

# Service Service Service



# Service Manual



## TABLE OF CONTENTS

	Page
Versions Variation .....	1-2
Specifications .....	1-3
Measurement Setup .....	1-4
Service Aids, Safety Instruction, etc .....	1-5
CD Playability Check .....	1-6 to 1-8
Disassembly Instructions.....	2
Service Program Test .....	3
Block & Wiring Diagram.....	4-1 to 4-2
Front Board & Key Board .....	5
MCU Board.....	6
ECO6 Tuner Board : Systems Non-Cenelec .....	7A
CD Board .....	8
Mains Board & Mic Board .....	9
High Amp Board & Power Board & USB Jack Board....	10
AF9 Board .....	12
Mechanical Exploded View & Parts List .....	13
Electrical Parts List .....	14

**CLASS 1  
LASER PRODUCT**

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# VERSION VARIATIONS

## SPECIFICATIONS

### AMPLIFIER

RMS output power	
LF channel .....	105 W per channel
HF channel .....	105 W per channel
Total Bi-Amp power.....	420 W
Signal-to-noise ratio .....	60 dBA (IEC)
Frequency response .....	50 – 15000 Hz
Input sensitivity	
AUX .....	900/2400 mV
Output	
Speakers .....	3 Ω
Headphones.....	32 Ω
(1) (3 Ω, 1 kHz, 10% THD)	

### CD/MP3-CD PLAYER

Number of programmable tracks .....	99
Frequency response .....	50 – 20000 Hz -3dB
Signal-to-noise ratio .....	60 dBA
Channel separation .....	60 dBA (1 kHz)
Total harmonic distortion .....	< 0.003%
MPEG 1 Layer 3 (MP3-CD) .....	MPEG AUDIO
MP3-CD bit rate .....	32-256 kbps (128 kbps advised)
Sampling frequencies .....	32, 44.1, 48 kHz

### TUNER

FM wave range .....	87.5 – 108 MHz
MW wave range (9 kHz) .....	531 – 1602 kHz
MW wave range (10 kHz) .....	530 – 1700 kHz
Tuning grid .....	9/10 kHz
Number of presets .....	40
Antenna	
FM .....	75 Ω wire
MW .....	Loop antenna

### USB PLAYER

USB .....	12 Mb/s, V1.1
.....	support MP3 and WMA files
Number of albums/folders .....	maximum 99
Number of tracks/titles .....	maximum 400

### SPEAKERS

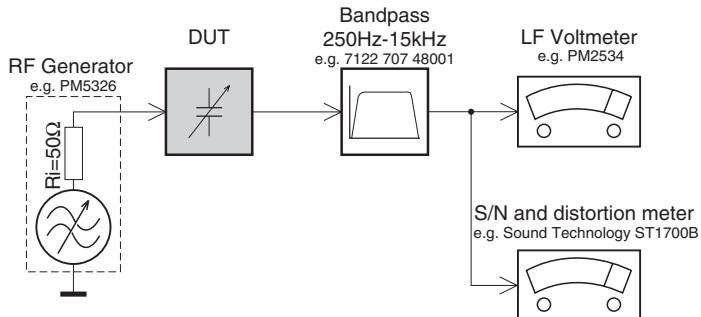
System 2-way; double port bass reflex	
Impedance .....	3 Ω
Woofer .....	1 x 5.5"
Tweeter.....	1 x 2"
Dimensions (w x h x d) ..	248 x 310 x 195 (mm)
Weight .....	3.65 kg each

### GENERAL

Material/finish .....	Polystyrene/Metal
AC Power .....	110 – 127 / 220 – 240 V; ..... 50/60 Hz Switchable
Power Consumption	
Active .....	90 W
Standby .....	≤ 15 W
Dimensions (w x h x d) ..	265 x 310 x 367 (mm)
Weight (without speakers) .....	9.1 kg

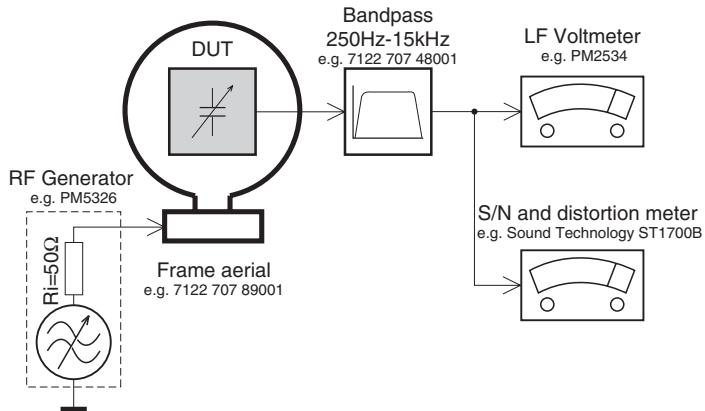
## MEASUREMENT SETUP

### Tuner FM



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

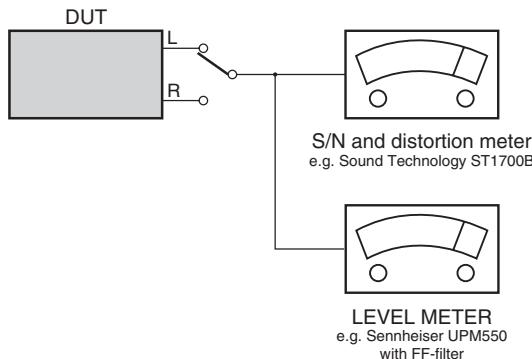
### Tuner AM (MW,LW)



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)



## SERVICE AIDS

### Service Tools:

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

### Compact Disc:

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



### 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



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  $\Delta$ .



## 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](http://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".

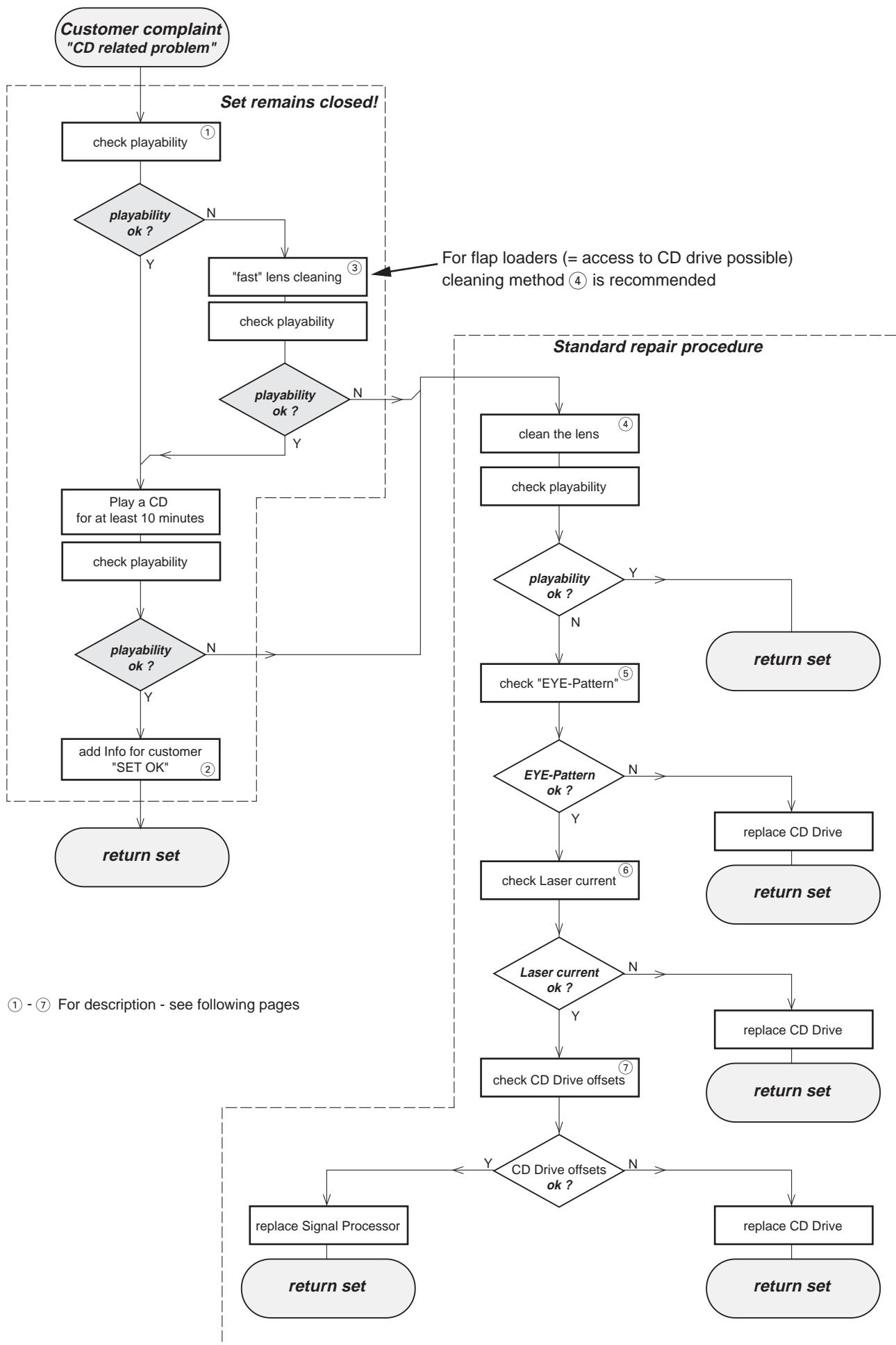
For additional questions please contact your local repair-helpdesk.

