Micro System

MCM761/12/61

Service
Service
Service

Service Manual

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CLASS 1
LASER PRODUCT

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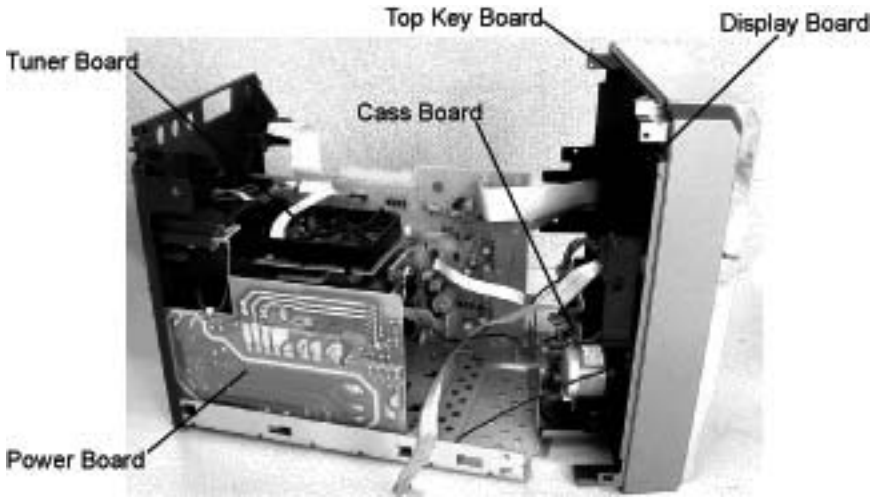
3141 785 34044

Version 1.4

PHILIPS

LACATION OF PCBS



VERSION VARIATIONS:

Type /Versions: / Board in used: / Service policy	MCM761									
	/05	/12	/37	/61	/98					
DISPLAY BOARD		C		C						
TOP KEY BOARD		C		C						
TUNER BOARD		M		M						
MAIN BOARD		C/M		C						
POWER BOARD		C/M		C/M						
CASS BOARD		C/M		C						
CD BOARD		C/M		C						

Type /Versions: / Features / Feature diffrence	MCM761									
	/05	/12	/37	/61	/98					
RDS		√								
VOLTAGE SELECTOR										
ECO STANDBY - DARK		√		√						

* TIPS : C -- Component Lever Repair.
M -- Module Lever Repair
√ -- Used

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /98
117V ± 10% for /37
220V ± 10% for /61
230 ± 10% for /05/12

Mains frequency : 50/60Hz

Power consumption : 55W at 1/8 P_{rated}
< 15W at Standby (Demo mode off)
< 0W at ECO Standby

Clock accuracy : < 4 seconds per day

Dimension centre unit : : 340 x 179 x 252 mm (L x D x H)

TUNER:

FM

Tuning range	: 87.5-108MHz
Grid	: 50kHz 100kHz for /37
IF frequency	: 10.7MHz ± 25kHz
Aerial input	: 75 ohm coaxial 300 ohm click fit for /37
Sensitivity at 26dB S/N	: < 22uV
Selectivity at 600kHz bandwidth	: > 25dB
Image rejection	: > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz	: < 3%
-3dB Limiting point	: < 23.5dBf
Crosstalk at RF=1mV, dev. 40kHz	: > 18dB

MW

Tuning range	: 531-1602kHz 530-1700kHz for /98/37
Grid	: 9kHz 10kHz for /98/37
IF frequency	: 450kHz ± 1kHz
Aerial input	: Frame aerial
Sensitivity at 26dB S/N	: < 22uV
Selectivity at 18kHz bandwidth	: > 18dB
IF rejection	: > 45dB
Image rejection	: > 28dB
Distortion at RF=50mV, M=80%	: < 5%

AMPLIFIER:

Output power (6 ohm, 1kHz, 10% THD)

L & R : 2 x 75W RMS

Frequency response within -3dB : 60Hz-16kHz

Bass : 60Hz ± 3 Steps

Treble : 12kHz ± 3 Steps

Incredible Surround : On / Off

Input sensitivity

Aux in (at 1kHz) : 500mV at 600 ohm

CD (Audio Disc1) : -6dB track (Trk 35)

USB : -6dB track

Output sensitivity

Headphone output at 32 ohm : 15mW ± 2dB (Max. vol.)

CASSETTE RECORDER:

Number of track	: 2 tracks (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 8dB	: 80Hz - 10kHz
Signal to Noise Ratio (Type I)	: > 48dBA
Signal to Noise Ratio (Type II)	: > 52dBA

COMPACT DISC:

Measurement done directly at the connector on the board.

Output Resistance	: < 100 ohm
Output Voltage (0dB, 1kHz)	: 0.5Vrms ± 1dB (unloaded)
Channel Unbalance	: < ±1dB
Channel Separation (1kHz)	: > 60dB
Frequency Response (±3dB)	: 20Hz-20kHz
Signal to Noise Ratio	: > 76dBA
MP3-CD Bit Rate	: 8-320 kbps
WMA-CD Bit Rate	: 64-192kbps
Sampling Frequencies	: 8,11.025,12,16,22.05,24, 32,44.1,48kHz
Recording Format	: ISO9660 UDF format not supported

USB:

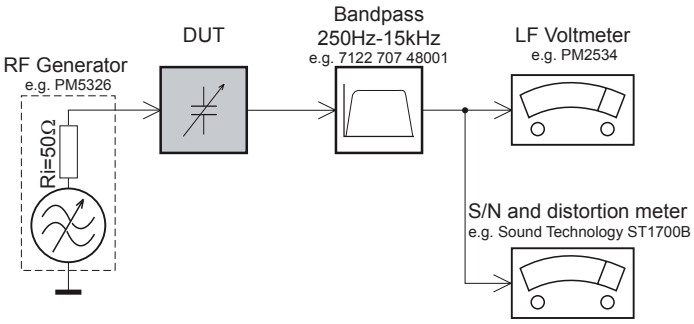
Measurement done at speaker terminals across 6Ω load w/ 500mW output and DSC setting in Jazz Mode.

Frequency response within ± 3dB	: 100Hz - 16kHz
Signal/Noise ratio (A-weighted)	: > 60dBA
Channel crosstalk at 1kHz	: > 35dB
Channel unbalance at 1kHz	: ±3dB

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

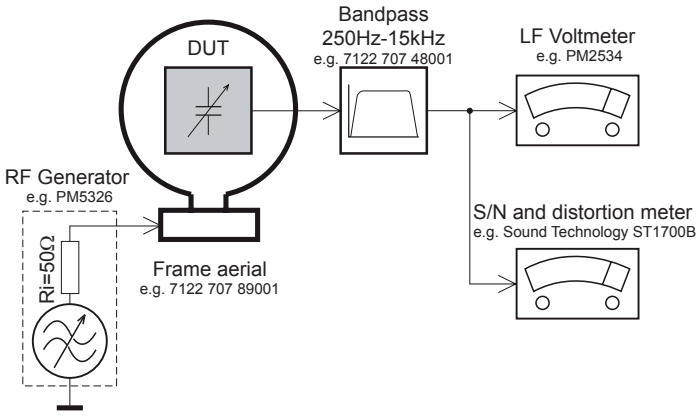
MEASUREMENT SETUP

Tuner FM



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

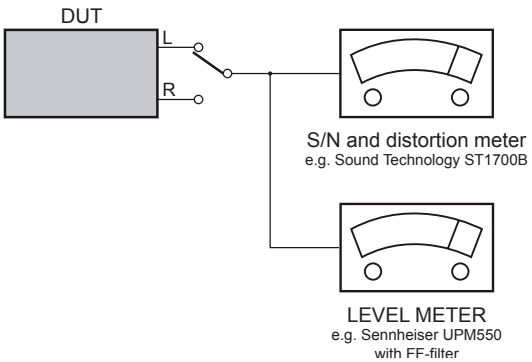
Tuner AM (MW,LW)



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).

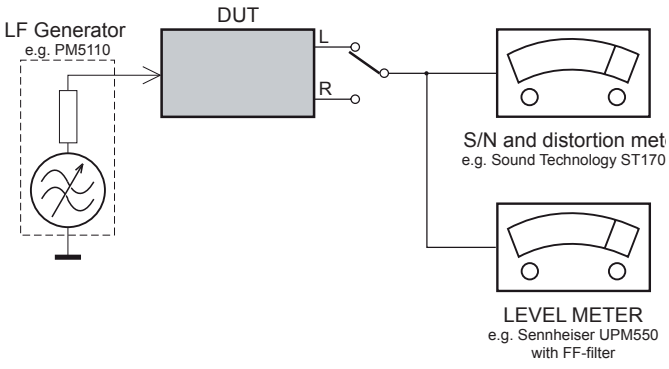
CD

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

(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

(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 ⚠.

CLASS 1
LASER PRODUCT

INFORMATION ABOUT LEAD-FREE SOLDERING

Philips CE is producing lead-free sets from 1.1.2005 onwards.
IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:

- On our website **www.atyourservice.ce.Philips.com** you find more information to:
  - BGA-de-/soldering (+ baking instructions)
  - Heating-profiles of BGAs and other ICs used in Philips-sets
  - Lead free

  You will find this and more technical information within the "magazine", chapter "workshop news".

For additional questions please contact your local repair-helpdesk.

SERVICE INSTRUCTION

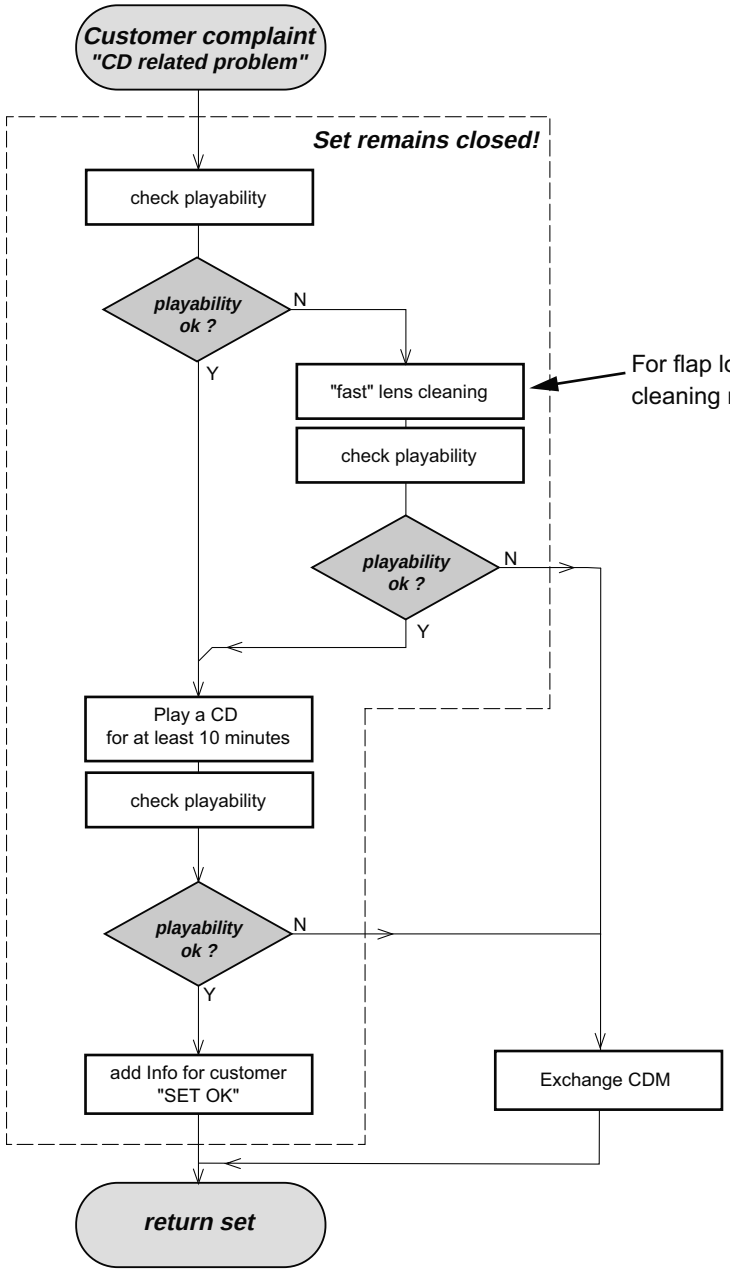
Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

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

1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.

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

INSTRUCTIONS ON CD PLAYABILITY



For flap loaders (= access to CD drive possible) cleaning method is recommended

- For description - see following pages

INSTRUCTIONS ON CD PLAYABILITY

PLAYABILITY CHECK

For sets which are compatible with **CD-RW** discs
use CD-RW Printed Audio Disc.....7104 099 96611
TR 3 (Fingerprint)
TR 8 (600µ Black dot) **maximum at 01:00**

- playback of these two tracks without audible disturbance
  playing time for: Fingerprint ≥10seconds
  Black dot from 00:50 to 01:10
- jump forward/backward (search) within a reasonable time

For all other sets
use CD-DA SBC 444A.....4822 397 30245
TR 14 (600µ Black dot) **maximum at 01:15**
TR 19 (Fingerprint)
TR 10 (1000µ wedge)

- playback of all these tracks without audible disturbance
  playing time for: 1000µ wedge ≥10seconds
  Fingerprint ≥10seconds
  Black dot from 01:05 to 01:25
- jump forward/backward (search) within a reasonable time

CUSTOMER INFORMATION

It is proposed to add an addendum sheet to the set which informs the customer that the set has been checked carefully - but no fault was found.
The problem was obviously caused by a scratched, dirty or copy-protected CD. In case problems remain, the customer is requested to contact the workshop directly.
The lens cleaning (method) should be mentioned in the addendum sheet.

The final wording in national language as well as the printing is under responsibility of the Regional Service Organizations.

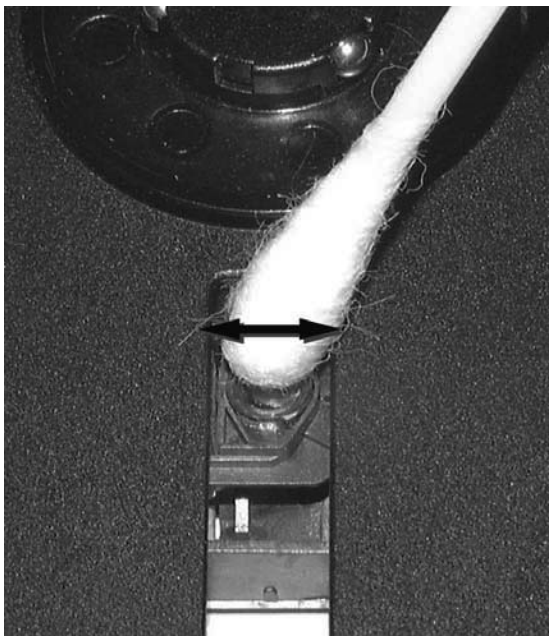
LIQUID LENS CLEANING

Before touching the lens it is advised to clean the surface of the lens by blowing clean air over it. This to avoid that little particles make scratches on the lens.

Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use “Cleaning Solvent

The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. Clean the lens gently (don’t press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

The direction of cleaning must be in the way as indicated in the picture below.



DISMANTLING INSTRUCTIONS

Dismantling of the Cover Cassette and Universal Loader

1) Remove the Cover Cassette (pos 1+pos 2) in the direction as shown in Figure 1.
2) Loosen 4 screws to remove the Cover Top (pos 62) by sliding it out towards the rear before lifting up.
   - 2 screws on the rear
   - 1 screw each on the left & right side
3) Loosen 2 screws each to remove the Panel Left (pos 61) and Panel Right (pos 60). The Panels are removed by sliding it towards the rear and outwards.
   - 1 screw on the rear
   - 1 screw on the side
   - see Service position A
4) Loosen 4 screws A (see Figure 2) to remove the Bracket Module Mounting (pos 54) and Universal Loader (pos 58).
   - 2 screws each on the left & right side
5) Shake up the Bracket Module Mounting and CD Loader as shown in Figure 3 till the Cover CD (pos7) fall off.

