Service
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Service Manual

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CLASS 1
LASER PRODUCT

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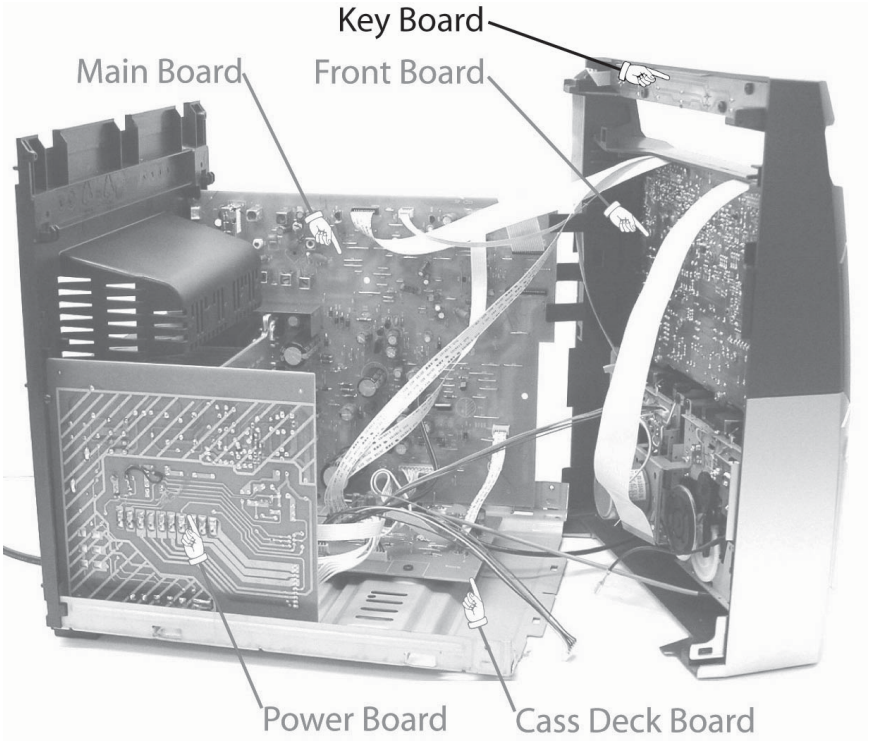
GB 3141 785 30140

Version 1.0

PHILIPS

LOCATION OF PCBS



VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	FWM35							
	/21	/21M	/22	/30				
Karaoke								
News			x					
RDS			x					
Rotary Encoder (volume control)	x	x	x	x				
Jog Shuttle								
Voltage Selector	x	x						
Aux Input	x	x	x	x				
Digital Output								
Headphone Socket	x	x	x	x				
Line Output								
Matrix Surround Loudspeakers								
Standby - FTD Clock Display	x	x	x	x				
ECO Standby - Dark			x					
ECO6 Tuner board - System Non-Cenelec	x	x		x				
ECO6 Tuner board - System Cenelec			x					
ETF7 Tape Module: Non-Autoreverse Ferro	x	x	x	x				
POWER 2001 Module (30-70W Version):	x	x	x	x				

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21/21M
230V ± 10% for /22/30
Mains frequency : 50/60Hz
Power consumption : < 1W at ECO Standby /22/25
< 15W Standby w/Clock on
< 30W Active
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 367mm

TUNER:

FM

Tuning range : 87.5-108MHz
Grid : 50kHz
IF frequency : 10.7MHz ± 20kHz
Aerial input : 75Ω coaxial
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 25dB
IF rejection : > 60dB [80dB]
Image rejection : > 25dB [75dB]
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 8µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

MW

Tuning range : 531-1602kHz
530-1700kHz for /21
Grid : 9kHz
10kHz for /21
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.4mV/M[4.0mv/m]
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5%

AMPLIFIER:

Output power (6Ω, 1 kHz, 10% THD) : 2 x 40W RMS
Frequency response within -3dB : 50Hz-15kHz
Dynamic Bass Boost : DBB OFF, DBB 1, DBB 2, DBB 3 [2)]
Digital Sound Control : Jazz, Rock, Techno, Optimal [2)]
Headphone output at 32Ω : 15mW ± 2dB
5mW ± 2dB (CD mode)
Input sensitivity
Aux / CDR : 500mV / 1.0V at 600Ω

CASSETTE RECORDER:

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

COMPACT DISC:

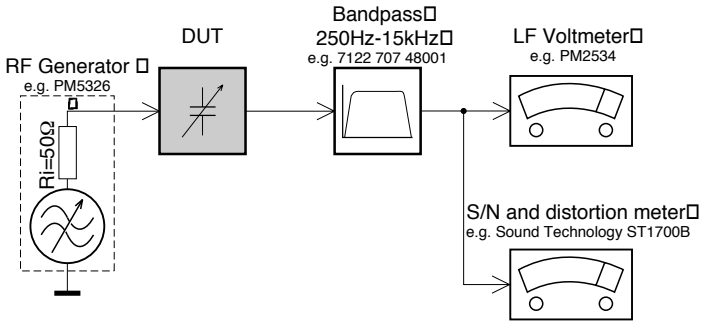
Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ±1dB, R_{out} = 100Ω
Signal/Noise ratio (A-weighted) : > 86dBA
Distortion at 1kHz : < 0.003%
Channel unbalance at 1kHz : ±1dB
Channel separation at 1kHz : > 60dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)
MPEG 1 Layer 3 (MP3-CD) : MPEG AUDIO
MP3-CD Bit Rate : 56-256 kbps
MP3-CD Sampling Frequencies : 32 kHz, 44.1kHz, 48kHz
Recording Format : ISO 9660
UDF format not supported

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

[1)] Frequency response in each setting is software controlled.

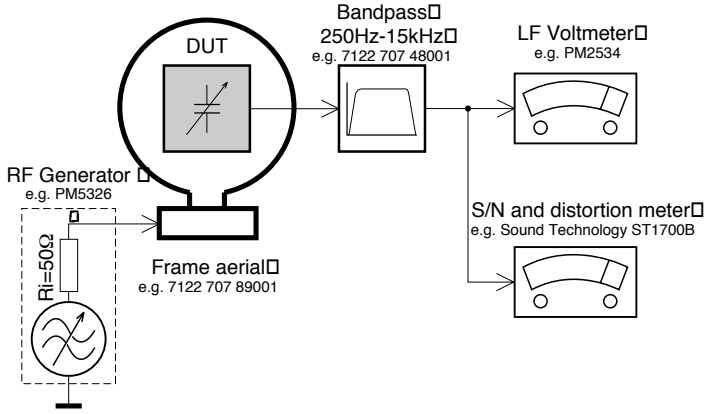
MEASUREMENT SETUP

Tuner FM



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

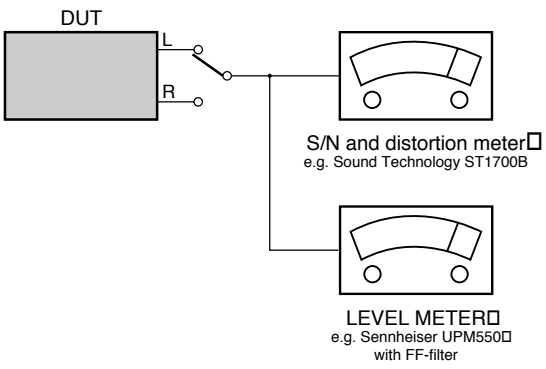
Tuner AM (MW,LW)



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).

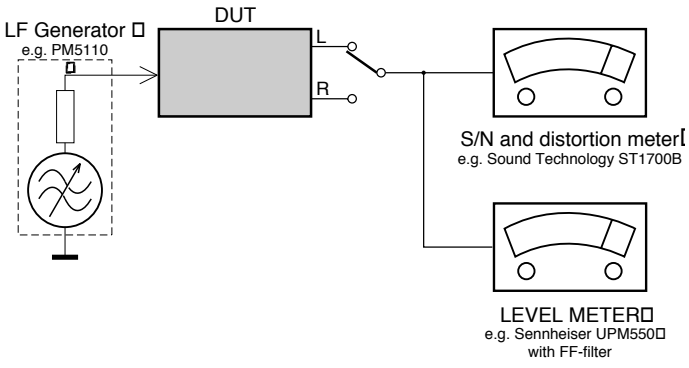
CD

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

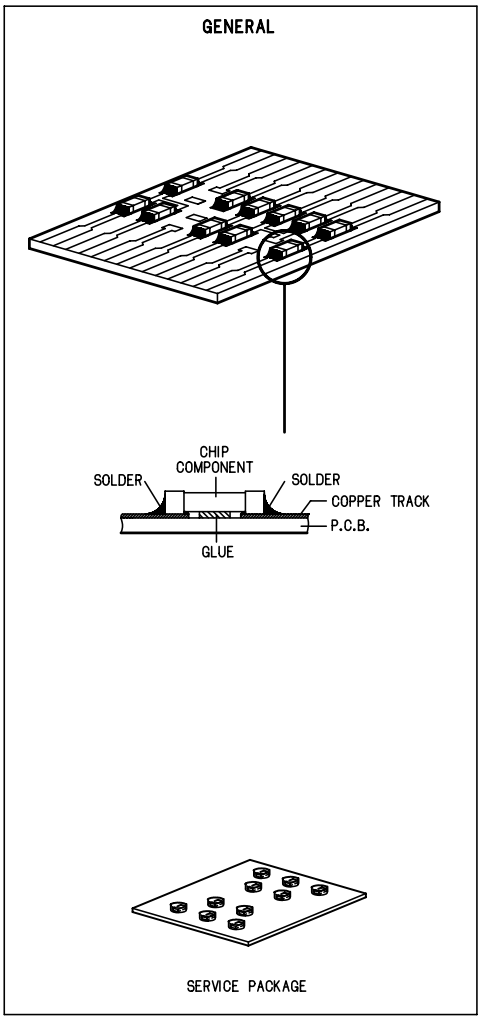
Compact Disc:

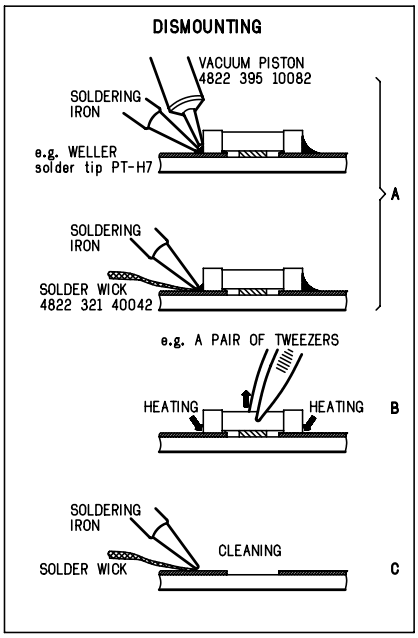
SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

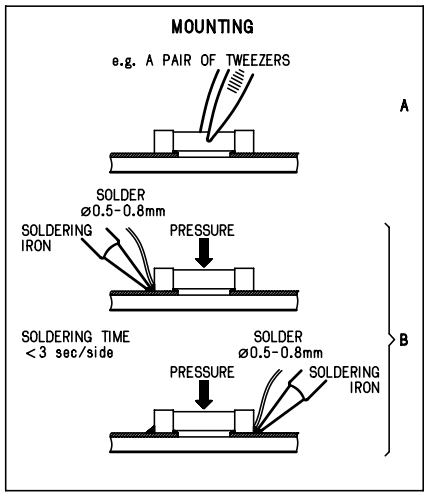
ESD Equipment:

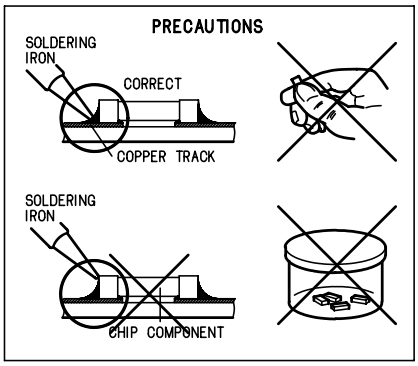
Anti-static table mat - large 1200x650x1.25mm ...4822 466 10953
anti-static table mat - small 600x650x1.25mm 4822 466 10958
Anti-static wristband 4822 395 10223
Connectorbox (1MΩ) 4822 395 11307
Extension cable
(to connect wristband to conn.box) 4822 320 11305
Connecting cable
(to connect table mat to 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

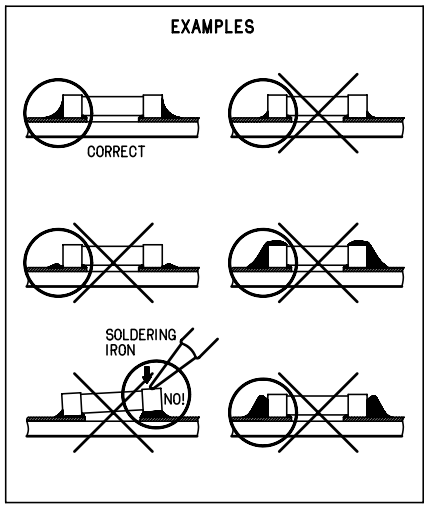
HANDLING CHIP COMPONENTS











ESD

(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.

(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 kan 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.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(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.

(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 utiliséés les piéces de rechange identiques à celles spécifiées.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand 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."

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

(GB) Warning !

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

(S) Varning !

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

(SF) Varoitus !

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

(DK) Advarse !

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

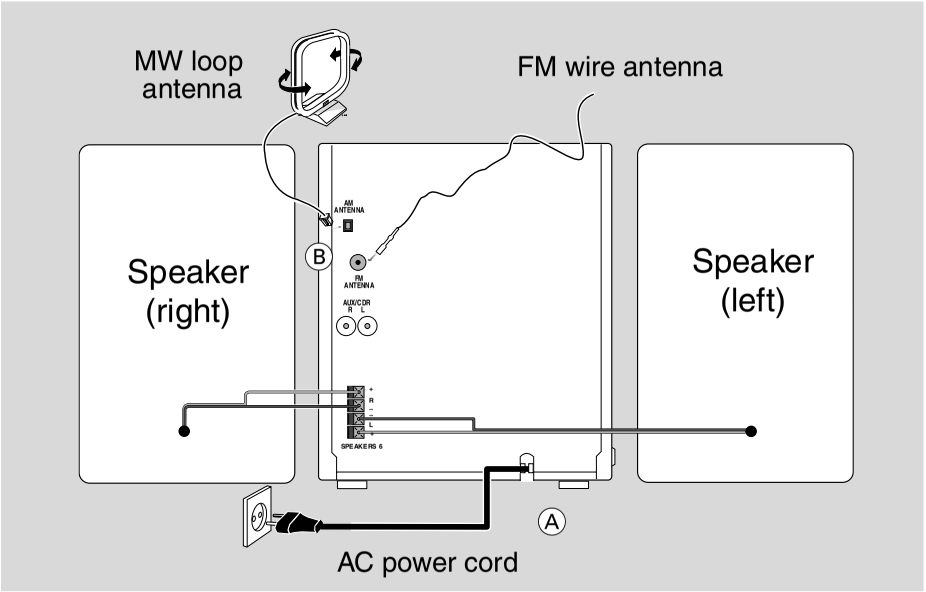
SERVICE INSTRUCTION

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

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):

  1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
  2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
  3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
  4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.

- Check the cabinet for defects, to avoid touching of any inner parts by the customer.



Rear connections

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

Ⓐ Power

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

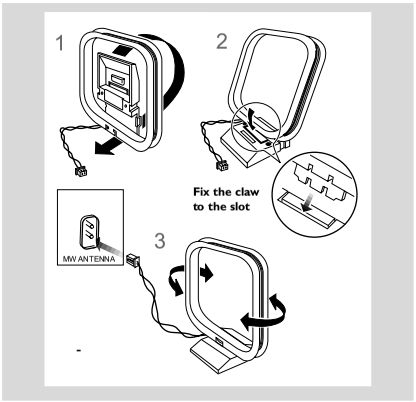
WARNING!
– For optimal performance, use only the original power cable.
– Never make or change any connections with the power switched on.

To avoid overheating of the system, a safety circuit has been built in. Therefore, your system may switch to Standby mode automatically under extreme conditions. If this happens, let the system cool down before reusing it *(not available for all versions)*.

Ⓑ Antennas Connection

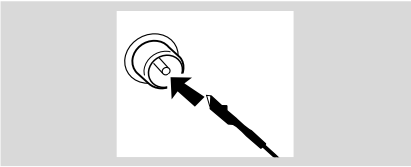
Connect the supplied MW loop antenna and FM antenna to the respective terminals. Adjust the position of the antenna for optimal reception.

MW Antenna



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

FM Antenna

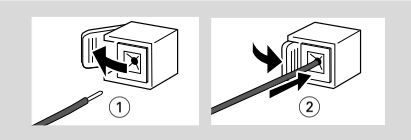


For better FM stereo reception, connect an outdoor FM antenna to the FM ANTENNA terminal.

Ⓒ Speakers Connection

Front Speakers

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



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

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

Optional connection

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

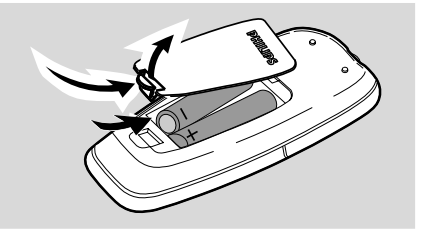
Connecting other equipment to your system

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

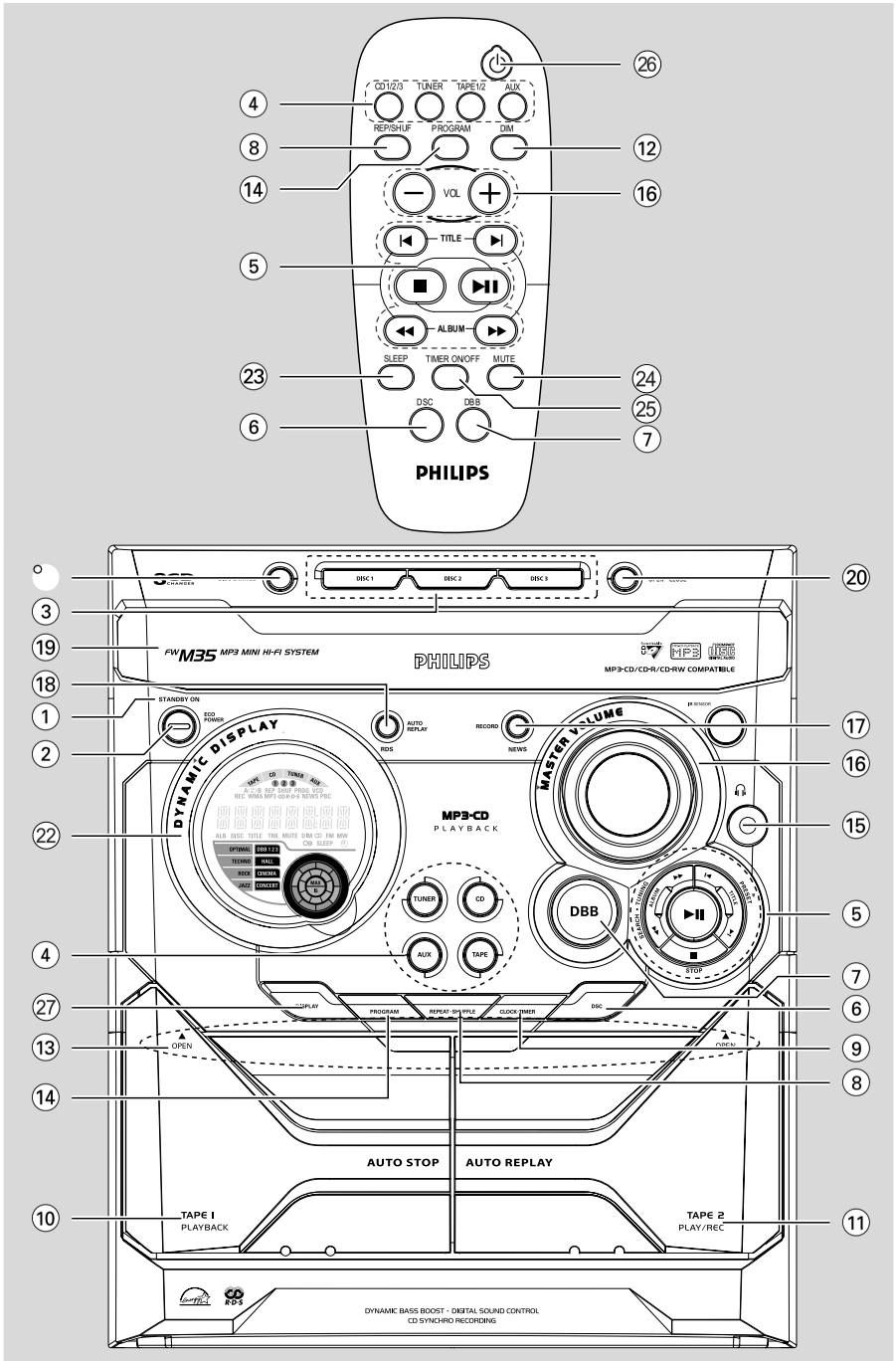
Note:
– If you are connecting equipment with a mono output (a single audio out terminal), connect it to the AUX/CDR left terminal. Alternatively, you can use a "single to double" cinch cable (the output sound still remain mono).

Inserting batteries into the remote control

Insert two batteries (Type R03 or AAA) into the remote control with the correct polarity as indicated by the "+" and "—" symbols inside the battery compartment.



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



Controls

Controls on the system and remote control

① **STANDBY ON**
– to switch the system on or to standby mode.

② **ECO POWER**
– to switch the system on or to Eco Power standby mode.

③ **DISC 1/2/3 (CD DIRECT 1/2/3)**
– to select a disc tray for playback.

④ **Source selection** – to select the following :

CD (CD 1•2•3)
– to select disc tray 1, 2 or 3.

TUNER (BAND)
– to select waveband : FM or MW.

TAPE (TAPE 1•2)
– to select tape deck 1 or 2.

AUX (VIDEO/CDR)
– to select the input for an additional appliance : AUX or CDR.

⑤ **Mode Selection**

◀◀ ▶▶ SEARCH•TUNING
for MP3-CD ..... to select previous/next album.
for CD ..... to search backward/forward.
for Tuner ..... to tune to a lower or higher radio frequency.
for Tape ..... to rewind or fast forward.
for Clock ..... *(on the system only)* to set the hour.

■ STOP
for CD/ MP3-CD .. to stop playback or to clear a programme.
for Tuner ..... *(on the system only)* to stop programming.
for Tape ..... to stop playback or recording.
for Demo ..... *(on the system only)* to activate/deactivate the demonstration.
for Clock ..... *(on the system only)* to exit clock setting.
for Plug & Play ..... *(on the system only)* to exit plug & play mode.

▶II PLAY•PAUSE
for CD/ MP3-CD .. to start or interrupt playback.
for Tape ..... to start playback.
for Plug & Play ..... *(on the system only)* to initiate and start plug & play mode.

⏮ PREV / ⏭ NEXT (— TITLE +)
for MP3-CD ..... to select previous/next title.
for CD ..... to skip to the beginning of the current, previous, or next track.
for Tuner ..... to select a preset radio station.
for Clock ..... *(on the system only)* to set the minute.

⑥ **DSC**
– Selects different types of preset sound equaliser settings (OPTIMAL, JAZZ, ROCK or TECHNO).

⑦ **DBB**
– to select the desired bass boost level. (DBB 1, DBB 2, DBB 3 or DBB OFF)

⑧ **REPEAT/SHUFFLE (REP/SHUF)**
– to playback track(s)/disc(s)/programme repeatedly.
– Turns on/off the random play mode.

⑨ **CLOCK•TIMER (CLK/ TIMER)**
– to view the clock.
– set the clock or set the timer (on the set only).

⑩ **Tape deck 1**

⑪ **Tape deck 2**

Controls

⑫ **DIM MODE**
– to select different brightness for the display screen : DIM 1, DIM 2, DIM 3 or DIM OFF.

⑬ ▲ **OPEN**
– to open the tape deck door.

⑭ **PROGRAM**
for CD/ MP3-CD .. to programme disc tracks.
for Tuner ..... to programme preset radio stations.
for Clock ..... to select 12- or 24-hour clock mode.

⑮ 🎧
– to connect headphones.

⑯ **VOLUME (VOL +/–)**
– to increase or decrease the volume.

⑰ **NEWS/RECORD**
– to hear News automatically.
– to start recording on tape deck 2.

⑱ **RDS/AUTO REPLAY**
– to select RDS information.
– to select continuous playback in either AUTO REPLAY or ONCE MODE only.

⑲ **Disc tray**

⑳ **OPEN•CLOSE**
– to open or close the disc tray.

° **DISC CHANGE**
– to change disc(s).

Display screen
– to view the current status of the system.

㉓ **SLEEP**
– to activate/deactivate or set the sleep timer.

㉔ **MUTE**
– Mutes or restores the volume.

㉕ **TIMER ON/OFF**
– activates/deactivates the timer function.

㉖ ⏻
– to switch the system to standby mode.
– to switch the system to Eco Power standby mode.

㉗ **DISPLAY**
– Display the album and title name for MP3 disc.

Notes for remote control:
– First, select the source you wish to control by pressing one of the source select keys on the remote control (CD or TUNER, for example).
– Then select the desired function (►, ⏮, ⏭, for example).

Maintenance

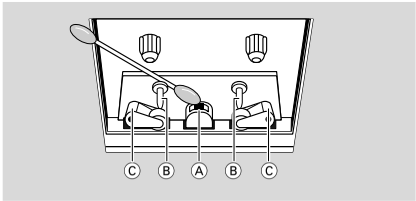
Cleaning the Cabinet
Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs

When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the centre out. Do not wipe in circular motion.
Do not use solvents such as benzene, thinner, commercially available cleaners, or antistatic spray intended for analogue records.

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

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



Demagnetising the heads
Use a demagnetising tape available at your dealer.

Troubleshooting

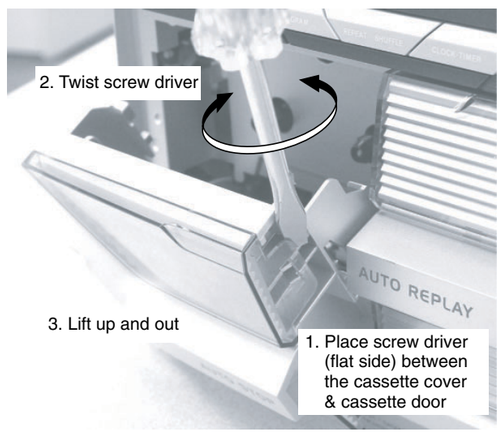
WARNING
Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty. Do not open the system as there is a risk of electric shock.

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

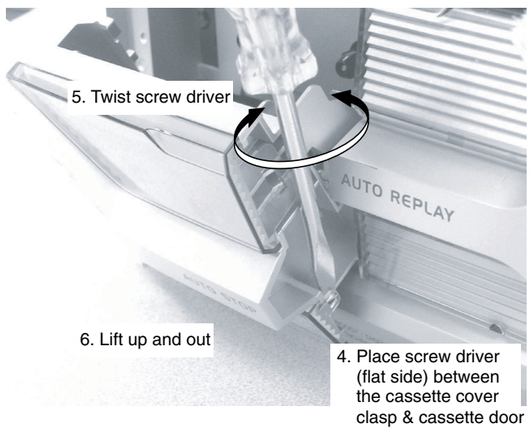
Problem	Solution
"NO DISC" is displayed.	Insert a disc. Check if the disc is inserted upside down. Wait until the moisture condensation at the lens has cleared. Replace or clean the disc, see "Maintenance". Use a finalized CD-RW or a correct MP3-CD format disc.
"DISC NOT FINALIZED" is displayed.	Use a finalised CD-RW or CD-R.
Radio reception is poor.	If the signal is too weak, adjust the antenna or connect an external antenna for better reception. Increase the distance between the Mini HiFi System and your TV or VCR.
Recording or playback cannot be made.	Clean deck parts, see "Maintenance". Use only NORMAL (IEC I) tape. Apply a piece of adhesive tape over the missing tab space. Remove and reconnect the AC power plug and switch on the system again.
The tape deck door cannot open.	Remove and reconnect the AC power plug and switch on the system again.
The system does not react when buttons are pressed.	Adjust the volume. Disconnect the headphones. Check that the speakers are connec ted correctly. Check if the stripped speaker wire is clamped. Make sure the MP3-CD was recorded within 32-256 kbps bit rate with sampling frequencies at 48 kHz, 44.1 kHz or 32 kHz.
Sound cannot be heard or is of poor quality.	Check the speaker connections and location.
The left and right sound outputs are reversed.	Select the source (CD or TUNER, for example) before pressing the function button (▶, ⏮, ⏭).
The remote control does not function properly.	Reduce the distance between the remote control and the system. Insert the batteries with their polarities (+/– signs) aligned as indicated. Replace the batteries. Point the remote control directly towards the IR sensor.
The time is not working.	Set the clock correctly. Press and hold CLOCK•TIMER to switch on the timer. If recording or tape dubbing is in progress, stop recording.
Not all lighted buttons are showing light.	Press DIM to select DIM OFF display mode.
The Clock/Timer setting is erased.	Power has been interrupted or the power cord has been disconnected. Reset the clock/timer.
The system displays features automatically and buttons start flashing.	Press and hold ■ on the system to switch off the demonstration.

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover



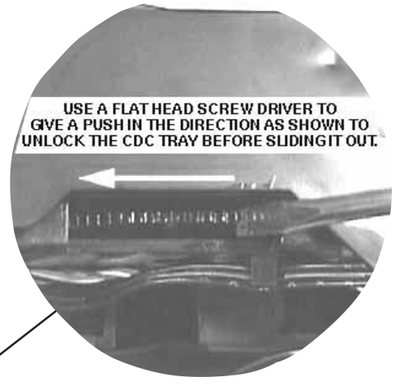
Remove Cassette Upper Cover



Remove Cassette Nether Cover

Dismantling of the CDC Module and Front Panel

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

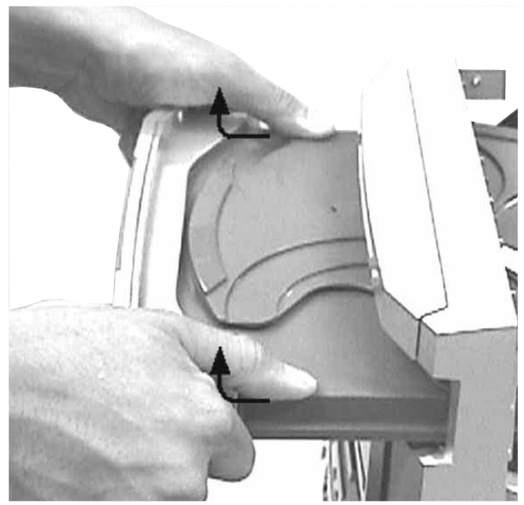


Sliding Out The CDC Tray

2-1

Dismantling of the CDC Module and Front Panel

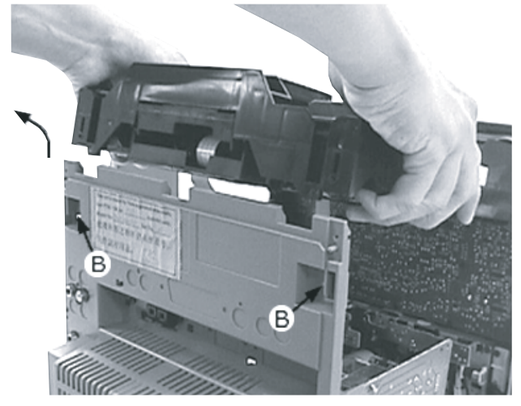
4) Remove the Cover Tray CDC as indicated.