## 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



① - ⑦ For description - see following pages

## INSTRUCTIONS ON CD PLAYABILITY

(1)

### 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 (600 $\mu$  Black dot) **maximum at 01:00**

- playback of these two tracks without audible disturbance  
playing time for: Fingerprint  $\geq$  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 (600 $\mu$  Black dot) **maximum at 01:15**  
TR 19 (Fingerprint)  
TR 10 (1000 $\mu$  wedge)

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

(2)

### 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 ③) 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.

(4)

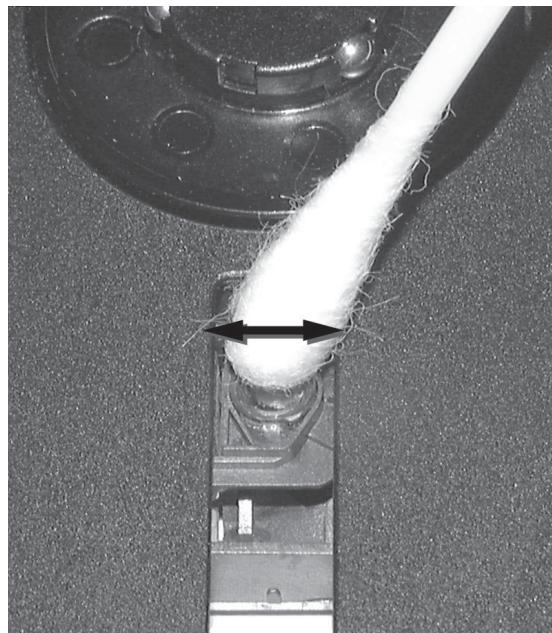
### LIQUID LENS CLEANING

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 B4-No2", available with codenumber 4822 389 10026.

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.



(3)

### FAST LENS CLEANING (dry brush)

Use lens cleaning CD  
SBC AC300 ..... 9082 100 00043

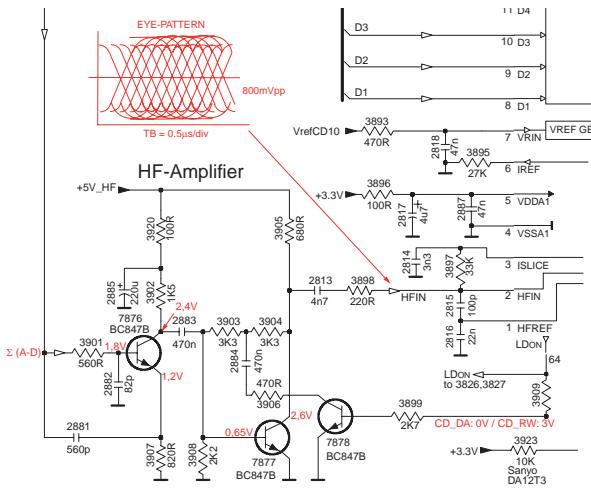
Insert the lens cleaning CD, press PLAY and follow the voice guide's instructions on the CD.

## INSTRUCTIONS ON CD PLAYABILITY

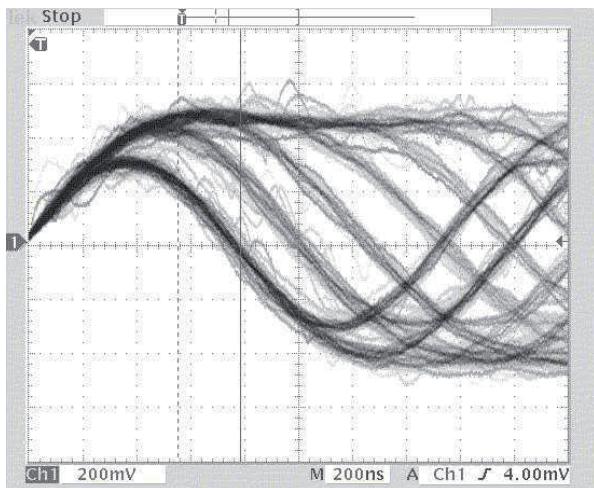
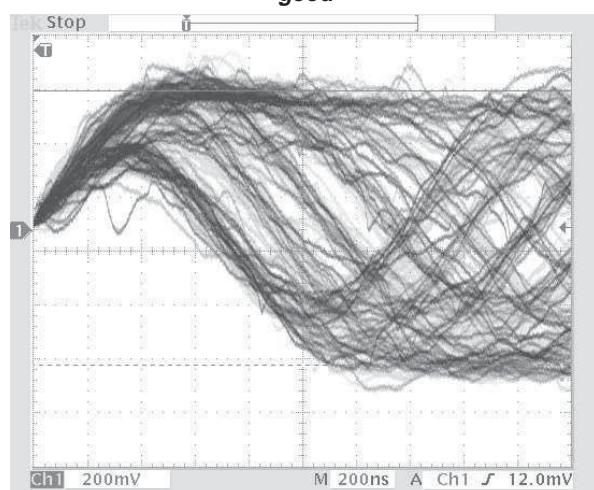
⑤

### EYE-PATTERN SIGNAL – JITTER MEASUREMENT

Measure the signal on the input of the Signal processor using an **analog** oscilloscope. Please find the exact measuring point in your Service Manual.



See below examples of the signal. Amplitude should read at least 700mVpp using SBC444A.

**good****bad**

If the oscilloscope shows a signal like the 'bad' one, and/or the amplitude decreases within 1 minute - the CD drive has to be replaced.

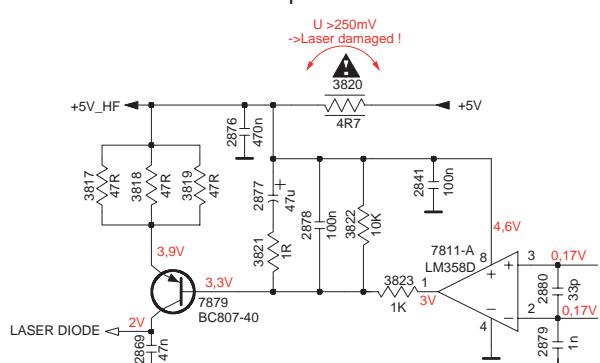
⑥

### CD DRIVE – LASER CURRENT MEASUREMENT

The laser current can be measured as a voltage drop on a resistor. The resistor is marked in every Service Manual. The value depends on the type of CD drive.

	typical value	most probable defect
VAMxxxx	: 150-230mV	$\geq 350\text{mV}$
MCDxx	: 170-230mV	$\geq 300\text{mV}$
DA1x	: 210-250mV	$\geq 350\text{mV}$
DA2x	: 175-200mV	$\geq 250\text{mV}$
Use SBC444A (CD-DA) for measurement.		