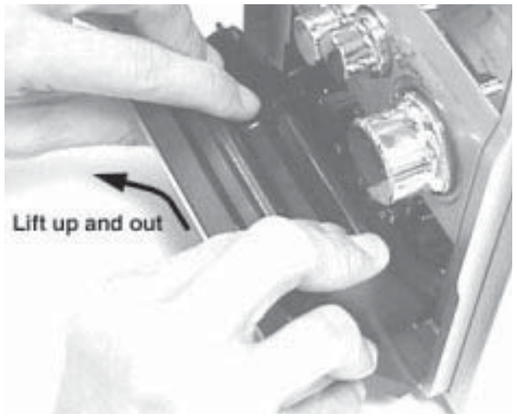


Figure 1

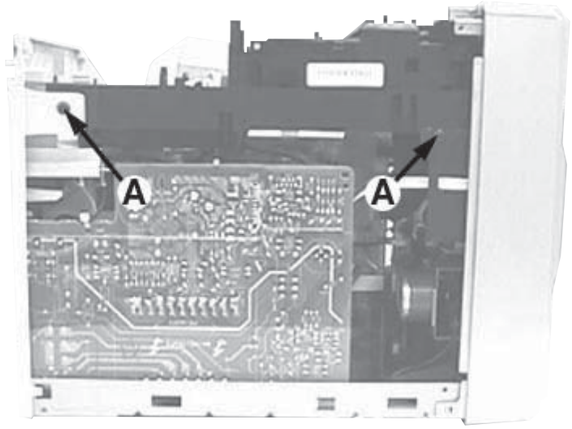


Figure 2

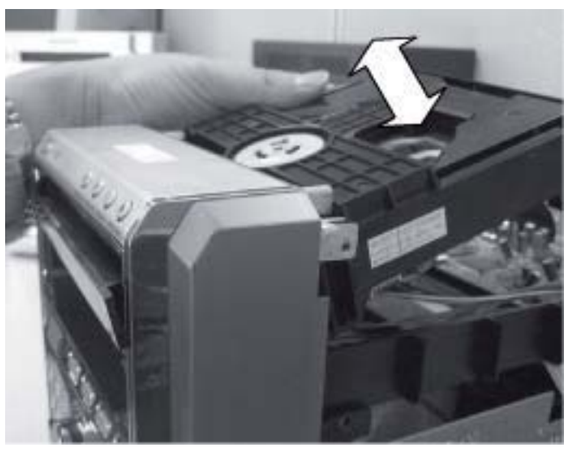


Figure 3

Detaching the Universal Loader from the Bracket Module Mounting

1) Slide out the Loader Tray fully and remove 4 screws B (see Figure 4) to detach the Universal Loader (pos 58) from the Bracket Module Mounting (pos 54).
   - see Service position B

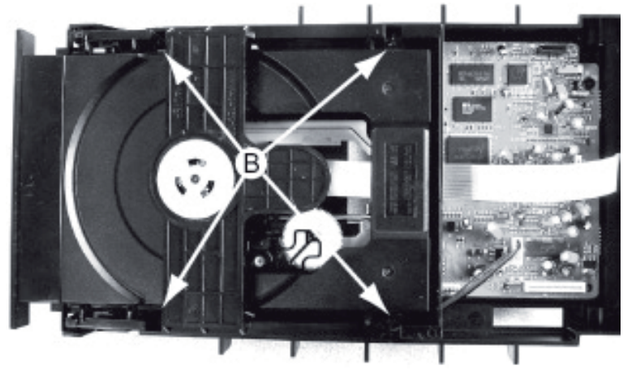


Figure 4

Detaching the Front Panel assembly from the Bottom/Rear assembly

1) Remove 2 screws C (see Figure 5) from the bottom of the Cabinet Front .

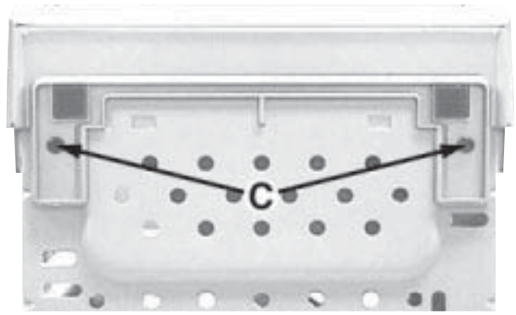


Figure 5

2) Release the fixation of the Main Board to Bracket Combi by removing the 1 screw and pulling the Main Board outwards (see Figure 6).

3) Uncatch 2 catches on the left & right sides of the Cabinet Front and slides the Front Panel assembly out towards the front.
   - see Service position C

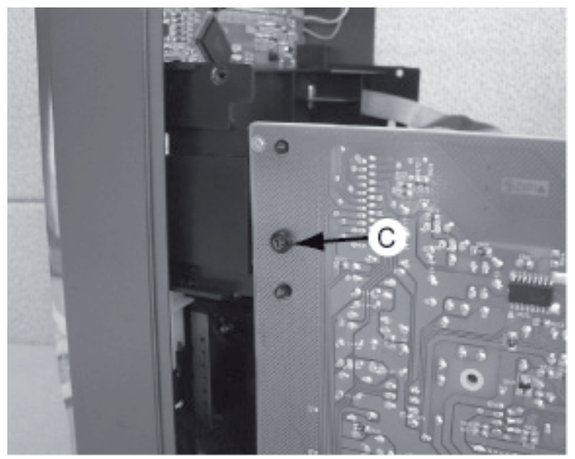


Figure 7

DISMANTLING INSTRUCTIONS

Dismantling of the Front Panel assembly

1) The Knob Volume (pos 10) can be remove by pulling it out in the direction as shown in Figure 7
2) The Knob Bass/Knob Treble (pos 11) can be remove by pulling it out in the direction as shown in Figure 8.
3) Loosen 4 screws D (see Figure 10) to remove the Shield Tape Deck and Module Tape Deck (pos 29).
4) Loosen 2 screws E (see Figure 9) to remove the Bracket Top Support .
5) Loosen 4 screws G (see Figure 9) to remove the Bracket Main.
6) Loosen 6 screws C4 (see Figure 11) to remove the Display Board.
7) Loosen 4 screws H (see Figure 11) to remove the Top Key Board.

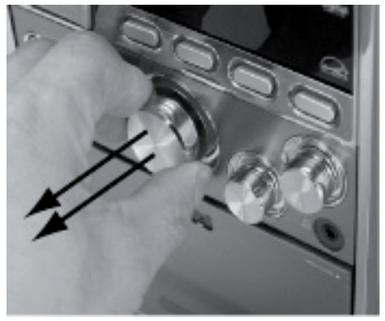


Figure 7

Figure 8

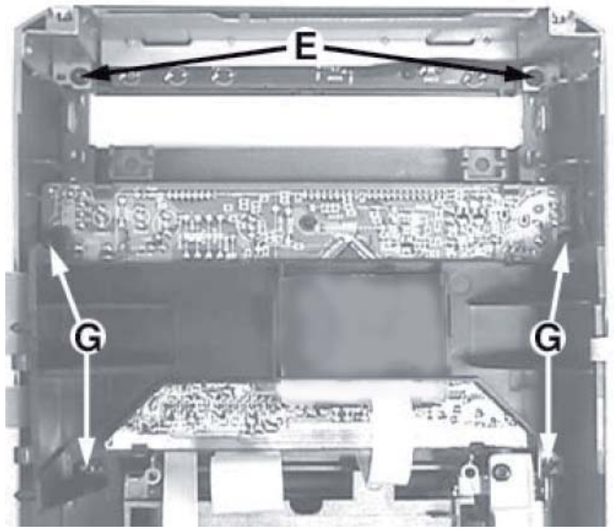


Figure 9

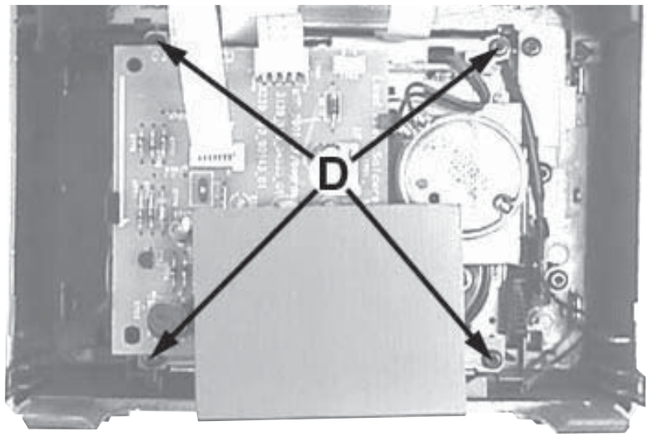


Figure 10

Dismantling of the Front Panel assembly

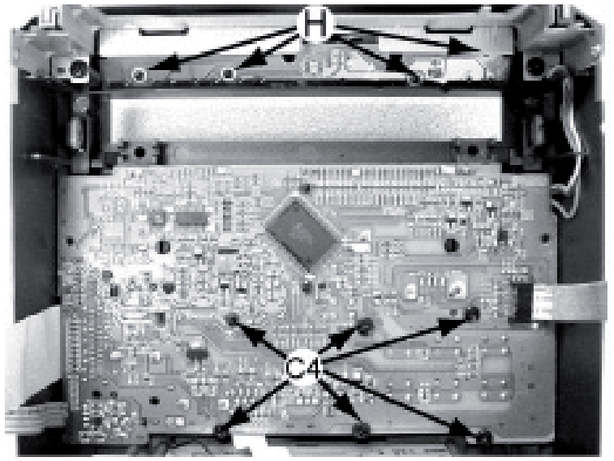


Figure 11

Dismantling of the Rear Panel assembly

1) Loosen 3 screws K and 2 catches C5 (see Figure 12) to remove the Tuner Board assembly.
2) Loosen 3 screws L (see Figure 12) to free the Main Board.
3) Loosen 1 screw M (see Figure 12) to free the Mains Socket Board.
4) Loosen 1 screw N and 2 catches C6 (see Figure 12) to free the Panel Rear (pos 53) by sliding it out towards the rear.

Note : Tuner Board assembly and Mains Socket Board can also be remove together with the Panel Rear.

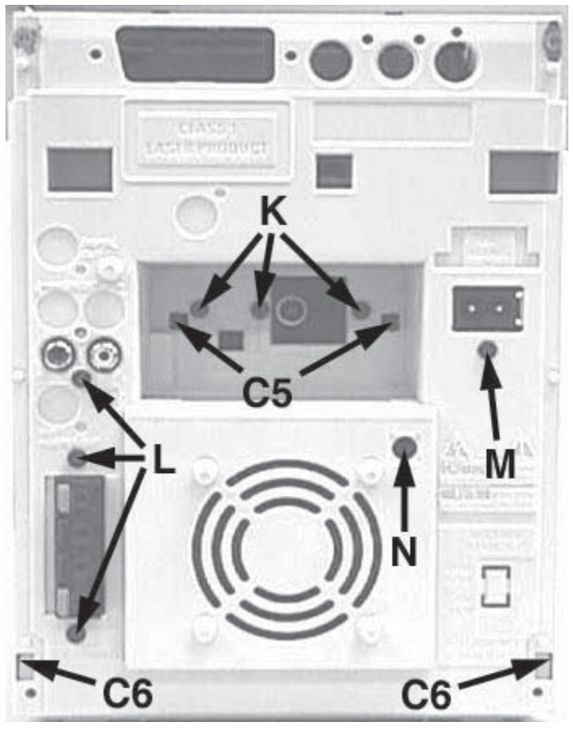


Figure 12

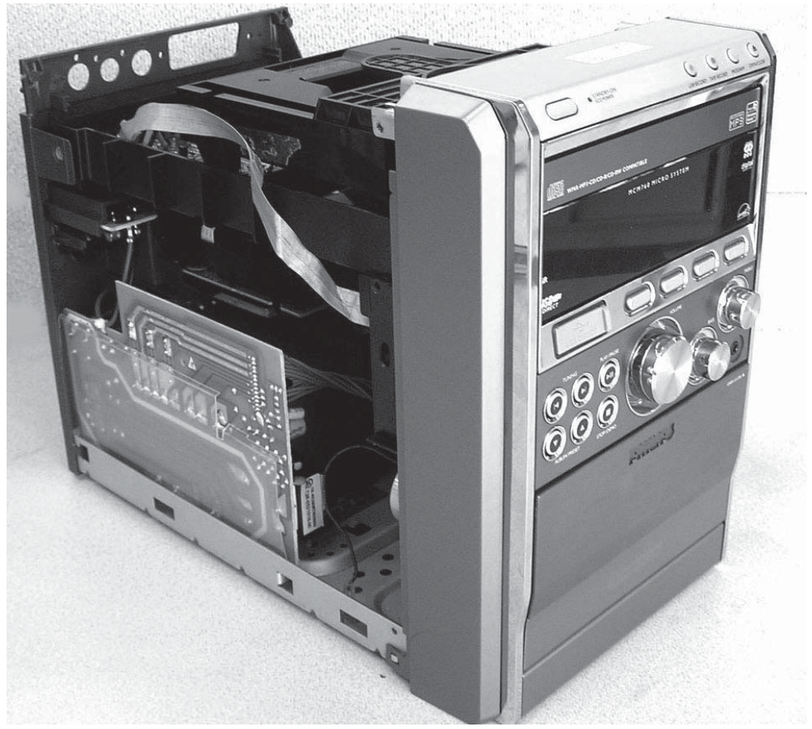
DISMANTLING INSTRUCTIONS

Repair Hints & Service Positions

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

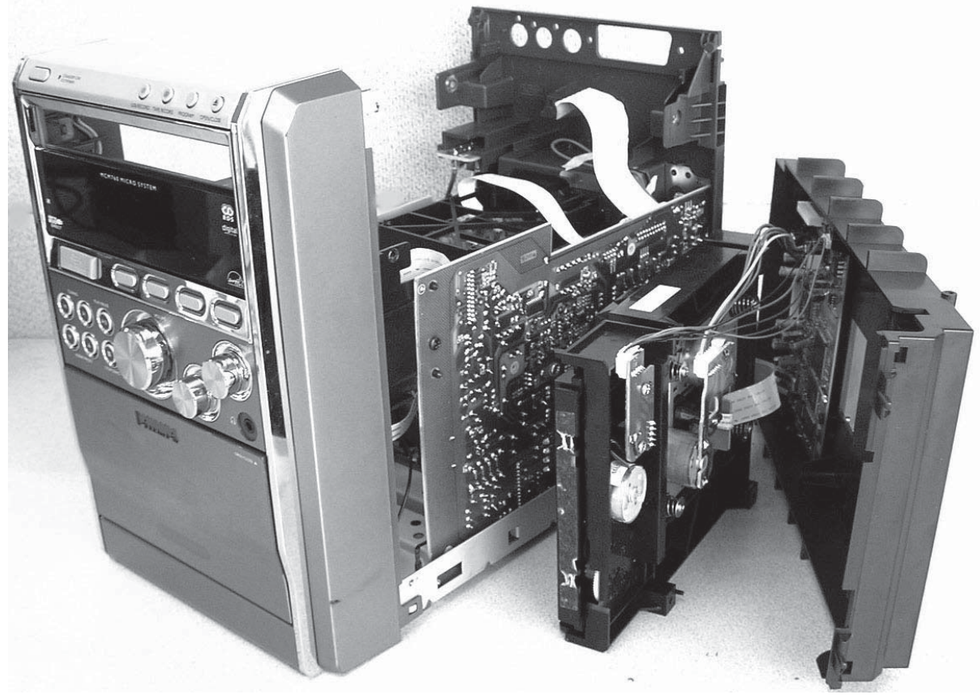
Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occurs.

