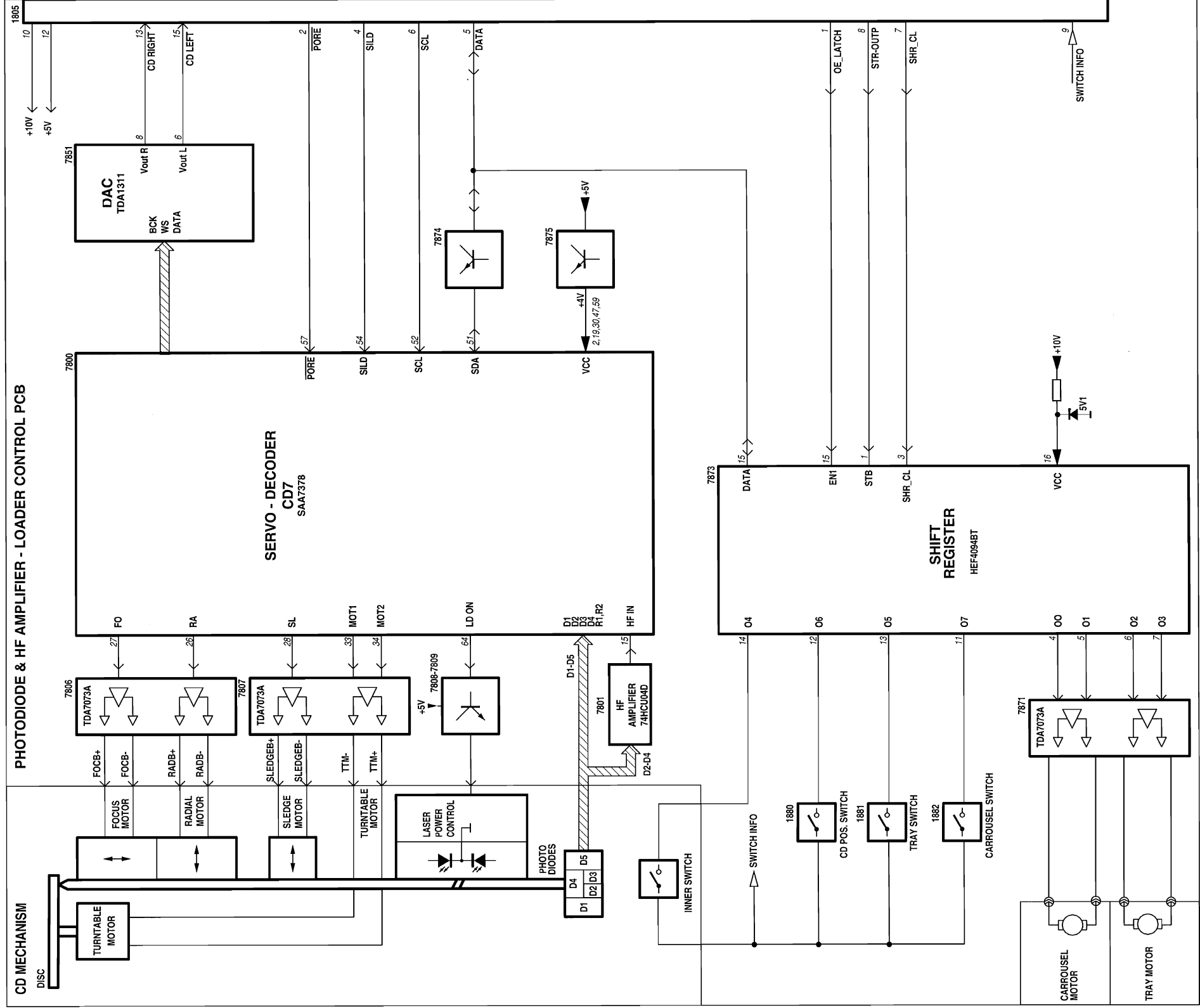


fig.3

Service Position



Blockdiagram

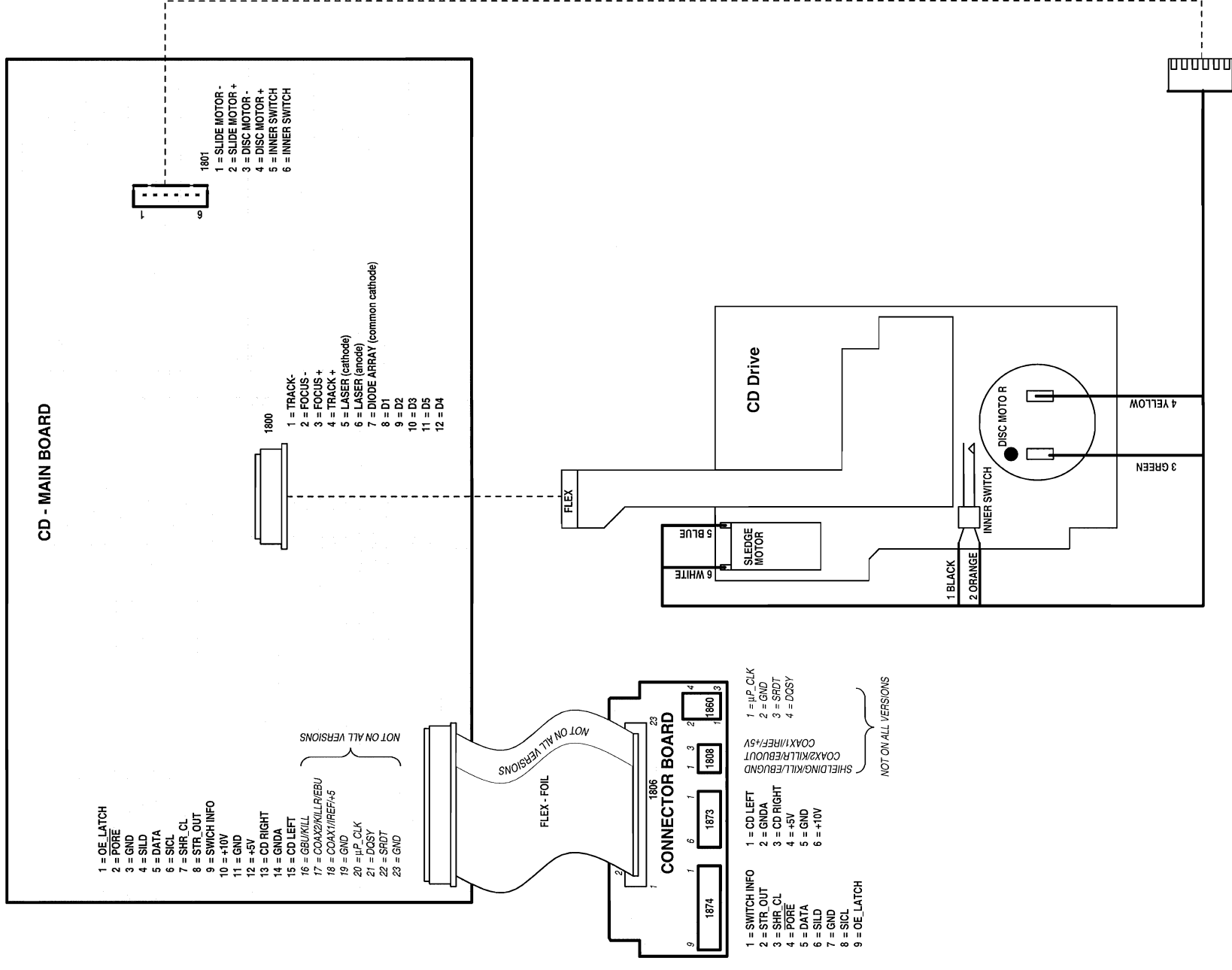


NOT ON ALL VERSIONS

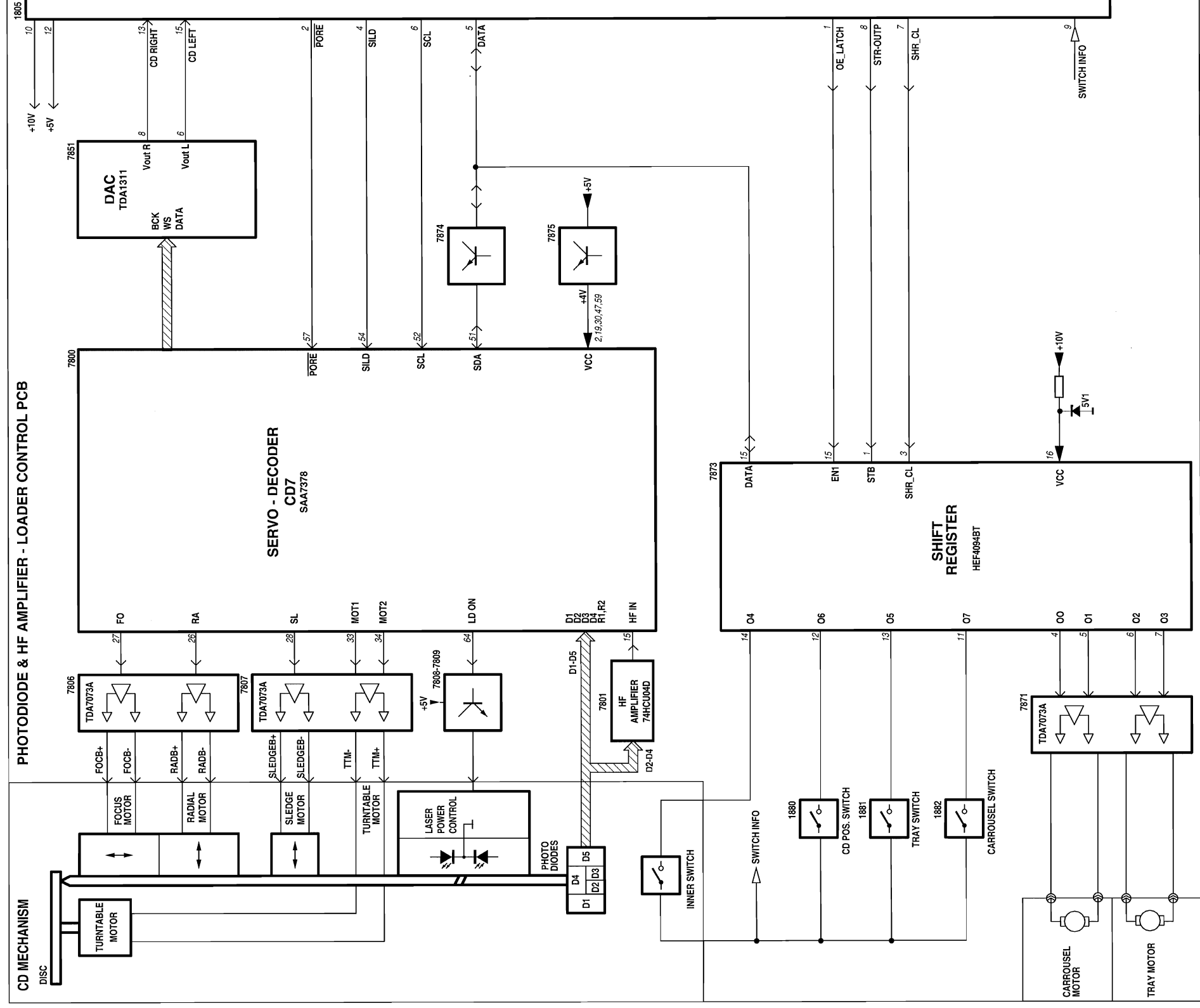
For sets without this board flexfoil 8002 is connected directly.

Wiring diagram

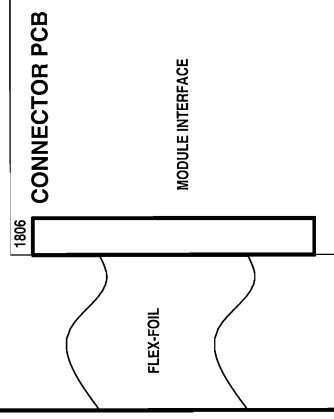
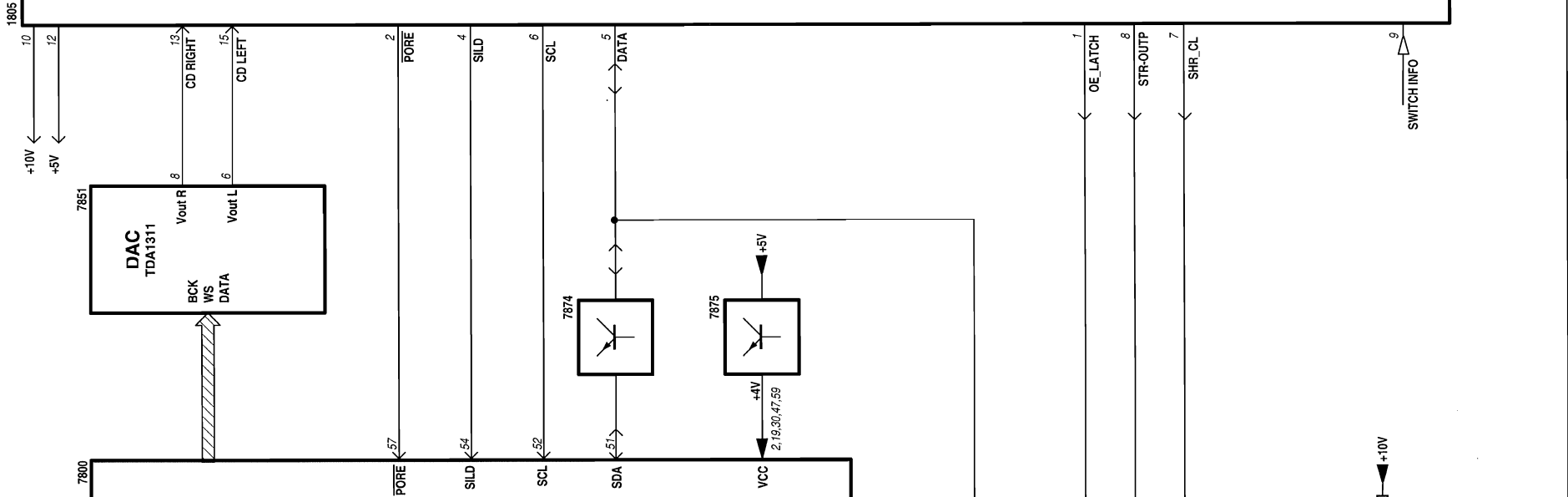
Remarks



Blockdiagram



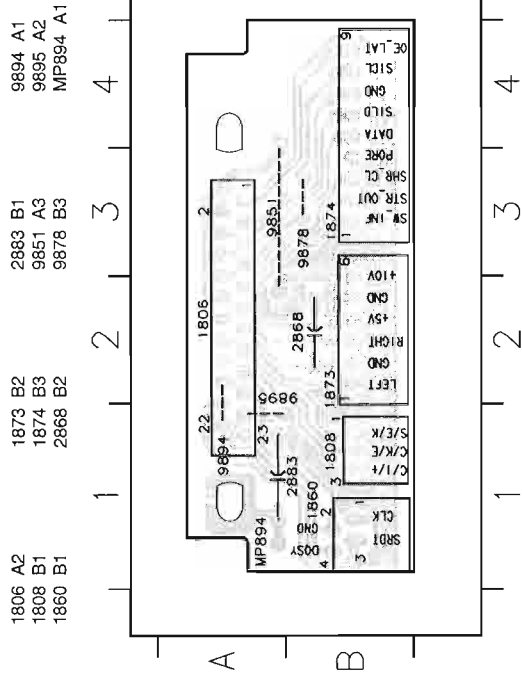
PHOTODIODE & HF AMPLIFIER - LOADER CONTROL PCB



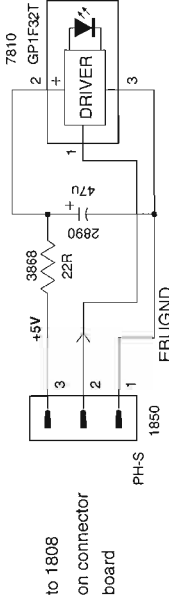
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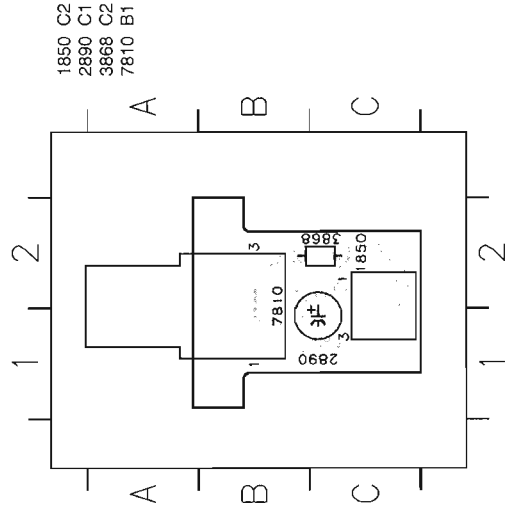
Connector Board Copperside view



