Service
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Service Manual

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CLASS 1
LASER PRODUCT

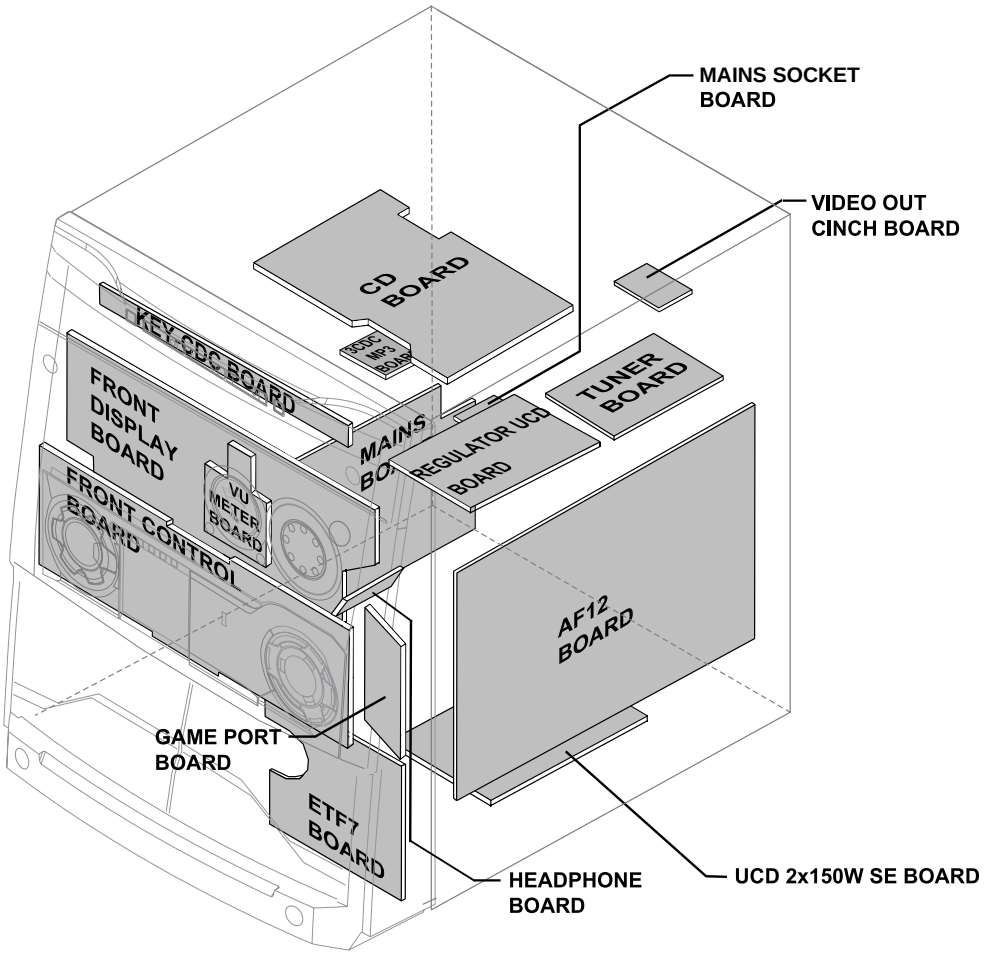
Published by SL 0416 Service Audio Printed in The Netherlands Subject to modification

GB 3140 785 32961

Version 1.1

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS



VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	FWM730 /21	FWM730 /22								
Aux in /CDR in	x	x								
Line Out	x	x								
Surround Out										
Subwoofer Out										
Video Out	x	x								
Matrix Surround										
CD Text										
Dolby B										
RDS		x								
Game Port (Video/Audio L/Audio R)	x	x								
Dolby Pro Logic (DPL)										
Incredible Surround	x	x								
Karaoke Features										
Voltage Selector	x									
ECO Power Standby (Clock Display Off)	x	x								
ECO6 Tuner Board - Systems Non-Cenelec	x									
ECO6 Tuner Board - Systems Cenelec		x								
Center/Surround Channel										
ETF7 ND/DD/FR - Chapter 9	x	x								
ETF7 DB/DD/FR - Chapter 9A										

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21
230V ± 10% for /22/30
Mains frequency : 50/60Hz
Power consumption : < 1W at ECO Power Standby
: 25W at Standby
: 150W at Active
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265W x 322H x 390Dmm

TUNER:

FM

Tuning range : 87.5-108MHz
Grid : 50kHz
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75Ω coaxial
300Ω click fit for /37
Sensitivity at 26dB S/N : < 22 µV
Selectivity at 300kHz bandwidth : > 25dB
Image rejection : > 25dB [>75dB]
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 23.5µV
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 : < 4.0mV/M
Selectivity at 300kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5%

AMPLIFIER:

Output power (4Ω, 1kHz, 10% THD)
L & R : 2 x 150W RMS
Frequency response within -3dB : 50Hz-15kHz
Incredible Surround : ON/OFF
WOOX : Level 1, 2, 3 & OFF
Digital Sound Control (DSC) : Digital, Rock, Pop, Newage, Classic, Electric
Virtual Ambience Control (VAC) : Hall, Concert, Cinema, Disco, Arcade, Cyber
Game Sound : Speed /Punch /Blast /Off
Input sensitivity
Aux in : 640mV ± 2dB at 1kHz
CDR in : 1V ± 3dB at 1kHz
Game Port (at 1kHz) : 310mV ± 2dB
Output sensitivity
Line out (Left/Right) : 450mV ± 2dB at 22kΩ
Headphone output at 32Ω : 700mW ± 2dB (Max. vol.)

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 : 78kHz ± 10kHz
Rec/Pb frequency response within 10dB : 125Hz - 8kHz
Signal to Noise Ratio (Type I) : > 48dBA

COMPACT DISC:

Measurement done at output conn. of the CDC module.
Frequency response : < ±1.5dB for 20Hz-20kHz
Output Voltage (in Vrms) : 0.5Vrms ± 1dB unloaded
Signal to Noise Ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.003%
Channel Unbalance : < ±1dB
Channel Separation (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, 44.1 kHz, 48kHz
Recording Format : ISO 9660
UDF format not supported

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

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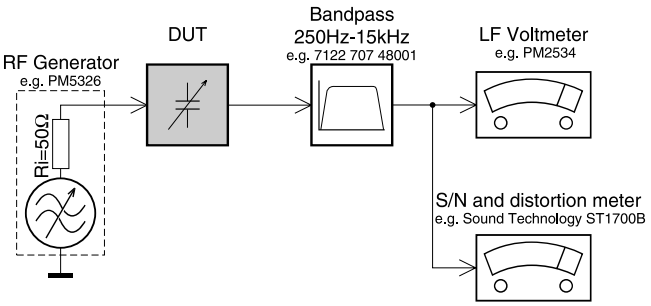
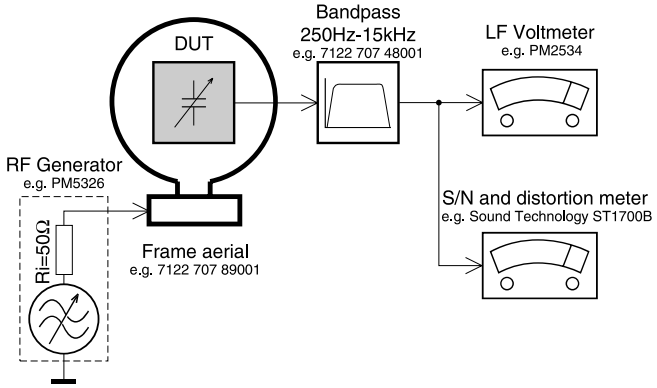
MEASUREMENT SETUP

Tuner FM



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

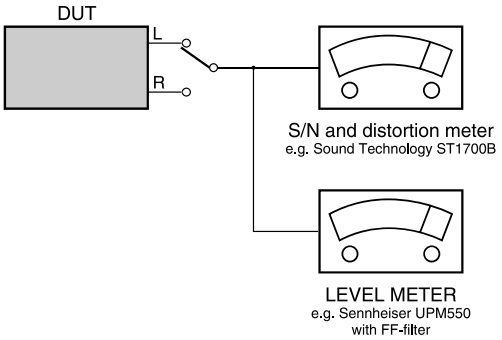
Tuner AM (MW,LW)



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).

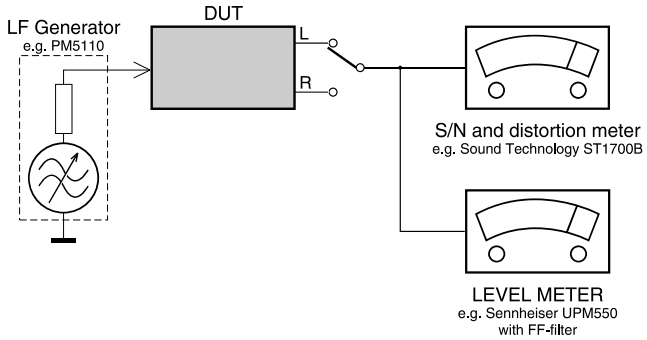
CD

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

Cassette:

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

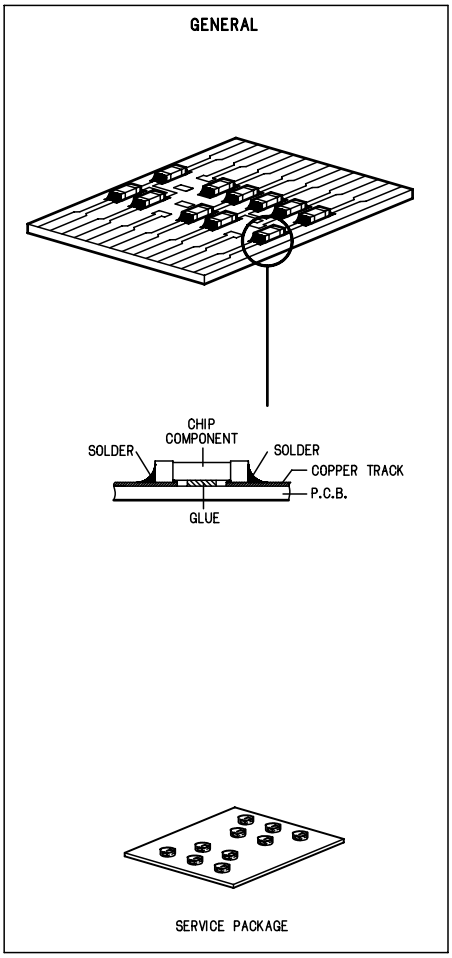
Compact Disc:

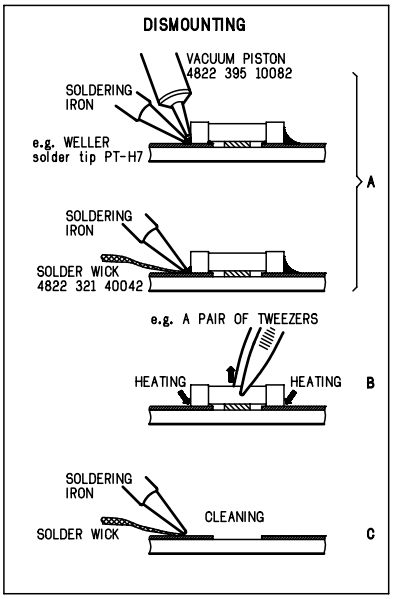
SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

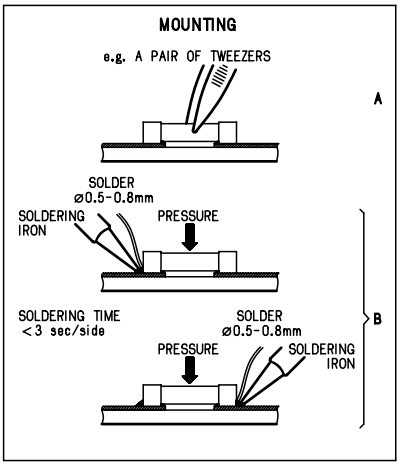
ESD Equipment:

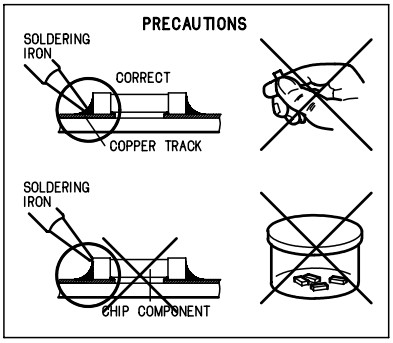
Anti-static table mat - large 1200x650x1.25mm ... 4822 466 10953
Anti-static table mat - small 600x650x1.25mm 4822 466 10958
Anti-static wristband 4822 395 10223
Connector box (1MΩ) 4822 320 11307
Extension cable
(to connect wristband to conn. box) 4822 320 11305
Connecting cable
(to connect table mat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

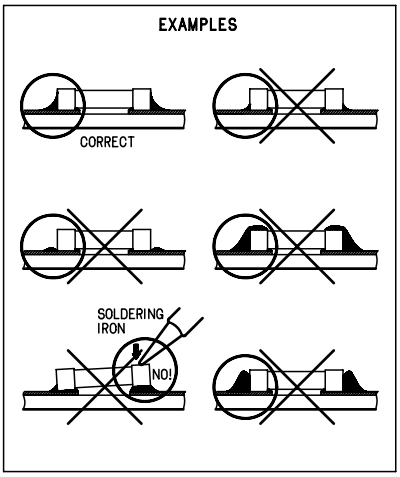
HANDLING CHIP COMPONENTS











(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

ESD

(NL) WAARSCHUWING

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

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

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

(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

Safety components are marked by the symbol ⚠ .

(NL)

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

De Veiligheidsonderdelen zijn aangeduid met het symbool ⚠

(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.

Less composants de sécurité sont marqués ⚠

(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.

Sicherheitsbauteile sind durch das Symbol ⚠ markiert.

(I)

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

Componenty di sicurezza sono marcati con ⚠

(GB)

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

CLASS 1
LASER PRODUCT

(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 !

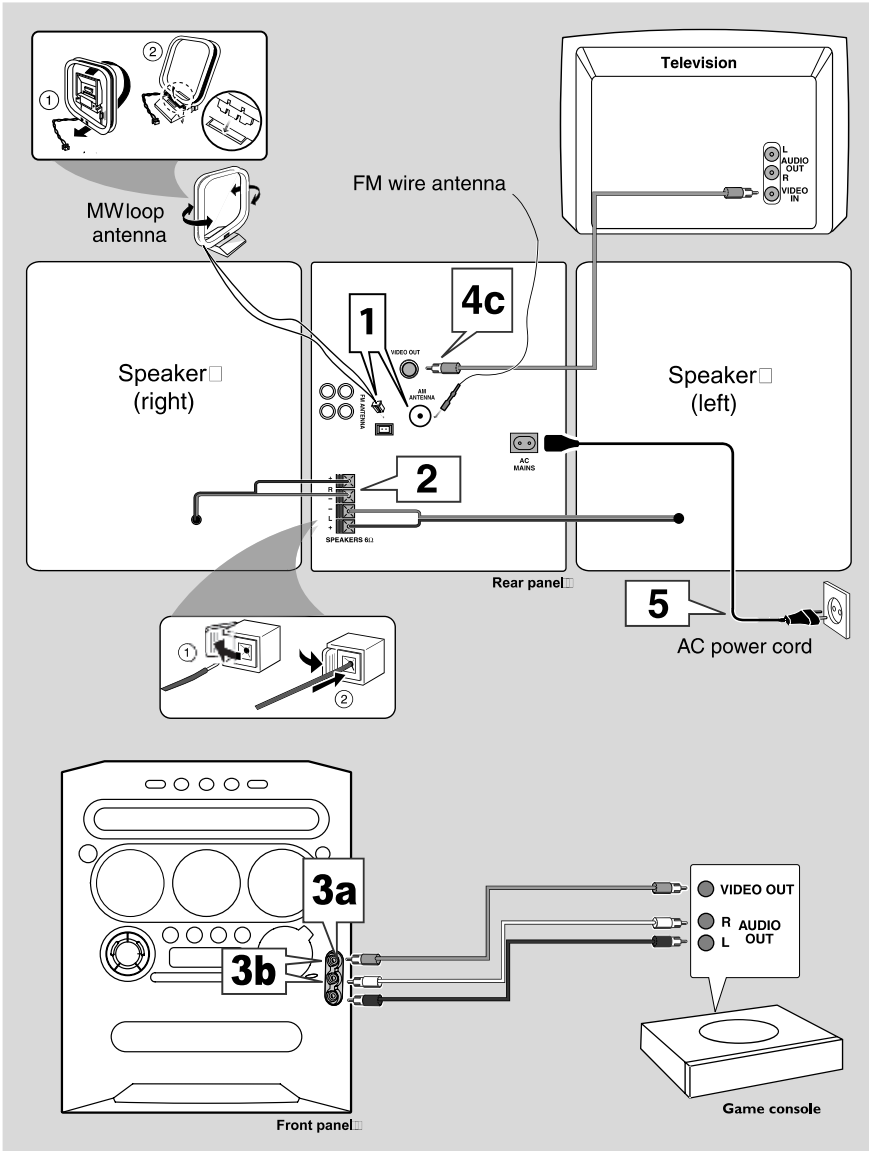
Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

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

(F)

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



Warning!

– Use only the supplied speakers. The combination of the main unit and speakers provides the best sound. Using other speakers can damage the unit and sound quality will be negatively affected.

– Never make or change connections with the power switched on.

– Connect the AC power cord to the power outlet only after you have finished hooking up everything.

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

Step 1: Connecting FM/MW antennas

– Place the MW loop antenna on a shelf or attach it to a stand or wall.

– Extend the FM antenna and fix its ends to the wall.

– Adjust the position of the antennas for optimal reception.

– Position the antennas as far as possible from a TV, VCR or other radiation source to prevent unwanted noise.

– For better FM stereo reception, connect the external FM antenna.

Step 2: Connecting the speakers

Connect the speaker wires to the SPEAKERS terminals, right speaker to "**R**" and left speaker to "**L**", coloured (marked) wire to "**+**" and black (unmarked) wire to "**—**". Fully insert the stripped portion of the speaker wire into the terminal as shown on page 10.

Notes:

– Ensure that the speaker cables are correctly connected. Improper connections may damage the system due to short-circuit.

– Do not connect more than one speaker to any one pair of +/- speaker terminals.

Step 3: Connecting to the game console

IMPORTANT!

Gameport inputs are for the game console only.

a. Use the game console's video cable (not supplied) to connect its video output to the GAMEPORT-**VIDEO** terminal.

b. Use the game console's audio cables (not supplied) to connect its audio outputs to the GAMEPORT-**AUDIO L. / AUDIO R.** terminals.

c. Use the video cable (yellow) to connect the **VIDEO OUT** terminal to the video input on the TV for viewing.

Notes:

– On the TV, the Video Input jack is usually yellow and might be labeled A/V In, CVBS, Composite or Baseband.

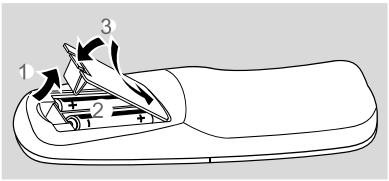
– To avoid magnetic interference, do not position the front speakers too close to your TV.

Step 4: Connecting the AC power cord

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

Connections

Step 5: Inserting batteries into the remote control



1 Open the battery compartment cover.

2 Insert two batteries type R06 or AA, following the indications (+/–) inside the compartment.

3 Close the cover.

Using the remote control to operate the system

1 Aim the remote control directly at the remote sensor (iR) on the main unit.

2 Select the source you wish to control by pressing one of the source select keys on the remote control (for example CD, TUNER).

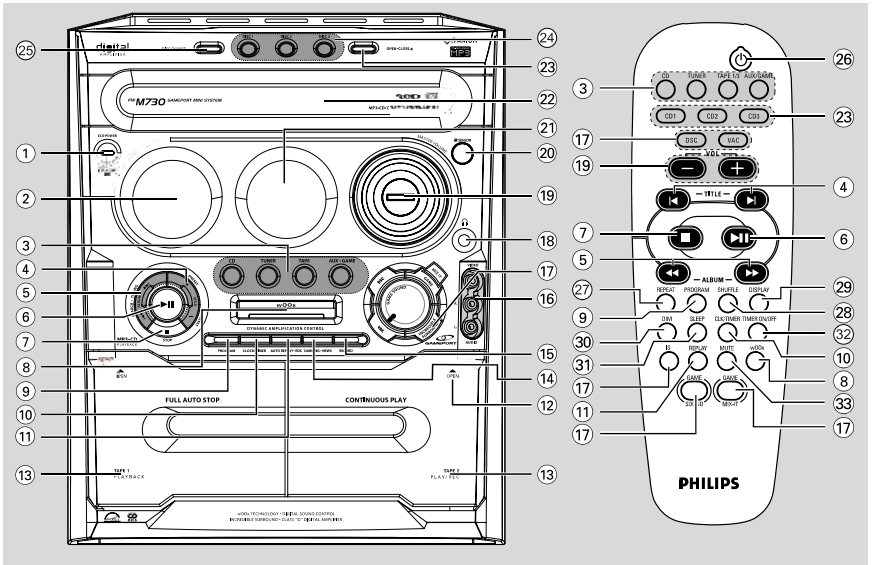
3 Then select the desired function (for example ▶II, I◀, ▶I).

CAUTION!

– Remove batteries if they are exhausted or will not be used for a long time.

– Do not use old and new or different types of batteries in combination.

– Batteries contain chemical substances, so they should be disposed of properly.



Main unit and remote control

① **STANDBY ON ⏻ / ECO POWER**
– Switches to the Eco Power standby mode or turns on the system.
– *Switches to the standby mode.

② **Display screen**

③ **CD / TUNER / TAPE(TAPE1/2) / AUX•GAME**
– Selects the relevant active mode.
– **CD:** toggles between DISC 1~3.
– **TUNER:** toggles between FM and MW band.
– **AUX•GAME:** toggles between AUX and GAMEPORT mode.
– **TAPE**: toggles between Tape Deck 1 and Tape Deck 2.

④ **PRESET (–) (⏮) PRESET (+) (⏭)**
– **CD:** selects a track or selects a title from MP3 disc.
– **TUNER:** selects a preset radio station.
– **CLOCK:** sets the minutes.

⑤ **SEARCH•TUNING•ALBUM ⏮◀◀ / ▶▶⏭ (◀◀ / ▶▶)**
– **CD:** *searches backward/forward.
– **MP3-CD:** select an album
– **TUNER:** tunes the radio frequency up/down.
– **CLOCK:** sets the hours.
– **TAPE:** searches backward/forward.

⑥ **PLAY•PAUSE ▶II**
– **CD:** starts/pauses playback.
– **TAPE:** starts playback.
(only on the main unit)
– **TUNER:** *enters Plug & Play mode and/or starts preset radio station installation.

⑦ **STOP ■**
– Exits an operation.
– **CD:** stops playback or clears a programme.
– **TUNER:** *erases a preset radio station.
(only on the main unit)
– *Turns on/off the demonstration mode.

⑧ **wOOx**
– Selects the enhanced or normal wOOx sound effect.

⑨ **PROGRAM**
– **CD:** starts or confirms tracks programming.
– **TUNER:** starts *automatic/manual preset

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

Functional Overview

⑩ **CLOCK•TIMER (CLK/TIMER)**
– *Enters clock or timer setting mode.

⑪ **AUTO REPLAY•RDS**
– Selects continuous playback in either AUTO PLAY or ONCE mode only.
– Selects RDS information in the TUNER mode.

⑫ **OPEN ▲**
– Opens the tape deck

⑬ **TAPE1 / TAPE2**
– Tape deck 1 and tape deck 2.

⑭ **DUBBING•NEWS**
– Dubs a tape
– *Turns on/off news.

⑮ **RECORD**
– Starts recording on tape deck 2

⑯ **VIDEO**
– Use a video cable to connect to your game console's video output.

AUDIO L. / AUDIO R.
– Use an audio cable to connect to your game console's left/right audio output.

⑰ **INCREDIBLE SURROUND**
– Creates a super-enhanced stereo effect.

DSC
– Selects different type of preset sound equaliser settings (NEW AGE, ELECTRIC, DIGITAL, POP, CLASSIC or ROCK.).

VAC
– Selects different type of ambience-based equaliser settings (CINEMA, ARCADE, CONCERT, DISCO, CYBER or HALL).

MIX IT (GAME MIX IT)
– Mixes the game sound with your favourite music from one of these music sources (CD, TUNER or AUX).

GAME SOUND
– Adjusts the game's output volume level.
– Selects different type of equaliser setting for Gameport (SPEED, PUNCH or BLAST).

⑱ 🎧
– Plugs in the headphones jack. The speakers output will be cancelled.

⑲ **MASTER VOLUME (VOL + –)**
– Adjusts the volume level.

⑳ **iR SENSOR**
– Points the remote control towards this sensor.

㉑ **VU meters**
– Indicates signal strength of left/right channel.

㉒ **DISC TRAY**

㉓ **OPEN•CLOSE ⏏ (DISC 1~3)**
– Opens/closes the respective disc tray.

㉔ **DISC 1, 2 and 3**
– Selects a disc tray to playback

㉕ **DISC CHANGE**
– Changes discs

Control buttons available on the remote control only

㉖ ⏻
– Switches to the Eco Power standby mode.
– *Switches to the standby mode.

㉗ **REPEAT**
– Repeats a track/disc/all programmed tracks.

㉘ **SHUFFLE**
– Turns on/off the random play mode.

㉙ **DISPLAY**
– Displays the album and title name for MP3 disc.

㉚ **DIM**
– Turns on/off the dim mode.

㉛ **SLEEP**
– Sets the sleep timer function.

㉜ **TIMER ON/OFF**
– Turns on/off the timer function.

㉝ **MUTE**
– Mutes or restores the volume

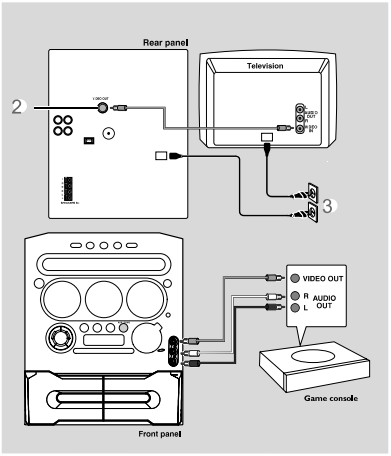
**** = Press and hold the button for more than two seconds.***

Gameport Operations

About Gameport

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

Preparation before use



1 Connect your game console's video and audio output to the GAMEPORT video and audio inputs respectively (refer to "**Connections - Connecting to game console**).

2 Connect your TV's video input to the **VIDEO OUT** (**CVBS**) on the rear panel.

3 Connect all the AC power cord to the power outlet.

Starting operation

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

5 Press **AUX•GAME** until "GAMEPORT" is display.

6 Press **GAME** to select the type of sound setting that best suit the game : SPEED, PUNCH, BLAST or OFF.

7 If you like to mix your game sound to your favourite music, press **MIX-IT** to select the desired music source : CD, TUNER, AUX, TAPE or OFF.
CD → "MIX-CD"
TUNER → "MIX-TU"
AUX → "MIX-AUX"
TAPE → "MIX-TA1"/"MIX-TA2"
OFF → "MIX-OFF"

Note:
– To change the disc tray, you have to press CD, then press CD 1~3 to select the desired disc tray.

8 If necessary, start playback of your chosen mixer source.

9 Start playing your favourite game.

To adjust the game console's volume level
Adjust **GAME VOLUME**.

Notes:
– You can only activate GAME VOLUME and MIX-IT while in the game source mode.
– If your game console is switched on, the video image will always appear on the TV even though you are not in the gameport mode.

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

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

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

Lift up and out

Figure 1

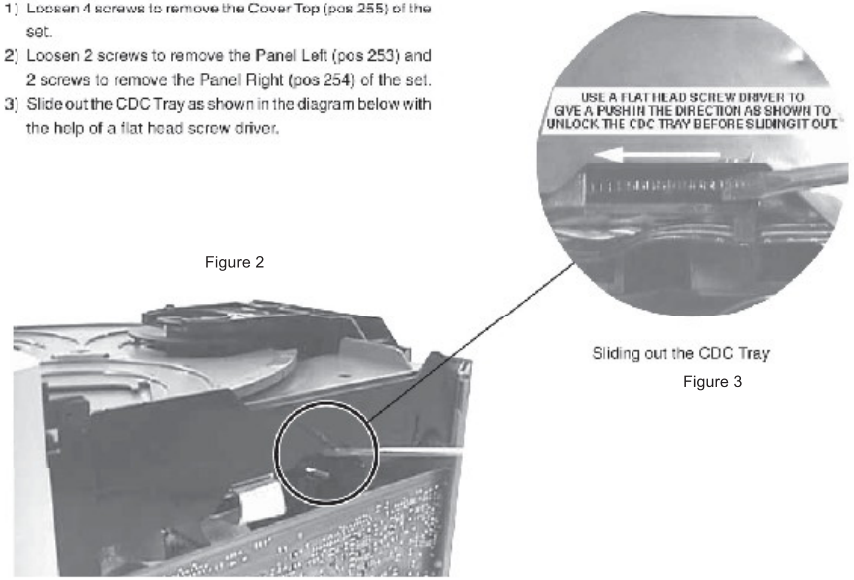
Remove Cassette Cover

Cassette Cover

Dismantling of the CDC Module and Front Panel

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

Figure 2



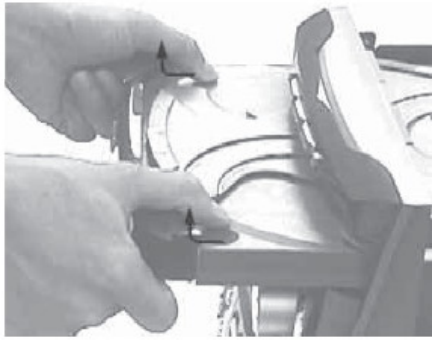
Sliding out the CDC Tray

Figure 3

Dismantling of the CDC Module and Front Panel

4) Remove the Cover Tray CDC as indicated.