### Laser power control



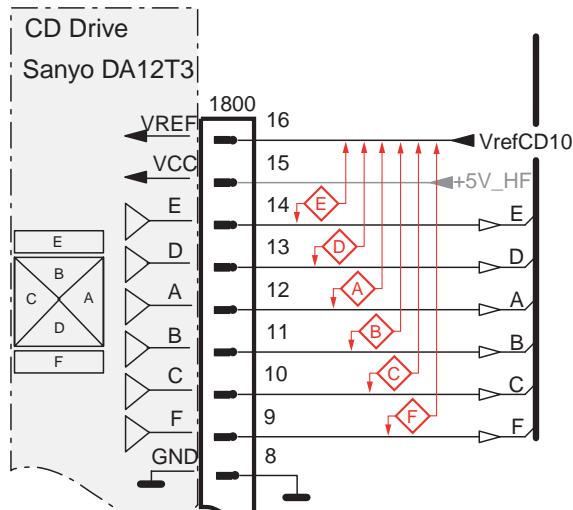
### CD DRIVE – OFFSET MEASUREMENT

The photodiodes of the CD-drive may have an offset. These offsets have to be compensated by the signal processor. High offsets can lead to poor playability of some CDs (skipping tracks).

To measure the offset values, start the **Service Test Program** - section "Focus Test" without a CD.

The offsets can be measured with a DC Millivoltmeter directly on the connector (see drawing below). Pin numbering varies from drive to drive.

**The values from diode A-D should read  $0 \pm 10\text{mV}$ . Diodes E and F are less critical.**

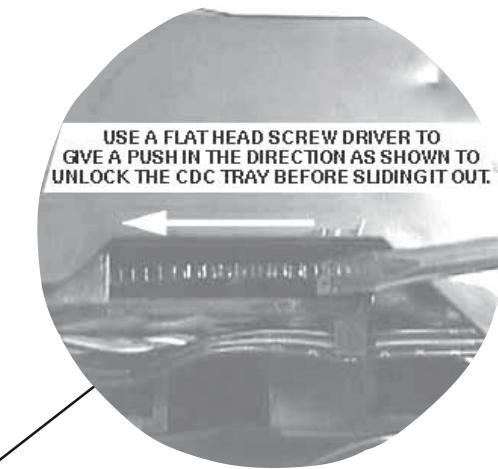
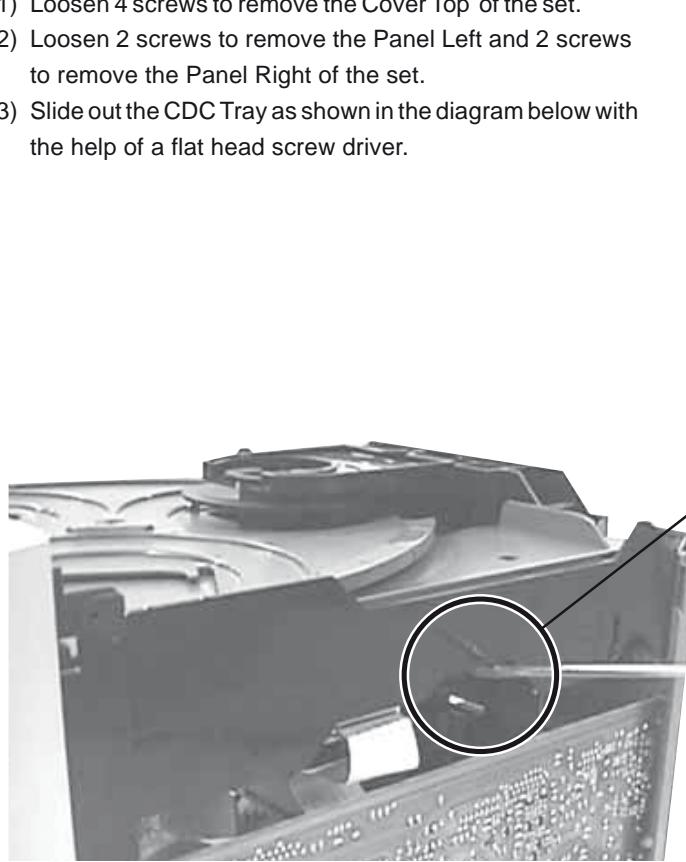


If one of the offsets is higher than  $\pm 10\text{mV}$  the CD drive has to be replaced. Otherwise replace the Signal Processor.

## DISMANTLING INSTRUCTIONS

### Dismantling of the CDC Module and Front Panel

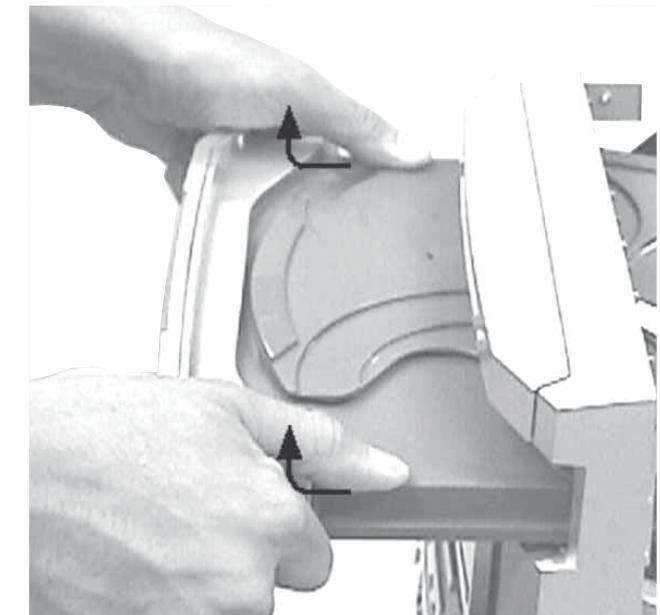
- 1) Loosen 4 screws to remove the Cover Top of the set.
- 2) Loosen 2 screws to remove the Panel Left and 2 screws to remove the Panel Right of the set.
- 3) Slide out the CDC Tray as shown in the diagram below with the help of a flat head screw driver.



Sliding Out The CDC Tray

### Dismantling of the CDC Module and Front Panel

- 4) Remove the Cover Tray CDC as indicated.