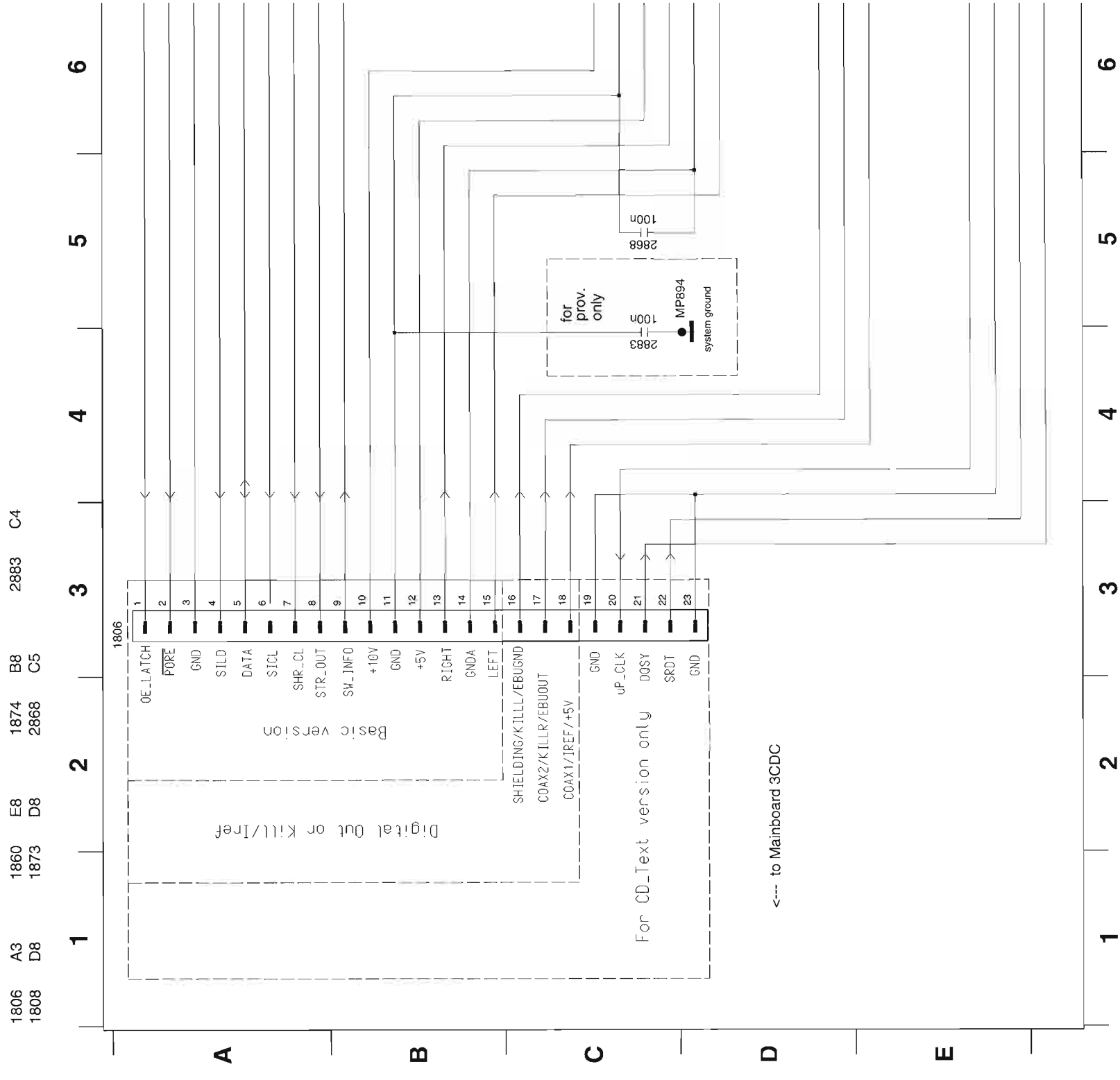
Circuit Diagram Optical out



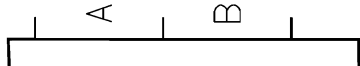
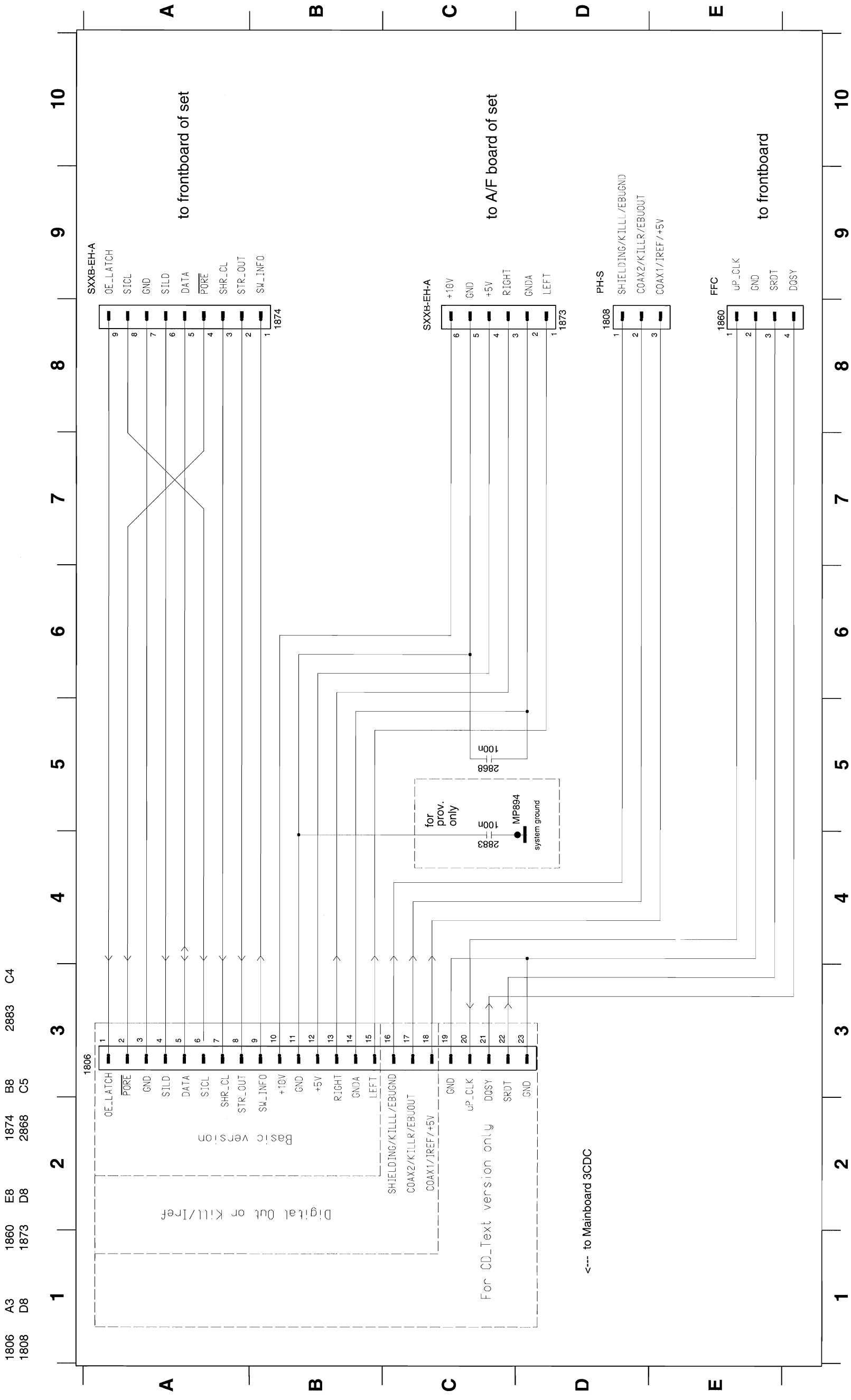
Component Layout Optical out



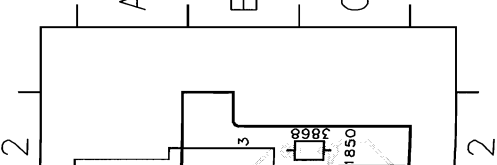
Circuit diagram Connector Board



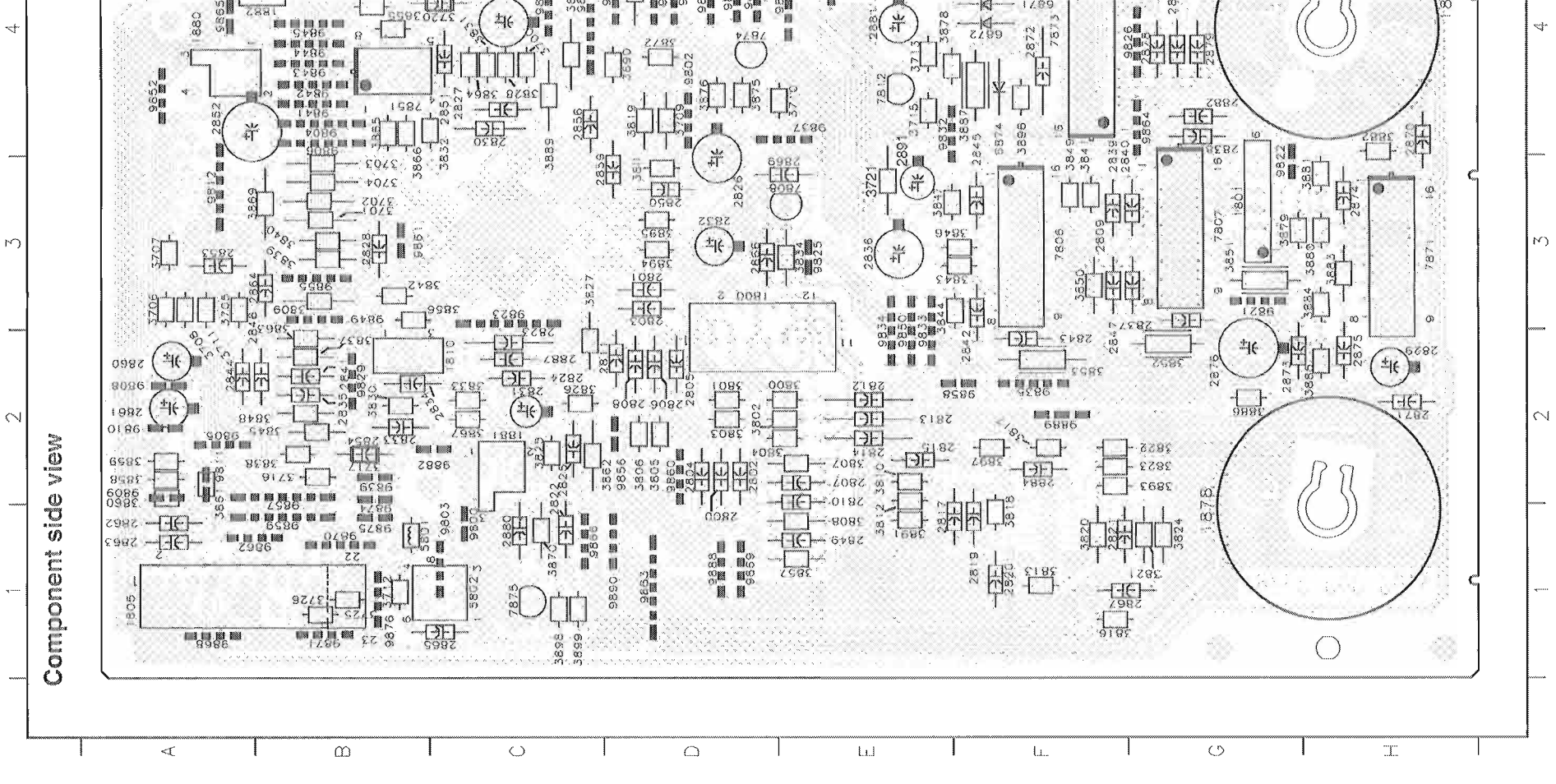
Circuit diagram Connector Board



optical out



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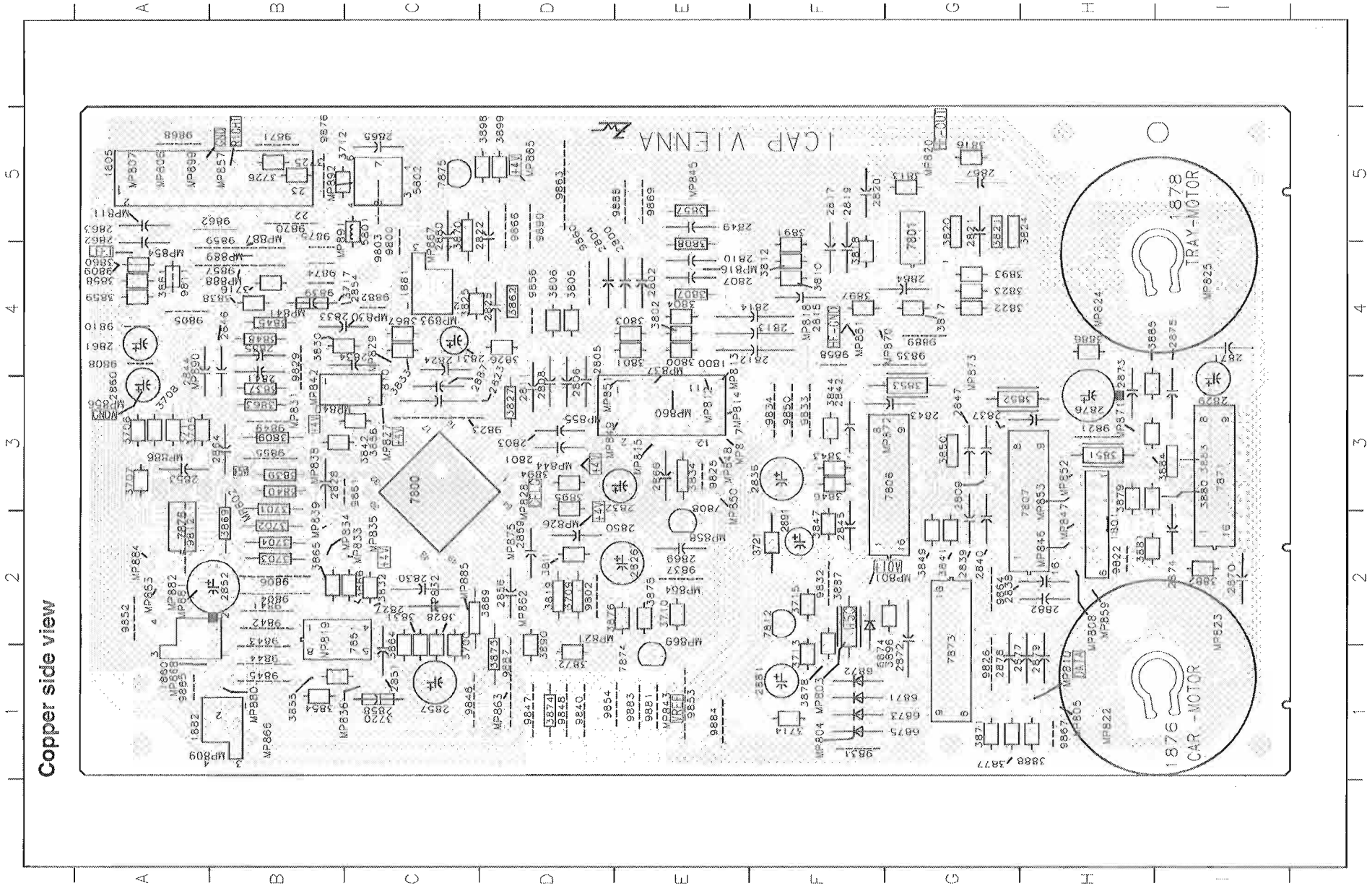


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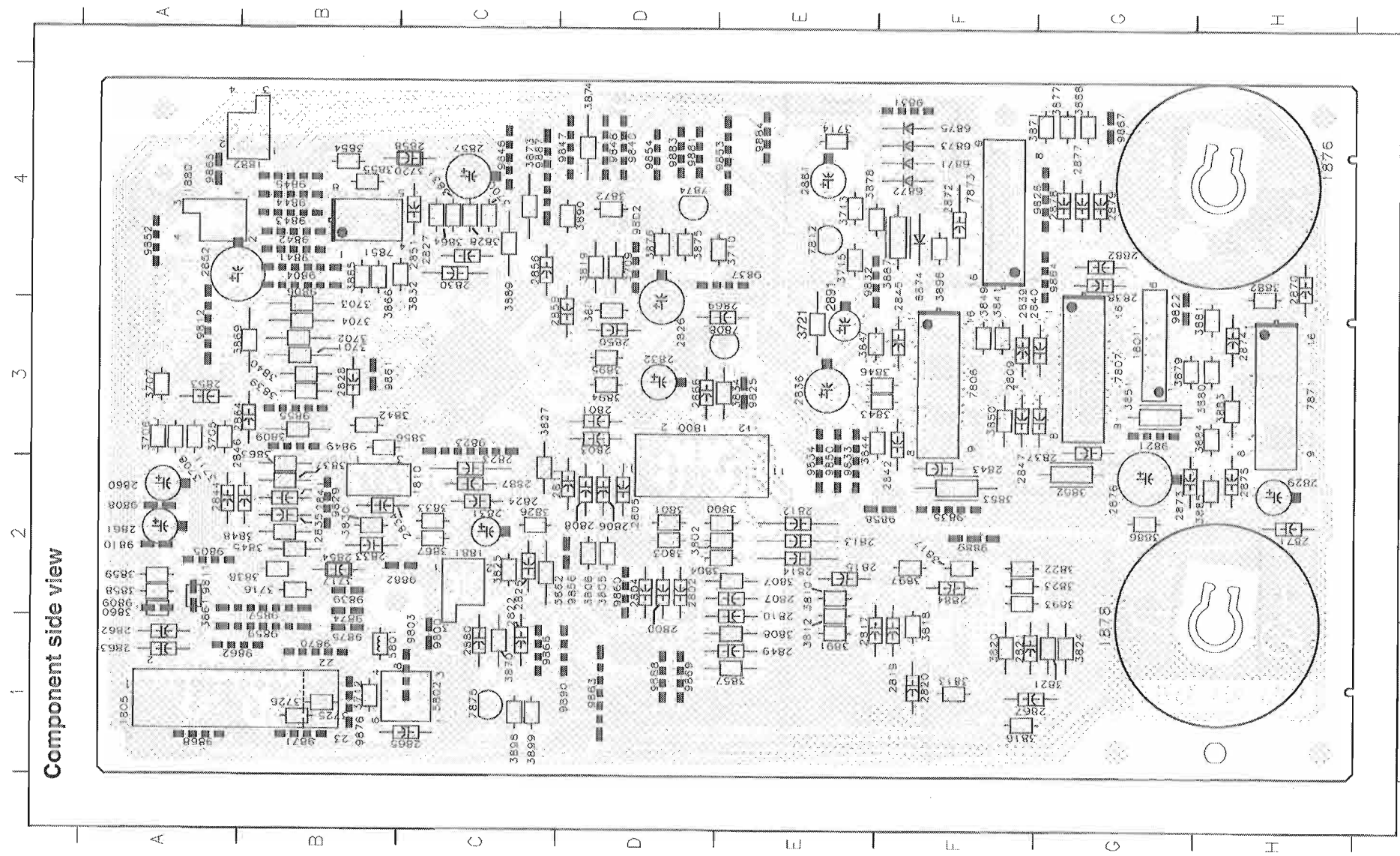
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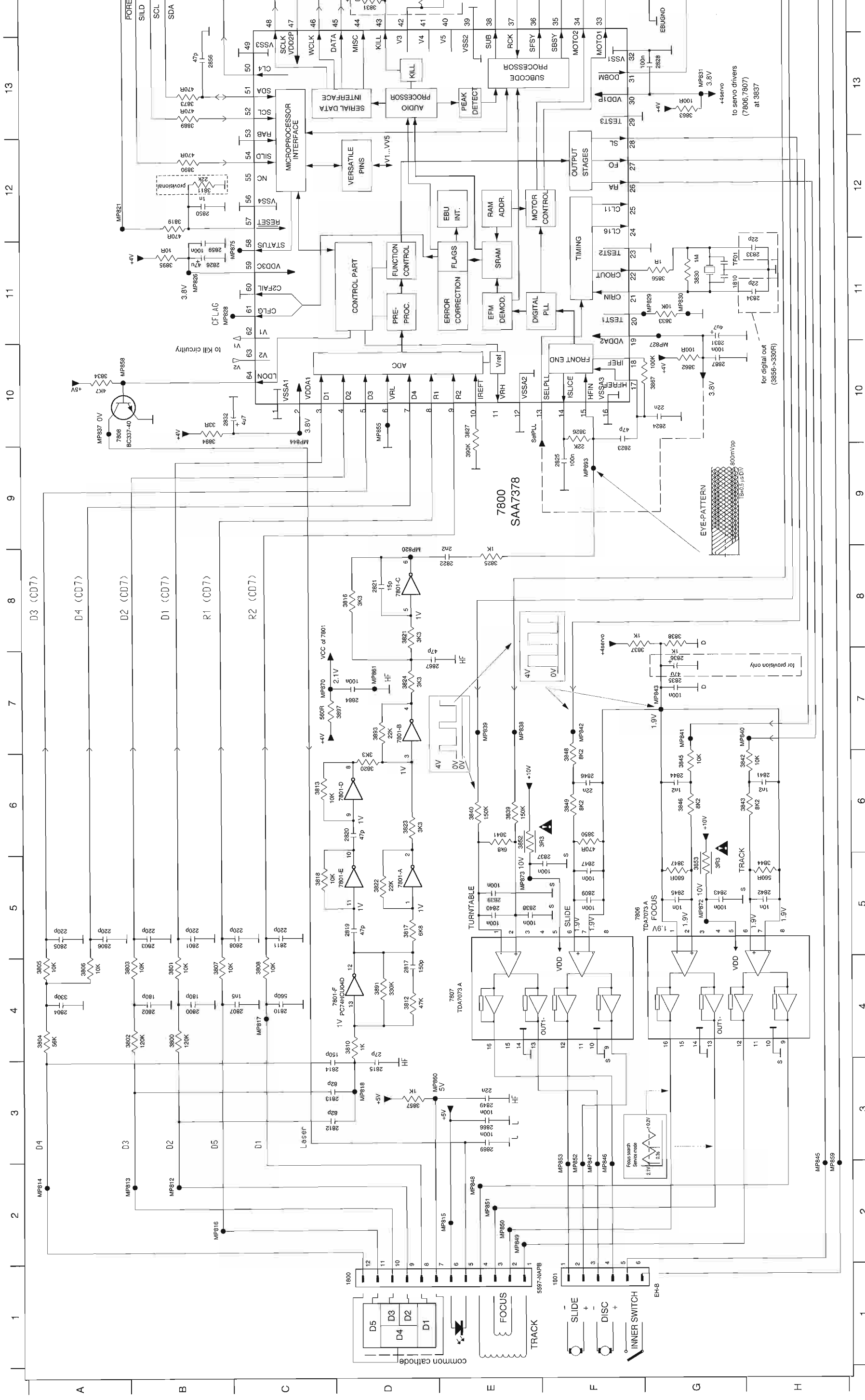
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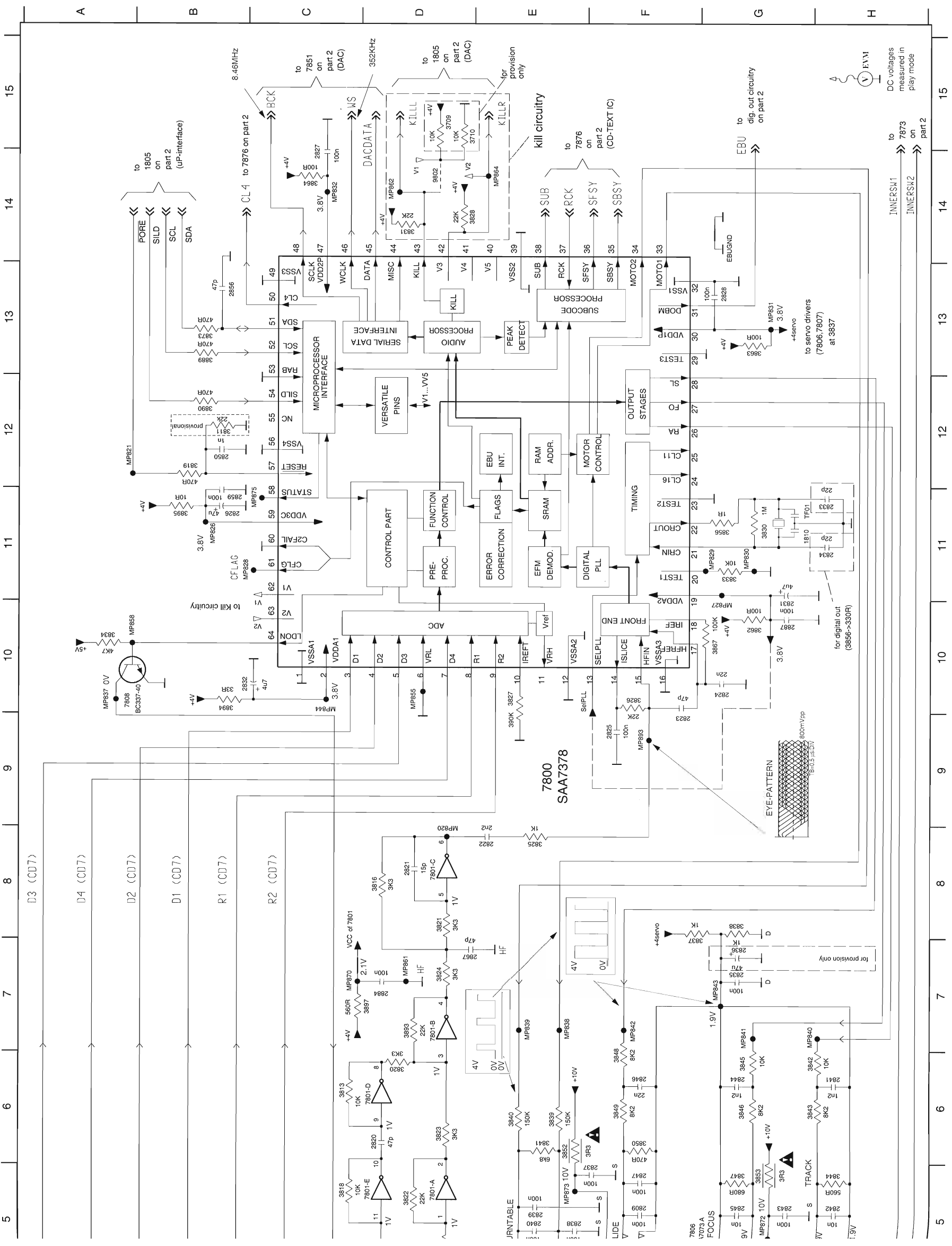
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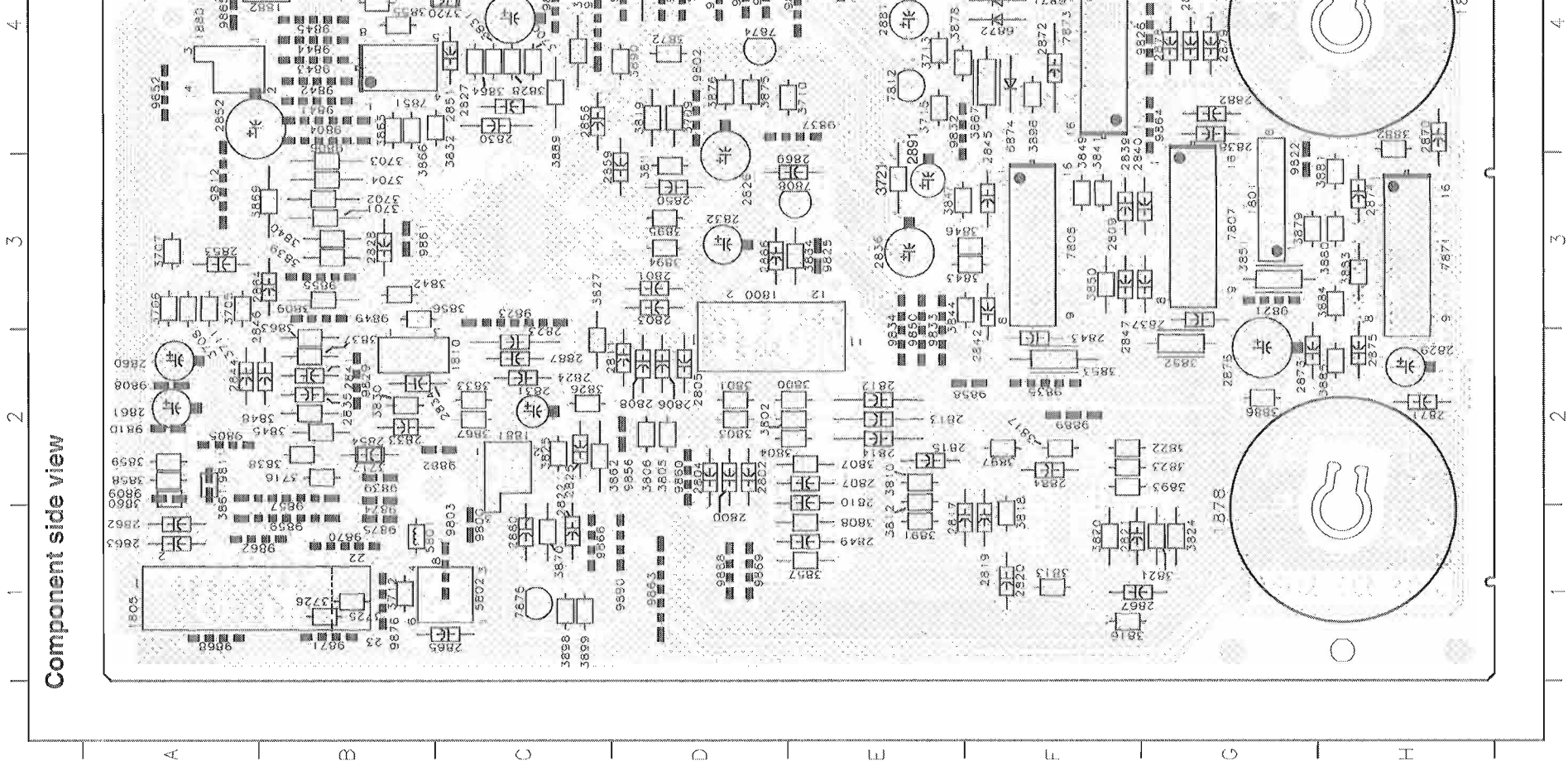
Circuit Diagram Main Board part1