Remove Cover Tray CDC

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

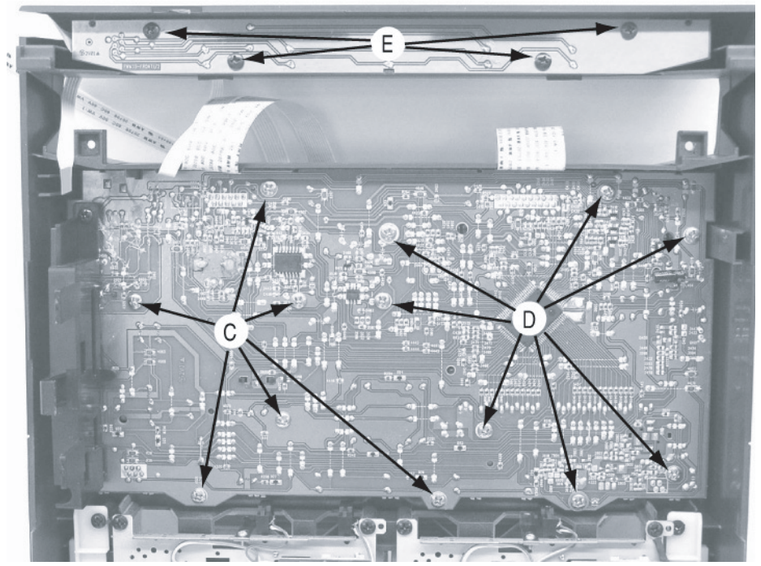
Front View CDC



Remove CDC Module

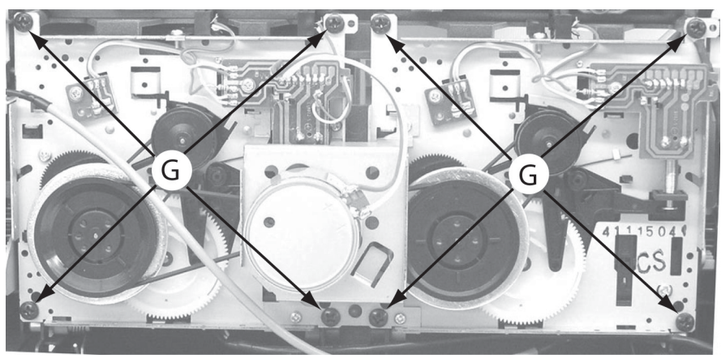
Dismantling of the Front Board

1) Remove 6 screws C and 7 screws D as indicated to loosen the Front Board.
2) Remove 4 screws E as indicated to loosen the Front Board.



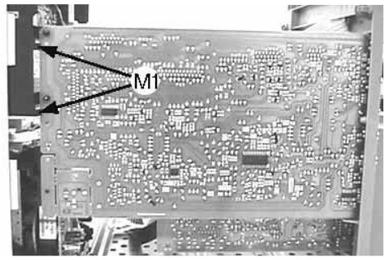
Dismantling of the ETF Tape Module

1) Remove 8 screws G as indicated to loosen the ETF Tape Module.

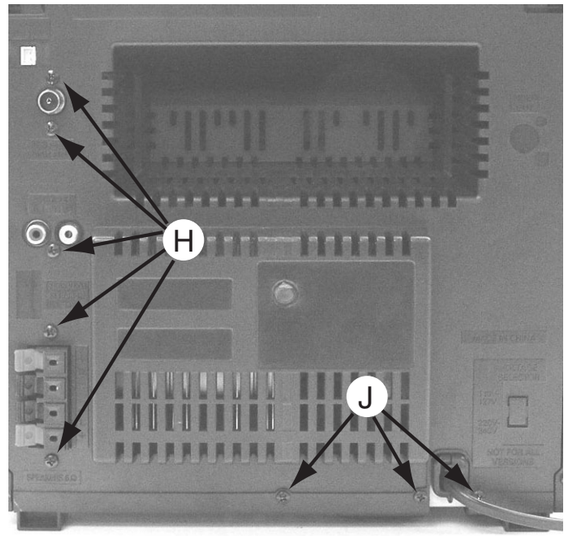


Dismantling of Rear Portion

1) Remove 5 screws H and uncatch M1 as indicated to loosen the Main Board.
2) Remove 3 screws J as indicated to loosen the Panel Rear.



Remove Main Board



Repair Hints

1) The Knob Volume can be remove pull it out in the direction as indicated. See picture 1.

Picture 1

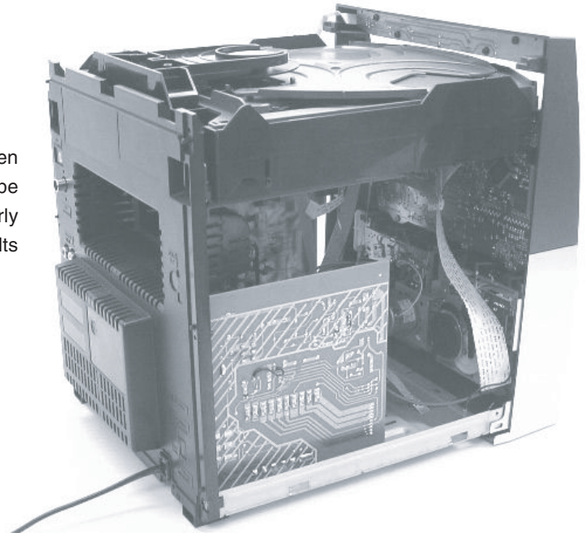
2-3

Repair Hints

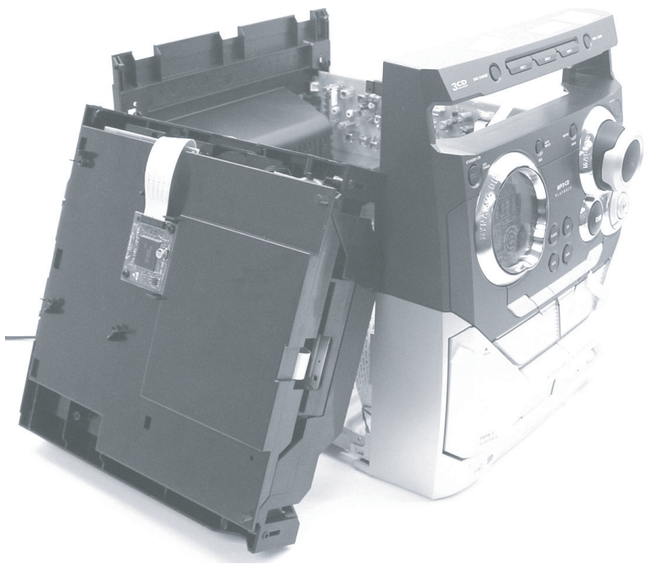
3) During repair it is possible to disconnect the Tape board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

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

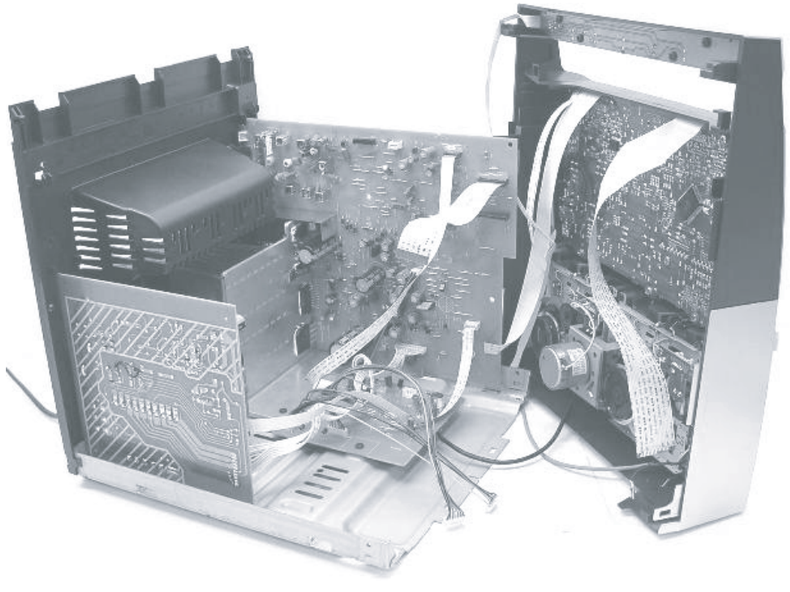
Service pos A



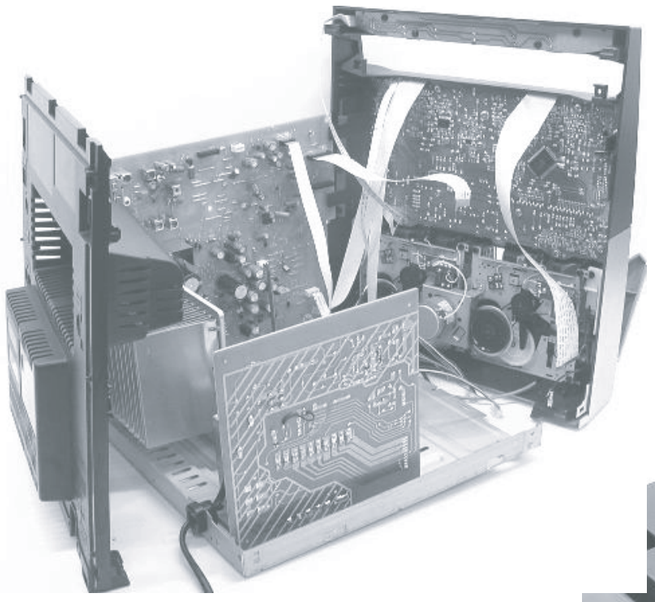
Service pos B



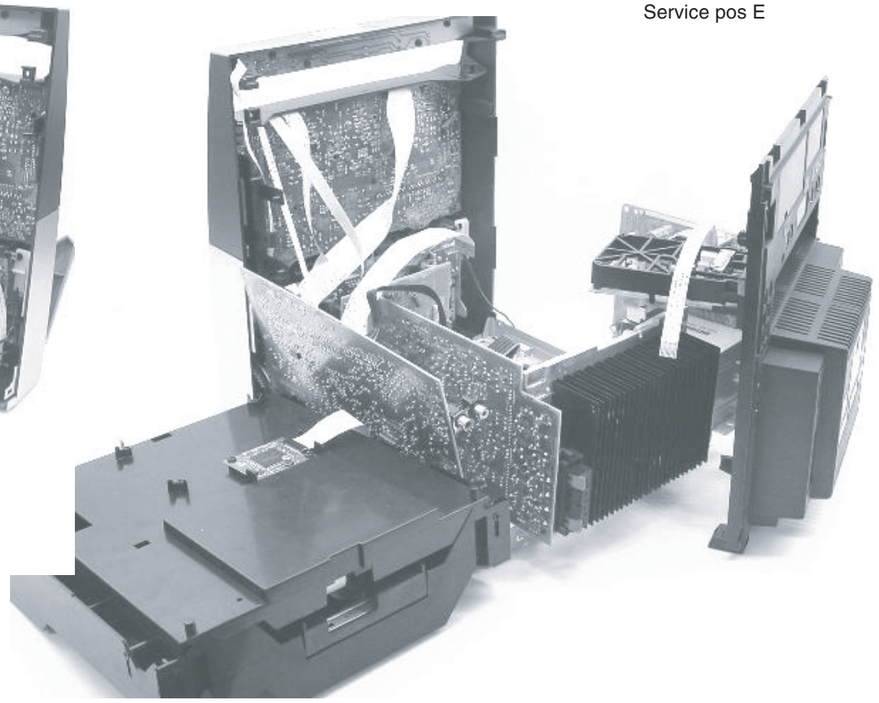
Service pos C



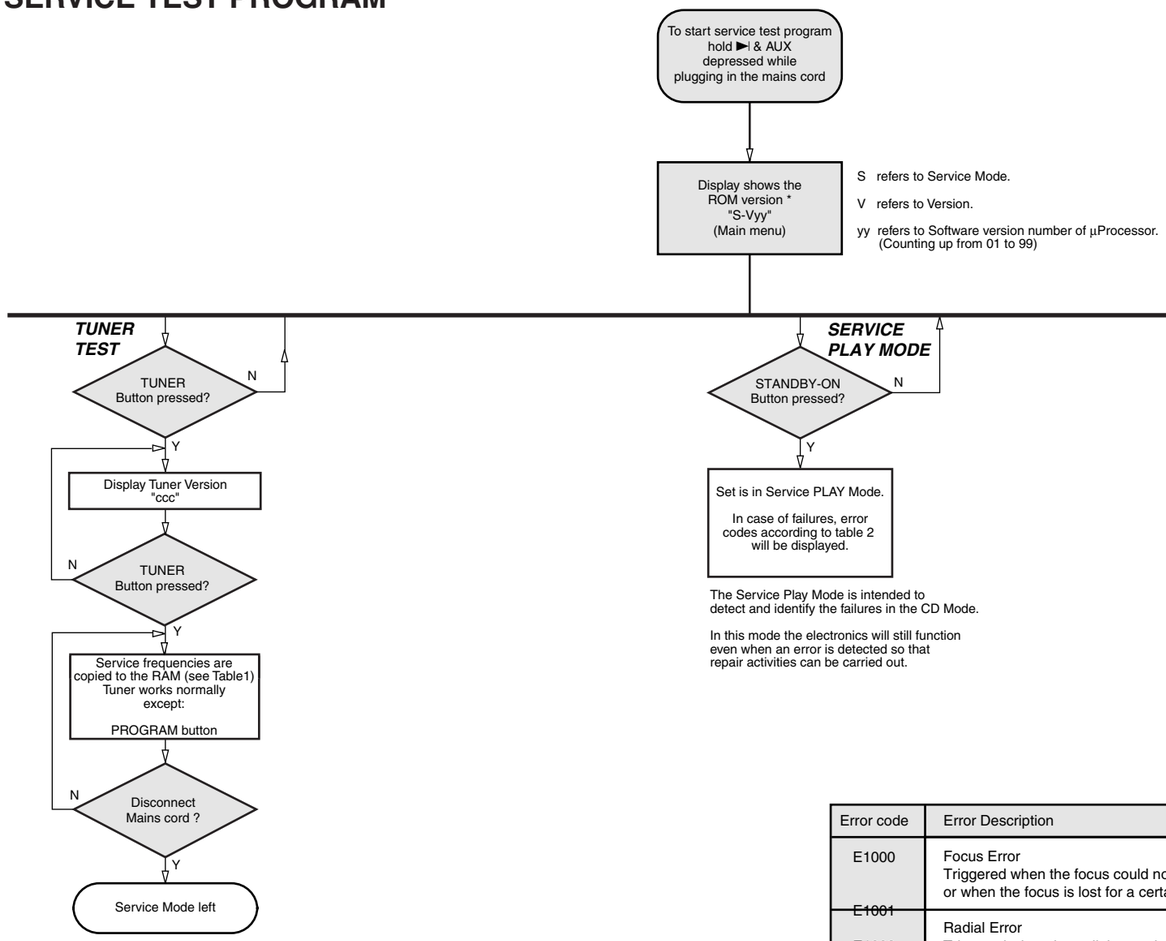
Service pos D



Service pos E



SERVICE TEST PROGRAM



note 1 : Only DISC 2, 3, AUX, ALB, TITLE, MUTE, FM, DBB12, TECHNO, JAZZ, CONCERT & R.C. are on.

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

Table 1

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

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

Table 2

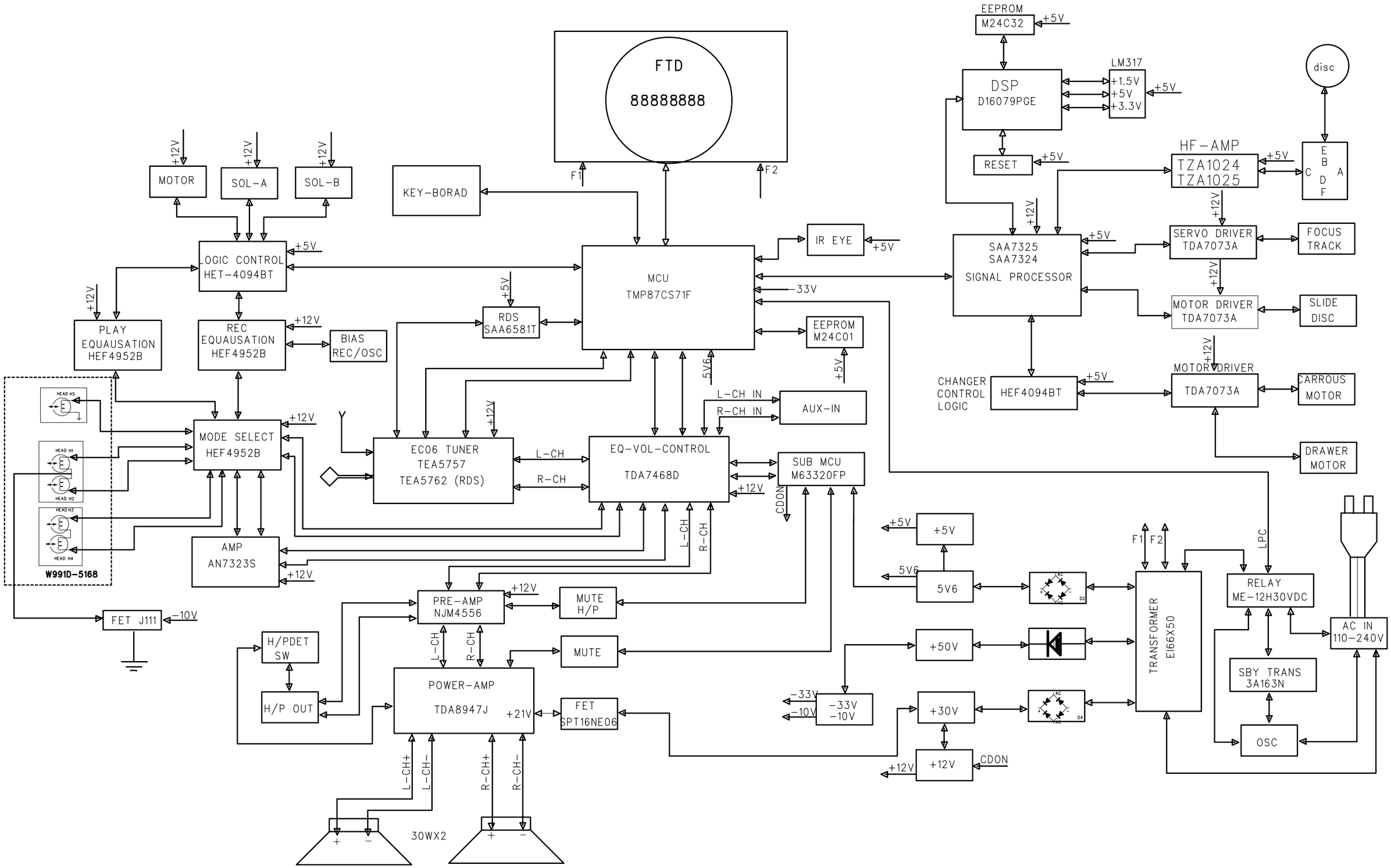
DEMO Mode

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

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 "FAIL" will be displayed.
EEPROM FORMAT	|◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
ROTARY ENCODER TEST	Volume Knob or Jog Shuttle knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

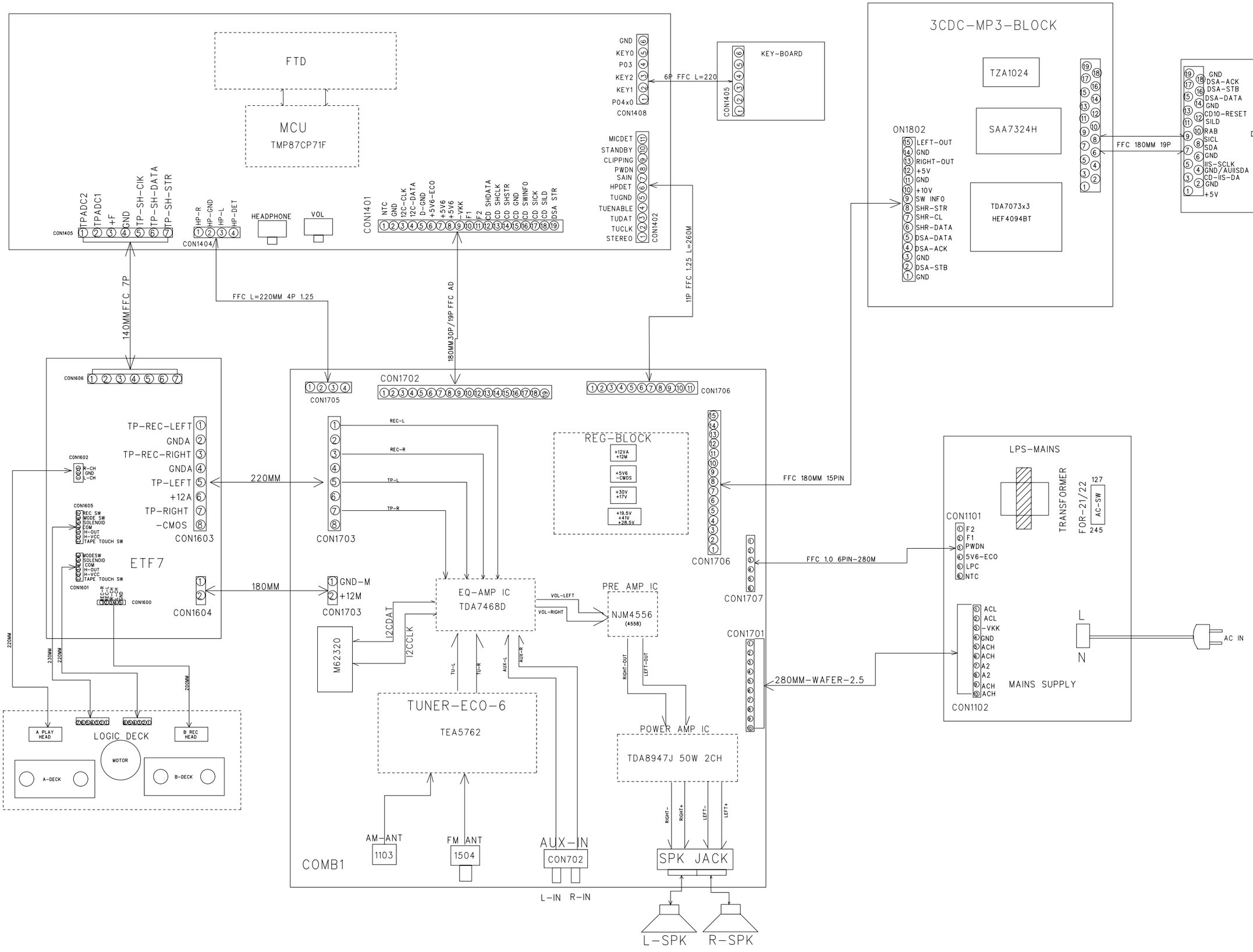
4-1

SET BLOCK DIAGRAM



4-2

SET WIRING DIAGRAM



FRONT & KEY BOARD

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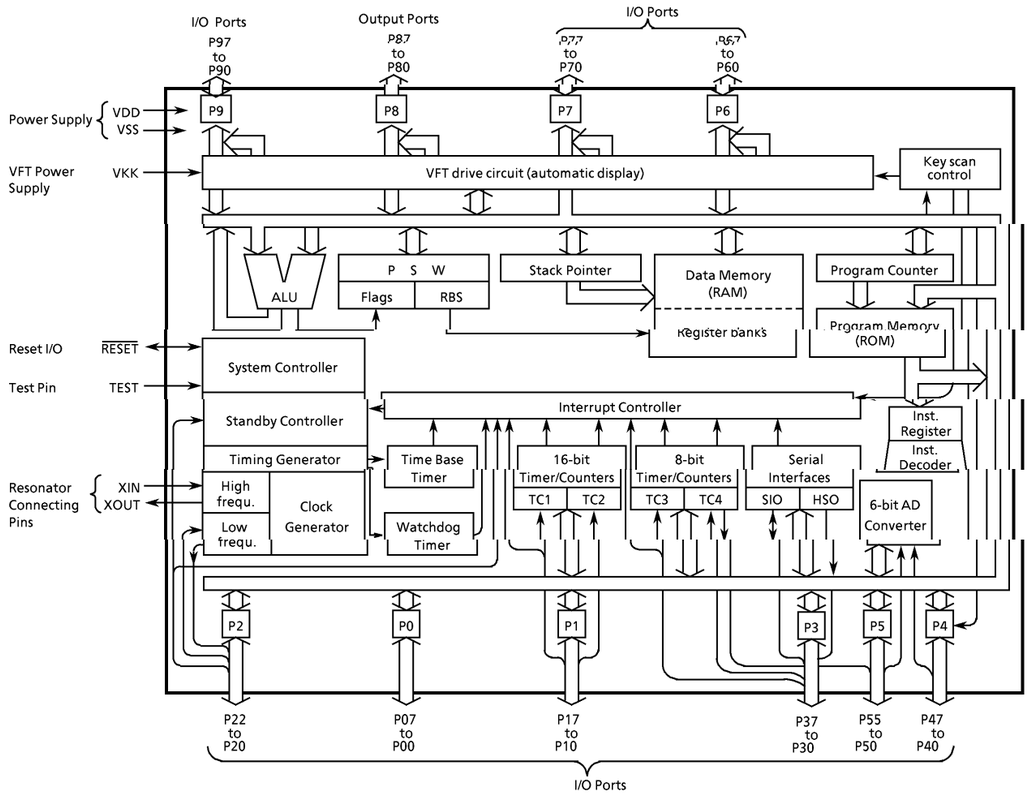
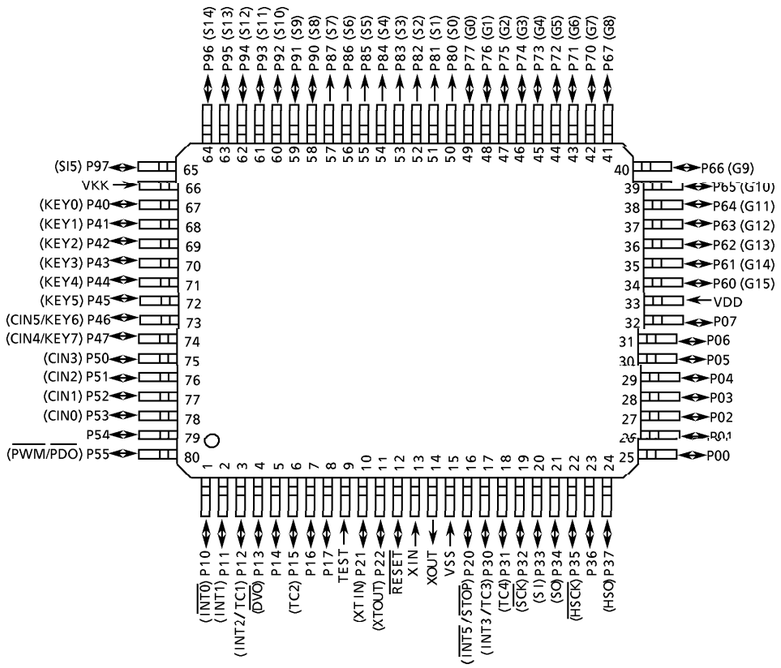
Remark: For Ver. 22, the whole Front Board Ass'y can be orderd with 12nc: 9940 000 01504

INTERNAL BLOCK DIAGRAM
MICROCONTROLLER - IC TMP87PS71F



PIN ASSIGNMENT (TOP VIEW)
MICROCONTROLLER - IC TMP87PS71F



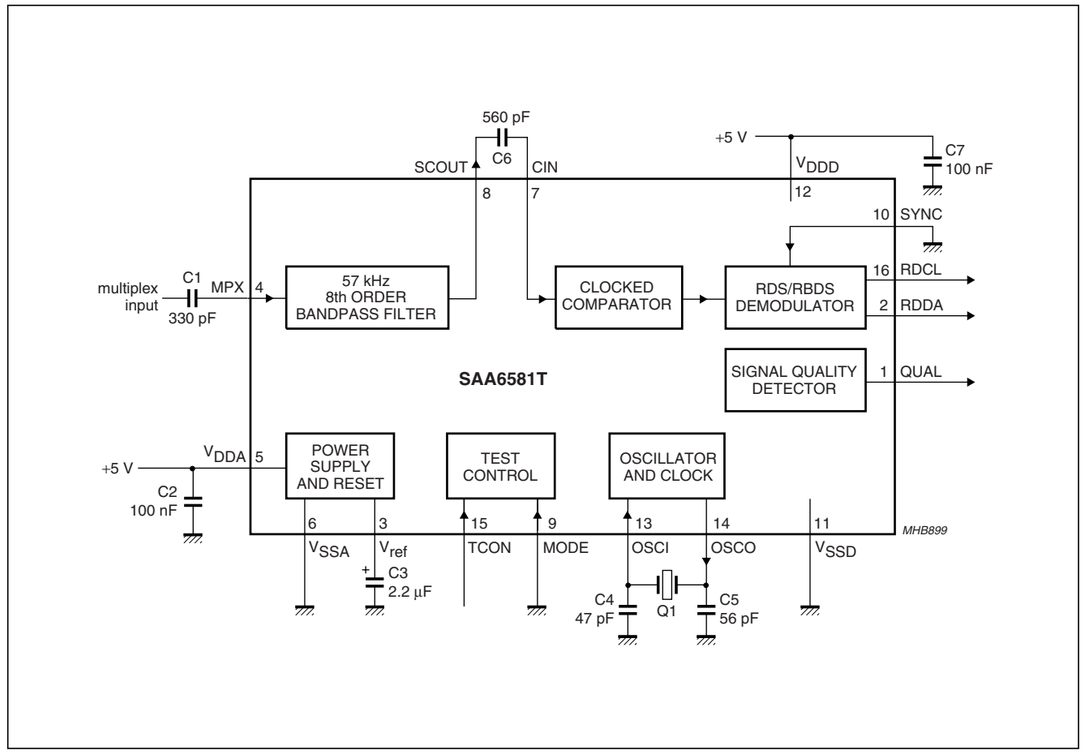
PIN DESCRIPTION
MICROCONTROLLER - IC TMP87PS71F

Pin Function

Pin Name	Input / Output	Function	
P07 to P00	I/O	Two 8-bit programmable input/output ports (tri-state). Each bit of these ports can be individually configured as an input or an output under software control. During reset, all bits are configured as inputs. When used as a divider output, the latch must be set to "1".	
P17, P16, P14	I/O		
P15 (TC2)	I/O (Input)		Timer/Counter 2 input
P13 ($\overline{DVO}$)	I/O (Output)		Divider output
P12 (INT2 / TC1)	I/O (Input)		External interrupt input 2 or Timer/Counter 1 input
P11 (INT1)			External interrupt input 1
P10 ($\overline{INT0}$)			External interrupt input 0
P22 (XTOUT)	I/O (Output)	3-bit input/output port with latch. When used as an input port, the latch must be set to "1".	Resonator connecting pins (32.768 kHz). For inputting external clock, XTIN is used and XTOUT is opened.
P21 (XTIN)	I/O (Input)		
P20 ($\overline{INT5}$ / $\overline{STOP}$)			External interrupt input 5 or STOP mode release signal input
P37 (HSO)	I/O (Output)	8-bit input/output port with latch. When used as an input port, a HSO output, a SIO input/output, a timer/counter input, or an interrupt input, the latch must be set to "1".	HSO serial data output
P36	I/O		
P35 ($\overline{HSCK}$)	I/O (Output)		HSO serial clock output
P34 (SO)			SIO serial data output
P33 (SI)	I/O (Input)		SIO serial data input
P32 ($\overline{SCK}$)	I/O (I/O)		SIO serial clock input/output
P31 (TC4)	I/O (Input)		Timer/Counter 4 input
P30 (INT3 / TC3)			External interrupt input 3 or Timer/Counter 3 input
P47 (CIN4 / KEY7), P46 (CIN5 / KEY6)	I/O (Input)	8-bit input/output port with latch. When used as an input port, the latch must be set to "1".	Comparator inputs or Key scan inputs
P45 (KEY5) to P40 (KEY0)			Key scan inputs
P55 ($\overline{PWM}$ / $\overline{PDO}$)	I/O (Output)	6-bit input/output port with latch. When used as an input port, a comparator input, or a $\overline{PWM}$ / $\overline{PDO}$ output, the latch must be set to "1".	8-bit PWM output or 8-bit programmable divider output
P54	I/O		
P53 (CIN0) to P50 (CIN3)	I/O (Input)		Comparator inputs
P67 (G8) to P60 (G15)	I/O (Output)	Three 8-bit high breakdown voltage I/O ports with the latch. When used as a VFT driver output, the latch must be cleared to"0".	VFT digit driver outputs
P77 (G0) to P70 (G7)			
P97 (S15) to P90 (S8)			VFT segment driver outputs (Key strobe outputs)
P87 (S7) to P80 (S0)	Output (Output)	8-bit high breakdown voltage output port with latch. When used as VFT driver output, the latch must be cleared to"0".	
XIN, XOUT	Input, Output	Resonator connecting pins for high-frequency clock. For inputting external clock, XIN is used and XOUT is opened.	
$\overline{RESET}$	I/O	Reset signal input or watchdog timer output/address-trap-reset output/system-clock-reset output.	
TEST	Input	Test pin for out-going test. Be tied to low.	
VDD, VSS	Power Supply	+ 5 V, 0 V (GND)	
VKK		VFT driver power supply	