Service position A

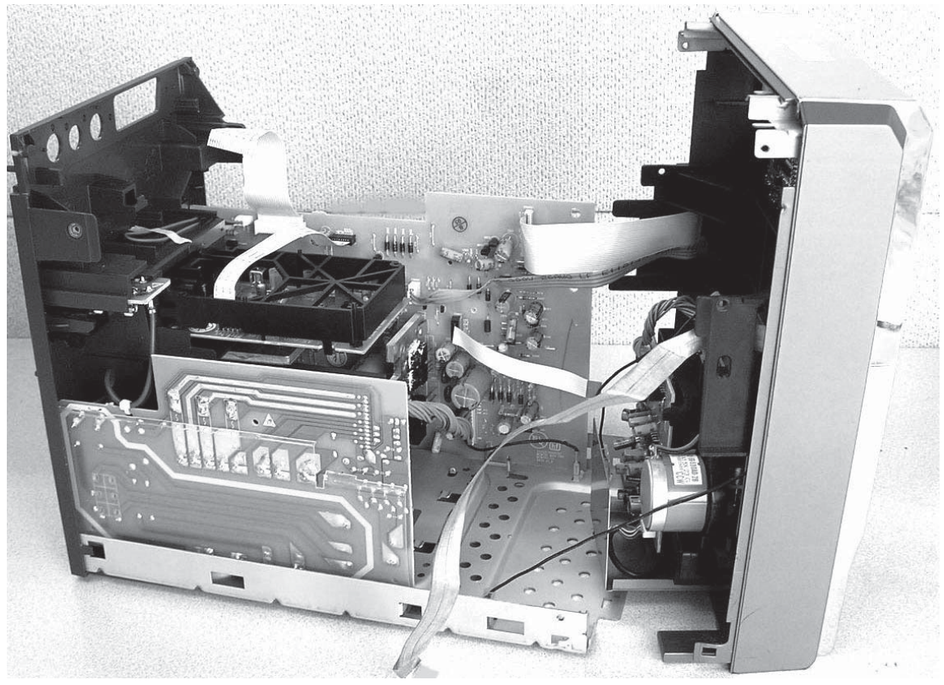


2-3

Service position B

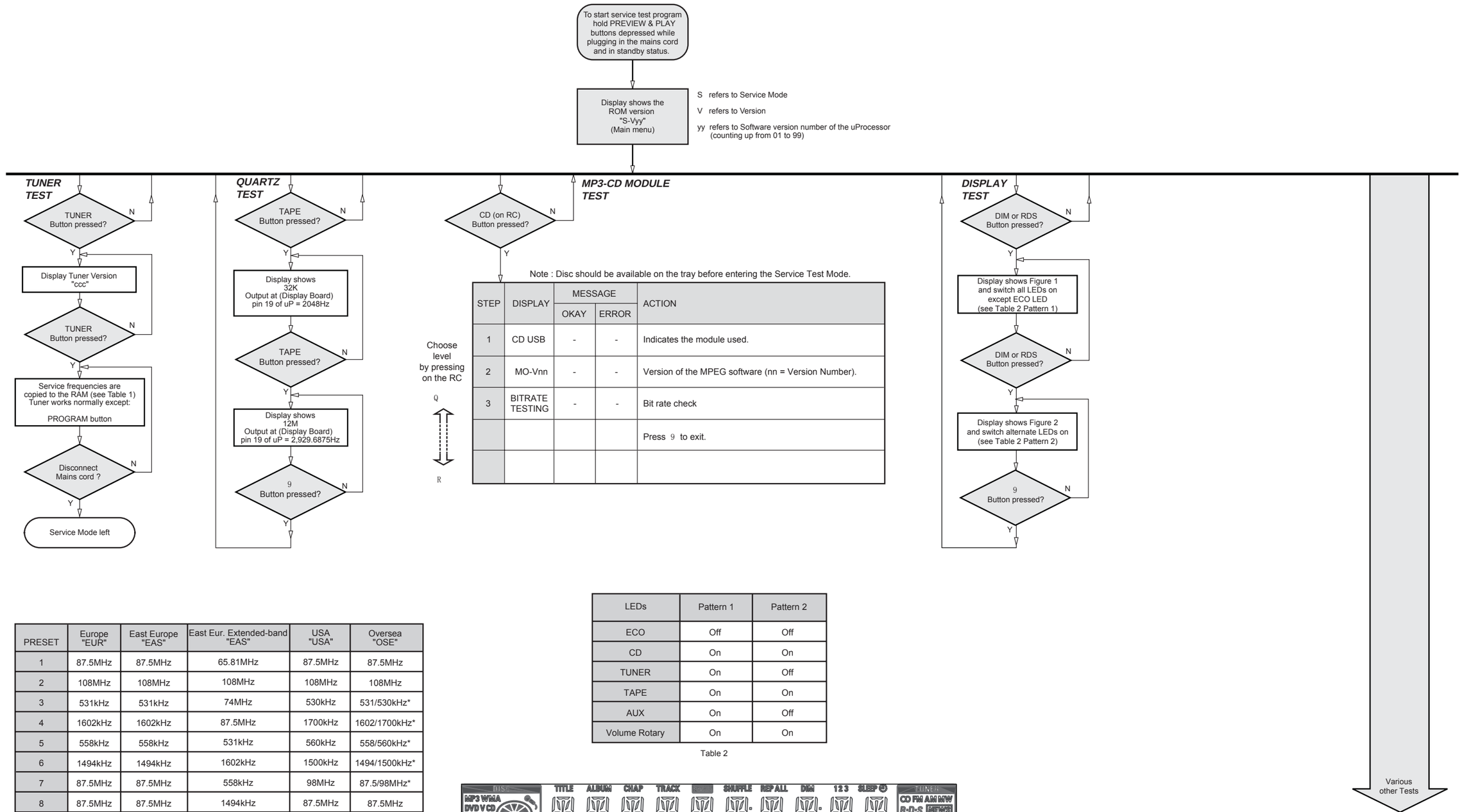


Service position C



3-1

SERVICE TEST PROGRAM



STEP	DISPLAY	MESSAGE		ACTION
		OKAY	ERROR	
1	CD USB	-	-	Indicates the module used.
2	MO-Vnn	-	-	Version of the MPEG software (nn = Version Number).
3	BITRATE TESTING	-	-	Bit rate check
				Press 9 to exit.

PRESET	Europe "EUR"	East Europe "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	87.5MHz	87.5MHz	558kHz	98MHz	87.5/98MHz*
8	87.5MHz	87.5MHz	1494kHz	87.5MHz	87.5MHz
9	87.5MHz	87.5MHz	98MHz	87.5MHz	87.5MHz
10	87.5MHz	87.5MHz	70.01MHz	87.5MHz	87.5MHz
11	98MHz	98MHz	65.81MHz	87.5MHz	98/87.5MHz*

Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz).
By holding the ECO and TUNER 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 (/98) version.
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. version.

LEDs	Pattern 1	Pattern 2
ECO	Off	Off
CD	On	On
TUNER	On	Off
TAPE	On	On
AUX	On	Off
Volume Rotary	On	On

Table 2

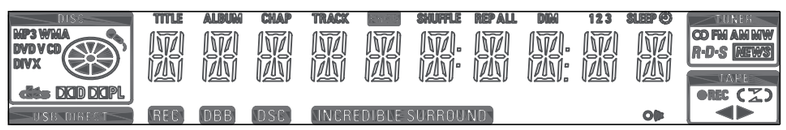


Figure 1

Remark：Full Display Pattern function is not available for no RDS version.

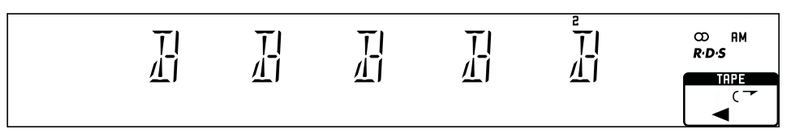
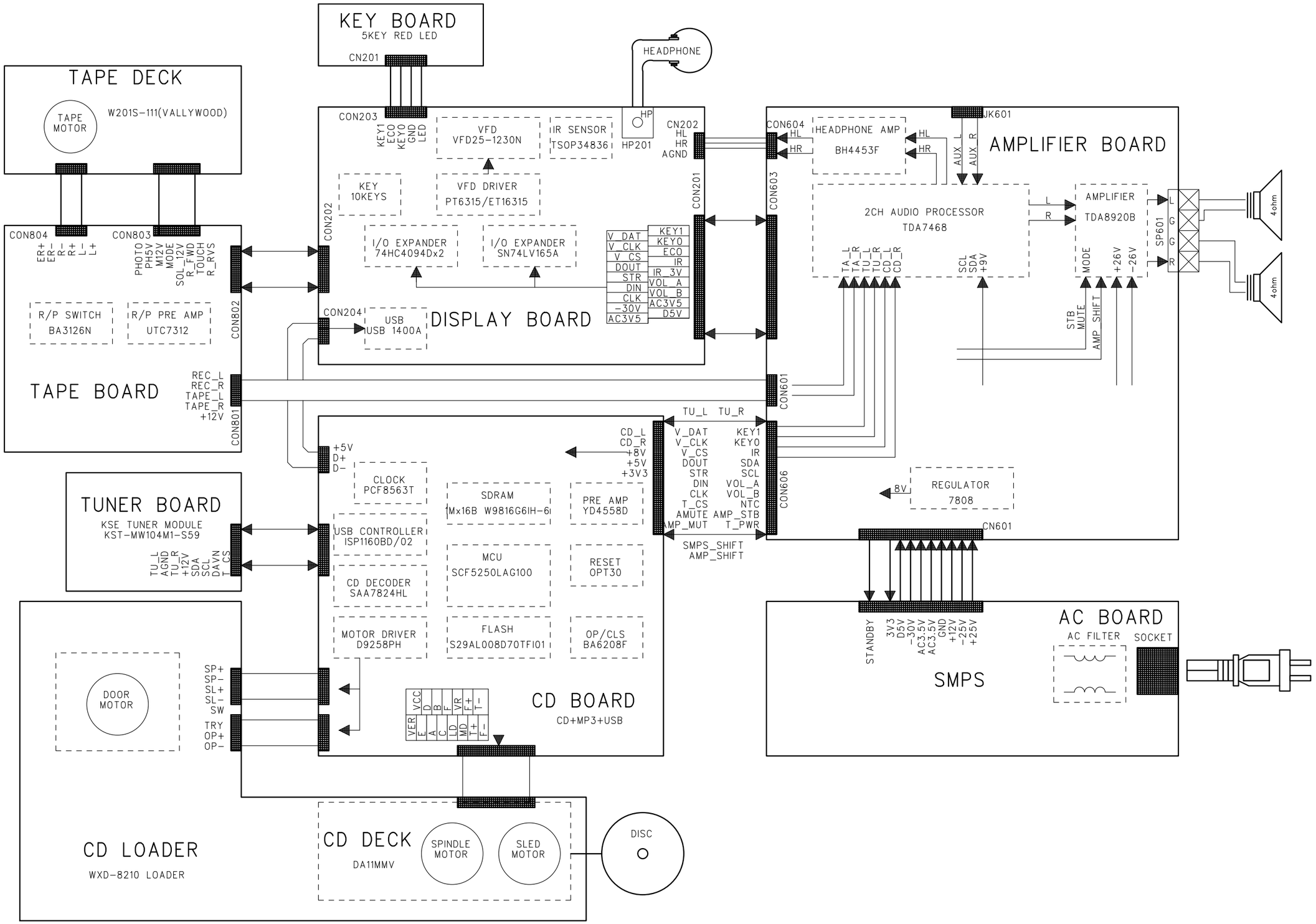


Figure 2

TEST	Activated with	ACTION
EEPROM TEST	S 9 to Exit	Test patterns will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test patterns correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT TEST	S	Load default data. Display shows "NEW" for 1 second. ***Caution! All presets from the customer will be lost!!***
DEMO TOGGLE	B II	Pressing this button will toggle between DEMO ON and DEMO OFF. The DEMO status will scroll once across the Display.
ROTARY ENCODER TEST	Volume, Treble or Bass Knob	Display shows value for 2 seconds. Values increases or decreases until Volume Maximum (0dB) or Volume Minimum (VOL MUTE) is reached.
LEAVE SERVICE TEST PROGRAM	Disconnect mains cord	

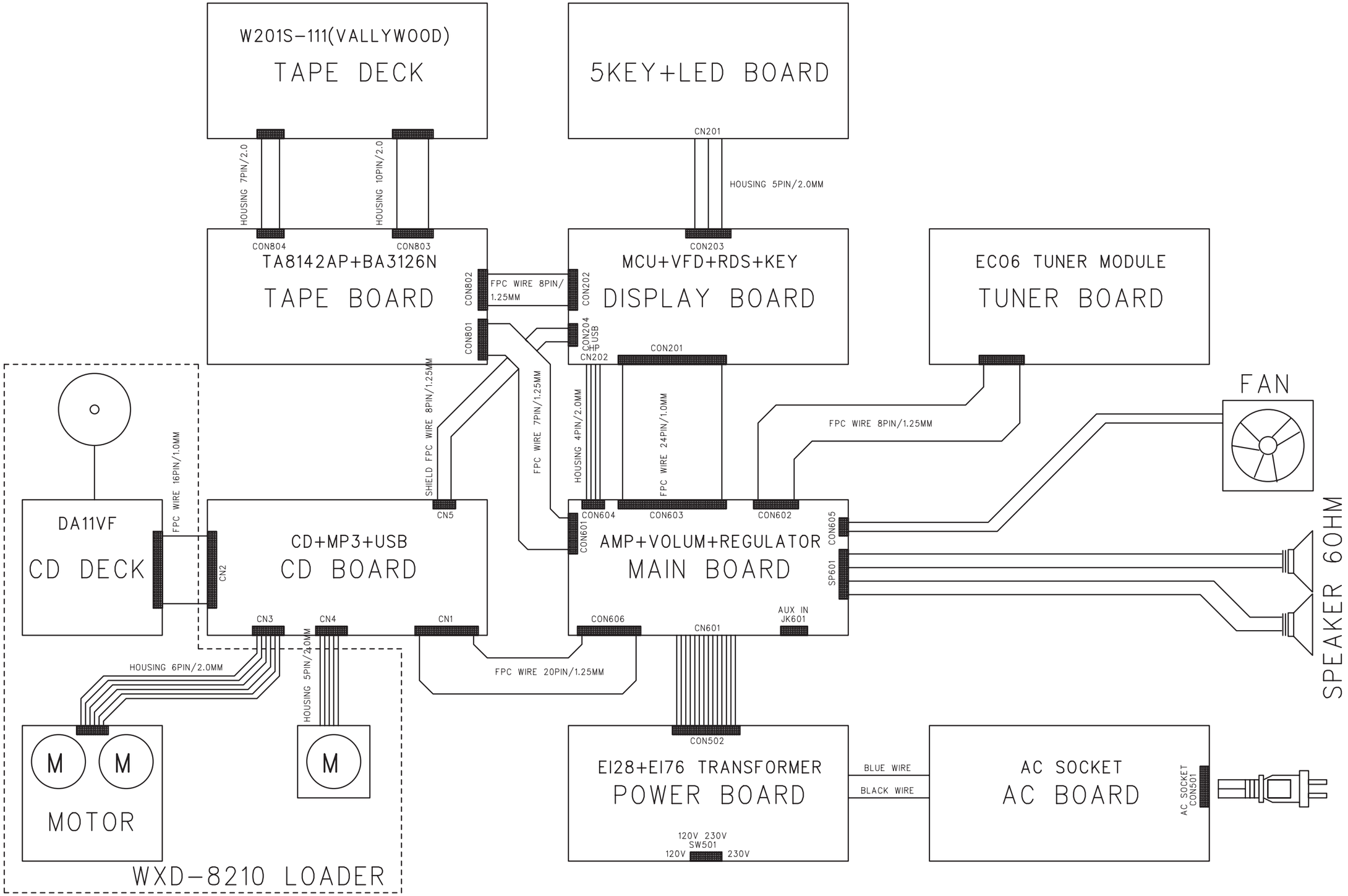
4-1

SET BLOCK DIAGRAM



5-1

SET WIRING DIAGRAM



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DISPLAY BOARD

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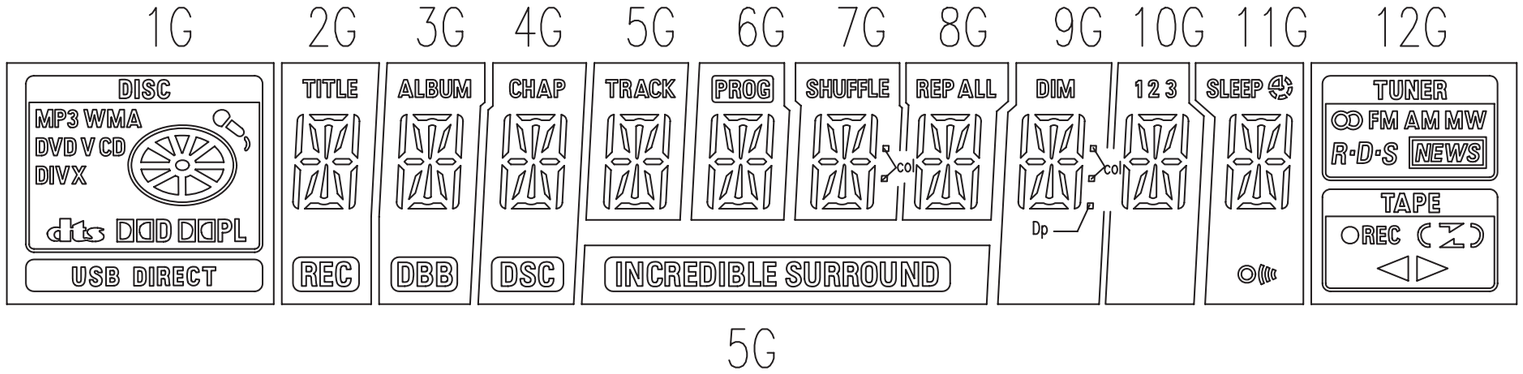
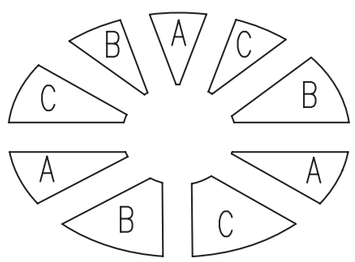
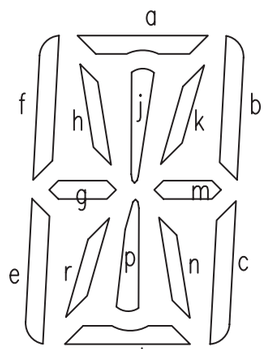
FTD DISPLAY PIN CONNECTION