Figure 4

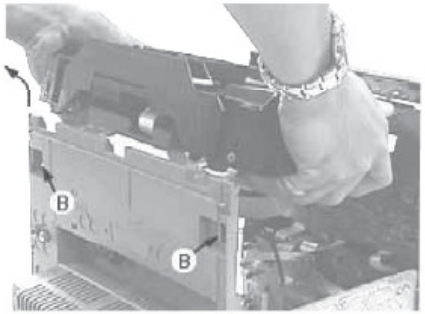


Remove Cover Tray CDC

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

Front View CDC

Figure 5



Remove CDC Module

Figure 6

DISMANTLING INSTRUCTIONS

Detaching the Front Panel assembly from the Bottom/Rear assembly

1) Remove 2 screws B as shown in Figure 8 from the bottom of the Cabinet Front .

2) Release the fixation of the AF Board to Bracket CDC Right by releasing the 2 catches C1 (see Figure 9) and pulling the AF Board outwards as shown in Figure 8.

3) Uncatch 2 catches C2 (see Figure 9) on the left & right sides of the Cabinet Front and slides the Front Panel assembly out towards the front.

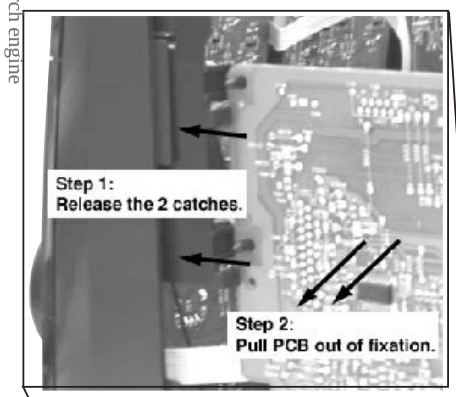


Figure 8

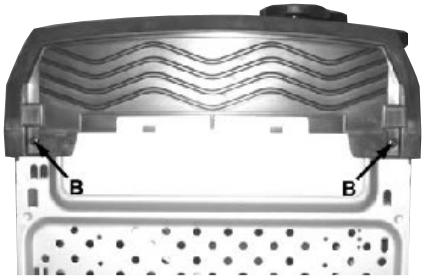


Figure 7

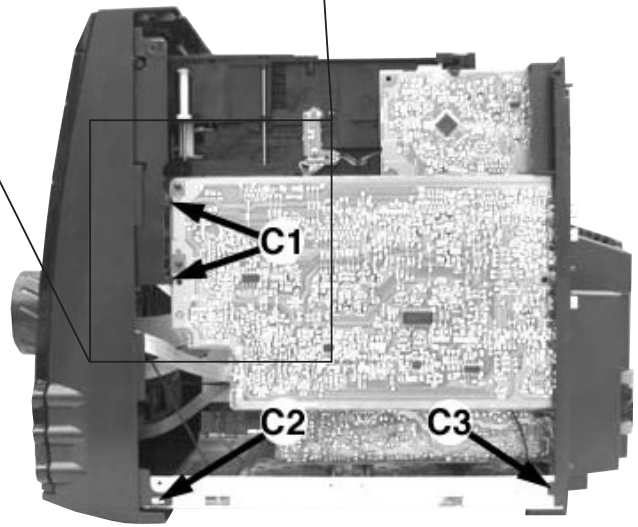


Figure 9

2-2

Dismantling of the Front Control Board and Front Display Board

1) The Knob Volume Rotary can be remove by pulling it out in the direction as shown in Figure 10.

2) The Knob Jog Rotary can be remove by inserting a strong string into the slot and pull it in the direction as shown in Figure 11.

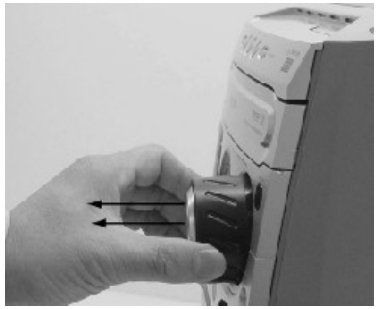


Figure 10

Figure 11

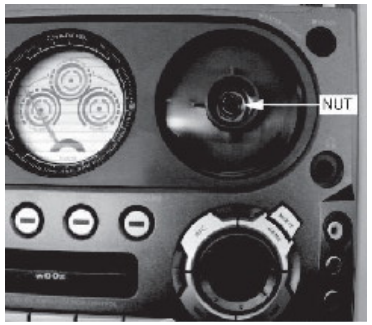


Figure 12

3) Loosen 2 nuts (see Figure 12) to remove the Front Display Board.

4) Loosen 8 screws D (see Figure 13) to remove the Front Display Board.

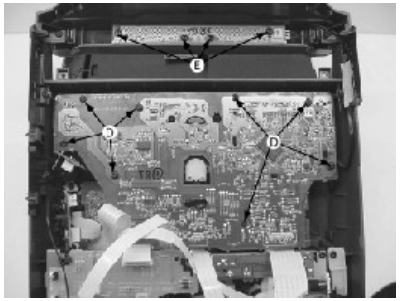


Figure 13

5) Loosen 4 screws E (see Figure 13) to remove the CDC Key Board.

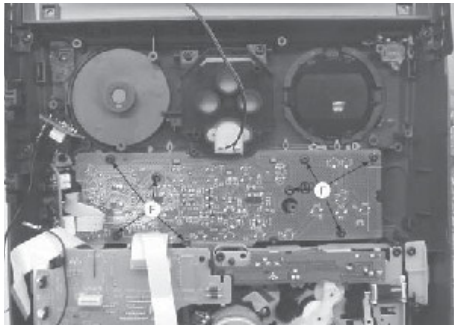


Figure 14

6) Loosen 8 screws F (see Figure 14) to remove the Front Control Board .

7) Loosen 3 screws G (see Figure 15) to remove the Headphone Board and Game Port Board.

DISMANTLING INSTRUCTIONS

Dismantling of the Game Port Board and Headphone Board

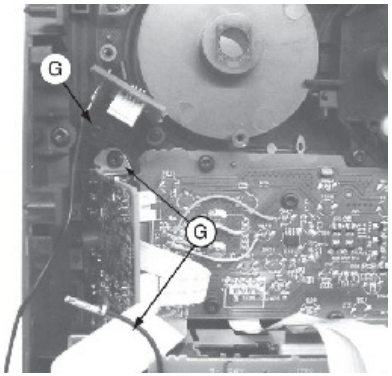


Figure 15

Dismantling of the ETF Tape Module

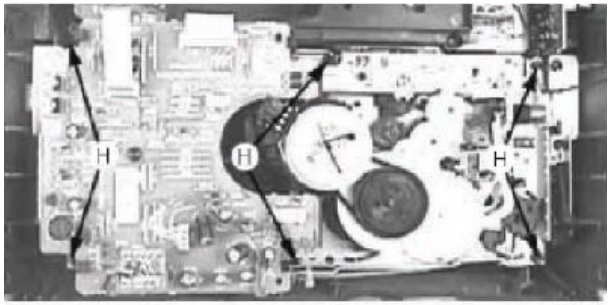


Figure 16

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

2-3

Dismantling of Rear Portion

1) Remove 2 screws I (see Figure 17) to loose the AF12 Board.

2) Loosen 3 screws J and uncatch N (see Figure 17) to remove the Tuner Board.

3) Loosen 1 screws K (see Figure 17) to remove the Video Board.

4) Loosen 4 screws L (see Figure 17) and uncatch C5 (see Figure 18) to remove the Fan.

5) Loosen3 screws M (see Figure 17) and uncatch C3 (see Figure 9) to remove the Panel Rear by sliding it out towards the rear.

Figure 18

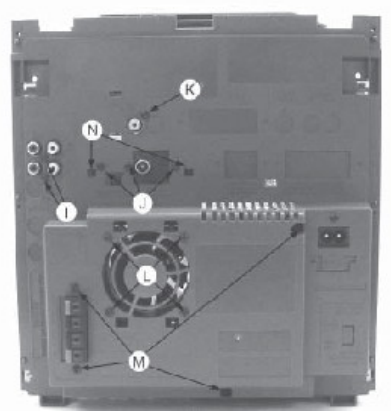


Figure 17

Repair Hint

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

2) Due to the short flex cable wires in the ETF Module, the PCB should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. see Figure 19.

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

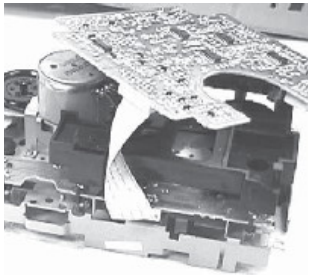
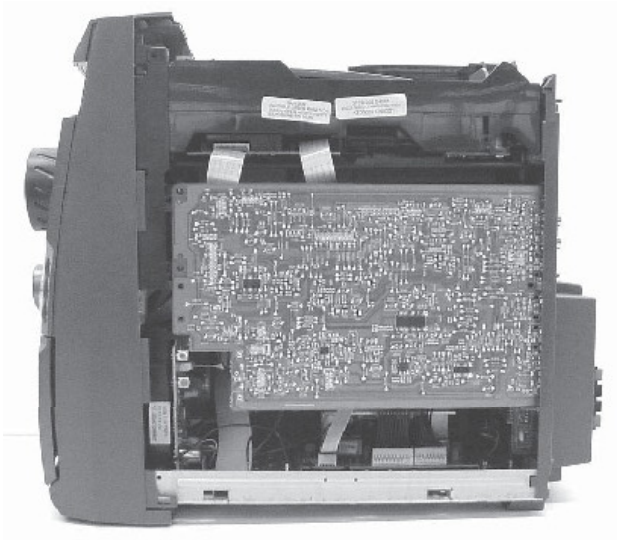


Figure 19

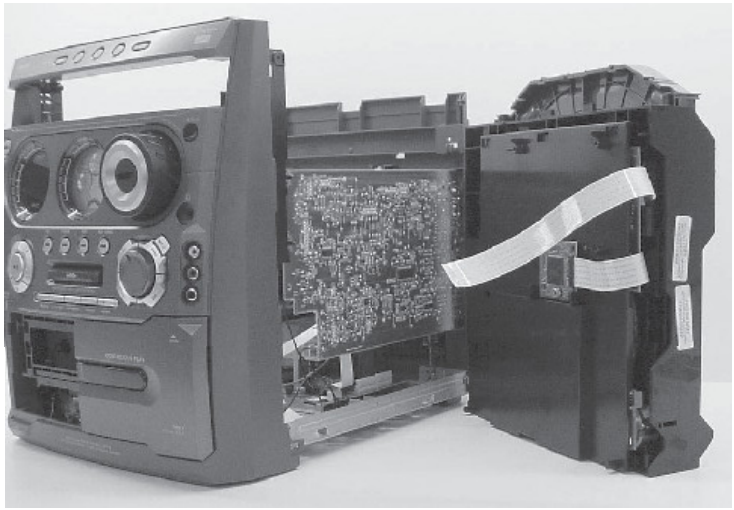
2-4

DISMANTLING INSTRUCTIONS

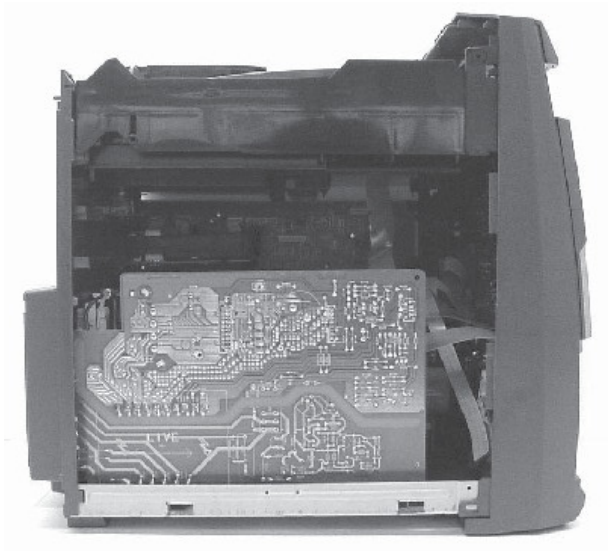
Service position A

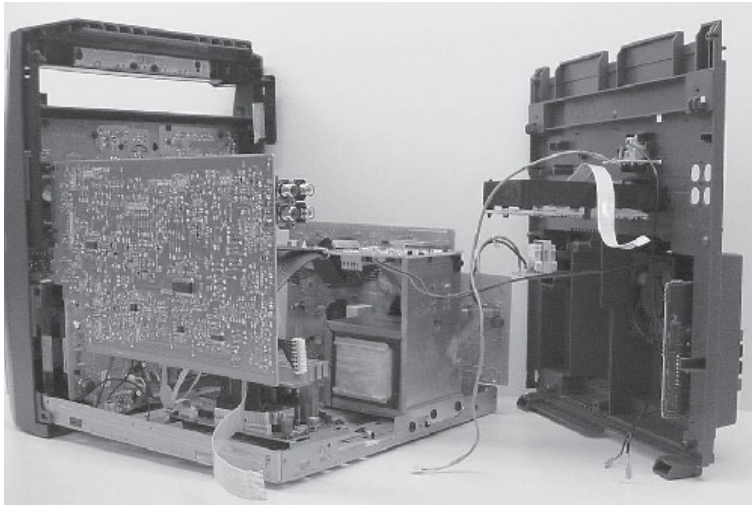


Service position B



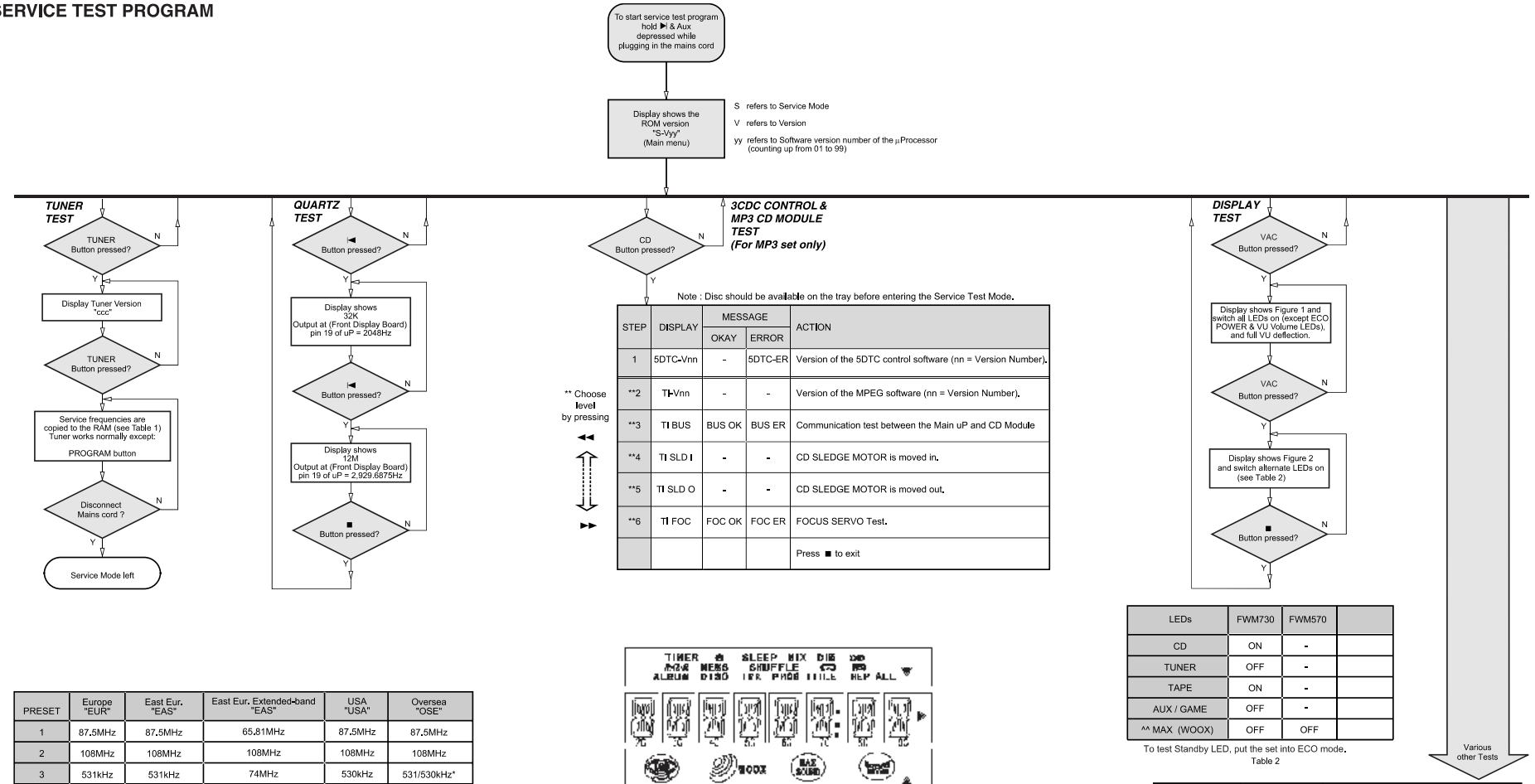
Service position C





3-1

SERVICE TEST PROGRAM



STEP	DISPLAY	MESSAGE OKAY	MESSAGE ERROR	ACTION
1	5DTC-Vnn	-	5DTC-ER	Version of the 5DTC control software (nn = Version Number).
**2	TI-Vnn	-	-	Version of the MPEG software (nn = Version Number).
**3	TI BUS	BUS OK	BUS ER	Communication test between the Main uP and CD Module
**4	TI SLD I	-	-	CD SLEDGE MOTOR is moved in.
**5	TI SLD O	-	-	CD SLEDGE MOTOR is moved out.
**6	TI FOC	FOC OK	FOC ER	FOCUS SERVO Test.
				Press ■ to exit

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

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

Figure 1

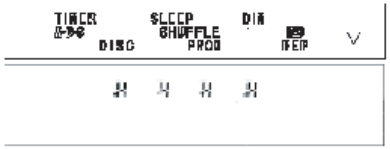


Figure 2

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

Table 1

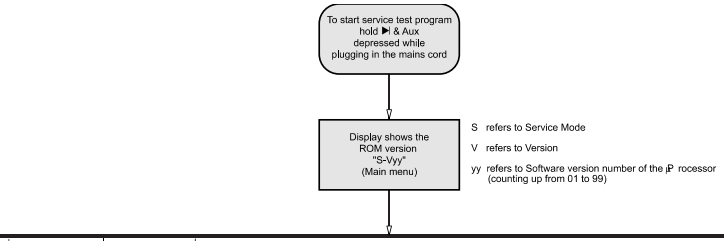
Note: * Depending on the selected grid frequency (9 or 10kHz)
By holding the TUNER and ▶▶ buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended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

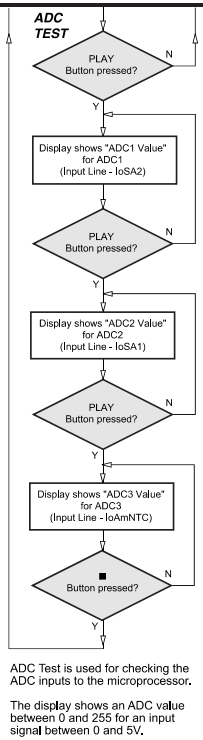
TEST	Activated with	ACTION
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT TEST	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution! All presets from the customer will be lost!!***
ROTARY ENCODER TEST	Rotary Volume Knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DEMO	^^ MAX/WOOX 2	DEMO will toggle on or off. The message: "DEMO ON" or "DEMO OFF" will scroll across the display to show the new status of the set.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

^^ MAX - FWM570, WOOX - FWM730

3-2

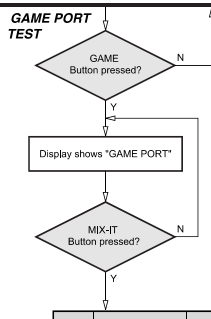
SERVICE TEST PROGRAM





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

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



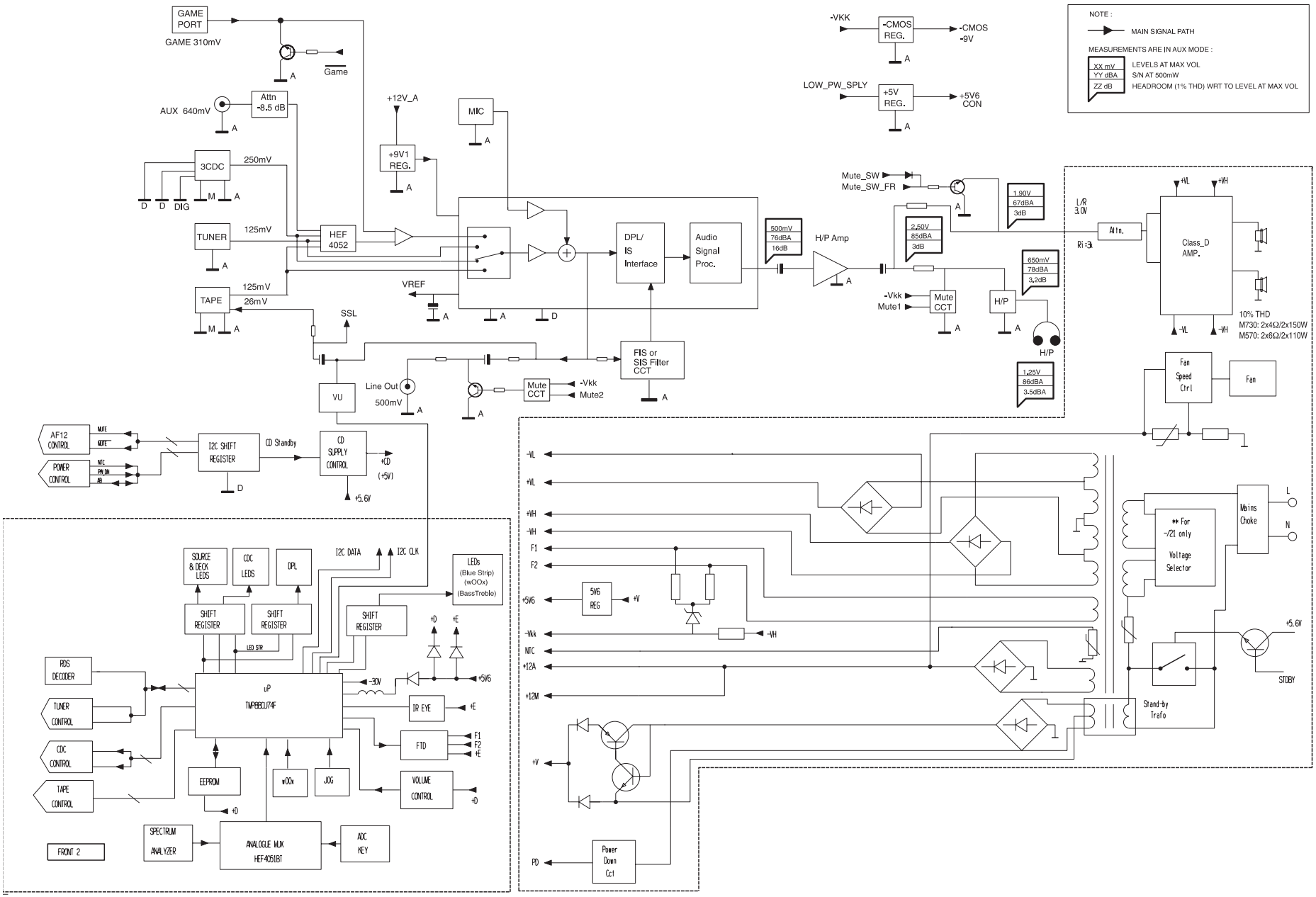
Choose desired background source by pressing button

" MIX-IT "

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

4-1

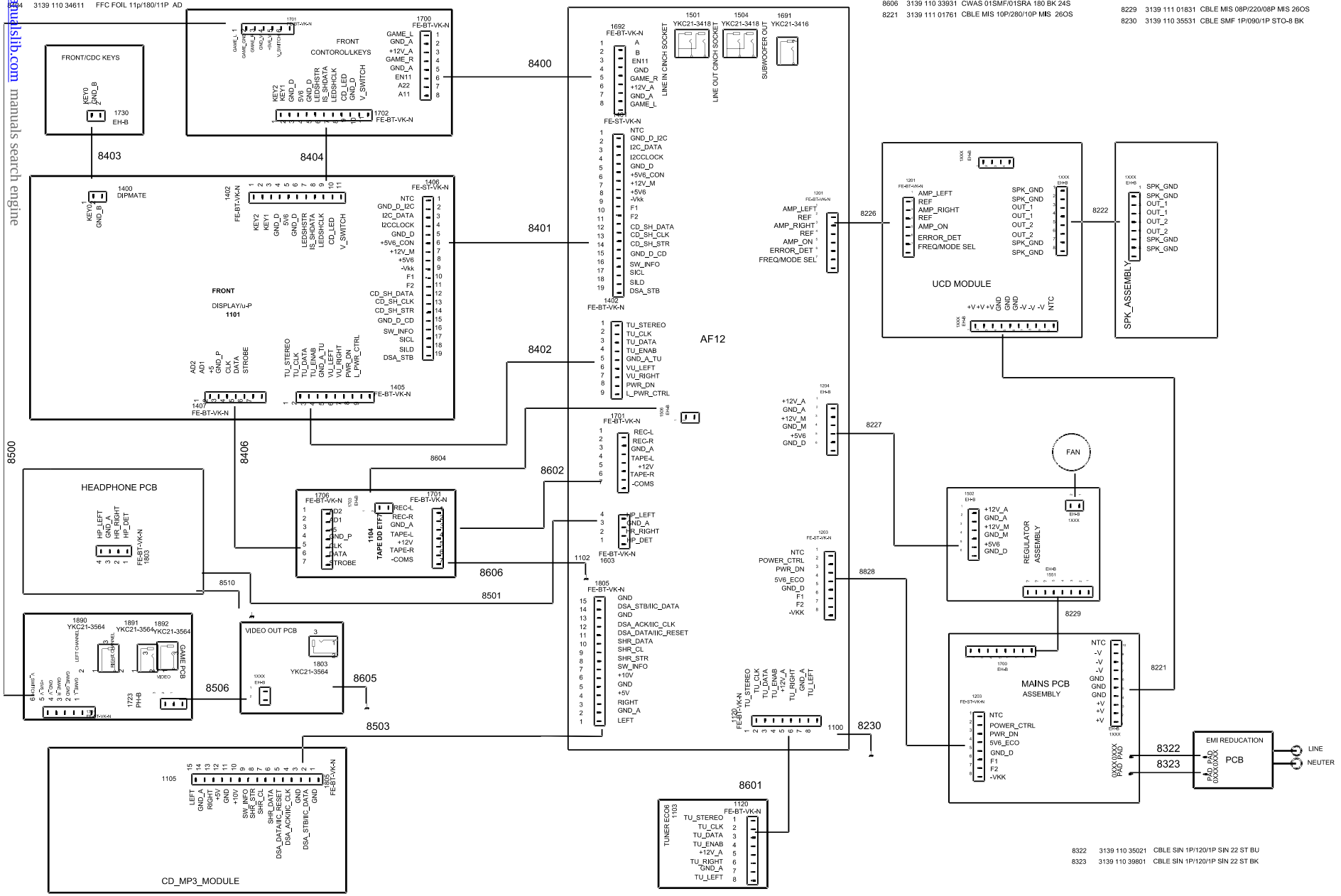
SERVICE BLOCK DIAGRAM



SERVICE WIRING DIAGRAM

4-2

8400	3139 110 34921	FFC FOIL 08P/280/08P BD
8401	3139 111 02491	FFC FOIL 19P/280/19P AD
8402	3140 110 22471	FFC FOIL 09P/280/09P AD
8403	3139 110 37171	CBLE HR 02P/220/02P OE 26OS BK
8404	3139 110 34611	FFC FOIL 11p/180/11P AD
8406	3140 110 22481	FFC FOIL 07P/280/07P BD
8500	3139 110 35211	FFC FOIL 06P/80/06P AD
8501	3139 110 33941	FFC FOIL 04P/180/04P BD
8503	3139 110 35881	FFC FOIL 15P/180/15P BD
8506	3140 110 22451	CBLE PH 3P/340/3P OE SCR WIRE
8510	3139 111 02641	CWAS SMF 1P/22O/1P STO-8 BK
8601	3139 110 35050	FFC FOIL 08P/220/08P AD
8602	3139 110 34131	FFC FOIL 07P/180/07P AD
8604	3139 110 38381	CBLE HR 02P/180/02P HR 26 OS BK
8605	3139 111 02621	CWAS SMF 1P/280/1P STO-8 BK
8606	3139 110 33931	CWAS 01SMF/01SRA 180 BK 24S
8221	3139 111 01761	CBLE MIS 10P/280/10P MIS 26OS
8222	3139 111 02131	CBLE MIS 08P/120/08P MIS 26OS
8226	3139 110 35901	FFC FOIL 07P/220/07P AD
8227	3139 111 03201	CBLE MIS 06P/220/06P MIS 26OS
8228	3140 110 22501	FFC FOIL 08P/280/08P AD
8229	3139 111 01831	CBLE MIS 08P/220/08P MIS 26OS
8230	3139 110 35531	CBLE SMF 1P/090/1P STO-8 BK
8322	3139 110 35021	CBLE SIN 1P/120/1P SIN 22 ST BU
8323	3139 110 39801	CBLE SIN 1P/120/1P SIN 22 ST BK