INTERNAL BLOCK DIAGRAM
RDS/RBDS DEMODULATOR - IC SAA6581T

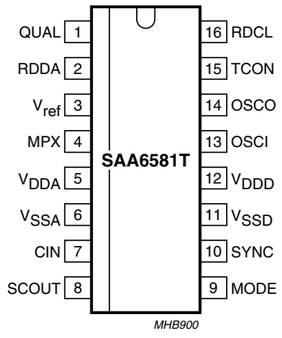
BLOCK DIAGRAM



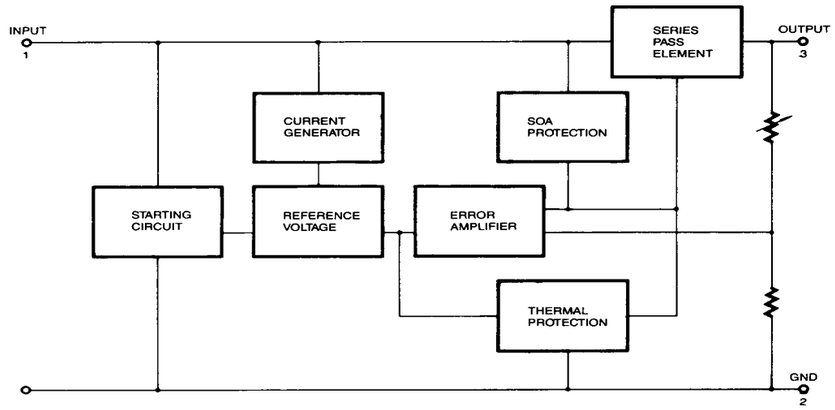
PIN DESCRIPTION
RDS/RBDS DEMODULATOR - IC SAA6581T

PINNING

SYMBOL	PIN	DESCRIPTION
QUAL	1	signal quality indication output
RDDA	2	RDS data output
V_{ref}	3	reference voltage output ($^1/_2V_{DDA}$)
MPX	4	multiplex signal input
V_{DDA}	5	analog supply voltage (5 V)
V_{SSA}	6	analog ground (0 V)
CIN	7	comparator input
SCOUT	8	switched capacitor filter output
MODE	9	oscillator frequency select input
SYNC	10	ARI clamping control input
V_{SSD}	11	digital ground (0 V)
V_{DDD}	12	digital supply voltage (5 V)
OSCI	13	oscillator input
OSCO	14	oscillator output
TCON	15	test control input
RDCL	16	RDS clock output

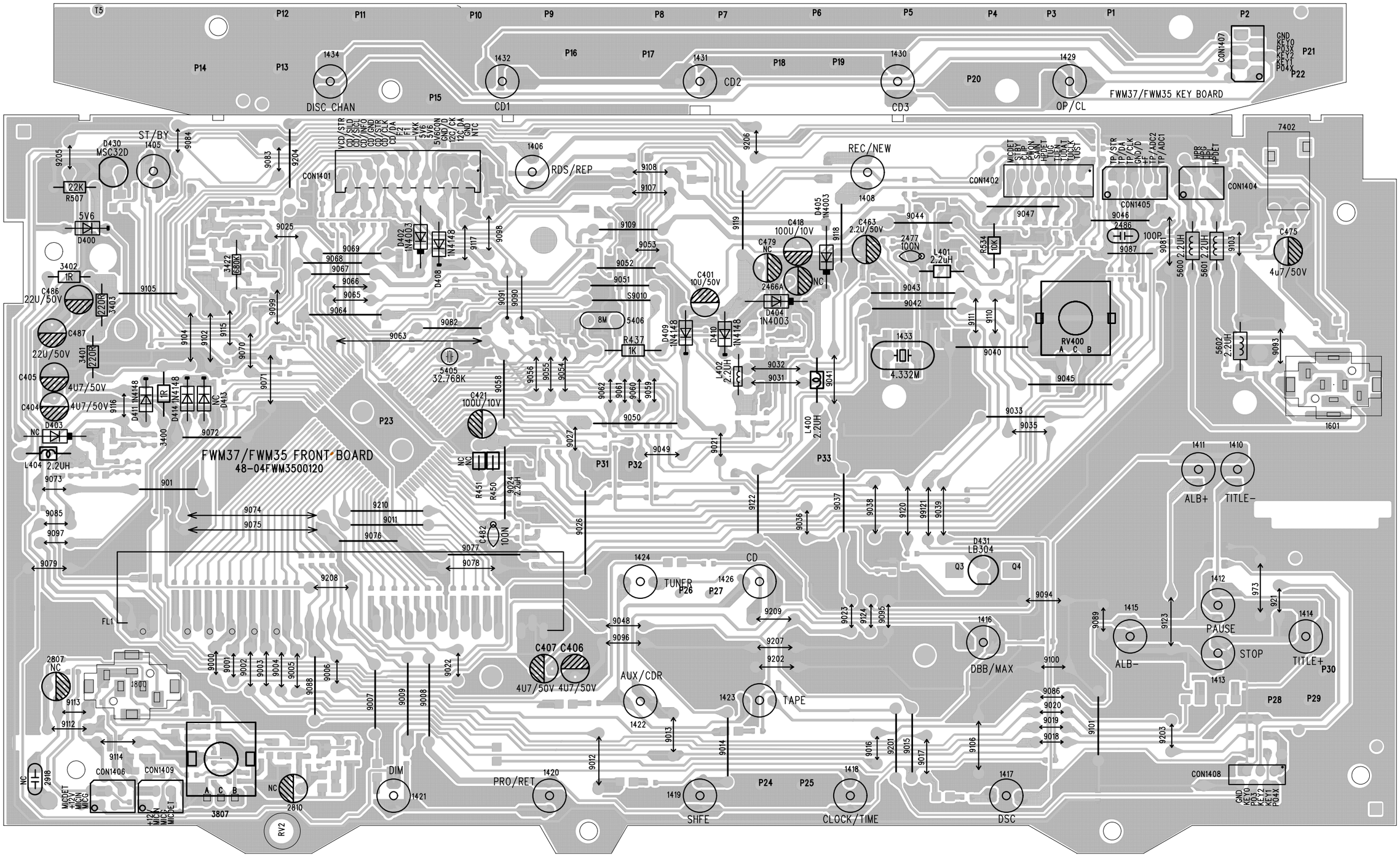


INTERNAL BLOCK DIAGRAM
POSITIVE VOLTAGE REGULATOR - IC KA7805



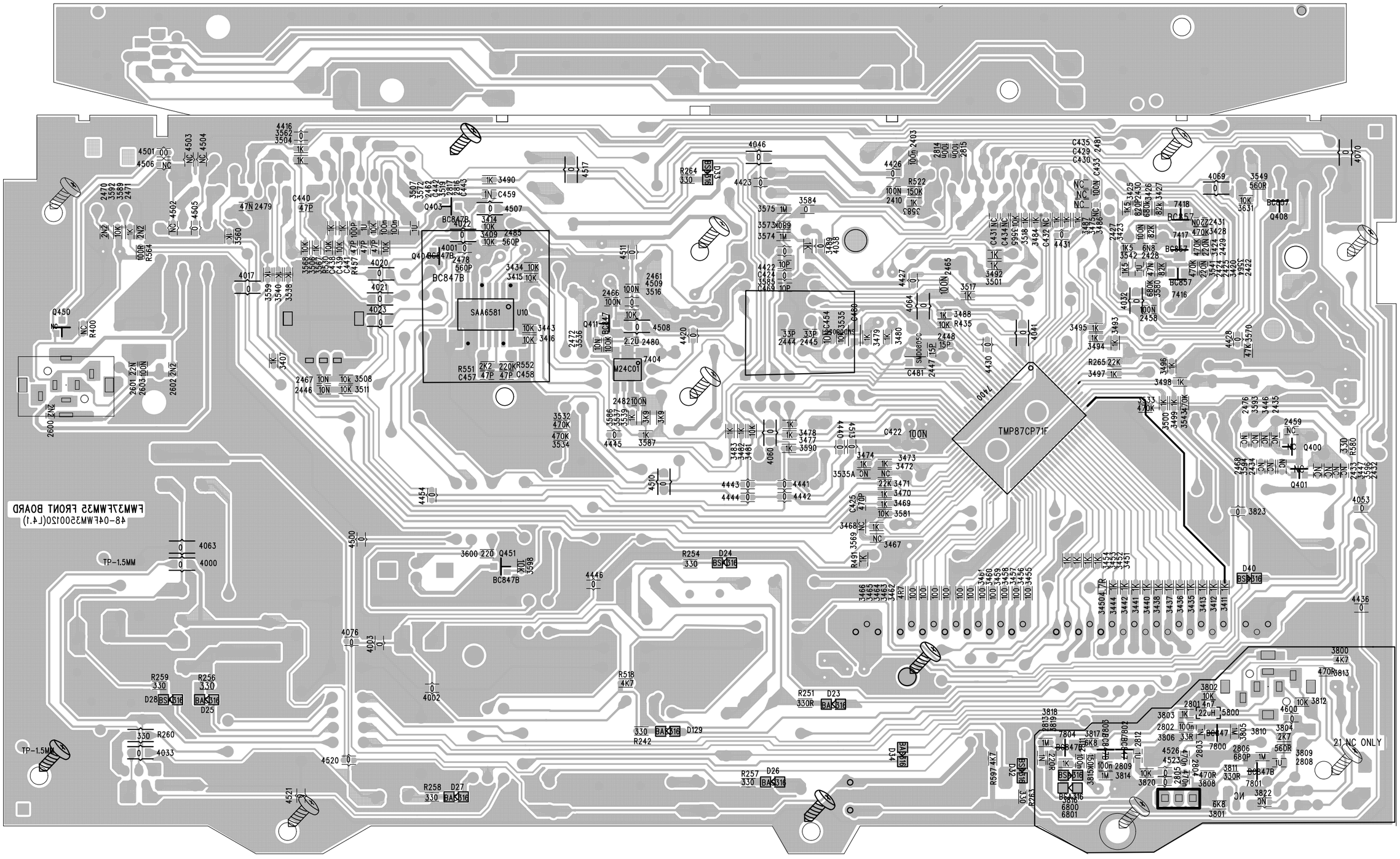
5-4

PCB LAYOUT - FRONT & KEY BOARD (TOP VIEW)



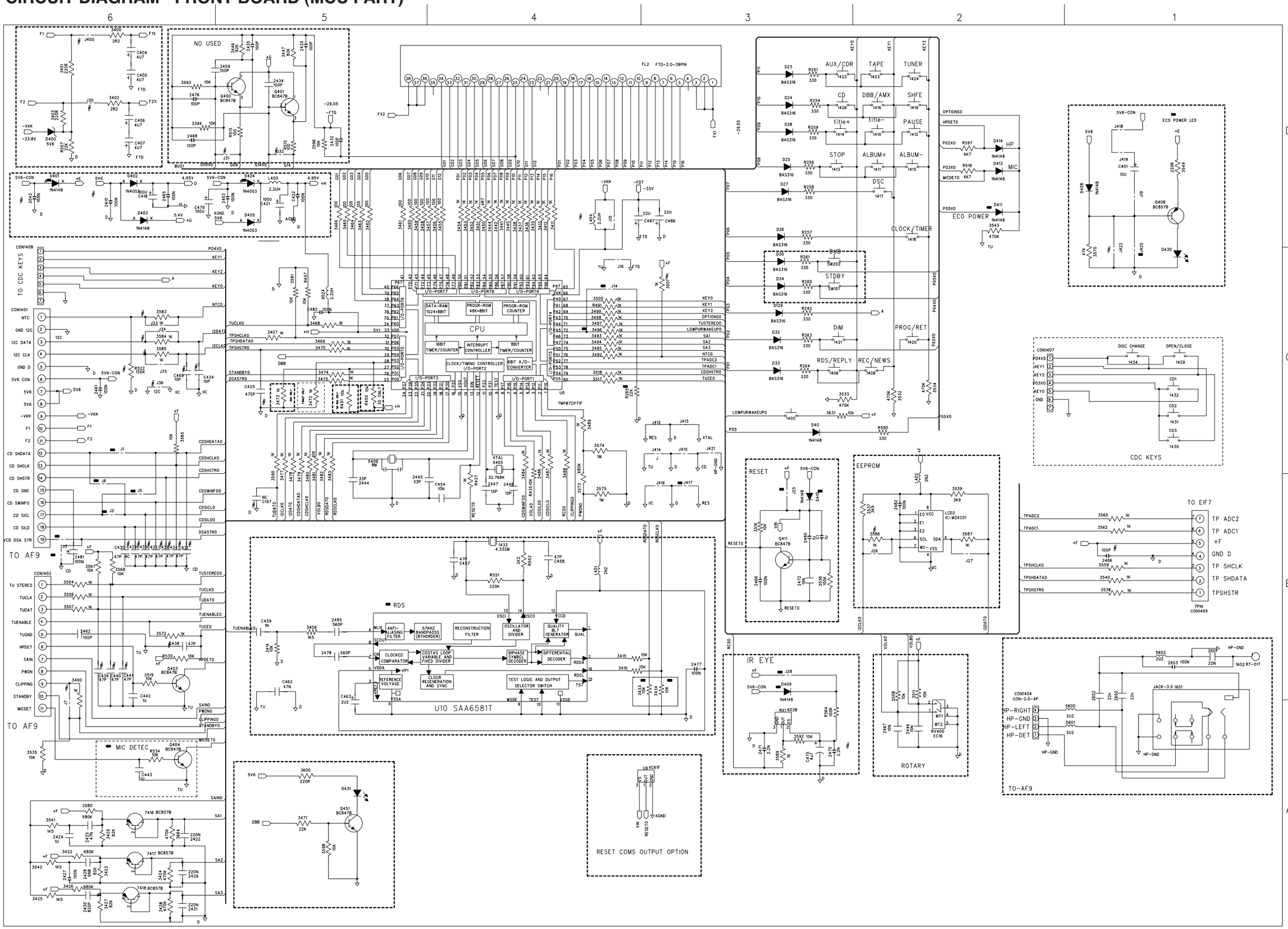
5-5

PCB LAYOUT - FRONT & KEY BOARD (BOTTOM VIEW)



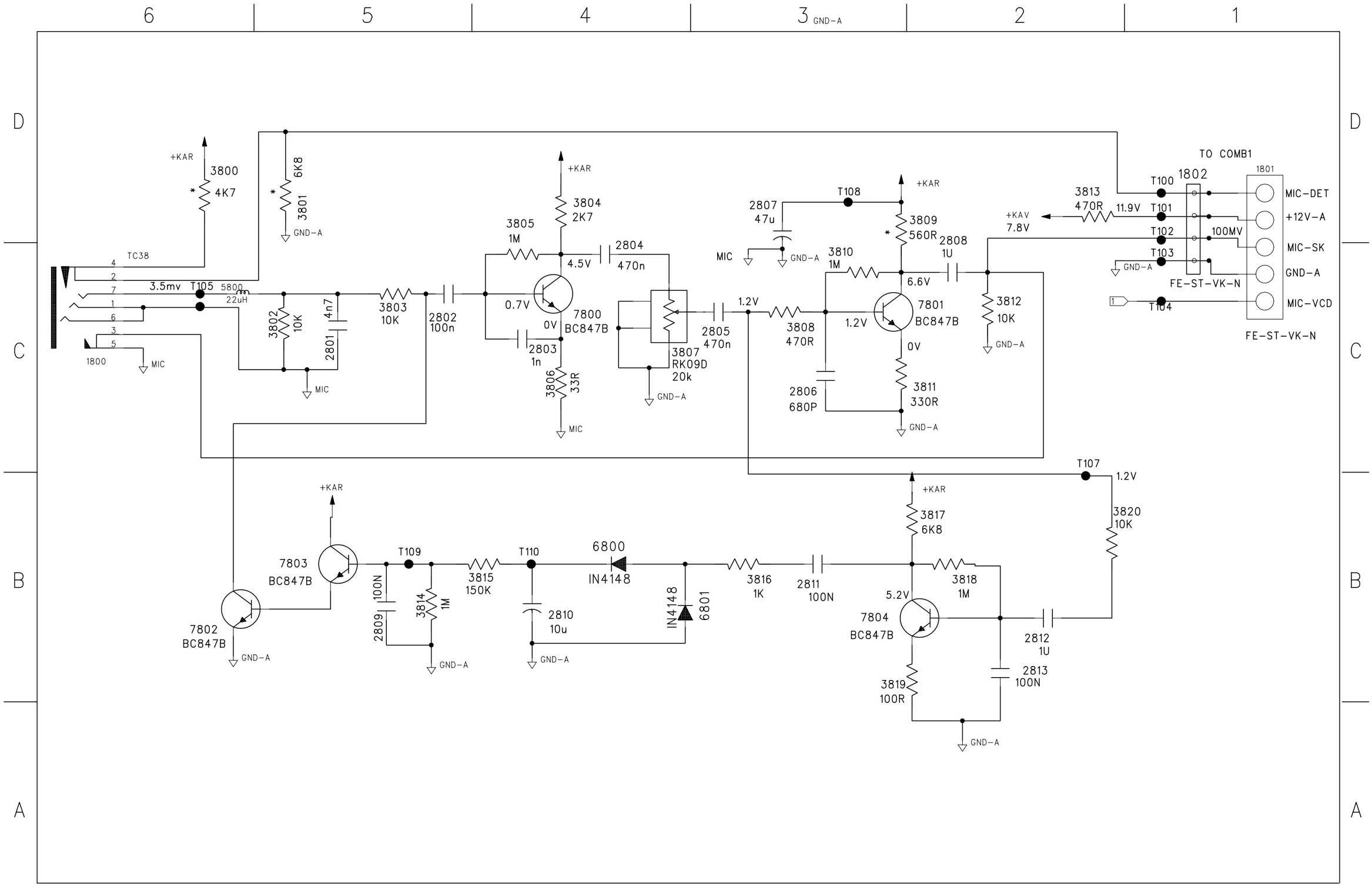
5-6

CIRCUIT DIAGRAM - FRONT BOARD (MCU PART)



5-7

CIRCUIT DIAGRAM - FRONT BOARD (MIC PART)



5-8

ELECTRICAL PARTS - FRONT BOARD

1800	9940 000 01325	MICRO PHONE JACK D3.6 /21
1405	9940 000 01243	TACT SWITCH
1406	9940 000 01243	TACT SWITCH
1408	9940 000 01243	TACT SWITCH
1410	9940 000 01243	TACT SWITCH
1420	9940 000 01243	TACT SWITCH
1421	9940 000 01243	TACT SWITCH
1422	9940 000 01243	TACT SWITCH
1601	9940 000 01244	V/PHONE JACK 3.5MM
3807	9940 000 01324	ROTARY VOLUME 20K /21
5406	9940 000 01242	CER. RESONATOR 8.00M 2P
7400	9940 000 01238	IC TMP87PS71AF-QF80 /22
7400	9940 000 01339	IC TMP87PS71F /21/30
7404	9940 000 01236	IC M24C01-WMN6
D430	9940 000 01233	LED LAMP (MICRO)(RED)
D431	9940 000 01234	LED LAMP 3MM (RED)
FL1	9940 000 01235	FTD DISPLAY VFD70-1201FN
L600	9940 000 01211	TOROID COIL 180UH 10TX2
RV400	9940 000 01241	ROTARY ENCODER
U10	9352 686 05118	IC SM SAA6581T
	9940 000 01239	OPTIC SENSER

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

MAIN BOARD

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6-1

BRIEF INTRODUCTION OF THE MAIN BOARD

The Main Board consists of the following features :

a. TDA7468D

TDA7468D (IC704) provides the basic sound processing - loudness, bass, treble, volume & mute controls and source selection -TUNER, TAPE, CD & AUX including Mic mixing for the set.
Sound features such as ALC, DBB, DSC and IS are controlled by the microprocessor IC on the Front Board via I²C Bus.
Undesirable noise during source switching are muted off by via the software of the microprocessor IC on the Front Board.

b. TDA8947J

The TDA8947J contains a unique protection circuit that is solely based on multiple temperature measurements inside the chip. This gives maximum output power for all supply voltages and load conditions with no unnecessary audio holes . Almost any supply voltage and load impedance combination can be made as long as thermal boundary conditions (number of channels used, external heatsink and ambient temperature) allow it.

c. MIC MIXING

Simple Mic mixing is provided by pin 2 of TDA7468D. During Mic mixed a 1nF capacitor is connected across this pin to ground instead of a chip connector(0R).

d. HEADPHONE AMPLIFIER

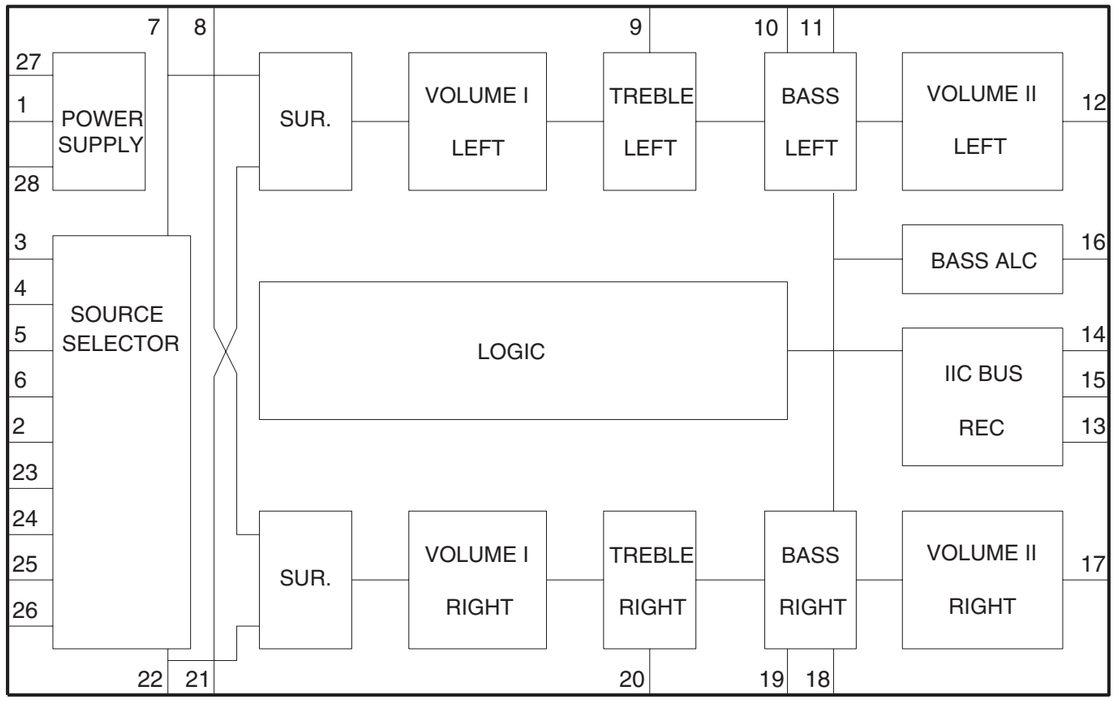
Headphone amplifier NJM4556AM is provided after the Sound processor to drive 32 ohm to 1kohm headphone.

Remark: 1) For ECO6 Tuner Part built in Main Board, refer to Chapter 7A & Chapter 7B.

2) For Ver 22, whole Main Board Ass'y can be ordered with 12nc: 9940 000 01506.

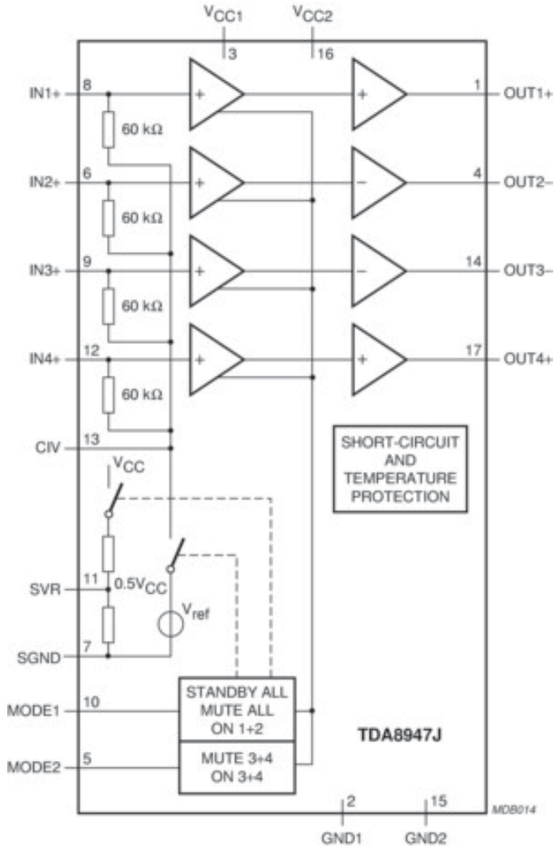
INTERNAL BLOCK DIAGRAM
IC TDA7468D

TDA7468



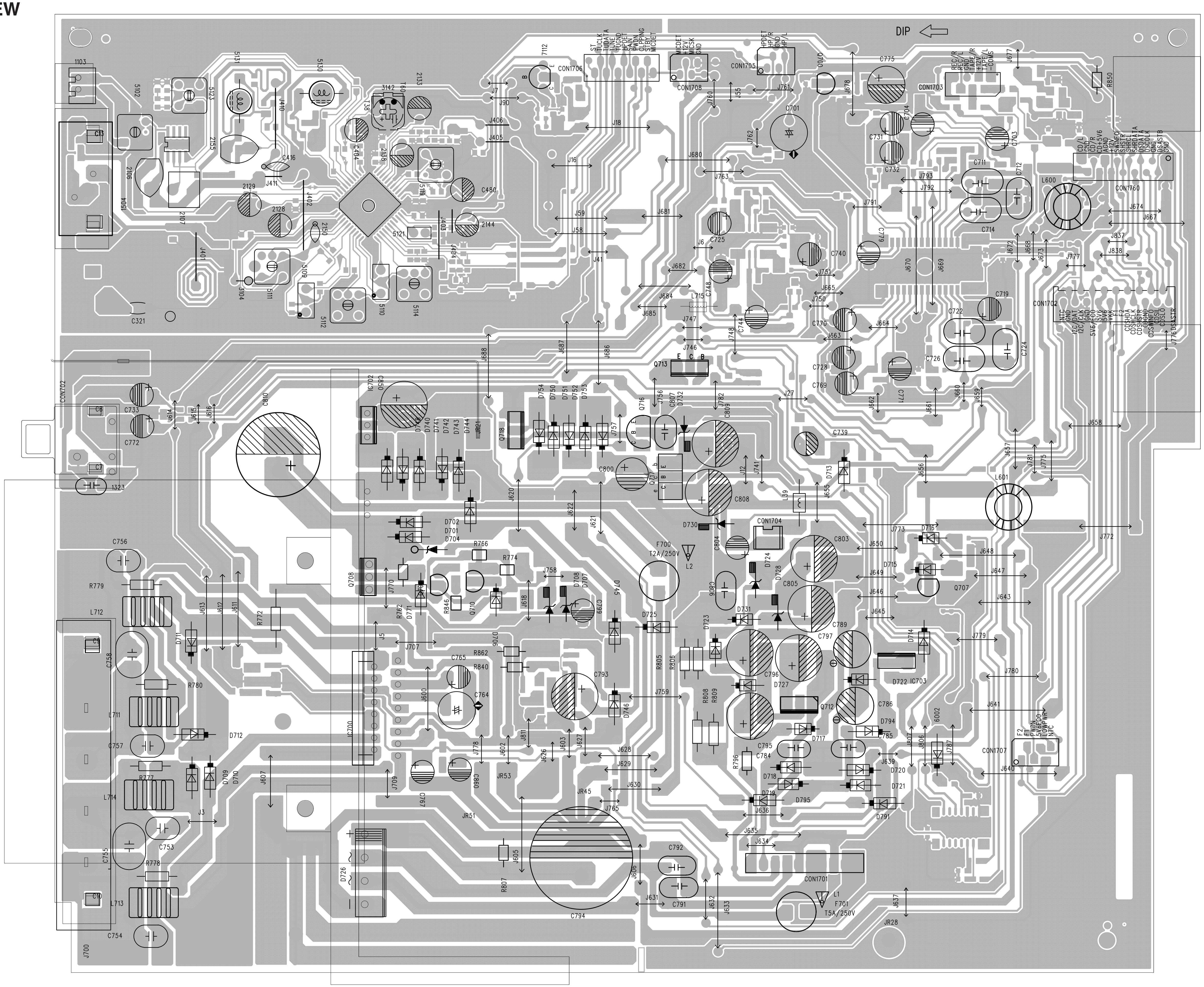
6-2

INTERNAL BLOCK DIAGRAM
IC TDA8947J 4-CHANNEL AUDIO AMPLIFIER



6-3

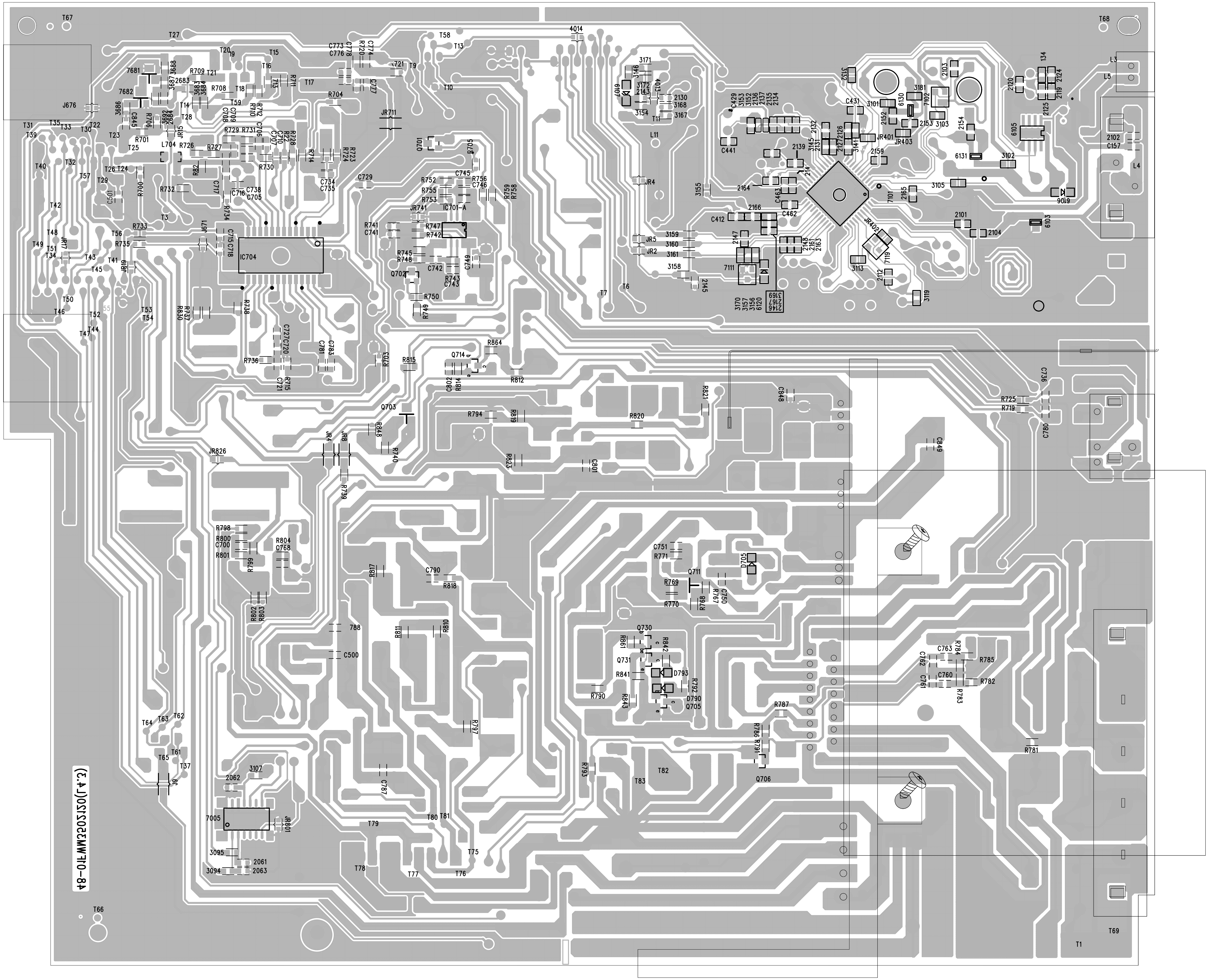
PCB LAYOUT - MAIN BOARD_for /21/30
TOP VIEW