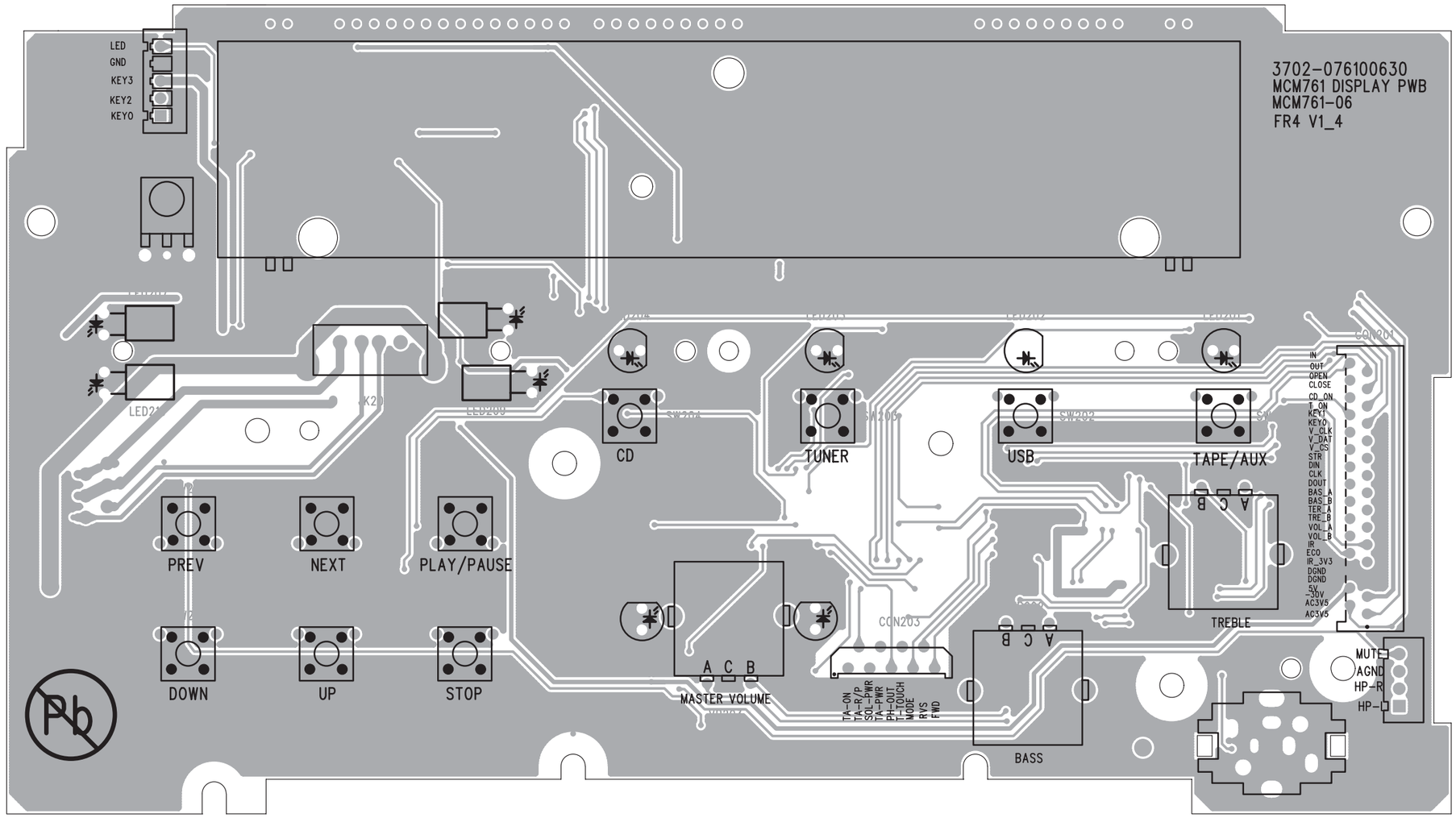




P \ G	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G
P1	DISC	REC	DBB	DSC	INCREDIBLE SURROUND		col		col	1	SLEEP	TUNER
P2	MP3							REP	Dp	2		
P3	DVD	TITLE	ALBUM	CHAP	TRACK	PROG	SHUFFLE	ALL	DIM	3		FM
P4	DIVX	a	a	a	a	a	a	a	a	a	a	AM
P5	CD	h	h	h	h	h	h	h	h	h	h	MW
P6	V	j,p	j,p	j,p	j,p	j,p	j,p	j,p	j,p	j,p	j,p	R·D·S
P7	WMA	k	k	k	k	k	k	k	k	k	k	NEWS
P8	USB DIRECT	b	b	b	b	b	b	b	b	b	b	TAPE
P9	dts	f	f	f	f	f	f	f	f	f	f	○REC
P10		m	m	m	m	m	m	m	m	m	m	
P11	DOLBY DIGITAL	g	g	g	g	g	g	g	g	g	g	
P12	DOLBY PL	c	c	c	c	c	c	c	c	c	c	
P13		e	e	e	e	e	e	e	e	e	e	
P14	C	r	r	r	r	r	r	r	r	r	r	
P15	B	n	n	n	n	n	n	n	n	n	n	
P16	A	d	d	d	d	d	d	d	d	d	d	

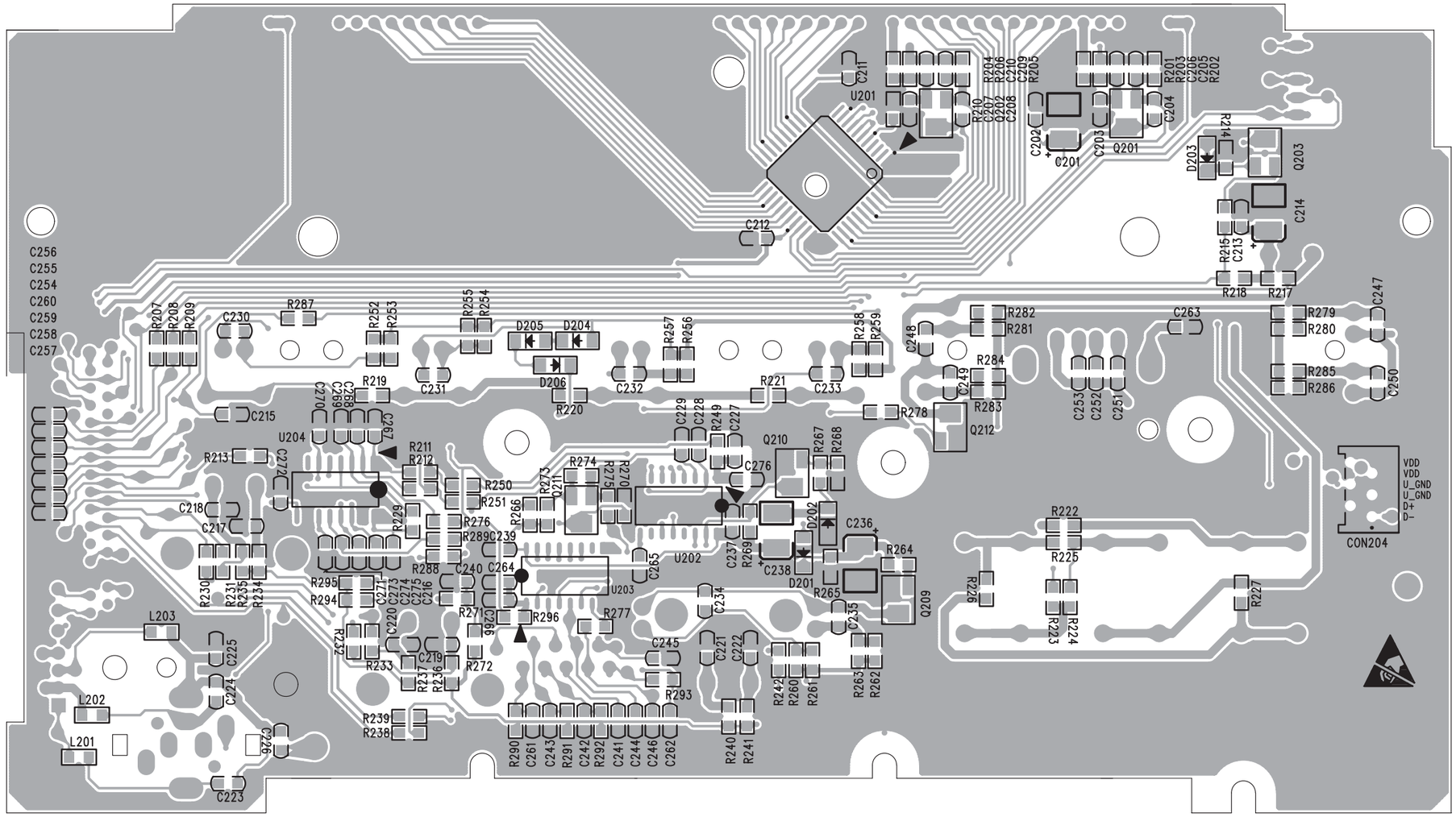
6-3

PCB LAYOUT - DISPLAY BOARD (TOP VIEW)



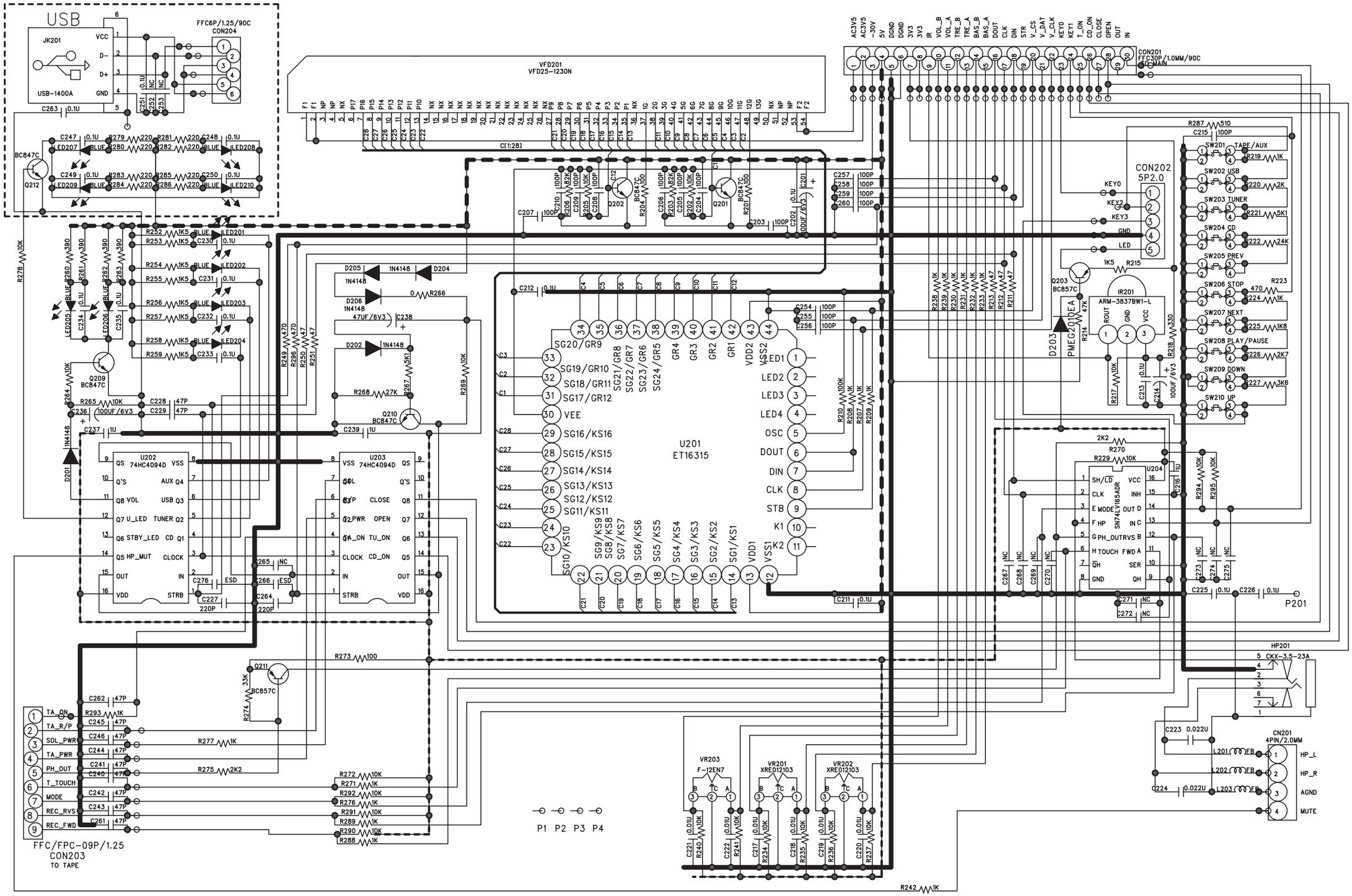
6-4

PCB LAYOUT - DISPLAY BOARD (BOTTOM VIEW)



6-5

CIRCUIT DIAGRAM - DISPLAY BOARD



CD BOARD

7-1

**The board is not intented to be repaired on component level.
Circuit Diagram and Printed Circuit Board drawings
are published for orientation only.**

**In case of defects please replace the entire board.
The board can be ordered with codenumber “9965 100 23096”.**

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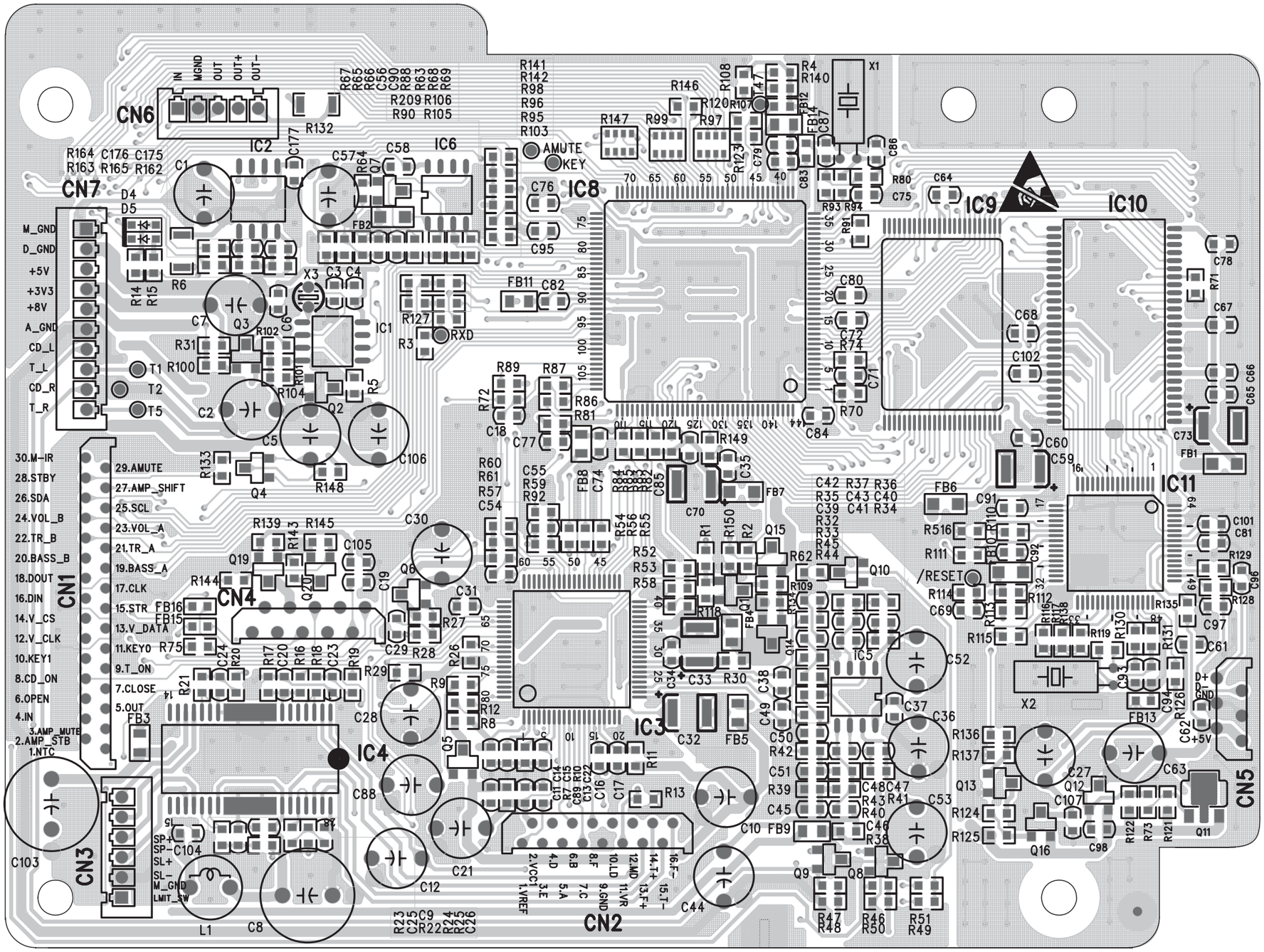
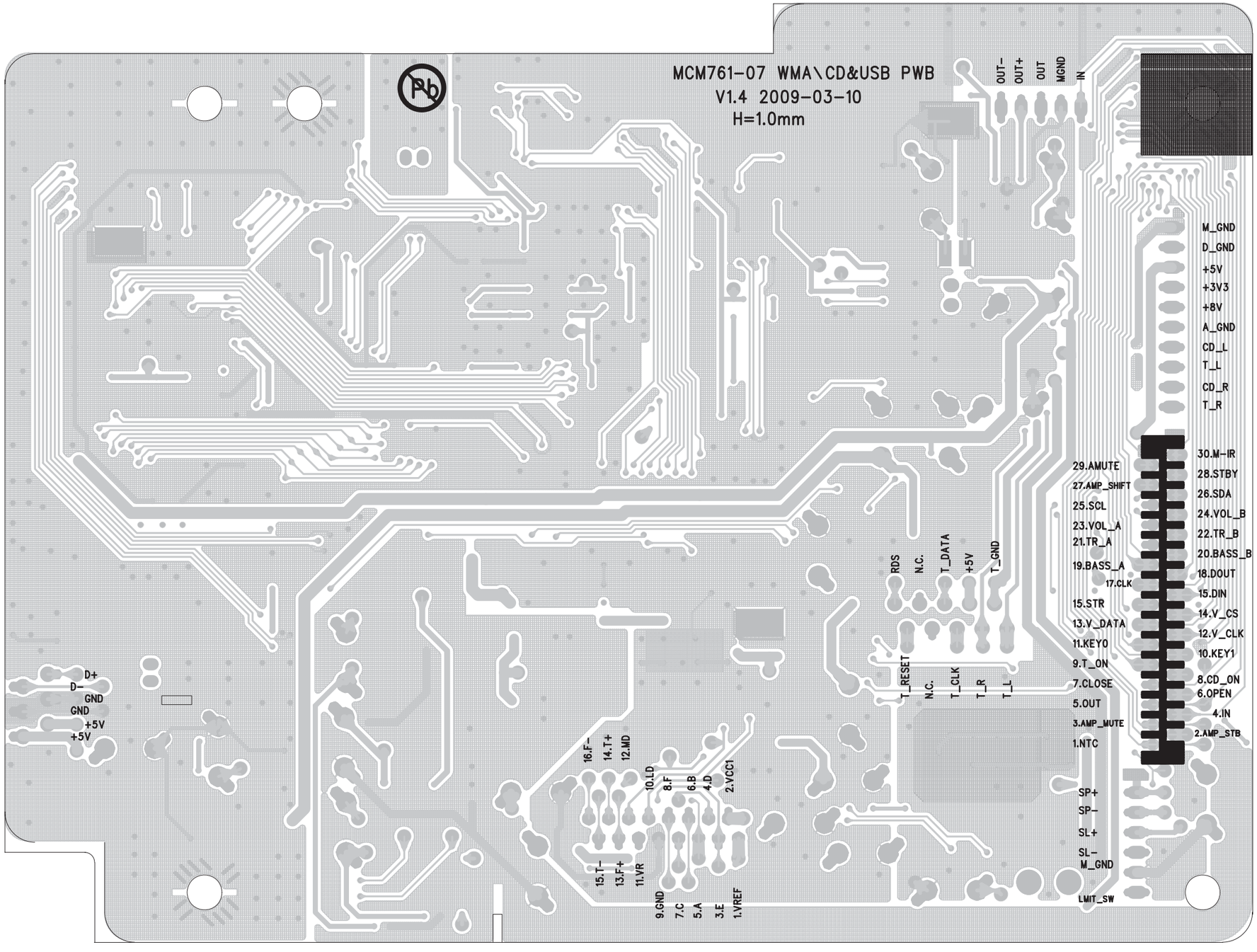
PCB LAYOUT - CD BOARD (TOP VIEW)