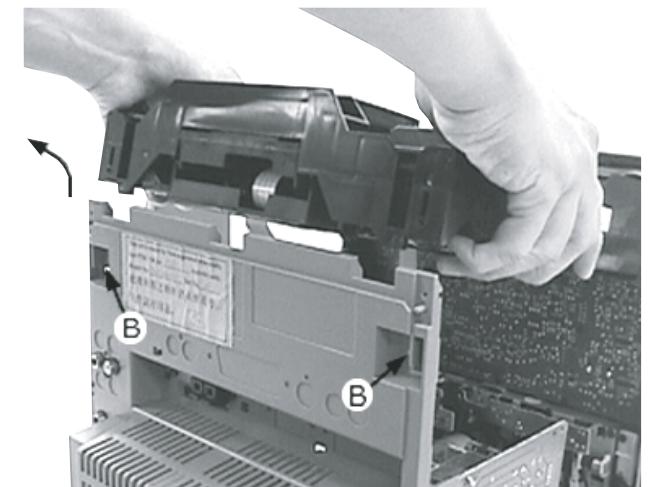


Remove Cover Tray CDC

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

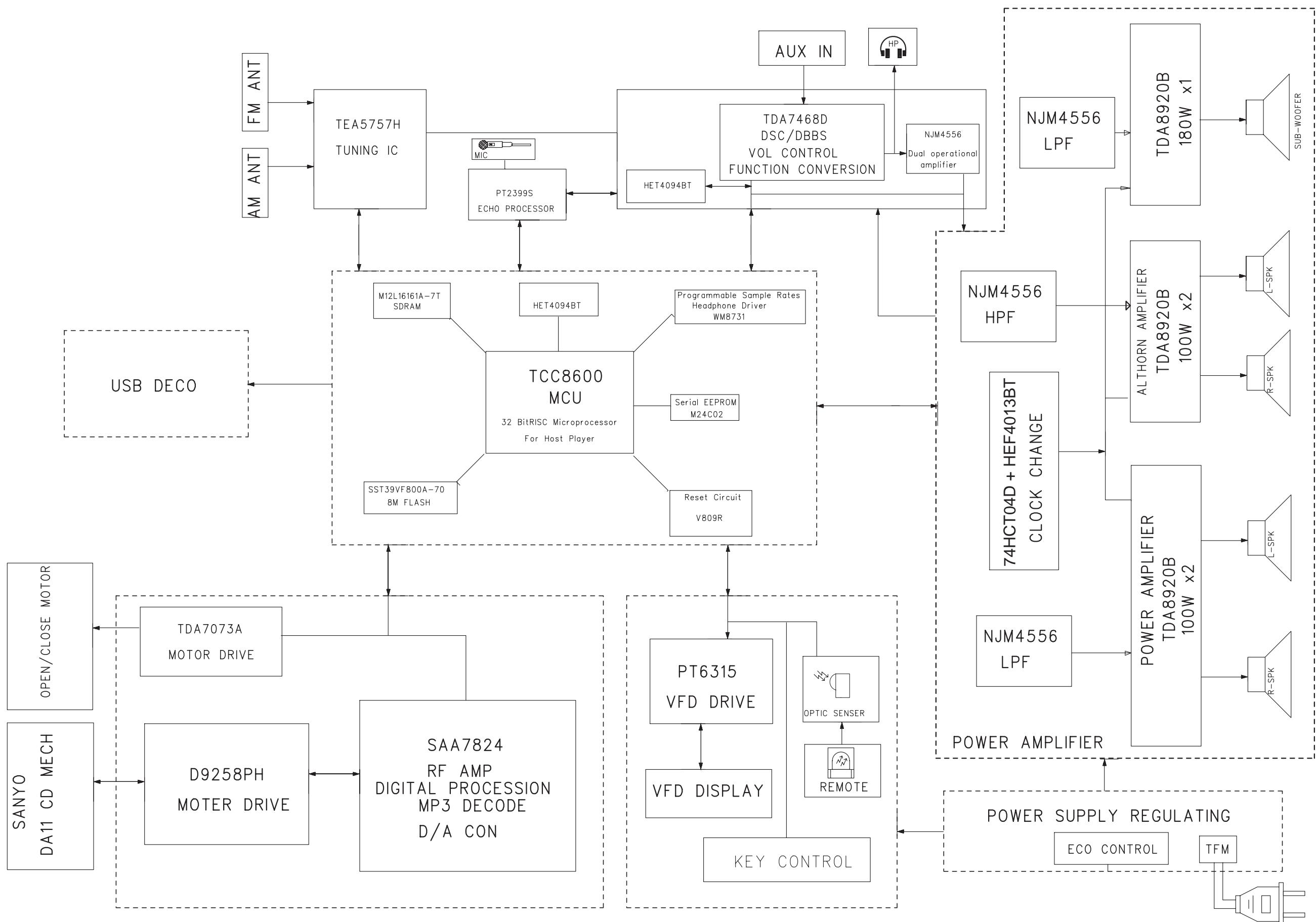


Front View CDC