6-4

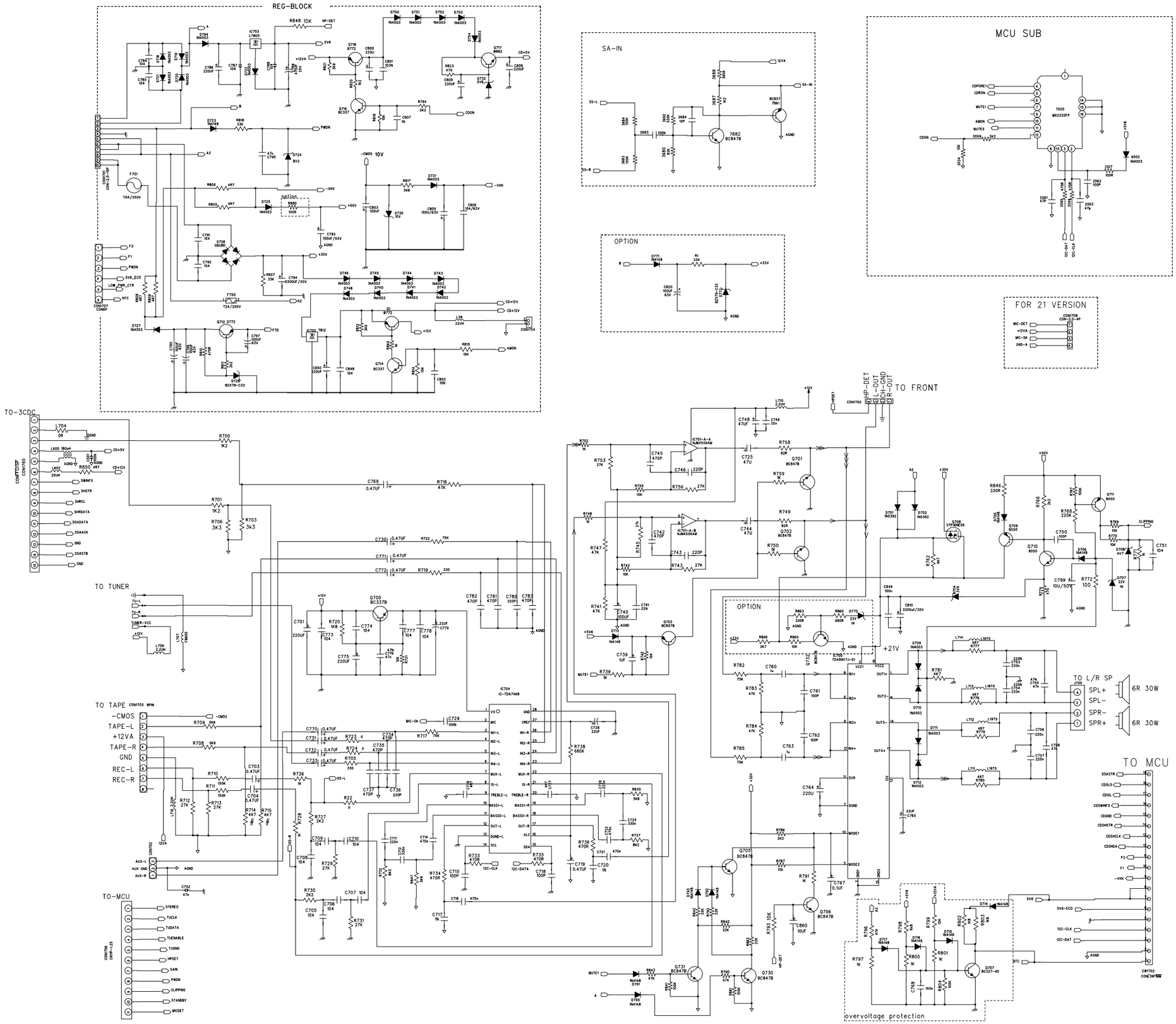
PCB LAYOUT - MAIN BOARD_for /21/30

BOTTOM VIEW



6-5

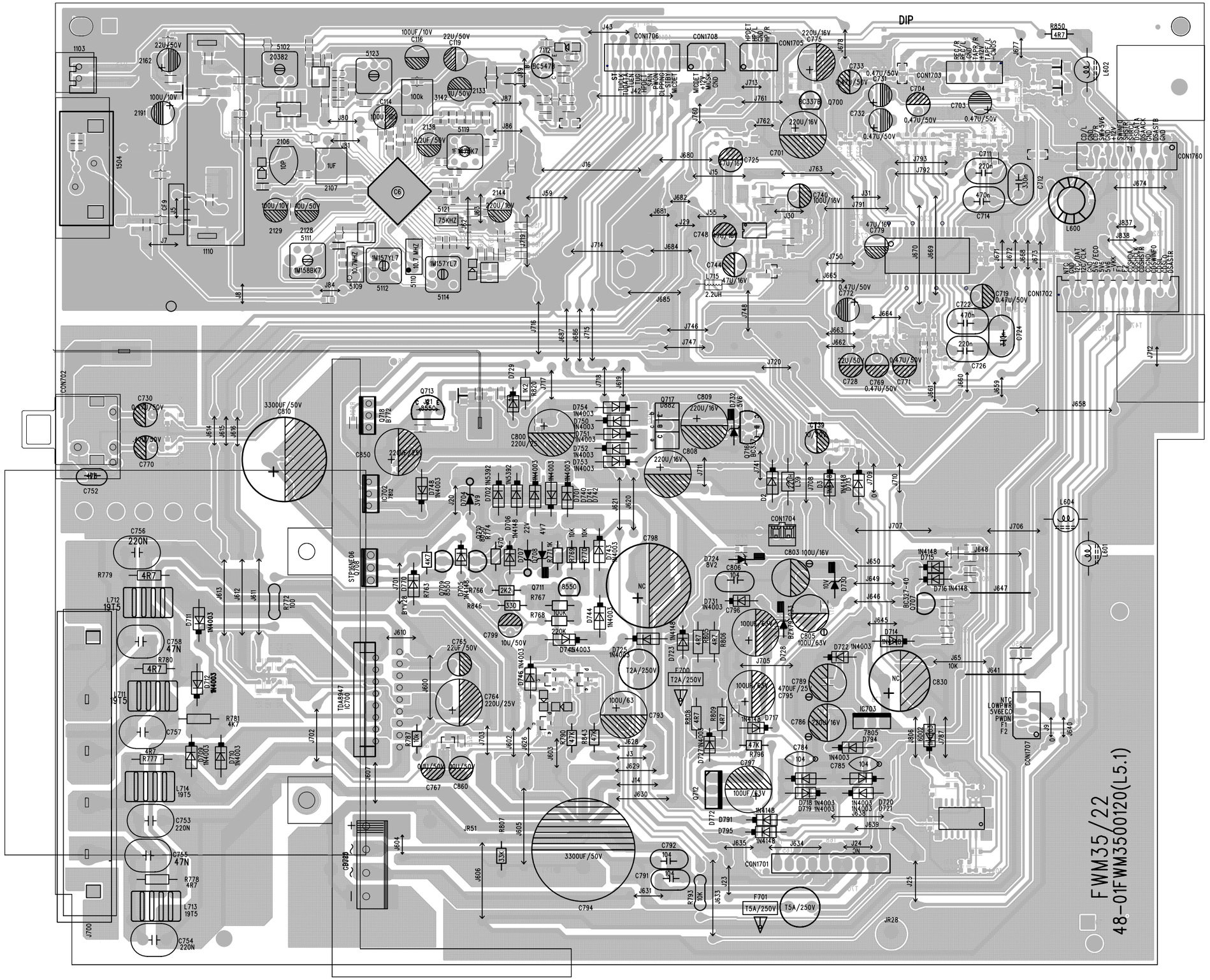
CIRCUIT DIAGRAM - MAIN BOARD
AMP PART



6-6

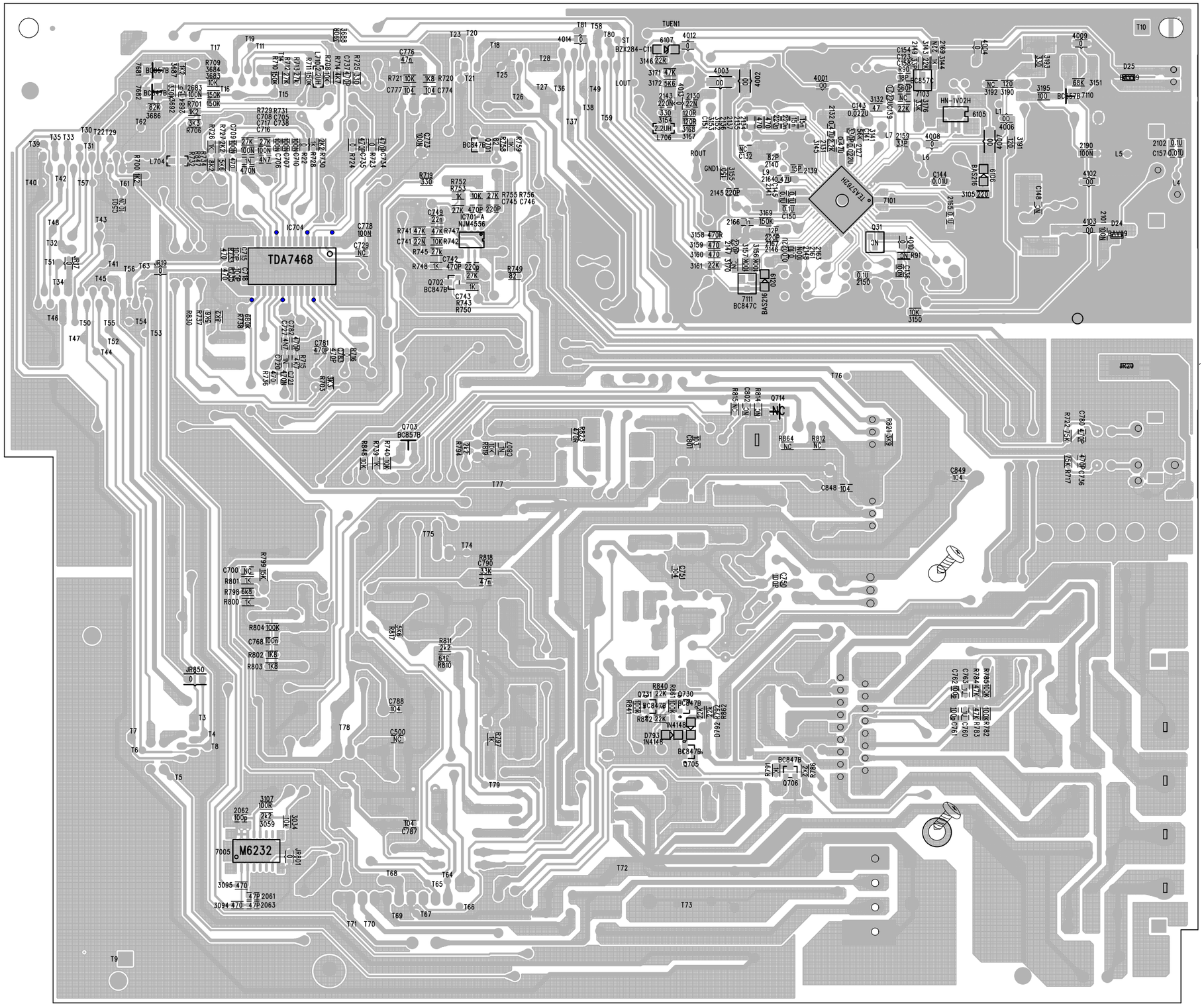
PCB LAYOUT - MAIN BOARD_for /22 (9940 000 01506)

TOP VIEW



6-7

PCB LAYOUT - MAIN BOARD_for /22 (9940 000 01506)
BOTTOM VIEW

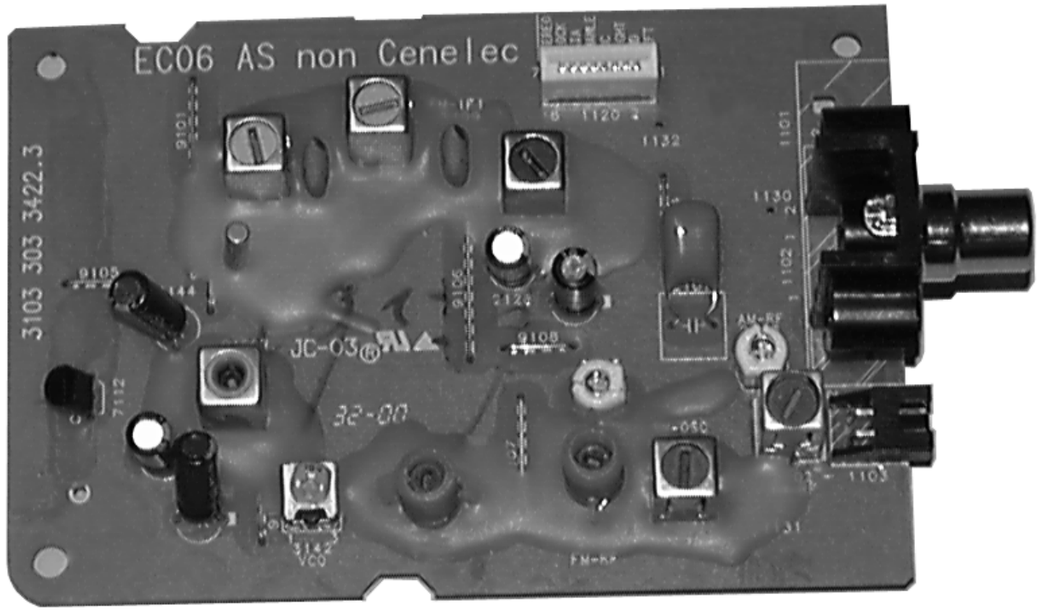


6-8

ELECTRICAL PARTS - MAIN BOARD

1110		9940 000 00256	TUNER (MITSUMI) FE450-G01
1504		9940 000 01218	COAXIAL JACK HIR-401V
2106		9940 000 01207	TRIMMER 10PF 6MM (WH)
5102		9940 000 01212	AM IFT (BLACK) 7MM
5109		9940 000 01208	CER. FILTER
5110		9940 000 01208	CER. FILTER
5111		9940 000 01213	AM IFT 7MM (BLACK)
5112		9940 000 01215	AM IFT 7MM (YELLOW)
5114		9940 000 01215	AM IFT 7MM (YELLOW)
5119		9940 000 01214	FM IFT 7MM (BLACK)
5123		9940 000 01216	AM OSC 7MM (BROWN)
7005		4822 209 17345	M62320FP
7101		9351 740 80557	IC TEA5757H/V1 /21
7101		9351 772 20557	IC SM TEA5762H/V1
C794		9940 000 01206	E.CAP 3300UF 50V +/-20%
C810		9940 000 01205	E.CAP 3300UF 35V +/-20%
CON702		9940 000 01221	V/RCA JACK 2P
D726		4822 130 11139	GBU8D
F700	⚠	9940 000 01222	FUSE RADIAL LT 2A 250V
F701	⚠	9940 000 01223	FUSE RADIAL T5A 250V
IC700		9940 000 01203	IC TDA8947J/N3
IC701		5322 209 15853	IC NJM4556AM
IC702		4822 209 90087	IC KA7812
IC703		9965 000 14344	IC KA7805
IC704		9322 150 74668	IC TDA7468D
J700		9940 000 01219	SPK JACK (RD/BLK/BLK/RD)
L602		9940 000 01209	TOROID COIL 25µH
L711		9940 000 01217	AIR COIL 6X18.5T (0.5MM)
L712		9940 000 01217	AIR COIL 6X18.5T (0.5MM)
L713		9940 000 01217	AIR COIL 6X18.5T (0.5MM)
L714		9940 000 01217	AIR COIL 6X18.5T (0.5MM)
Q708		4822 130 11336	STP16NF06FP
Q712		9940 000 01193	TRANSISTORS KSB772YS
Q717		9940 000 01194	TRANSISTORS KSD882Y
Q718		9940 000 01193	TRANSISTORS KSB772YS
		9940 000 01322	COAXIAL JACK /21

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



ECO6 Tuner Part

version: ***SYSTEMS non-CENELEC***

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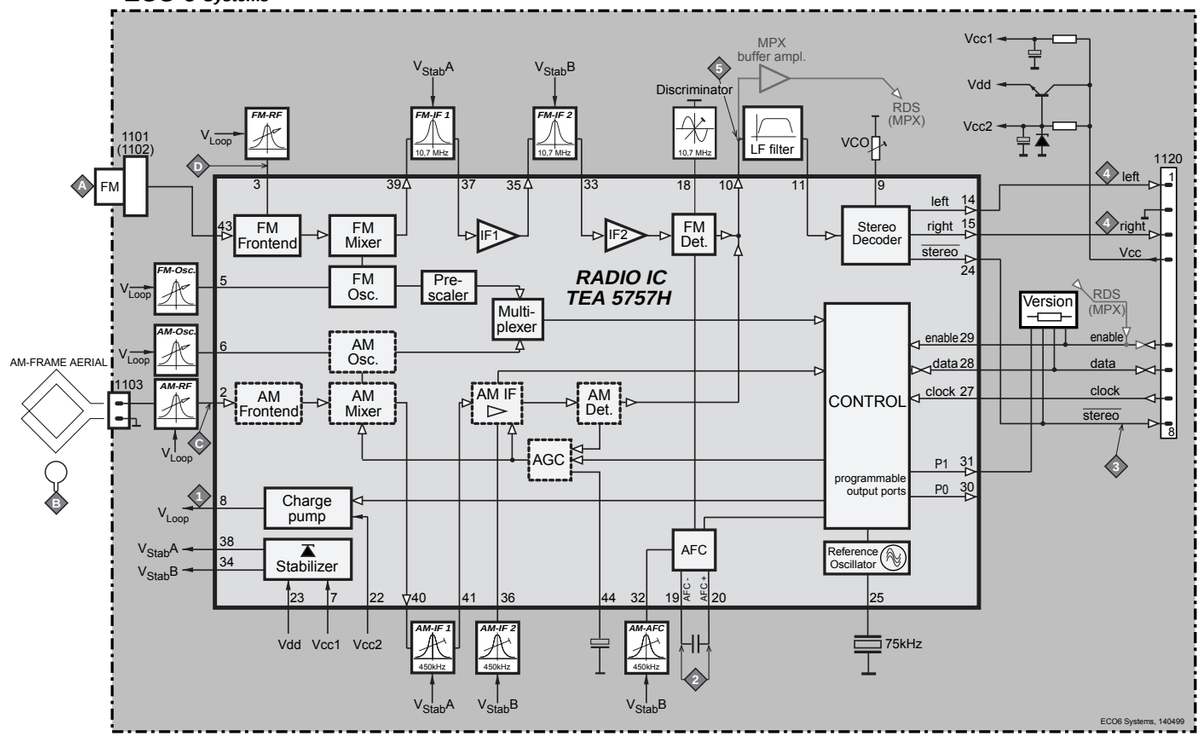
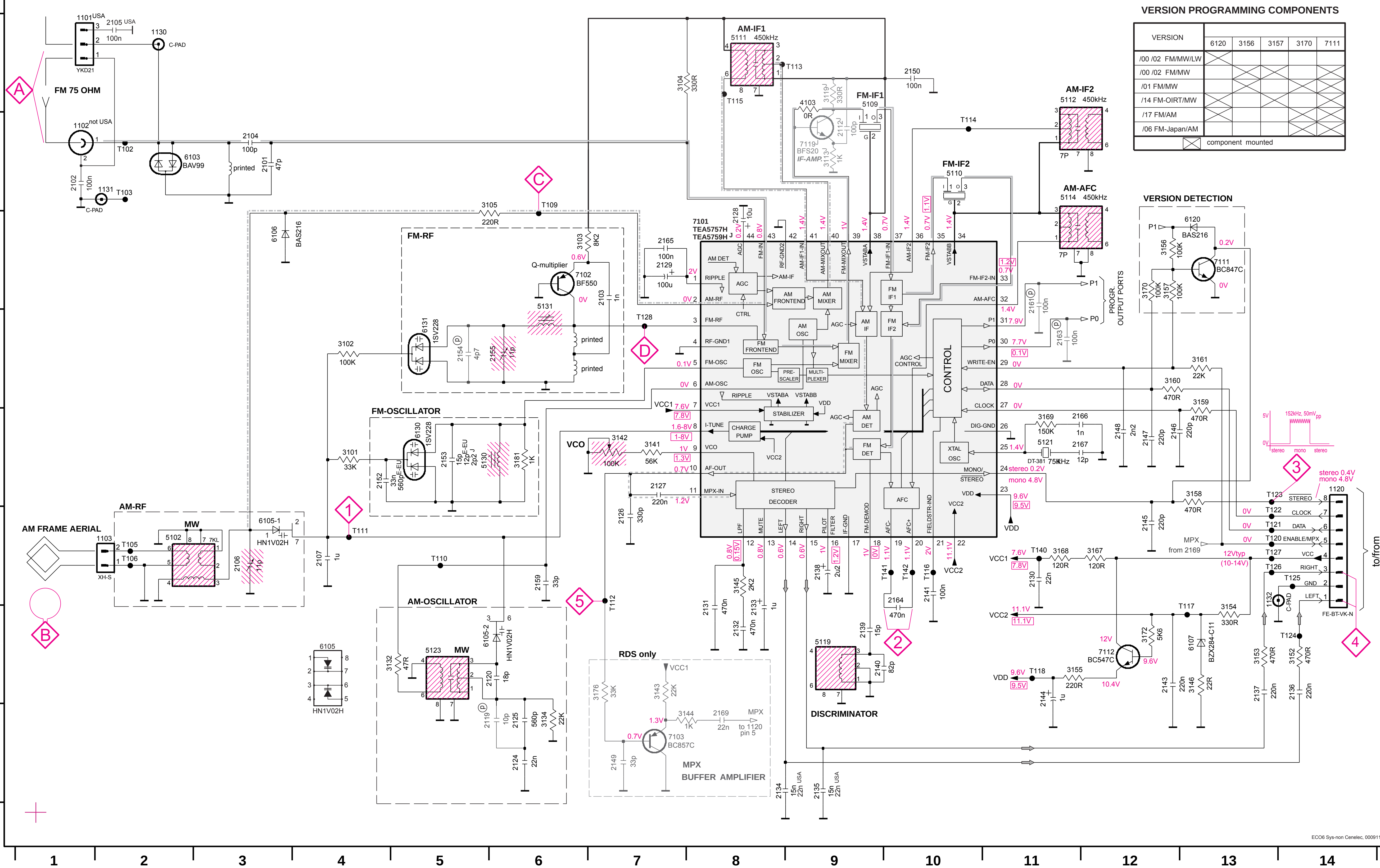
BLOCK DIAGRAM

TUNER PART
ECO 6 Systems



TUNER PART ECO6 / SYSTEMS NON CENELEC



LEGEND

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

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

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

1101	A1
1102	B1
1103	F2
1120	E14
1130	A2
1131	B2
1132	G13
2101	B3
2102	B1
2103	C7
2104	B3
2105	A2
2106	F3
2107	F4
2119	H6
2120	G6
2124	H6
2125	H6
2126	F7
2127	E7
2128	C8
2129	C7
2130	F11
2131	G8
2132	G8
2133	G8
2134	H8
2135	H9
2136	G14
2137	G13
2138	F9
2139	G9
2140	G9
2141	F10
2143	G12
2144	G11
2145	F12
2146	E12
2147	E12
2148	E12
2149	H7
2150	A10
2152	E4
2153	E5
2154	D5
2155	D5
2159	F6
2161	C11
2163	D11
2164	F10
2165	C7
2166	E11
2167	E11
2169	H8
3101	E4
3102	D4
3103	C6
3104	A7
3105	B6
3132	G5
3134	H6
3141	E7
3142	E7
3143	G7
3144	H7
3145	F8
3146	G13
3152	G14
3153	G13
3154	G13
3155	G11
3156	C12
3157	C12
3158	E13
3159	D13
3160	D12
3161	D13
3167	F12
3168	F11
3169	E11
3170	C12
3172	G12
3176	G7
3181	E6
5102	F2
5109	B9
5110	B10
5111	A8
5112	A11
5114	B11
5119	G9
5121	E11
5123	G5
5130	E5
5131	C6
6103	B2
6105-1	F3
6105-2	G5
6106	C3
6107	G13
6120	C13
6130	E5
6131	D5
7101	C8
7102	C6
7103	H7
7111	C13
7112	G12
T102	B2
T103	B2
T105	F2
T106	F2
T109	B6
T110	F5
T111	F4
T112	F7
T113	A8
T114	B10
T115	A8
T116	F10
T117	G13
T118	G11
T120	F13
T121	F13
T122	F13
T123	E13
T124	G14
T125	F14
T126	F13
T127	F13
T128	D7
T140	F11
T141	F10
T142	F10

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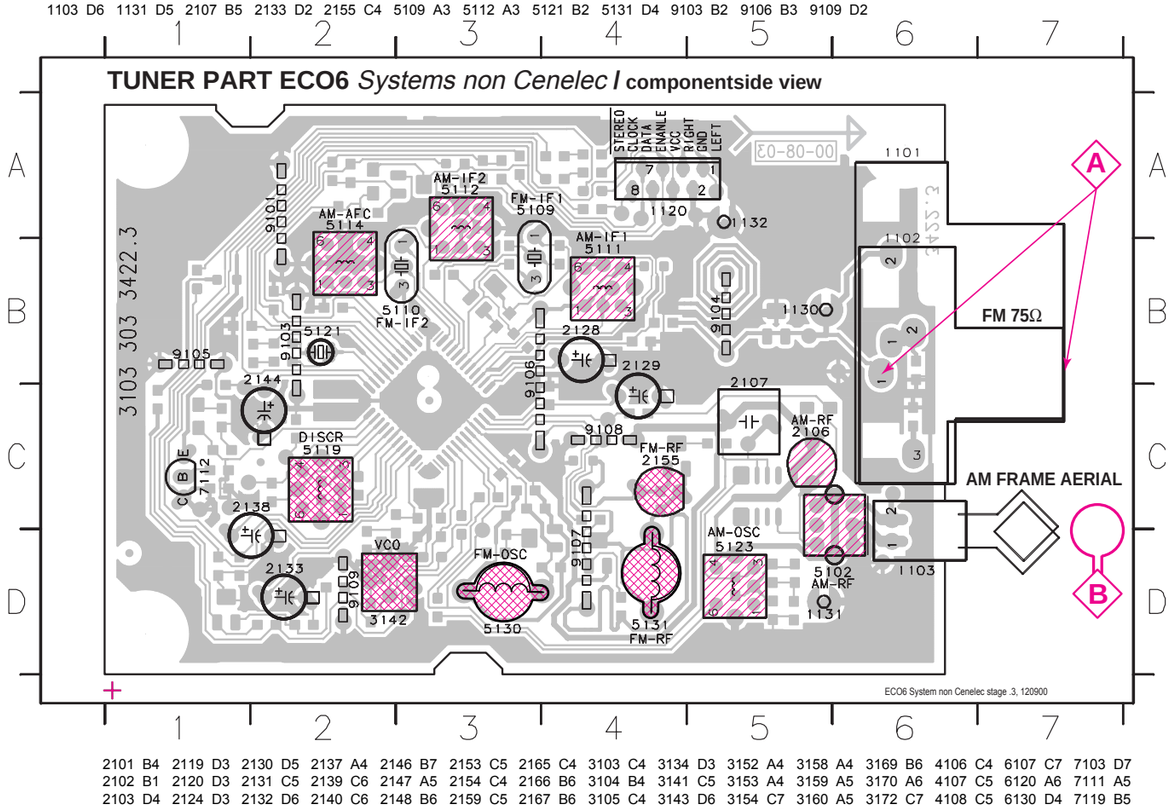
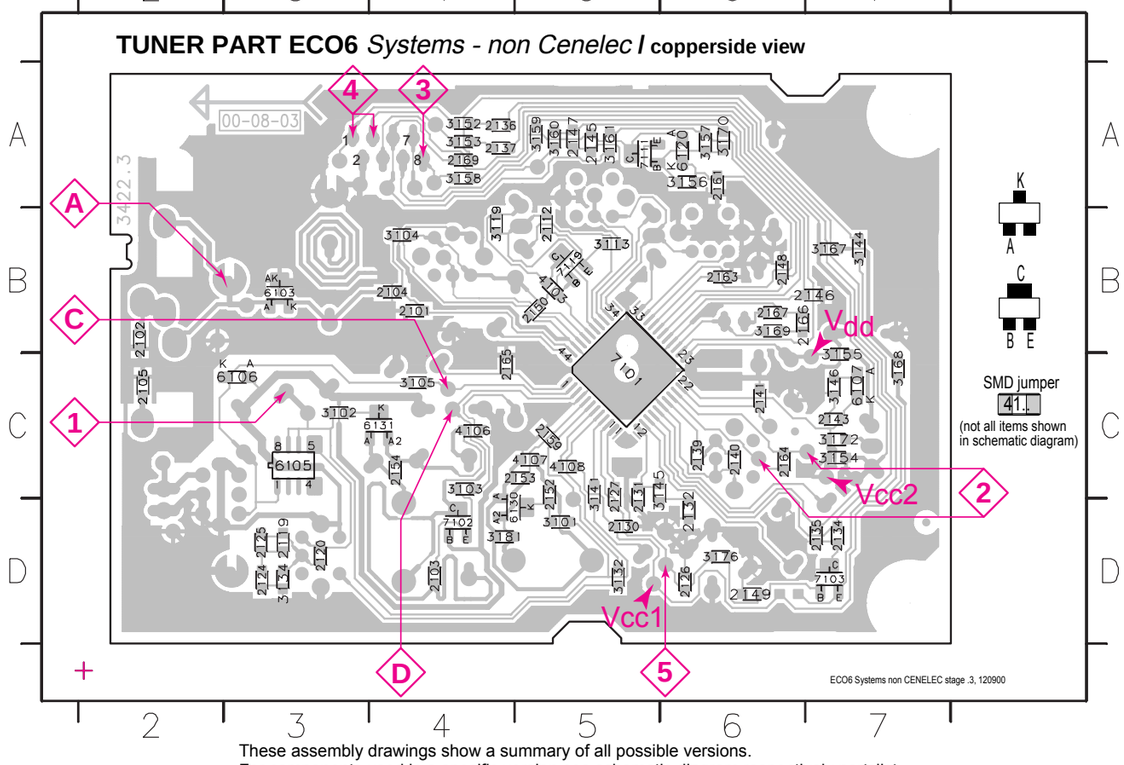
1101 A6 1120 A4 1132 A5 2128 C4 2138 C2 3142 D2 5110 B3 5114 A2 5123 D5 7112 C1 9104 B5 9107 D4
1102 B6 1130 B5 2106 C5 2129 B4 2144 B2 5102 D6 5111 B4 5119 C2 5130 D3 9101 A2 9105 B1 9108 C4
1103 D6 1131 D5 2107 B5 2133 D2 2155 C4 5109 A3 5112 A3 5121 B2 5131 D4 9103 B2 9106 B3 9109 D2



2101 B4 2119 D3 2130 D5 2137 A4 2146 B7 2153 C5 2165 C4 3103 C4 3134 D3 3152 A4 3158 A4 3169 B6 4106 C4 6107 C7 7103 D7
2102 B1 2120 D3 2131 C5 2139 C6 2147 A5 2154 C4 2166 B6 3104 B4 3141 C5 3153 A4 3159 A5 3170 A6 4107 C5 6120 A6 7111 A5
2103 D4 2124 D3 2132 D6 2140 C6 2148 B6 2159 C5 2167 B6 3105 C4 3143 D6 3154 C7 3160 A5 3172 C7 4108 C5 6130 D4 7119 B5
2104 B4 2125 D3 2134 D7 2141 C6 2149 D6 2161 A6 2169 A4 3113 B5 3144 B7 3155 C7 3161 A5 3176 D6 6103 B3 6131 C4
2105 C1 2126 D6 2135 D7 2143 C7 2150 B5 2163 B6 3101 D5 3119 B5 3145 C5 3156 A6 3167 B7 3181 D4 6105 C3 7101 C5
2112 B5 2127 C5 2136 A4 2145 A5 2152 C5 2164 C6 3102 C3 3132 D5 3146 C7 3157 A6 3168 C7 4103 B5 6106 C3 7102 D4



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

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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	D	IC 7101 pin 21 shortcircuit to block AFC 2141	5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A mod=1kHz Δf=±22.5kHz	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz 1)
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C Δf=±10kHz V_{RF} = 0.5mV (as low as possible)	IC 7101 pin 36 220R 100nF	5111	5	f0 symmetric max.
			IC 7101 pin 40 220R 100nF see remark 2)	5112		
AM AFC **MW**		C continuous wave V_{RF} = 2mV		5114	2	0 ± 2 mV DC
AM RF 3)						
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	5	f0 symmetric max.
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO6, Sys + PA with frame aerial, 070799