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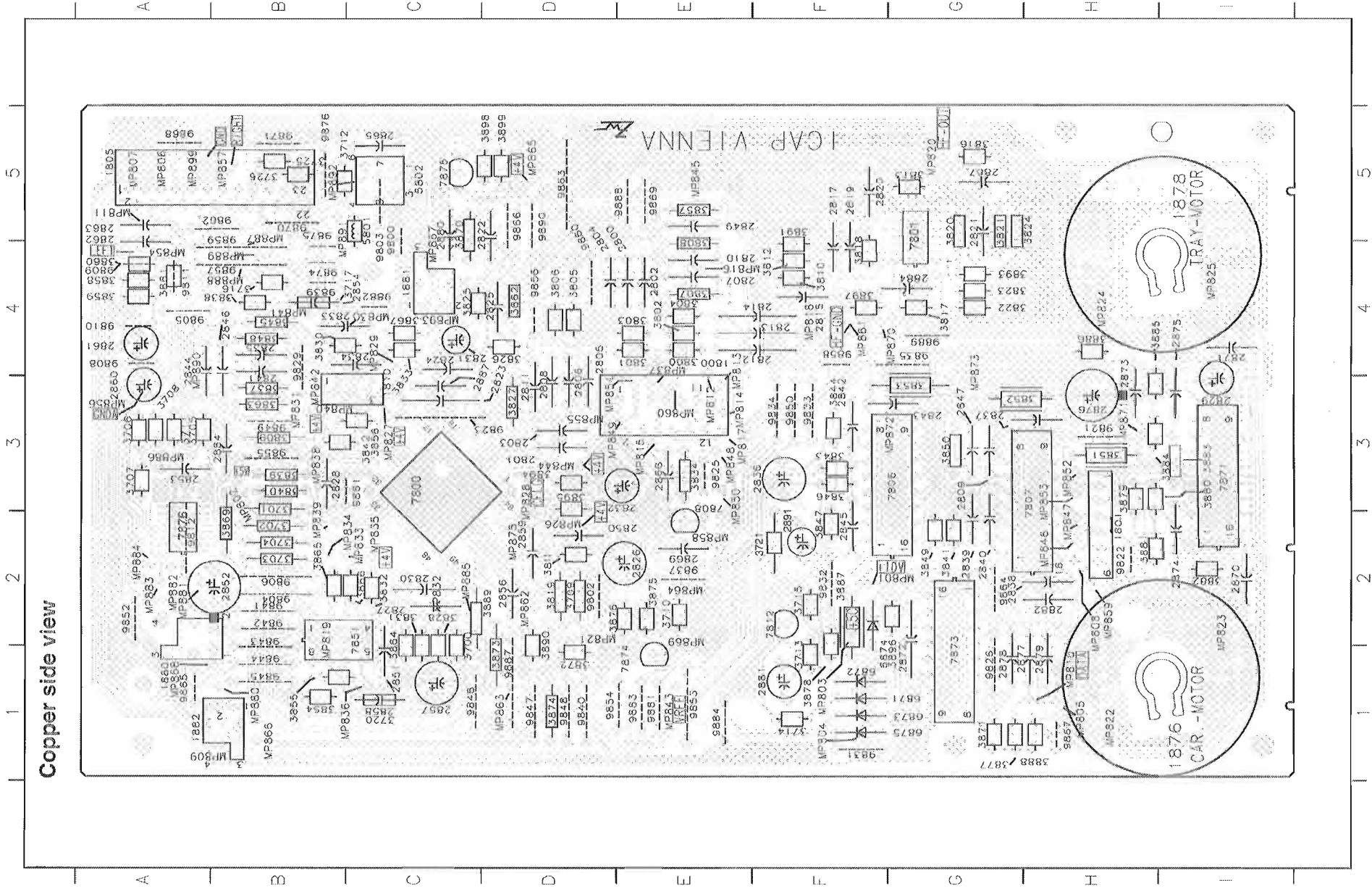