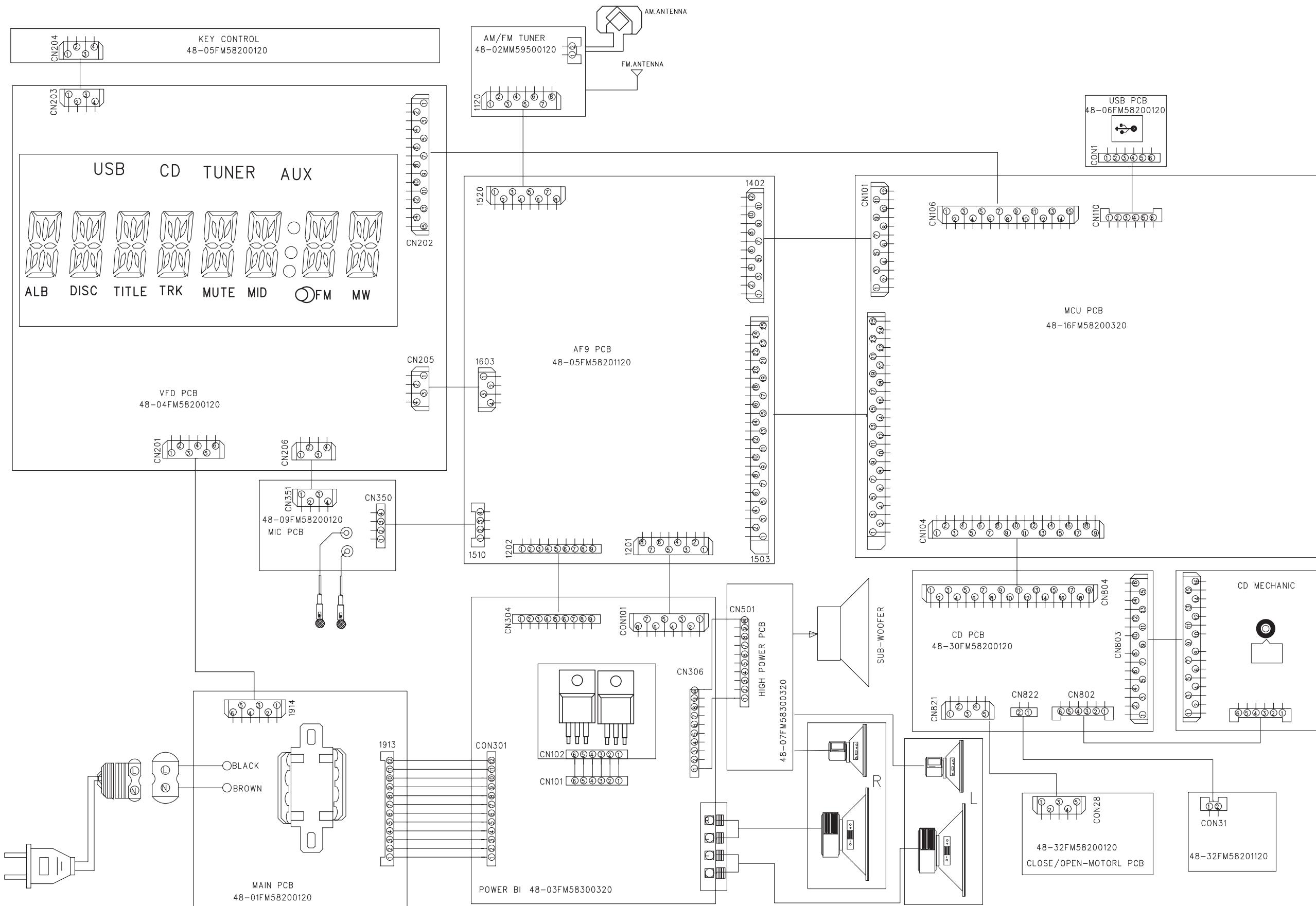


Remove CDC Module

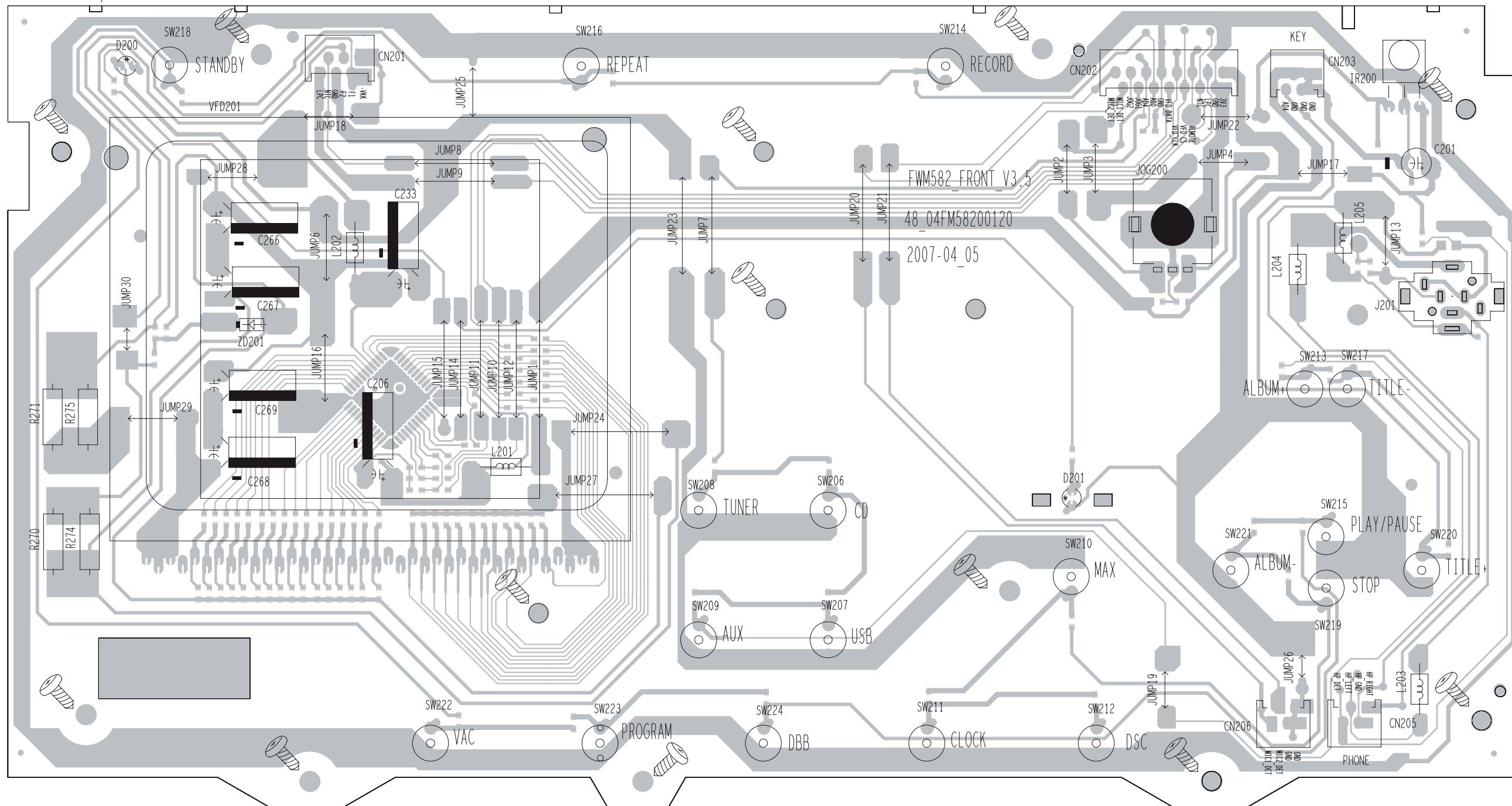
## SET BLOCK DIAGRAM



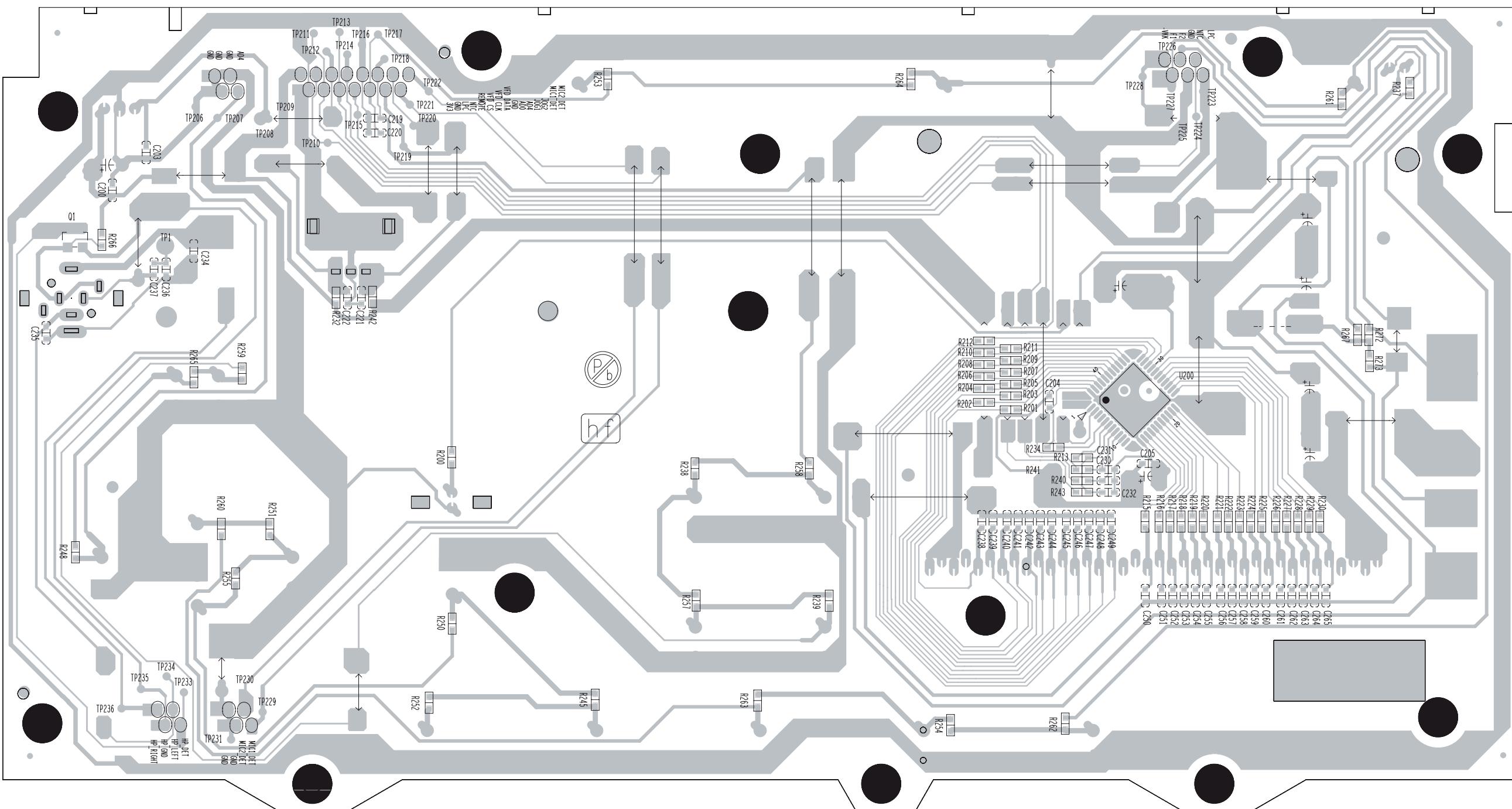
## **SET WIRING DIAGRAM**



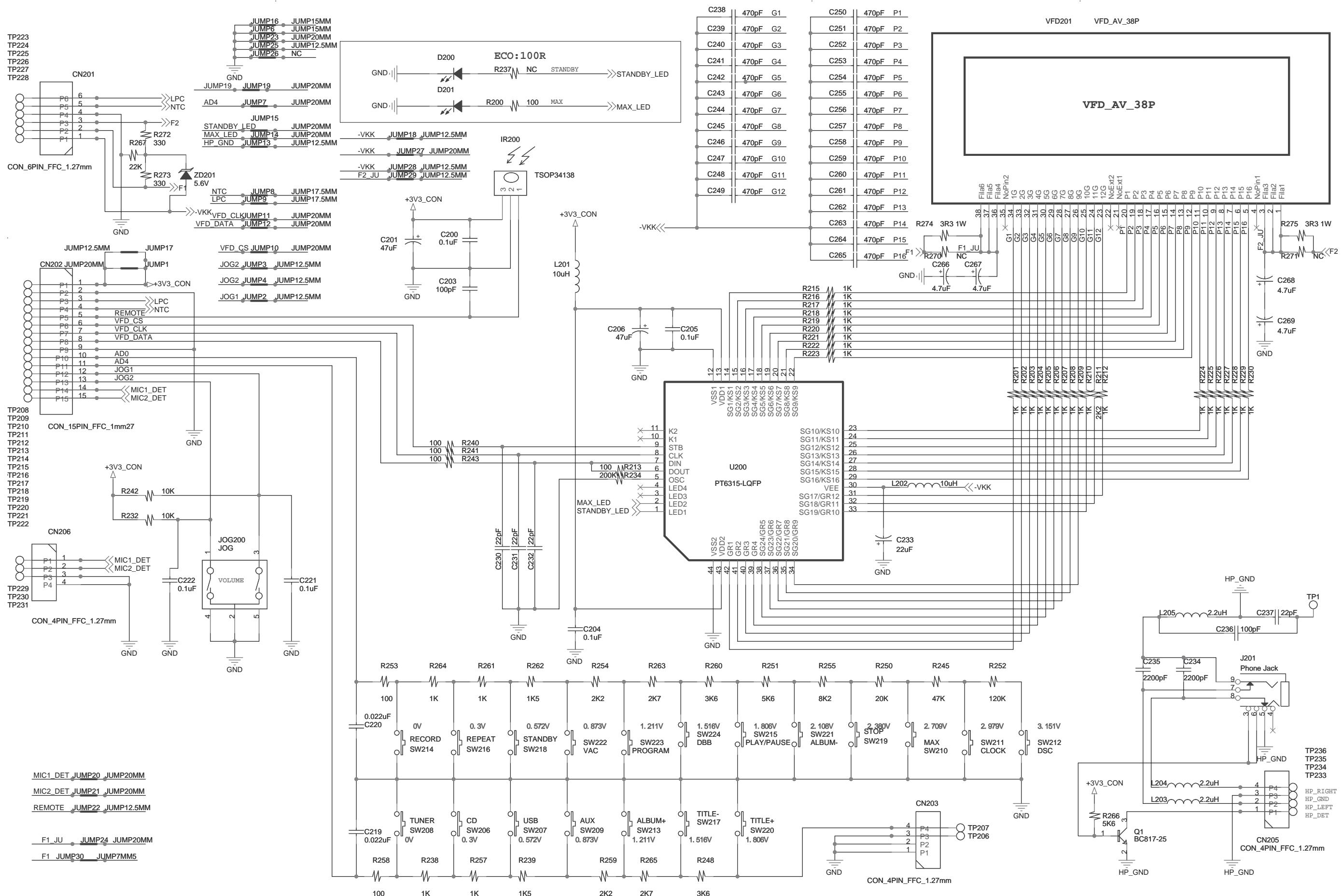