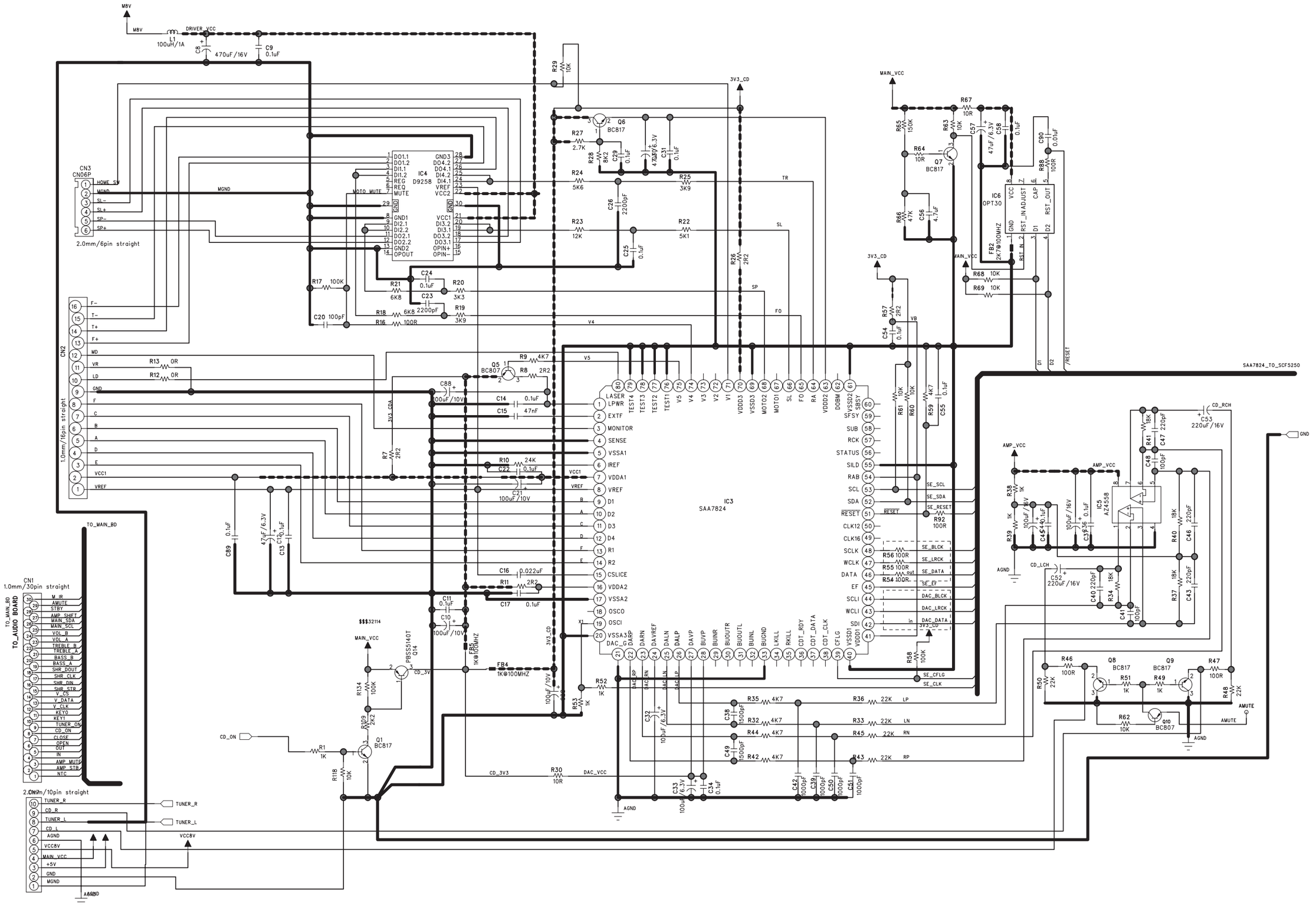
7-3

PCB LAYOUT - CD BOARD (BOTTOM VIEW)



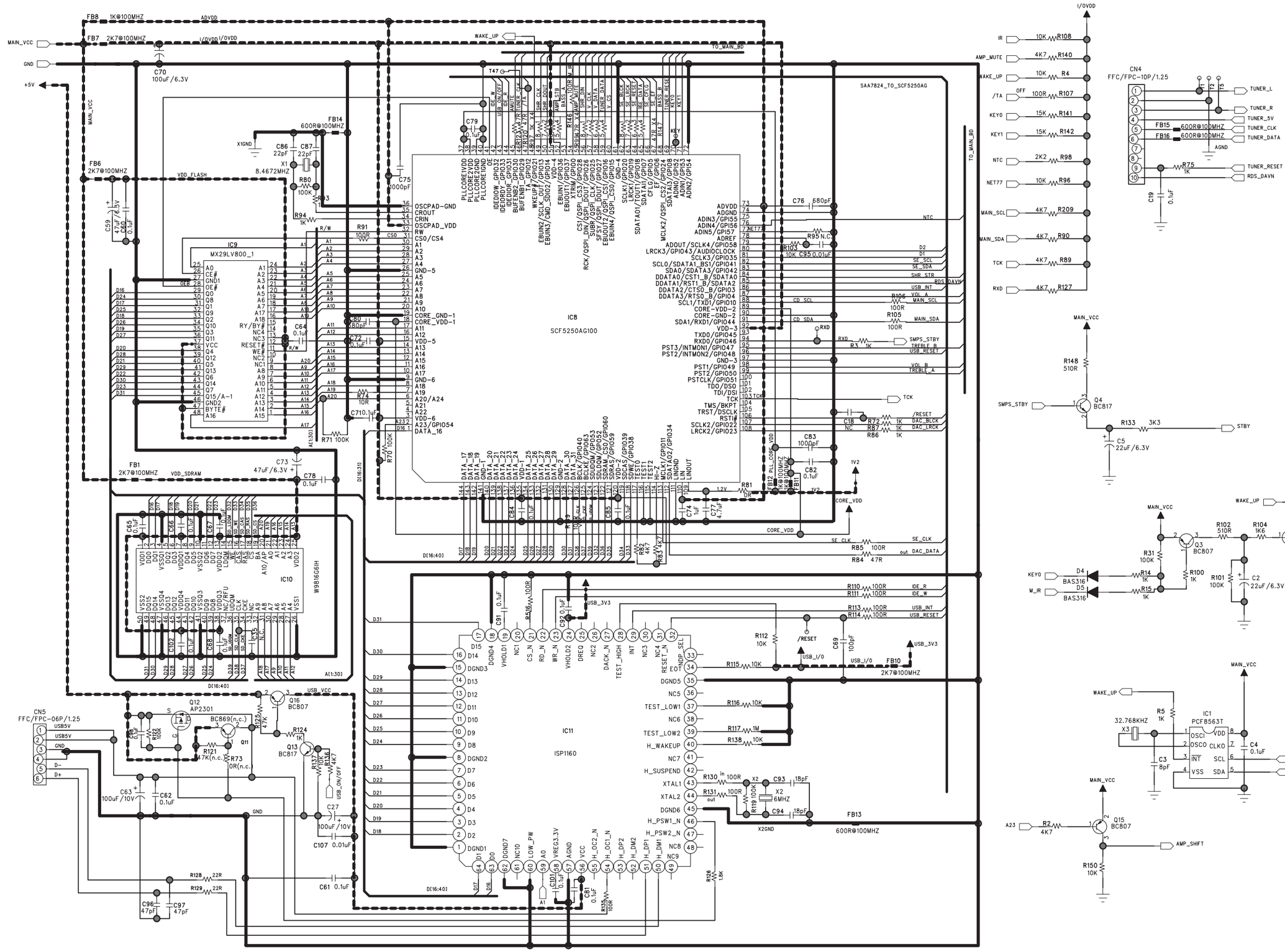
7-4

CIRCUIT DIAGRAM - CD BOARD (PART1)



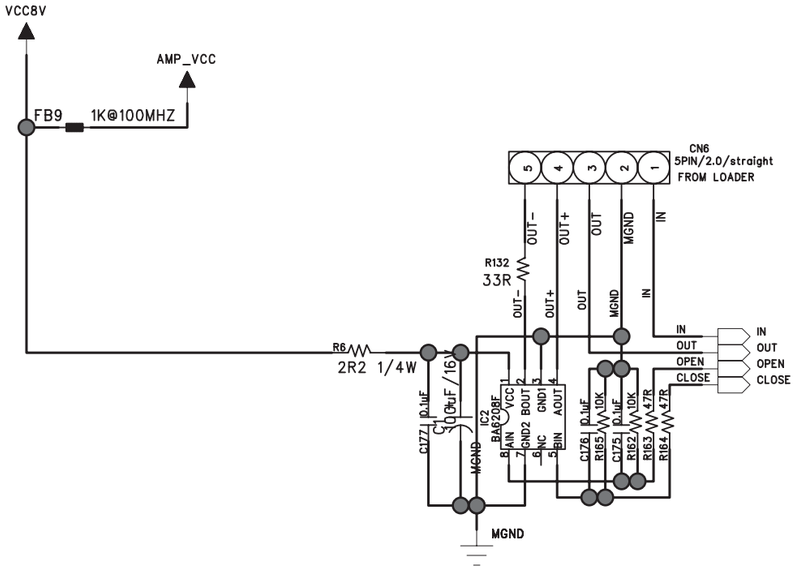
7-5

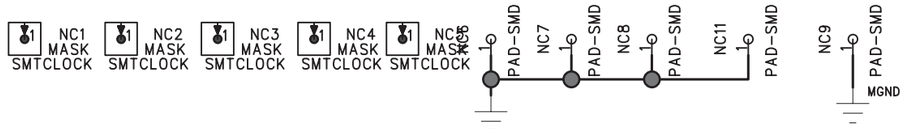
CIRCUIT DIAGRAM - CD BOARD (PART2)

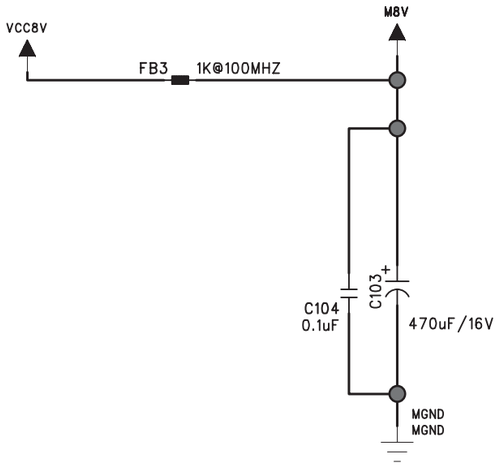


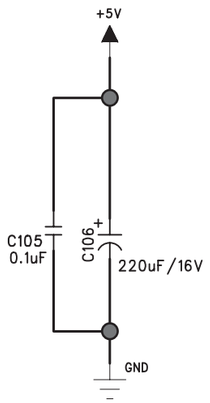
7-6

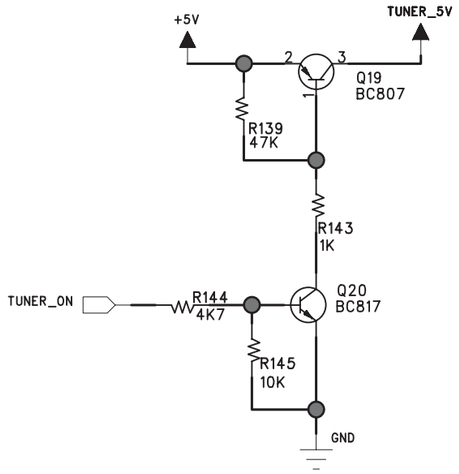
CIRCUIT DIAGRAM - CD BOARD (PART3)