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

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

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

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

4) MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* *SYSTEMS NON-CENELEC*

7A-4

MISCELLANEOUS

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

CAPACITORS

2101 ©	4822 126 13692	47pF	1%	63V	
2102 ©	4822 126 13838	100nF	10%	50V	not USA
2103 ©	5322 122 31647	1nF	10%	63V	
2104 ©	5322 122 32531	100pF	5%	50V	
2105 ©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00191	3-11pF TRIMCAP.,N450			
2107	4822 121 51319	1µF	20%	50V	
2120 ©	4822 126 13689	18pF	1%	63V	
2124 ©	5322 122 32654	22nF	10%	63V	
2125 ©	2020 552 96199	560pF	1%	50V	
2126 ©	5322 122 31863	330pF	5%	50V	
2127 ©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130 ©	5322 122 32654	22nF	10%	63V	
2131 ©	4822 126 13482	470nF	20%	16V	
2132 ©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134 ©	4822 126 13188	15nF	5%	63V	not USA
2134 ©	5322 122 32654	22nF	10%	63V	USA only
2135 ©	4822 126 13188	15nF	5%	63V	not USA
2135 ©	5322 122 32654	22nF	10%	63V	USA only
2136 ©	4822 126 14076	220nF	20%	25V	
2137 ©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139 ©	4822 126 14236	15pF	5%	50V	
2140 ©	4822 126 13695	82pF	1%	63V	
2141 ©	4822 126 13838	100nF	10%	50V	
2143 ©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145 ©	4822 122 33575	220pF	5%	50V	
2146 ©	4822 122 33575	220pF	5%	50V	
2147 ©	4822 122 33575	220pF	5%	50V	
2148 ©	4822 122 33127	2,2nF	10%	63V	
2149 ©	5322 122 32659	33pF	5%	50V	RDS only
2150 ©	4822 126 13838	100nF	10%	50V	
2152 ©	4822 126 12105	33nF	5%	63V	not for East Europe
2152 ©	5322 116 80853	560pF	5%	63V	for East Europe only
2153 ©	4822 126 13486	15pF	2%	63V	not for East Europe
2153 ©	4822 122 33926	12pF	2%	50V	for East Europe only
2155	2020 800 00191	3-11pF TRIMCAP.,N450			
2159 ©	5322 122 32659	33pF	5%	50V	
2164 ©	4822 126 13482	470nF	20%	16V	
2165 ©	4822 126 13838	100nF	10%	50V	
2166 ©	5322 122 31647	1nF	10%	63V	
2167 ©	4822 122 33926	12pF	5%	50V	
2169 ©	4822 122 33127	2,2nF	10%	63V	RDS only

RESISTORS

3101 ©	4822 051 20333	33kΩ	5%	0,1W	
3102 ©	4822 117 10837	100kΩ	1%	0,1W	
3103 ©	4822 051 20822	8,2kΩ	5%	0,1W	
3104 ©	4822 117 13577	330Ω	1%	0,1W	
3105 ©	4822 117 11503	220Ω	5%	0,1W	
3132 ©	4822 051 20479	47Ω	5%	0,1W	
3134 ©	4822 051 20223	22kΩ	5%	0,1W	
3141 ©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			

RESISTORS

3143 ©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144 ©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145 ©	4822 117 11449	2,2kΩ	1%	0,1W	
3146 ©	4822 051 20229	22Ω	5%	0,1W	
3152 ©	4822 051 20471	470Ω	5%	0,1W	
3153 ©	4822 051 20471	470Ω	5%	0,1W	
3154 ©	4822 117 13577	330Ω	1%	0,1W	
3155 ©	4822 117 11503	220Ω	5%	0,1W	
3156 ©	4822 117 10837	100kΩ	1%	0,1W	
3157 ©	4822 117 10837	100kΩ	1%	0,1W	
3158 ©	4822 051 20471	470Ω	5%	0,1W	
3159 ©	4822 051 20471	470Ω	5%	0,1W	
3160 ©	4822 051 20471	470Ω	5%	0,1W	
3161 ©	4822 051 20223	22kΩ	5%	0,1W	
3167 ©	4822 051 20121	120Ω	5%	0,1W	
3168 ©	4822 051 20121	120Ω	5%	0,1W	
3169 ©	4822 051 20154	150kΩ	5%	0,1W	
3170 ©	4822 117 10837	100kΩ	1%	0,1W	
3172 ©	4822 051 20562	5,6kΩ	5%	0,1W	
3176 ©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3181 ©	4822 051 10102	1kΩ	2%	0,25W	
4103 ©	4822 051 20008	CHIP JUMPER 0805			
4106 ©	4822 051 20008	CHIP JUMPER 0805			
4107 ©	4822 051 20008	CHIP JUMPER 0805			
4108 ©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	FM-IF FILTER 10,7MHz
5110	4822 242 70665	FM-IF FILTER 10,7MHz
5111	2422 549 44023	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 70302	AM-IF FILTER 450kHz
5119	4822 157 11443	DISCRIMINATOR COIL
5121	4822 242 10261	QUARTZ 75kHz
5123	2422 549 44108	RF-COIL, AM-OSCILLATOR
5130	4822 157 11843	RF COIL 1,5 TURNS
5131	4822 157 11843	RF COIL 1,5 TURNS

DIODES

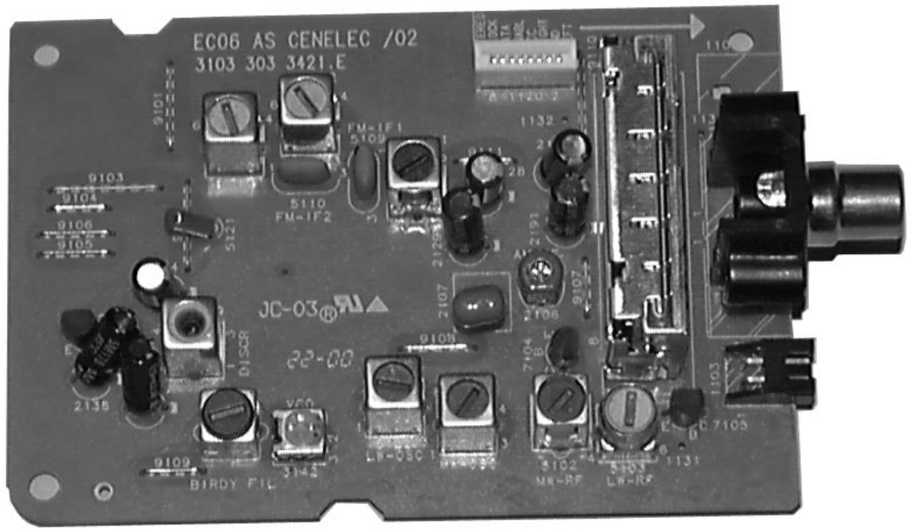
6103 ©	5322 130 34337	BAV99
6105 ©	4822 130 83075	HN1V02H
6106 ©	4822 130 83757	BAS216
6107 ©	9340 386 90115	BZX284-C11
6120 ©	4822 130 83757	BAS216
6130 ©	4822 130 82833	1SV228
6131 ©	4822 130 82833	1SV228

TRANSISTORS

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

INTEGRATED CIRCUITS

7101 ©	9351 740 80557	TEA5757H/V1, RADIO IC



ECO6 Tuner PART

version: ***SYSTEMS CENELEC***

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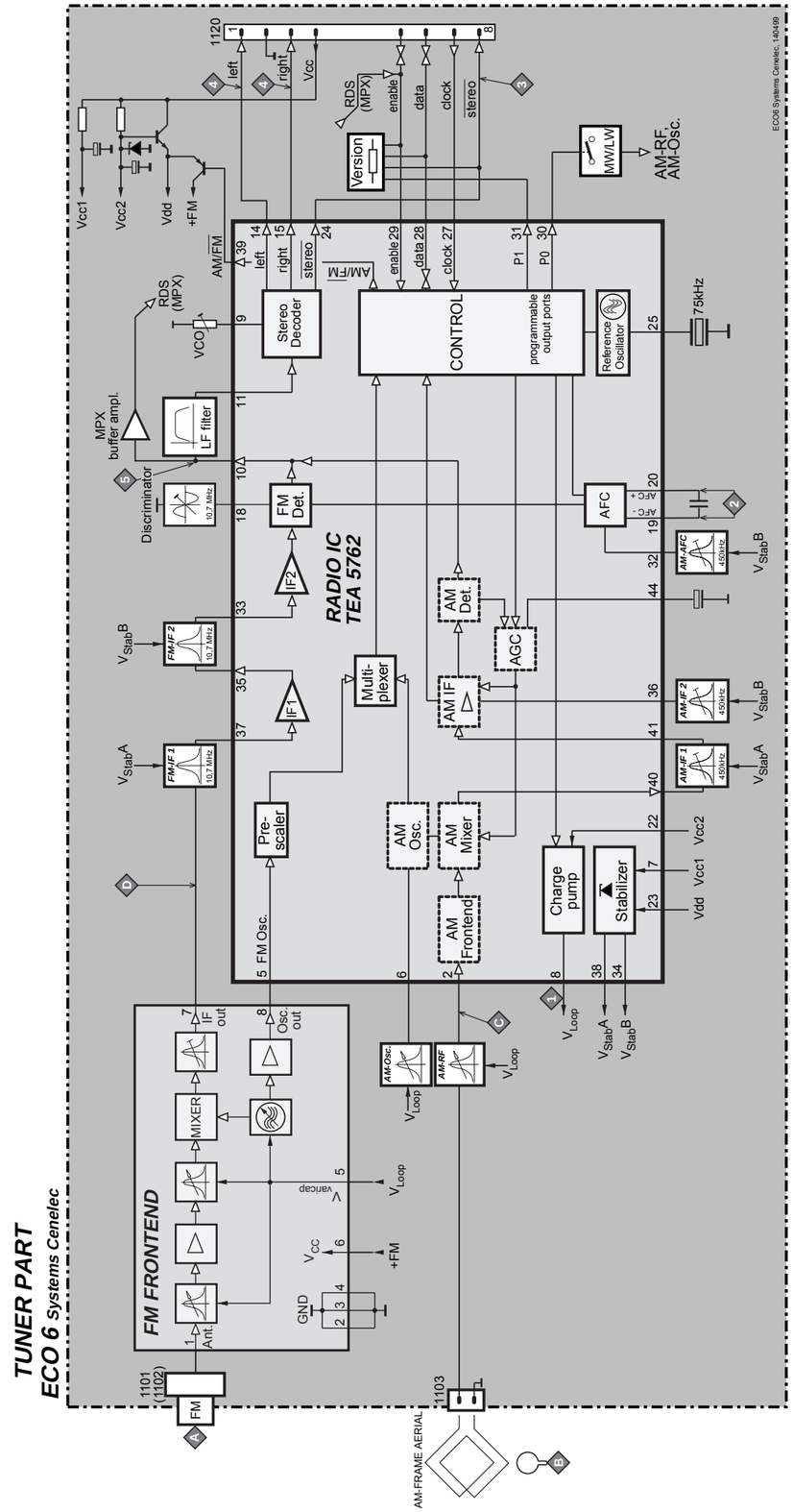
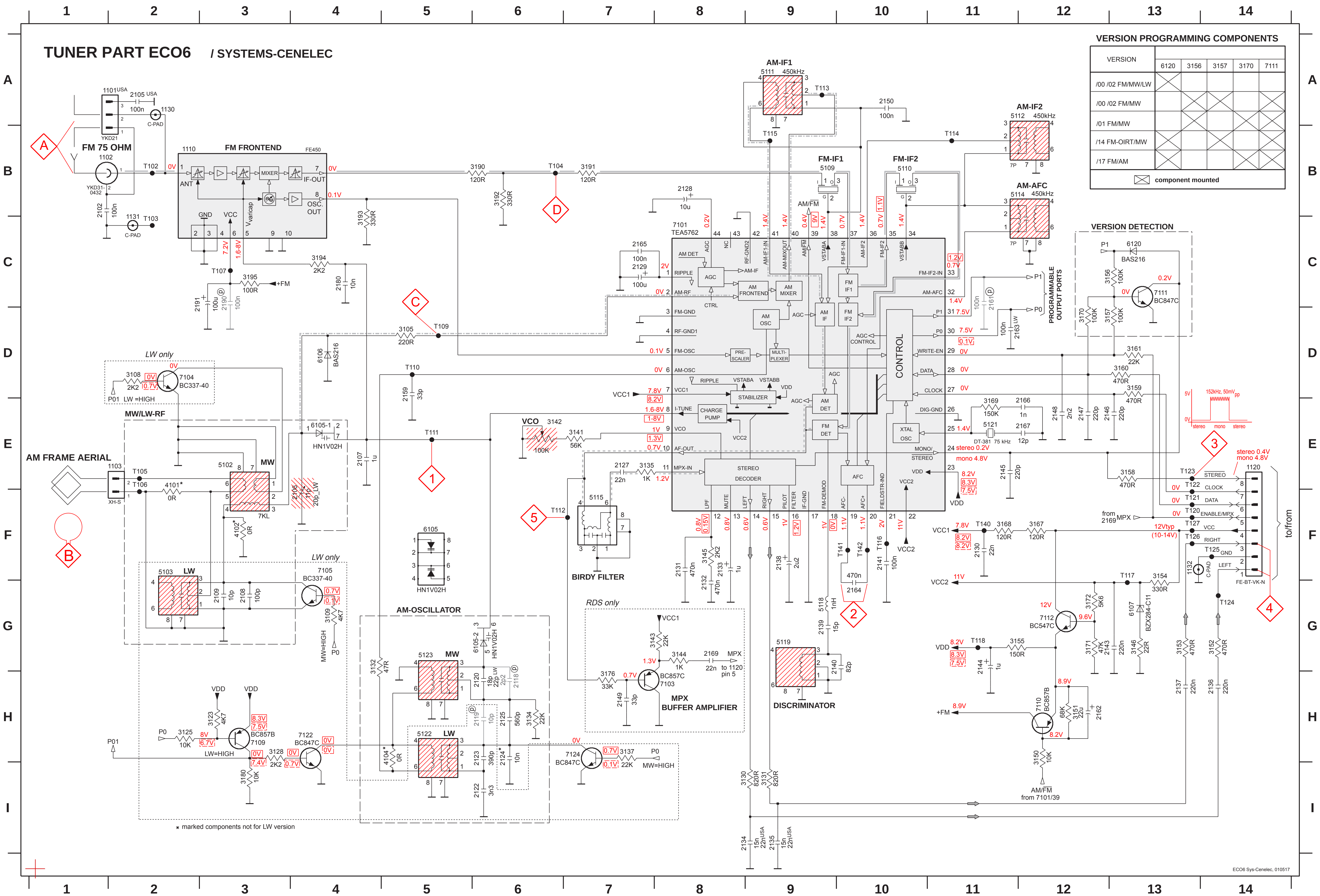
BLOCK DIAGRAM





1101 A2
1102 B1
1103 E2
1110 B2
1120 E14
1130 A2
1131 C2
1132 F13
2102 B1
2105 A2
2106 E3
2107 E4
2108 G3
2109 G3
2118 H6
2119 H6
2120 H6
2122 I6
2123 H6
2124 H6
2125 H6
2127 E7
2128 B8
2129 C7
2130 F11
2131 F8
2132 F8
2133 F8
2134 I8
2135 I9
2136 H14
2137 H13
2138 F9
2139 G9
2140 G9
2141 F10
2143 G12
2144 G11
2145 E11
2146 E12
2147 E12
2148 E12
2149 H7
2150 A10
2159 D5
2161 C11
2162 H12
2163 D11
2164 G10
2165 C7
2166 E11
2167 E11
2169 G8
2180 C4
2190 C3
2191 C3
3105 D5
3108 D2
3109 G4
3123 H3
3125 H2
3128 H3
3130 I9
3131 I9
3132 G4
3134 H6
3135 E7
3137 H7
3141 E7
3142 E6
3143 G7
3144 G8
3145 F8
3146 G13
3150 H12
3151 H12
3152 G14
3153 G13
3154 F13
3155 G12
3156 C12
3157 D12
3158 E13
3159 D13
3160 D13
3161 D13
3167 F12
3168 F11
3169 E11
3170 D12
3171 G12
3172 G12
3176 H7
3180 I3
3190 B6
3191 B7
3192 B6
3193 B4
3194 C4
3195 C3
4101 E2
4102 F3
4104 H5
5102 E3
5103 F2
5109 B9
5110 B10
5111 A9
5112 A11
5114 B11
5115 E7
5118 G9
5119 G9
5121 E11
5122 H5
5123 G5
6105-1 E4
6105-2 G6
6106 D4
6107 G13
6120 C13
7101 C8
7103 H8
7104 D2
7105 F4
7109 H3
7110 H12
7111 C13
7112 G12
7122 H4
7124 H7
T102 B2
T103 B2
T104 B6
T105 E2
T106 E2
T107 C3
T109 D5
T110 D5
T111 E5
T112 F7
T113 A9
T114 B11
T116 F10
T117 F13
T118 G11
T120 F13
T121 F13
T122 E13
T123 E13
T124 G14
T125 F14
T126 F13
T127 F13
T140 F11
T141 F10
T142 F10

LEGEND

* ... only assembled in FM/AM-version
(p)...for provision only
USA ... for USA version only
LW ... for LW version only

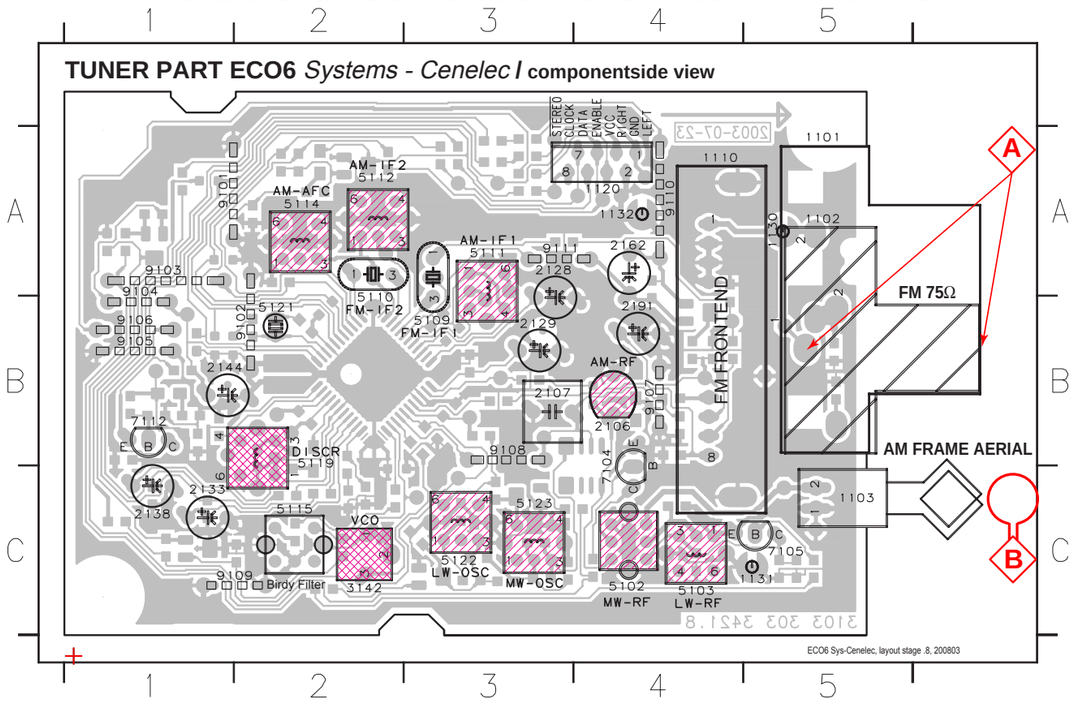
SMD jumper
41xx
0R

EVM

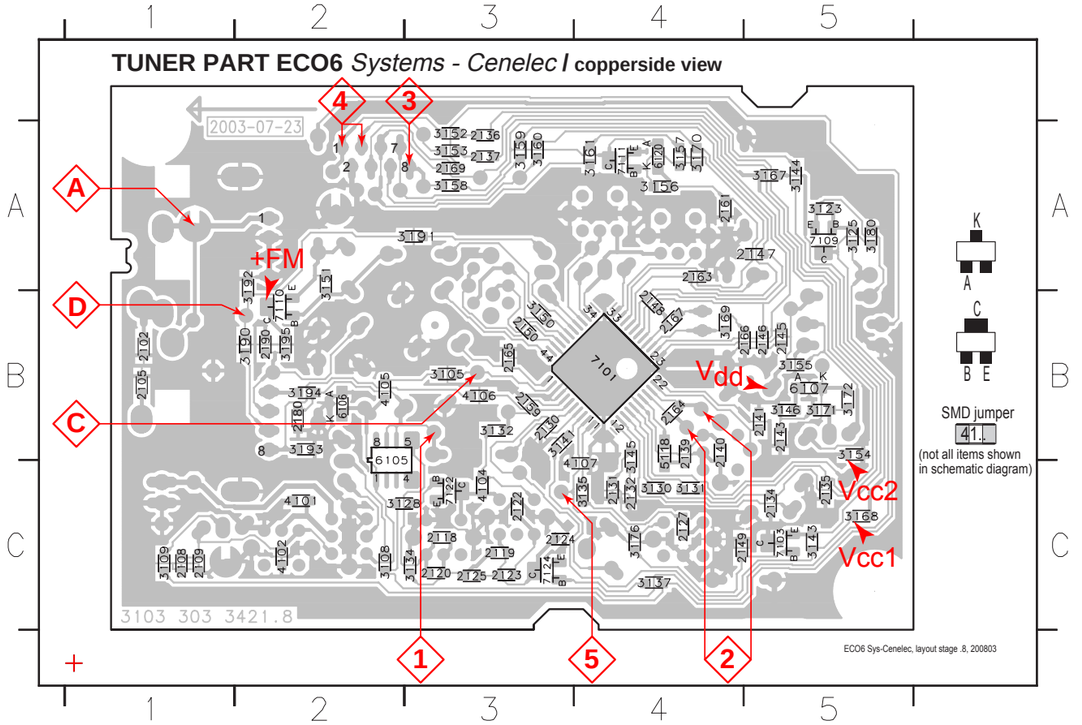
...V FM mode stereo
...V MW mode
...V LW mode
voltages measured while set is tuned to a strong transmitter

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

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



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



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

7B-3

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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	1	8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
FM - IF						
FM	10.7MHz, 45mV continuous wave	D	IC 7101 21 shortcircuit to block AFC 2141	5119	2	0mV ±3mV
FM - VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz 1)
FM RF (channel separation)	Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.					
FM	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	A	98MHz	IF coil inside FM frontend 1110	4	right channel min.
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C Δf = ±10kHz V_{RF} = 0.5mV (as low as possible)	IC 7101 36 100nF 220R	5111	5	max. f_o symmetric
			IC 7101 40 100nF 220R see remark 2)	5112		
AM AFC **MW**		C continuous wave V_{RF} = 2mV		5114	2	0mV ±2mV
AM RF 3)						
MW	1494kHz	B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	5	max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		

ECO6 Sys Cenelec, 190599

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

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

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

3) For AM RF adjustments the original frame antenna has to be used! MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* SYSTEMS-CENELEC

7B-4

MISCELLANEOUS

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

CAPACITORS

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

RESISTORS

3105 ©	4822 117 11503	220Ω	5%	0,1W	
3108 ©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3109 ©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3123 ©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3125 ©	4822 117 10833	10kΩ	1%	0,1W	LW only
3128 ©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3130 ©	3198 021 38210	820Ω	5%	0,06W	
3131 ©	3198 021 38210	820Ω	5%	0,06W	
3132 ©	4822 051 20479	47Ω	5%	0,1W	
3134 ©	4822 051 20223	22kΩ	5%	0,1W	
3135 ©	3198 021 31020	1kΩ	5%	0,06W	
3137 ©	4822 051 20223	22kΩ	5%	0,1W	LW only
3141 ©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			
3143 ©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144 ©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145 ©	4822 117 11449	2,2kΩ	1%	0,1W	
3146 ©	4822 051 20229	22Ω	5%	0,1W	
3150 ©	4822 117 10833	10kΩ	1%	0,1W	
3151 ©	4822 051 20683	68kΩ	5%	0,1W	
3152 ©	4822 051 20471	470Ω	5%	0,1W	
3153 ©	4822 051 20471	470Ω	5%	0,1W	
3154 ©	4822 117 13577	330Ω	1%	0,1W	
3155 ©	4822 117 10353	150Ω	5%	0,1W	
3156 ©	4822 117 10837	100kΩ	1%	0,1W	
3157 ©	4822 117 10837	100kΩ	1%	0,1W	
3158 ©	4822 051 20471	470Ω	5%	0,1W	
3159 ©	4822 051 20471	470Ω	5%	0,1W	
3160 ©	4822 051 20471	470Ω	5%	0,1W	
3161 ©	4822 051 20223	22kΩ	5%	0,1W	
3167 ©	4822 051 20121	120Ω	5%	0,1W	
3168 ©	4822 051 20121	120Ω	5%	0,1W	
3169 ©	4822 051 20154	150kΩ	5%	0,1W	
3170 ©	4822 117 10837	100kΩ	1%	0,1W	
3171 ©	4822 117 10834	47kΩ	1%	0,1W	
3172 ©	4822 051 20562	5,6kΩ	5%	0,1W	
3176 ©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3180 ©	4822 117 10833	10kΩ	1%	0,1W	LW only
3190 ©	4822 051 20121	120Ω	5%	0,1W	
3191 ©	4822 051 20121	120Ω	5%	0,1W	
3192 ©	4822 117 13577	330Ω	1%	0,1W	
3193 ©	4822 117 13577	330Ω	1%	0,1W	
3194 ©	4822 117 11449	2,2kΩ	1%	0,1W	
3195 ©	4822 051 20101	100Ω	5%	0,1W	
4101 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4102 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4104 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4105 ©	4822 051 20008	CHIP JUMPER 0805			
4106 ©	4822 051 20008	CHIP JUMPER 0805			
4107 ©	4822 051 20008	CHIP JUMPER 0805			

COILS

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

DIODES

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

TRANSISTORS

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

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC

TAPE BOARD

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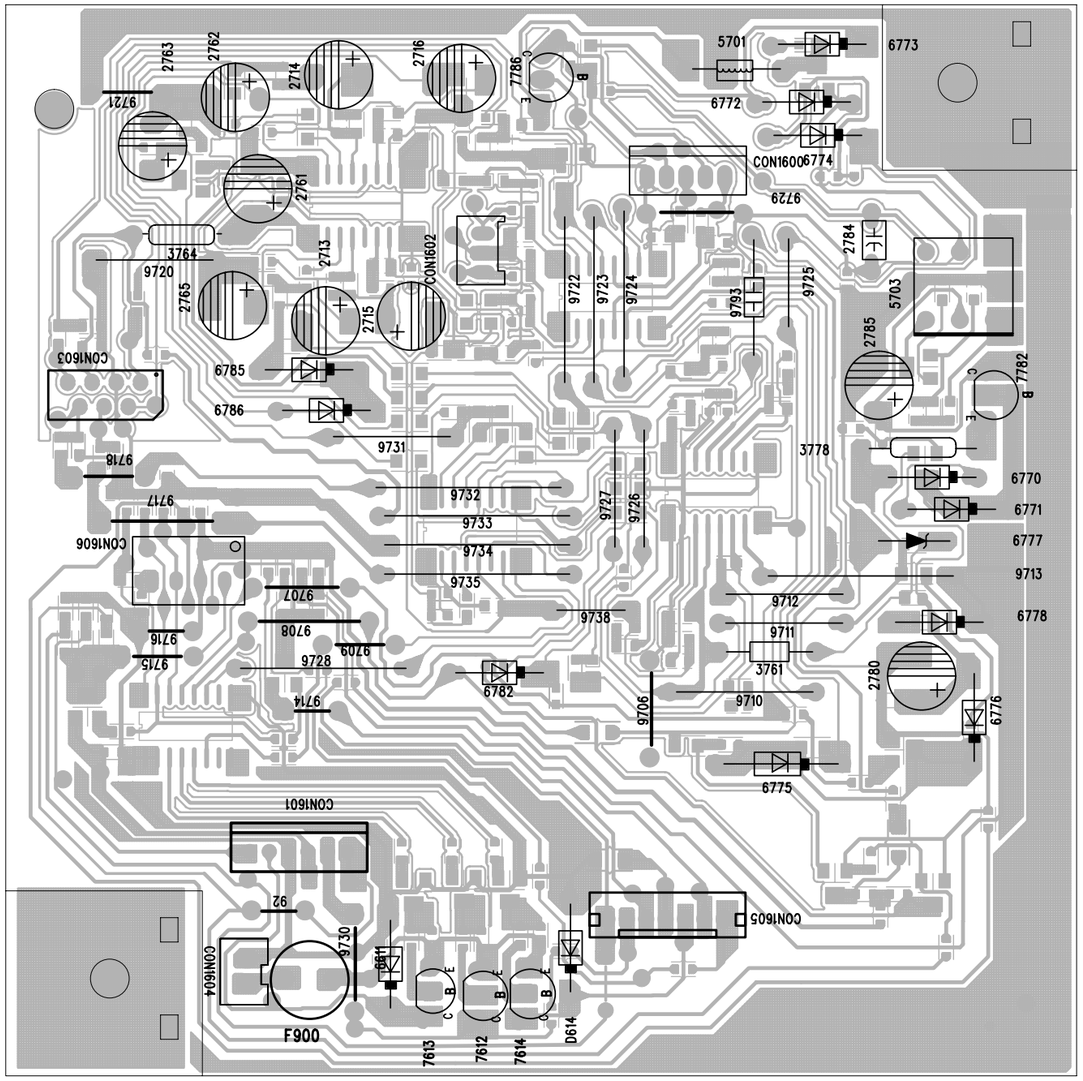
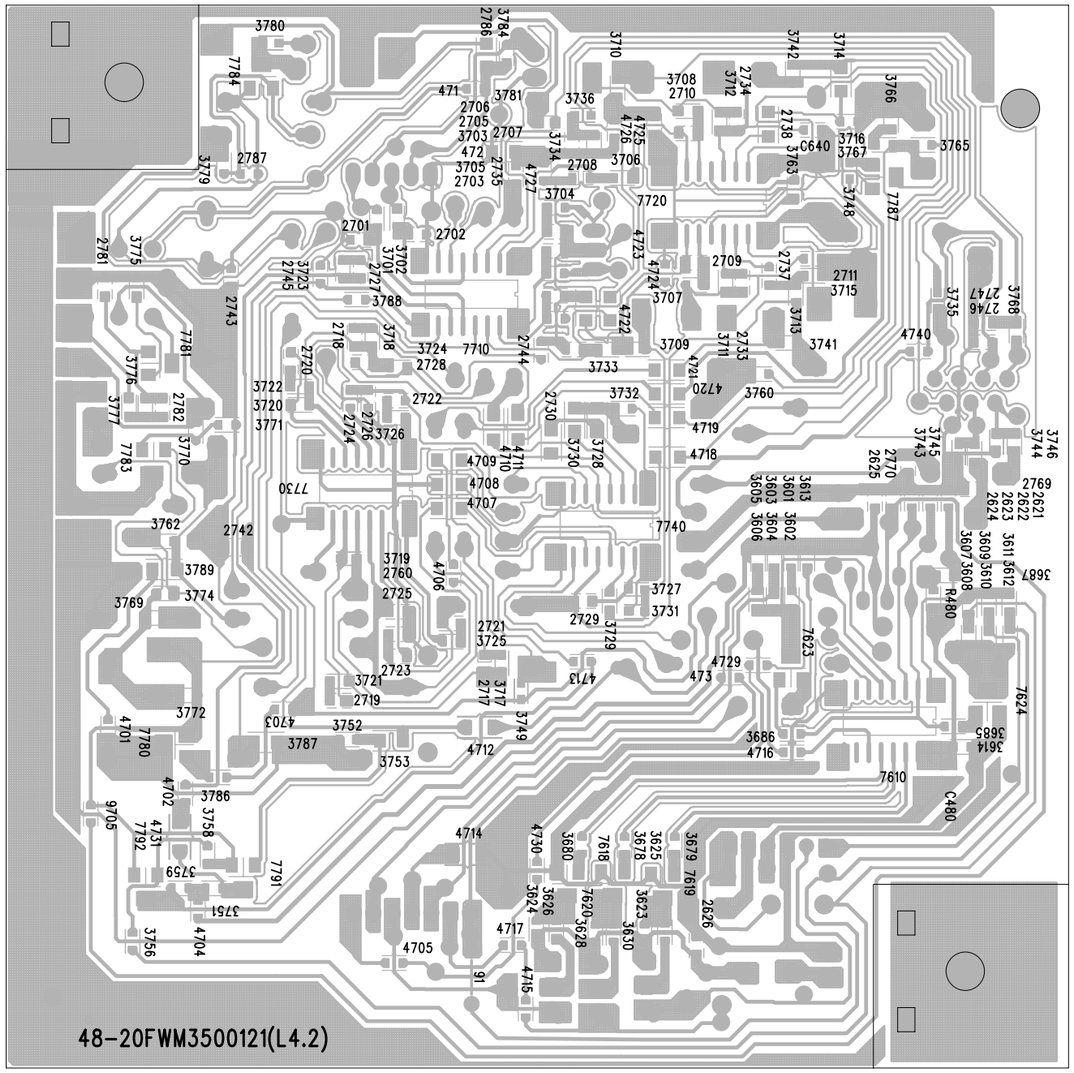
8-1

Remark: For Ver. 22, the whole Tape Board Ass'y can be orderd with 12nc: 9940 000 01508