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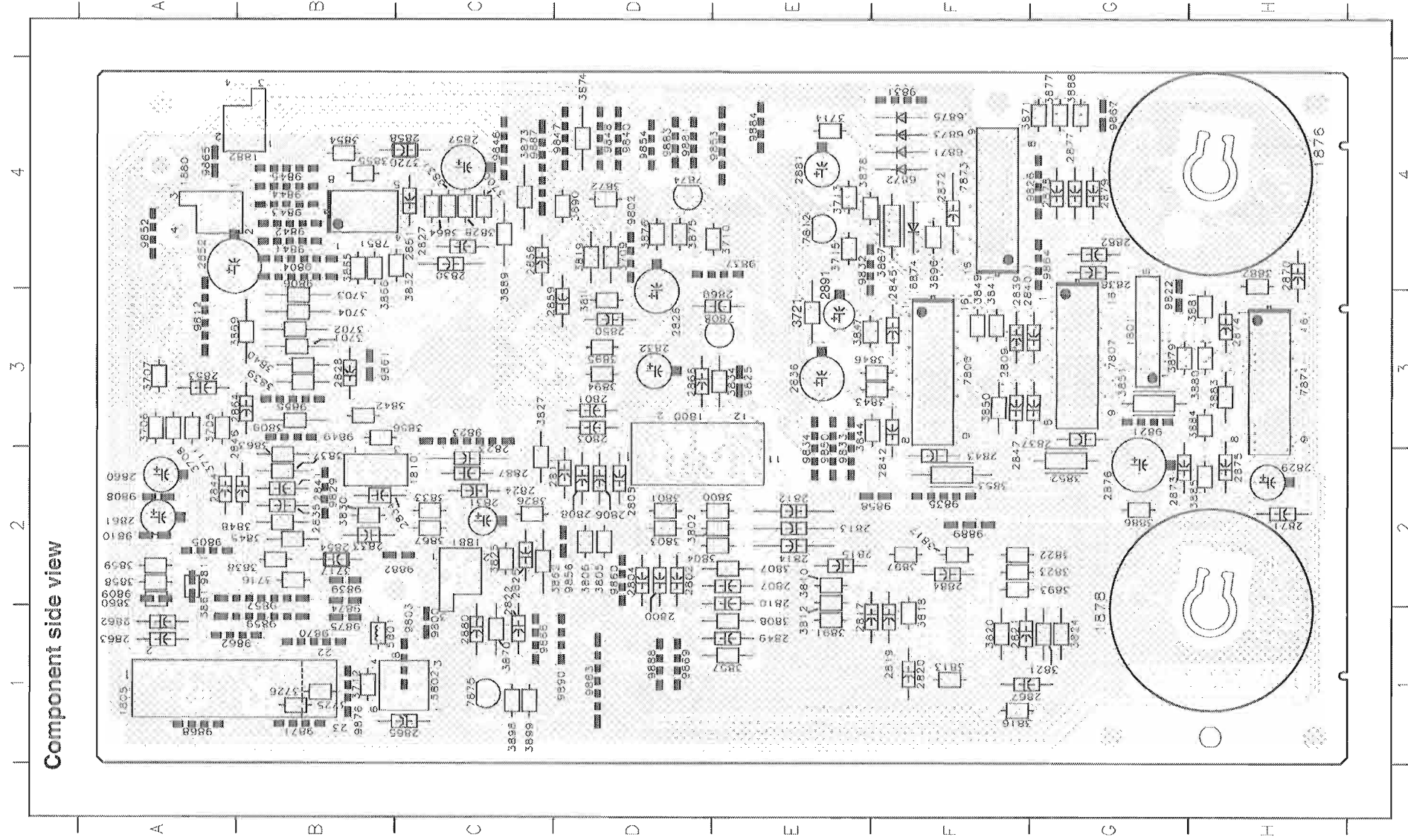
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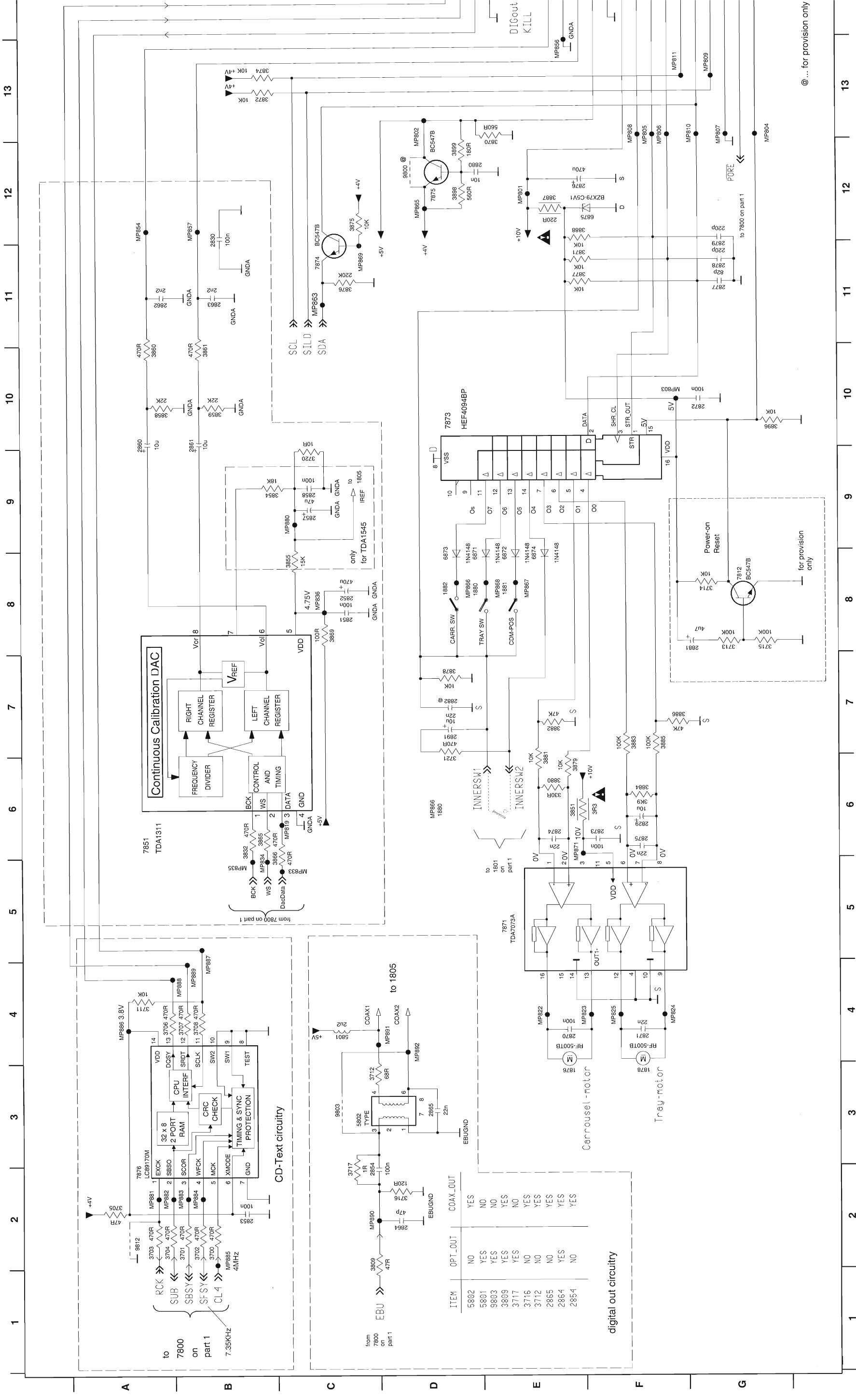
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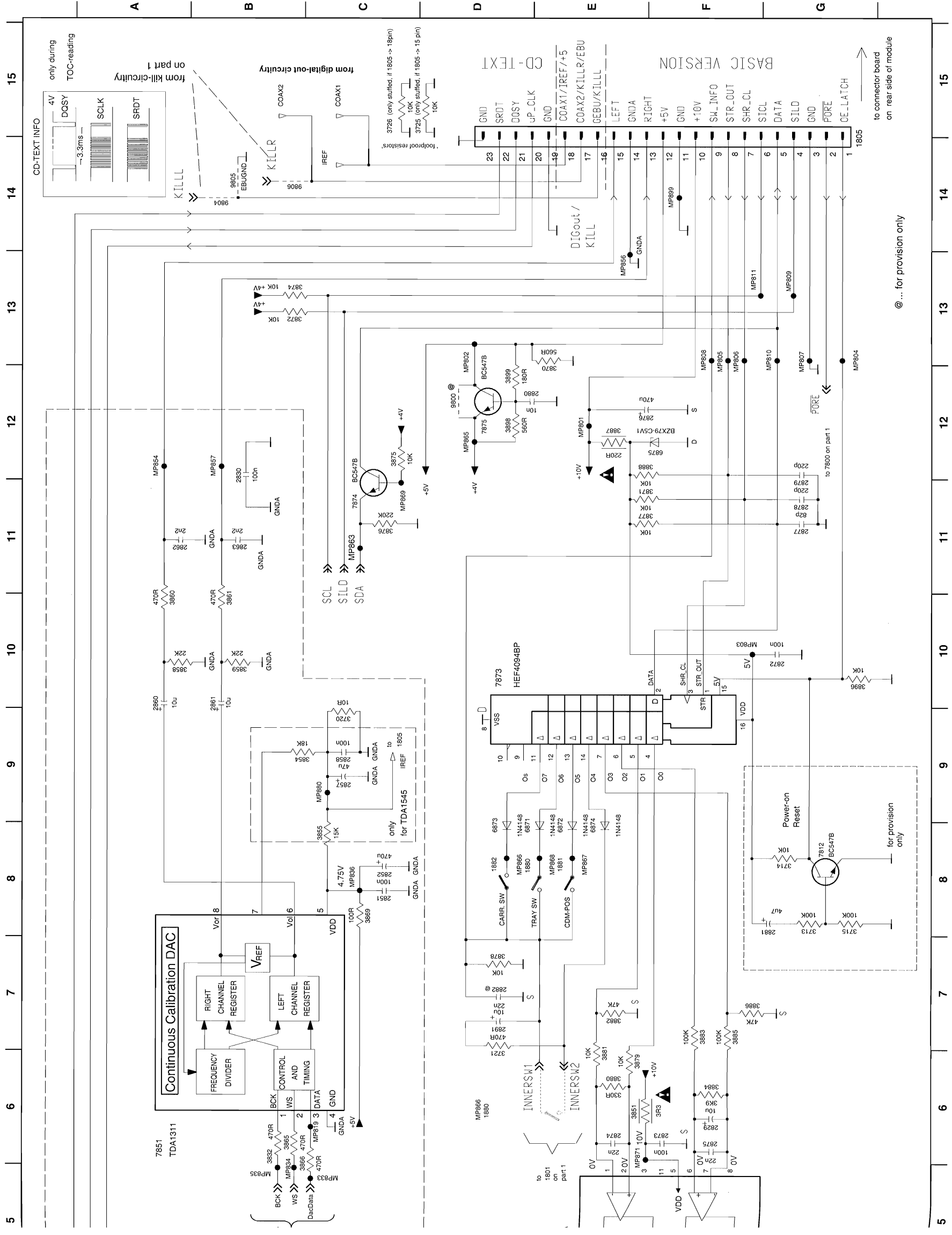
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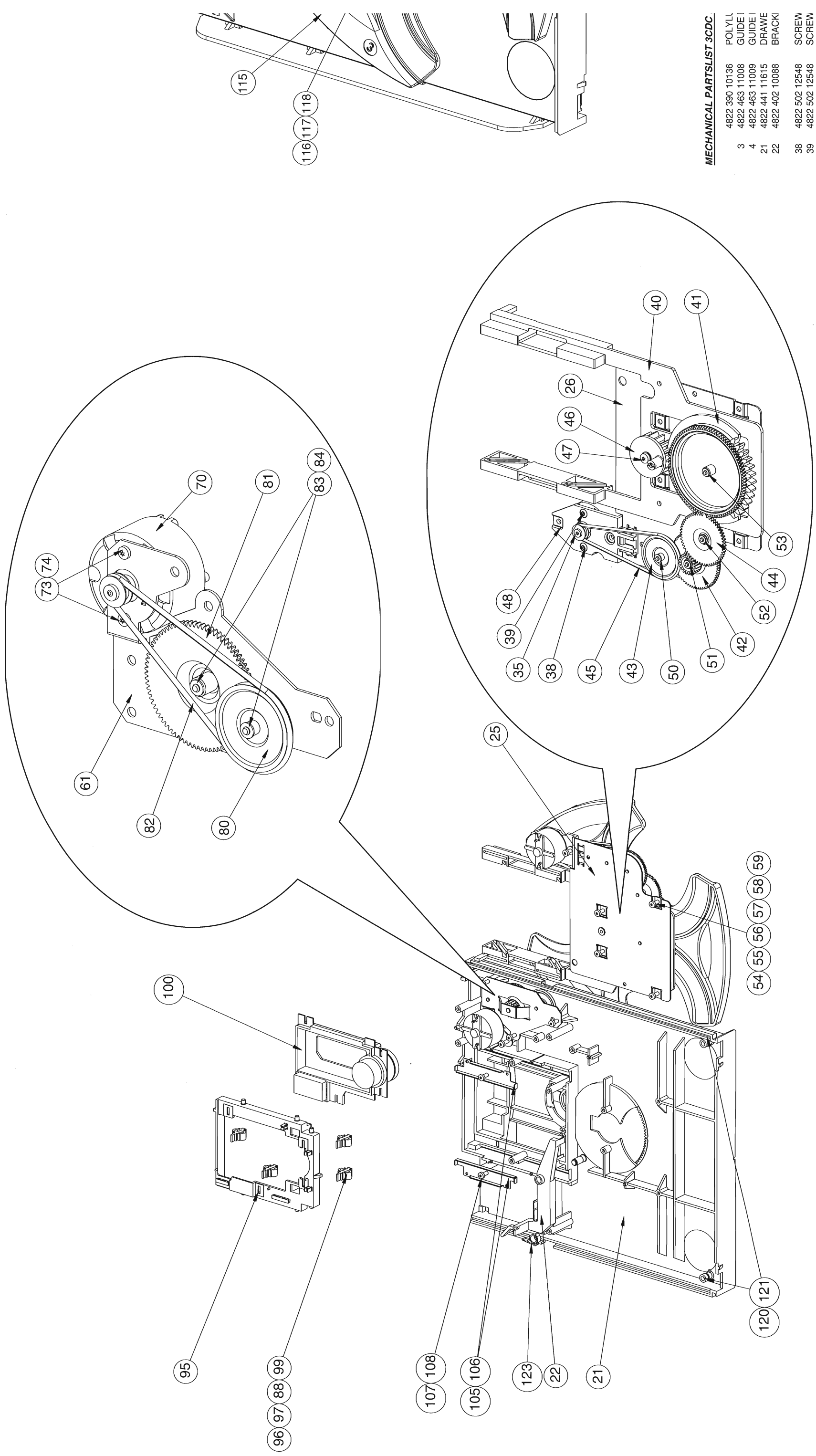
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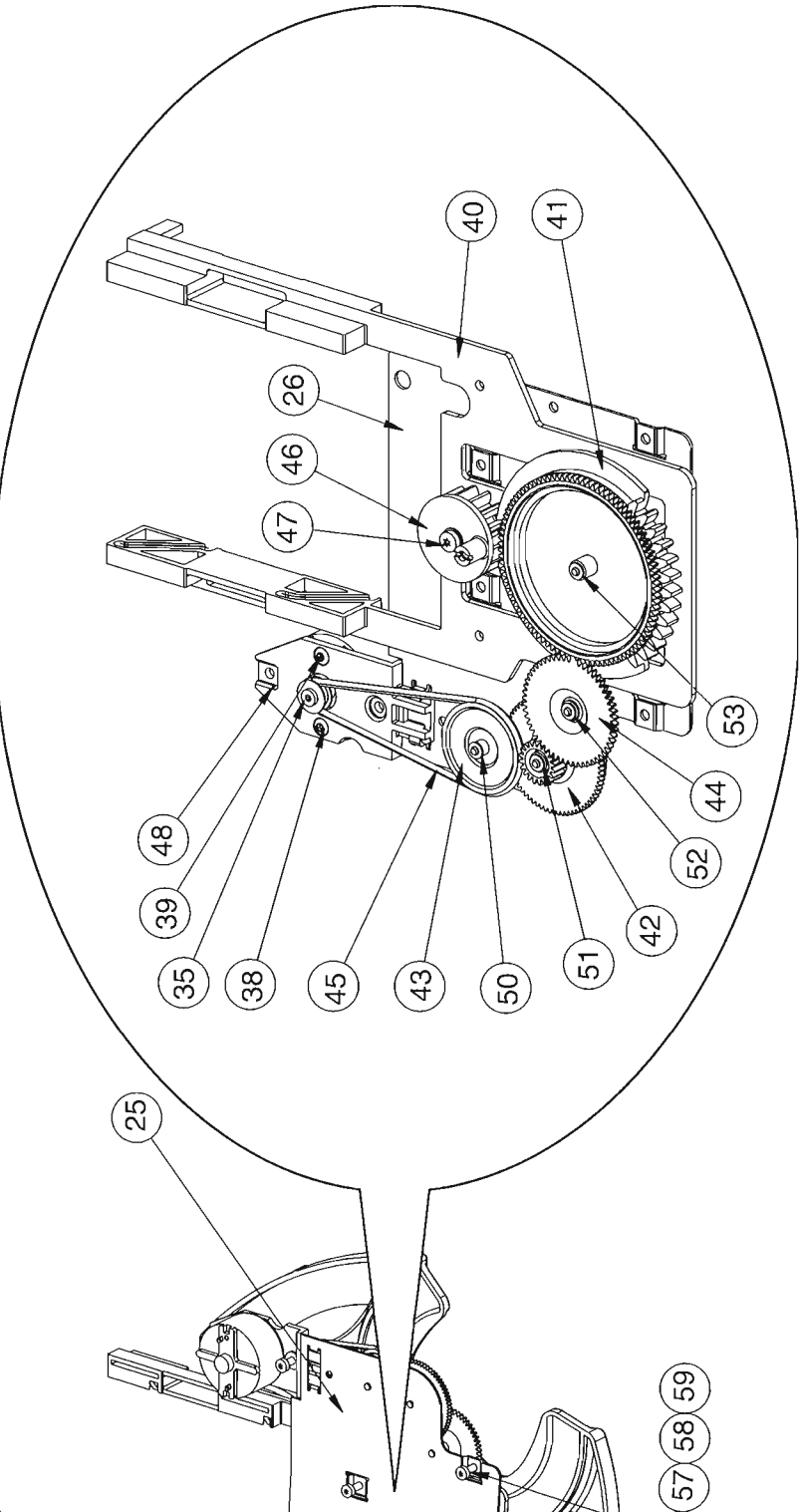
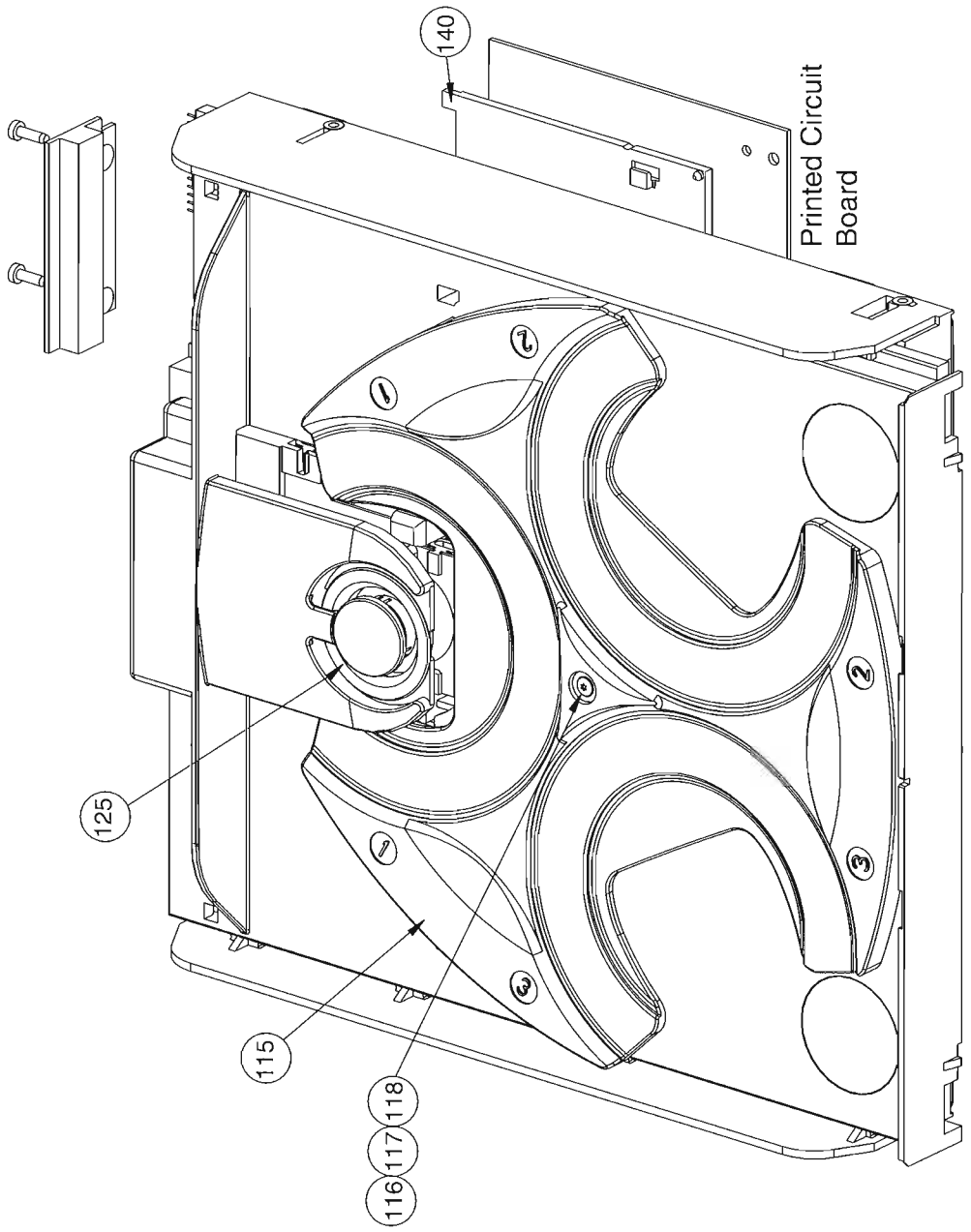
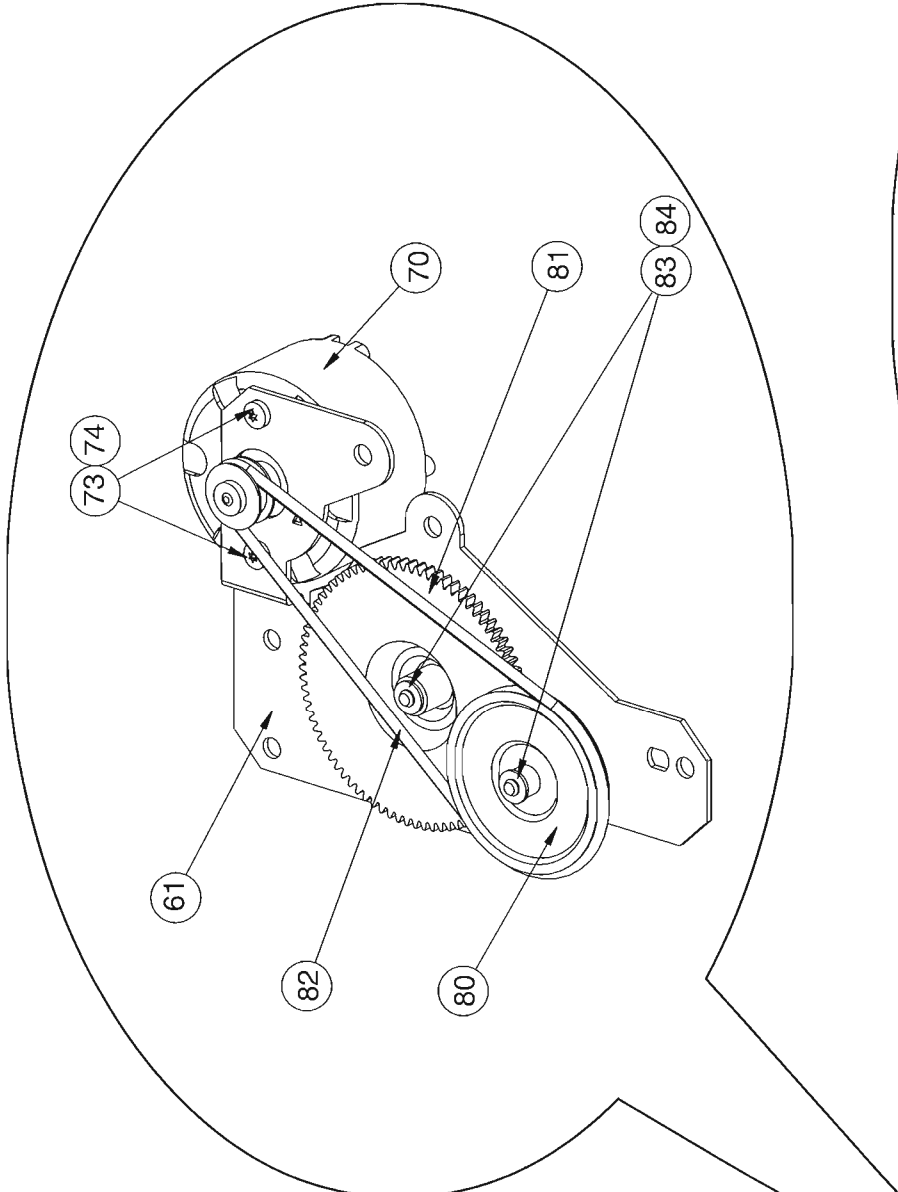


EXPLODED VIEW (3CDC MODULE)



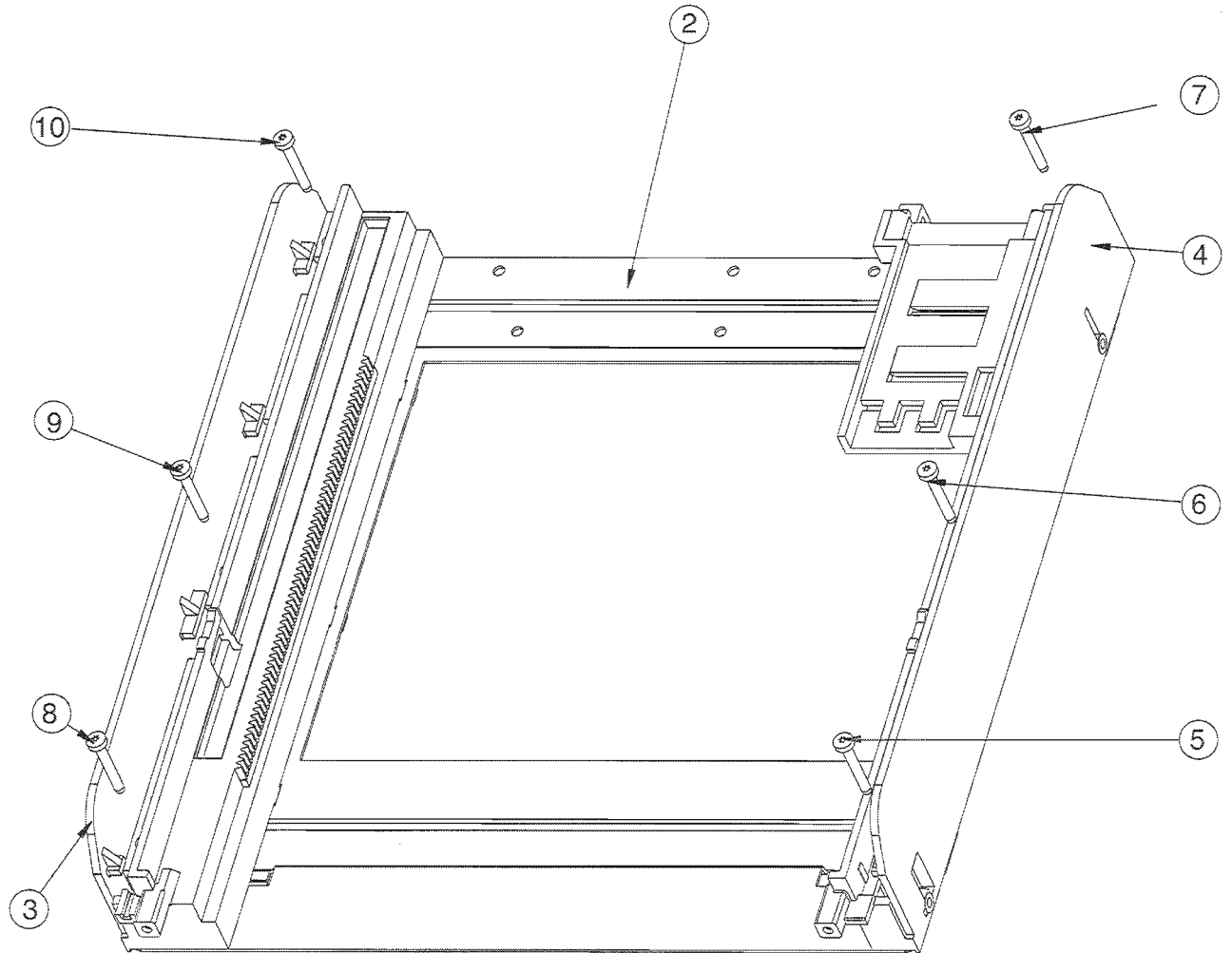
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21	4822 441 11615	DRAWE
22	4822 402 10088	BRACKI
38	4822 502 12548	SCREW
39	4822 502 12548	SCREW
40	4822 463 11011	SLIDE
41	4822 522 10509	CONTR
42	4822 522 10492	GEAR V