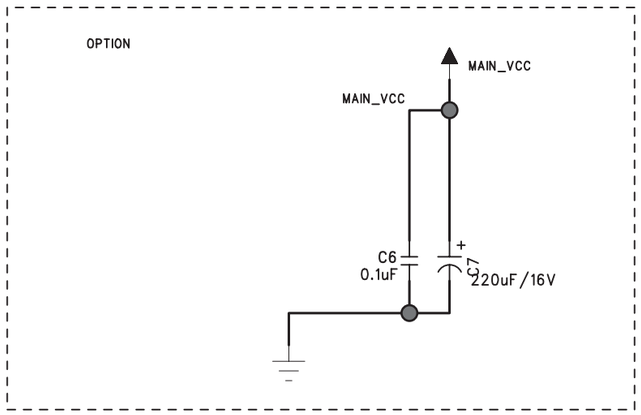






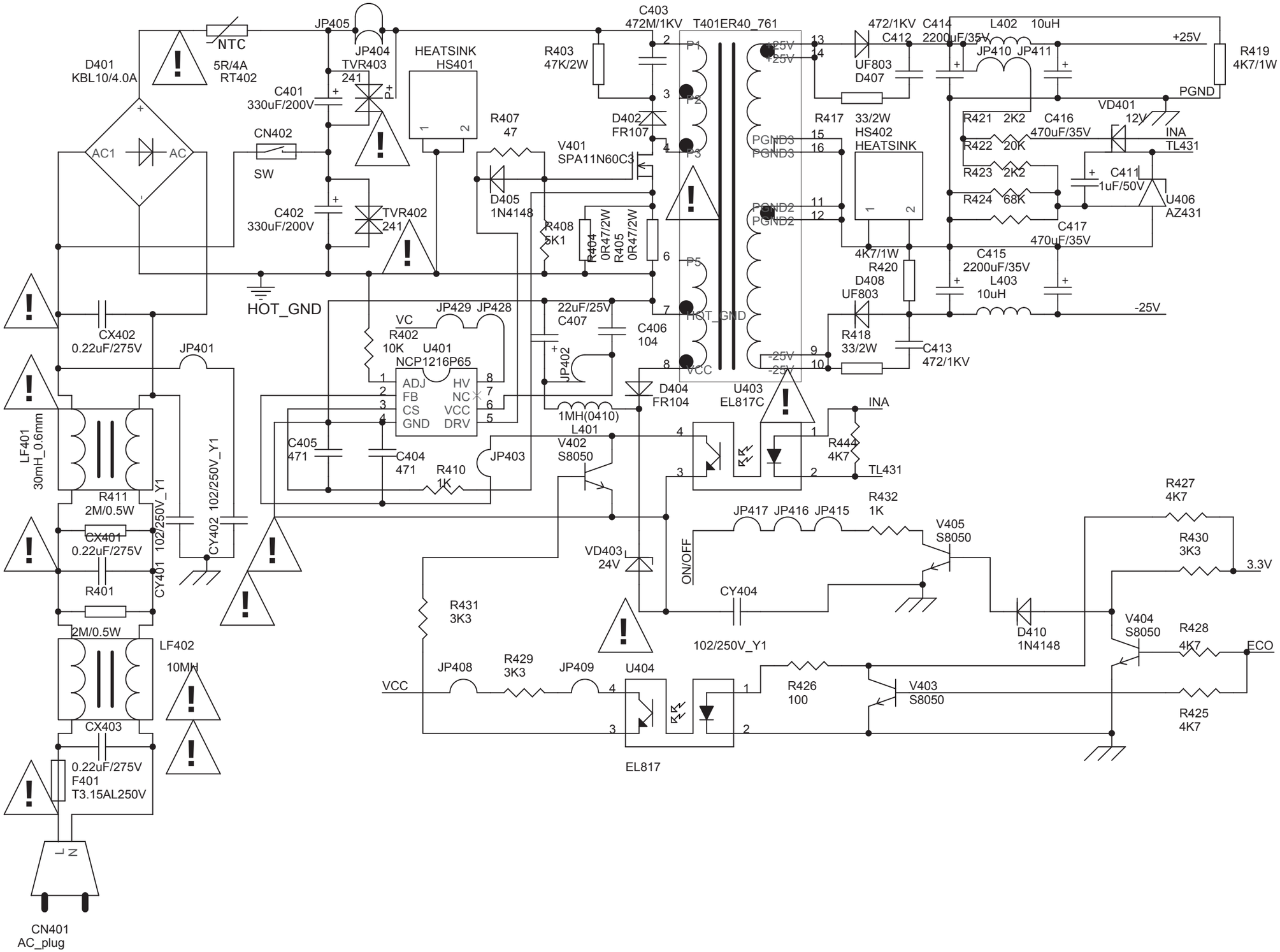






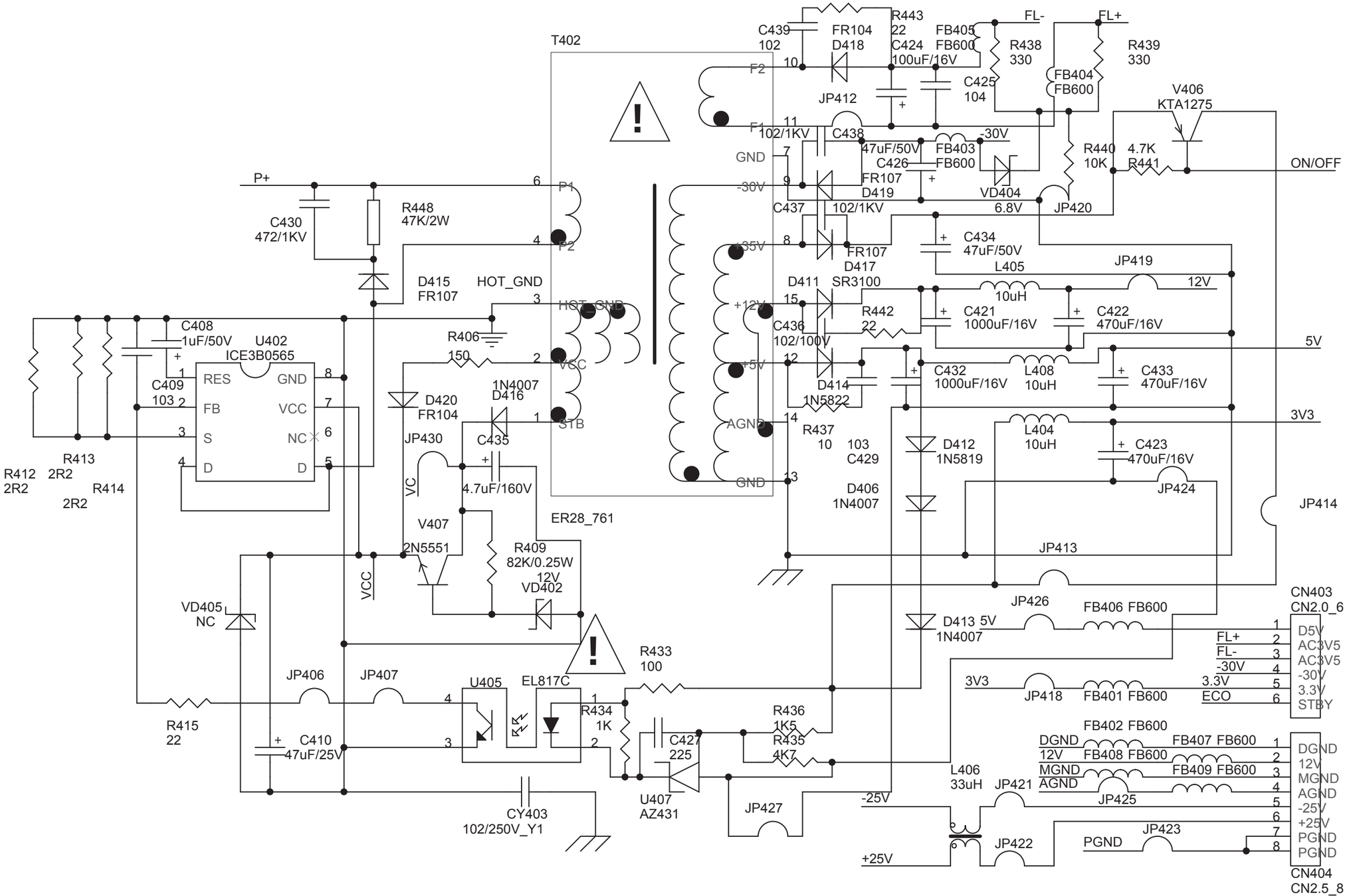
8-1

CIRCUIT DIAGRAM - POWER BOARD (PART1)



8-2

CIRCUIT DIAGRAM - POWER BOARD (PART2)



CASSETTE BOARD

9-1

**The board is not intented to be repaired on component level.
Circuit Diagram and Printed Circuit Board drawings
are published for orientation only.**

**In case of defects please replace the entire board.
The board can be ordered with codenumber “9965 100 23098”.**

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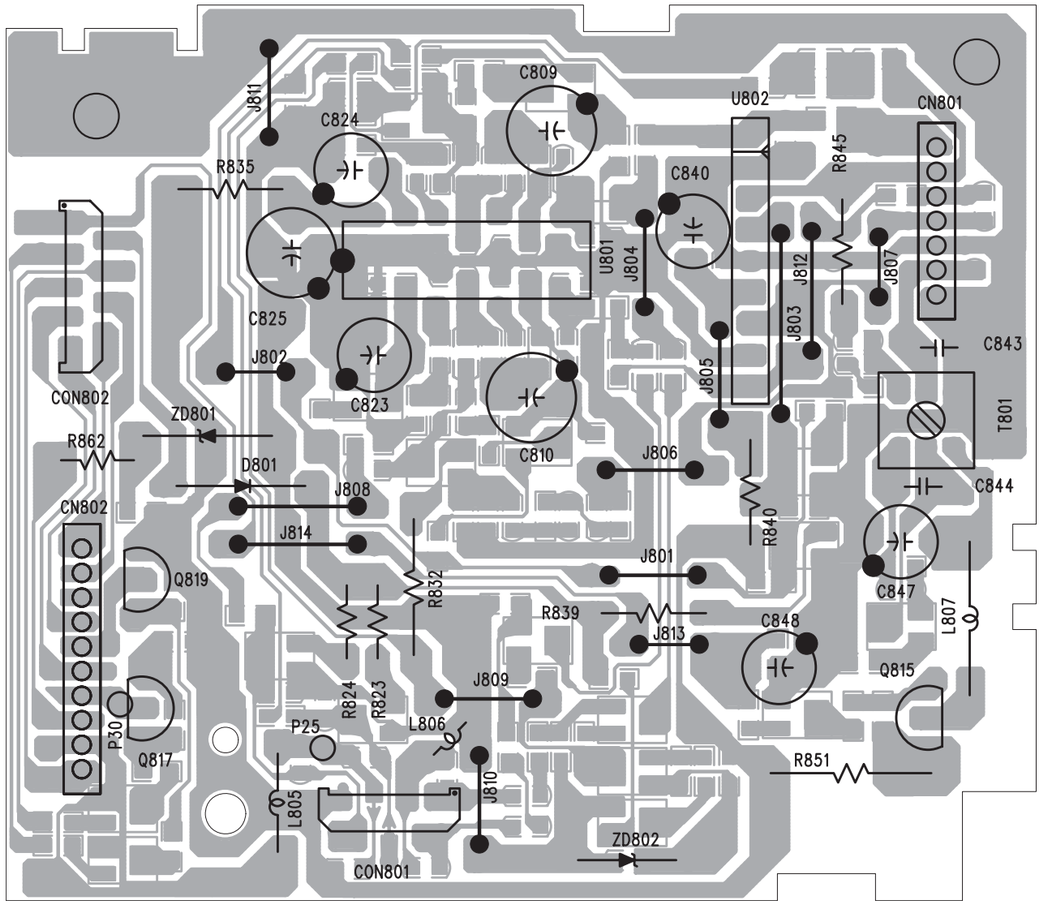
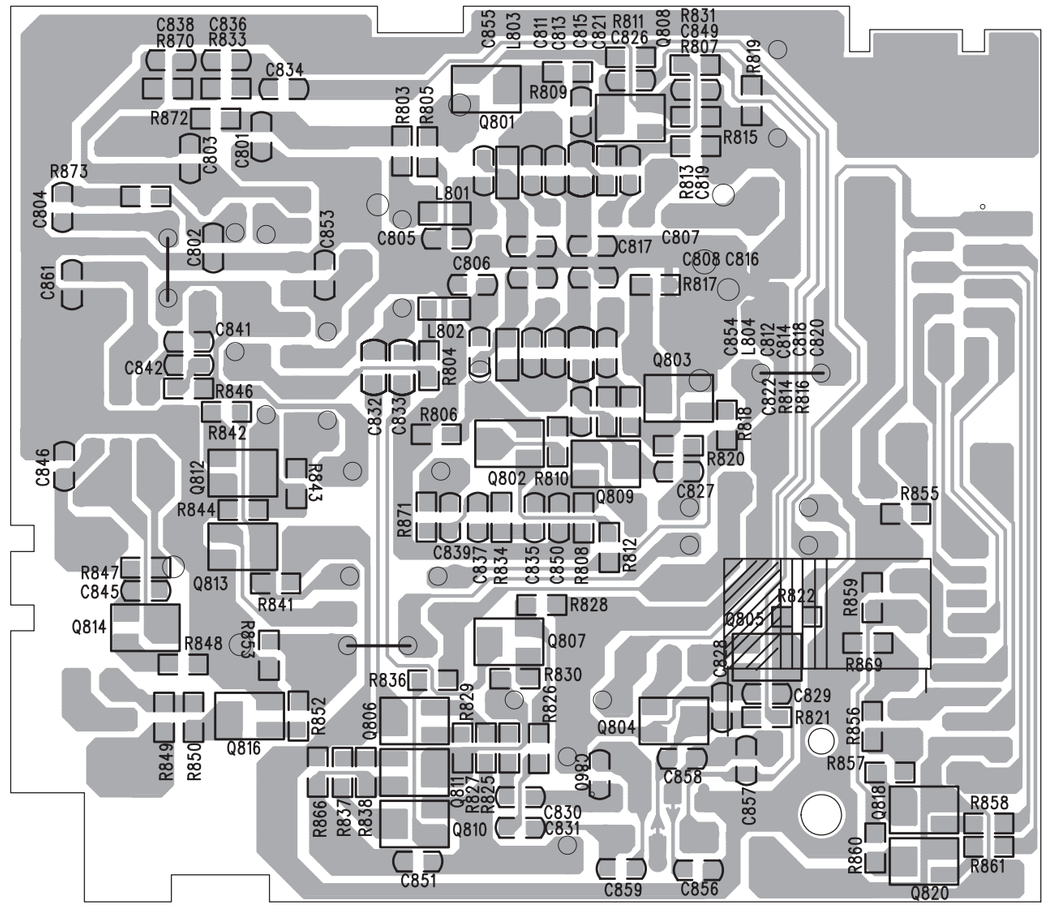
PCB LAYOUT - CASSETTE BOARD (TOP VIEW)

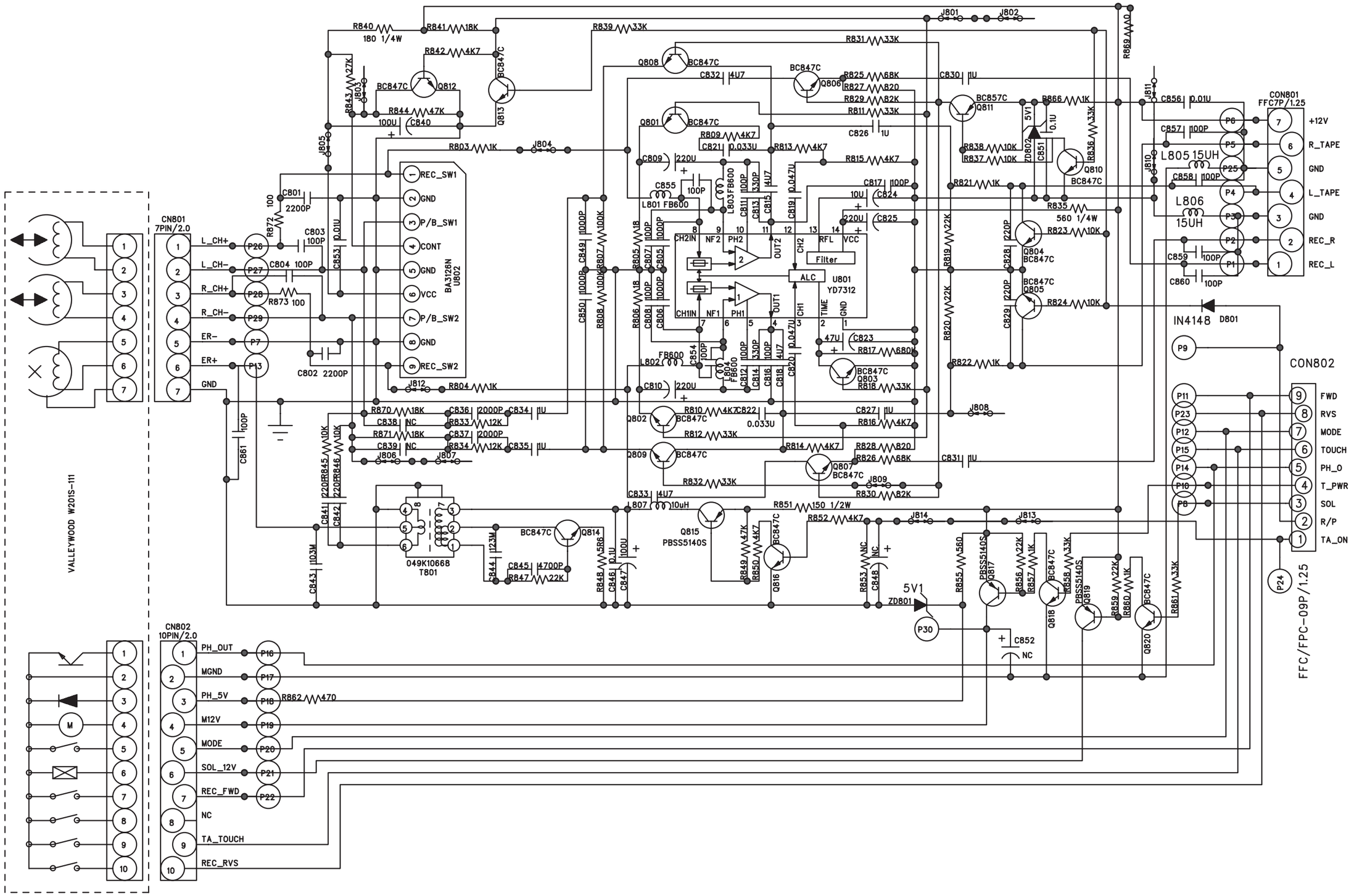


PCB LAYOUT - CASSETTE BOARD (BOTTOM VIEW)