PCB LAYOUT - TAPE BOARD (TOP VIEW)

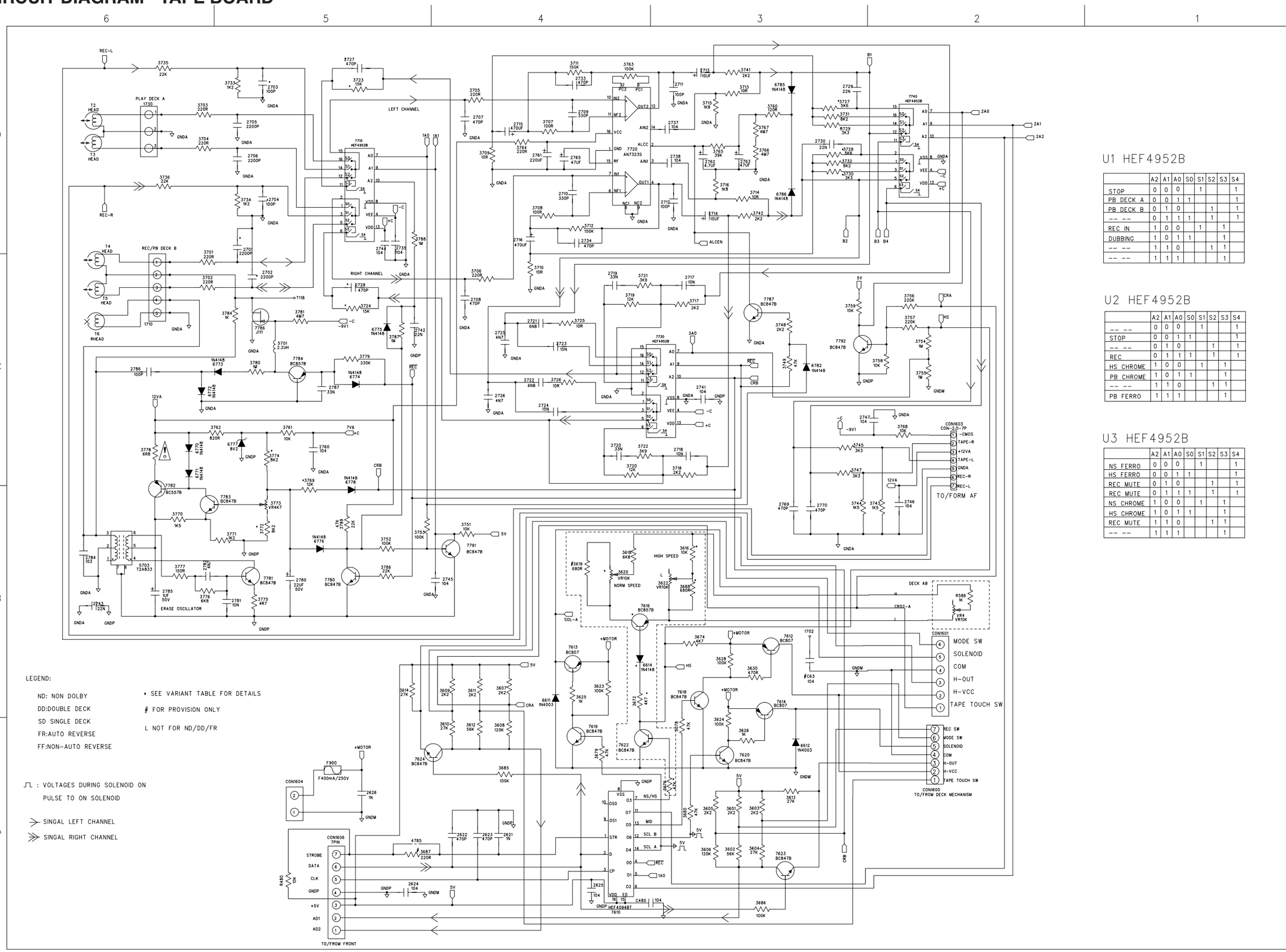


PCB LAYOUT - TAPE BOARD (BOTTOM VIEW)



8-3

CIRCUIT DIAGRAM - TAPE BOARD



U1 HEF4952B

	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
PB DECK A	0	0	1	1				1
PB DECK B	0	1	0			1		1
-- --	0	1	1	1		1		1
REC IN	1	0	0		1		1	
DUBBING	1	0	1	1			1	
-- --	1	1	0			1	1	
-- --	1	1	1				1	

U2 HEF4952B

	A2	A1	A0	S0	S1	S2	S3	S4
-- --	0	0	0		1			1
STOP	0	0	1	1				1
-- --	0	1	0			1		1
REC	0	1	1	1		1		1
HS CHROME	1	0	0		1		1	
PB CHROME	1	0	1	1			1	
-- --	1	1	0			1	1	
PB FERRO	1	1	1				1	

U3 HEF4952B

	A2	A1	A0	S0	S1	S2	S3	S4
NS FERRO	0	0	0		1			1
HS FERRO	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
NS CHROME	1	0	0		1		1	
HS CHROME	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
-- --	1	1	1				1	

LEGEND:

ND: NON DOLBY
DD:DOUBLE DECK
SD SINGLE DECK
FR:AUTO REVERSE
FF:NON-AUTO REVERSE

* SEE VARIANT TABLE FOR DETAILS

\# FOR PROVISION ONLY

L NOT FOR ND/DD/FR

⎍ : VOLTAGES DURING SOLENOID ON
PULSE TO ON SOLENOID

SINGAL LEFT CHANNEL
SINGAL RIGHT CHANNEL

8-4

ELECTRICAL PARTS - CASS DECK BOARD

3778	⚠	9940 000 01249	FUSE RES. 6.8Ω 1/4W +/-5%
5703		9940 000 01251	IFT OSC COIL 100KHZ
7610		5322 209 11306	HEF4094BT
7710		9940 000 01248	IC HF4952
7720		9322 140 00668	IC SM AN7323S (MATJ)
7730		9940 000 01248	IC HF4952
7740		9940 000 01248	IC HF4952
7786		4822 130 63494	FET J111
F900	⚠	9940 000 01252	FUSE RADIAL F400MA/250V

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

POWER BOARD

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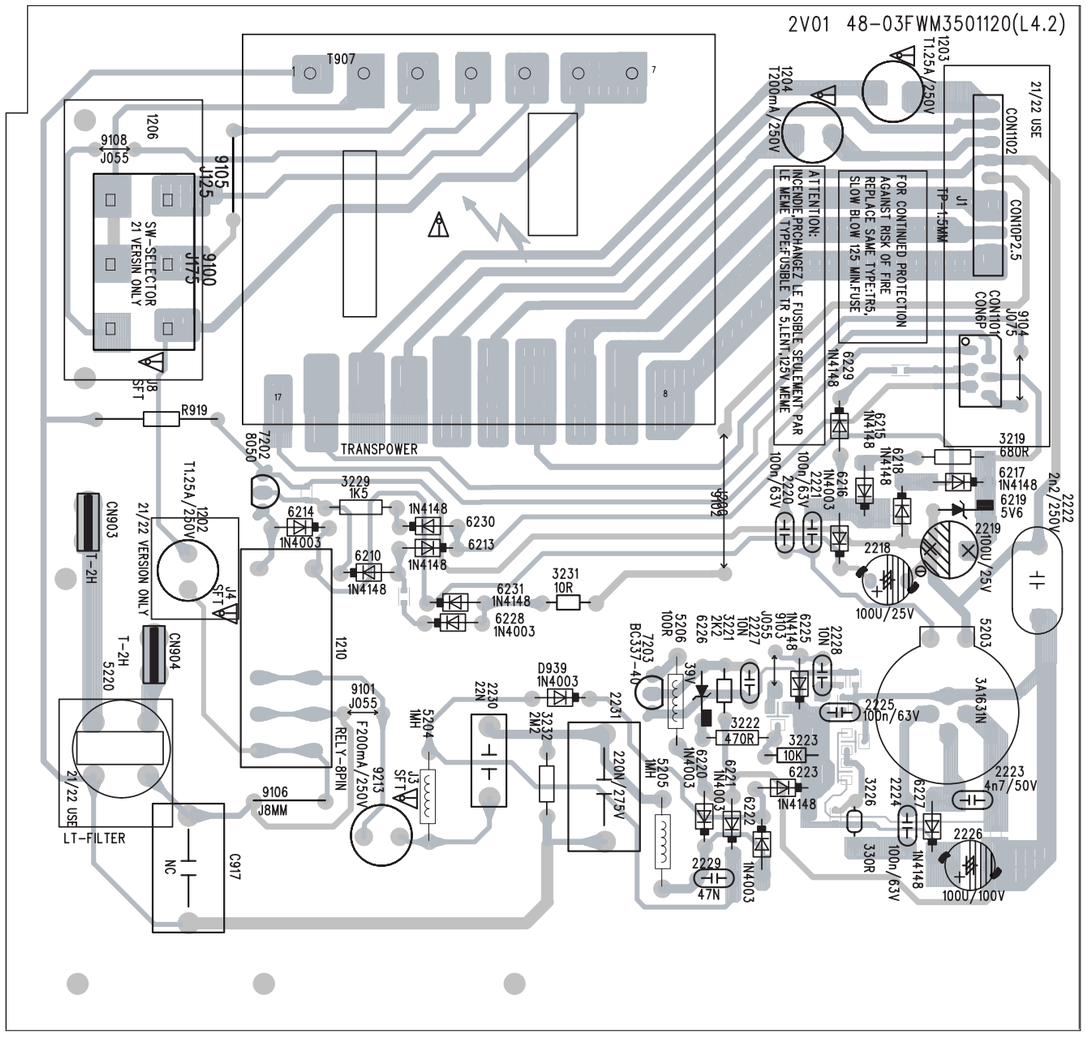
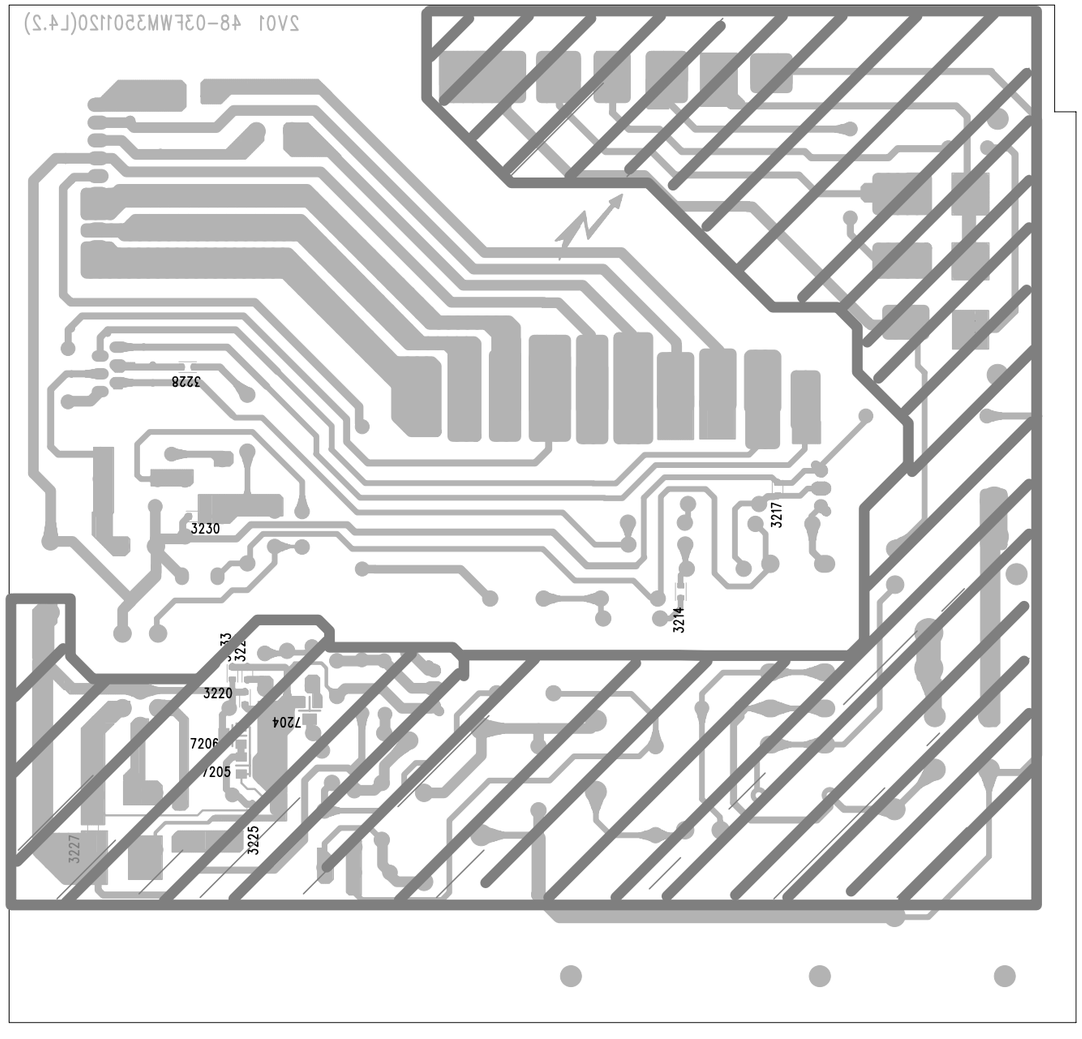
9-1

Remark: For Ver. 22, the whole Power Board Ass'y can be orderd with 12nc: 9940 000 01507

PCB LAYOUT - POWER BOARD (TOP VIEW)

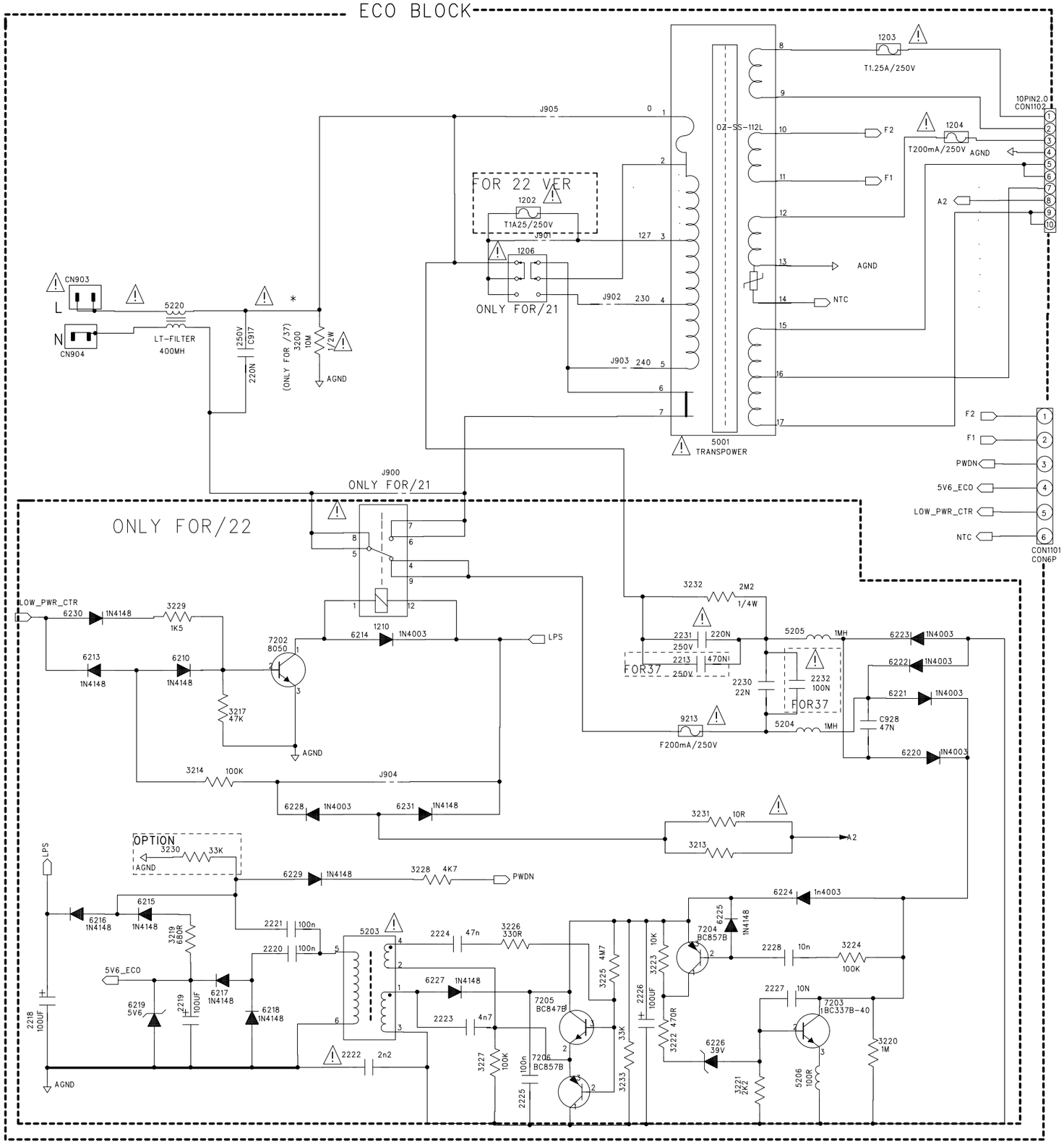


PCB LAYOUT - POWER BOARD (BOTTOM VIEW)



9-3

CIRCUIT DIAGRAM - POWER BOARD



9-4

ELECTRICAL PARTS - POWER BOARD

1206		9940 000 01323	SWITCH /21
1202	⚠	9940 000 01228	FUSE RADIAL F200MA/250V
1203	⚠	9940 000 01231	FUSE RADIAL T1.25A 250V
1204	⚠	9940 000 01229	FUSE RADIAL T200MA/250V
1210		9940 000 01232	RELAY ME-12H 30VDC
2222	⚠	9940 000 01224	SAFETY CAP 250V 0.0022µF +/-20%
2231	⚠	9940 000 01225	SAFETY CAP 275V 0.22µF +/-20%
5203	⚠	9940 000 01227	TRANSFORMER STANDBY
5220	⚠	9940 000 01226	AC LINE FILTER IND. 400µH 3A
9213	⚠	9940 000 01228	FUSE RADIAL F200MA/250V
C917	⚠	9940 000 01225	SAFETY CAP 275V 0.22µF +/-20%

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

3CDC-LC-MP3CD2002

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

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Service hints

CAUTION

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE
- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CD mechanism:
1. Disconnect flexfoil cable from the old CD drive
2. Put a paperclip on the flexfoil to short-circuit the contacts (fig.1)
3. Remove the old CD drive
4. Remove paperclip from the flexfoil and connect it to the new drive
5. Position the new CD drive in its studs
6. Remove solder joint from the Laserunit

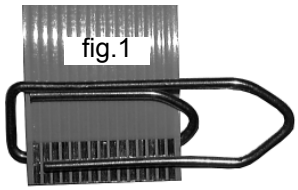
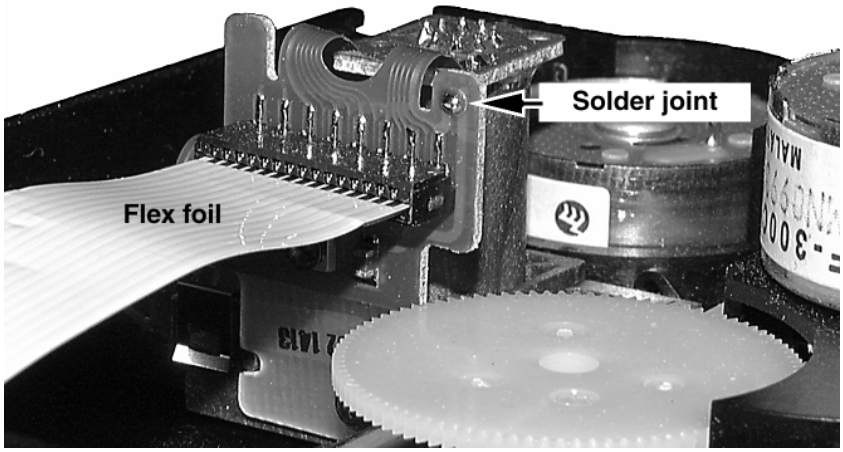


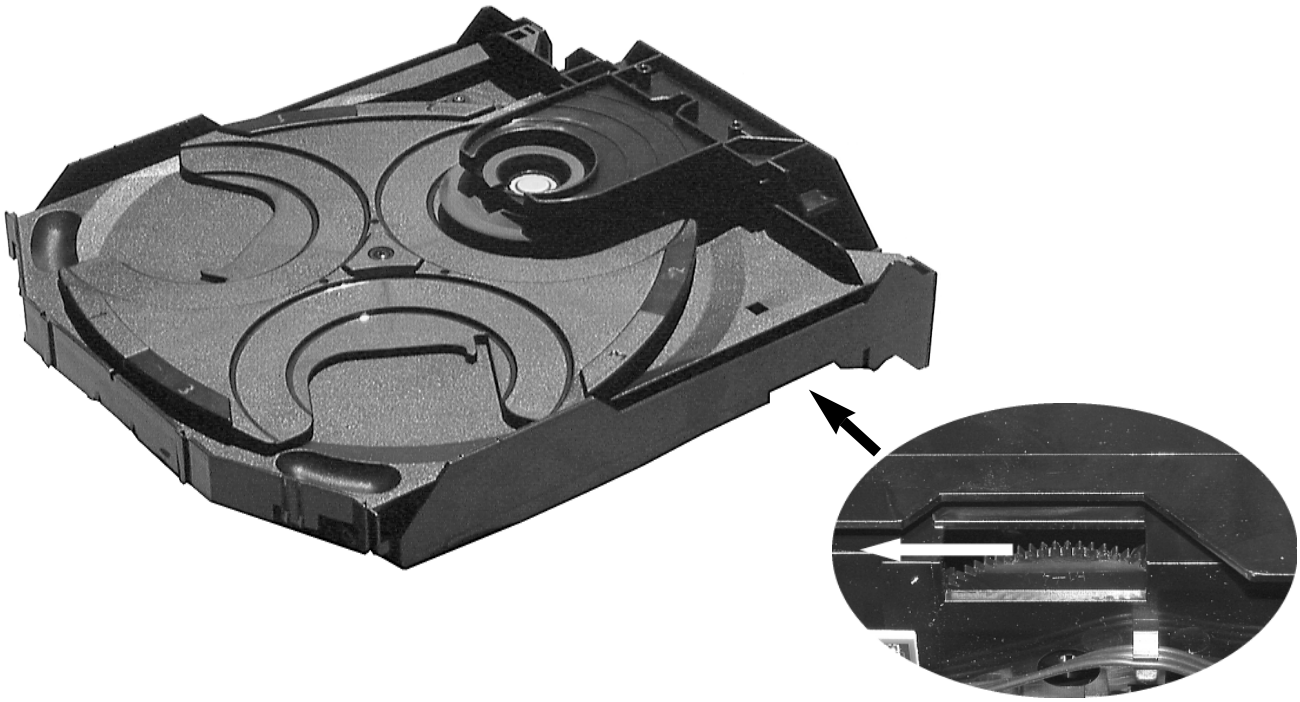
fig.1

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



Emergency open

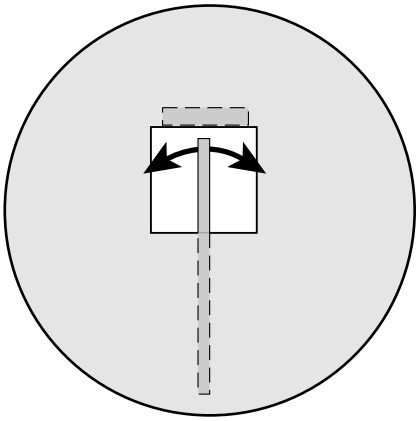
In case of a Supply fault, the tray can be opened manually.
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



Service hints

Dismantling of Tray

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



Detail A

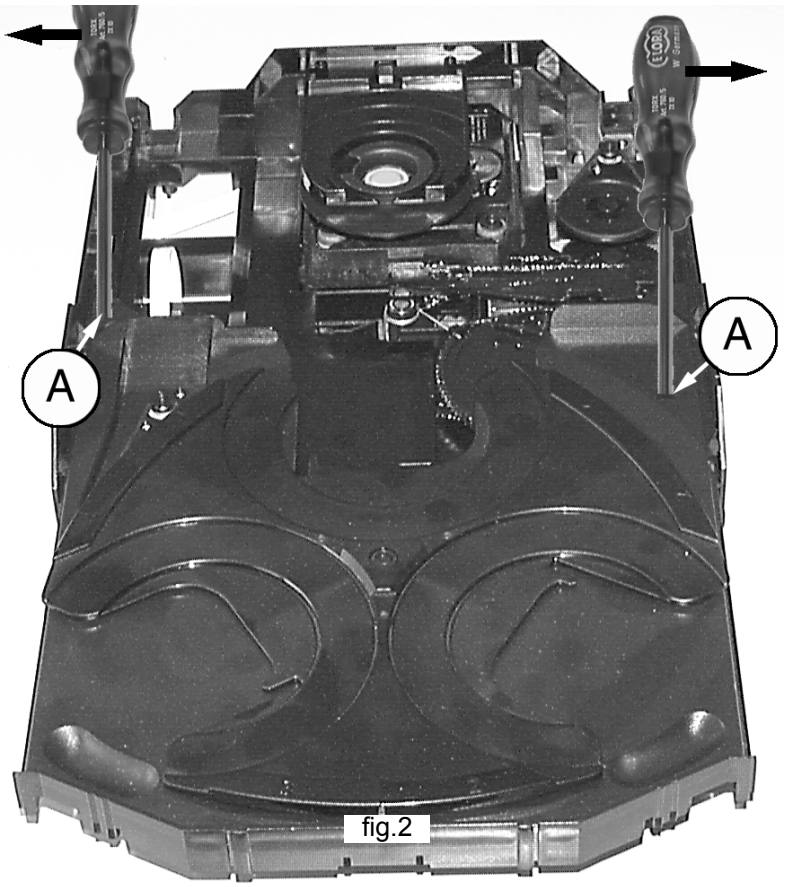
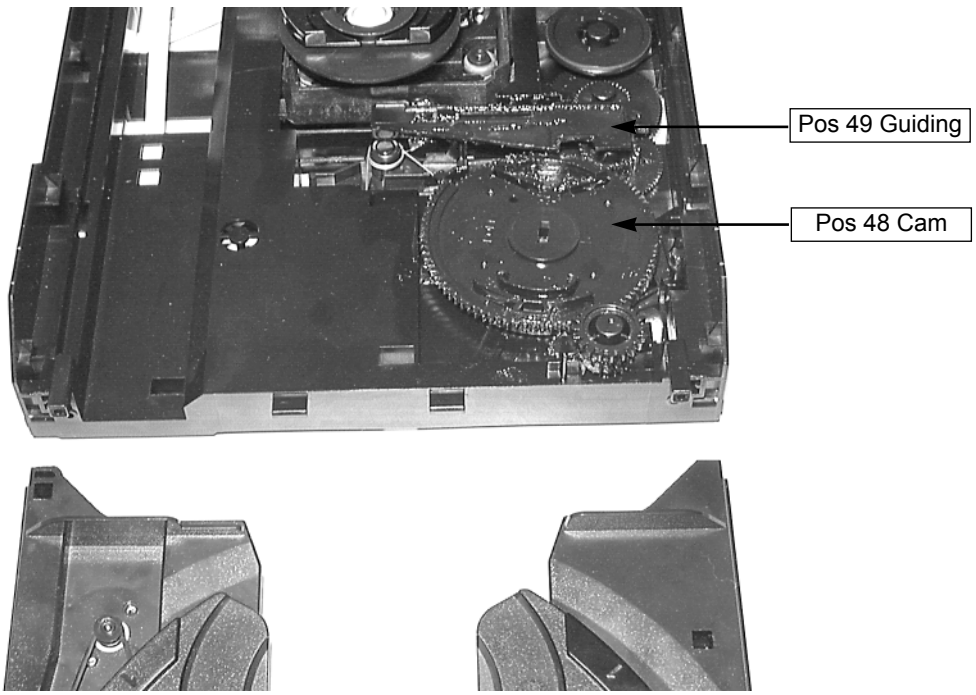


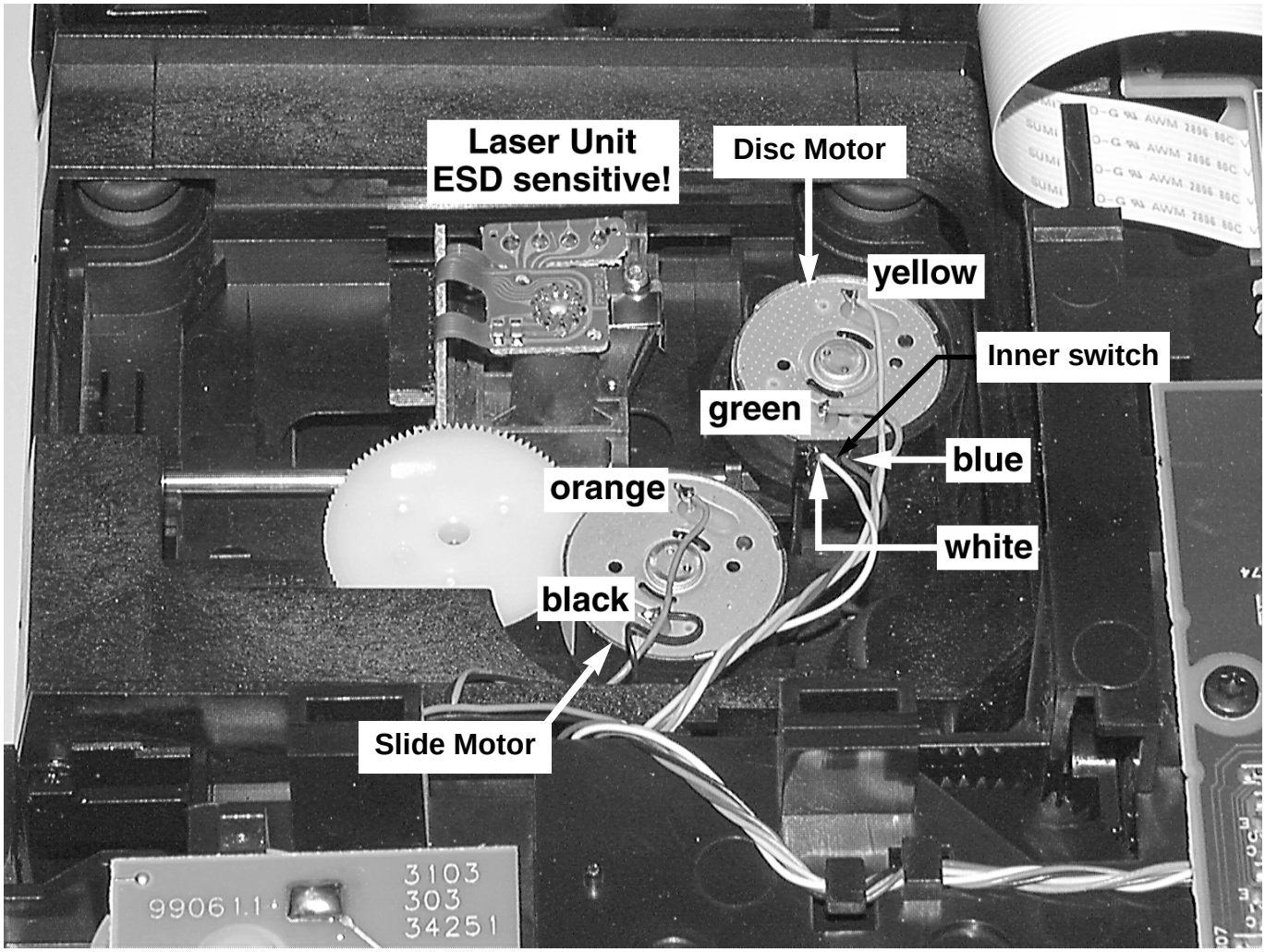
fig.2

Assembling of Tray

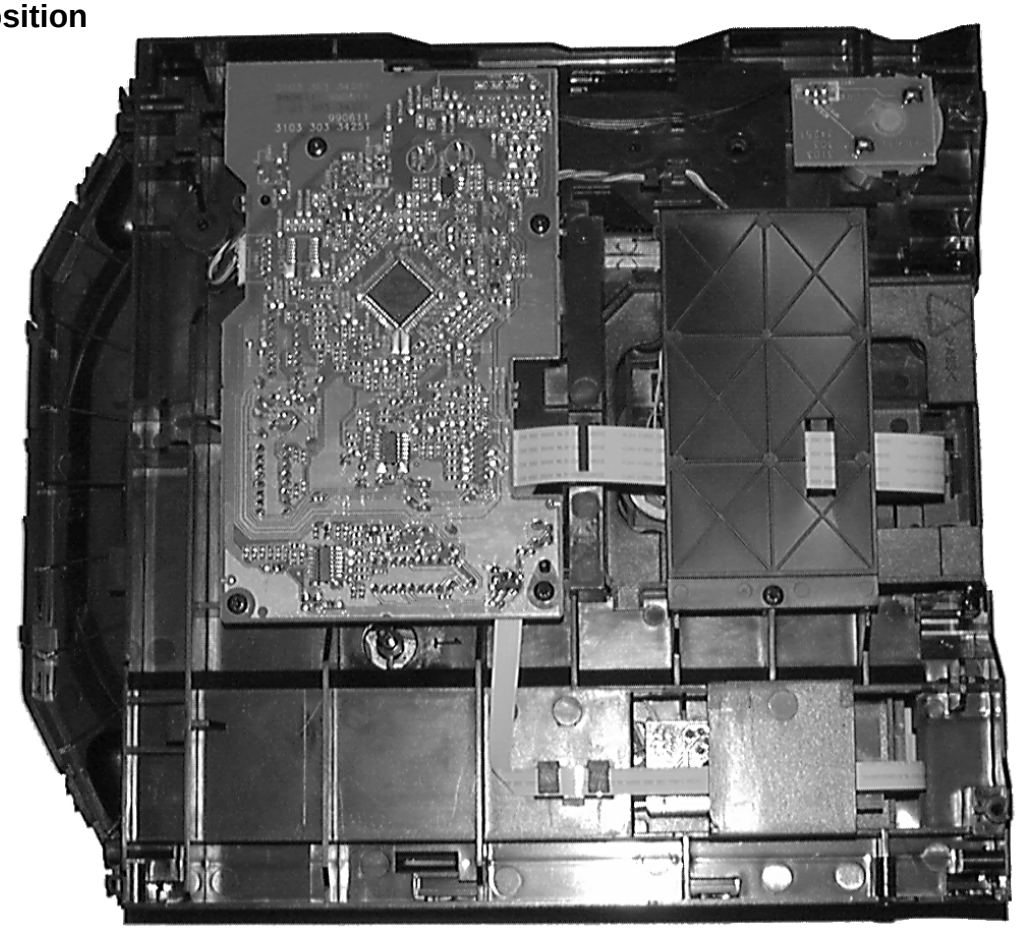
1. Turn Cam (pos. 48) clockwise to end position.
2. If necessary - move Guiding (pos. 49) to the right end position.
3. Insert the Tray.