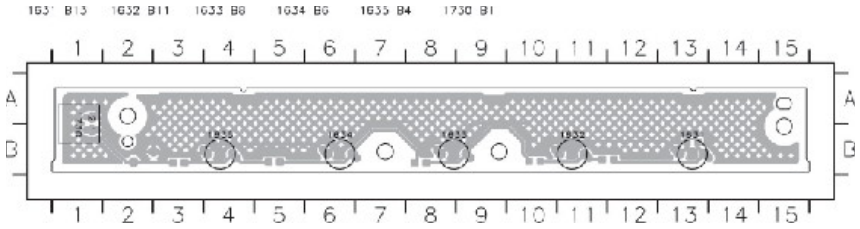
FRONT CONTROL BOARD

TABLE OF CONTENTS

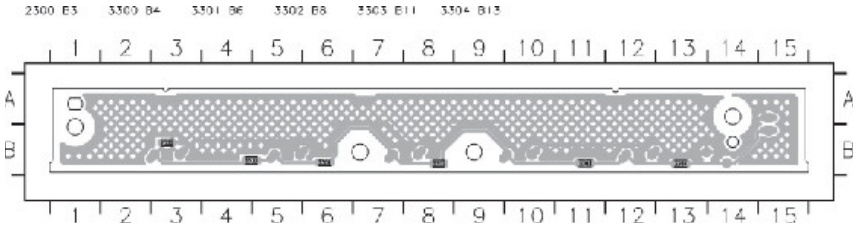
CDC Key part - Layout & Circuit diagram 5-1
Control part - Component Layout 5-2
Control part - Chip Layout 5-3
Control part - Circuit diagram 5-4
Game Port part - Layout & Circuit diagram 5-5
Electrical parts list 5-6

5-1

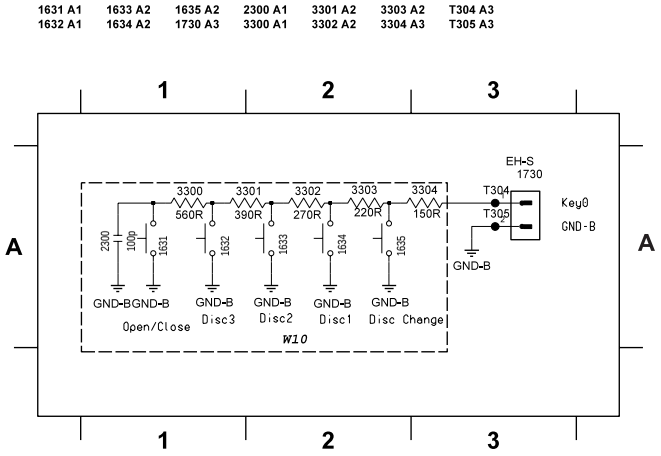
CDC KEY BOARD - COMPONENT LAYOUT



CDC KEY BOARD - CHIP LAYOUT



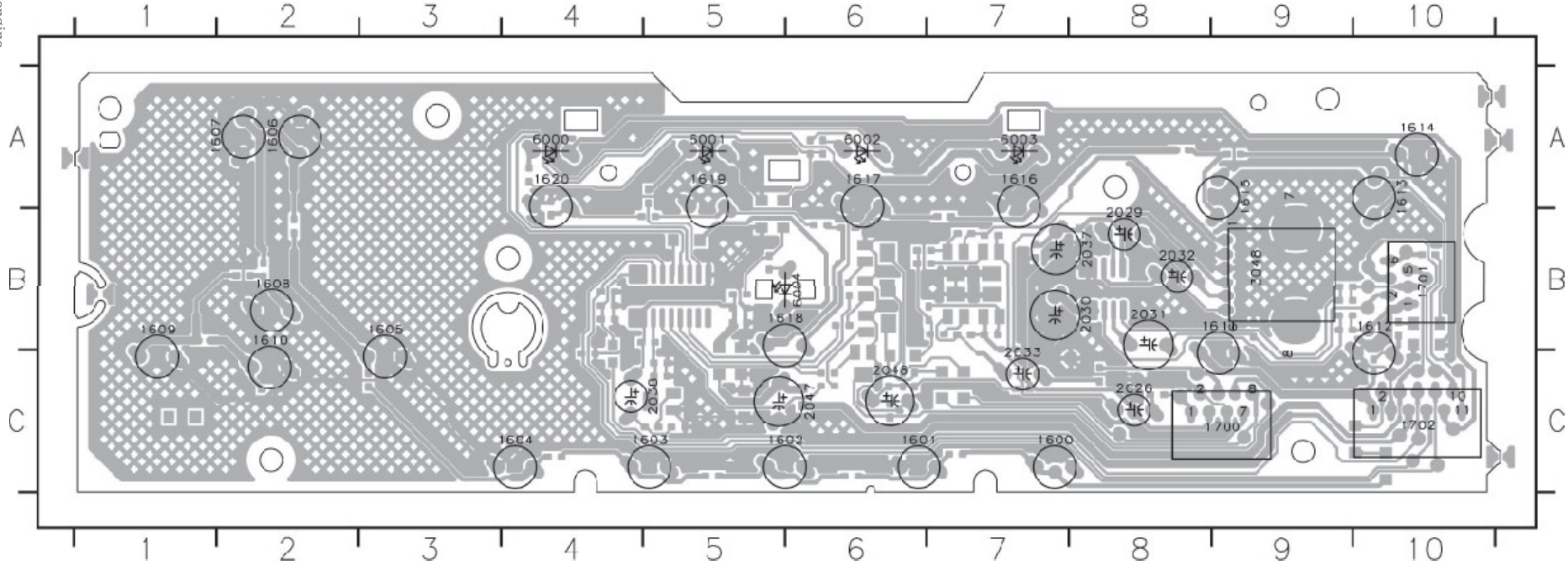
CDC KEY BOARD - CIRCUIT DIAGRAM



5-2

CONTROL BOARD - COMPONENT LAYOUT

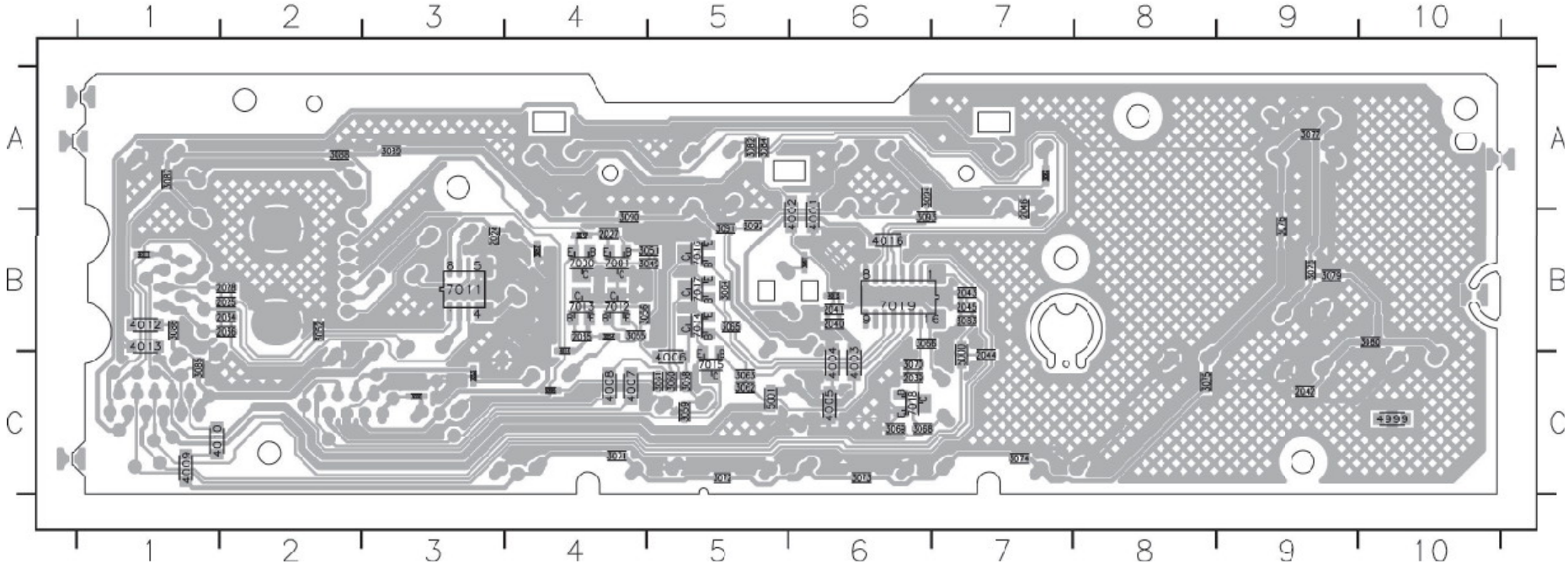
1600 C8 1601 C6 1602 C6 1603 C5 1604 C4 1605 C3 1606 A2 1607 A1 1608 B2 1609 B1 1610 C2 1611 C9 1612 B10 1613 A10 1614 A10 1615 A8 1616 A7 1617 A6 1618 B6 1619 A5 1620 A4 1700 C9 1701 B10 1702 C10 2026 C8 2029 B8 2030 B8 2031 B8 2032 B8 2033 C7 2037 B8 2038 C5 2047 C6 2048 C6 3048 B10 5000 A4 6001 A5 6002 A6 6003 A7 6004 B6



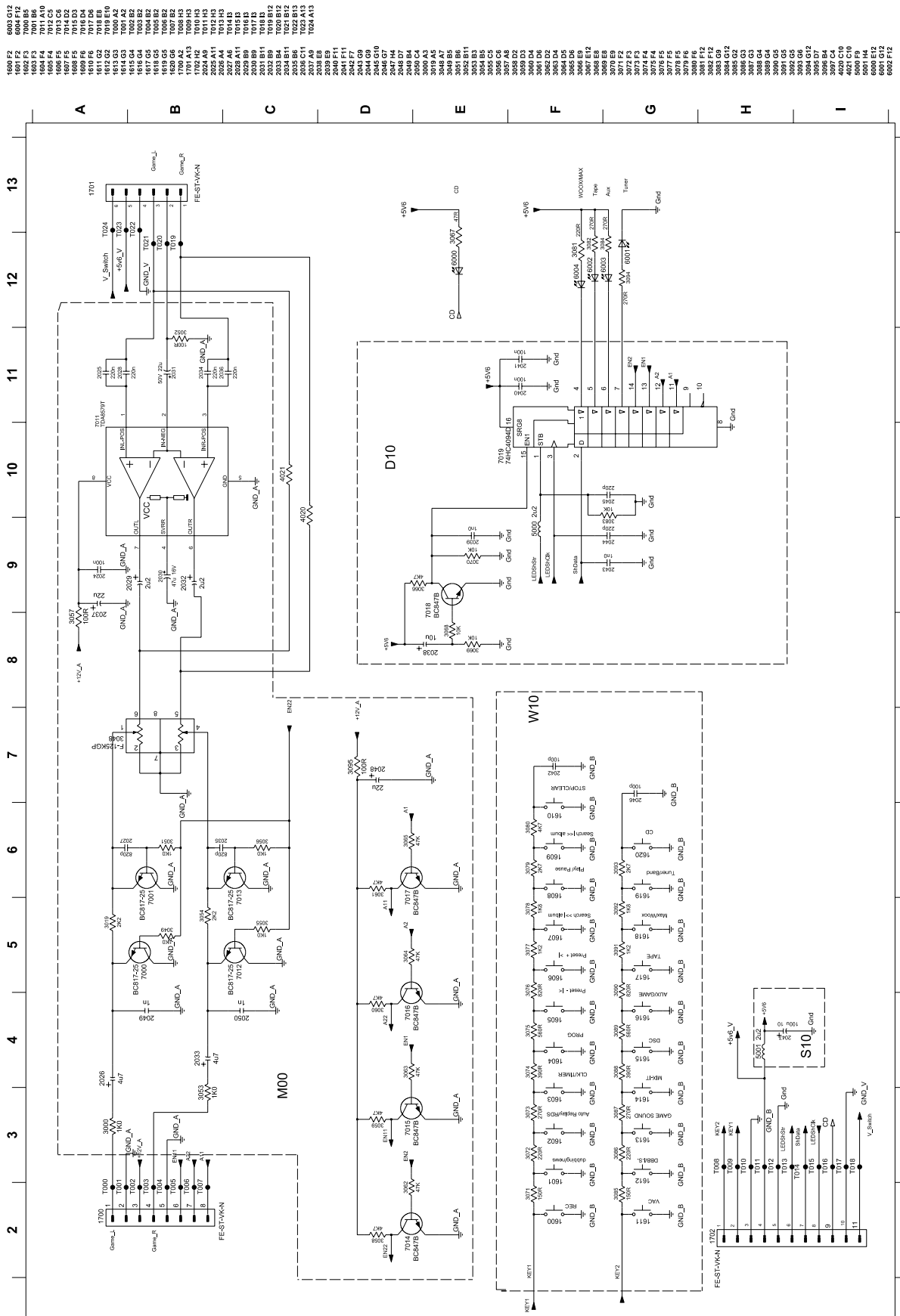
5-3

CONTROL BOARD - CHIP LAYOUT

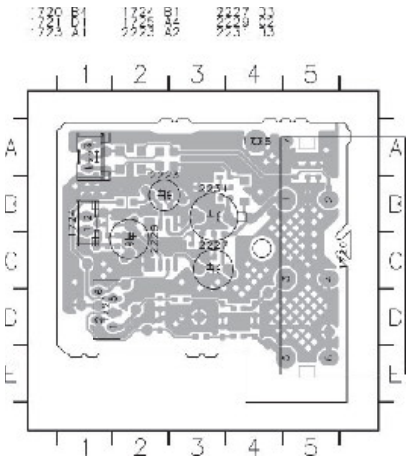
2021 B3	2039 C6	2016 B7	3054 B1	3061 C5	3068 C6	3075 C8	3082 A5	3089 A3	1001 B6	1008 C1	1015 B6	7011 B3	7018 C6
2025 B2	2040 B6	3000 C3	3055 B4	3062 C5	3069 C6	3076 B9	3083 B7	3090 B4	4002 B5	4009 C1	4016 B6	7012 B5	7019 B7
2027 B4	2041 B6	3019 B4	3056 B4	3063 C5	3070 C6	3077 A9	3084 A5	3091 B5	4003 C6	4010 C2	4999 C10	7013 B4	
2028 B4	2042 C9	3049 B5	3057 B1	3064 B5	3071 C1	3078 B9	3085 C1	3092 B5	4004 C6	4011 B1	5000 C7	7014 B5	
2034 B2	2043 B7	3051 B5	3058 C5	3065 B5	3072 C5	3079 B9	3086 B1	3093 B6	4005 C6	4012 B1	5001 C5	7015 C5	
2035 B4	2044 C7	3052 B2	3059 C5	3066 B6	3073 C6	3080 B10	3087 A1	3094 A6	4006 C4	4013 B1	7000 B4	7016 B5	
2036 B2	2045 B7	3053 C3	3060 C5	3067 A7	3074 C7	3081 B6	3088 A2	3095 C4	4007 C4	4014 B4	7001 B5	7017 B5	



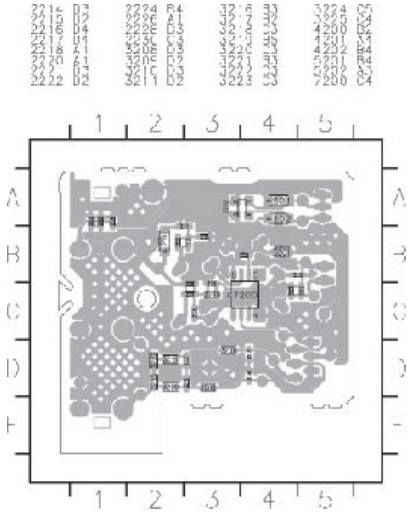
CONTROL BOARD - CIRCUIT DIAGRAM



GAME PORT BOARD - COMPONENT LAYOUT

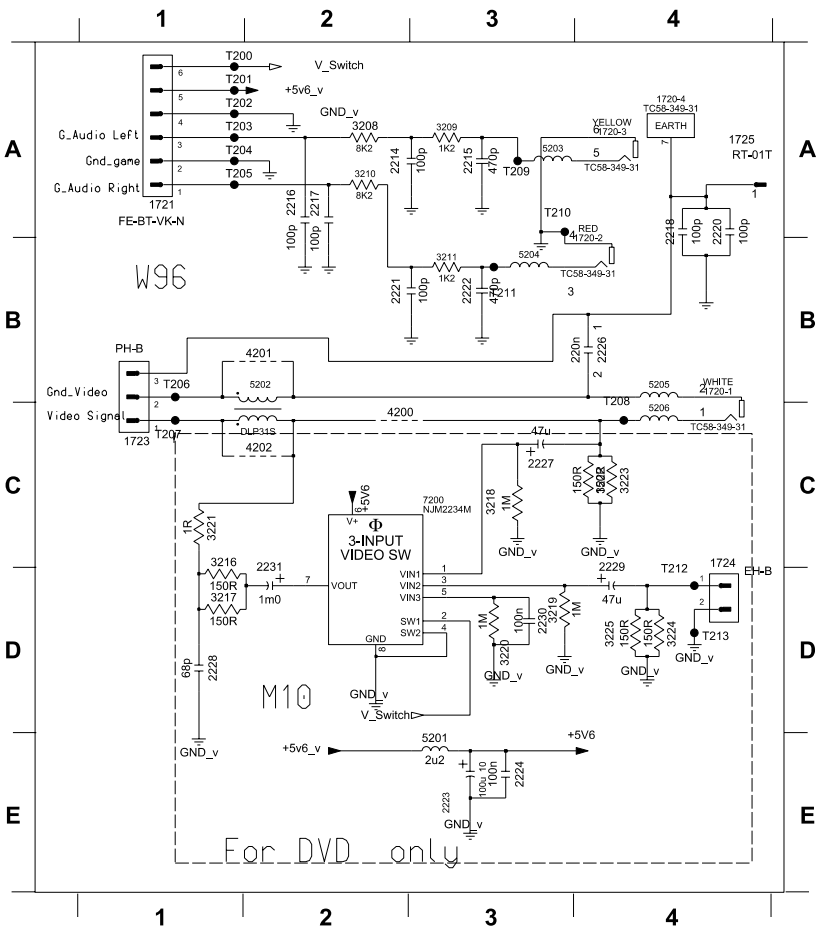


GAME PORT BOARD - CHIP LAYOUT



GAME PORT BOARD - CIRCUIT DIAGRAM

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



5-6

ELECTRICAL PARTSLIST - FRONT CONTROL BOARD

1600	4822 276 13775	SWITCH
1601	4822 276 13775	SWITCH
1602	4822 276 13775	SWITCH
1603	4822 276 13775	SWITCH
1604	4822 276 13775	SWITCH
1605	4822 276 13775	SWITCH
1606	4822 276 13775	SWITCH
1607	4822 276 13775	SWITCH
1608	4822 276 13775	SWITCH
1609	4822 276 13775	SWITCH
1610	4822 276 13775	SWITCH
1611	4822 276 13775	SWITCH
1612	4822 276 13775	SWITCH
1613	4822 276 13775	SWITCH
1614	4822 276 13775	SWITCH
1615	4822 276 13775	SWITCH
1616	4822 276 13775	SWITCH
1617	4822 276 13775	SWITCH
1618	4822 276 13775	SWITCH
1619	4822 276 13775	SWITCH
1620	4822 276 13775	SWITCH
1631	4822 276 13775	SWITCH
1632	4822 276 13775	SWITCH
1633	4822 276 13775	SWITCH
1634	4822 276 13775	SWITCH
1635	4822 276 13775	SWITCH
1720	2422 026 05625	SOC CINCH H 3P
3048	2122 400 00002	POTM CAR LIN 20KX2
6000	4822 130 11589	LED
6001	4822 130 11589	LED
6002	4822 130 11589	LED
6003	4822 130 11589	LED
6004	9322 178 87676	LED
7019	4822 209 15449	IC 74HC4094D

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

FRONT DISPLAY BOARD

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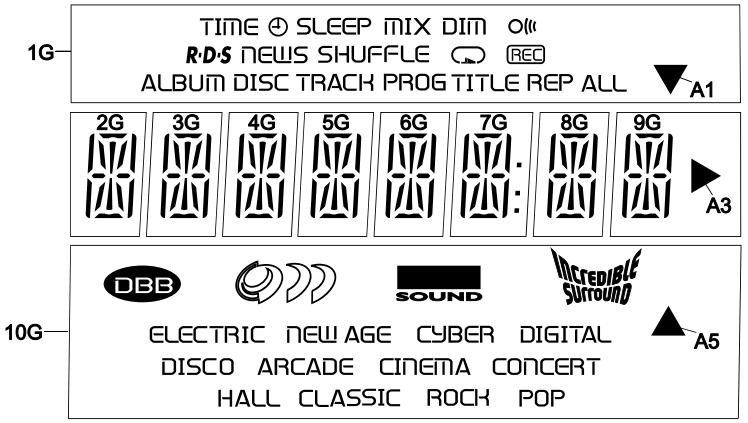
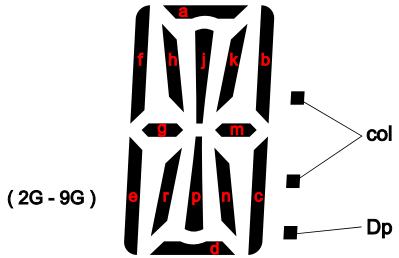
6-1

FTD DISPLAY PIN CONNECTION



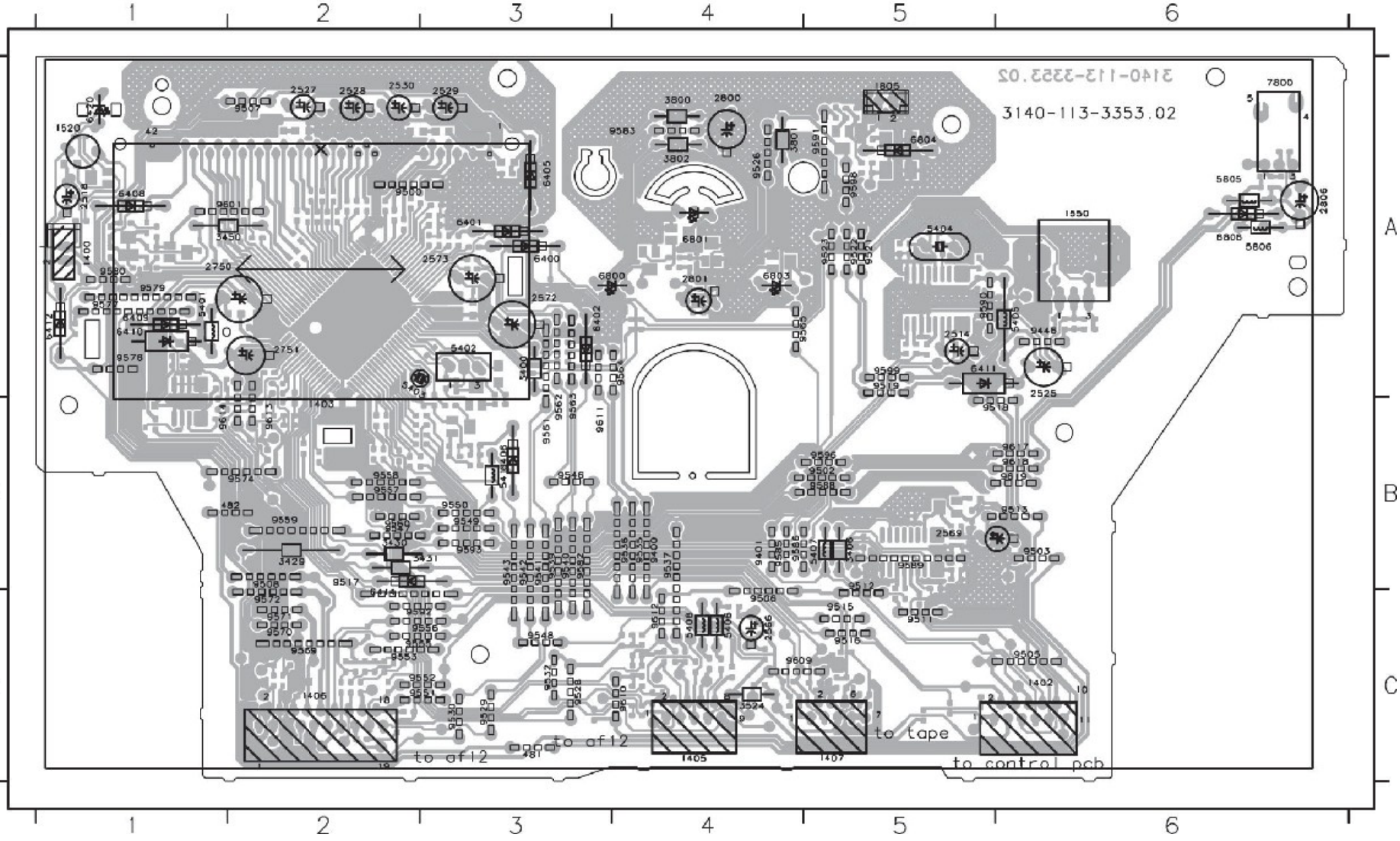


	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G
P1	TIME	a	a	a	a	a	a	a	a	DBB
P2	⏲	h	h	h	h	h	h	h	h	
P3	SLEEP	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	(Left)
P4	MIX	k	k	k	k	k	k	k	k	(Right)
P5	DIM	b	b	b	b	b	b	b	b	SOUND
P6		f	f	f	f	f	f	f	f	INCREDIBLE SURROUND
P7	R·D·S	m	m	m	m	m	m	m	m	ELECTRIC
P8	NEWS	g	g	g	g	g	g	g	g	NEW AGE
P9	SHUFFLE	c	c	c	c	c	c	c	c	CYBER
P10		e	e	e	e	e	e	e	e	DIGITAL
P11	REC	r	r	r	r	r	r	r	r	DISCO
P12	ALBUM	n	n	n	n	n	n	n	n	ARCADE
P13	DISC	d	d	d	d	d	d	d	d	CINEMA
P14	TRACK	-	-	-	-	-	col	-	-	CONCERT
P15	PROG	-	-	-	-	-	Dp	-	-	HALL
P16	TITLE	-	-	-	-	-	-	-	-	CLASSIC
P17	REP	-	-	-	-	-	-	-	-	ROCK
P18	ALL	-	-	-	-	-	-	-	-	POP
P19	▼	-	-	-	-	-	-	-	-	▲

6-2

DISPLAY BOARD - COMPONENT LAYOUT

1400	A1	2514	A5	2572	A3	3429	B2	5402	A3	6400	A3	6412	A1	9400	B4	9508	B2	9522	A5	9537	B4	9549	B3	9559	B2	9571	C2	9585	B4	9598	A5	9617	B6
1402	C6	2518	A1	2573	A3	3430	B2	5403	A2	6401	A3	6414	C2	9401	B4	9511	C5	9523	A5	9539	B3	9550	B3	9560	B2	9572	C2	9586	B4	9599	A5		
1403	B2	2525	A6	2750	A1	3431	B3	5404	A5	6402	A3	6420	A1	9446	A6	9512	B5	9526	A4	9540	B3	9551	C3	9561	B3	9574	B2	9588	B5	9601	A2		
1404	C4	2527	A2	2751	A2	3450	A2	5405	A6	6405	A3	6800	A3	9500	A2	9513	B5	9528	C3	9541	B3	9552	C3	9562	B3	9576	A1	9589	B5	9609	C4		
1405	C2	2528	A2	2800	A4	3524	C4	5406	C4	6406	B3	6801	A4	9502	B5	9514	C5	9529	C3	9542	B3	9553	C2	9563	B3	9577	A1	9590	A5	9610	C4		
1407	C5	2529	A3	2801	A4	3800	A4	5407	B5	6408	A1	6803	A4	9503	B6	9515	C5	9530	C3	9543	B3	9555	C2	9564	A4	9579	A1	9591	A5	9611	B3		
1520	A1	2530	A2	2806	A6	3801	A4	5408	C4	6409	A1	6804	A5	9505	C6	9516	B5	9531	C3	9546	B4	9556	C2	9565	A4	9580	A1	9592	C2	9612	C4		
1550	A6	2566	C4	3400	A3	3802	A4	5805	A6	6410	A1	6806	A6	9506	C4	9519	A5	9535	B4	9547	B2	9557	B2	9569	C2	9582	B3	9593	B5	9613	B2		
1805	A5	2569	B5	3406	B5	5401	A1	5806	A6	6411	A5	7800	A6	9507	A2	9521	A5	9536	B4	9548	C3	9558	B2	9570	C2	9583	A4	9596	B5	9614	B1		