MECHANICAL PARTSLIST 3CDC MODULE

3	4822 390 10136	POLYLUB GLY801 (GREASE)	43	4822 528 10937	PULLEY
4	4822 463 11008	GUIDE LEFT	44	4822 522 10493	IDLER WHEEL
21	4822 463 11009	GUIDE RIGHT	45	4822 358 10115	BELT
22	4822 441 11615	DRAWER	46	4822 466 10735	ECCENTRIC GEAR WHEEL
	4822 402 10088	BRACKET TUMBLER	50	4822 532 12364	WASHER
38	4822 502 12548	SCREW M2,6X3,5	51	4822 532 12364	WASHER
39	4822 502 12548	SCREW M2,6X3,5	52	4822 532 12364	WASHER
40	4822 463 11011	SLIDE	53	4822 532 12364	WASHER
41	4822 522 10509	CONTROL DISC	35	4822 361 10753	CARROUSEL MOTOR
42	4822 522 10492	GEAR WHEEL	70	4822 361 10753	CARROUSEL MOTOR



MECHANICAL PARTSLIST 3CDC MODULE

73	4822 502 12548	SCREW M2,6X3,5	98	4822 325 50215	SUSPENSION
74	4822 502 12548	SCREW M2,6X3,5	99	4822 325 50215	SUSPENSION
80	4822 528 10937	PULLEY	100	4822 691 10615	CD DRIVE VAM1201
81	4822 522 10494	GEAR DRAWER	115	4822 466 10736	CARROUSEL
82	4822 358 10115	BELT	117	4822 532 12365	BUSH DRAWER
83	4822 532 12364	WASHER	120	4822 532 51756	GROMMET
84	4822 532 12364	WASHER	121	4822 532 51756	GROMMET
95	4822 404 10894	SUPPORT	123	4822 402 10085	SWITCH BRACKET
96	4822 325 50215	SUSPENSION	125	4822 401 11708	DISC CLAMP
97	4822 325 50215	SUSPENSION	140	4822 466 10734	PLATE

ELECTRICAL PARTSLIST 3CDC MODULEMISCELLANEOUS

1800	4822 267 51453	Flex Foil connector 12pin
1805	4822 265 10979	Flex Foil connector 15pin
1805	4822 265 11182	Flex Foil connector 23pin
1805	4822 265 11184	Flex Foil connector 18pin
1806	4822 265 10981	Flex Foil connector 15pin
1806	4822 267 10757	Flex Foil connector 23pin top entry
1806	4822 265 11185	Flex Foil connector 18pin top entry
1860	4822 265 11183	Flex Foil connector 4pin side entry
1880	4822 276 13503	Switch
1881	4822 276 13503	Switch
1882	4822 276 13503	Switch
8002	4822 320 11974	Flex Foil 15pin length= 190mm
8002	4822 320 12229	Flex Foil 18pin length= 190mm
8002	4822 320 12231	Flex Foil 23pin length= 190mm
8002	4822 320 12232	Flex Foil 15pin length= 480mm

CAPACITORS

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 126 12787	330pF	10%	50V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12878	1.5nF	10%	16V
2808	4822 122 10466	220pF	10%	50V
2809	4822 126 12882	100nF	20%	50V
2810	4822 122 10459	560pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2812	4822 122 10319	82pF	5%	50V
2813	4822 122 10319	82pF	5%	50V
2814	4822 122 33849	150pF	10%	50V
2815	4822 122 33192	27pF	5%	50V
2817	4822 122 33849	150pF	10%	50V
2819	4822 122 33848	47pF	5%	50V
2820	4822 122 33848	47pF	5%	50V
2821	4822 122 10462	15pF	5%	50V
2822	4822 126 12339	2.2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12882	100nF	20%	50V
2826	4822 124 23624	470µF	20%	16V
2827	4822 126 12882	100nF	20%	50V
2828	4822 126 12882	100nF	20%	50V
2829	4822 124 41579	10µF	20%	50V
2830	4822 126 12882	100nF	20%	50V
2831	4822 124 12032	4.7µF	20%	50V
2832	4822 124 12032	4.7µF	20%	50V
2833	4822 122 33191	22pF	5%	50V
2834	4822 122 33191	22pF	5%	50V
2835	4822 126 12882	100nF	20%	50V
2837	4822 126 12882	100nF	20%	50V
2838	4822 126 12882	100nF	20%	50V
2839	4822 126 12882	100nF	20%	50V
2840	4822 126 12882	100nF	20%	50V
2841	4822 122 10574	1.2nF	10%	16V
2842	4822 121 51387	10nF	20%	16V
2843	4822 126 12882	100nF	20%	50V
2844	4822 122 10574	1.2nF	10%	16V
2845	4822 121 51387	10nF	20%	16V
2846	4822 126 11585	22nF	20%	50V
2847	4822 126 12882	100nF	20%	50V

CAPACITORS

2849	4822 126 11585	22nF	20%	50V
2850	4822 122 33197	1nF	10%	50V
2851	4822 126 12882	100nF	20%	50V
2852	4822 124 80857	470µF	20%	16V
2853	4822 126 12882	100nF	20%	50V
2856	4822 122 33848	47pF	5%	50V
2859	4822 126 12882	100nF	20%	50V
2860	4822 124 41579	10µF	20%	50V
2861	4822 124 41579	10µF	20%	50V
2862	4822 126 12339	2.2nF	10%	16V
2863	4822 126 12339	2.2nF	10%	16V
2864	4822 122 33848	47pF	5%	50V
2866	4822 126 12882	100nF	20%	50V
2867	4822 122 33848	47pF	5%	50V
2868	4822 126 12882	100nF	20%	50V
2869	4822 126 12882	100nF	20%	50V
2870	4822 126 12882	100nF	20%	50V
2871	4822 126 11585	22nF	20%	50V
2872	4822 126 12882	100nF	20%	50V
2873	4822 126 12882	100nF	20%	50V
2874	4822 126 11585	22nF	20%	50V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 80857	470µF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 122 10466	220pF	10%	50V
2880	4822 121 51387	10nF	20%	16V
2884	4822 126 12882	100nF	20%	50V
2887	4822 126 12882	100nF	20%	50V
2890	4822 124 23624	470µF	20%	16V
2891	4822 124 12125	10µF	20%	16V

RESISTORS

3700	4822 116 83883	470Ω	5%	0.16W
3701	4822 116 83883	470Ω	5%	0.16W
3702	4822 116 83883	470Ω	5%	0.16W
3703	4822 116 83883	470Ω	5%	0.16W
3704	4822 116 83883	470Ω	5%	0.16W
3705	4822 116 52195	47Ω	5%	0.5W
3706	4822 116 83883	470Ω	5%	0.16W
3707	4822 116 83883	470Ω	5%	0.16W
3708	4822 116 83883	470Ω	5%	0.16W
3710	4822 116 83864	10kΩ	5%	0.5W
3711	4822 116 83864	10kΩ	5%	0.5W
3717	4822 116 80176	1Ω	5%	0.5W
3720	4822 116 52176	10Ω	5%	0.5W
3721	4822 116 83883	470Ω	5%	0.16W
3725	4822 116 83864	10kΩ	5%	0.5W
3726	4822 116 83864	10kΩ	5%	0.5W
3800	4822 116 52239	120kΩ	5%	0.5W
3801	4822 116 83864	10kΩ	5%	0.5W
3802	4822 116 52239	120kΩ	5%	0.5W
3803	4822 116 83864	10kΩ	5%	0.5W
3804	4822 116 52291	56kΩ	5%	0.5W
3805	4822 116 83864	10kΩ	5%	0.5W
3806	4822 116 83864	10kΩ	5%	0.5W
3807	4822 116 83864	10kΩ	5%	0.5W
3808	4822 116 83864	10kΩ	5%	0.5W
3809	4822 116 52175	100Ω	5%	0.5W
3810	4822 050 11002	1kΩ	5%	0.2W
3812	4822 116 83884	47kΩ	5%	0.16W
3813	4822 116 83864	10kΩ	5%	0.5W
3816	4822 116 52269	3.3kΩ	5%	0.5W

ELECTRICAL PARTSLIST 3CDC MODULE

RESISTORS

3817	4822 116 83961	6,8kΩ	5%	0,16W
3818	4822 116 83864	10kΩ	5%	0,5W
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52269	3,3kΩ	5%	0,5W
3821	4822 116 52269	3,3kΩ	5%	0,5W
3822	4822 116 52257	22kΩ	5%	0,5W
3823	4822 116 52269	3,3kΩ	5%	0,5W
3824	4822 116 52269	3,3kΩ	5%	0,5W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 116 52278	390kΩ	5%	0,5W
3828	4822 116 52257	22kΩ	5%	0,5W
3830	4822 116 52235	1MΩ	5%	0,5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 116 83883	470Ω	5%	0,16W
3833	4822 116 83864	10kΩ	5%	0,5W
3834	4822 116 52283	4,7kΩ	5%	0,5W
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52245	150kΩ	5%	0,16W
3840	4822 116 52245	150kΩ	5%	0,16W
3841	4822 116 83961	6,8kΩ	5%	0,16W
3842	4822 116 83864	10kΩ	5%	0,5W
3843	4822 116 52303	8,2kΩ	5%	0,5W
3844	4822 116 52226	560Ω	5%	0,5W
3844	4822 116 83883	470Ω	5%	0,16W
3845	4822 116 83864	10kΩ	5%	0,5W
3846	4822 116 52303	8,2kΩ	5%	0,5W
3847	4822 116 52228	680Ω	5%	0,5W
3847	4822 116 83883	470Ω	5%	0,16W
3848	4822 116 52303	8,2kΩ	5%	0,5W
3849	4822 116 52303	8,2kΩ	5%	0,5W
3850	4822 116 83883	470Ω	5%	0,16W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10338	3,3Ω		NFR25
3853	4822 052 10338	3,3Ω		NFR25
3856	4822 116 52219	330Ω	5%	0,5W
3856	4822 116 80176	1Ω	5%	0,5W
3857	4822 050 11002	1kΩ	5%	0,2W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83883	470Ω	5%	0,16W
3861	4822 116 83883	470Ω	5%	0,16W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3865	4822 116 83883	470Ω	5%	0,16W
3866	4822 116 83883	470Ω	5%	0,16W
3867	4822 116 52234	100kΩ	5%	0,5W
3868	4822 116 52191	33Ω	5%	0,5W
3869	4822 116 52175	100Ω	5%	0,5W
3870	4822 116 52226	560Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W
3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83874	220kΩ	5%	0,5W
3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W

RESISTORS

3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 052 10221	220Ω	5%	
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 116 83883	470Ω	5%	0,16W
3891	4822 116 52272	330kΩ	5%	0,5W
3893	4822 116 52257	22kΩ	5%	0,5W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3896	4822 116 83864	10kΩ	5%	0,5W
3897	4822 116 52226	560Ω	5%	0,5W
3898	4822 116 52226	560Ω	5%	0,5W
3899	4822 116 52213	180Ω	5%	0,5W

COILS

1810	4822 242 10849	CRYSTAL 8MHz
1810	4822 242 73557	CERAMIC RES. 8,46MHz
5801	4822 157 11477	2,2μH

DIODES

6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1

TRANSISTORS

7808	4822 130 41344	BC337-40
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

7800 ©	4822 209 12752	SAA7378GP (Signal Processor CD7)
7801 ©	5322 209 11517	PC74HCU04T (HF Amplifier)
7806	4822 209 32852	TDA7073A/N2 (Servo Driver)
7807	4822 209 32852	TDA7073A/N2 (Motor Driver)
7810	4822 130 10845	OPTICAL OUT UNIT
7851	4822 209 32421	TDA1311A/N2(DAC)
7871	4822 209 32852	TDA7073A/N2 (Motor Driver)
7873	5322 209 10421	HEF4094BP (Shift Register)
7876	4822 209 16143	LC89170M (CD Text)

Brief introduction of the Combi Board

NOTES:

- 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, +12A, +12M, -26V, 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_ON. 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 (BC557B or ON4986) 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 (HEF4069BT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).
- e) **POWER AMPLIFIER**
IC 7391 (AN7124) is used as power amplifier.
- f) **CD ON CONTROL**
This circuit 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 & HEADPHONE PART**
a) **SIMPLE KARAOKE**
This is 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.
- g) **HEADPHONE OUTPUT**
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.

COMBI BOARD

TABLE OF CONTENTS

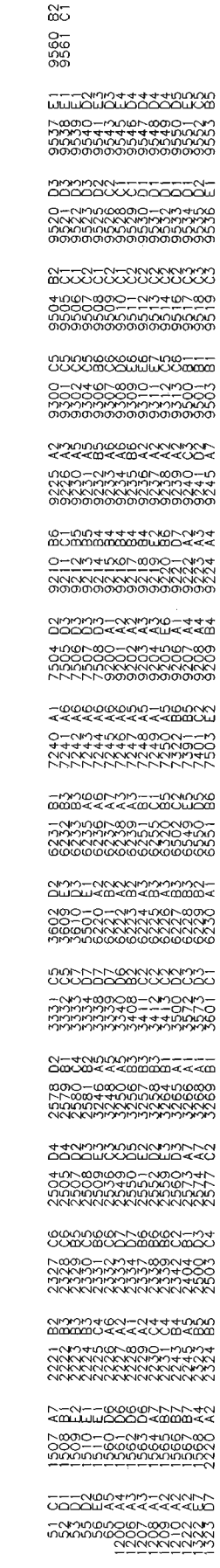
Brief Introduction	11-1
Main part - Component and Chip layouts	11-2
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Main part - Power Supply	11-4
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Brief introduction of the Combi Board

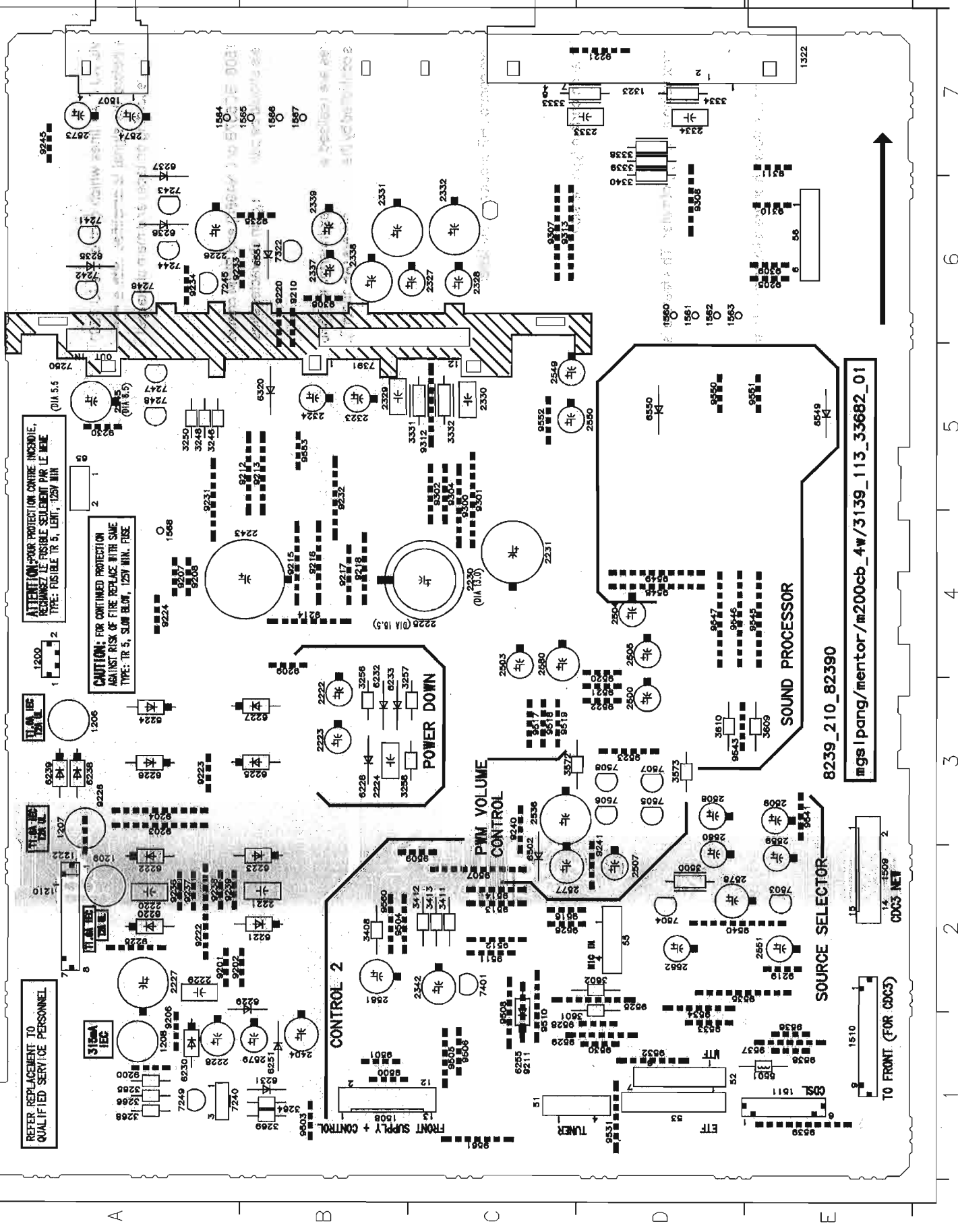
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One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BT). Karaoke mic. mixing is connected to the selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).
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The discrete volume control makes use of 4 Transistors 7505, 7506, 7507 & 7508 (BC557B or ON4986) and PWM control signal from μ P. For good performance transistors for the left and right channels should be paired for gain characteristics.
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Sound Features include the DBB, IS and 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069BT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).
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IC 7391 (AN7124) is used as power amplifier.
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This circuit 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.
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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.