## PCB LAYOUT - FRONT BOARD (TOP VIEW)



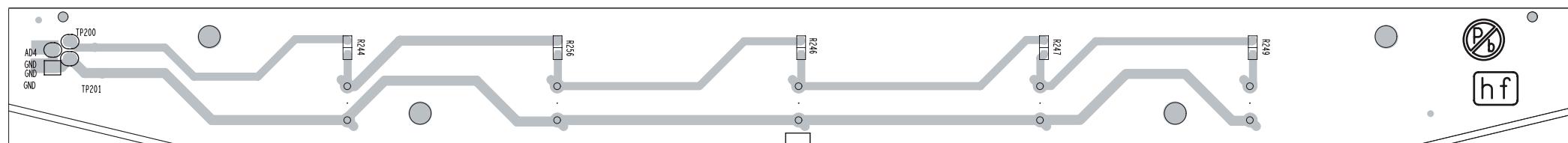
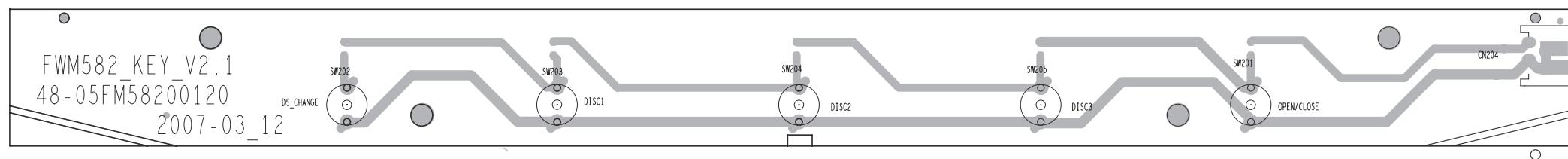
## **PCB LAYOUT - FRONT BOARD (BOTTOM VIEW)**