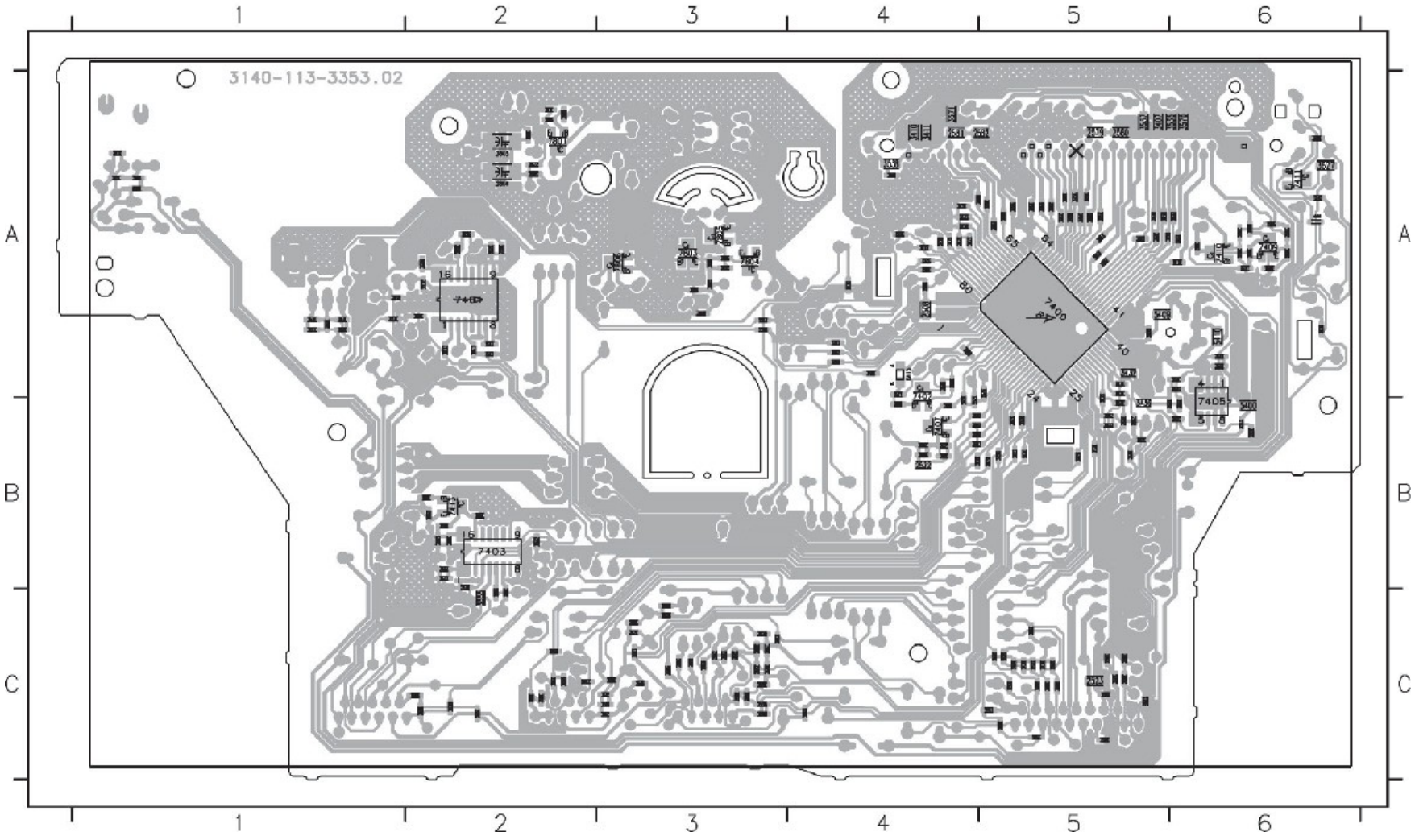


6-3

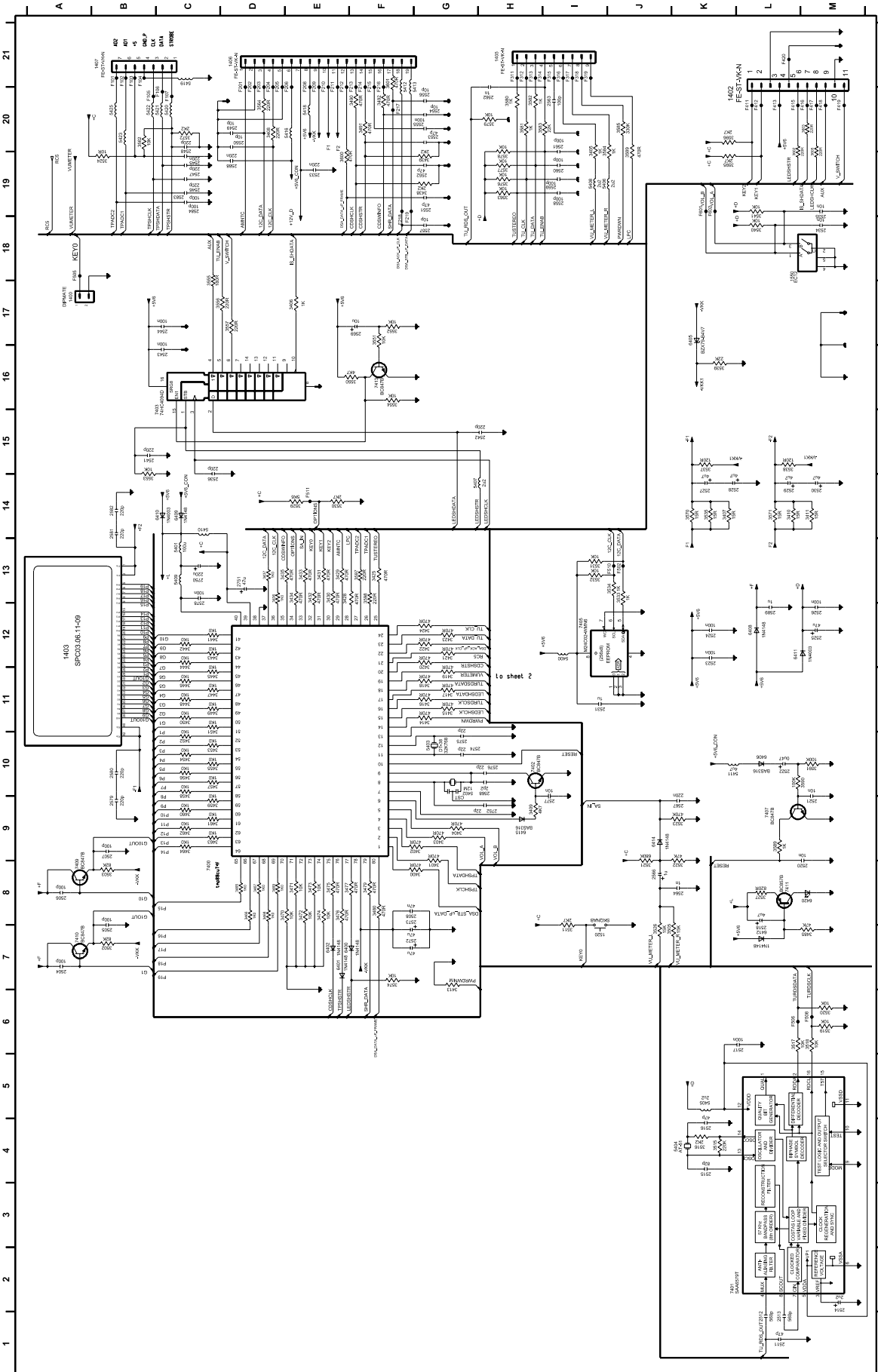
DISPLAY BOARD - CHIP LAYOUT

2504	A6	2524	B6	2550	C5	2567	B5	2589	A6	3413	C3	3433	B5	3449	A5	3465	A5	3485	A6	3522	C3	3541	A1	3570	A6
2505	A6	2526	A1	2551	C5	2568	A4	2803	A2	3414	B4	3434	A5	3451	A5	3466	A5	3490	C5	3523	B5	3550	B2	3571	A4
2506	A6	2531	A6	2552	C5	2574	B4	2804	A2	3415	B4	3435	A5	3452	A5	3467	A5	3491	C5	3526	C3	3551	B2	3572	C3
2507	A6	2534	A1	2553	C5	2575	A5	2808	A2	3416	B4	3436	B5	3453	A5	3468	A5	3492	C5	3527	A6	3552	B2	3574	A4
2508	A4	2535	A1	2554	C5	2576	A4	2810	A1	3417	B4	3437	A5	3454	A5	3469	A4	3502	A6	3529	B5	3553	B2	3576	C3
2511	A2	2536	B2	2555	C5	2577	A4	2812	A1	3418	B4	3438	C5	3455	A5	3470	A4	3503	A6	3530	B5	3554	B2	3577	C3
2513	A2	2541	B5	2556	C5	2578	A5	3401	A4	3419	B5	3439	C5	3456	A5	3471	A4	3505	C3	3531	A6	3555	C5	3578	C3
2514	A2	2542	B5	2557	C5	2579	A5	3402	A4	3420	B5	3441	A6	3457	A5	3472	A4	3511	A6	3532	B6	3556	C5	3579	C3
2515	A2	2543	B5	2558	C3	2580	A5	3403	A4	3421	B5	3442	A6	3458	A5	3473	A4	3515	A2	3533	A6	3557	C5	3580	C3
2516	A2	2544	B2	2559	C3	2581	A4	3404	A4	3422	B5	3443	A6	3459	A5	3474	A4	3516	A2	3534	B6	3560	C2	3581	C3
2517	A2	2545	C3	2560	C3	2582	A5	3405	C3	3423	B5	3444	A6	3460	A5	3475	A4	3517	A2	3535	A6	3561	C2	3582	C3
2520	B4	2546	C3	2561	C3	2583	C2	3407	A5	3424	B5	3445	A5	3461	A5	3476	A4	3518	A2	3537	A5	3562	C5	3583	C3
2521	B4	2547	C3	2562	C3	2584	C2	3409	B4	3425	B5	3446	A5	3462	A5	3477	A4	3519	A1	3538	A4	3563	C4	3584	C3
2522	B4	2548	C3	2563	C3	2587	B4	3410	A4	3426	B5	3447	A5	3463	A5	3479	A4	3520	A2	3539	A4	3564	C5	3585	C3
2523	C5	2549	C5	2564	C3	2588	C5	3411	A4	3432	B5	3448	A5	3464	A5	3480	A4	3521	C3	3540	A1	3565	C5	3589	B4

3590	B4	3821	A1	4520	C5	7401	A2																		
3591	B4	3822	A3	4522	C2	7402	A4																		
3595	C2	4500	A4	4523	C5	7403	B2																		
3596	C2	4501	C5	4525	A6	7405	B6																		
3804	A2	4502	B6	4526	A4	7407	B4																		
3805	A3	4505	A4	4527	A3	7409	A6																		
3806	A3	4509	A6	4528	A3	7410	A6																		
3807	A3	4511	A1	4529	C2	7411	A6																		
3808	A3	4512	A6	4530	C5	7413	B5																		
3809	A3	4513	B6	5400	B6	7801	A2																		
3810	A2	4515	A6	5409	A5	7803	A3																		
3812	A2	4516	A6	5410	A6	7804	A3																		
3813	A2	4517	B5	5411	B4	7805	A3																		
3814	A2	4518	B5	6415	A4	7806	A3																		
3820	A1	4519	C5	7400	A5																				

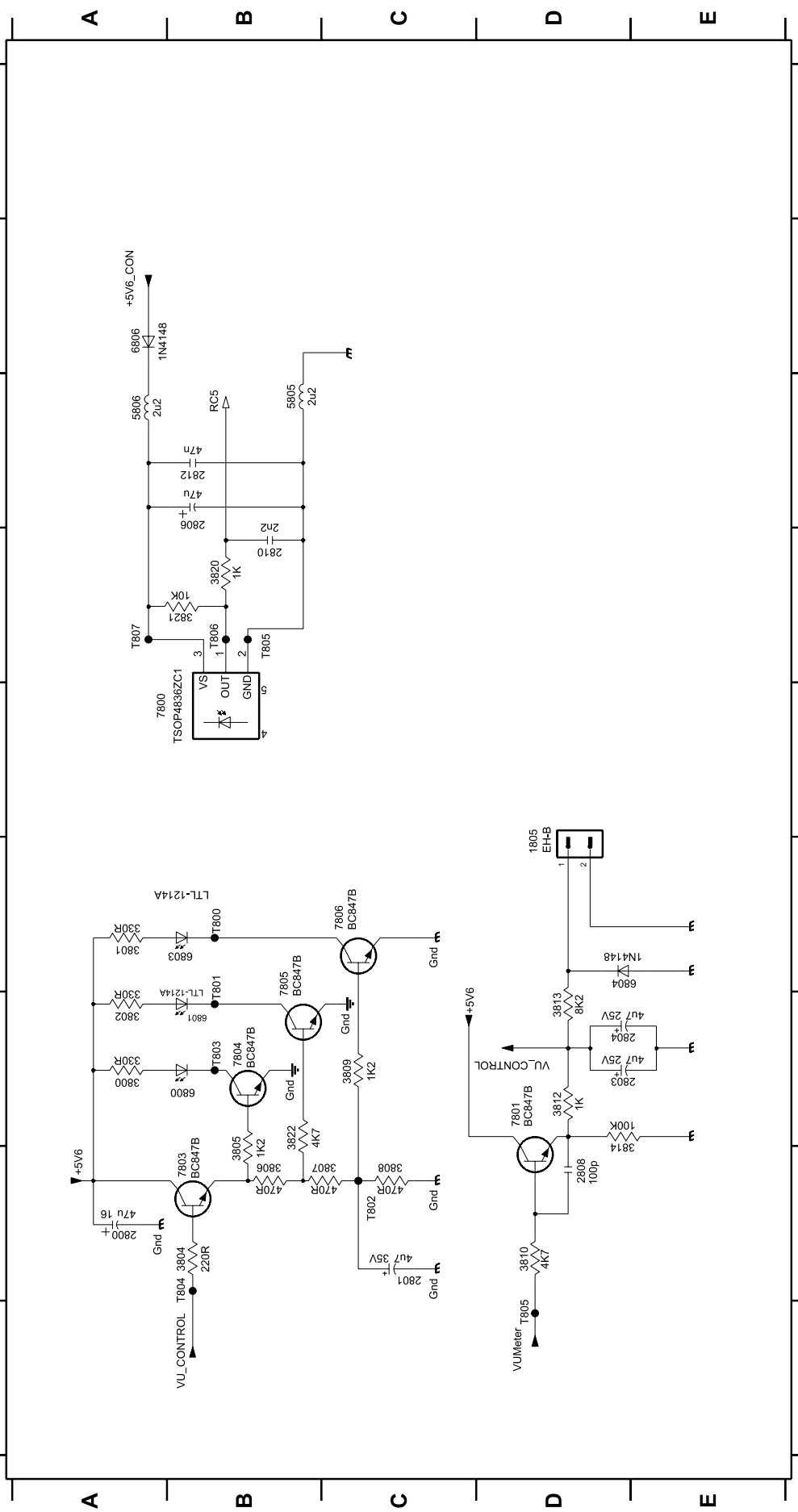


DISPLAY BOARD - CIRCUIT DIAGRAM 1



6-4

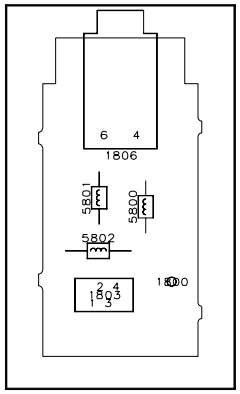
DISPLAY BOARD - CIRCUIT DIAGRAM 2



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

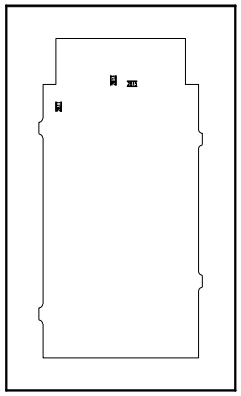
HEADPHONE BOARD - COMPONENT LAYOUT

1800 --
1803 --
1806 --
5800 --
5801 --
5802 --



HEADPHONE BOARD - CHIP LAYOUT

2811 --
2813 --
2815 --

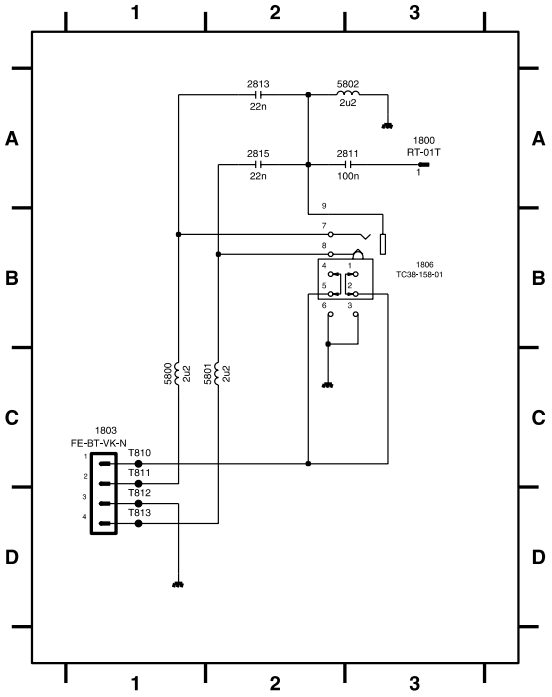


ELECTRICAL PARTSLIST - FRONT DISPLAY BOARD

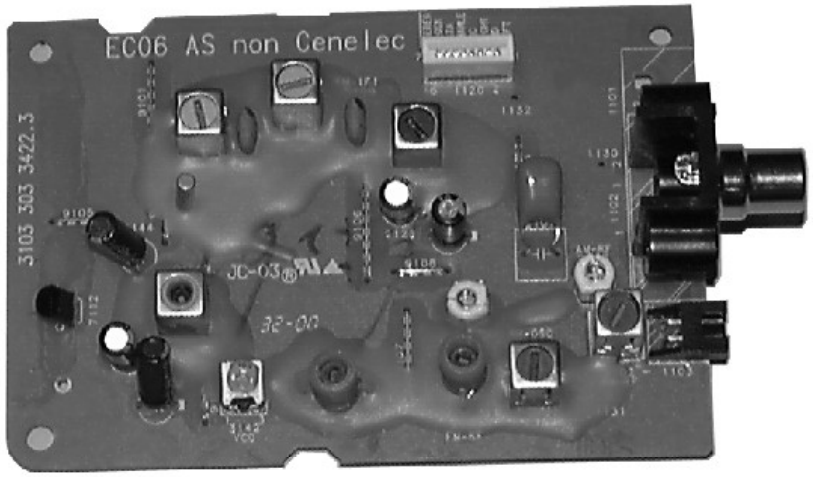
1403	3140 118 51831	FTD (MINI 404)
1520	4822 276 13775	SWITCH
1550	2422 129 16708	ROT ENCODER 24P
6420	9322 167 73676	LED LTL-4221NLC-KA
6800	9322 172 75676	LED VS LTL-1CHKFK
6801	9322 172 75676	LED VS LTL-1CHKFK
6803	9322 167 73676	LED LTL-4221NLC-KA
7400	9322 189 17671	IC SM TMP88PU74YF
7401	4822 209 31981	IC SAA6579T
7403	4822 209 15449	IC 74HC4094D
7405	9322 145 26668	EEPROM M24C02-WMN6
7800	9322 185 95667	IR RECEIVER TSOP4836

HEADPHONE BOARD - CIRCUIT DIAGRAM

1800 A3	1806 B3	2813 A2	5800 C1	5802 A3	T811 C1	T813 D1
1803 C1	2811 A3	2815 A2	5801 C2	T810 C1	T812 D1	



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



ECO6 Tuner Board

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

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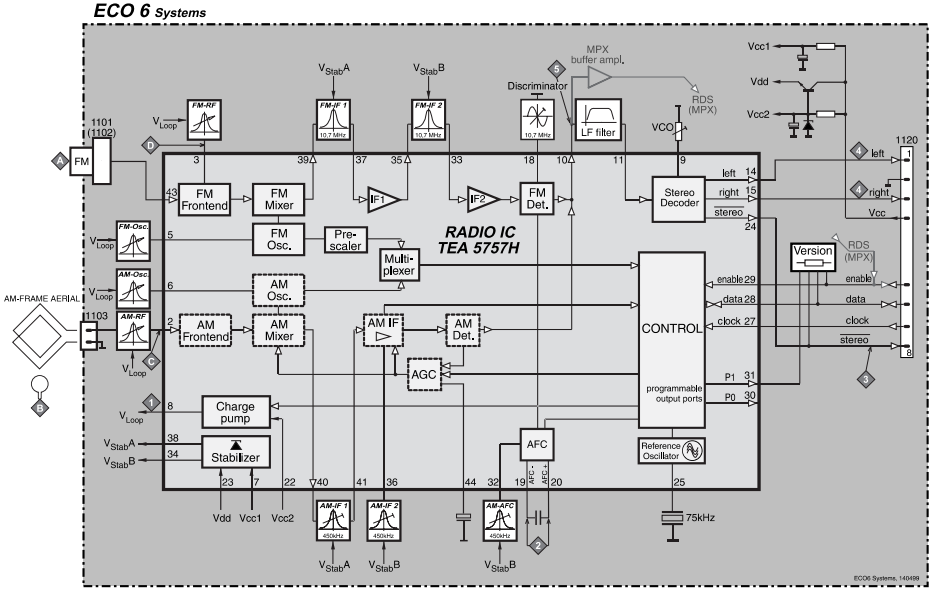
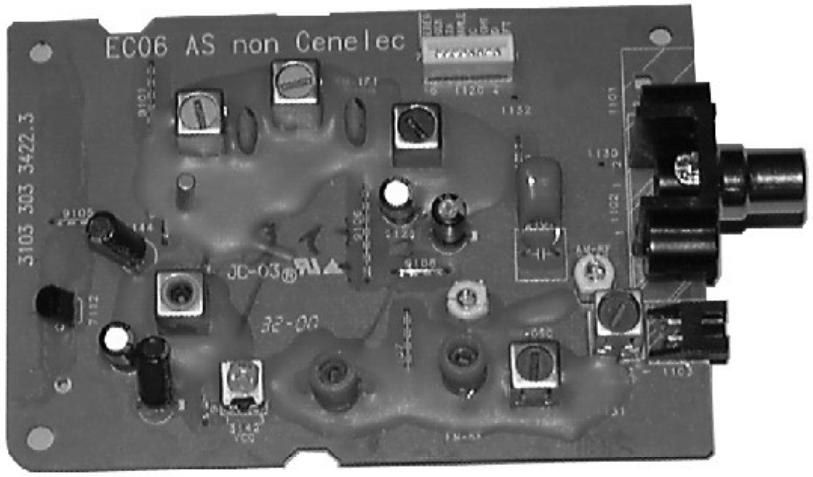
7A-1

BLOCK DIAGRAM

TUNER BOARD
ECO 6 Systems





ECO6 Tuner Board

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

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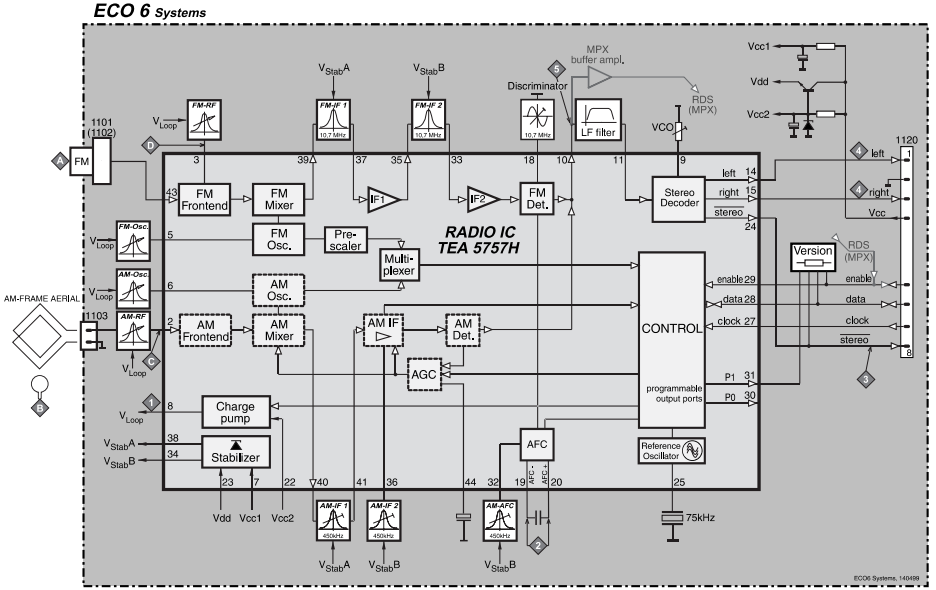
7A-1

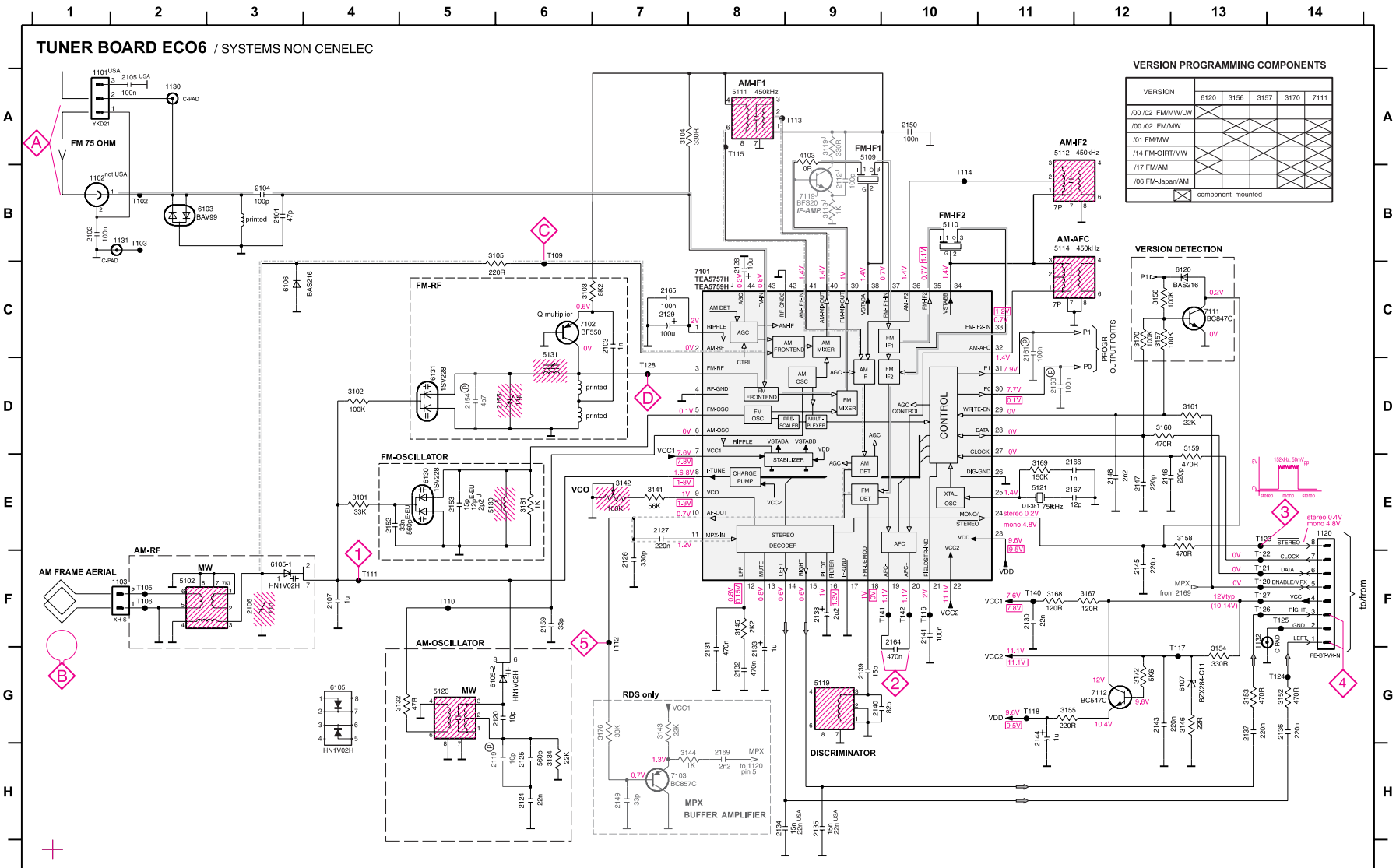
BLOCK DIAGRAM

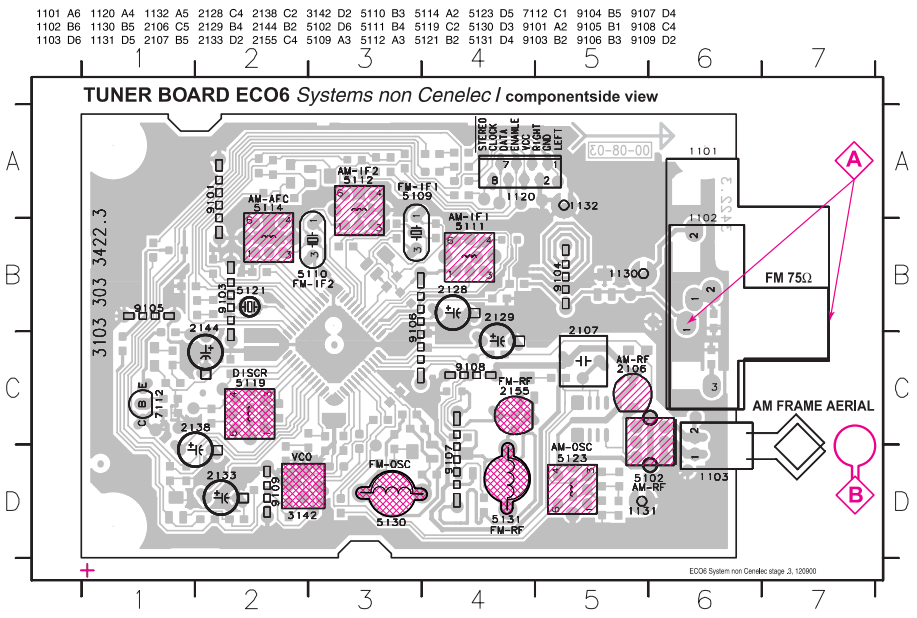
TUNER BOARD
ECO 6 Systems

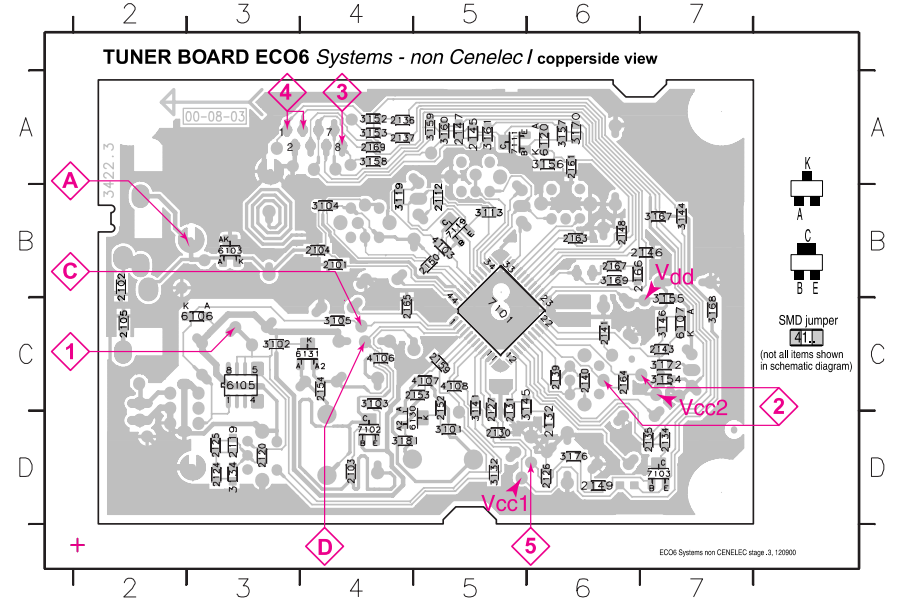


7A-2

TUNER BOARD ECO6 / SYSTEMS NON CENELEC







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

7A-3

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 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	108MHz	2155	◇4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	◇C Δf=±10kHz V_{RF} = 0.5mV (as low as possible)	IC 7101 36 220R 100nF	5111	◇5	max. f_o symmetric
			IC 7101 40 see remark [2] 220R 100nF	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	max. f_o symmetric
	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