Wiring



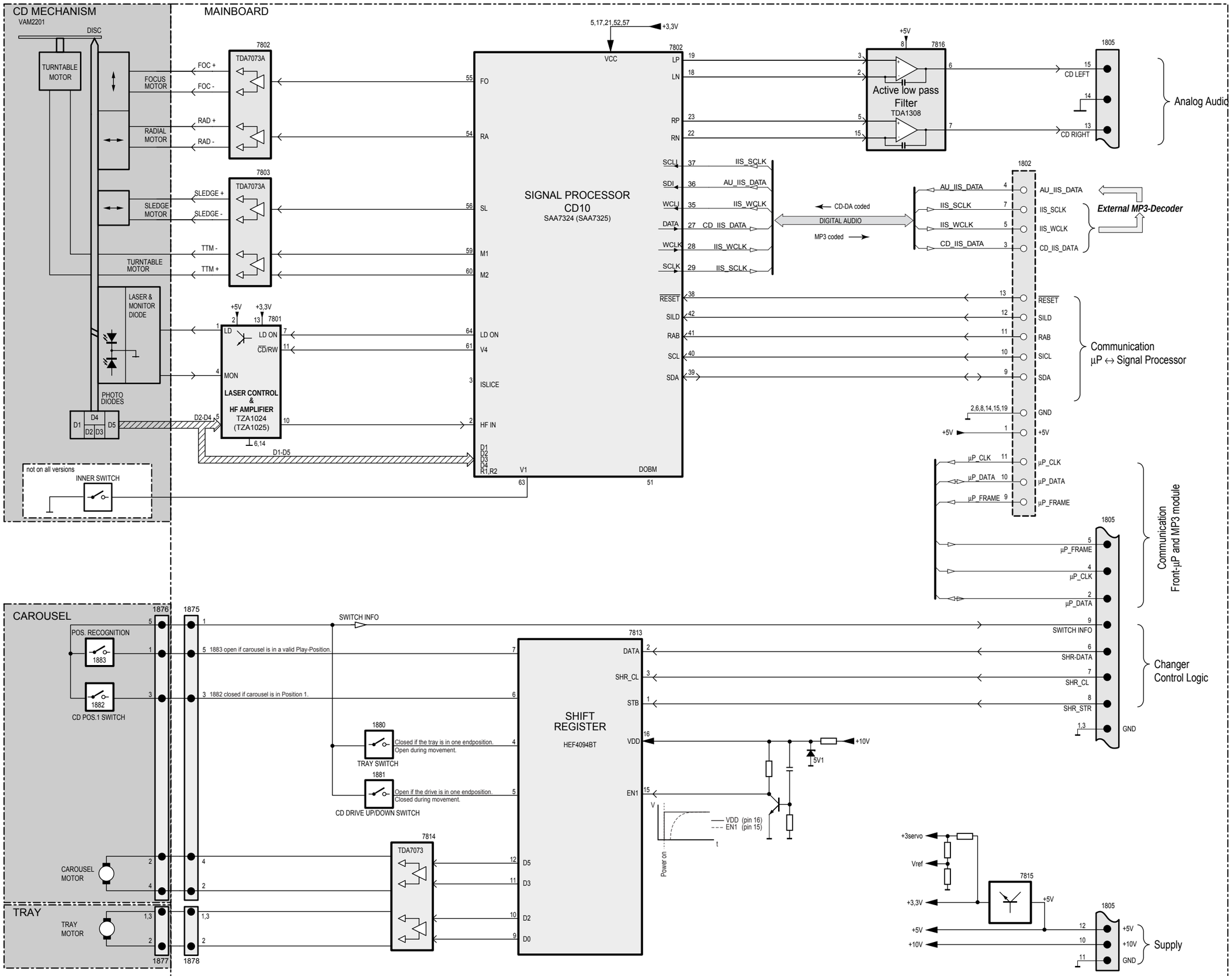
Service Position



10-5

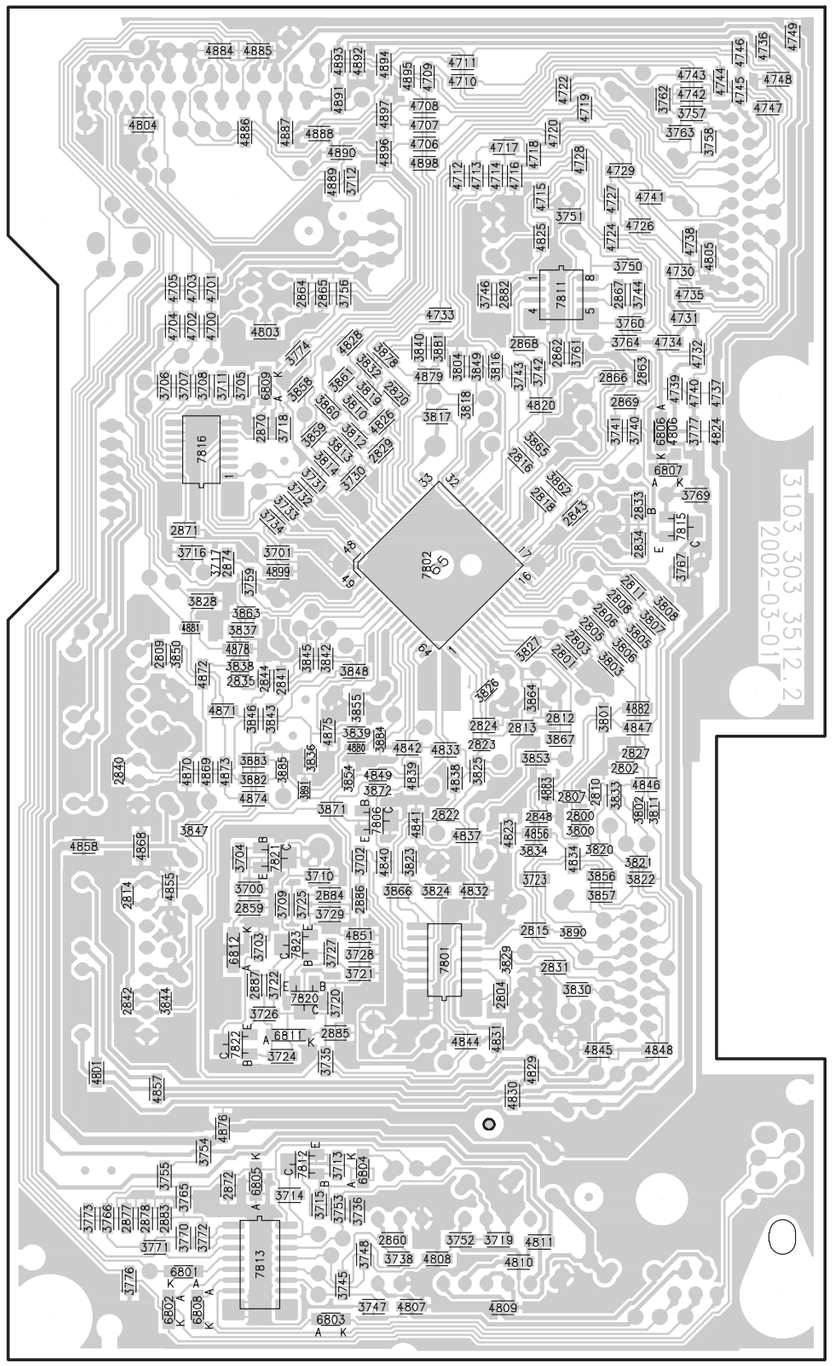
Blockdiagram

BLOCK DIAGRAM 3CDC-LC MP3 Version



10-6

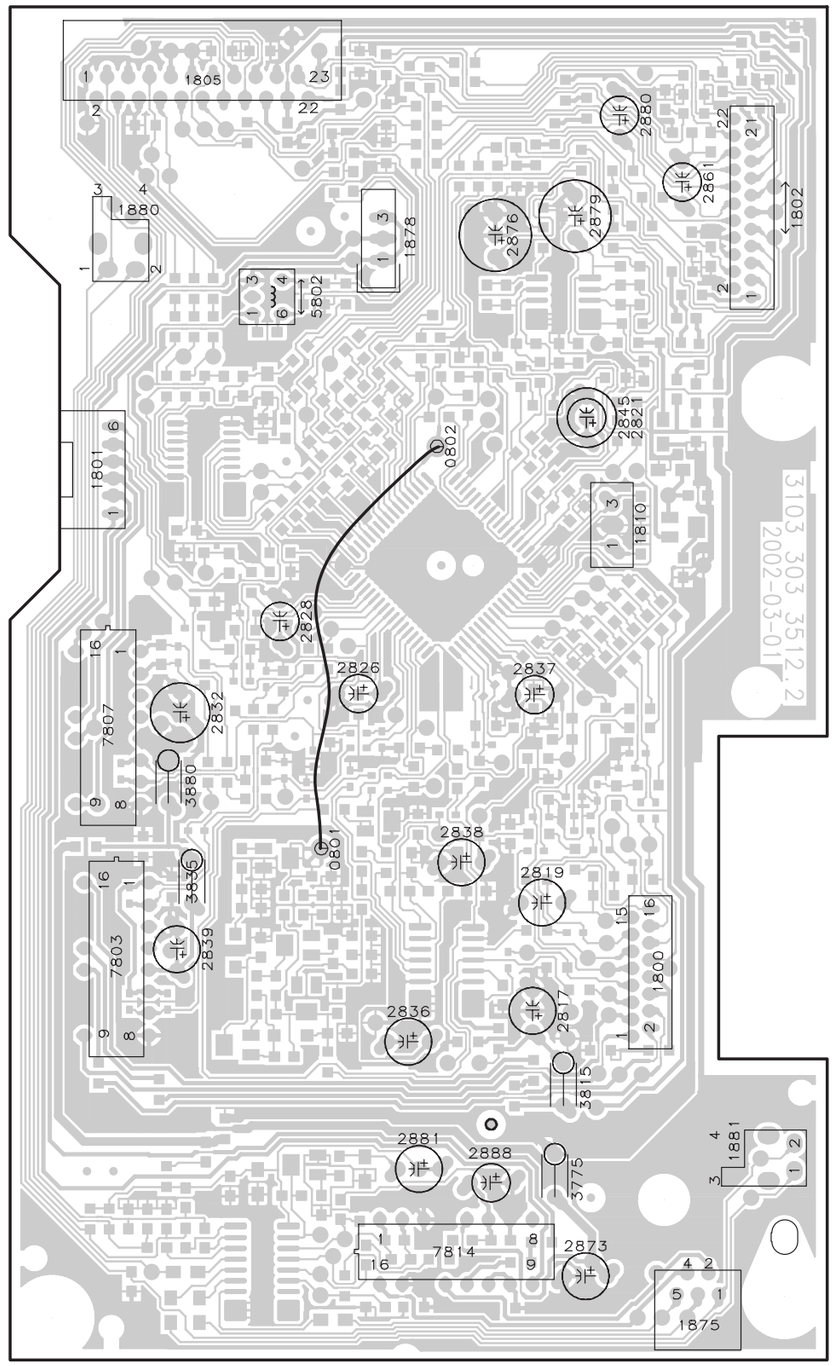
3CDC-LC-MP3CD2002 Copperside view



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

3CDC-LC-MP3CD2002 Layout stage .2 2002-05-27

3CDC-LC-MP3CD2002 Components seen from Copperside

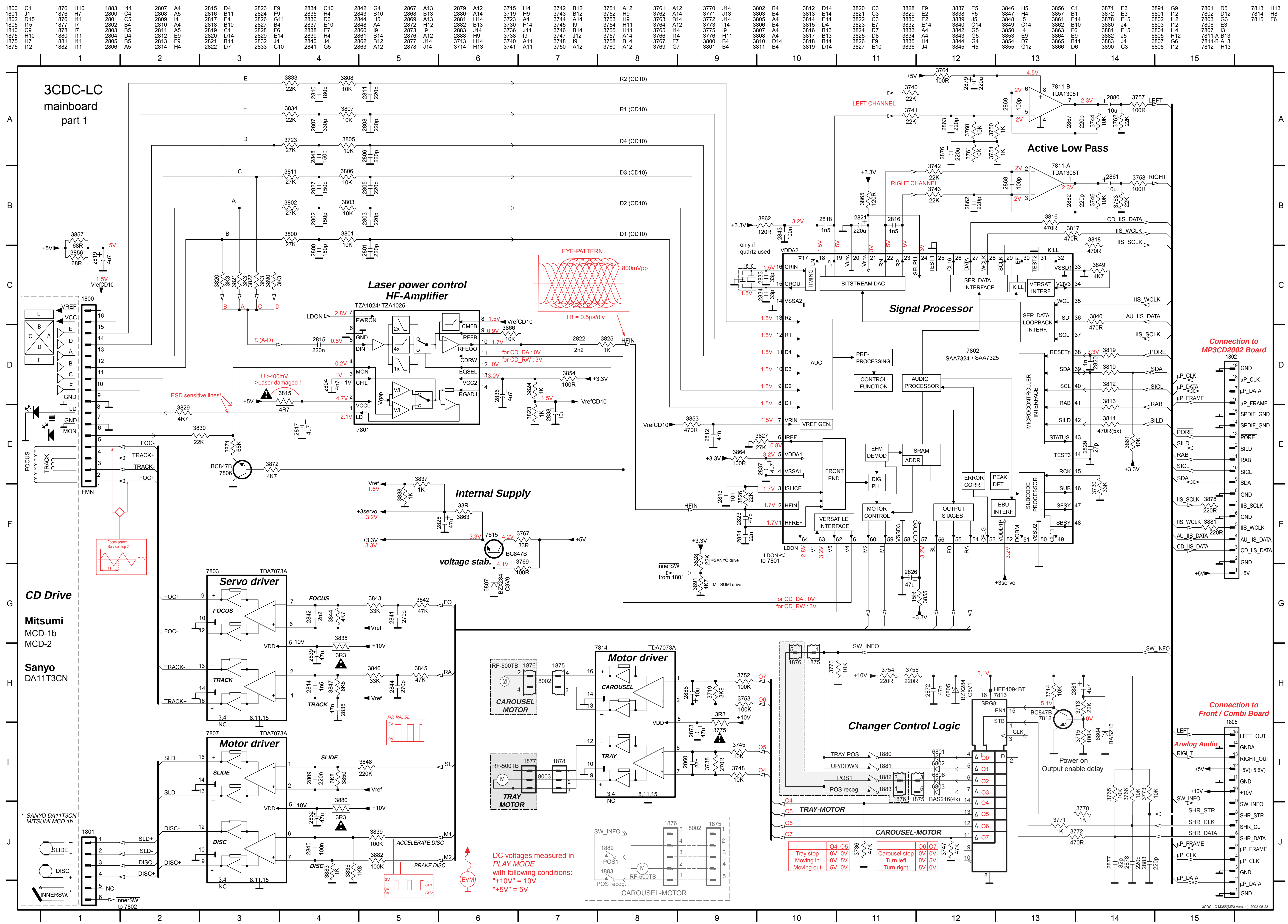


This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

3CDC-LC-MP3CD2002 Layout stage .2 2002-05-27

Mapping

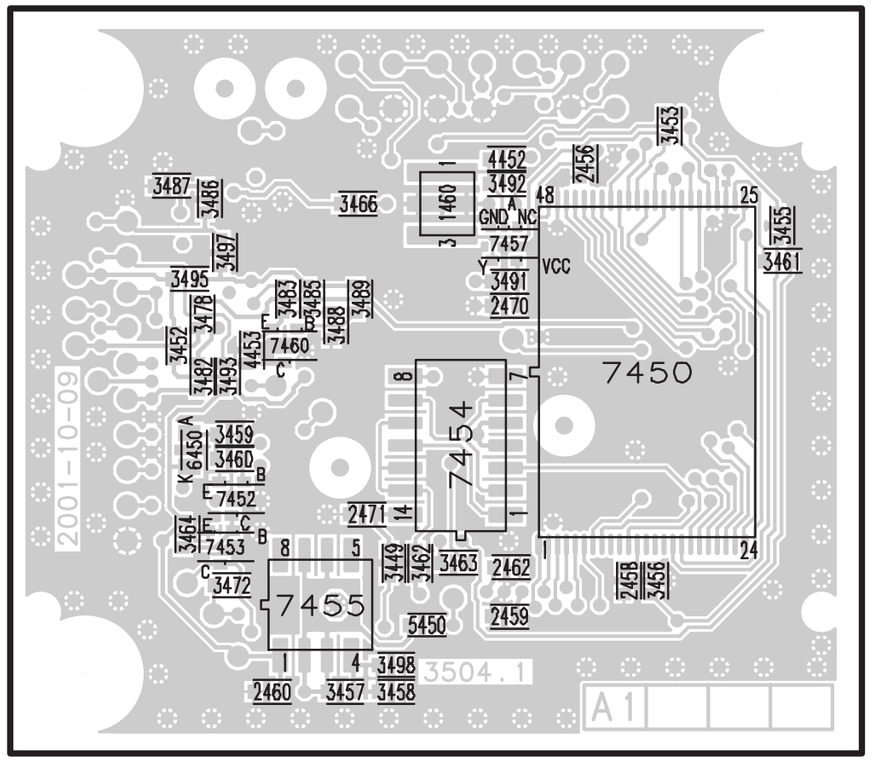
Copperside								Componentside	
2800	E4	3730	C3	3848	D3	4823	E3	1451	B5
2801	D4	3731	C2	3849	C3	4824	C5	1455	A4
2802	E4	3732	C2	3850	D1	4825	B4	2450	C1
2803	D4	3733	C2	3853	E4	4826	C3	2451	B1
2804	F3	3734	D2	3854	E3	4828	C3	2452	C2
2805	D4	3735	G2	3855	E3	4829	G4	2453	B1
2806	D4	3736	H3	3856	F4	4830	G3	2454	B1
2807	E4	3738	H3	3857	F4	4831	G3	2455	D2
2808	D4	3740	C4	3858	C2	4832	F3	2457	A2
2809	D1	3741	C4	3859	C2	4833	E3	2461	D4
2810	E4	3742	C4	3860	C2	4834	F4	2463	A3
2811	D4	3743	C4	3861	C2	4837	E3	2464	D4
2812	E4	3744	B4	3862	C4	4838	E3	2465	D4
2813	E4	3745	H2	3863	D2	4839	E3	2466	A3
2814	F1	3746	B3	3864	E4	4840	F3	2467	B4
2815	F4	3747	H3	3865	C4	4841	E3	2468	B4
2816	C4	3748	H3	3866	F3	4842	E3	2469	B4
2818	C4	3750	B4	3867	E4	4844	G3	2472	D3
2820	C3	3751	B4	3871	E2	4845	G4	3450	C1
2822	E3	3752	H3	3872	E3	4846	E4	3451	B1
2823	E3	3753	H2	3878	C3	4847	E4	3454	D2
2824	E3	3754	G2	3881	C3	4848	G4	3465	C1
2827	E4	3755	G1	3882	E2	4849	E3	3467	A3
2829	C3	3756	B2	3883	E2	4851	F3	3468	A3
2831	F4	3757	A5	3884	E3	4855	F1	3469	C4
2833	C4	3758	A5	3885	E2	4856	E4	3470	D3
2834	D4	3759	D2	3890	F4	4857	G1	3471	C4
2835	D2	3760	B4	3891	E2	4858	E1	3473	C4
2840	E1	3761	C4	4700	B2	4868	E1	3474	A3
2841	D2	3762	A4	4701	B2	4869	E2	3475	C4
2842	F1	3763	A4	4702	B2	4870	E2	3476	C4
2843	D4	3764	C4	4703	B2	4871	E2	3477	B4
2844	D2	3765	H2	4704	B1	4872	D2	3479	A2
2848	E4	3766	H1	4705	B1	4873	E2	3480	C4
2859	F2	3767	D4	4706	A3	4874	E2	3481	C4
2860	H3	3769	C5	4707	A3	4875	E2	3484	B4
2862	C4	3770	H2	4708	A3	4876	G2	3490	A4
2863	C4	3771	H1	4709	A3	4878	D2	3494	A2
2864	B2	3772	H2	4710	A3	4879	C3	3496	A4
2865	B2	3773	H1	4711	A3	4880	E3	3499	C1
2866	C4	3774	C2	4712	B3	4881	D2	4450	A4
2867	B4	3776	H1	4713	B3	4882	E4	6451	D4
2868	C4	3777	C5	4714	B3	4883	E4	7451	B3
2869	C4	3800	E4	4715	B4	4884	A2	7456	D4
2870	C2	3801	E4	4716	B3	4885	A2	7458	D1
2871	D2	3802	E4	4717	A3	4886	A2		
2872	G2	3803	D4	4718	A4	4887	A2		
2874	D2	3804	C3	4719	A4	4888	A2		
2877	H1	3805	D4	4720	A4	4889	B2		
2878	H1	3806	D4	4722	A4	4890	A2		
2882	B3	3807	D4	4724	B4	4891	A2		
2883	H1	3808	D4	4726	B4	4892	A3		
2884	F2	3810	C3	4727	B4	4893	A2		
2885	G2	3811	E4	4728	A4	4894	A3		
2886	F3	3812	C3	4729	A4	4895	A3		
2887	F2	3813	C2	4730	B4	4896	A3		
3700	F2	3814	C2	4731	B4	4897	A3		
3701	D2	3816	C3	4732	C5	4898	A3		
3702	F3	3817	C3	4733	B3	4899	D2		
3703	F2	3818	C3	4734	C4	6801	H2		
3704	F2	3819	C3	4735	B5	6802	H1		
3705	C2	3820	E4	4736	A5	6803	H2		
3706	C1	3821	F4	4737	C5	6804	G3		
3707	C2	3822	F4	4738	B5	6805	G2		
3708	C2	3823	F3	4739	C4	6806	C4		
3709	F2	3824	F3	4740	C5	6807	C4		
3710	F2	3825	E3	4741	B4	6808	H2		
3711	C2	3826	E3	4742	A5	6809	C2		
3712	B3	3827	D4	4743	A5	6811	G2		
3713	G2	3828	D2	4744	A5	6812	F2		
3714	H2	3829	F3	4745	A5	7801	F3		
3715	H2	3830	F4	4746	A5	7802	D3		
3716	D2	3832	C3	4747	A5	7806	E3		
3717	D2	3833	E4	4748	A5	7811	B4		
3718	C2	3834	E4	4749	A5	7812	G2		
3719	H3	3836	E2	4801	G1	7813	H2		
3720	F2	3837	D2	4803	B2	7815	D4		
3721	F3	3838	D2	4804	A1	7816	C2		
3722	F2	3839	E3	4805	B5	7820	F2		
3723	F4	3840	C3	4806	C4	7821	F2		
3724	G2	3842	D2	4807	H3	7822	G2		
3725	F2	3843	E2	4808	H3	7823	F2		
3726	F2	3844	F1	4809	H3				
3727	F2	3845	D2	4810	H4				
3728	F3	3846	E2	4811	H4				
3729	F2	3847	E2	4820	C4				


3CDC-LC
mainboard
part 1
Laser power control
HF-Amplifier
TZA1024/ TZA1025
EYE-PATTERN
800mVpp
TB = 0.5µs/div
Signal Processor
SAA7324 / SAA7325
Active Low Pass
TDA1308T
LEFT CHANNEL
RIGHT CHANNEL
Internal Supply
voltage stab.
CD Drive
Mitsumi
MCD-1b
MCD-2
Sanyo
DA11T3CN
Servo driver
TDA7073A
Motor driver
CAROUSEL MOTOR
TRAY MOTOR
Changer Control Logic
HEF4094BT
Power on
Output enable delay
Connection to
MP3CD2002 Board
Connection to
Front / Combi Board
Analog Audio
TRAY-MOTOR
CAROUSEL-MOTOR
ESD sensitive lines!
U >400mV
->Laser damaged !
DC voltages measured in
PLAY MODE
with following conditions:
"+10V" = 10V
"+5V" = 5V
3CDC-LC M355(MP3 Version) 2002-05-23

10-8

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

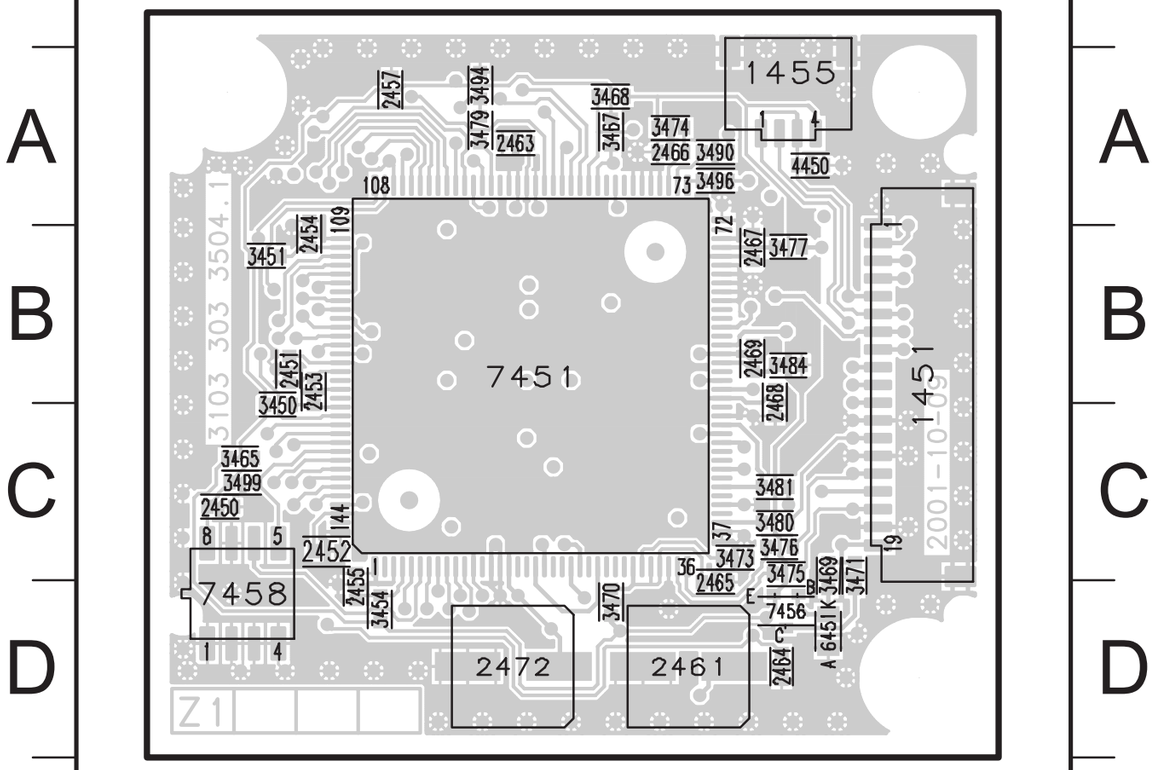
Side A



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

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

Side B



10-9

MP3-CD-2002

DSP

For Flash version: TMS320VC5416
For ROM version: TMS320VC5406

7451

Text version only

EEPROM 7458 M24C32

only for FLASH version

Flash EPROM 7450 Am29LV800B

Voltage stabilisation 7455 LM317D

for 5V front uP

.... only for FLASH version
* .... only for ROM version

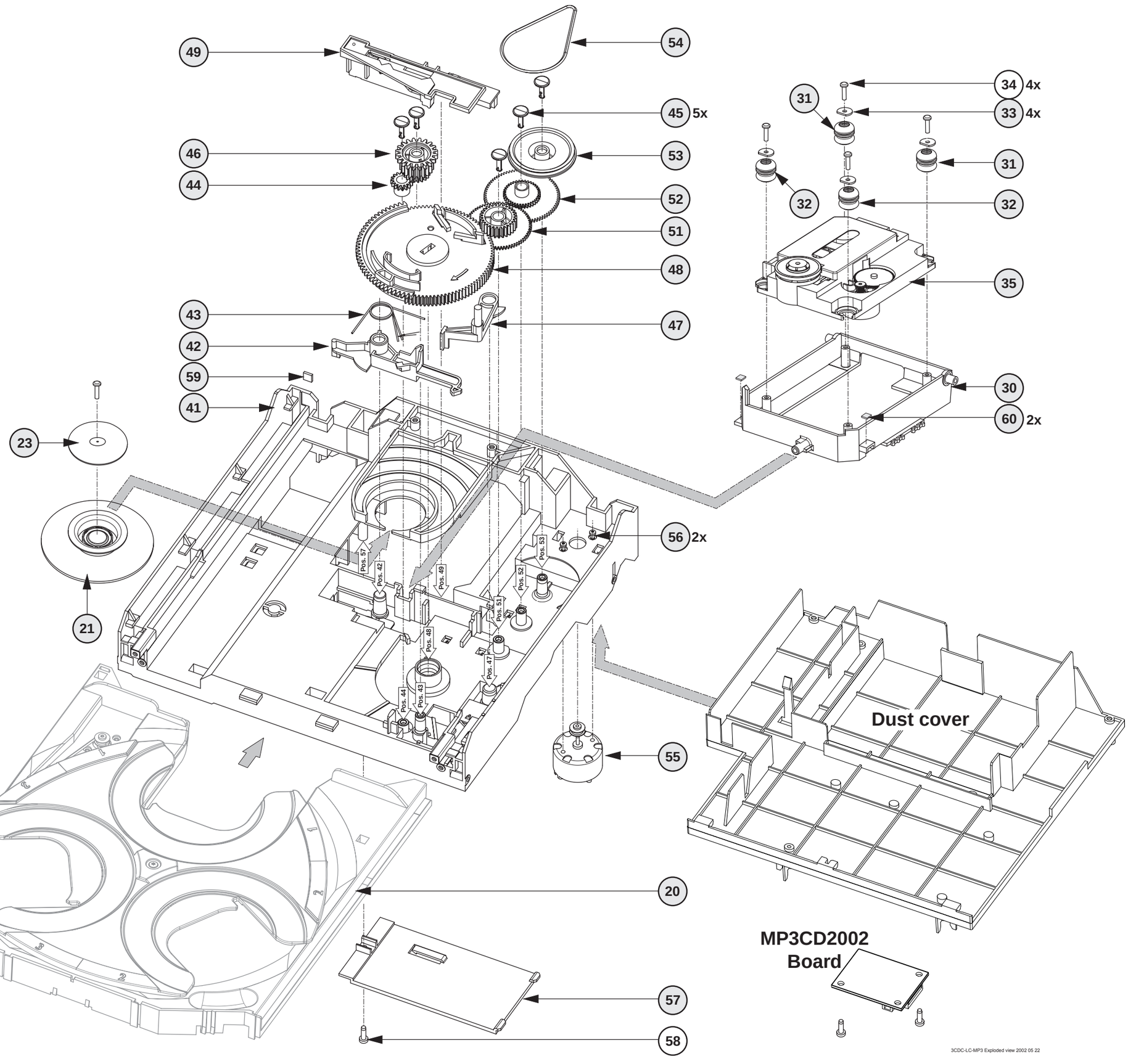
2451 B5
2452 B2
2453 B4
2454 B7
2455 C2
2456 C12
2457 D9
2458 C10
2459 D2
2460 E13
2461 D12
2462 D2
2463 D8
2464 G12
2465 G2
2466 G8
2467 H6
2468 H4
2469 H5
2470 D9
2471 E11
2472 D1
3449 E11
3450 A4
3451 B7
3452 H3
3453 A12
3454 C1
3455 C9
3456 C10
3457 D13
3458 D14
3459 F13
3460 F13
3461 E12
3462 E2
3463 F1
3464 F13
3465 A2
3466 H8
3467 F8
3468 F8
3469 E13
3470 F1
3471 E13
3472 H9
3473 G2
3474 G8
3475 G2
3476 H2
3477 H7
3478 B6
3479 H8
3480 H2
3481 H3
3482 H5
3483 H6
3484 H5
3485 I11
3486 I13
3487 I12
3488 I12
3489 I12
3490 H8
3491 D9
3492 F9
3493 H12
3494 H8
3495 H11
3496 H8
3497 I13
3498 D14
3499 A2
4450 C13
4452 F9
4453 I11
5450 B3
6450 E13
6451 E13
7450 A10
7451 D5
7452 F13
7453 F12
7454-A G11
7454-B F11
7454-C F11
7454-D G11
7455 D13
7456 E12
7457 E9
7458 A1
7460 I12