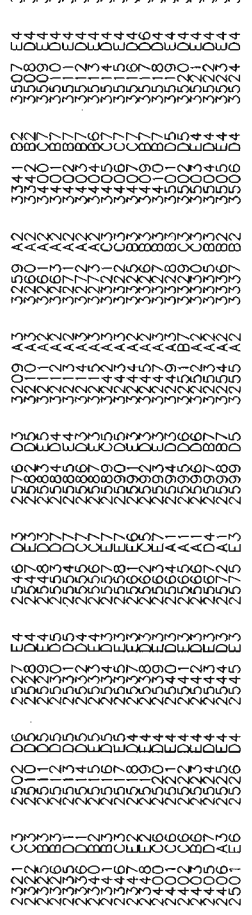
COMPONENT LAYOUT - MAIN PART



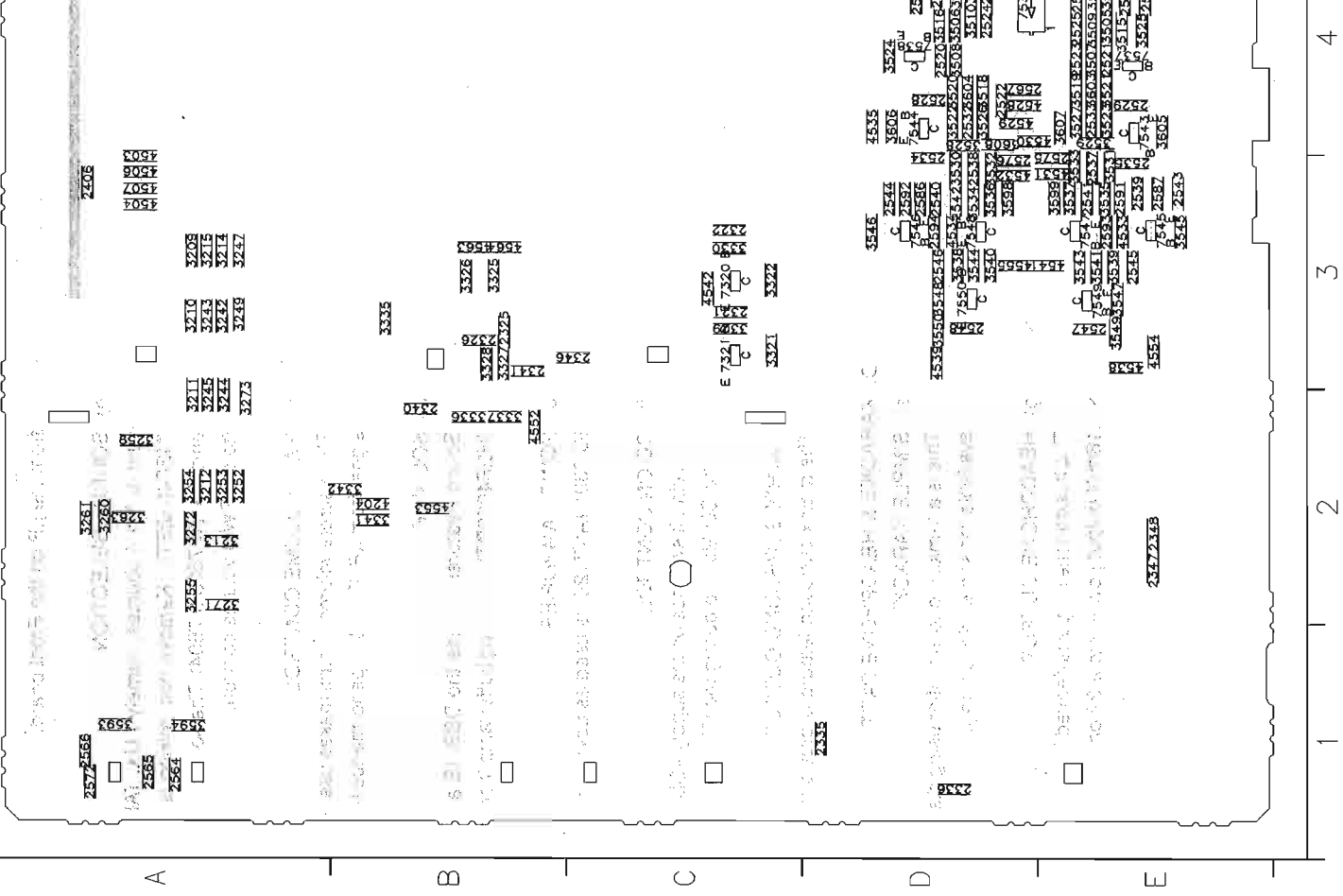
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.



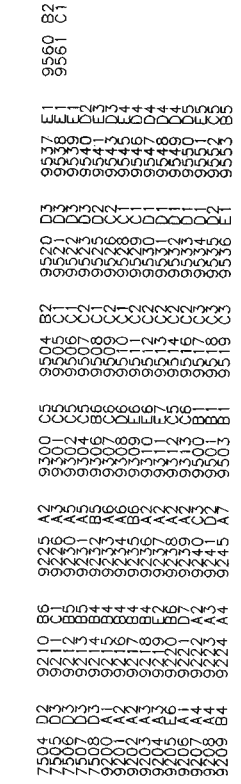
CHIP LAYOUT - MAIN PART



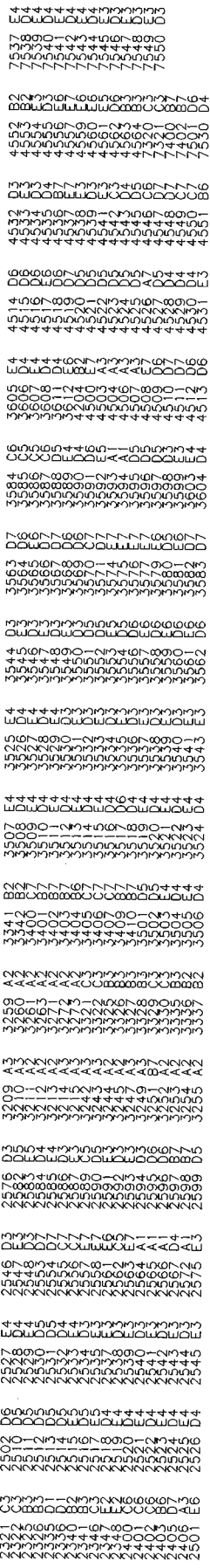
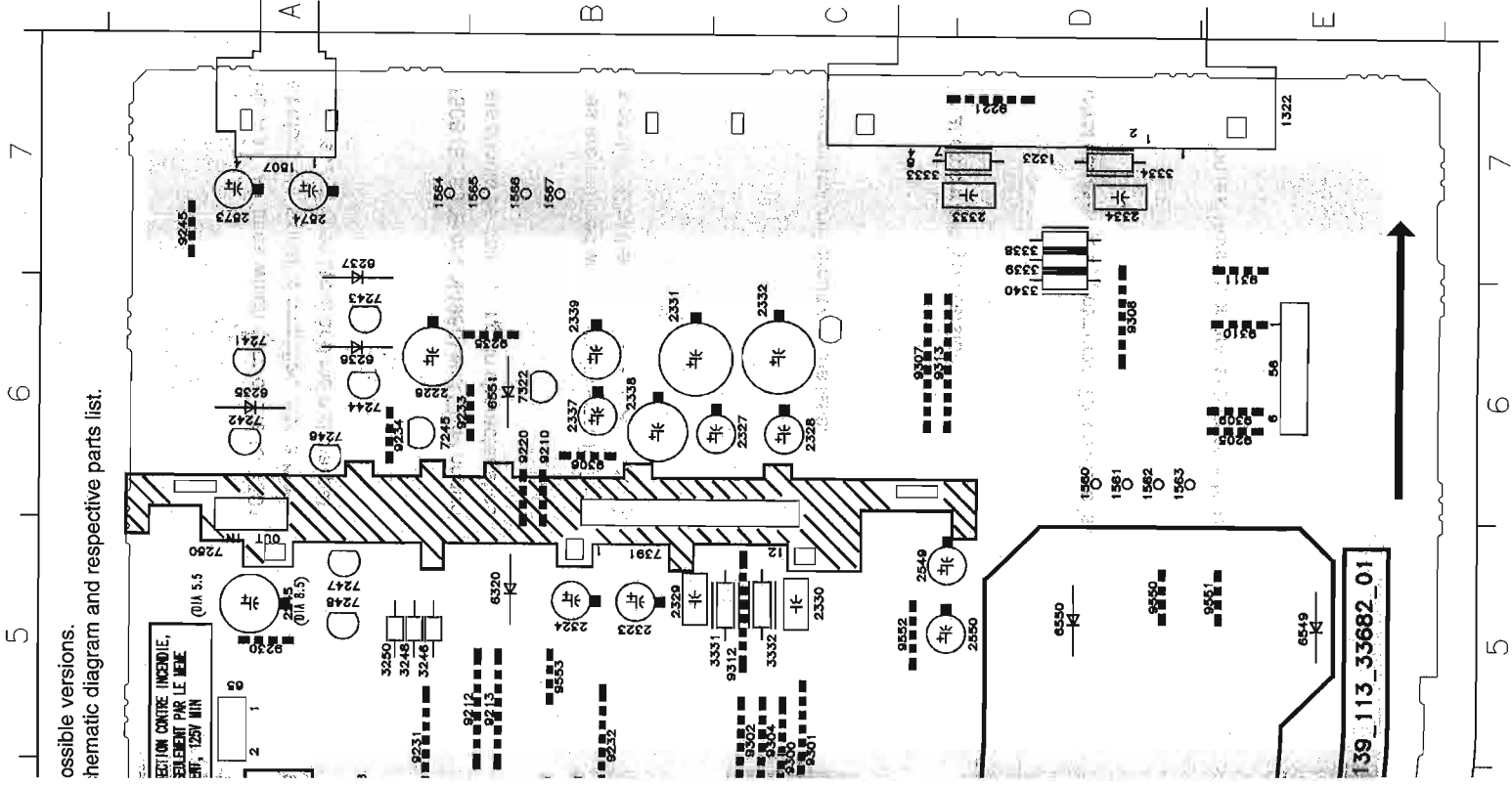
This assembly drawing shows a summary of For components used in a specific version s



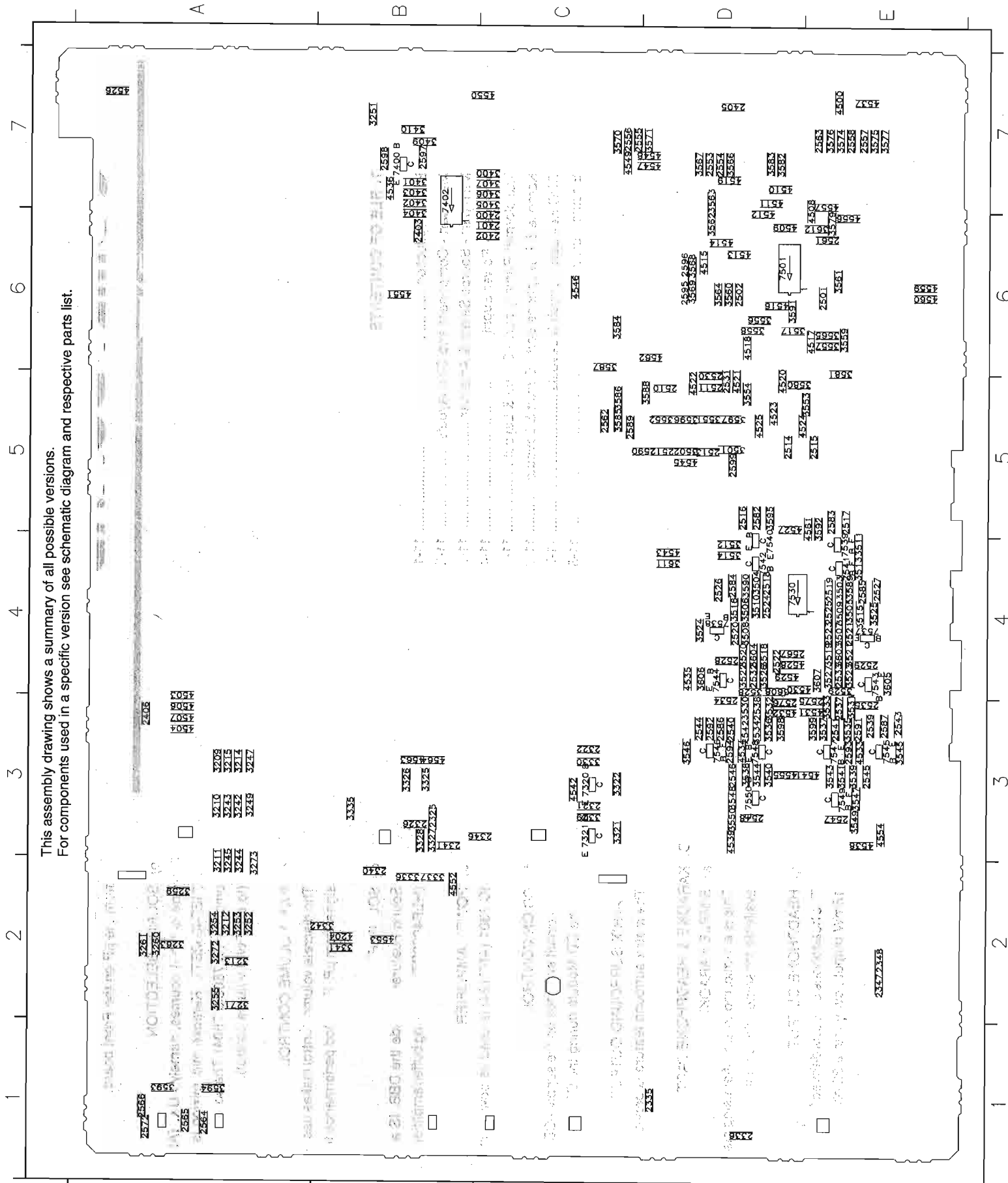
CHIP LAYOUT - MAIN PART



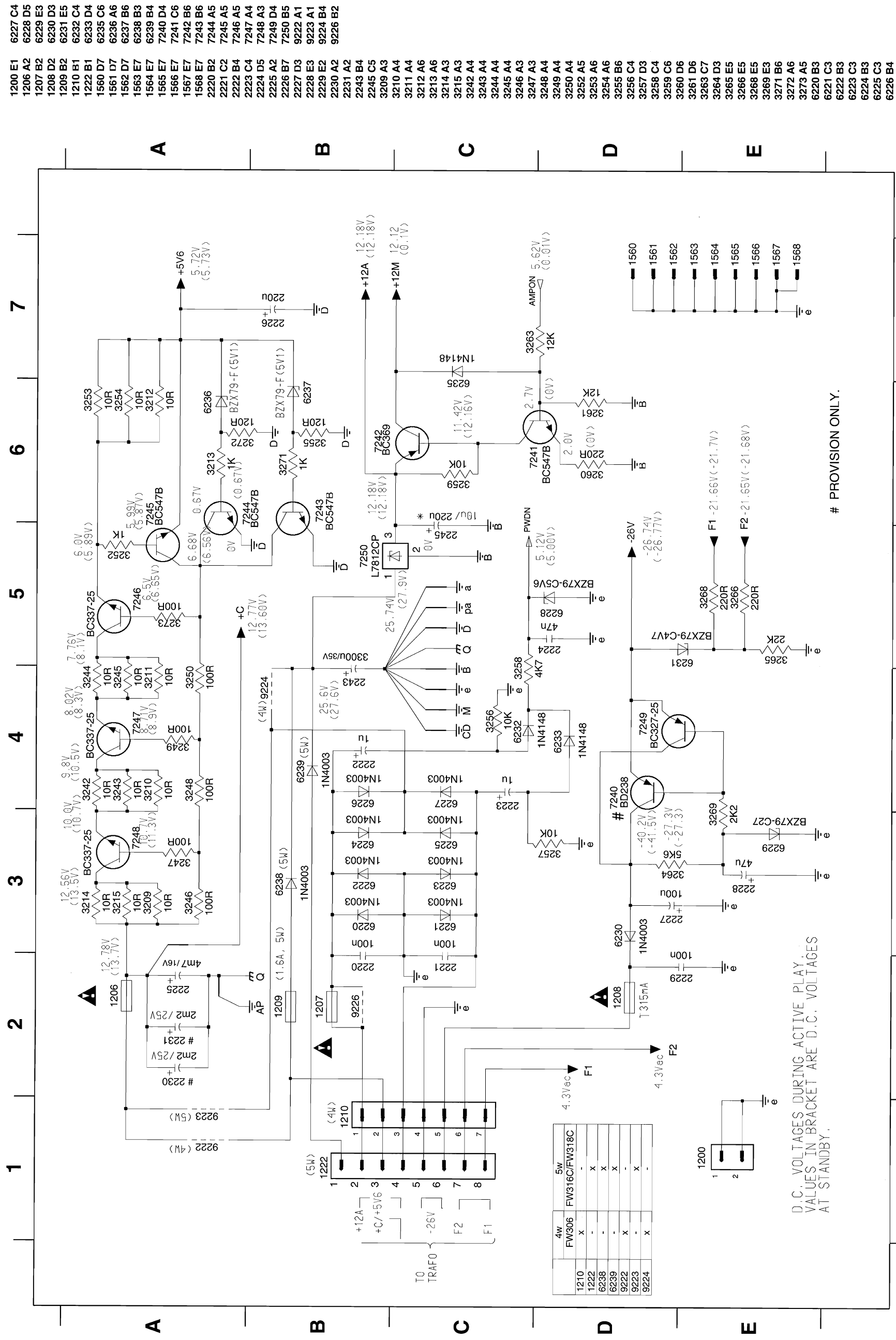
ossible versions.
chematic diagram and respective parts list.



This assembly drawing shows a summary of all possible versions.
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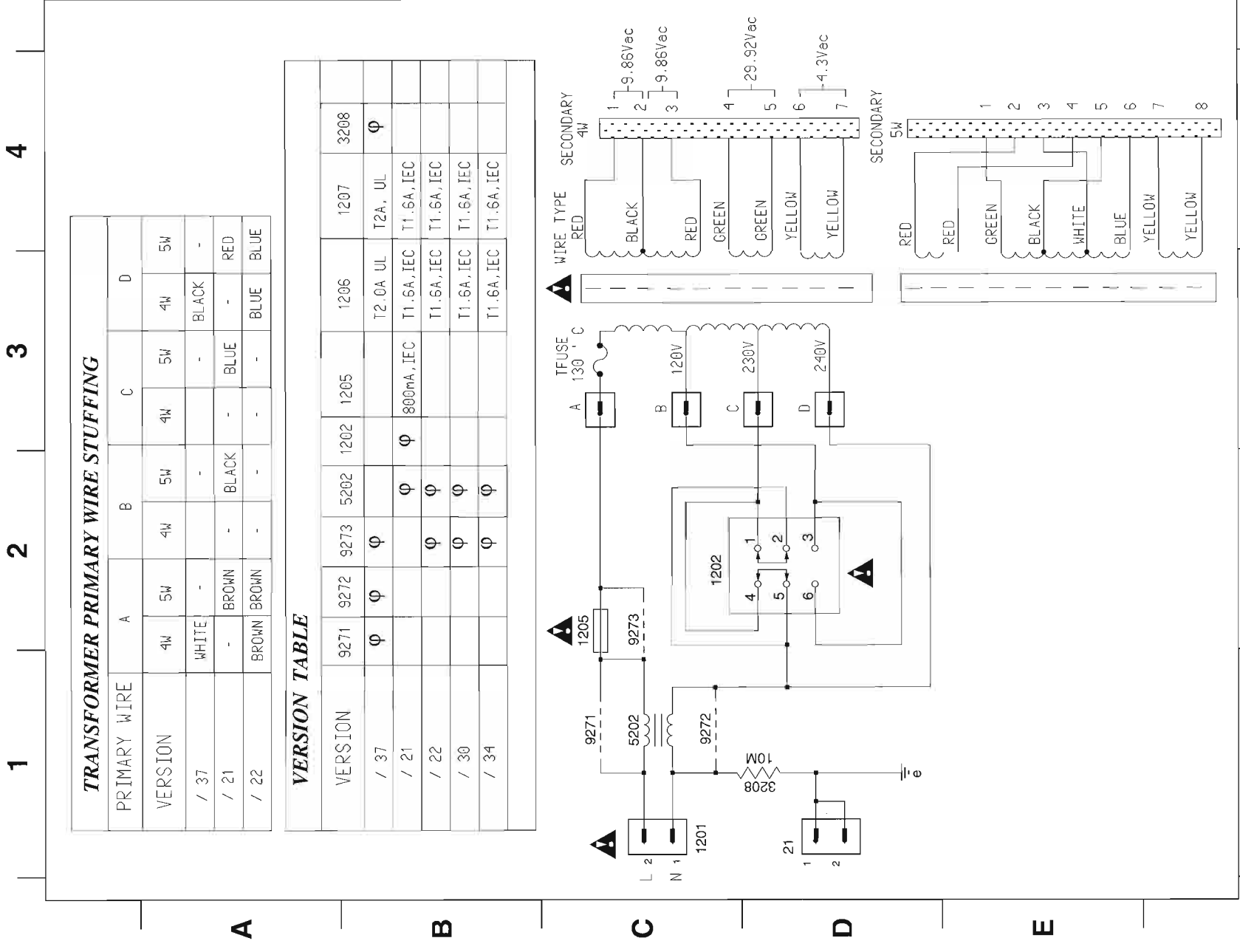
CIRCUIT DIAGRAM - POWER SUPPLY PART