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

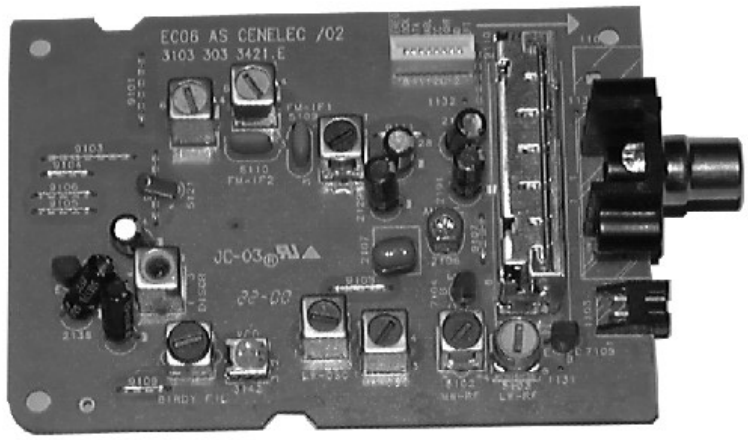
6103 ©	5322 130 34337	BAV99
6105 ©	4822 130 83075	HN1V02H
6106 ©	4822 130 83757	BAS216
6107 ©	9340 386 90115	BZX284-C11
6120 ©	4822 130 83757	BAS216
6130 ©	4822 130 82833	1SV228
6131 ©	4822 130 82833	1SV228

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 Board

version: ***SYSTEMS CENELEC***

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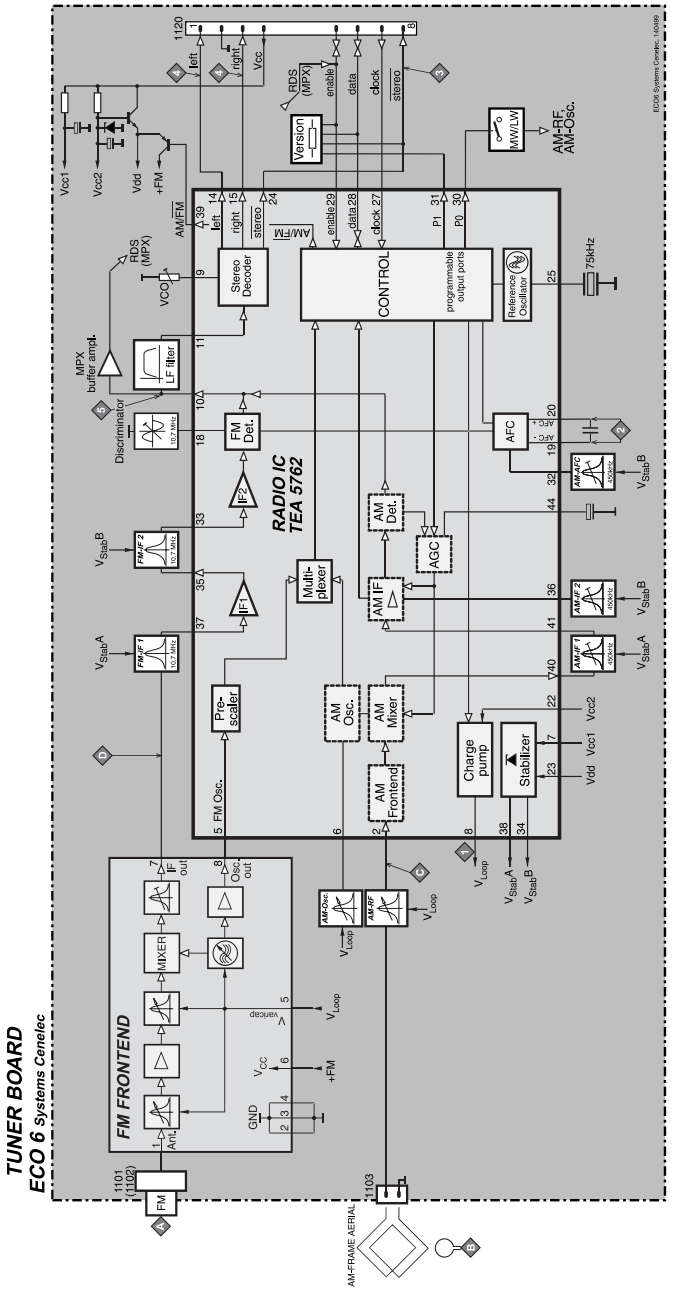
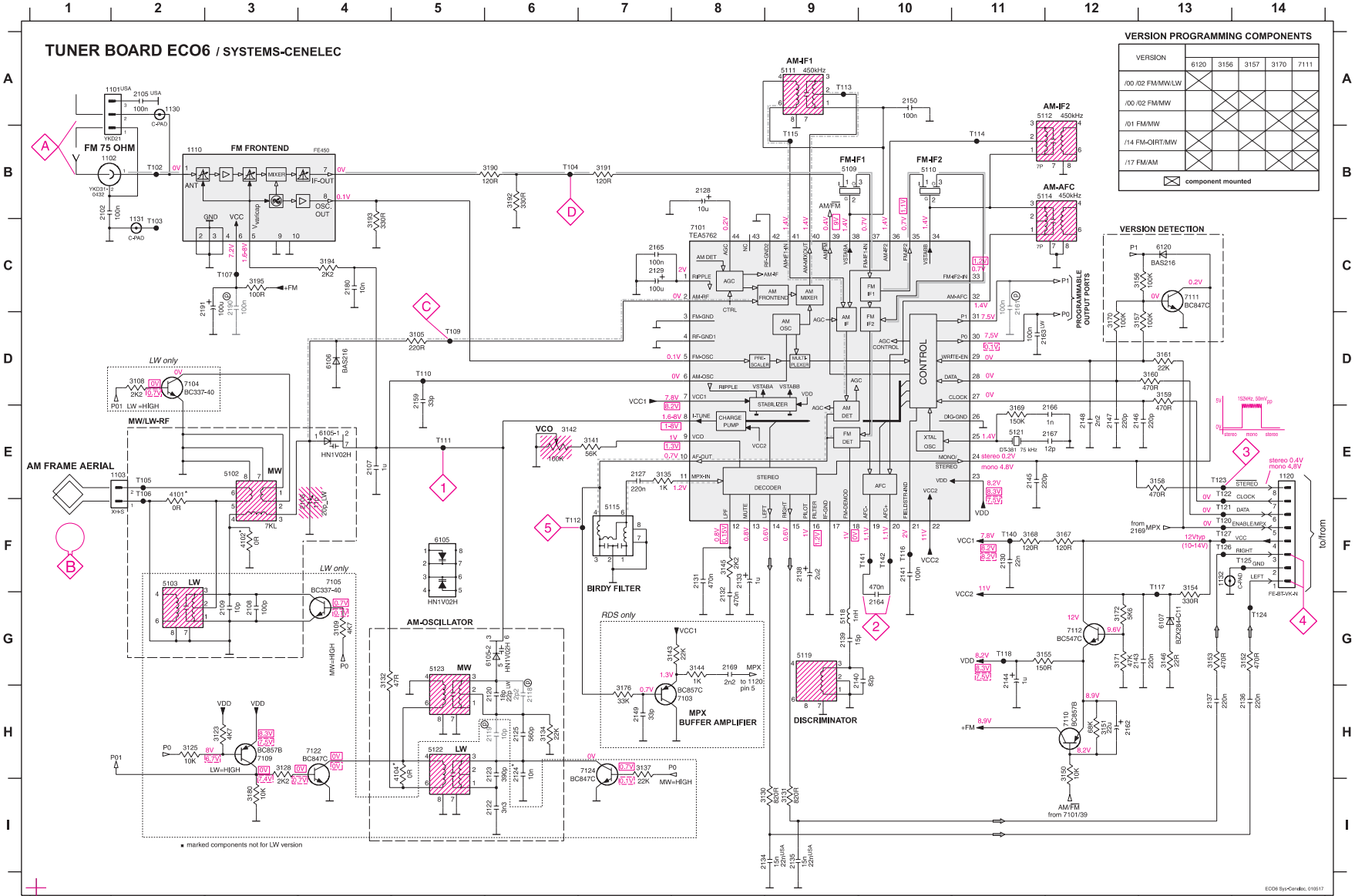
7B-1

BLOCK DIAGRAM



7B-2

TUNER BOARD ECO6 / SYSTEMS-CENELEC



VERSION PROGRAMMING COMPONENTS

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

component mounted

LEGEND

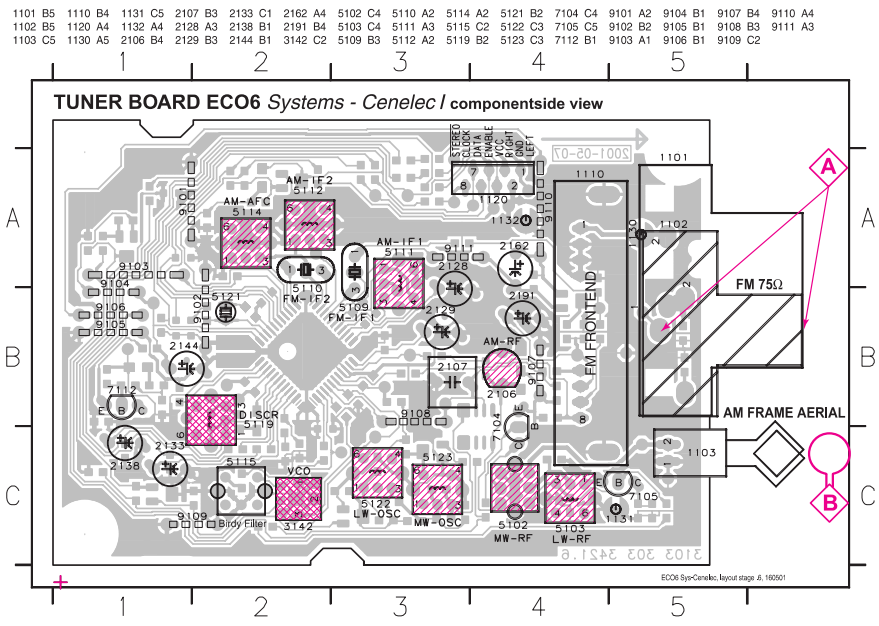
- * ... only assembled in FM/AM-version
- (P) ... for provision only
- USA ... for USA version only
- LW ... for LW version only

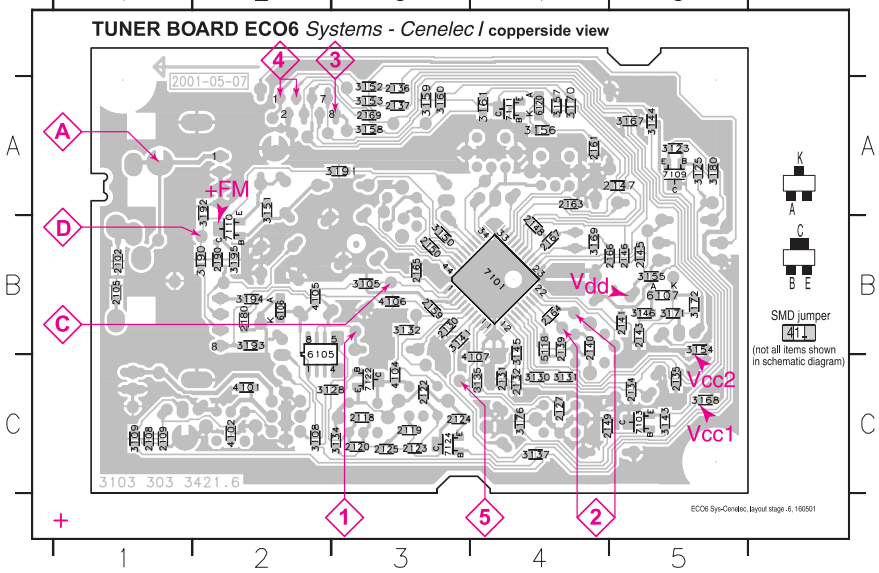
SMD jumper 41xx 0R

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

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

1101	A2	5121	E11
1102	B1	5122	H5
1103	E2	5123	G5
1110	B2	6105-1	E4
1120	E14	6105-2	G6
1130	A2	6106	D4
1131	C2	6107	G13
1132	F13	6120	C13
2102	B1	7101	C8
2105	A2	7103	H8
2106	E3	7104	D2
2107	E4	7105	F4
2108	G3	7109	H3
2109	G3	7110	H12
2118	H6	7111	C13
2119	H6	7112	G12
2120	H6	7122	H4
2122	I6	7124	H7
2123	H6	T102	B2
2124	H6	T103	B2
2125	H6	T104	B6
2127	E7	T105	E2
2128	B8	T106	E2
2129	C7	T107	C3
2130	F11	T109	D5
2131	F8	T110	D5
2132	F8	T111	E5
2133	F8	T112	F5
2134	I6	T113	A9
2135	I9	T114	B11
2136	H14	T116	F10
2137	H13	T117	F13
2138	F9	T118	G11
2139	G9	T120	F13
2140	G9	T121	F13
2141	F10	T122	E13
2143	G12	T123	E13
2144	G11	T124	G14
2145	E11	T125	F14
2146	E12	T126	F13
2147	E12	T127	F13
2148	E12	T140	F11
2149	H7	T141	F10
2150	A10	T142	F10
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		
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		





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

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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
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 220R 100nF	5111	◇5	max. f_o symmetric
			IC 7101 40 see remark 2) 220R 100nF	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, 160599

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

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

RESISTORS

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

COILS

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

DIODES

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

TRANSISTORS

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

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC

PWR303
MODULE UCD 100-150W

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

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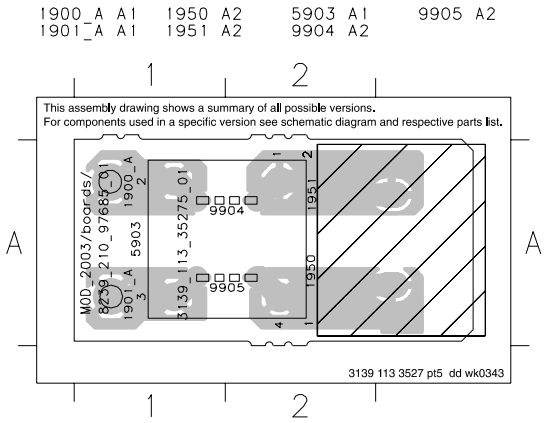
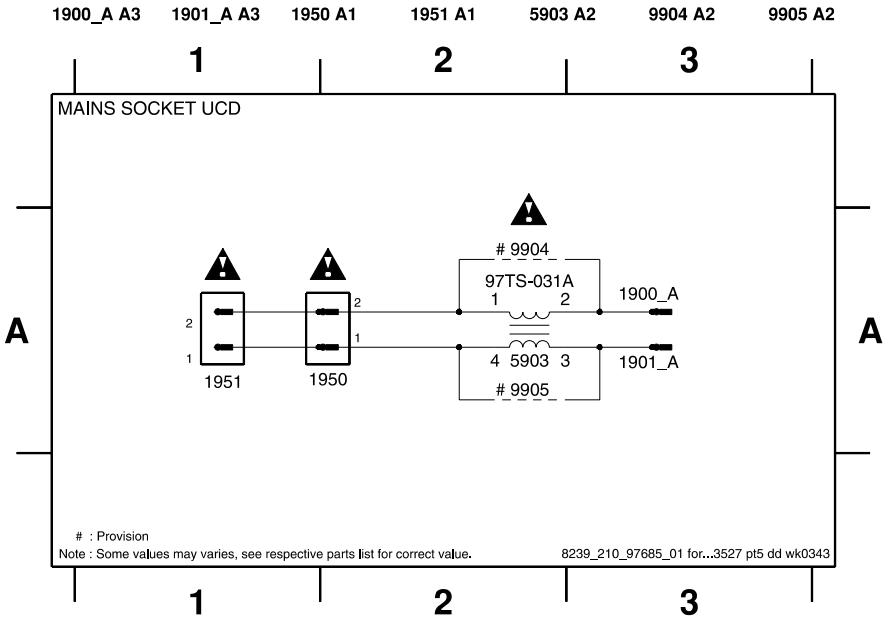
MAINS SOCKET UCD BOARD - COMPONENT LAYOUT



MAINS SOCKET UCD BOARD - CIRCUIT DIAGRAM

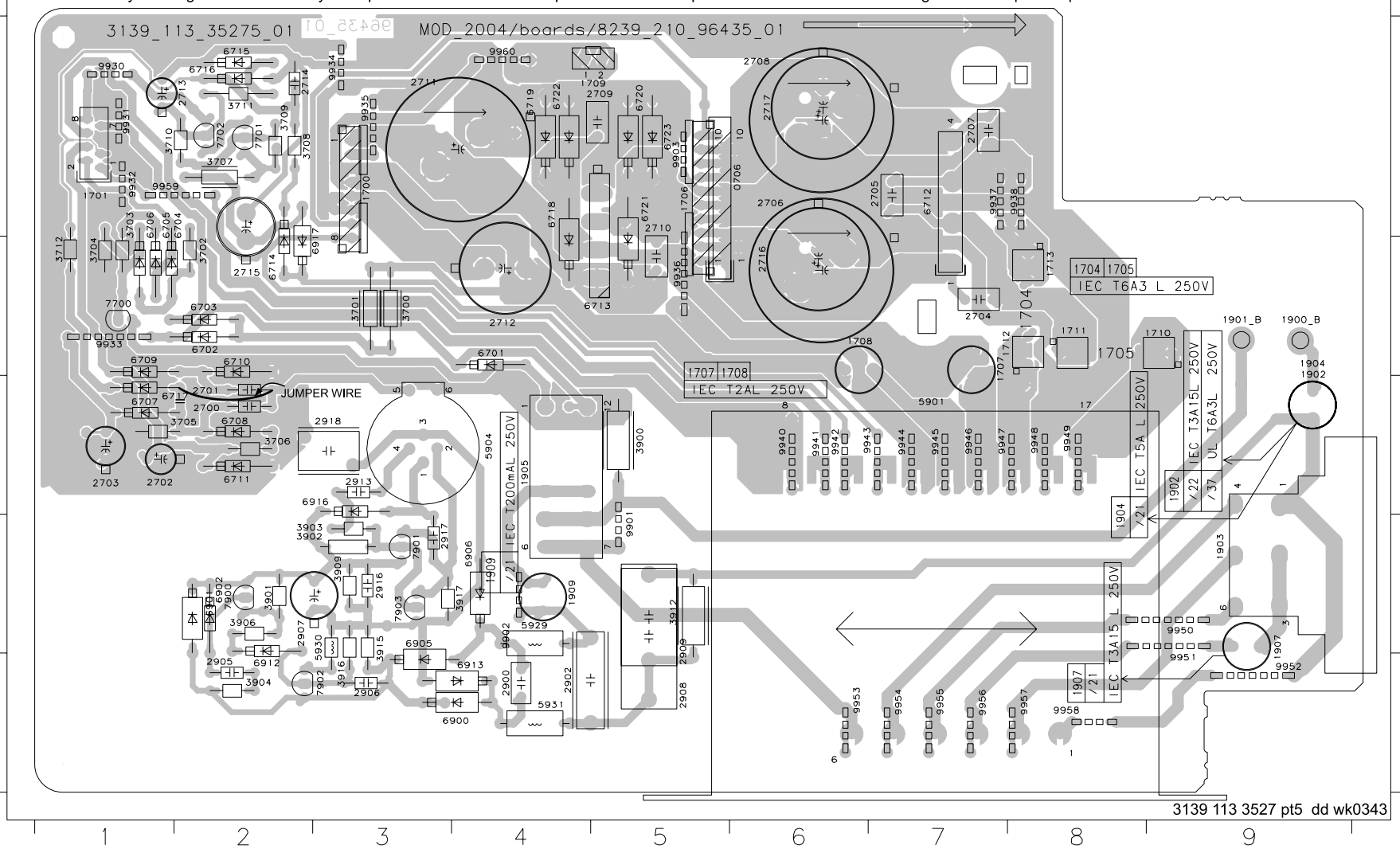


8-2

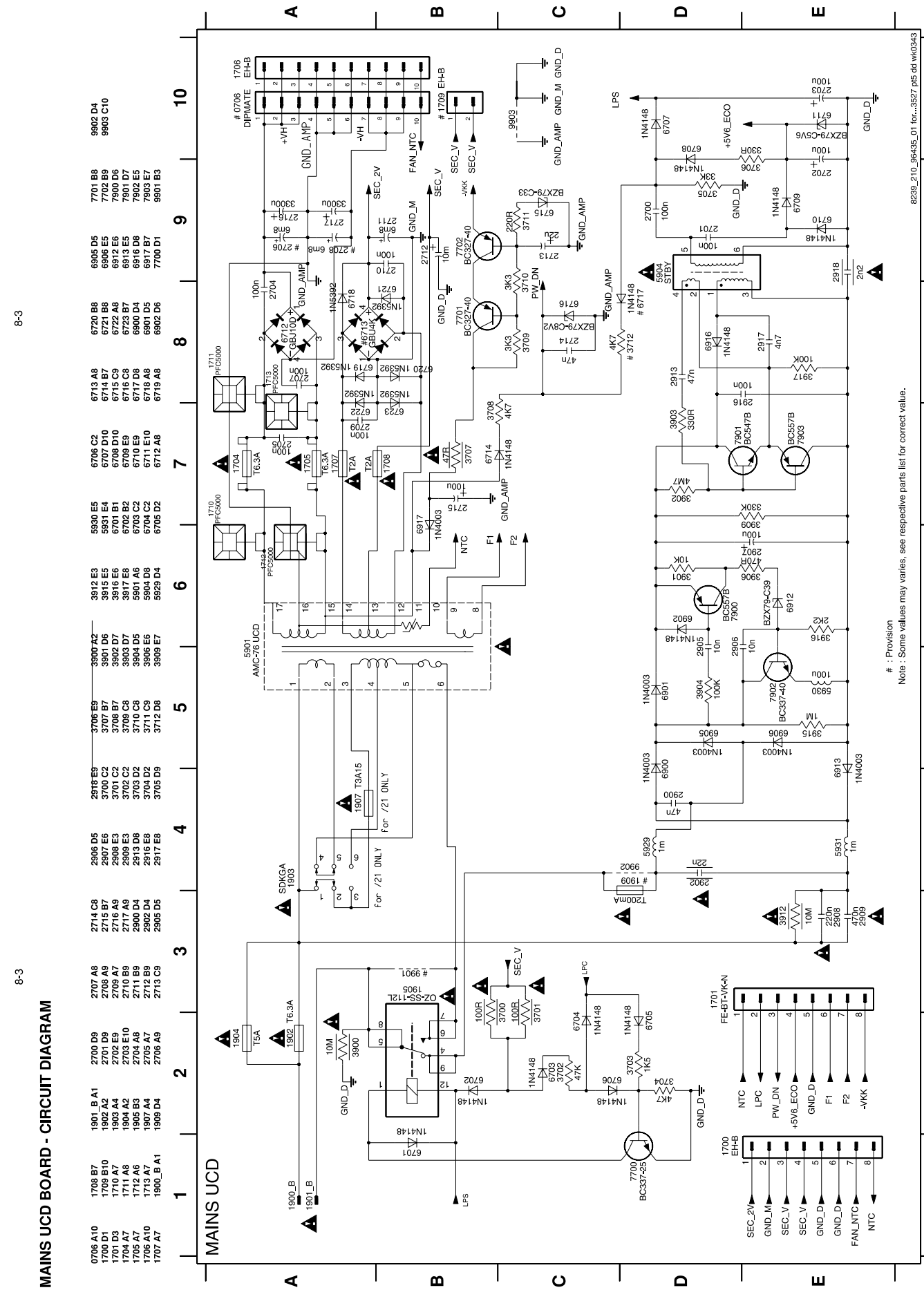
MAINS UCD BOARD - COMPONENT LAYOUT

0706 A6	1713 B8	2701 C2	2711 A3	2906 E3	3702 B2	3712 B1	3916 E3	6704 A2	6714 B2	6900 E4	7701 A2	9931 A1	9942 C6	9952 E9
1700 A3	1900_B B9	2702 C1	2712 B4	2907 D2	3703 A1	3900 C5	3917 D4	6705 A1	6715 A2	6901 D2	7702 A2	9932 A1	9943 C6	9953 E6
1701 A1	1901_B B9	2703 C1	2713 A2	2908 E5	3704 B1	3901 D2	5901 C7	6706 A1	6716 A2	6902 D2	7900 D2	9933 B1	9944 C7	9954 E7
1706 A5	1902_B9	2704 B7	2714 A2	2909 D5	3705 C2	3902 D2	5904 C4	6707 C1	6717 C2	6905 D3	7901 D3	9934 A3	9945 C7	9955 E7
1707 B7	1903 D9	2705 A7	2715 B2	2913 C3	3706 C2	3903 D2	5929 D4	6708 C2	6718 A4	6906 D4	7902 E3	9935 A3	9946 C7	9956 E7
1708 B6	1904 B9	2706 A6	2716 B6	2916 D3	3707 A2	3904 E2	5930 D3	6709 B1	6719 A4	6912 E2	7903 D3	9936 B5	9947 C7	9957 E8
1709 A5	1905 C4	2707 A7	2717 A6	2917 D3	3708 A2	3906 D2	5931 E4	6710 B2	6720 A5	6913 E4	9901 D5	9937 A7	9948 C8	9958 E8
1710 B9	1907 D9	2708 A6	2900 E4	2918 C3	3709 A2	3909 D3	6701 B4	6711 C2	6721 A5	6916 C3	9902 D4	9938 A8	9949 C8	9959 A1
1711 B8	1909 D4	2709 A5	2902 E4	3700 B3	3710 A1	3912 D5	6702 B2	6712 A7	6722 A4	6917 B3	9903 A5	9940 C6	9950 D9	9960 A4
1712 B7	2700 C2	2710 A5	2905 E2	3701 B3	3711 A2	3915 D3	6703 B2	6713 B5	6723 A5	7700 B1	9930 A1	9941 C6	9951 E9	