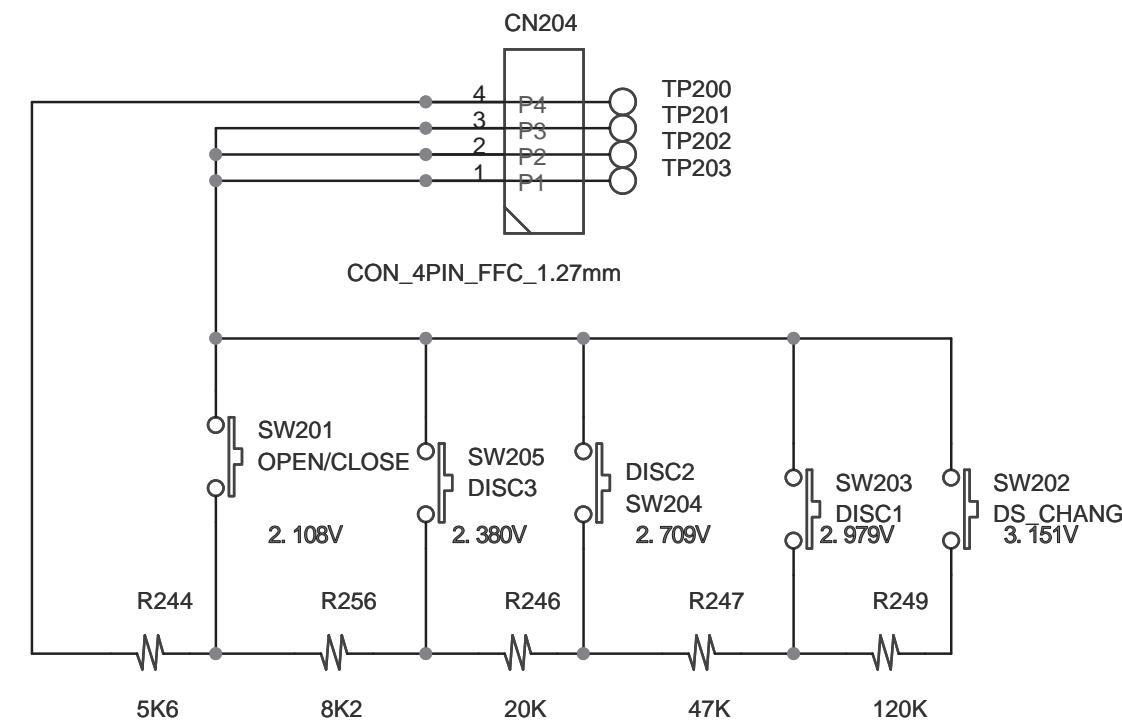
## CIRCUIT DIAGRAM - FRONT BOARD



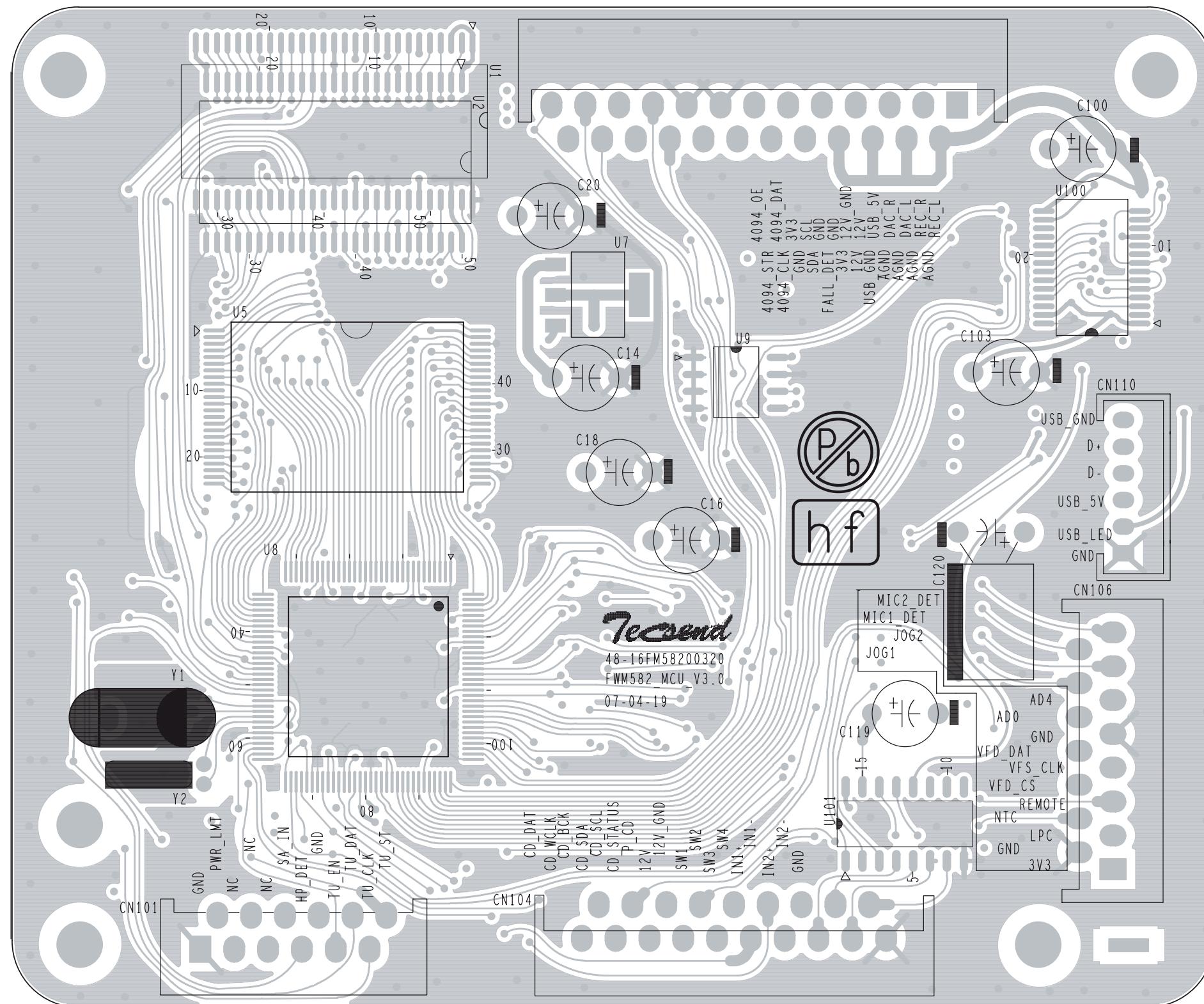
## PCB LAYOUT - KEY BOARD



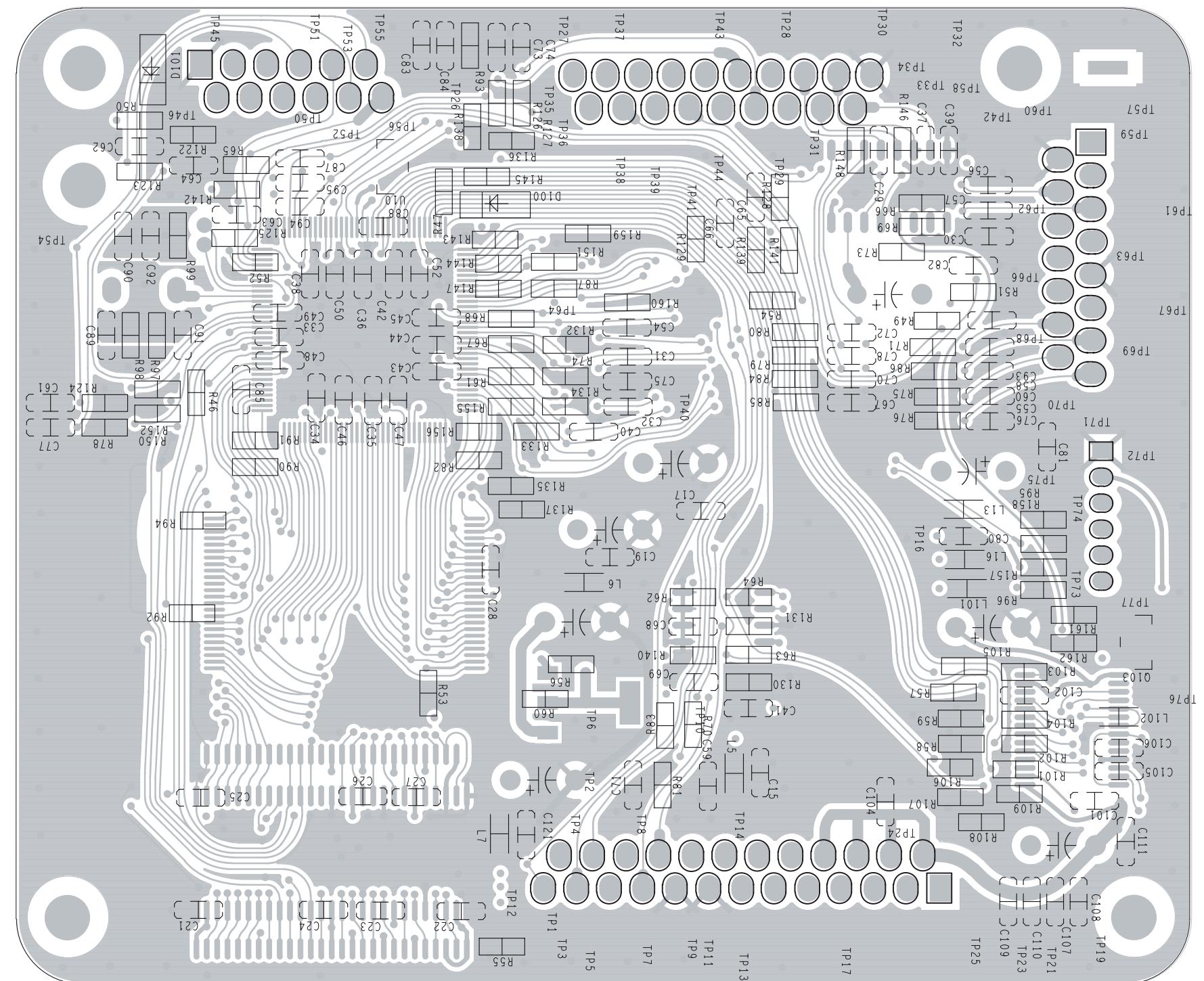