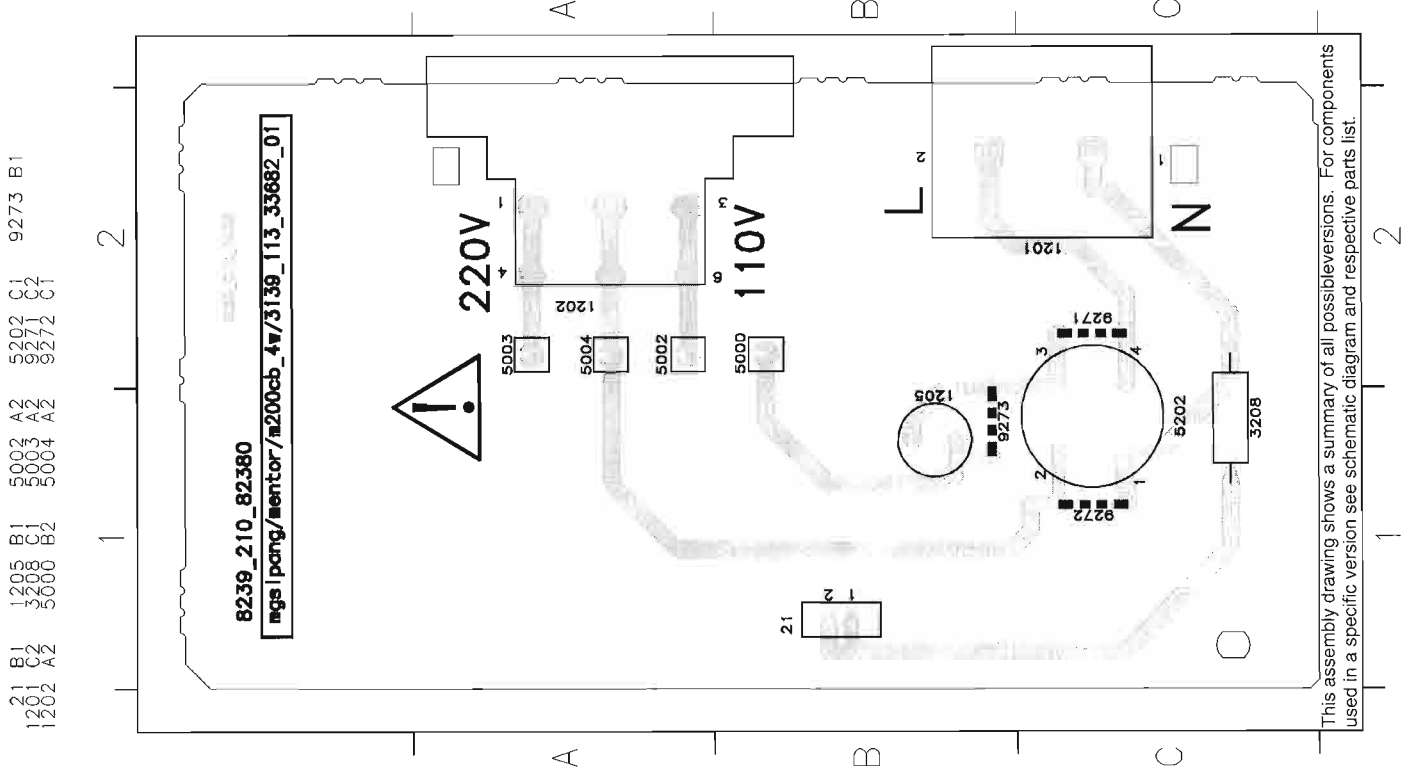
- 1200 E1
- 6227 C4
- 1206 A2
- 6228 D5
- 1207 B2
- 6229 E3
- 1208 D2
- 6230 D3
- 1209 B1
- 6231 E5
- 1210 B1
- 6232 C4
- 1222 B1
- 6233 D4
- 1560 D7
- 6235 C6
- 1561 D7
- 6236 A6
- 1562 D7
- 6237 B6
- 1563 E7
- 6238 B3
- 1564 E7
- 6239 B4
- 1565 E7
- 7240 D4
- 1566 E7
- 7241 C6
- 1567 E7
- 7242 B6
- 1568 E7
- 7243 B6
- 2220 B2
- 7244 A5
- 2221 C2
- 7245 A5
- 2222 B4
- 7246 A5
- 2223 C4
- 7247 A4
- 2224 D5
- 7248 A3
- 2225 A2
- 7249 D4
- 2226 B7
- 7250 B5
- 2227 D3
- 9222 A1
- 2228 E3
- 9223 A1
- 2229 E2
- 9224 B4
- 2230 A2
- 9226 B2
- 2231 A2
- 2243 B4
- 2245 C5
- 3209 A3
- 3210 A4
- 3211 A4
- 3212 A6
- 3213 A6
- 3214 A3
- 3215 A3
- 3242 A4
- 3243 A4
- 3244 A4
- 3245 A4
- 3246 A3
- 3247 A3
- 3248 A4
- 3249 A4
- 3250 A4
- 3252 A5
- 3253 A6
- 3254 A6
- 3255 B6
- 3256 C4
- 3257 D3
- 3258 C4
- 3259 C6
- 3260 D6
- 3261 D6
- 3263 C7
- 3264 D3
- 3265 E5
- 3266 E5
- 3268 E5
- 3269 E3
- 3271 B6
- 3272 A6
- 3273 A5
- 6220 B3
- 6221 C3
- 6222 B3
- 6223 C3
- 6224 B3
- 6225 C3
- 6226 B4

CIRCUIT DIAGRAM - TRANSFORMER PRIMARY PART

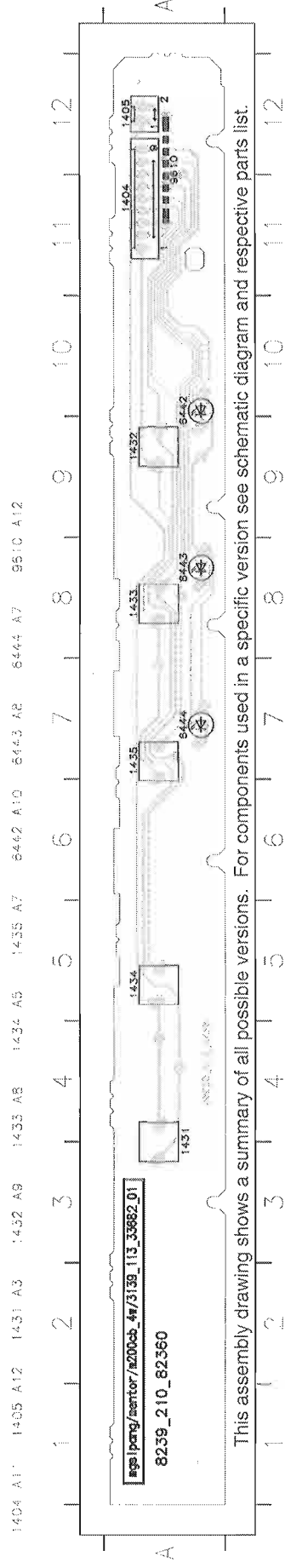
21 D1 1201 C1 1202 C2 1205 C2 3208 D1 5202 C1 9271 C1 9272 C1 9273 C2



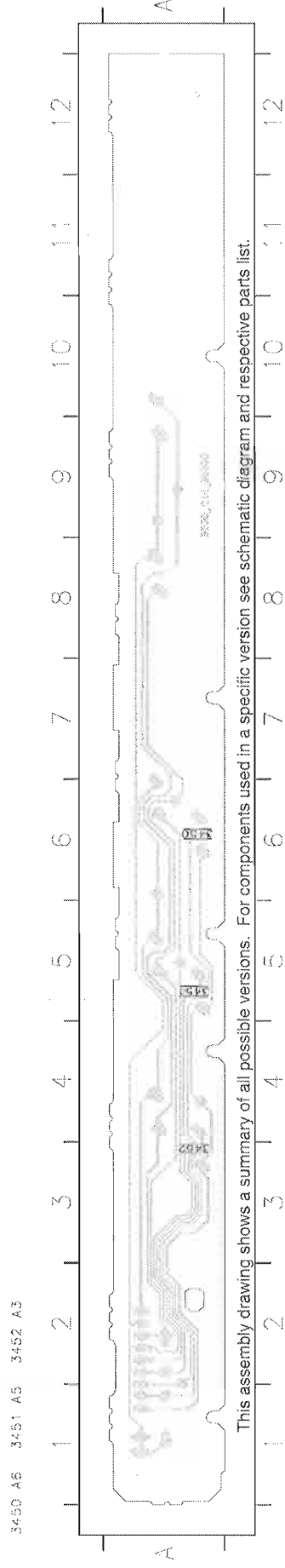
COMPONENT LAYOUT - TRANSFORMER PRIMARY



CDC KEY PART

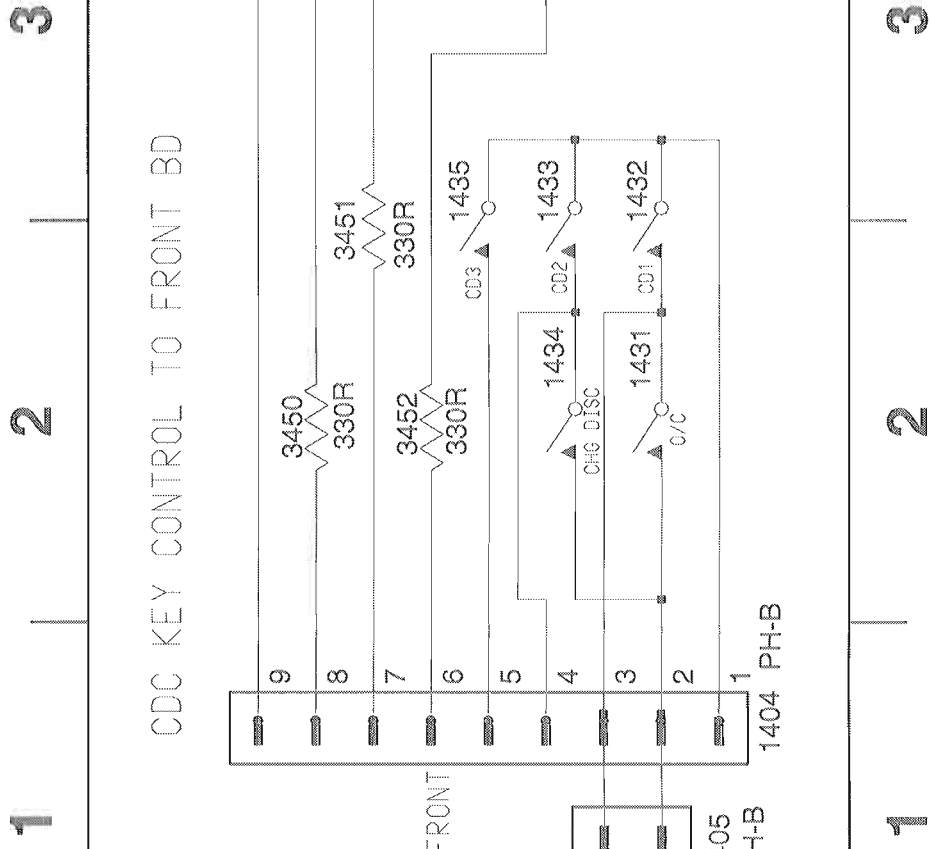


COMPONENT LAYOUT - CDC KEY



CHIP LAYOUT - CDC KEY

- 1404 A1 1431 A2 1433 A3 1435 A3 3451 A2 6442 A3 6444 A3
- 1405 A1 1432 A3 1434 A2 3450 A2 3452 A2 6443 A3



CIRCUIT DIAGRAM - CDC KEY PART

ELECTRICAL PARTS LIST - COMBI BOARD

MISCELLANEOUS	
1201	4822 265 31016 Δ AC Socket /37
1201	4822 265 31015 Δ AC Socket /22
1206	4822 253 10128 Δ Fuse T2A 250V /37
1206	4822 071 51602 Δ Fuse T1.6A 250V /22
1207	4822 253 10128 Δ Fuse T2A 250V /37
1207	4822 071 51602 Δ Fuse T1.6A 250V /22
1208	4822 071 53151 Δ Fuse T315mA 250V
1322	4822 267 31176 Loudspeaker Socket L/R
1324	4822 267 40898 Headphone Socket
1431	4822 276 13114 Tact Switch
1432	4822 276 13114 Tact Switch
1433	4822 276 13114 Tact Switch
1434	4822 276 13114 Tact Switch
1435	4822 276 13114 Tact Switch
1507	4822 265 20553 Aux Socket
1508	4822 267 10738 Flex Socket 13pins
1509	4822 265 10981 Flex Socket 15pins
CAPACITORS	
2220	5322 121 42386 100nF 5% 63V
2221	5322 121 42386 100nF 5% 63V
2222	4822 124 40242 1μF 20% 63V
2223	4822 124 40242 1μF 20% 63V
2224	4822 121 43526 47nF 5% 250V
2225	4822 124 11878 4700μF 16V
2226	4822 124 22263 220μF 20% 25V
2227	4822 124 40255 100μF 20% 63V
2228	4822 124 41751 47μF 20% 50V
2229	5322 121 42386 100nF 5% 63V
2243	4822 124 42367 3300μF 20% 35V
2245	4822 124 41579 10μF 20% 50V
2321	4822 122 32535 680pF 10% 63V
2322	4822 122 32535 680pF 10% 63V
2323	4822 124 40242 1μF 20% 63V
2324	4822 124 40242 1μF 20% 63V
2325	5322 122 34099 470pF 10% 63V
2326	5322 122 34099 470pF 10% 63V
2327	4822 124 40433 47μF 20% 25V
2328	4822 124 40433 47μF 20% 25V
2329	4822 121 43526 47nF 5% 250V
2330	4822 121 43526 47nF 5% 250V
2331	4822 123 14024 1000μF 20% 16V
2332	4822 123 14024 1000μF 20% 16V
2333	4822 121 43526 47nF 5% 250V
2334	4822 121 43526 47nF 5% 250V
2335	5322 122 32654 22nF 10% 63V
2336	5322 122 32654 22nF 10% 63V
2337	4822 124 40433 47μF 20% 25V
2338	4822 124 22263 220μF 20% 25V
2339	4822 124 81029 100μF 20% 25V
2340	4822 122 32535 680pF 10% 63V
2341	4822 122 32535 680pF 10% 63V

ELECTRICAL PARTS LIST - COMBI BOARD

RESISTORS	
2541	4822 126 12105 33nF 5% 63V
2542	4822 126 12105 33nF 5% 63V
2543	4822 126 13296 100nF 10% 16V
2544	4822 126 13296 100nF 10% 16V
2545	4822 126 13296 100nF 10% 16V
2546	4822 126 13296 100nF 10% 16V
2547	4822 126 13869 470nF +80/-20% 16V
2548	4822 126 13869 470nF +80/-20% 16V
2549	4822 126 13581 0.22μF 20% 50V
2550	4822 126 13581 0.22μF 20% 50V
2551	4822 124 40242 1μF 20% 63V
2552	4822 124 40242 1μF 20% 63V
2553	4822 122 33805 330pF 10% 63V
2554	4822 122 33805 330pF 10% 63V
2555	4822 122 33805 330pF 10% 63V
2556	4822 122 33805 330pF 10% 63V
2557	4822 122 33805 330pF 10% 63V
2558	4822 122 33805 330pF 10% 63V
2559	4822 124 40242 1μF 20% 63V
2560	4822 124 40242 1μF 20% 63V
2561	4822 126 12944 47nF 10% 50V
2562	4822 126 10002 100nF 20% 25V
2563	5322 122 32531 100pF 5% 50V
2564	4822 122 33805 330pF 10% 63V
2565	4822 122 33805 330pF 10% 63V
2566	4822 126 10002 100nF 20% 25V
2567	4822 122 33177 10nF 20% 50V
2572	4822 126 10002 100nF 20% 25V
2572	4822 126 13296 100nF 10% 16V
2573	4822 124 40246 4.7μF 20% 63V
2574	4822 124 40246 4.7μF 20% 63V
2577	4822 124 80195 470μF 20% 10V
2578	4822 124 81029 100μF 20% 25V
2579	4822 124 40433 47μF 20% 25V
2580	4822 124 41584 100μF 20% 10V
2581	4822 124 81029 100μF 20% 25V
2582	4822 126 13296 100nF 10% 16V
2583	4822 126 13296 100nF 10% 16V
2584	4822 126 13296 100nF 10% 16V
2585	4822 126 13296 100nF 10% 16V
2586	4822 126 13296 100nF 10% 16V
2587	4822 126 13296 100nF 10% 16V
2589	4822 122 32535 680pF 10% 63V
2590	4822 122 32535 680pF 10% 63V
2591	4822 126 13692 47pF 1% 63V
2592	4822 126 13692 47pF 1% 63V
2593	4822 126 13692 47pF 1% 63V
2594	4822 126 13692 47pF 1% 63V
2597	4822 126 13693 56pF 1% 63V
2598	4822 126 13693 56pF 1% 63V
2599	4822 122 32535 680pF 10% 63V