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

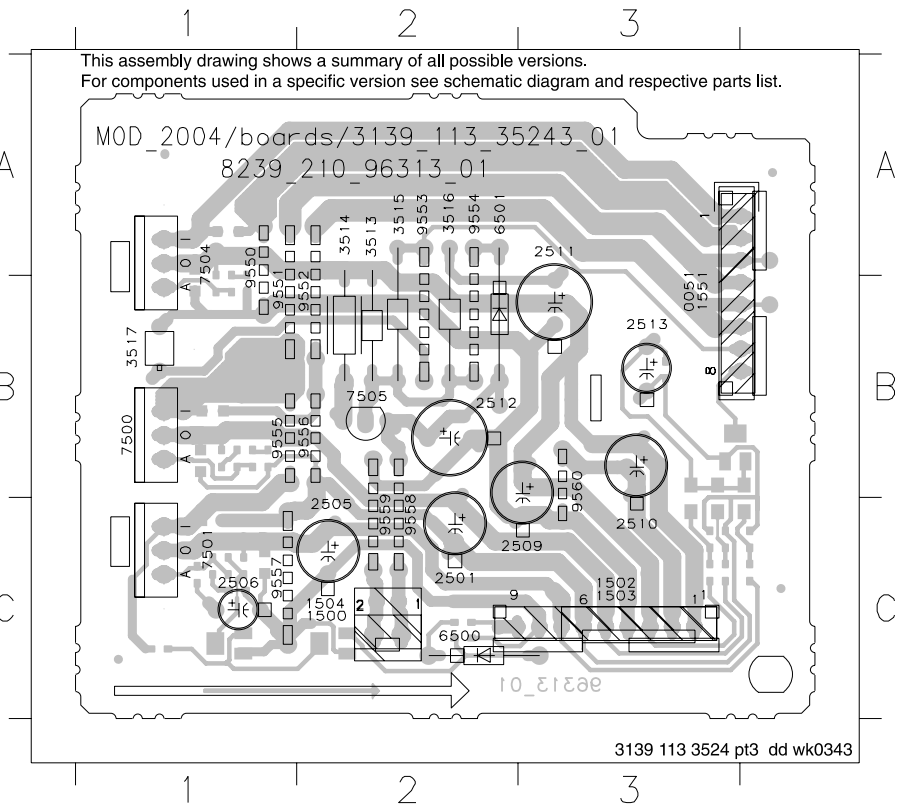


MAINS UCD BOARD - CIRCUIT DIAGRAM



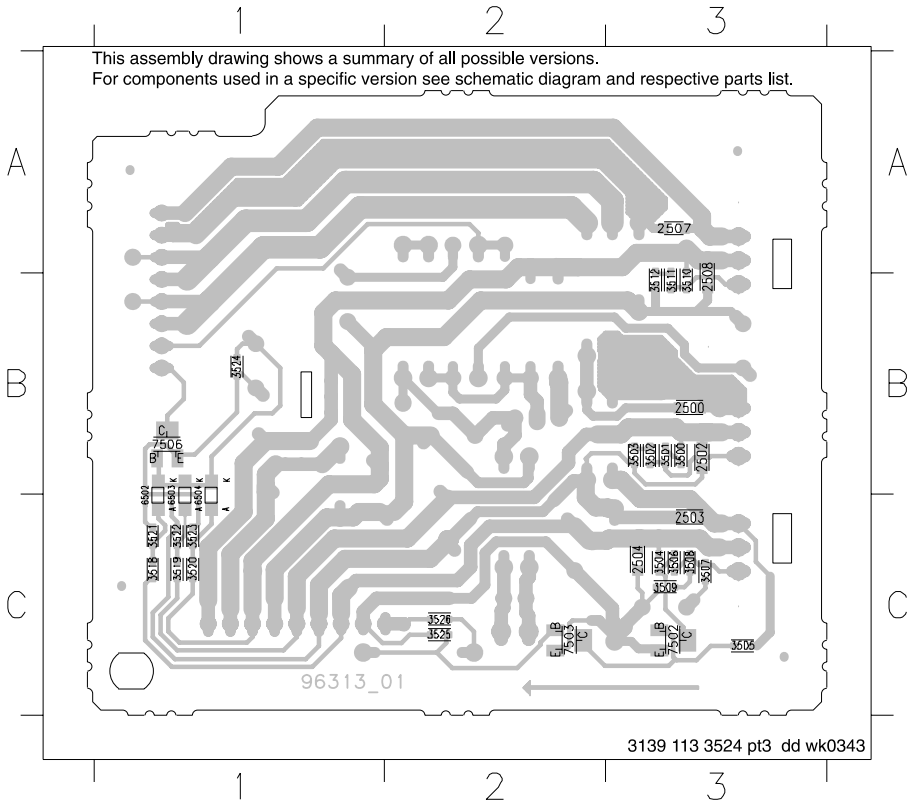
REGULATOR UCD BOARD - COMPONENT LAYOUT

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



REGULATOR UCD BOARD - CHIP LAYOUT

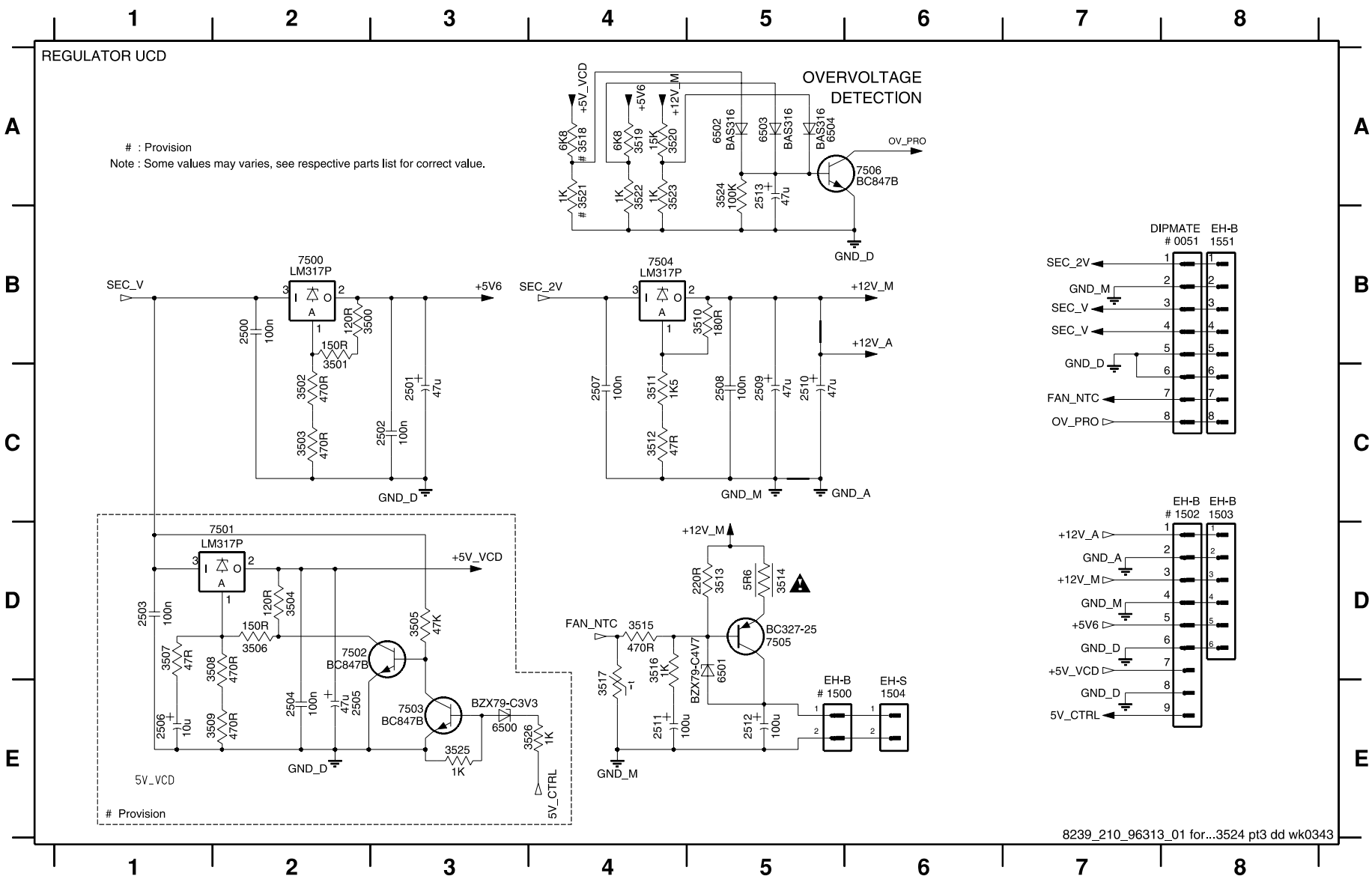
2500 B3	2508 B3	3504 C3	3509 C3	3519 C1	3524 B1	6504 C1	
2502 B3	3500 B3	3505 C3	3510 B3	3520 C1	3525 C2	7502 C3	
2503 C3	3501 B3	3506 C3	3511 B3	3521 C1	3526 C2	7503 C2	
2504 C3	3502 B3	3507 C3	3512 B3	3522 C1	6502 C1	7506 B1	
2507 A3	3503 B3	3508 C3	3518 C1	3523 C1	6503 C1		



8-5

REGULATOR UCD BOARD - CIRCUIT DIAGRAM

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

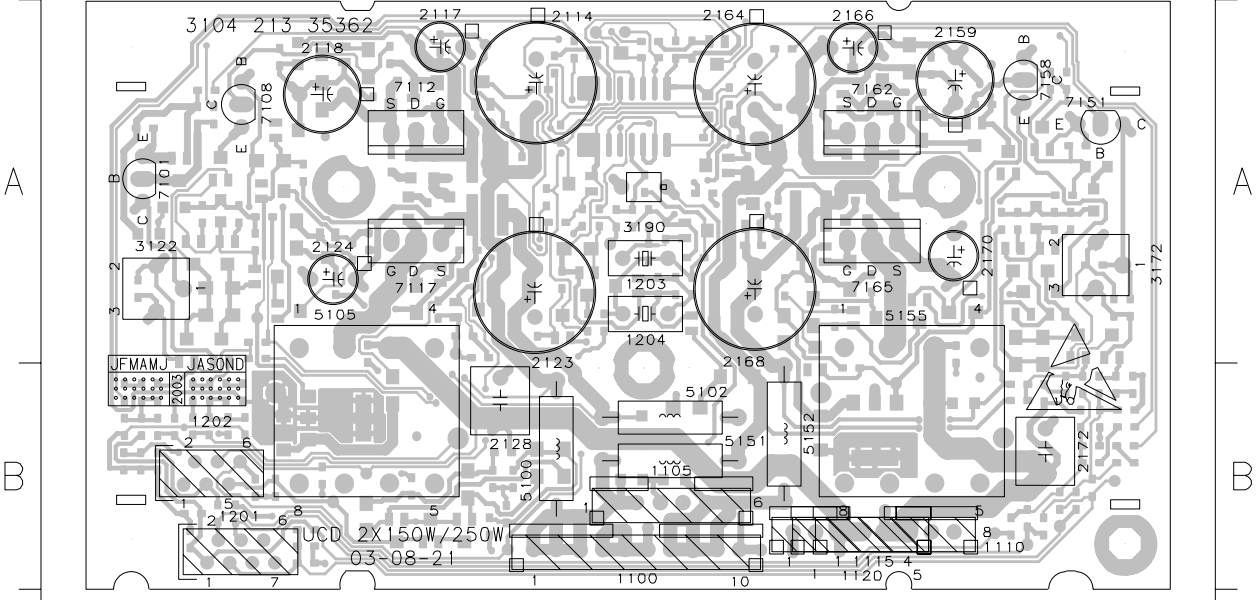


8-6

AMPLIFIER UCD BOARD (SE) - COMPONENT LAYOUT

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

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



3104 213 3536 pt2 dd wk0343

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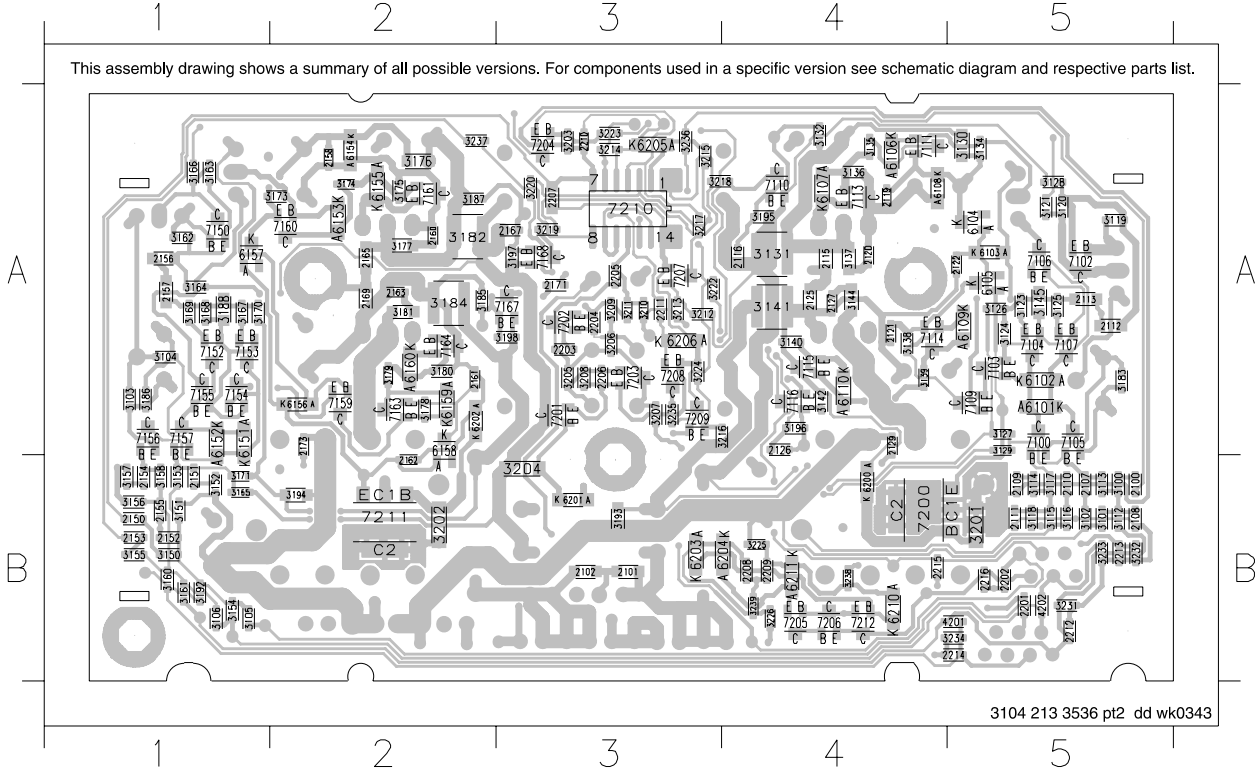
AMPLIFIER UCD BOARD (SE) - CHIP LAYOUT

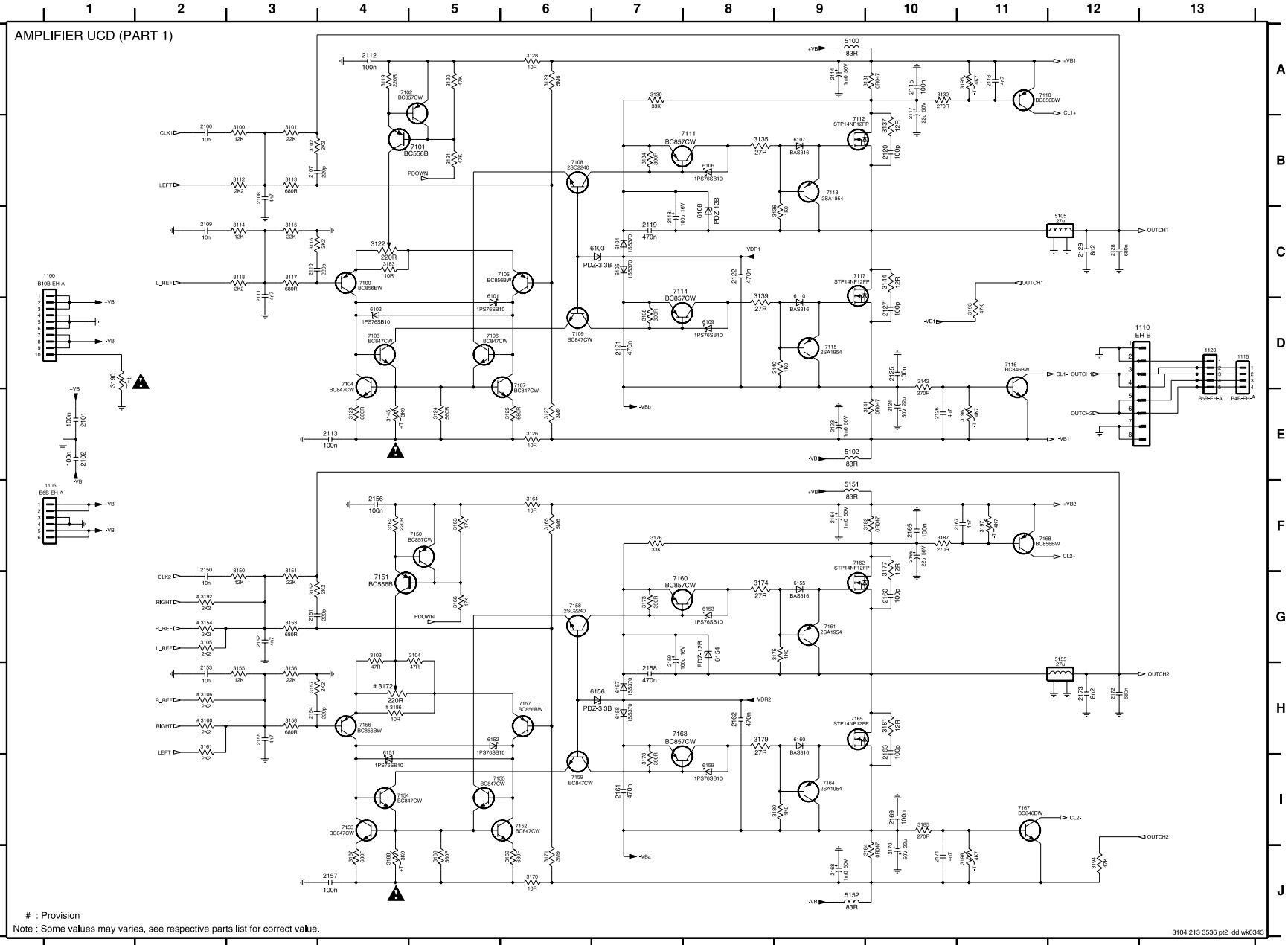
2100 B5	2122 A5	2161 A2	2208 B4	3106 B1	3127 A5	3144 A4	3164 A1	3180 A2	3198 A3
2101 B3	2125 A4	2162 B2	2209 B4	3112 B5	3128 A5	3145 A5	3165 B1	3181 A2	3201 B5
2102 B3	2126 A4	2163 A2	2210 A3	3113 B5	3129 A5	3150 B1	3166 A1	3182 A2	3202 B2
2107 B5	2127 A4	2165 A2	2211 A3	3114 B5	3130 A5	3151 B1	3167 A1	3183 A5	3203 A3
2108 B5	2129 A4	2167 A3	2212 B5	3115 B5	3131 A4	3152 B1	3168 A1	3184 A2	3204 B3
2109 B5	2150 B1	2169 A2	2213 B5	3116 B5	3132 A4	3153 B1	3169 A1	3185 A2	3205 A3
2110 B5	2151 B1	2171 A3	2214 B5	3117 B5	3134 A5	3154 B1	3170 A1	3186 A1	3206 A3
2111 B5	2152 B1	2173 A2	2215 B4	3118 B5	3135 A4	3155 B1	3171 B1	3187 A2	3207 A3
2112 A5	2153 B1	2201 B5	2216 B5	3119 A5	3136 A4	3156 B1	3173 A2	3188 A1	3208 A3
2113 A5	2154 B1	2202 B5	3100 B5	3120 A5	3137 A4	3157 B1	3174 A2	3192 B1	3209 A3
2115 A4	2155 B1	2203 A3	3101 B5	3121 A5	3138 A4	3158 B1	3175 A2	3193 B3	3210 A3
2116 A4	2156 A1	2204 A3	3102 B5	3123 A5	3139 A4	3160 B1	3176 A2	3194 B2	3211 A3
2119 A4	2157 A1	2205 A3	3103 A1	3124 A5	3140 A4	3161 B1	3177 A2	3195 A4	3212 A3
2120 A4	2158 A2	2206 A3	3104 A1	3125 A5	3141 A4	3162 A1	3178 A2	3196 A4	3213 A3
2121 A4	2160 A2	2207 A3	3105 B1	3126 A5	3142 A4	3163 A1	3179 A2	3197 A3	3214 A3

3215 A3	6158 A2	F101 B3							
3216 A4	6159 A2	F102 B3							
3217 A3	6160 A2	F103 B2							
3218 A3	6200 B4	F104 B2							
3219 A3	6201 B3	F105 B2							
3220 A3	6202 A2	F106 B3							
3222 A3	6203 B3	F107 A4							
3223 A3	6204 B4	F108 A4							
3224 A3	6205 A3	F109 A2							
3225 B4	6206 A4	F110 A3							
3226 B4	6207 A4	F111 A5							
3231 B5	6108 A4	F112 B2							
3232 B5	6109 A5	F113 A3							
3233 B5	6110 A4	F114 B1							
3234 B5	6151 A1	F115 B1							
3235 A3	6152 A1	F116 B1							
3236 A3	6153 A2	F117 B1							
3237 A2	6154 A2	F118 B4							
3238 B4	6155 A2	F119 B4							
3239 B4	6156 A2	F120 B4							
4201 B5	6157 A1	F121 A3							
4202 B5	F100 B3	F122 A3							
6101 A5									
6102 A5									
6103 A5									
6104 A5									
6105 A5									
6106 A4									
6107 A4									
6108 A4									
6109 A5									
6110 A4									
6151 A1									
6152 A1									
6153 A2									
6154 A2									
6155 A2									
6156 A2									
6157 A1									



8-8

AMPLIFIER UCD BOARD (SE) - CIRCUIT DIAGRAM PART 1



\# : Provision

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

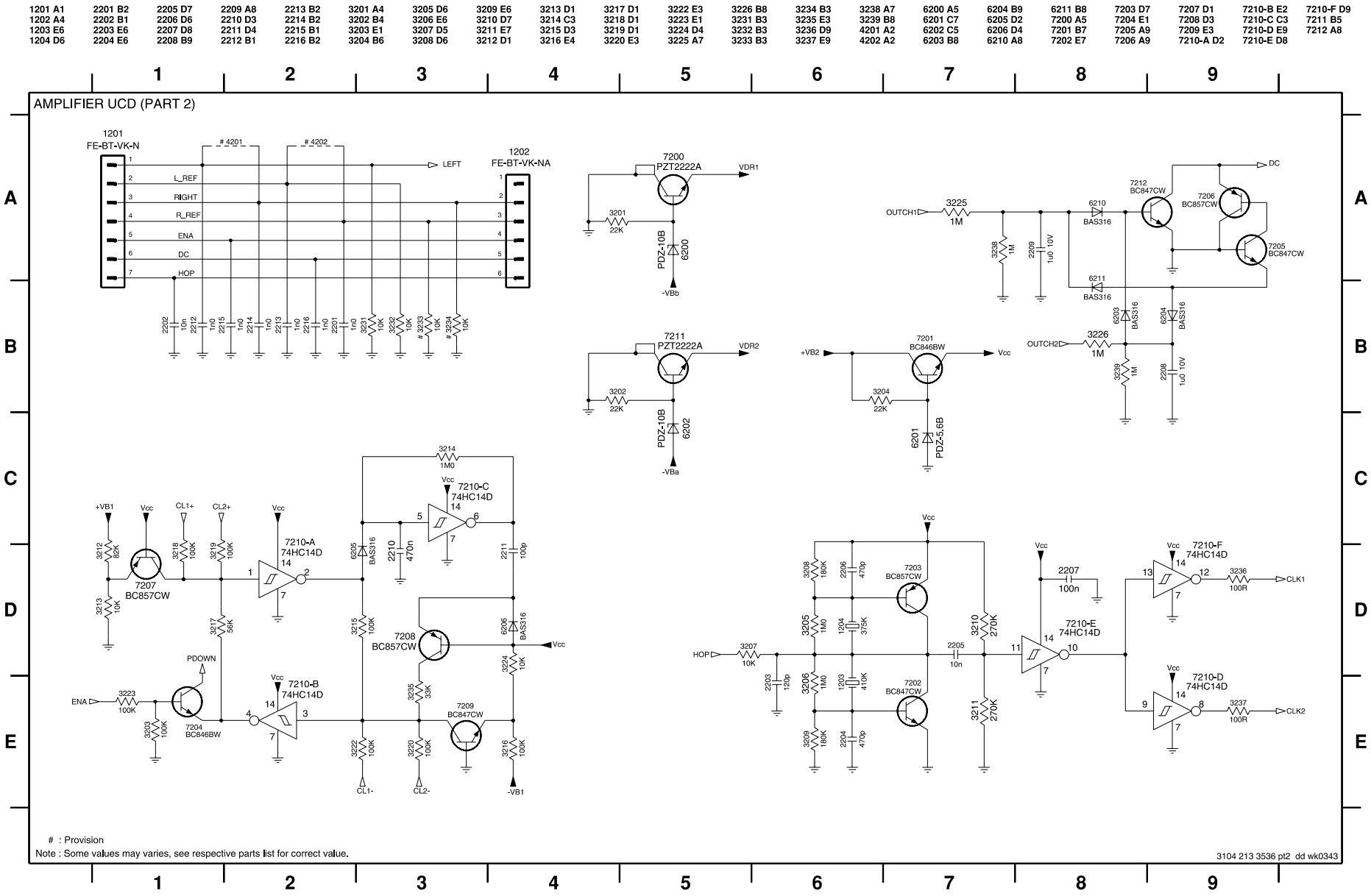
3104 213 3536 pt2 dd wk0343

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

8-9

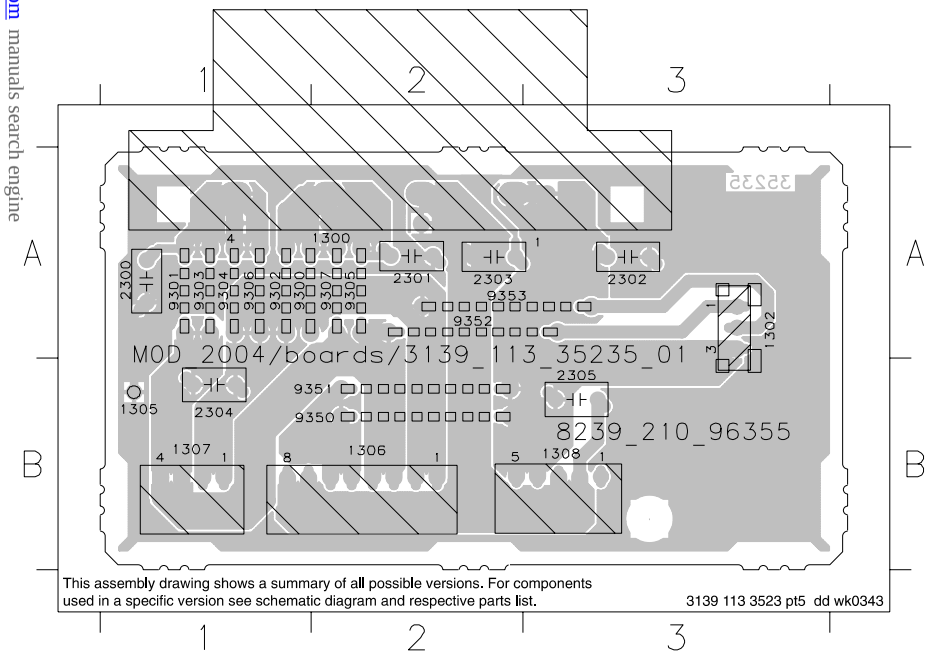
AMPLIFIER UCD BOARD (SE) - CIRCUIT DIAGRAM PART 2

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



SPEAKER UCD BOARD - COMPONENT LAYOUT

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



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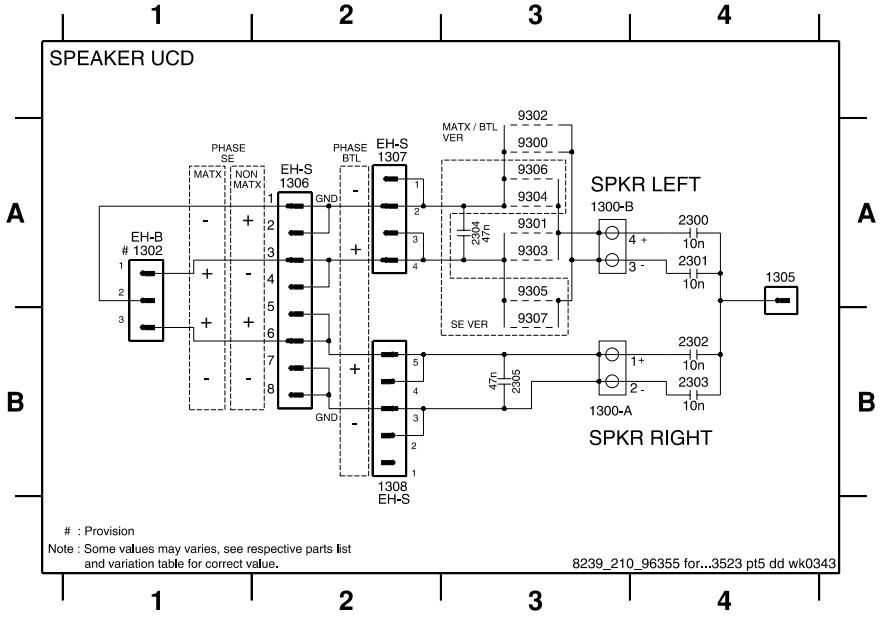
SPEAKER UCD BOARD - CIRCUIT DIAGRAM

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



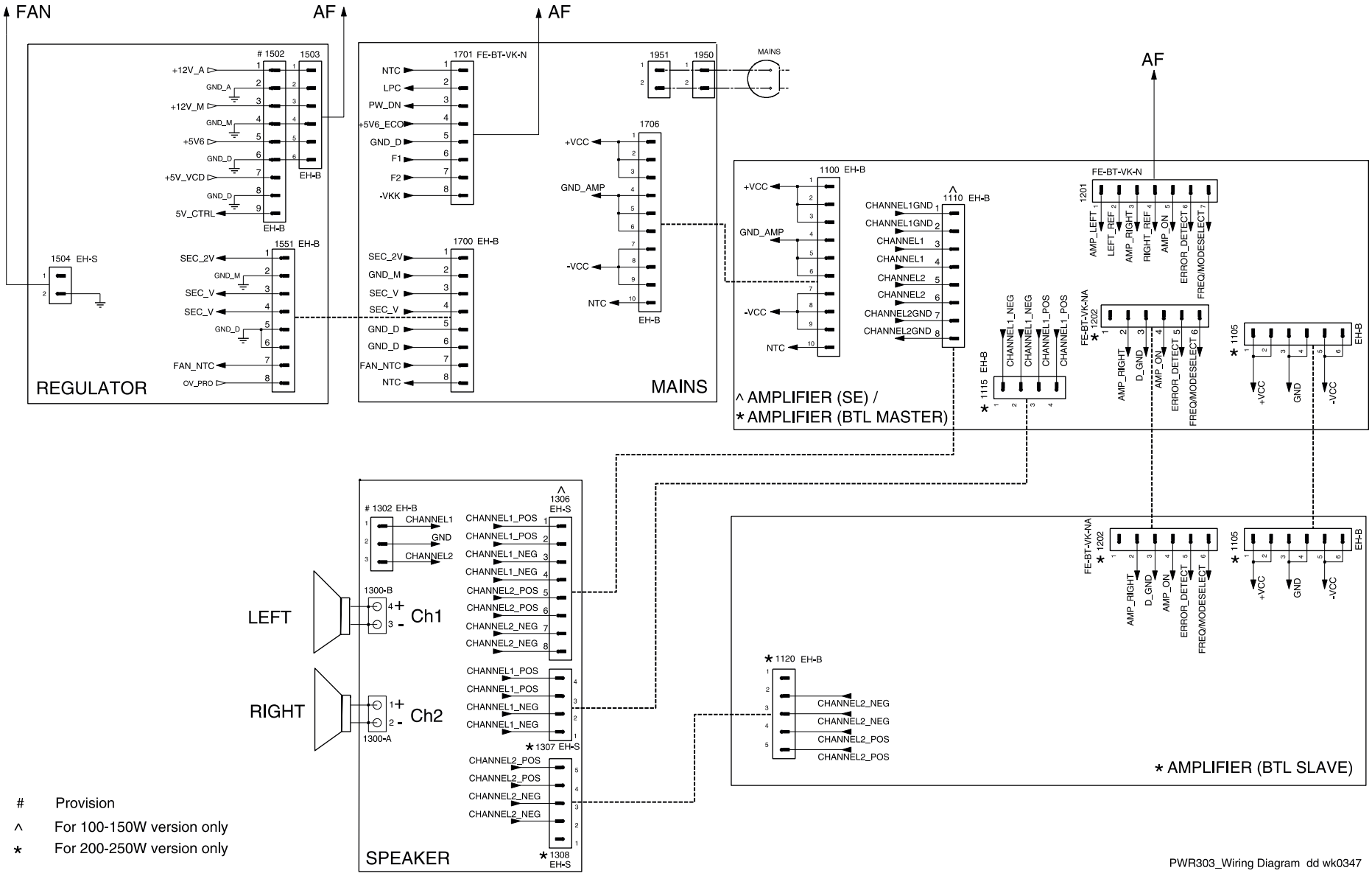
SPEAKER UCD BOARD - VARIATION TABLE

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

X - item in use.