10-10

EXPLODED VIEW (3CDC-LC MODULE)

MECHANICAL PARTS ***Loader***

20	3103 304 66500	DRAWER BLACK
21	3140 114 29070	PRESSURE RING-DA11
23	3140 111 21270	METAL RING-DA11
30	3103 304 66560	SUPPORT
31	4822 529 10386	RUBBER DAMPER CD DRIVE, REAR
32	4822 529 10387	RUBBER DAMPER CD DRIVE, FRONT
33	3103 304 06970	WASHER
35	3103 309 05350	CD DRIVE MCD1B
41	3103 304 66480	FRAME
42	3103 304 66540	BRACKET-GUIDING
43	3103 301 06460	SPRING-GUIDING
44	3103 304 06890	GEAR-3
45	3103 304 06980	NAIL FIXATION
46	3103 304 06880	GEAR-2
47	3103 304 66530	BRACKET-LOAD
48	3103 304 06910	CAM
49	3103 304 66510	GUIDING
51	3103 304 06900	GEAR-4
52	3103 304 06870	GEAR-1
53	3103 304 06960	PULLEY-FRAME
54	3103 304 66910	DRIVING-BELT-DRAWER
55	4822 361 10753	TRAY MOTOR
56	4822 502 12548	SCREW M2,6X3,5
57	3103 304 69880	COVER-DA11
59	4822 466 12146	RUBBER



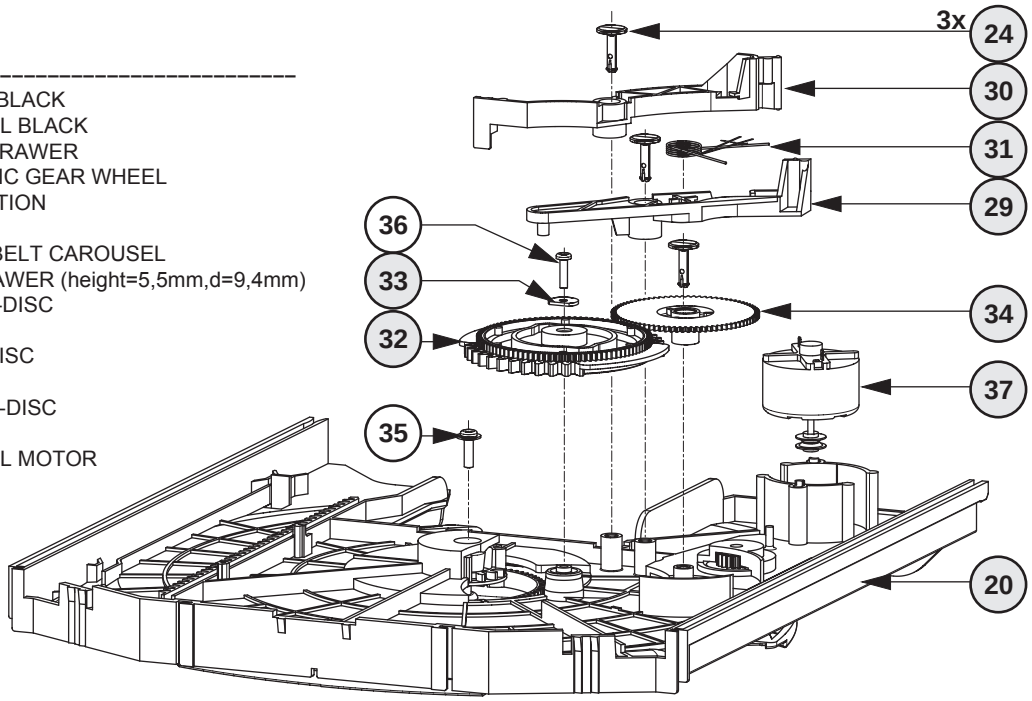
X spare part

Y non spare part

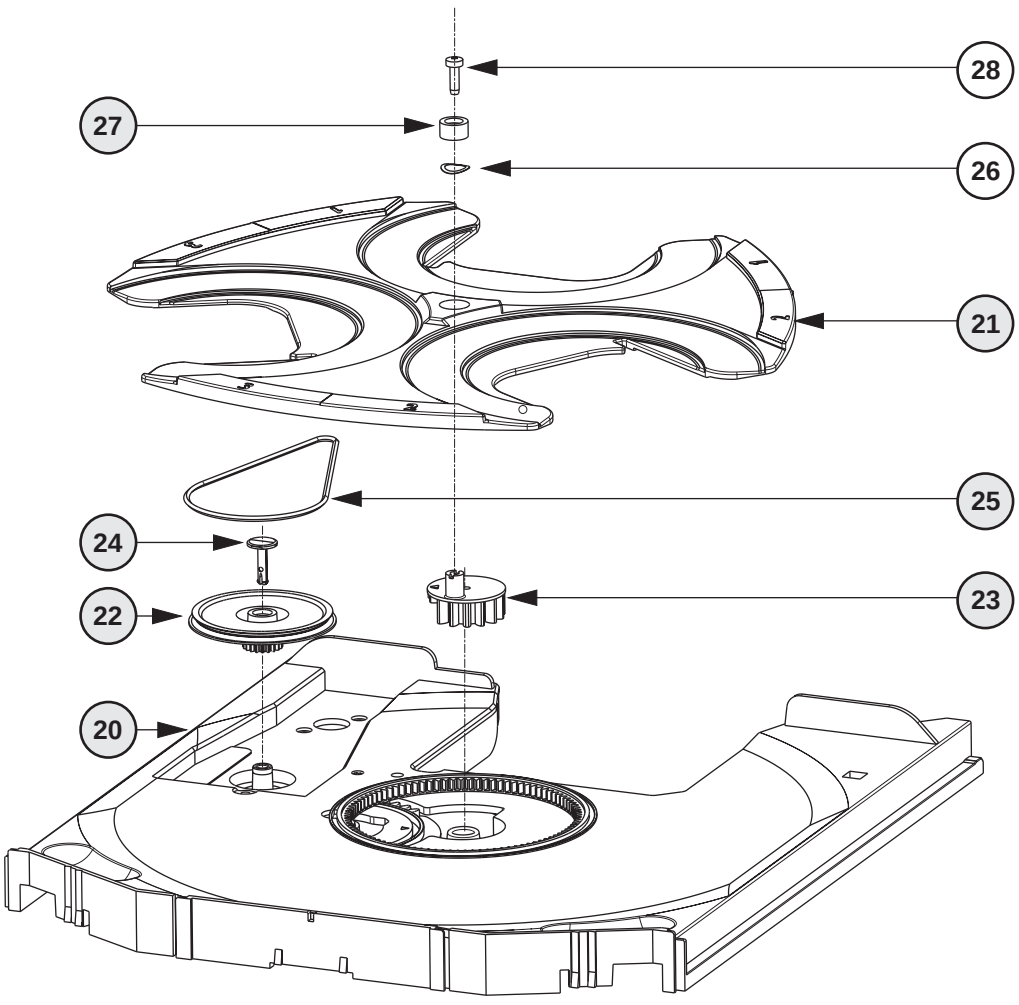
Drawer bottom view

MECHANICAL PARTS ***Drawer***

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



Drawer top view



X spare part

Y non spare part

3CDC-LC Drawer assy 1999 09 13

ELECTRICAL PARTSLIST 3CDC-LC MODULE

MISCELLANEOUS

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

CAPACITORS

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

CAPACITORS

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

RESISTORS

3713 ©	4822 051 30223	22kΩ	5%	0,06W
3714 ©	4822 051 30103	10kΩ	5%	0,06W
3715 ©	4822 117 13632	100kΩ	1%	0,06W
3719 ©	4822 051 30392	3,9kΩ	5%	0,06W
3723 ©	4822 051 20273	27kΩ	5%	0,1W
3730 ©	4822 051 20333	33kΩ	5%	0,1W
3736 ©	4822 117 12925	47kΩ	1%	0,06W
3738 ©	4822 051 30271	270Ω	5%	0,06W
3740 ©	4822 051 20223	22kΩ	5%	0,1W
3741 ©	4822 051 20223	22kΩ	5%	0,1W
3742 ©	4822 051 20223	22kΩ	5%	0,1W
3743 ©	4822 051 20223	22kΩ	5%	0,1W
3744 ©	4822 051 30103	10kΩ	5%	0,06W
3745 ©	4822 117 10833	10kΩ	1%	0,1W
3746 ©	4822 051 30103	10kΩ	5%	0,06W
3747 ©	4822 117 12925	47kΩ	1%	0,06W
3748 ©	4822 051 30103	10kΩ	5%	0,06W
3750 ©	4822 051 30102	1kΩ	5%	0,06W
3751 ©	4822 051 30102	1kΩ	5%	0,06W
3752 ©	4822 117 13632	100kΩ	1%	0,06W
3753 ©	4822 117 13632	100kΩ	1%	0,06W
3754 ©	4822 051 30221	220Ω	5%	0,06W
3755 ©	4822 117 11503	220Ω	5%	0,1W
3757 ©	4822 117 11373	100Ω	1%	0,1W
3758 ©	4822 051 30101	100Ω	5%	0,06W
3760 ©	4822 117 10833	10kΩ	1%	0,1W
3761 ©	4822 051 30103	10kΩ	5%	0,06W
3762 ©	4822 051 30223	22kΩ	5%	0,06W
3763 ©	4822 051 30223	22kΩ	5%	0,06W
3764 ©	4822 117 11373	100Ω	1%	0,1W
3765 ©	4822 051 30103	10kΩ	5%	0,06W
3766 ©	4822 117 10833	10kΩ	1%	0,1W
3767 ©	4822 051 30339	33Ω	5%	0,06W
3769 ©	4822 051 30101	100Ω	5%	0,06W
3770 ©	4822 051 30102	1kΩ	5%	0,06W
3771 ©	4822 051 30102	1kΩ	5%	0,06W
3772 ©	4822 051 30471	470Ω	5%	0,06W
3773 ©	4822 117 10833	10kΩ	1%	0,1W
3774 ©	4822 117 11373	100Ω	1%	0,1W
3775 ⚠	4822 052 10338	3,3Ω	5%	NFR25
3776 ©	4822 051 30103	10kΩ	5%	0,06W
3800 ©	4822 051 30273	27kΩ	5%	0,06W
3801 ©	4822 117 10833	10kΩ	1%	0,1W
3802 ©	4822 051 30273	27kΩ	5%	0,06W
3803 ©	4822 117 10833	10kΩ	1%	0,1W
3805 ©	4822 051 30103	10kΩ	5%	0,06W
3806 ©	4822 051 30103	10kΩ	5%	0,06W
3807 ©	4822 051 30103	10kΩ	5%	0,06W
3808 ©	4822 051 30103	10kΩ	5%	0,06W

ELECTRICAL PARTSLIST 3CDC-LC MODULE

RESISTORS

3810 ©	4822 051 30471	470Ω	5%	0,06W	
3811 ©	4822 051 30273	27kΩ	5%	0,06W	
3812 ©	4822 051 20471	470Ω	5%	0,1W	
3813 ©	4822 051 20471	470Ω	5%	0,1W	
3814 ©	4822 051 20471	470Ω	5%	0,1W	
3815 ▲	4822 052 10478	4,7Ω	5%	NFR25	
3816 ©	4822 051 20471	470Ω	5%	0,1W	
3817 ©	4822 051 30471	470Ω	5%	0,06W	
3818 ©	4822 051 30471	470Ω	5%	0,06W	
3819 ©	4822 051 20471	470Ω	5%	0,1W	
3820 ©	4822 051 30332	3,3kΩ	5%	0,06W	
3821 ©	4822 051 30332	3,3kΩ	5%	0,06W	
3822 ©	4822 051 20332	3,3kΩ	5%	0,1W	
3823 ©	4822 051 30102	1kΩ	5%	0,06W	
3824 ©	4822 051 30102	1kΩ	5%	0,06W	
3825 ©	4822 051 10102	1kΩ	2%	0,25W	
3826 ©	4822 051 30223	22kΩ	5%	0,06W	
3827 ©	4822 051 20273	27kΩ	5%	0,1W	
3829 ©	4822 117 13608	4,7Ω	5%	0,06W	
3830 ©	4822 051 20223	22kΩ	5%	0,1W	
3833 ©	4822 051 30223	22kΩ	5%	0,06W	
3834 ©	4822 051 30223	22kΩ	5%	0,06W	
3835 ▲	4822 052 10338	3,3Ω	5%	NFR25	
3836 ©	4822 117 12903	1,8kΩ	1%	0,06W	
3837 ©	4822 051 10102	1kΩ	2%	0,25W	
3838 ©	4822 051 30102	1kΩ	5%	0,06W	
3839 ©	4822 117 13632	100kΩ	1%	0,06W	
3840 ©	4822 051 20471	470Ω	5%	0,1W	
3842 ©	4822 117 10834	47kΩ	1%	0,1W	
3843 ©	4822 051 20333	33kΩ	5%	0,1W	
3844 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3845 ©	4822 117 10834	47kΩ	1%	0,1W	
3846 ©	4822 051 20333	33kΩ	5%	0,1W	
3847 ©	4822 051 30682	6,8kΩ	5%	0,06W	
3848 ©	3198 021 52240	220kΩ	5%	0,1W	
3849 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3850 ©	4822 051 30682	6,8kΩ	5%	0,06W	
3853 ©	4822 051 20471	470Ω	5%	0,1W	
3854 ©	4822 117 11373	100Ω	1%	0,1W	
3855 ©	4822 117 12971	15Ω	5%	0,06W	
3856 ©	4822 117 12521	68Ω	1%	0,1W	
3857 ©	4822 117 12521	68Ω	1%	0,1W	
3861 ©	4822 051 30103	10kΩ	5%	0,06W	
3862 ©	4822 051 20121	120Ω	5%	0,1W	
3863 ©	4822 051 30339	33Ω	5%	0,06W	
3864 ©	4822 051 30101	100Ω	5%	0,06W	
3865 ©	4822 051 30121	120Ω	5%	0,06W	
3866 ©	4822 051 30103	10kΩ	5%	0,06W	
3871 ©	4822 051 20683	68kΩ	5%	0,1W	
3872 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3878 ©	4822 117 11503	220Ω	5%	0,1W	
3880 ▲	4822 052 10338	3,3Ω	5%	NFR25	
3881 ©	4822 117 11503	220Ω	5%	0,1W	
3882 ©	4822 117 10837	100kΩ	1%	0,1W	
3883 ©	4822 051 10102	1kΩ	2%	0,25W	
3890 ©	4822 051 30332	3,3kΩ	5%	0,06W	
3891 ©	4822 051 30472	4,7kΩ	5%	0,06W	
4700 ©	4822 051 20008	CHIP JUMPER 0805			
4701 ©	4822 051 20008	CHIP JUMPER 0805			
4702 ©	4822 051 20008	CHIP JUMPER 0805			
4703 ©	4822 051 20008	CHIP JUMPER 0805			
4704 ©	4822 051 20008	CHIP JUMPER 0805			
4705 ©	4822 051 20008	CHIP JUMPER 0805			
4706 ©	4822 051 20008	CHIP JUMPER 0805			

RESISTORS

4707 ©	4822 051 20008	CHIP JUMPER 0805
4708 ©	4822 051 20008	CHIP JUMPER 0805
4709 ©	4822 051 20008	CHIP JUMPER 0805
4710 ©	4822 051 20008	CHIP JUMPER 0805
4711 ©	4822 051 20008	CHIP JUMPER 0805
4712 ©	4822 051 20008	CHIP JUMPER 0805
4713 ©	4822 051 20008	CHIP JUMPER 0805
4714 ©	4822 051 20008	CHIP JUMPER 0805
4715 ©	4822 051 20008	CHIP JUMPER 0805
4716 ©	4822 051 20008	CHIP JUMPER 0805
4717 ©	4822 051 30008	CHIP JUMPER 0603
4718 ©	4822 051 20008	CHIP JUMPER 0805
4719 ©	4822 051 20008	CHIP JUMPER 0805
4720 ©	4822 051 20008	CHIP JUMPER 0805
4722 ©	4822 051 20008	CHIP JUMPER 0805
4724 ©	4822 051 20008	CHIP JUMPER 0805
4726 ©	4822 051 20008	CHIP JUMPER 0805
4727 ©	4822 051 20008	CHIP JUMPER 0805
4728 ©	4822 051 20008	CHIP JUMPER 0805
4729 ©	4822 051 20008	CHIP JUMPER 0805
4730 ©	4822 051 20008	CHIP JUMPER 0805
4731 ©	4822 051 30008	CHIP JUMPER 0603
4732 ©	4822 051 20008	CHIP JUMPER 0805
4733 ©	4822 051 30008	CHIP JUMPER 0603
4734 ©	4822 051 20008	CHIP JUMPER 0805
4735 ©	4822 051 20008	CHIP JUMPER 0805
4736 ©	4822 051 30008	CHIP JUMPER 0603
4737 ©	4822 051 30008	CHIP JUMPER 0603
4738 ©	4822 051 30008	CHIP JUMPER 0603
4739 ©	4822 051 30008	CHIP JUMPER 0603
4740 ©	4822 051 30008	CHIP JUMPER 0603
4741 ©	4822 051 20008	CHIP JUMPER 0805
4742 ©	4822 051 20008	CHIP JUMPER 0805
4743 ©	4822 051 20008	CHIP JUMPER 0805
4744 ©	4822 051 30008	CHIP JUMPER 0603
4745 ©	4822 051 20008	CHIP JUMPER 0805
4746 ©	4822 051 20008	CHIP JUMPER 0805
4747 ©	4822 051 20008	CHIP JUMPER 0805
4748 ©	4822 051 20008	CHIP JUMPER 0805
4749 ©	4822 051 30008	CHIP JUMPER 0603
4801 ©	4822 051 20008	CHIP JUMPER 0805
4804 ©	4822 051 20008	CHIP JUMPER 0805
4806 ©	4822 051 20008	CHIP JUMPER 0805
4807 ©	4822 051 20008	CHIP JUMPER 0805
4808 ©	4822 051 20008	CHIP JUMPER 0805
4809 ©	4822 051 20008	CHIP JUMPER 0805
4810 ©	4822 051 20008	CHIP JUMPER 0805
4811 ©	4822 051 20008	CHIP JUMPER 0805
4820 ©	4822 051 20008	CHIP JUMPER 0805
4823 ©	4822 051 30008	CHIP JUMPER 0603
4824 ©	4822 051 30008	CHIP JUMPER 0603
4825 ©	4822 051 20008	CHIP JUMPER 0805
4826 ©	4822 051 20008	CHIP JUMPER 0805
4828 ©	4822 051 30008	CHIP JUMPER 0603
4829 ©	4822 051 20008	CHIP JUMPER 0805
4830 ©	4822 051 20008	CHIP JUMPER 0805
4831 ©	4822 051 20008	CHIP JUMPER 0805
4832 ©	4822 051 30008	CHIP JUMPER 0603
4833 ©	4822 051 20008	CHIP JUMPER 0805
4834 ©	4822 051 20008	CHIP JUMPER 0805
4837 ©	4822 051 20008	CHIP JUMPER 0805
4838 ©	4822 051 30008	CHIP JUMPER 0603
4839 ©	4822 051 20008	CHIP JUMPER 0805
4840 ©	4822 051 20008	CHIP JUMPER 0805

ELECTRICAL PARTSLIST 3CDC-LC MODULE

RESISTORS

4841	©	4822 051 20008	CHIP JUMPER 0805
4842	©	4822 051 20008	CHIP JUMPER 0805
4844	©	4822 051 20008	CHIP JUMPER 0805
4845	©	4822 051 20008	CHIP JUMPER 0805
4846	©	4822 051 20008	CHIP JUMPER 0805
4847	©	4822 051 20008	CHIP JUMPER 0805
4848	©	4822 051 20008	CHIP JUMPER 0805
4849	©	4822 051 30008	CHIP JUMPER 0603
4851	©	4822 051 30008	CHIP JUMPER 0603
4855	©	4822 051 20008	CHIP JUMPER 0805
4856	©	4822 051 20008	CHIP JUMPER 0805
4857	©	4822 051 20008	CHIP JUMPER 0805
4858	©	4822 051 20008	CHIP JUMPER 0805
4868	©	4822 051 20008	CHIP JUMPER 0805
4869	©	4822 051 20008	CHIP JUMPER 0805
4870	©	4822 051 20008	CHIP JUMPER 0805
4871	©	4822 051 20008	CHIP JUMPER 0805
4872	©	4822 051 20008	CHIP JUMPER 0805
4873	©	4822 051 20008	CHIP JUMPER 0805
4874	©	4822 051 20008	CHIP JUMPER 0805
4875	©	4822 051 20008	CHIP JUMPER 0805
4876	©	4822 051 20008	CHIP JUMPER 0805
4878	©	4822 051 20008	CHIP JUMPER 0805
4879	©	4822 051 20008	CHIP JUMPER 0805
4880	©	4822 051 20008	CHIP JUMPER 0805
4882	©	4822 051 20008	CHIP JUMPER 0805
4883	©	4822 051 20008	CHIP JUMPER 0805
4884	©	4822 051 20008	CHIP JUMPER 0805
4885	©	4822 051 20008	CHIP JUMPER 0805
4886	©	4822 051 20008	CHIP JUMPER 0805
4887	©	4822 051 30008	CHIP JUMPER 0603
4888	©	4822 051 20008	CHIP JUMPER 0805
4889	©	4822 051 20008	CHIP JUMPER 0805
4890	©	4822 051 20008	CHIP JUMPER 0805
4891	©	4822 051 30008	CHIP JUMPER 0603

RESISTORS

4892	©	4822 051 20008	CHIP JUMPER 0805
4893	©	4822 051 20008	CHIP JUMPER 0805
4894	©	4822 051 20008	CHIP JUMPER 0805
4895	©	4822 051 20008	CHIP JUMPER 0805
4896	©	4822 051 20008	CHIP JUMPER 0805
4897	©	4822 051 20008	CHIP JUMPER 0805
4898	©	4822 051 20008	CHIP JUMPER 0805
4899	©	4822 051 20008	CHIP JUMPER 0805

COILS

1810		2422 540 98519	RESONATOR 8,467MHz

DIODES

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

TRANSISTORS

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

INTEGRATED CIRCUITS

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

ELECTRICAL PARTSLIST MP3CD2002 MODULE

MISCELLANEOUS

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

CAPACITORS

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

RESISTORS

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

RESISTORS

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

COILS

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

DIODES

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

TRANSISTORS

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

INTEGRATED CIRCUITS

7450 ©	not available	please order complete MP3 module
7451 ©	not available	please order complete MP3 module
7455 ©	4822 209 17108	LM317LD Voltage Regulator
7457 ©	9352 456 50115	HC1G04, Inverter
7458 ©	9322 130 41668	M24C64, EEPROM
	3103 308 67020	**complete MP3CD2002 Module**

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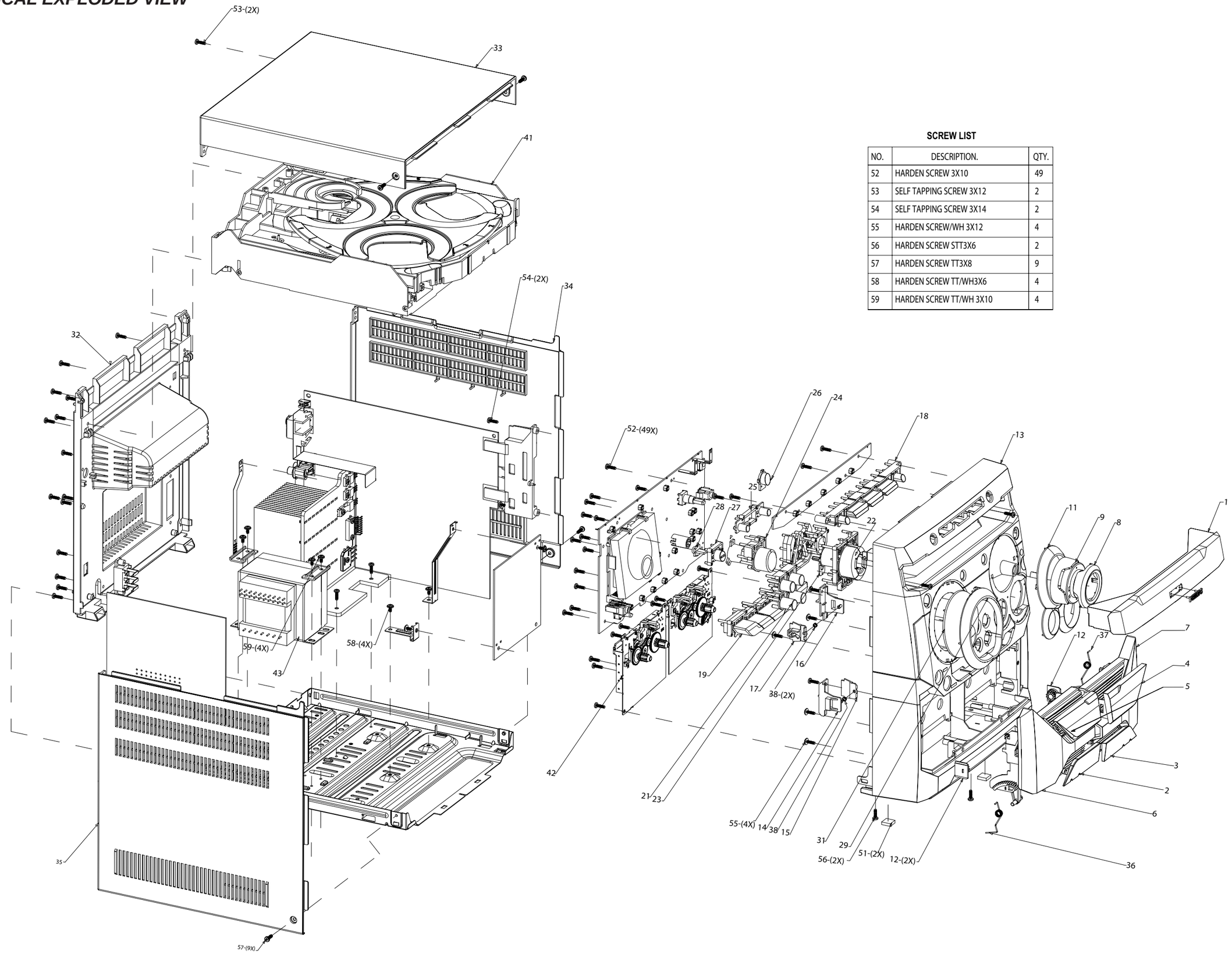
MECHANICAL EXPLODED VIEW



SCREW LIST

NO.	DESCRIPTION.	QTY.
52	HARDEN SCREW 3X10	49
53	SELF TAPPING SCREW 3X12	2
54	SELF TAPPING SCREW 3X14	2
55	HARDEN SCREW/WH 3X12	4
56	HARDEN SCREW STT3X6	2
57	HARDEN SCREW TT3X8	9
58	HARDEN SCREW TT/WH3X6	4
59	HARDEN SCREW TT/WH 3X10	4

MECHANICAL & ACCESSORIES

1	9940 000 01275	CDC TRAY DOOR /22
1	9940 000 01331	CDC TRAY DOOR /21/30
2	9940 000 01292	CASS LENS BOTTOM L
3	9940 000 01291	CASS LENS BOTTOM R
4	9940 000 01288	CASS RIGHT TOP LENS
5	9940 000 01289	CASS LEFT TOP LENS
6	9940 000 01287	CASS BOX LEFT /21/22
6	9940 000 01338	CASS BOX LEFT /30
7	9940 000 01286	CASS BOX RIGHT /21/22
7	9940 000 01337	CASS BOX RIGHT /30
8	9940 000 01297	VOL KNOB GRIP
9	9940 000 01296	VOL KNOB RING
11	9940 000 01281	COSMETIC RING
12	9940 000 01295	DAMPER GEAR ASS'Y
13	9940 000 01278	FRONT CAB /22
13	9940 000 01332	FRONT CAB /21
13	9940 000 01336	FRONT CAB /30
14	9940 000 01284	LEFT-BRACKET
15	9940 000 01294	PUSH CATCH LEFT
16	9940 000 01283	RIGHT-BRACKET
17	9940 000 01293	PUSH CATCH
18	9940 000 01305	CD DISC KEYS
19	9940 000 01306	MODEL KEY
21	9940 000 01301	SOURCE KEYS
22	9940 000 01299	CD CONTROL KEY
23	9940 000 01298	CD PLAY KEY
24	9940 000 01303	DBB KNOB
25	9940 000 01302	AUTO KEYS
26	9940 000 01309	IR LENS
27	9940 000 01304	STANDBY KEY
28	9940 000 01307	STANDBY LENS
29	9940 000 01282	DISPLAY RING
31	9940 000 01308	DISPLAY LENS
32	9940 000 01279	REAR PANEL
33	9940 000 01285	TOP COVER
34	9940 000 01277	PANEL RIGHT
35	9940 000 01276	PANEL LEFT
36	9940 000 01266	SPRING -LEFT
37	9940 000 01267	SPRING -RIGHT
38	9940 000 01268	SPRING COMPRESSION
39	9940 000 01264	FOOT RUBBER 4MM
41	9940 000 01269	3CD MECH CASING ASS'Y
42	9940 000 01271	LOGIC DECK W991D-5168
43	9940 000 01333	MIC KNOB /21
	9940 000 01189	REMOTE CONTROL FWM35
	9940 000 01191	SPK BOX L R 30W 6R
	9940 000 01192	AM LOOP ANTENNA LAN-031
	9940 000 01381	FM ANTENNA
	9940 000 01253	PCBAS ETF7-FERRO
⚠	9940 000 01263	AC CORD 1.9M /22
⚠	9940 000 01329	AC CORD VDE APP 1.83M /21
⚠	9940 000 01334	AC CORD SAA APP 2M /30
	9940 000 01272	MP3 BD ASS'Y (ROM TXT 5V)
	9940 000 01273	CD BD ASS'Y
	9940 000 01274	CD DRIVER(SANYO)
	9940 000 01327	AC CORD BUSHING /21

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

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ELECTRICAL PARTS - MISCELLANEOUS

⚠	9940 000 01254	TRANSFORMER 230V /22
⚠	9940 000 01326	TRANSFORMER 127-240V /21
⚠	9940 000 01341	TRANSFORMER 240V /30
	9940 000 01255	15P FFC 1.25MM L=180MM
	9940 000 01256	4P FFC 1.25MM L=220MM
	9940 000 01257	11P FFC 1.25MM L=260MM
	9940 000 01258	6P FFC 1.25MM L=280MM
	9940 000 01259	6P FFC 1.25MM L=280MM
	9940 000 01261	7P FFC 1.25MM L=280MM
	9940 000 01262	19P FFC 1.25MM L=280MM
	9940 000 01328	19P FFC 1MM L=180MM /21
	9940 000 01335	7P FFC 1.25MM L=220MM /30
	9940 000 01504	FRONT BOARD ASS'Y /22
	9940 000 01506	MAIN BOARD ASS'Y /22
	9940 000 01507	POWER BOARD ASS'Y /22
	9940 000 01508	CASS DECK BOARD ASS'Y /22

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