ELECTRICAL PARTS LIST - COMBI BOARD

ELECTRICAL PARTS LIST - COMBI BOARD

RESISTORS

3341	4822 117 11449	2k2 1% 0,1W	3532	4822 051 20223	22k 5% 0,1W	3589	4822 051 20105	1M 5% 0,1W	4531	4822 051 20008	OR Jumper 0805
3342	4822 117 10833	10k 1% 0,1W	3533	4822 051 20223	22k 5% 0,1W	3590	4822 051 20105	1M 5% 0,1W	4532	4822 051 20008	OR Jumper 0805
3343	4822 051 20101	100R 5% 0,1W	3534	4822 051 20154	150k 5% 0,1W	3591	4822 117 10833	10k 1% 0,1W	4533	4822 051 20008	OR Jumper 0805
3344	4822 051 20101	100R 5% 0,1W	3535	4822 051 20154	150k 5% 0,1W	3592	4822 051 20273	27k 5% 0,1W	4534	4822 051 20008	OR Jumper 0805
3400	4822 117 11449	2k2 1% 0,1W	3536	4822 117 10834	47k 1% 0,1W	3593	4822 051 10102	1k 2% 0,25W	4535	4822 051 20008	OR Jumper 0805
3401	4822 117 11449	2k2 1% 0,1W	3537	4822 117 10834	47k 1% 0,1W	3594	4822 051 10102	1k 2% 0,25W	4536	4822 051 20008	OR Jumper 0805
3402	4822 117 11449	2k2 1% 0,1W	3538	4822 051 20224	220k 5% 0,1W	3595	4822 051 20273	27k 5% 0,1W	4537	4822 051 20008	OR Jumper 0805
3403	4822 117 11449	2k2 1% 0,1W	3539	4822 051 20224	220k 5% 0,1W	3596	4822 051 20683	68k 5% 0,1W	4538	4822 051 20008	OR Jumper 0805
3404	4822 117 11449	2k2 1% 0,1W	3540	4822 051 20474	470k 5% 0,1W	3597	4822 051 20683	68k 5% 0,1W	4539	4822 051 20008	OR Jumper 0805
3405	4822 051 20471	470R 5% 0,1W	3541	4822 051 20474	470k 5% 0,1W	3598	4822 051 10102	1k 2% 0,25W	4541	4822 051 20008	OR Jumper 0805
3406	4822 117 11449	2k2 1% 0,1W	3543	4822 051 20104	100k 5% 0,1W	3599	4822 051 10102	1k 2% 0,25W	4542	4822 051 20008	OR Jumper 0805
3407	4822 117 11449	2k2 1% 0,1W	3544	4822 051 20104	100k 5% 0,1W	3601	4822 116 83884	47k 5% 0,5W	4543	4822 051 20008	OR Jumper 0805
3409	4822 051 20562	5k6 5% 0,1W	3545	4822 051 20104	100k 5% 0,1W	3602	4822 116 83884	47k 5% 0,5W	4543	4822 051 20008	OR Jumper 0805
3410	4822 051 20562	5k6 5% 0,1W	3546	4822 051 20104	100k 5% 0,1W	3603	4822 051 20105	1M 5% 0,1W	4545	4822 051 20008	OR Jumper 0805
3411	4822 116 52175	100R 5% 0,5W	3547	4822 051 20334	330k 5% 0,1W	3604	4822 051 20105	1M 5% 0,1W	4546	4822 051 20008	OR Jumper 0805
3412	4822 116 52175	100R 5% 0,5W	3548	4822 051 20334	330k 5% 0,1W	3605	4822 051 20104	100k 5% 0,1W	4547	4822 051 20008	OR Jumper 0805
3413	4822 116 52175	100R 5% 0,5W	3549	4822 051 20104	100k 5% 0,1W	3606	4822 051 20104	100k 5% 0,1W	4548	4822 051 20008	OR Jumper 0805
3450	4822 051 20331	330R 5% 0,1W	3550	4822 051 20104	100k 5% 0,1W	3607	4822 051 20105	1M 5% 0,1W	4549	4822 051 20008	OR Jumper 0805
3451	4822 051 20331	330R 5% 0,1W	3551	4822 051 20228	2R2 5% 0,1W	3608	4822 051 20105	1M 5% 0,1W	4550	4822 051 20008	OR Jumper 0805
3452	4822 051 20331	330R 5% 0,1W	3552	4822 051 20228	2R2 5% 0,1W	3609	4822 116 83864	10k 5% 0,5W	4551	4822 051 20008	OR Jumper 0805
3500	4822 052 10339	33R 5% 0,33W	3553	4822 117 10834	47k 1% 0,1W	3610	4822 116 83864	10k 5% 0,5W	4552	4822 051 20008	OR Jumper 0805
3501	4822 117 10834	47k 1% 0,1W	3554	4822 117 10834	47k 1% 0,1W	3611	4822 051 20472	4k7 5% 0,1W	4553	4822 051 20008	OR Jumper 0805
3502	4822 117 10834	47k 1% 0,1W	3555	4822 051 20472	4k7 5% 0,1W	4203	4822 051 20008	OR Jumper 0805	4554	4822 051 20008	OR Jumper 0805
3503	4822 051 20104	100k 5% 0,1W	3556	4822 051 20472	4k7 5% 0,1W	4205	4822 051 20008	OR Jumper 0805	4555	4822 051 20008	OR Jumper 0805
3504	4822 051 20104	100k 5% 0,1W	3557	4822 051 20105	1M 5% 0,1W	4401	4822 051 20008	OR Jumper 0805	4556	4822 051 20008	OR Jumper 0805
3505	4822 051 20104	100k 5% 0,1W	3558	4822 051 20105	1M 5% 0,1W	4402	4822 051 20008	OR Jumper 0805	4557	4822 051 20008	OR Jumper 0805
3506	4822 051 20104	100k 5% 0,1W	3559	4822 051 20471	470R 5% 0,1W	4500	4822 051 20008	OR Jumper 0805	4558	4822 051 20008	OR Jumper 0805
3507	4822 051 20683	68k 5% 0,1W	3560	4822 051 20471	470R 5% 0,1W	4503	4822 051 20008	OR Jumper 0805	4559	4822 051 20008	OR Jumper 0805
3508	4822 051 20683	68k 5% 0,1W	3561	4822 051 20153	15k 5% 0,1W	4507	4822 051 20008	OR Jumper 0805	4560	4822 051 20008	OR Jumper 0805
3509	4822 117 10834	47k 1% 0,1W	3562	4822 051 20153	15k 5% 0,1W	4508	4822 051 20008	OR Jumper 0805	4561	4822 051 20008	OR Jumper 0805
3510	4822 117 10834	47k 1% 0,1W	3563	4822 051 20153	15k 5% 0,1W	4509	4822 051 20008	OR Jumper 0805	4562	4822 051 20008	OR Jumper 0805
3511	4822 117 10834	47k 1% 0,1W	3564	4822 117 11503	220R 1% 0,1W	4510	4822 051 20008	OR Jumper 0805	4563	4822 051 20008	OR Jumper 0805
3512	4822 117 10834	47k 1% 0,1W	3565	4822 117 11503	220R 1% 0,1W	4511	4822 051 20008	OR Jumper 0805	4564	4822 051 20008	OR Jumper 0805
3513	4822 117 10834	47k 1% 0,1W	3566	4822 117 11383	12k 1% 0,1W	4512	4822 051 20008	OR Jumper 0805	COILS & FILTERS		
3514	4822 117 10834	47k 1% 0,1W	3567	4822 117 11383	12k 1% 0,1W	4513	4822 051 20008	OR Jumper 0805	5202	4822 157 71285	coil 400µH 30%
3515	4822 051 20683	68k 5% 0,1W	3568	4822 051 20822	8k2 5% 0,1W	4514	4822 051 20008	OR Jumper 0805	5321	4822 157 11477	Coil 2,2µH 5%
3516	4822 051 20683	68k 5% 0,1W	3569	4822 051 20822	8k2 5% 0,1W	4515	4822 051 20008	OR Jumper 0805	5322	4822 157 11477	Coil 2,2µH 5%
3517	4822 117 10833	10k 1% 0,1W	3570	4822 117 11383	12k 1% 0,1W	4516	4822 051 20008	OR Jumper 0805	5324	4822 157 11477	Coil 2,2µH 5%
3518	4822 051 20104	100k 5% 0,1W	3571	4822 117 11383	12k 1% 0,1W	4517	4822 051 20008	OR Jumper 0805	5501	4822 157 11477	Coil 2,2µH 5%
3519	4822 051 20104	100k 5% 0,1W	3574	4822 051 20223	22k 5% 0,1W	4518	4822 051 20008	OR Jumper 0805	DIODES		
3520	4822 051 20223	22k 5% 0,1W	3575	4822 051 20223	22k 5% 0,1W	4519	4822 051 20008	OR Jumper 0805	6220	4822 130 31878	1N4003G
3521	4822 051 20223	22k 5% 0,1W	3576	4822 051 20223	22k 5% 0,1W	4520	4822 051 20008	OR Jumper 0805	6221	4822 130 31878	1N4003G
3522	4822 051 20105	1M 5% 0,1W	3577	4822 051 20471	470R 5% 0,1W	4521	4822 051 20008	OR Jumper 0805	6222	4822 130 31878	1N4003G
3523	4822 051 20105	1M 5% 0,1W	3579	4822 051 20223	22k 5% 0,1W	4522	4822 051 20008	OR Jumper 0805	6223	4822 130 31878	1N4003G
3524	4822 051 20104	100k 5% 0,1W	3580	4822 051 20223	22k 5% 0,1W	4523	4822 051 20008	OR Jumper 0805	6224	4822 130 31878	1N4003G
3525	4822 051 20104	100k 5% 0,1W	3581	4822 051 20223	22k 5% 0,1W	4524	4822 051 20008	OR Jumper 0805	6225	4822 130 31878	1N4003G
3526	4822 051 20563	56k 5% 0,1W	3582	4822 117 11454	820R 1% 0,1W	4525	4822 051 20008	OR Jumper 0805	6226	4822 130 31878	1N4003G
3527	4822 051 20563	56k 5% 0,1W	3583	4822 117 11454	820R 1% 0,1W	4526	4822 051 20008	OR Jumper 0805	6227	4822 130 31878	1N4003G
3528	4822 051 20333	33k 5% 0,1W	3584	4822 051 10102	1k 2% 0,25W	4527	4822 051 20008	OR Jumper 0805	6228	4822 130 34173	BZX79-B5V6
3529	4822 051 20333	33k 5% 0,1W	3585	4822 051 20479	47R 5% 0,1W	4528	4822 051 20008	OR Jumper 0805	6229	4822 130 34379	BZX79-B27
3530	4822 051 20104	100k 5% 0,1W	3586	4822 117 11449	2k2 1% 0,1W	4529	4822 051 20008	OR Jumper 0805	6230	4822 130 31878	1N4003G
3531	4822 051 20104	100k 5% 0,1W	3587	4822 117 11507	6k8 1% 0,1W	4530	4822 051 20008	OR Jumper 0805			
			3588	4822 051 20471	470R 5% 0,1W						

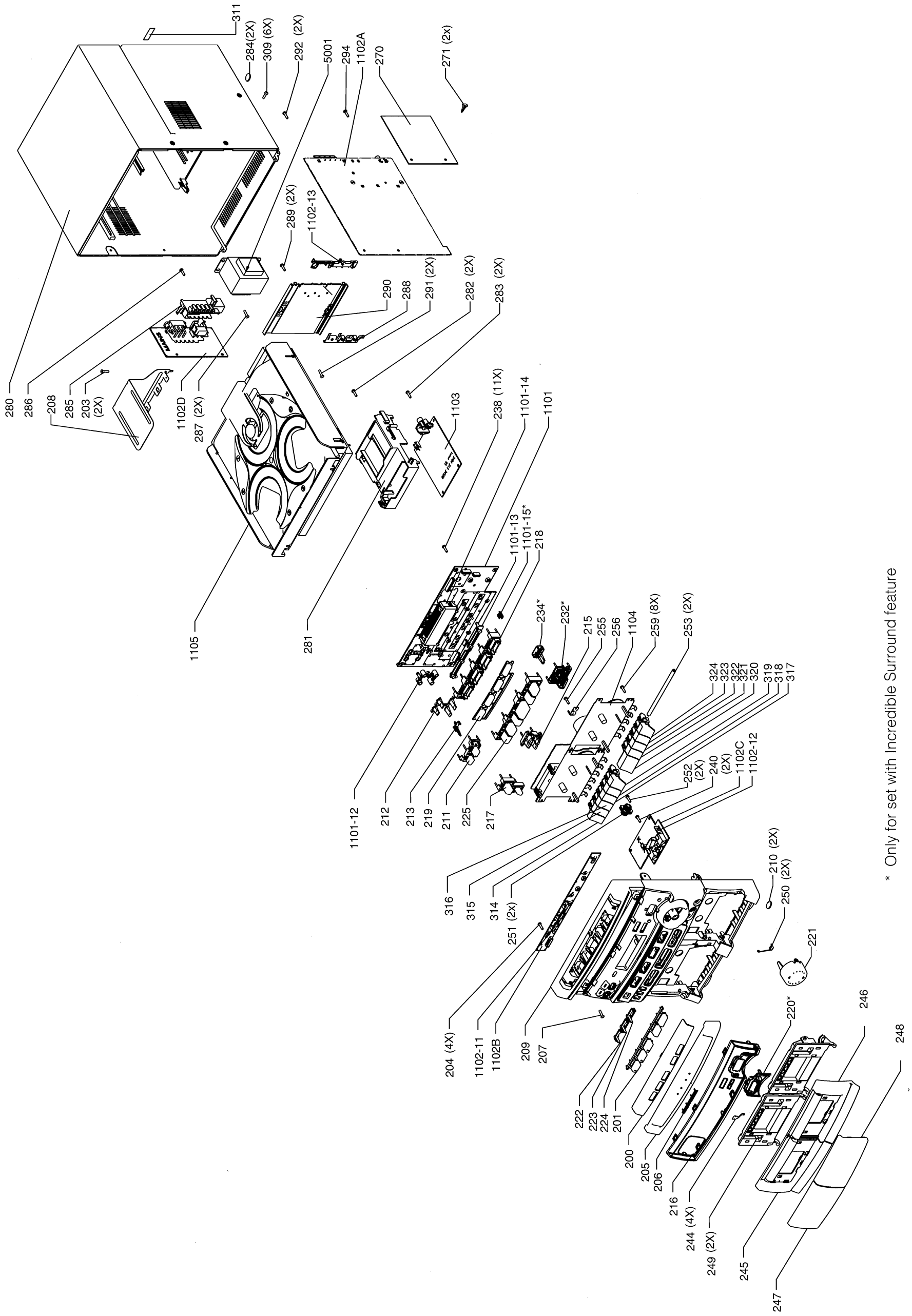
ELECTRICAL PARTS LIST - COMBI BOARD**DIODES**

6231	4822 130 34174	BZX79-B4V7	7546	5322 130 60508	BC857B
6232	4822 130 30621	1N4148	7547	4822 130 60511	BC847B
6233	4822 130 30621	1N4148	7548	4822 130 60511	BC847B
6235	4822 130 30621	1N4148	7549	4822 130 60511	BC847B
6236	4822 130 34233	BZX79-B5V1	7550	4822 130 60511	BC847B
6237	4822 130 34233	BZX79-B5V1			
6251	4822 130 34173	BZX79-B5V6			
6255	4822 130 31878	1N4003G			
6320	4822 130 30621	1N4148			
6442	4822 130 10792	LTL-1CHPE			
6443	4822 130 10792	LTL-1CHPE			
6444	4822 130 10792	LTL-1CHPE			
6502	4822 130 34173	BZX79-B5V6			
6549	4822 130 30621	1N4148			
6550	4822 130 30621	1N4148			
6551	4822 130 30621	1N4148			

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

TRANSISTORS & INTEGRATED CIRCUITS

7241	4822 130 40959	BC547B			
7242	5322 130 44593	BC369			
7243	4822 130 40959	BC547B			
7244	4822 130 40959	BC547B			
7245	4822 130 40959	BC547B			
7246	4822 130 40981	BC337-25			
7247	4822 130 40981	BC337-25			
7248	4822 130 40981	BC337-25			
7249	4822 130 41246	BC327-25			
7250	4822 209 33575	L7812CP			
7320	4822 130 42615	BC817-40			
7321	4822 130 42615	BC817-40			
7322	4822 130 41246	BC327-25			
7391	4822 209 12925	AN7124			
7400	5322 130 60508	BC857B			
7401	4822 130 40981	BC337-25			
7402	5322 209 11306	HEF4094BT			
7501	5322 209 11102	HEF4052BT			
7503	4822 130 41096	BC550C			
7504	4822 130 41096	BC550C			
7505	4822 130 44568	BC557B (ON4986)			
7506	4822 130 44568	BC557B (ON4986)			
7507	4822 130 44568	BC557B (ON4986)			
7508	4822 130 44568	BC557B (ON4986)			
7530	5322 209 14482	HEF4069UBT			
7537	4822 130 60511	BC847B			
7538	4822 130 60511	BC847B			
7539	4822 130 60511	BC847B			
7540	4822 130 60511	BC847B			
7541	4822 130 60511	BC847B			
7542	4822 130 60511	BC847B			
7543	4822 130 60511	BC847B			
7544	4822 130 60511	BC847B			
7545	5322 130 60508	BC857B			



* Only for set with Incredible Surround feature

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

SCREW LISTS - MAIN UNIT

200	4822 450 10439	Window CDC Control	356	4822 219 10452	RC0799/01 for FW316C/22	203	M3 x 6
201	4822 410 11635	Button Open/Close & CDC/Sel	356	4822 219 10433	RC0799/04 for FW316C/37	204	D3 x 12
205	4822 442 01269	Cover Tray CDC1 /22	356	4822 219 10451	RC07102/04 for FW318C/37	207	D3 x 12
205	4822 442 01223	Cover Tray CDC1 /37	384	4822 303 50082	AM Frame Aerial	238	D3 x 12
206	4822 454 13035	Badge Philips /22	385	4822 321 10882	Mains Cord /37	240	D3 x 12
206	4822 454 13265	Badge (Ph-Mag) Assembly /37	385	4822 321 10249	Mains Cord /22	252	D3 x 12
209	4822 459 04887	Cabinet Front	387	4822 736 15955	Instruction For Use /22	255	D3 x 12
210	4822 462 40683	Plate (Foot)	387	4822 736 15907	Instruction For Use /37	259	D3 x 12
211	4822 410 11636	Button Set DSC/DBB	1456	4822 320 12246	Flex Cable 13pins 22cm	282	D3 x 12
215	4822 410 11657	Button Set Ck/RDS	5001	4822 146 10928	Mains Transformer /37	283	D3 x 12
216	4822 450 10441	Window Display FW316C	5001	4822 146 10945	Mains Transformer /22	286	D3 x 12
216	4822 450 10461	Window Display FW318C				287	D3 x 16
217	4822 410 11638	Button Set Power/HSD				289	M3 x 15
218	4822 410 11643	Button Source Select				291	D3 x 16
220	4822 442 01268	Cover IS FW318C				292	D3 x 12
221	4822 410 11644	Knob Volume Up/Down				294	D3 x 12
225	4822 410 11639	Button Set Controls				309	D3 x 12
232	4822 410 11705	Button IS FW318C					
244	4822 492 70231	Spring Leaf					
245	4822 442 01224	Cover Door Cassette Left					
246	4822 442 01225	Cover Door Cassette Right					
247	4822 381 11935	Lens Cassette Left					
248	4822 381 11936	Lens Cassette Right					
249	4822 443 10881	Door Cassette					
250	4822 492 42709	Spring-Door					
251	4822 529 10322	Damper Assembly					
271	4822 466 93148	Spacer 5mm					
280	4822 426 10581	Cabinet Rear /37					
280	4822 426 10598	Cabinet Rear /22					
284	4822 462 40683	Plate (Foot)					
314	4822 410 11656	Button Record 1					
315	4822 410 11658	Button Play 1					
316	4822 410 11659	Button Rewind 1					
317	4822 410 11661	Button Fast Forward 1					
318	4822 410 11662	Button Stop/Eject 1					
319	4822 410 11663	Button Pause 1					
320	4822 410 11664	Button Play 1					
321	4822 410 11665	Button Rewind 2					
322	4822 410 11666	Button Fast Forward 2					
323	4822 410 11667	Button Stop/Eject 2					
324	4822 410 11668	Button Pause 2					
350	4822 445 10739	Loudspeaker Box /22					
350	4822 445 10709	Loudspeaker Box /37					
351	4822 303 50063	FM Aerial 75R /22					
351	4822 320 11094	FM Aerial 300R /37					

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

Technical Service Data

Service Solutions Group
Technical Publications Department
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Jefferson City, TN 37760

File: 1998: 1860

FW316C3701 AND FW52C37 AUDIO SYSTEMS

This supplement includes updated replacement parts for model FW316C3701 and introduces new model FW52C37.

FW316C3701 Updated Mechanical and Accessories Parts

The replacement parts shown below should be used instead of the parts listed in the Mechanical and Accessories Parts List on page 12-2 of manual 1860. For all other information, refer to manual 1860.

Ref.	Part No.	Description	Ref.	Part No.	Description
205	4822 442 01358	Cover Tray CDC1 /37	221	4822 410 11798	Knob Volume Up/Down
209	4822 459 04973	Cabinet Front	225	4822 410 11799	Button Set Controls
211	4822 410 11796	Button Set DSC/DBB	245	4822 442 01355	Cover Cassette Door Left
217	4822 410 11797	Button Set HSD/Power	246	4822 442 01356	Cover Cassette Door Right

FW52C37 Mechanical and Accessories Parts

The replacement parts shown below are the only differences between model FW52C37 and model FW316C3701, which is covered in manual 1860. For all other FW52C37 information, refer to manual 1860.

Ref.	Part No.	Description	Ref.	Part No.	Description
205	4822 442 01223	Cover Tray CDC1 /37	225	4822 410 11639	Button Set Controls
209	4822 459 04887	Cabinet Front	245	4822 442 01232	Cover Cassette Door Left
211	4822 410 11636	Button Set DSC/DBB	246	4822 442 01233	Cover Cassette Door Right
216	4822 450 10502	Window Display	247	4822 381 11941	Lens Cassette Left
217	4822 410 11638	Button Set HSD/Power	248	4822 381 11942	Lens Cassette Right
221	4822 410 11644	Knob Volume Up/Down			

To order parts, call the TOLL FREE Philips Sales Center number:
(In USA) 1-800-851-8885 • (Facsimile) 1-800-535-3715 • (In Canada) 1-800-363-PART

REFER TO MANUAL 1860 FOR IMPORTANT SAFETY NOTICE/GUIDELINES

SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST BECOME FAMILIAR WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

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