8-11

WIRING DIAGRAM



\# Provision

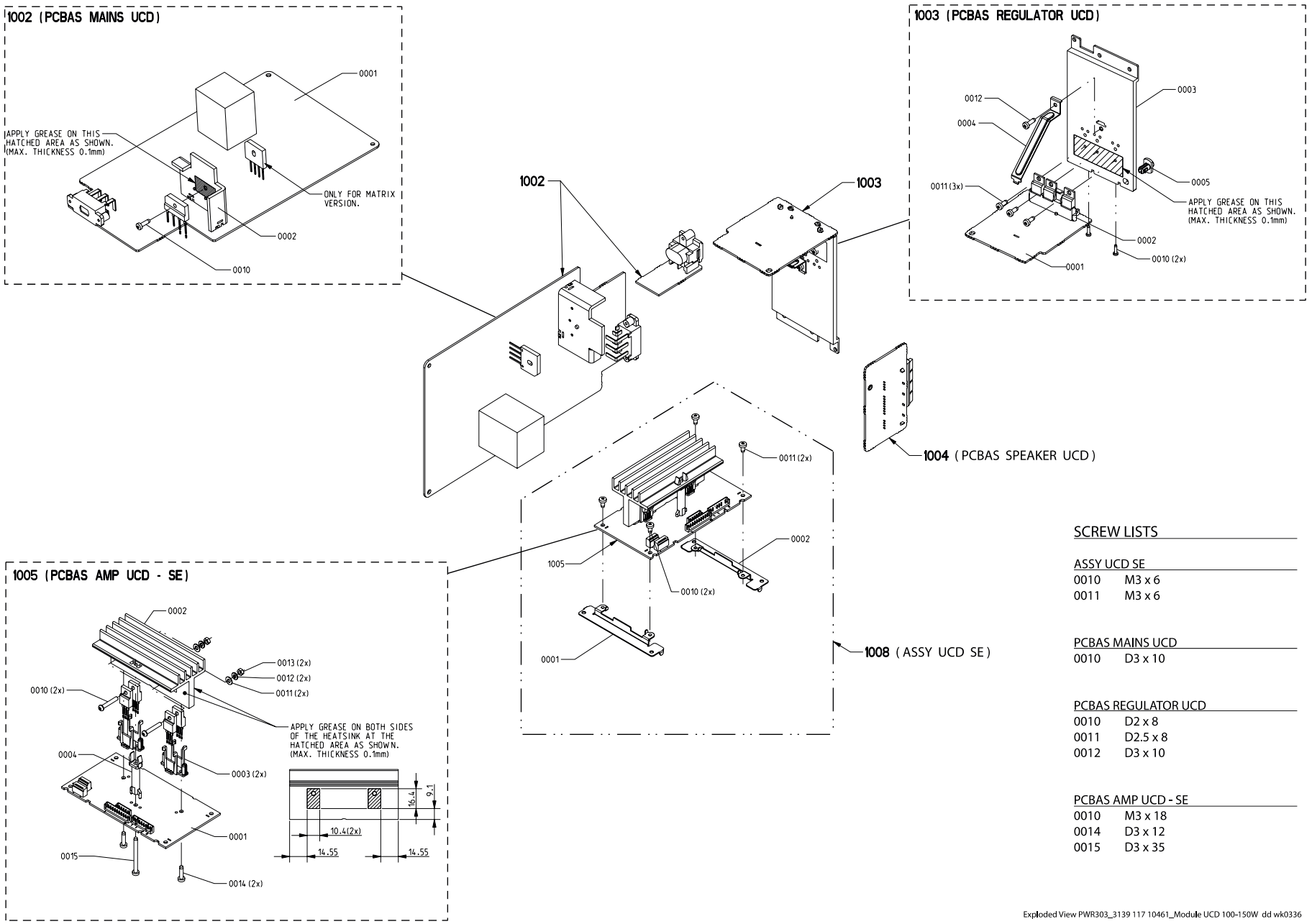
^ For 100-150W version only

* For 200-250W version only

PWR303_Wiring Diagram dd wk0347

8-12

EXPLODED VIEW



SCREW LISTS

ASSY UCD SE

0010	M3 x 6
0011	M3 x 6

PCBAS MAINS UCD

0010	D3 x 10

PCBAS REGULATOR UCD

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

PCBAS AMP UCD - SE

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

Exploded View PWR303_3139 117 10461_Module UCD 100-150W dd wk0336

ELECTRICAL PARTS LIST - MAINS UCD BOARD

MISCELLANEOUS

1701	4822 265 11515	FLEX CONNECTOR 8P	
1704	4822 070 36302	⚠ FUSE 5X20 T 6,3A 250V	
1705	4822 070 36302	⚠ FUSE 5X20 T 6,3A 250V	
1707	9965 000 07788	⚠ FUSE RAD LT 2A 250V	
1708	9965 000 07788	⚠ FUSE RAD LT 2A 250V	
1710	2422 090 01101	SOC FUSE V 1P F	
1711	2422 090 01101	SOC FUSE V 1P F	
1712	2422 090 01101	SOC FUSE V 1P F	
1713	2422 090 01101	SOC FUSE V 1P F	
1902	4822 071 53152	⚠ FUSE RAD LT 3,15A 250V	/22
1902	4822 252 51123	⚠ FUSE RAD LT 6,3A 250V	/37
1903	9965 000 07789	⚠ VOLTAGE SELECTOR	/21
1904	4822 071 55002	⚠ FUSE RAD LT 5A 250V	/21
1905	2422 132 07519	⚠ RELAY 1P 12V 16A OZ-SS L	
1907	4822 071 53152	⚠ FUSE RAD LT 3,15A 250V	/21
1950	4822 265 31015	⚠ MAINS SOCKET	/21/22
1951	2422 030 00328	⚠ MAINS SOCKET	/37

CAPACITORS

2700	2020 561 90365	100nF +80/-20% 50V	
2701	2020 561 90365	100nF +80/-20% 50V	
2702	4822 124 41584	100uF 20% 10V	
2703	4822 124 40207	100uF 20% 25V	
2704	5322 121 42578	100nF 5% 250V	
2705	5322 121 42578	100nF 5% 250V	
2707	5322 121 42578	100nF 5% 250V	
2709	5322 121 42578	100nF 5% 250V	
2710	5322 121 42578	100nF 5% 250V	
2711	2022 020 00782	6800uF 20% 35V	
2712	2020 012 93745	10000uF 20% 16V	
2713	4822 124 81151	22uF 50V	
2714	4822 126 12785	47nF 50V	
2715	2020 012 93741	100uF 20% 100V	
2716	2022 020 00644	3300uF 20% 50V	
2717	2022 020 00644	3300uF 20% 50V	
2900	4822 121 43526	47nF 5% 250V	
2902	2222 336 19106	⚠ 22nF 20% 275V	
2905	4822 121 51387	10nF 20% 16V	
2906	4822 121 51387	10nF 20% 16V	
2907	4822 124 40255	100uF 20% 63V	
2908	4822 121 10512	⚠ 220nF 20% 275V	/22
2909	4822 126 13589	⚠ 470nF 20% 275V	/21/37
2913	4822 126 12785	47nF 50V	
2916	2020 561 90365	100nF +80/-20% 50V	
2917	4822 126 11714	4,7nF 20%	
2918	4822 126 14088	⚠ 2,2nF 20% 250V	

RESISTORS

3700	4822 052 10101	⚠ 100R 5% 0,33W	
3701	4822 052 10101	⚠ 100R 5% 0,33W	
3702	4822 116 83884	47k 5% 0,5W	
3703	4822 116 52243	1k5 5% 0,5W	
3704	4822 116 52283	4k7 5% 0,5W	
3705	4822 050 23303	33k 1% 0,6W	
3706	4822 116 52219	330R 5% 0,5W	
3707	4822 052 10479	⚠ 47R 5% 0,33W	
3708	4822 116 52283	4k7 5% 0,5W	
3709	4822 116 52269	3k3 5% 0,5W	
3710	4822 116 52269	3k3 5% 0,5W	
3711	4822 116 83872	220R 5% 0,5W	
3900	4822 053 21106	⚠ 10M 5% 0,5W	/37
3901	4822 050 21003	10k 1% 0,6W	
3902	4822 050 24705	4M7 1% 0,6W	
3903	4822 116 52219	330R 5% 0,5W	
3904	4822 116 52234	100k 5% 0,5W	
3906	4822 116 83883	470R 5% 0,5W	
3909	4822 116 52272	330k 5% 0,5W	
3912	4822 053 21106	⚠ 10M 5% 0,5W	
3915	4822 116 83866	1M 5% 0,5W	
3916	4822 116 52256	2k2 5% 0,5W	
3917	4822 116 52234	100k 5% 0,5W	

COILS & FILTERS

5903	4822 157 11628	⚠ FIL MAINS	
5904	2422 549 45157	⚠ TRAFO STANDBY 3A1631N	
5929	4822 157 53473	IND FXD 1000uH 10%	
5930	4822 157 52333	IND FXD 100uH 5%	
5931	4822 157 53473	IND FXD 1000uH 10%	

DIODES

6701	4822 130 30621	1N4148	
6702	4822 130 30621	1N4148	
6703	4822 130 30621	1N4148	
6704	4822 130 30621	1N4148	
6705	4822 130 30621	1N4148	
6706	4822 130 30621	1N4148	
6707	4822 130 30621	1N4148	
6708	4822 130 30621	1N4148	
6709	4822 130 30621	1N4148	
6710	4822 130 30621	1N4148	
6711	4822 130 34173	BZX79-C5V6	
6712	9322 197 92682	BRIDGE GBJ10D	
6714	4822 130 30621	1N4148	
6715	4822 130 34142	BZX79-C33	
6716	4822 130 34382	BZX79-C8V2	
6718	4822 130 31878	1N5392	
6719	4822 130 31878	1N5392	
6720	4822 130 31878	1N5392	
6721	4822 130 31878	1N5392	
6722	4822 130 31878	1N5392	/21
6723	4822 130 31878	1N5392	/21
6900	4822 130 31878	1N4003G	
6901	4822 130 31878	1N4003G	
6902	4822 130 30621	1N4148	

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ELECTRICAL PARTS LIST - MAINS UCD BOARD

6905	4822 130 31878	1N4003G	
6906	4822 130 31878	1N4003G	
6912	4822 130 34145	BZX79-C39	
6913	4822 130 31878	1N4003G	
6916	4822 130 30621	1N4148	
6917	4822 130 31878	1N4003G	
7701	4822 130 41327	BC327-40	
7702	4822 130 41327	BC327-40	
7900	4822 130 44568	BC557B	
7901	4822 130 40959	BC547B	
7902	4822 130 40855	BC337-40	
7903	4822 130 44568	BC557B	

TRANSISTORS & INTEGRATED CIRCUITS

7700	4822 130 40981	BC337-25	

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

ELECTRICAL PARTS LIST - REGULATOR UCD BOARD

MISCELLANEOUS

0002	3139 114 75361	HOLDER IC	
0005	3139 114 71010	STOPPER HEATSINK	

CAPACITORS

2500	4822 126 14585	100nF 10% 50V	
2501	4822 124 81286	47uF 20% 16V	
2502	4822 126 14585	100nF 10% 50V	
2507	2222 580 15649	100nF 10% 50V	
2508	4822 126 14585	100nF 10% 50V	
2509	4822 124 81286	47uF 20% 16V	
2510	4822 124 81286	47uF 20% 16V	
2511	4822 124 41643	100uF 20% 16V	
2512	4822 124 41643	100uF 20% 16V	
2513	4822 124 80231	47uF 20% 16V	

RESISTORS

3500	4822 051 30121	120R 5% 0,062W	
3501	4822 051 30151	150R 5% 0,062W	
3502	4822 051 30471	470R 5% 0,062W	
3503	4822 051 30471	470R 5% 0,062W	
3510	4822 051 30181	180R 5% 0,062W	
3511	4822 051 30152	1k5 5% 0,062W	
3512	4822 051 30479	47R 5% 0,062W	
3513	4822 116 83872	220R 5% 0,5W	
3514	4822 052 10568	⚠ 5R6 5% 0,33W	
3515	4822 116 83883	470R 5% 0,5W	
3516	4822 050 11002	1k 1% 0,4W	
3517	4822 117 12063	NTC DC 5W 10k 5%	
3519	4822 051 30682	6k8 5% 0,062W	
3520	4822 051 30153	15k 5% 0,062W	
3522	4822 051 30102	1k 5% 0,062W	
3523	4822 051 30102	1k 5% 0,062W	
3524	4822 117 13632	100k 1% 0,62W	

DIODES

6501	4822 130 34174	BZX79-C4V7	
6502	4822 130 11397	BAS316	
6503	4822 130 11397	BAS316	
6504	4822 130 11397	BAS316	

TRANSISTORS & INTEGRATED CIRCUITS

7500	4822 209 81351	IC LM317P	
7504	4822 209 81351	IC LM317P	
7505	4822 130 41246	BC327-25	
7506	5322 130 60159	BC847B	

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

ELECTRICAL PARTS LIST - SPEAKER UCD BOARD

MISCELLANEOUS

1300	4822 267 31176	SOC CLICK 4P	

CAPACITORS

2300	4822 121 41857	10nF 5% 250V	
2301	4822 121 41857	10nF 5% 250V	
2302	4822 121 41857	10nF 5% 250V	
2303	4822 121 41857	10nF 5% 250V	

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

ELECTRICAL PARTS LIST - AMPLIFIER UCD BOARD (SE)

MISCELLANEOUS

0003	3104 214 39321	TO-220 HOLDER
0004	3104 214 39331	SPACER
1201	4822 267 10953	FLEX CONNECTOR 7P
1203	2422 540 98578	RES CER 410kHz
1204	2422 540 98552	RES CER 375kHz

CAPACITORS

2100	5322 126 11583	10nF 10% 50V
2101	2222 580 15649	100nF 10% 50V
2102	2222 580 15649	100nF 10% 50V
2107	4822 126 13883	220pF 5% 50V
2108	4822 126 13193	4,7nF 10% 63V
2109	5322 126 11583	10nF 10% 50V
2110	4822 126 13883	220pF 5% 50V
2111	4822 126 13193	4,7nF 10% 63V
2112	2222 580 15649	100nF 10% 50V
2113	2222 580 15649	100nF 10% 50V
2114	3198 026 51020	1000uF 20% 50V
2115	2222 580 15649	100nF 10% 50V
2116	4822 126 13193	4,7nF 10% 63V
2117	4822 124 81151	22uF 50V
2118	4822 124 41643	100uF 20% 16V
2119	3198 017 44740	470nF 10V
2120	2020 557 90726	100pF 5% 100V
2121	3198 017 44740	470nF 10V
2122	3198 017 44740	470nF 10V
2123	3198 026 51020	1000uF 20% 50V
2124	4822 124 81151	22uF 50V
2125	2222 580 15649	100nF 10% 50V
2126	4822 126 13193	4,7nF 10% 63V
2127	2020 557 90726	100pF 5% 100V
2128	5322 121 42498	680nF 5% 63V
2129	2238 586 15635	8,2nF 10% 50V
2150	5322 126 11583	10nF 10% 50V
2151	4822 126 13883	220pF 5% 50V
2152	4822 126 13193	4,7nF 10% 63V
2153	5322 126 11583	10nF 10% 50V
2154	4822 126 13883	220pF 5% 50V
2155	4822 126 13193	4,7nF 10% 63V
2156	2222 580 15649	100nF 10% 50V
2157	2222 580 15649	100nF 10% 50V
2158	3198 017 44740	470nF 10V
2159	4822 124 41643	100uF 20% 16V
2160	2020 557 90726	100pF 5% 100V
2161	3198 017 44740	470nF 10V
2162	3198 017 44740	470nF 10V
2163	2020 557 90726	100pF 5% 100V
2164	3198 026 51020	1000uF 20% 50V
2165	2222 580 15649	100nF 10% 50V
2166	4822 124 81151	22uF 50V
2167	4822 126 13193	4,7nF 10% 63V
2168	3198 026 51020	1000uF 20% 50V
2169	2222 580 15649	100nF 10% 50V
2170	4822 124 81151	22uF 50V
2171	4822 126 13193	4,7nF 10% 63V
2172	5322 121 42498	680nF 5% 63V
2173	2238 586 15635	8,2nF 10% 50V
2201	5322 126 11578	1nF 10% 50V
2202	5322 126 11583	10nF 10% 50V
2203	5322 122 33861	120pF 10% 50V
2204	4822 126 13881	470pF 5% 50V
2205	5322 126 11583	10nF 10% 50V
2206	4822 126 13881	470pF 5% 50V
2207	2222 580 15649	100nF 10% 50V
2208	3198 017 41050	1uF 10V
2209	3198 017 41050	1uF 10V
2210	3198 017 44740	470nF 10V
2211	2020 552 94427	100pF 5% 50V
2212	5322 126 11578	1nF 10% 50V
2213	5322 126 11578	1nF 10% 50V
2214	5322 126 11578	1nF 10% 50V
2215	5322 126 11578	1nF 10% 50V
2216	5322 126 11578	1nF 10% 50V

RESISTORS

3100	4822 051 30123	12k 5% 0,062W
3101	4822 051 30223	22k 5% 0,062W
3102	4822 051 30222	2k2 5% 0,062W
3112	4822 051 30222	2k2 5% 0,062W
3113	4822 051 30681	680R 5% 0,062W
3114	4822 051 30123	12k 5% 0,062W
3115	4822 051 30223	22k 5% 0,062W
3116	4822 051 30222	2k2 5% 0,062W
3117	4822 051 30681	680R 5% 0,062W
3118	4822 051 30222	2k2 5% 0,062W
3119	4822 051 30221	220R 5% 0,062W
3120	4822 117 12925	47k 1% 0,063W
3121	4822 117 12925	47k 1% 0,063W
3122	4822 101 11382	220R 30% 1W
3123	4822 051 30681	680R 5% 0,062W
3124	4822 051 30561	560R 5% 0,062W
3125	4822 051 30681	680R 5% 0,062W
3126	4822 051 30109	10R 5% 0,062W
3127	2322 702 60395	RST SM 0603 3M9 5%
3128	4822 051 30109	10R 5% 0,062W
3129	2322 702 60565	RST SM 0603 5M6 5%
3130	4822 051 20333	33k 5% 0,1W
3131	2122 118 06384	RST SM 1218 R047 5%
3132	4822 051 30271	270R 5% 0,062W
3134	4822 051 30391	390R 5% 0,062W
3135	2322 702 60279	RST SM 0603 27R 5%
3136	4822 051 30102	1k 5% 0,062W
3137	4822 051 20129	12R 5% 0,1W
3138	4822 051 30391	390R 5% 0,062W

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ELECTRICAL PARTS LIST - AMPLIFIER UCD BOARD (SE)

3139	2322 702 60279	RST SM 0603 27R 5%
3140	4822 051 30102	1k 5% 0,062W
3141	2122 118 06384	RST SM 1218 R047 5%
3142	4822 051 30271	270R 5% 0,062W
3144	4822 051 20129	12R 5% 0,1W
3145	2122 663 00025 ⚠	PTC SM 0805 40V 3k9 10%
3150	4822 051 30123	12k 5% 0,062W
3151	4822 051 30223	22k 5% 0,062W
3152	4822 051 30222	2k2 5% 0,062W
3153	4822 051 30681	680R 5% 0,062W
3154	4822 051 30222	2k2 5% 0,062W
3155	4822 051 30123	12k 5% 0,062W
3156	4822 051 30223	22k 5% 0,062W
3157	4822 051 30222	2k2 5% 0,062W
3158	4822 051 30681	680R 5% 0,062W
3160	4822 051 30222	2k2 5% 0,062W
3162	4822 051 30221	220R 5% 0,062W
3163	4822 117 12925	47k 1% 0,063W
3164	4822 051 30109	10R 5% 0,062W
3165	2322 702 60565	RST SM 0603 5M6 5%
3166	4822 117 12925	47k 1% 0,063W
3167	4822 051 30681	680R 5% 0,062W
3168	4822 051 30561	560R 5% 0,062W
3169	4822 051 30681	680R 5% 0,062W
3170	4822 051 30109	10R 5% 0,062W
3171	2322 702 60395	RST SM 0603 3M9 5%
3172	4822 101 11382	220R 30% 1W
3173	4822 051 30391	390R 5% 0,062W
3174	2322 702 60279	RST SM 0603 27R 5%
3175	4822 051 30102	1k 5% 0,062W
3176	4822 051 20333	33k 5% 0,1W
3177	4822 051 20129	12R 5% 0,1W
3178	4822 051 30391	390R 5% 0,062W
3179	2322 702 60279	RST SM 0603 27R 5%
3180	4822 051 30102	1k 5% 0,062W
3181	4822 051 20129	12R 5% 0,1W
3182	2122 118 06384	RST SM 1218 R047 5%
3183	4822 051 30109	10R 5% 0,062W
3184	2122 118 06384	RST SM 1218 R047 5%
3185	4822 051 30271	270R 5% 0,062W
3186	4822 051 30109	10R 5% 0,062W
3187	4822 051 30271	270R 5% 0,062W
3188	2122 663 00025 ⚠	PTC SM 0805 40V 3k9 10%
3190	4822 117 12063 ⚠	NTC DC 5W 10k 5%
3193	4822 117 10834	47k 1% 0,1W
3194	4822 117 10834	47k 1% 0,1W
3195	2322 615 33472	NTC SM 0603 0W125 4k7 5%
3196	2322 615 33472	NTC SM 0603 0W125 4k7 5%
3197	2322 615 33472	NTC SM 0603 0W125 4k7 5%
3198	2322 615 33472	NTC SM 0603 0W125 4k7 5%
3201	4822 051 10223	22k 2% 0,25W
3202	4822 051 10223	22k 2% 0,25W
3203	4822 117 13632	100k 1% 0,62W
3204	4822 051 10223	22k 2% 0,25W
3205	4822 051 30105	1M 5% 0,062W
3206	4822 051 30105	1M 5% 0,062W
3207	4822 051 30103	10k 5% 0,062W
3208	2322 702 60184	RST SM 0603 180k 5%
3209	2322 702 60184	RST SM 0603 180k 5%
3210	4822 117 12889	270k 1% 0,063W
3211	4822 117 12889	270k 1% 0,063W
3212	4822 117 12864	82k 5% 0,6W
3213	4822 051 30103	10k 5% 0,062W
3214	4822 051 30105	1M 5% 0,062W
3215	4822 117 13632	100k 1% 0,62W
3216	4822 117 13632	100k 1% 0,62W
3217	4822 051 30563	56k 5% 0,062W
3218	4822 117 13632	100k 1% 0,62W
3219	4822 117 13632	100k 1% 0,62W
3220	4822 117 13632	100k 1% 0,62W
3222	4822 117 13632	100k 1% 0,62W
3223	4822 117 13632	100k 1% 0,62W
3224	4822 051 30103	10k 5% 0,062W
3225	4822 051 30105	1M 5% 0,062W
3226	4822 051 30105	1M 5% 0,062W
3231	4822 051 30103	10k 5% 0,062W
3232	4822 051 30103	10k 5% 0,062W
3233	4822 051 30103	10k 5% 0,062W
3234	4822 051 30103	10k 5% 0,062W
3235	4822 051 30333	33k 5% 0,062W
3236	4822 051 30101	100R 5% 0,062W
3237	4822 051 30101	100R 5% 0,062W
3238	4822 051 30105	1M 5% 0,062W
3239	4822 051 30105	1M 5% 0,062W

COILS & FILTERS

5100	4822 157 11411	IND FXD BEAD 100MHz 83R
5102	4822 157 11411	IND FXD BEAD 100MHz 83R
5105	3104 218 15671	IND FXD SC4684-145 PM1
5151	4822 157 11411	IND FXD BEAD 100MHz 83R
5152	4822 157 11411	IND FXD BEAD 100MHz 83R
5155	3104 218 15671	IND FXD SC4684-145 PM1

DIODES

6101	4822 130 11528	1PS76SB10
6102	4822 130 11528	1PS76SB10
6103	9340 548 47115	PDZ3.3B
6104	9322 198 95685	DIO SIG SM 1SS370
6105	9322 198 95685	DIO SIG SM 1SS370
6106	4822 130 11528	1PS76SB10
6107	4822 130 11397	BAS316
6108	9340 548 61115	DIO REG SM PDZ12B
6109	4822 130 11528	1PS76SB10
6110	4822 130 11397	BAS316

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ELECTRICAL PARTS LIST - AMPLIFIER UCD BOARD (SE)

DIODES

6151	4822 130 11528	1PS76SB10
6152	4822 130 11528	1PS76SB10
6153	4822 130 11528	1PS76SB10
6154	9340 548 61115	DIO REG SM PDZ12B
6155	4822 130 11397	BAS316
6156	9340 548 47115	PDZ3.3B
6157	9322 198 95685	DIO SIG SM 1SS370
6158	9322 198 95685	DIO SIG SM 1SS370
6159	4822 130 11528	1PS76SB10
6160	4822 130 11397	BAS316
6200	4822 130 11551	PDZ10B
6201	3198 020 55680	DIO REG SM PDZ5.6B
6202	4822 130 11551	PDZ10B
6203	4822 130 11397	BAS316
6204	4822 130 11397	BAS316
6205	4822 130 11397	BAS316
6206	4822 130 11397	BAS316
6210	4822 130 11397	BAS316
6211	4822 130 11397	BAS316

TRANSISTORS & INTEGRATED CIRCUITS

7100	9340 218 20135	TRA SIG SM BC856BW
7101	4822 130 41691	TRA SIG BC556B
7102	9340 218 60115	TRA SIG SM BC857CW
7103	9340 217 80115	TRA SIG SM BC847CW
7104	9340 217 80115	TRA SIG SM BC847CW
7105	9340 218 20135	TRA SIG SM BC856BW
7106	9340 217 80115	TRA SIG SM BC847CW
7107	9340 217 80115	TRA SIG SM BC847CW
7108	4822 130 43233	TRA SIF 2SC2240
7109	9340 217 80115	TRA SIG SM BC847CW
7110	9340 218 20135	TRA SIG SM BC856BW
7111	9340 218 60115	TRA SIG SM BC857CW
7112	9322 173 29687	FET POW STP14NF12FP
7113	9322 198 96685	TRA SIG SM 2SA1954B
7114	9340 218 60115	TRA SIG SM BC857CW
7115	9322 198 96685	TRA SIG SM 2SA1954B
7116	9340 217 40135	TRA SIG SM BC846BW
7117	9322 173 29687	FET POW STP14NF12FP
7150	9340 218 60115	TRA SIG SM BC857CW
7151	4822 130 41691	TRA SIG BC556B
7152	9340 217 80115	TRA SIG SM BC847CW
7153	9340 217 80115	TRA SIG SM BC847CW
7154	9340 217 80115	TRA SIG SM BC847CW
7155	9340 217 80115	TRA SIG SM BC847CW
7156	9340 218 20135	TRA SIG SM BC856BW
7157	9340 218 20135	TRA SIG SM BC856BW
7158	4822 130 43233	TRA SIG 2SC2240
7159	9340 217 80115	TRA SIG SM BC847CW
7160	9340 218 60115	TRA SIG SM BC857CW
7161	9322 198 96685	TRA SIG SM 2SA1954B
7162	9322 173 29687	FET POW STP14NF12FP
7163	9340 218 60115	TRA SIG SM BC857CW
7164	9322 198 96685	TRA SIG SM 2SA1954B
7165	9322 173 29687	FET POW STP14NF12FP
7167	9340 217 40135	TRA SIG SM BC846BW
7168	9340 218 20135	TRA SIG SM BC856BW
7200	9339 753 30135	TRA POW SM PZT2222A
7201	9340 217 40135	TRA SIG SM BC846BW
7202	3198 010 42310	TRA SIG SM BC847BW
7203	3198 010 42320	TRA SIG SM BC857BW
7204	9340 217 40135	TRA SIG SM BC846BW
7205	9340 217 80115	TRA SIG SM BC847CW
7206	9340 218 60115	TRA SIG SM BC857CW
7207	9340 218 60115	TRA SIG SM BC857CW
7208	9340 218 60115	TRA SIG SM BC857CW
7209	9340 217 80115	TRA SIG SM BC847CW
7210	5322 209 11548	IC SM 74HC14D
7211	9339 753 30135	TRA POW SM PZT2222A
7212	9340 217 80115	TRA SIG SM BC847CW

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

ETF7 TAPE MODULE

(Non-Dolby Version)

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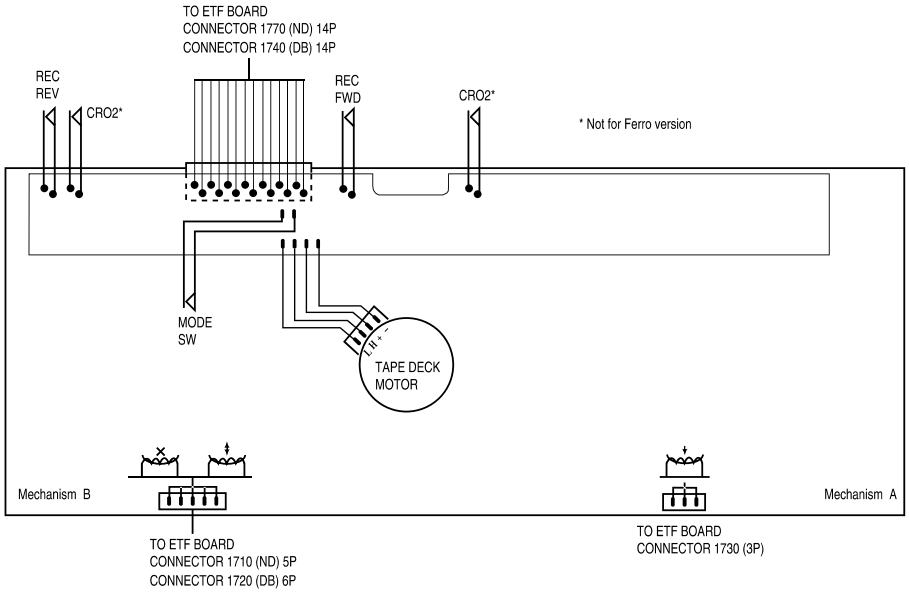
9-1