9-3

CIRCUIT DIAGRAM - CASSETTE BOARD



10-1

MAIN & TOP KEY BOARD

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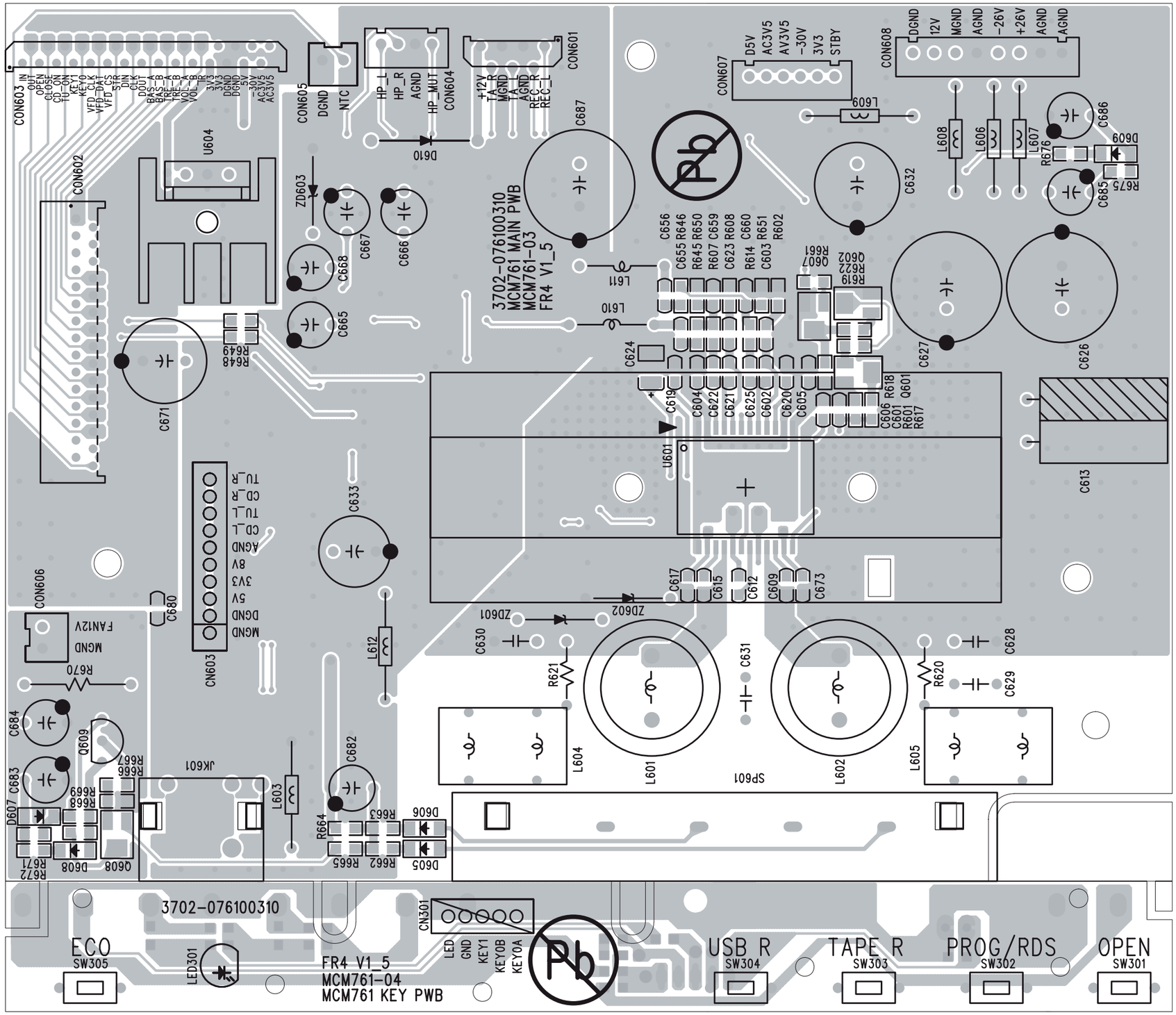
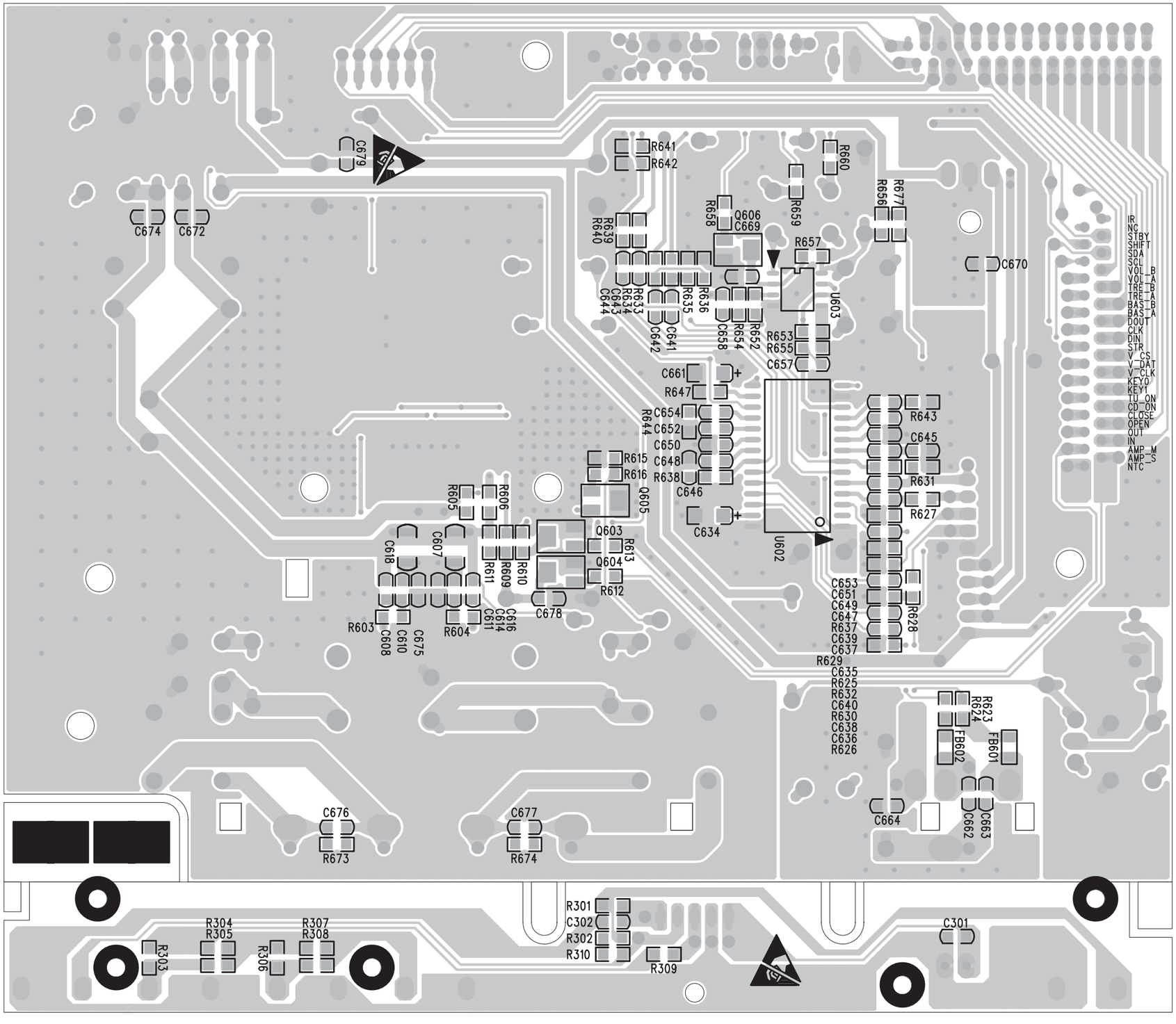
10-2

PCB LAYOUT - MAIN & TOP KEY BOARD (TOP VIEW)



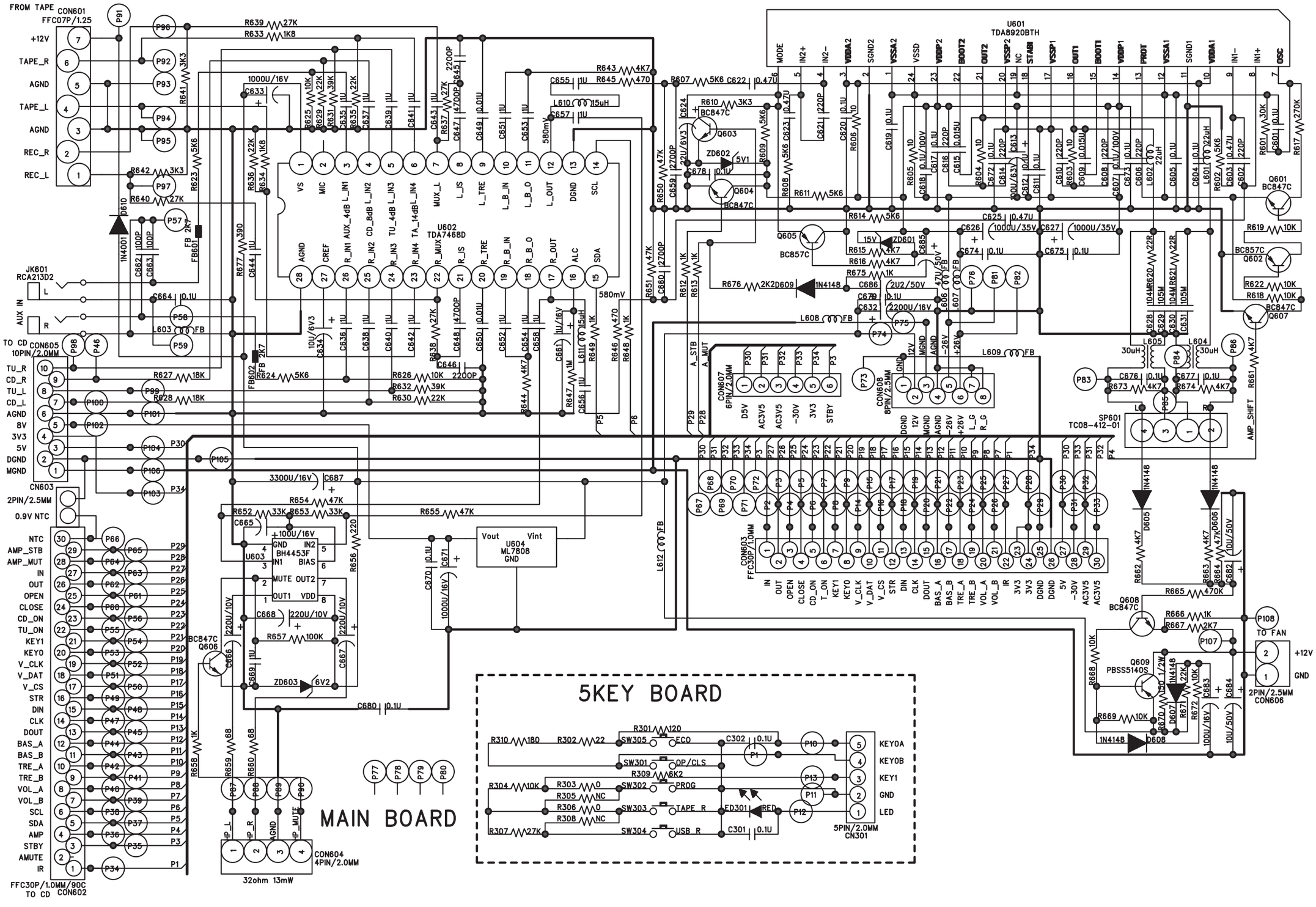
10-3

PCB LAYOUT - MAIN & TOP KEY BOARD (BOTTOM VIEW)



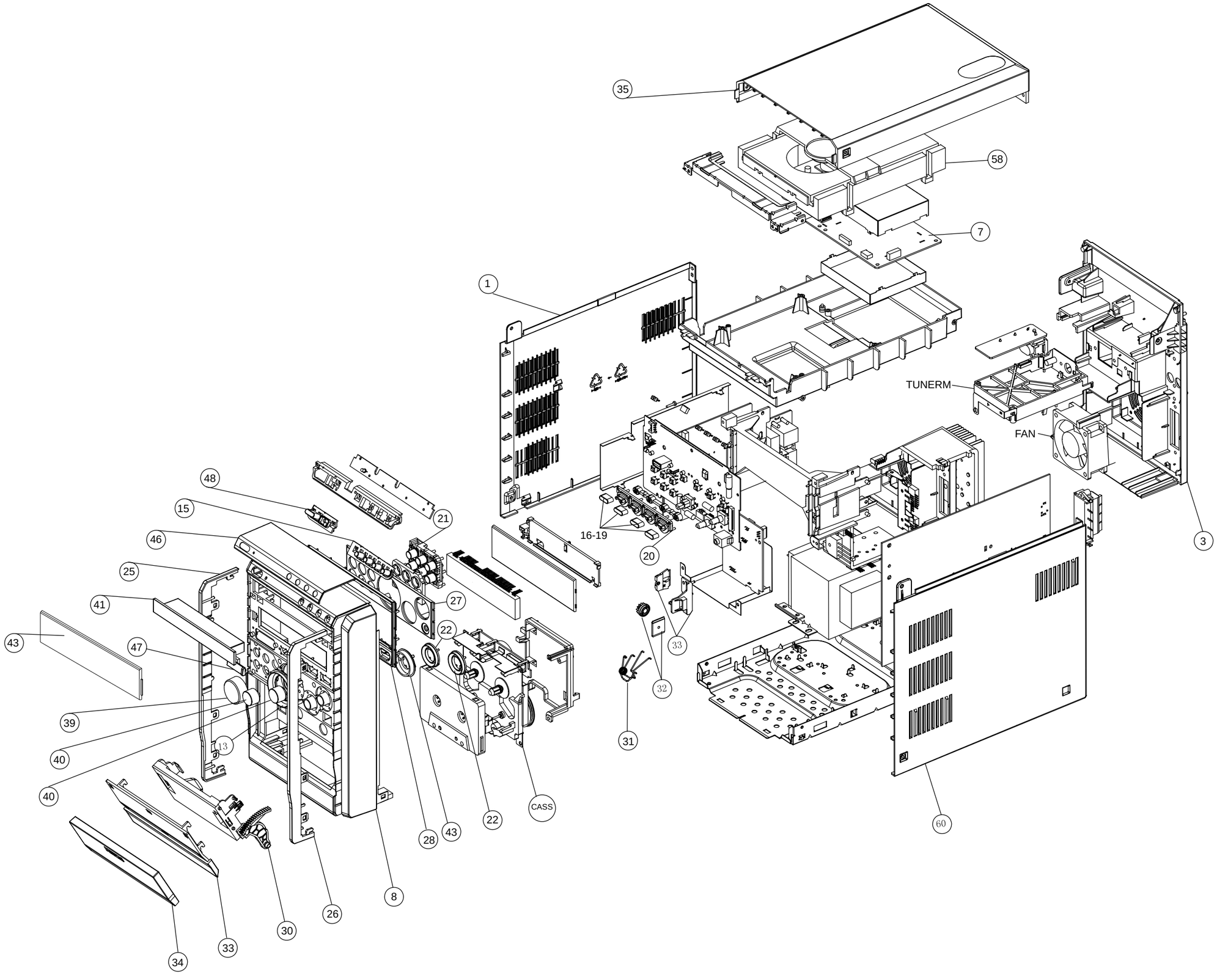
10-4

CIRCUIT DIAGRAM - MAIN & TOP KEY BOARD



11-1

SET MECHANICAL EXPLODED VIEW



MECHANICAL & ACCESSORIES PARTS LIST

Loc.	12NC	Description
MAIN UNIT		
1	996510023152	PANEL-LEFT
2	996510023149	PANEL-RIGHT
3	996510023142	CABINET-REAR MCM761/12
8	996510016506	CABINET FRONT
9	996510016507	LENS-VOLUME LIGHT GUIDE
12	996510017134	AM LOOP ANT 18.1uH 8T
15	994000005616	BUTTON-FUNCTION /12
15	996510016511	BUTTON-FUNCTION /61
16	996500039329	BUTTON-SOURCE (CD)
17	996500039330	BUTTON-SOURCE (TUNER)
18	996500039331	BUTTON-SOURCE (USB)
19	996500039332	BUTTON-SOURCE (TAPE/AUX)
20	994000005618	BRACKET-SOURCE BUTTON
21	996510023102	BUTTON-CD FUNCTION
22	994000005621	RING-BASS/TREBLE KNOB
23	994000005622	RING-VOLUME KNOB
25	994000005624	FRAME-FRONT CABINET (L)
26	994000005625	FRAME-FRONT CABINET (R)
27	996510016512	PANEL FRONT CABINET
28	994000005627	FRAME-FRONT CABINET /12
28	996510016513	FRAME-FRONT CABINET /61
30	994000005628	BRACKET-CASSETTE DOOR
32	994000001664	DAMPER GEAR ASSEMPLY
33	996510016514	DOOR-CASSETTE
33	994000005312	CATCH ASSEMPLY
34	996510016515	PANEL CASS DOOR
35	996510023116	CABINET TOP
39	994000005636	KNOB-VOLUME
40	994000005637	KNOB-BASS/TREBLE
41	996510016516	DOOR CD
43	996510023089	LENS DISPLAY MCM761/12
43	996510016517	LENS DISPLAY MCM761/61
46	996510023151	PANEL TOP ORNAMENTAL R1
47	994000005698	USB-COVER
48	994000005614	BUTTON POWER
58	994000005588	CD LOADER WXD8210D
31	994000005642	SPRING-CASSETTE DOOR
ACCORD	⚠ 996510016519	AC CORD PHINO H03VVH2-F
CASS	994000005606	CASS DECK MECH W201S-111
CASS	996510023104	CASSETTE DECK W201S-111C
CDM	994000005591	CD DRIVER DA11VF (SANYO)
CN204CD	996510023079	FFC CABLE 6P P1.25MM L320MM
CN2CDM	994000002122	FFC CABLE 16P L=170MM
CN601CA	994000003312	FFC CABLE 7P P1.25MM L160MM
CON201M	996510023071	FFC CABLE 30P P1MM L220MM
CON203C	996510023138	FFC CABLE 9P P1.25MM L110MM
CON606C	996510023076	FFC CABLE 30P P1MM L90MM
FAN	996510023136	FAN JD6025LS1 DC12V 0.09A
FMANT	994000004329	FM ANT WIRE 75R 1.0M
FMANT	996510000308	FM ANT WIRE 75R L1.0M
RC	994000005589	REMOTE CONTROL
SPKBOX	996510023115	SPEAKER BOX ASS'Y 4R 75W L+R
TUNECN4	996510023144	FFC CABLE 10P P1.25MM L70MM
TUNERM	996510023103	TUNER MODULE FM/AM/RDS(KSE) /12
TUNERM	996520034393	TUNER ASSEMBLY /61
5	996510023098	CASS. PWB ASSEMBLY
6	⚠ 996510023112	POWER BOARD ASSEMBLY /12
6	⚠ 996510016484	POWER BOARD ASSEMBLY /61
7	996510023096	CD PWB ASSEMBLY /12
7	996520034397	CD PWB ASSEMBLY /61
2A	996510023105	MAIN PWB ASSEMBLY (AMP BOARD) /12