Tapedeck wiring (Double deck)



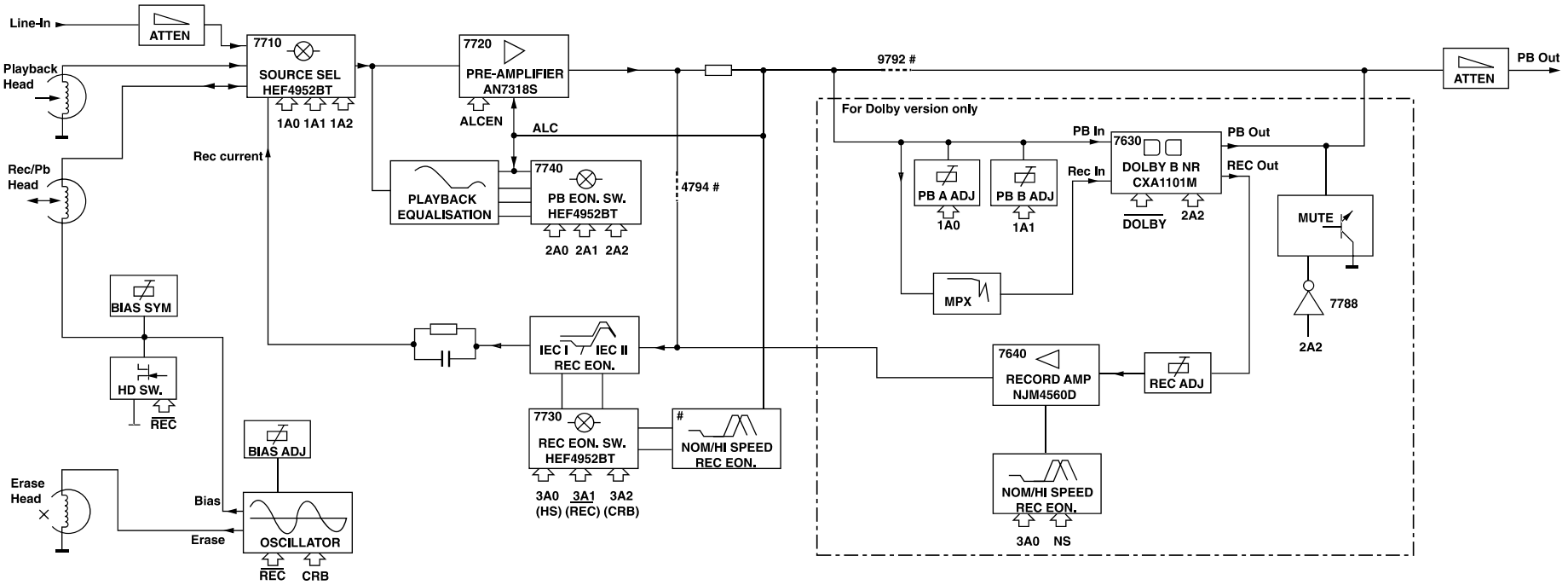
Variations table for Analog Circuit

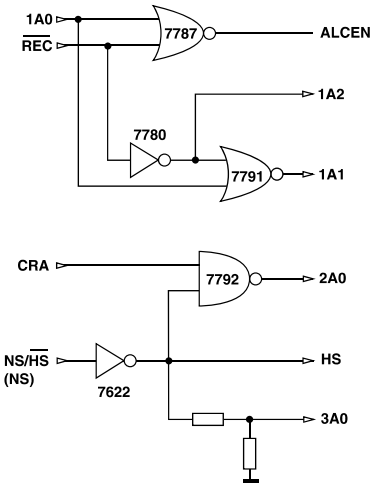
	Autoreverse ND/DD/FR	Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Chrome/Ferro	Ferro
2624	-	-	100nF
2701 , 2702	150pF	270pF	270pF
2703 , 2704	100pF	220pF	220pF
2717 , 2718	10nF	15nF	15nF
2721 , 2722	6,8nF	6,8nF	-
2727 , 2728	470pF	1nF	1nF
3616	10k	1k	1k
3618	6k8	-	-
3620	10k trimmer	-	-
3622	-	10k trimmer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

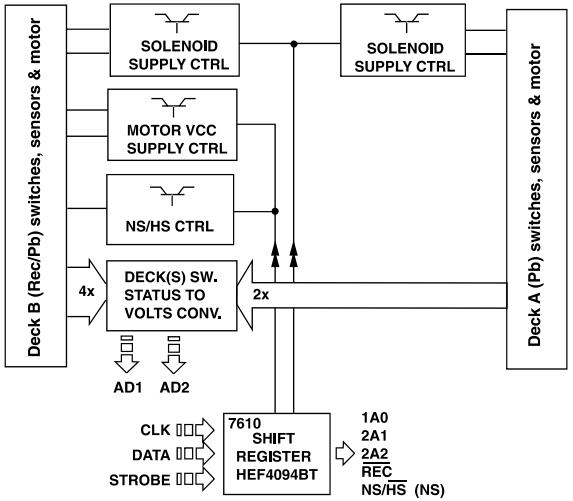
	Autoreverse ND/DD/FR	Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Chrome/Ferro	Ferro
3769	12k	8k2	8k2
3772	6k8	5k6	5k6
4785	-	-	0R jumper
3774	15k	8k2	8k2
6614	1N4148	-	-
7616	BC857B	-	-
7622	BC847B	-	-

9-2

BLOCK DIAGRAM







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

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby version only)
   Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952BT)
   The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952BT)
   The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby B NR version only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

9-3

13. Motor Speed (For FR versions only)
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

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

15. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/ LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

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

9-4

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

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

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

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

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

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

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

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

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

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

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

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

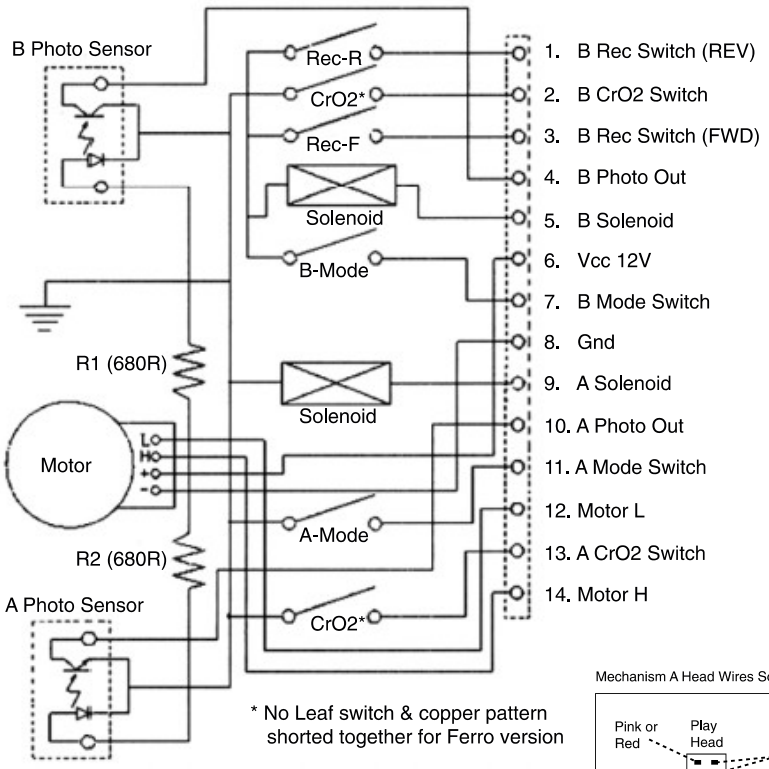
CONNECTOR 1740 — DECK A & B CONTROL INTERFACE ***(For Dolby B NR version only)***

1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
4	PHOTO B	Photo sensor output (tape movement indication)	
5	SOL B	Solenoid supply for deck B	
6	Vcc	Deck / Motor supply	
7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
8	GND M	Deck / Motor ground	
9	SOL A	Solenoid supply for deck A	
10	PHOTO A	Photo sensor output (tape movement indication)	
11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
12	L	L pin for motor	
13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
14	H	H pin for motor	

CONNECTOR 1770 — DECK A & B CONTROL INTERFACE ***(For Non-Dolby version only)***

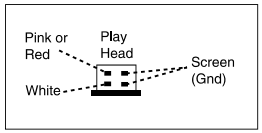
1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
4	PHOTO B	Photo sensor output (tape movement indication)	
5	SOL B	Solenoid supply for deck B	
6	Vcc	Deck / Motor supply	
7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
8	GND M	Deck / Motor ground	
9	SOL A	Solenoid supply for deck A	
10	PHOTO A	Photo sensor output (tape movement indication)	
11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
12	L	L pin for motor	
13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
14	H	H pin for motor	

TAPE MECHANISM ELECTRONICS

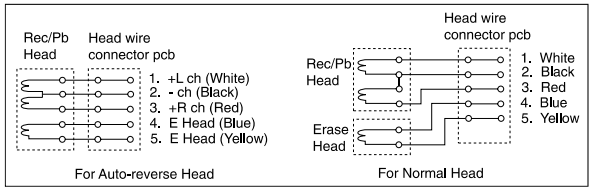


* No Leaf switch & copper pattern shorted together for Ferro version

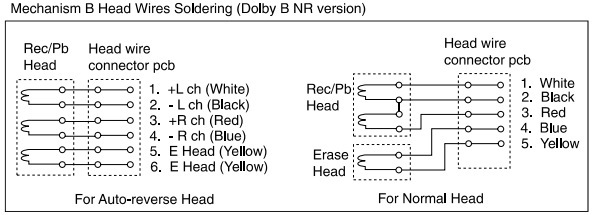
Mechanism A Head Wires Soldering



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)



9-5

TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	1 or 2 LEFT RIGHT	frequency counter	3620	3150Hz +/- 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	1 or 2 LEFT RIGHT	W&F-meter	check	<0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	1 or 2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A^	RECORD	5 or 6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV +/- 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via 3 or 4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	THD-meter	check	<3% *

SBC419A^ : 4822 397 30069
SBC420 : 4822 397 30071

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

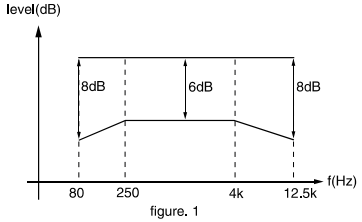


figure. 1

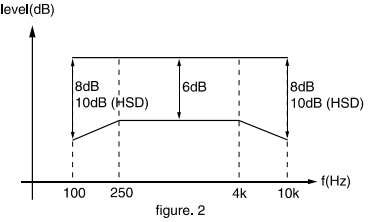
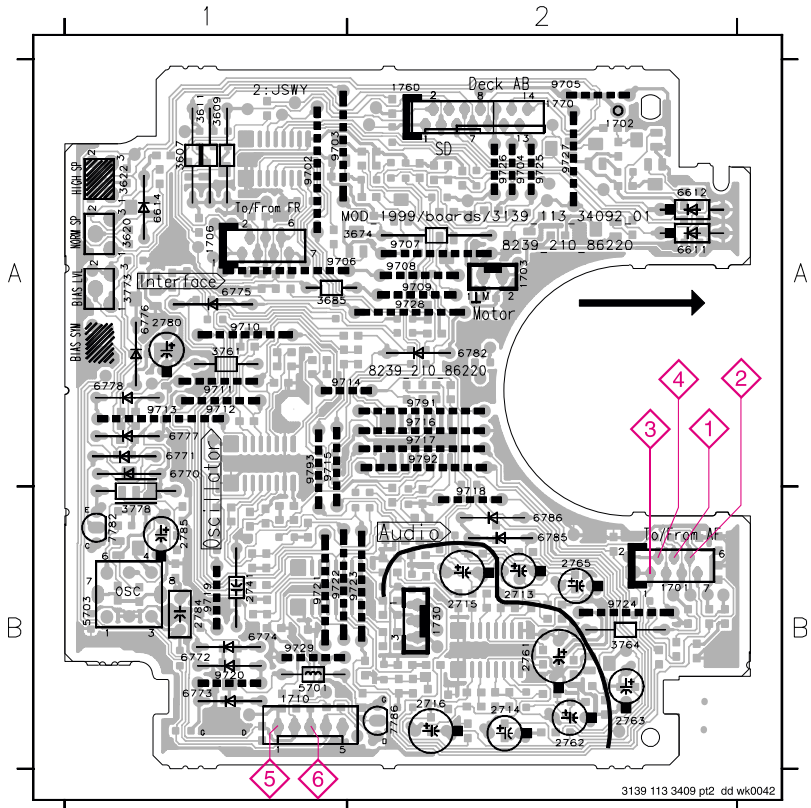


figure. 2

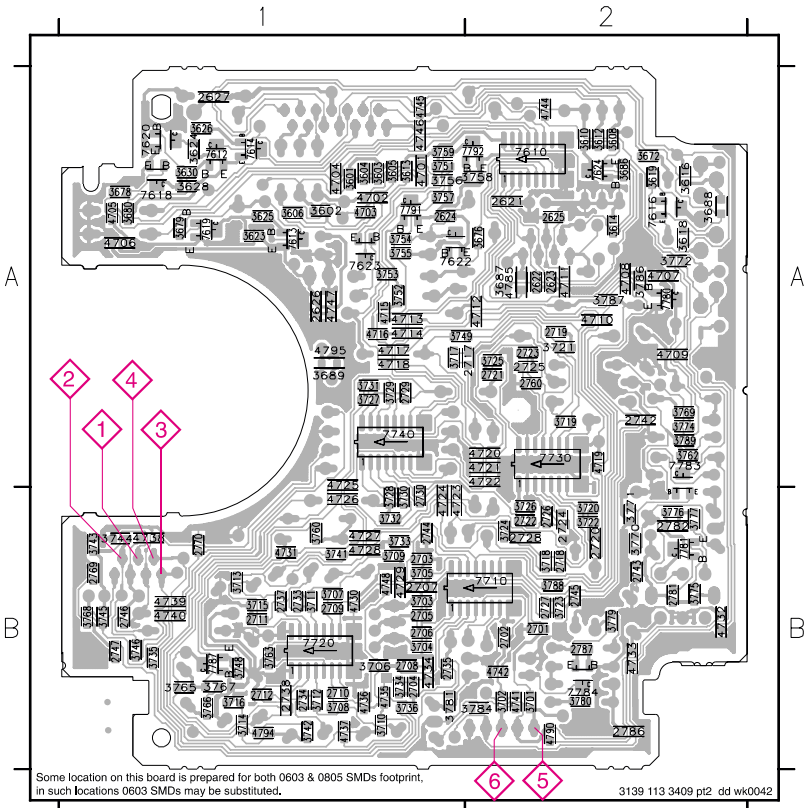
COMPONENT LAYOUT

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



CHIP LAYOUT

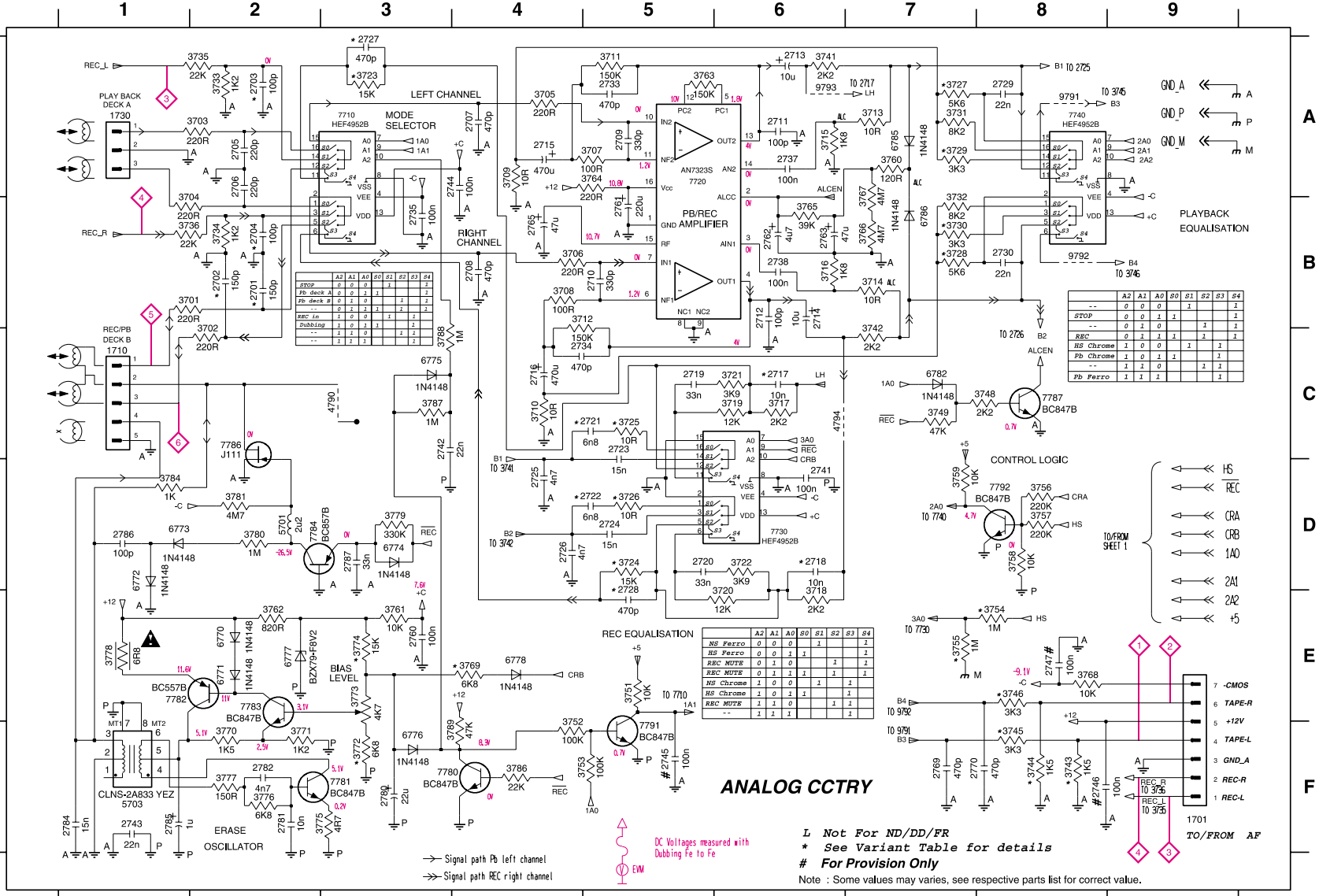
2621 A2	2724 B2	3602 A1	3688 A2	3725 A2	3757 A1	4701 A1	4727 B1	7612 A1			
2622 A2	2725 A2	3603 A1	3689 A1	3726 B2	3758 A2	4702 A1	4728 B1	7613 A1			
2623 A2	2726 B2	3604 A1	3701 B2	3727 A1	3759 A1	4703 A1	4729 B1	7614 A1			
2624 A1	2727 B2	3605 A1	3702 B2	3728 B1	3760 B1	4704 A1	4730 B1	7616 A2			
2625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



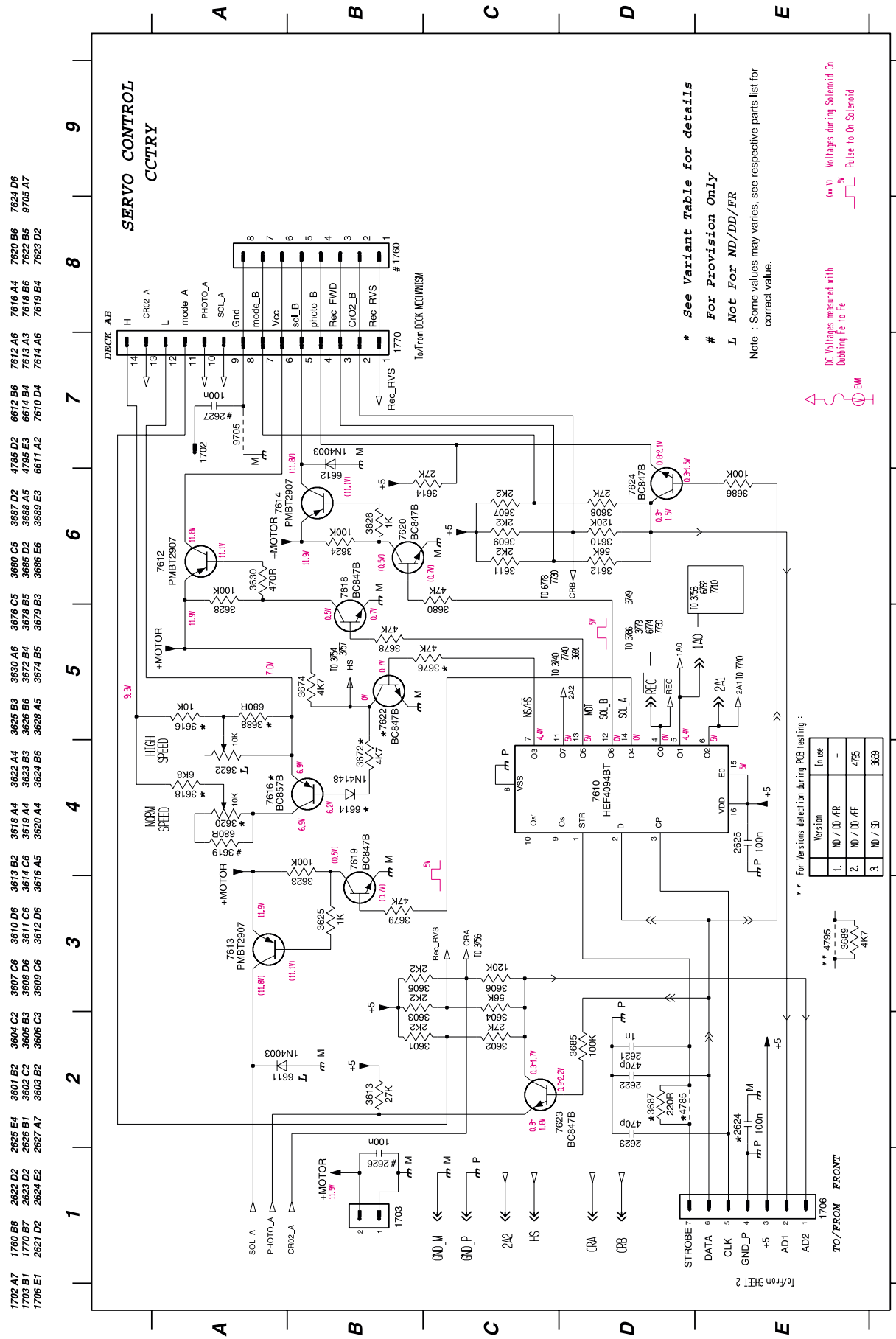
9-7

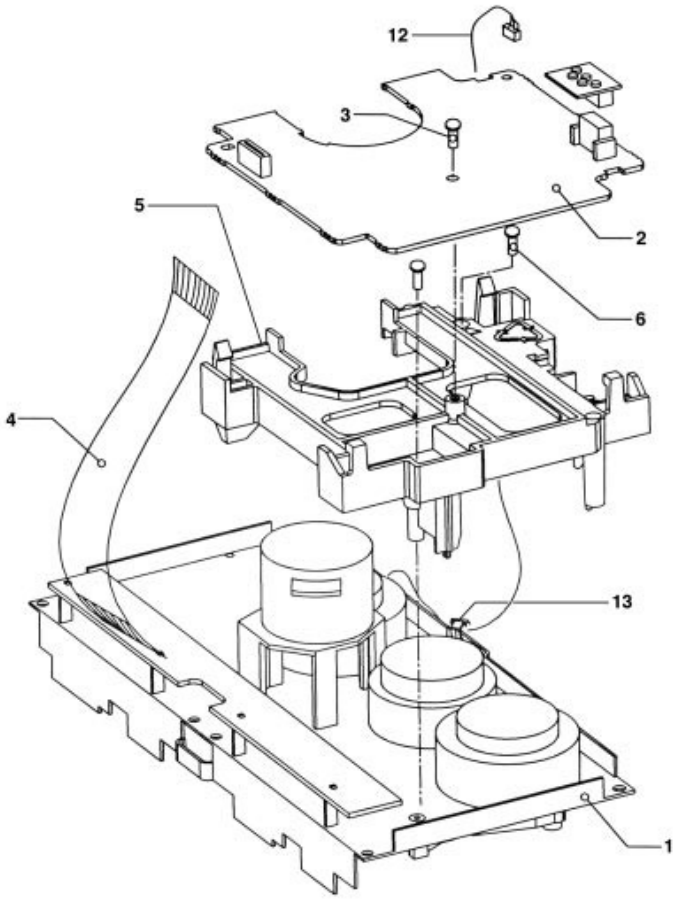
ANALOG CIRCUIT

1701 F9	2705 A2	2712 B6	2719 C5	2726 D4	2735 B3	2745 F5	2765 B4	2785 F1	3705 A4	3712 B4	3719 C6	3726 D5	3733 A2	3744 F8	3753 F5	3760 A7	3767 A7	3774 E3	3781 D2	4794 C6	6774 D3	6786 B7	7782 E1	9791 A8
1710 C1	2706 A2	2713 A6	2720 D5	2727 A3	2737 A6	2746 F8	2769 F7	2786 D1	3706 B4	3713 A7	3720 E6	3727 A7	3734 B2	3745 F8	3754 E8	3761 E3	3768 E8	3775 F3	3784 D1	5701 D2	6775 C3	7710 A3	7783 E2	9792 B8
1730 A1	2707 A4	2714 B6	2721 C5	2728 E5	2738 B6	2747 E8	2770 F8	2787 D3	3707 A5	3714 B7	3721 C6	3728 B7	3735 A2	3746 E8	3755 E7	3762 E2	3769 E4	3776 F2	3786 F4	5703 F1	6776 F3	7720 A5	7784 D2	9793 A6
2701 B2	2708 B4	2715 A4	2722 D5	2729 A8	2741 D6	2760 E3	2780 F3	3701 B1	3708 B4	3715 A6	3722 D6	3729 A7	3736 B1	3748 C8	3756 D8	3763 A5	3770 F2	3777 F2	3787 C3	6770 E2	6777 E2	7730 D6	7786 C2	
2702 B2	2709 A5	2716 C4	2723 C5	2730 B8	2742 C3	2761 B5	2781 F2	3702 C2	3709 A4	3716 B6	3723 A3	3730 B7	3741 A6	3749 C7	3757 D8	3764 A5	3771 F2	3778 E1	3788 C3	6771 E2	6778 E4	7740 A8	7787 C8	
2703 A2	2710 B5	2717 C6	2724 D5	2733 A5	2743 F1	2762 B6	2782 F2	3703 A2	3710 C4	3717 C6	3724 D5	3731 A7	3742 C7	3751 E5	3758 D8	3765 B6	3772 F3	3779 D3	3789 F4	6772 D1	6782 C7	7780 F4	7791 F5	
2704 B2	2711 A6	2718 D6	2725 D4	2734 C4	2744 A4	2763 B6	2784 F1	3704 B1	3711 A5	3718 E6	3725 C5	3732 B7	3743 F8	3752 F4	3759 D7	3766 B7	3773 E3	3780 D2	4790 C3	6773 D1	6785 A7	7781 F3	7792 D8	



SERVO CONTROL CIRCUIT





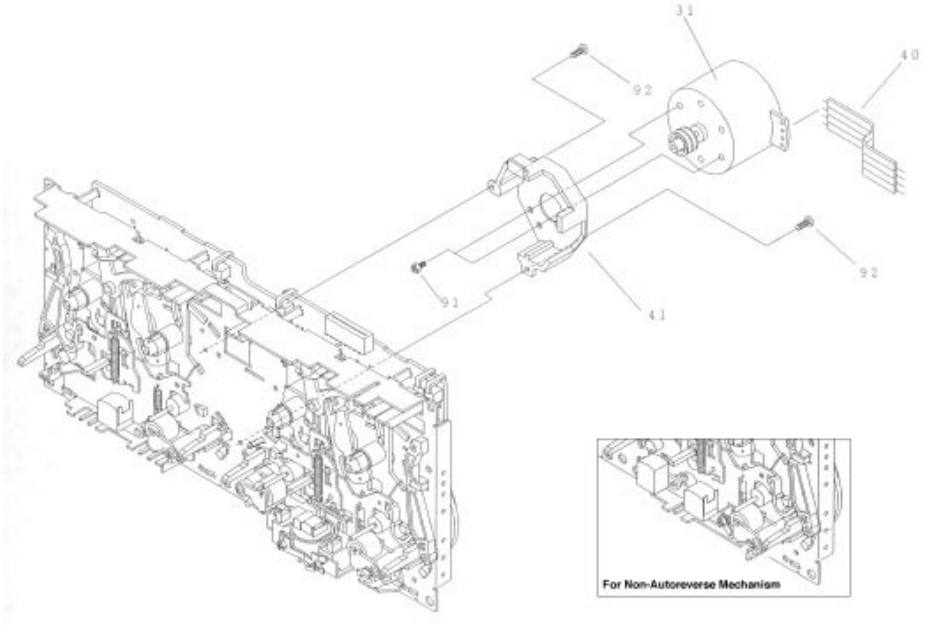
3139 118 77070 (Incl. ...77080) dd wk926

TAPE MODULE EXPLODED VIEW

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

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

9-9



TAPE MECHANISM - MOTOR EXPLODED VIEW

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

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