ELECTRICAL PARTS LIST

Loc.	12NC	Description
MAIN PCB ASSY		
C607	996510023106	CH-CAP CER 0.1UF 100V+80%/-20%
C618	996510023106	CH-CAP CER 0.1UF 100V+80%/-20%
C629	996510016493	CAP MMF HMFS 5 1UF 50V +/-10%
C631	996510016493	CAP MMF HMFS 5 1UF 50V +/-10%
C687	996510023145	CAP ELECT 3300UF16V+/-20%12X25
CON605	996510023131	CONNECTOR 2P P2.5MM
TOCON606	996510009658	THERMISTOR RES NTC 10K +/-3%
CON603	996510040679	FFC CONNECTOR 30PIN P1.00MM WHITE
CON606	996510023131	CONNECTOR 2P P2.5MM
D601	996510000271	DIODE RLS4148 LL-34
D602	996510000271	DIODE RLS4148 LL-34
D603	996510000271	DIODE RLS4148 LL-34
D604	996510000271	DIODE RLS4148 LL-34
D605	996510000271	DIODE RLS4148 LL-34
D606	996510000271	DIODE RLS4148 LL-34
D607	996510000271	DIODE RLS4148 LL-34
D608	996510000271	DIODE RLS4148 LL-34
D609	996510000271	DIODE RLS4148 LL-34
D620	996510016485	DIODE 1N4001
JK601	994000005662	AUX JACK 4P 3.5MM TC58-292-53
L601	996510023077	CHOKE COIL 22uH 20% 1KHz 0.1R
L602	996510023077	CHOKE COIL 22uH 20% 1KHz 0.1R
L603	996510023084	FILTER BEAD RH3.5X6X0.8
L604	996510007060	TORODIDAL COIL 30uH +/-30% DCR
L605	996510007060	TORODIDAL COIL 30uH +/-30% DCR
L606	996510023084	FILTER BEAD RH3.5X6X0.8
L607	996510023084	FILTER BEAD RH3.5X6X0.8
L608	996510023084	FILTER BEAD RH3.5X6X0.8
L609	996510023084	FILTER BEAD RH3.5X6X0.8
L610	996510023146	BEAD COIL 3.5x1.5x3 15UH
L611	996510023146	BEAD COIL 3.5x1.5x3 15UH
L612	996510023084	FILTER BEAD RH3.5X6X0.8
Q609	994000005652	TRANSISTOR PBSS5140S
SP601	994000002095	SPK TERMINAL TC08-412-0
U601	996510023093	IC TDA8920BTH/N2 POWER AMP
U602	996500041701	IC TDA7468D SOUND SO28
U603	996500041703	IC BH4453F
U604	994000005656	IC ML7808FA REGULATOR TO-220F
ZD601	996510007763	ZENER DIODE BZX55C15V TAPING.
ZD602	996510007761	ZENER DIODE 5V1 1/2W TAPING.
ZD603	996510023095	DIODE BZX79-C6V2
TOP KEY PCB ASSY		
LED301	996510000292	LED 3MM 3R4HD-7(RED) TAPING
SW301	996500041895	SWITCH TACT
SW302	996500041895	SWITCH TACT
SW303	996500041895	SWITCH TACT
SW304	996500041895	SWITCH TACT
SW305	996500041895	SWITCH TACT
DISPLAY PWB ASSEMBLY		
C266	994000004264	MULT. VAR. 10.6-15.4V
C276	994000004264	MULT. VAR. 10.6-15.4V
D201	996510000271	DIODE RLS4148 LL-34
D202	996510000271	DIODE RLS4148 LL-34

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DISPLAY PWB ASSEMBLY		
D203	994000004422	SCHOTTKY
D204	996510000271	DIODE RLS4148 LL-34
D205	996510000271	DIODE RLS4148 LL-34
D206	996510000271	DIODE RLS4148 LL-34
HP201	994000003605	MICRO PHONE JACK
IR201	996510008916	IR RECEIVER IRM-3638TF4
IR201	996510023118	IR RECEIVER ARM-3837BW1-L
JK201	994000004263	USB JACK USB-1400A 4P
LED201	994000005678	LED 3MM SUPER BLUE
LED202	994000005678	LED 3MM SUPER BLUE
LED203	994000005678	LED 3MM SUPER BLUE
LED204	994000005678	LED 3MM SUPER BLUE
LED205	994000005678	LED 3MM SUPER BLUE
LED206	994000005678	LED 3MM SUPER BLUE
LED207	994000005678	LED 3MM SUPER BLUE
LED208	994000005678	LED 3MM SUPER BLUE
LED209	994000005678	LED 3MM SUPER BLUE
LED210	994000005678	LED 3MM SUPER BLUE
RVR202	994000001628	ROTARY ENCODER
SW201	994000001627	TACT SWITCH AI KFC-A06-5
SW202	994000001627	TACT SWITCH AI KFC-A06-5
SW203	994000001627	TACT SWITCH AI KFC-A06-5
SW204	994000001627	TACT SWITCH AI KFC-A06-5
SW205	994000001627	TACT SWITCH AI KFC-A06-5
SW206	994000001627	TACT SWITCH AI KFC-A06-5
SW207	994000001627	TACT SWITCH AI KFC-A06-5
SW208	994000001627	TACT SWITCH AI KFC-A06-5
SW209	994000001627	TACT SWITCH AI KFC-A06-5
SW210	994000001627	TACT SWITCH AI KFC-A06-5
U201	996510000296	IC VFD DRIVER PT6315 LQFP44
U201	996510023107	IC VFD DRIVER ET16315 LQFP44
U202	994000005676	IC 74HC4094D MEMORY
U203	994000005676	IC 74HC4094D MEMORY
U204	996510023109	IC SN74LV165ADR
VFD201	994000005681	FTD VFD25-1230N
VR201	994000001628	ROTARY ENCODER
VR203	994000005683	ROTARY ENCODER L23FX10(T)

CASS. PWB ASSEMBLY (ONLY FOR REFERENCE)		
D801	996510016501	DIODE IN4148FT-72
L801	996510023121	FERRITE BEAD 600R@100MHz
L802	996510023121	FERRITE BEAD 600R@100MHz
L803	996510023121	FERRITE BEAD 600R@100MHz
L804	996510023121	FERRITE BEAD 600R@100MHz
L807	996510016481	RAD. AXIAL TYPE INDUCTOR 10UH
Q815	994000005652	TRANSISTOR PBSS5140S
Q817	994000005652	TRANSISTOR PBSS5140S
Q819	994000005652	TRANSISTOR PBSS5140S
T801	996500041709	IFT 049K10668 TYPE 7CDA BLACK
T801	996510023114	TAPE IFT YD-10668
U801	996510023091	IC D7312CP PREAMPLIFIER
U801	996510023122	IC UTC7312 PREAMPLIFIER YW
U801	996510023129	IC YD7312 PREAMPLIFIER
U802	996500041707	IC BA3126N
ZD801	996510007761	ZENER DIODE 5V1 1/2W TAPING.
ZD802	996510007761	ZENER DIODE 5V1 1/2W TAPING.

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MECHANICAL & ACCESSORIES PARTS LIST

Loc.	12NC	Description
POWER BOARD ASSEMBLY (ONLY FOR REFERENCE)		
C401	996510023069	CAP ELECT 330UF 200V +/-20%
C402	996510023069	CAP ELECT 330UF 200V +/-20%
C403	996510023137	CAP CER CT81 4700pF 1KV +/-20%
C412	996510023137	CAP CER CT81 4700pF 1KV +/-20%
C413	996510023137	CAP CER CT81 4700pF 1KV +/-20%
C430	996510023137	CAP CER CT81 4700pF 1KV +/-20%
C436	996510023147	CH-CAP CER 1000PF 100V +/-10%
C437	996510023083	CAP CER CT81 1000pF 1KV +/-10%
C438	996510023083	CAP CER CT81 1000pF 1KV +/-10%
C439	996510023147	CH-CAP CER 1000PF 100V +/-10%
CX401	996510023132	CAP MKP 0.22UF 275V +/-20%
CX402	996510023132	CAP MKP 0.22UF 275V +/-20%
CX403	996510023132	CAP MKP 0.22UF 275V +/-20%
CY401	996510023128	CAP CER 1000PF 250VY1+/-20%Y5U
CY402	996510023128	CAP CER 1000PF 250VY1+/-20%Y5U
CY403	996510023128	CAP CER 1000PF 250VY1+/-20%Y5U
CY404	996510023128	CAP CER 1000PF 250VY1+/-20%Y5U
D401	996510023127	BRIDGE RECTIFIER DIODE KBL10
D402	996510023086	DIODE FR107 FAST RECT 1A/1000V
D404	996510023094	DIODE FAST FR104 400V/1A
D405	996510000271	DIODE RLS4148 LL-34
D406	996510007042	DIODE RECT 1N4007 1A/1000VDO41
D407	996510023125	DIODE RECTIFIER UF803 8.0A300V
D408	996510023125	DIODE RECTIFIER UF803 8.0A300V
D410	996510000271	DIODE RLS4148 LL-34
D411	996510023073	SCHOTTKY BARRIER DIODE SR3100
D412	996510006964	DIODE 1N5819 DO-41
D413	996510007042	DIODE RECT 1N4007 1A/1000VDO41
D414	996510023072	SCHOTTKY BARRIER DIODE 1N5822
D415	996510023086	DIODE FR107 FAST RECT 1A/1000V
D416	996510023086	DIODE FR107 FAST RECT 1A/1000V
D417	996510023086	DIODE FR107 FAST RECT 1A/1000V
D418	996510023094	DIODE FAST FR104 400V/1A
D419	996510023086	DIODE FR107 FAST RECT 1A/1000V
D420	996510023094	DIODE FAST FR104 400V/1A
F401	⚠ 996510023141	FUSE ROUND TYPE T5AL250V
FB401	996510023121	FERRITE BEAD 600R@100MHz
FB402	996510023121	FERRITE BEAD 600R@100MHz
FB403	996510023121	FERRITE BEAD 600R@100MHz
FB404	996510023121	FERRITE BEAD 600R@100MHz
FB405	996510023121	FERRITE BEAD 600R@100MHz
FB406	996510023121	FERRITE BEAD 600R@100MHz
FB407	996510023121	FERRITE BEAD 600R@100MHz
FB408	996510023121	FERRITE BEAD 600R@100MHz
FB409	996510023121	FERRITE BEAD 600R@100MHz
L401	996510023117	LF 1000UH 10%LGA0410 DCR:17.4R
L402	996510023113	INDUCTOR 10uH+/-10%
L403	996510023113	INDUCTOR 10uH+/-10%
L404	996510023134	POWER IND. RCH0507-100K 10uH
L405	996510023134	POWER IND. RCH0507-100K 10uH
L406	996510007060	TORODIDAL COIL 30uH +/-30% DCR
L408	996510023134	POWER IND. RCH0507-100K 10uH
LF401	996510023143	LINE FILTER 4.5A 30MH
LF402	996510023099	LINE FILTER 40MH 10%
RT402	⚠ 996510023101	THERMISTOR NTC 5R +/-20% 4A
S401	⚠ 994000003327	AC POWER SOCKET 2PIN
T401	⚠ 996510023126	TRASFO ER40 6.5A 200W 230V
T402	⚠ 996510023085	TRASFO ER28 0.5A 12W 230V
U401	996510023088	IC NCP1216D65R2G CONTROLLER
U402	996510023087	IC ICE3B0565 SMPS CONTROLLER
U403	996510023135	PHOTO-COUPLER POWER CTR
U404	996510023135	PHOTO-COUPLER POWER CTR

ELECTRICAL PARTS LIST

Loc.	12NC	Description
POWER BOARD ASSEMBLY (ONLY FOR REFERENCE)		
U405	996510023135	PHOTO-COUPLER POWER CTR
U406	996510023139	IC AZ431AZ-ATRE1
U407	996510023139	IC AZ431AZ-ATRE1
V401	996510023075	TR_M MOSFET 11N60C3
V402	996510007050	CH-TRNPN3DA8050hFE=120-220SOT
V403	996510007050	CH-TRNPN3DA8050hFE=120-220SOT
V404	996510007050	CH-TRNPN3DA8050hFE=120-220SOT
V405	996510007050	CH-TRNPN3DA8050hFE=120-220SOT
V406	996510023078	TR PNP KTA1275-O 1.0A-160.0VL
V407	996510023123	TRANSISTOR 2N5551 AMPLIFIER
VD401	996510007088	CH-ZENER DIODE 12V ZMM12 LL-34
VD402	996510007088	CH-ZENER DIODE 12V ZMM12 LL-34
VD403	996510023092	CH-ZENER DIODE 24V LL-34
VD404	996510023119	CH-ZENER DIODE RLZ6.8B LL-34
CD PWB ASSEMBLY (ONLY FOR REFERENCE)		
CN1	996510040679	FFC CONNECTOR 30PIN P1.00MM WHITE
D4	996510007742	CH-DIODE
D5	996510007742	CH-DIODE
FB1	994000005661	CH-FB 2700R +/-25% SZ2012K272T
FB10	994000005661	CH-FB 2700R +/-25% SZ2012K272T
FB11	996510023097	FERRITE BEAD 1K+/-25%/100MHZ
FB12	996510023097	FERRITE BEAD 1K+/-25%/100MHZ
FB13	996510023124	FB 600R +/-25% 100MHZ
FB14	996510023124	FB 600R +/-25% 100MHZ
FB15	996510023124	FB 600R +/-25% 100MHZ
FB16	996510023124	FB 600R +/-25% 100MHZ
FB2	994000005661	CH-FB 2700R +/-25% SZ2012K272T
FB3	996510023097	FERRITE BEAD 1K+/-25%/100MHZ
FB4	996510023097	FERRITE BEAD 1K+/-25%/100MHZ
FB5	996510023097	FERRITE BEAD 1K+/-25%/100MHZ
FB6	994000005661	CH-FB 2700R +/-25% SZ2012K272T
FB7	994000005661	CH-FB 2700R +/-25% SZ2012K272T
FB8	996510023097	FERRITE BEAD 1K+/-25%/100MHZ
FB9	996510023097	FERRITE BEAD 1K+/-25%/100MHZ
IC1	996510007759	IC PCF8563T CLOCK SOP8
IC10	996510023111	IC 16M_SDRAM W9816G6IH-6
IC11	994000005692	IC ISP1160BD/01 USB CONTROLLER
IC2	996510023133	IC BA6208F MOTOR DRIVER
IC3	996510007750	IC SAA7824HL LQFP80
IC4	996510006955	IC D9258 MOTOR DRIVER
IC5	996500041702	IC AZ4558 OPERATIONAL
IC5	996510023082	IC NJM4558M DMP8
IC6	996510007745	IC OPT30 RESET OPTEK SOP-8
IC8	996510007744	IC SCF5250
IC9	996510023074	IC 8M S29AL008D70TFI01 FLASH
L1	996510007751	INDUCTOR RTB6046-101K-1A 100UH
Q12	996510023081	CH-MOSFET AP2301GN
Q14	996510023108	CH-TRANSISTOR PBSS5140T
X1	994000002109	CRYSTAL 8.4672MHZ 22PF
X2	994000005688	X'TAL 6MHZ +/-20PPM 20PF 3X8MM.
X3	994000005671	X'TAL 32.768KHZ +/-20PPM 12PF

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

REVISION LIST

1.0 Manual 3141 785 34040

Initial Service Manual released.

1.1 Manual 3141 785 34041

In this version, Some diagrams updated

1.2 Manual 3141 785 34042

In this version, Page 11-2 Partslist updated.
Add:

2	996510023105	MAIN PWB ASSEMBLY /12

1.3 Manual 3141 785 34043

In this version, Page 11-2,3 Partslist updated.
Add:

CON603	996510040679	FFC CONNECTOR 30PIN P1.00MM WHITE
CN1	996510040679	FFC CONNECTOR 30PIN P1.00MM WHITE

1.4 Manual 3141 785 34044

In this version, Page 11-1 Mechanical Exploded View updated.

The item numbers in Set Mechanical Exploded View have been corrected according to parts list.