## CIRCUIT DIAGRAM - KEY BOARD



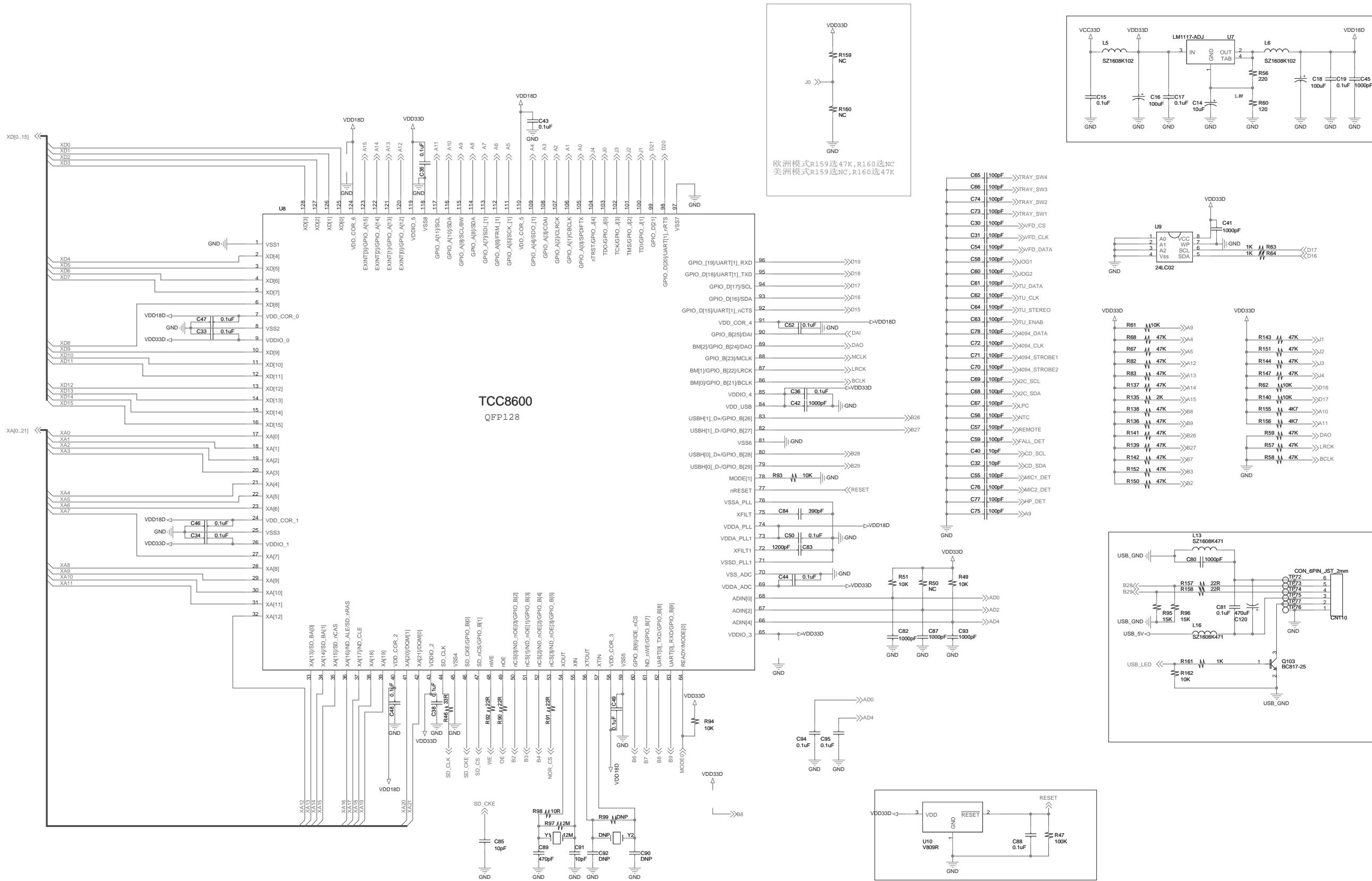
# PCB LAYOUT - MCU BOARD (TOP VIEW)



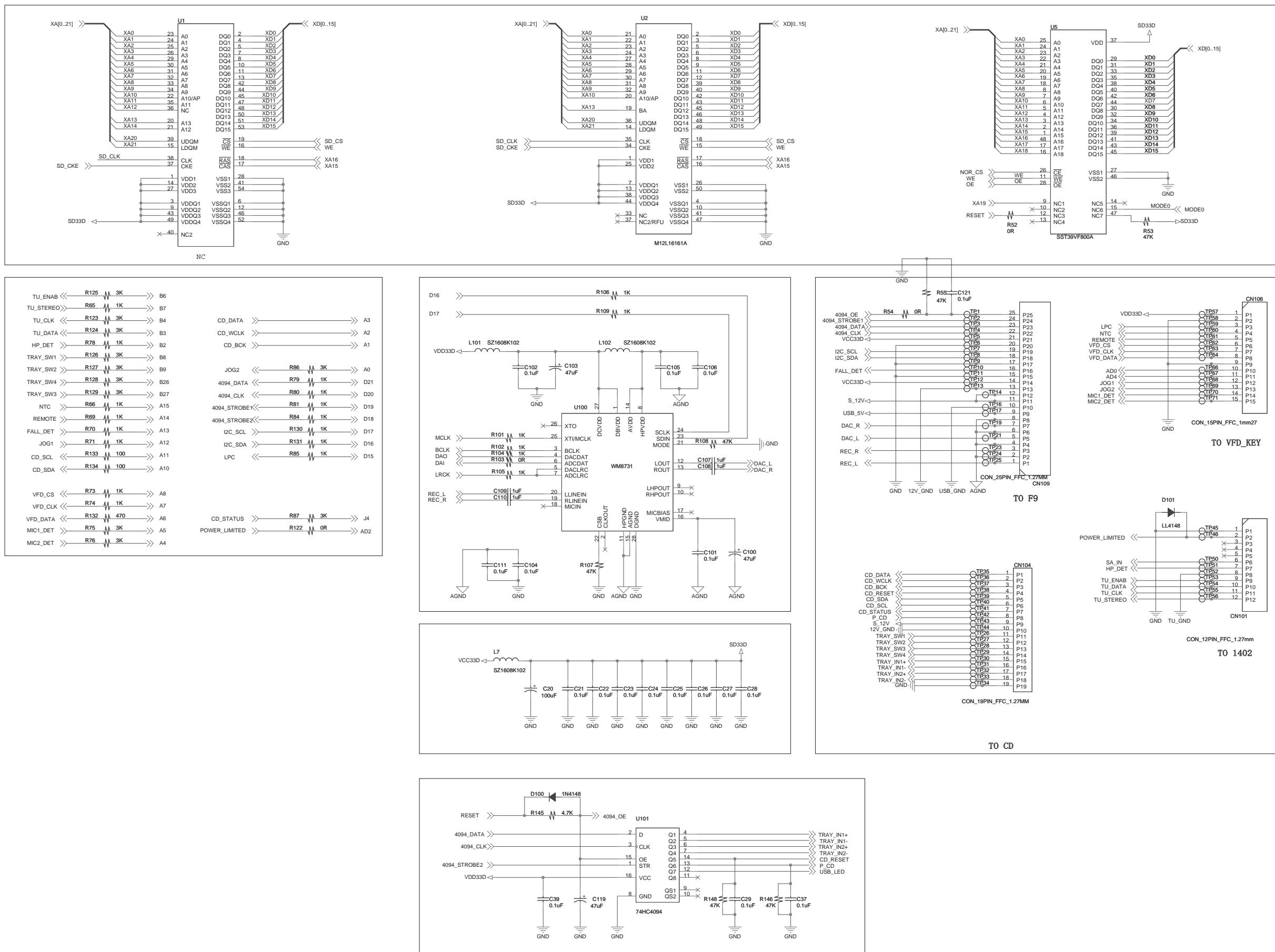
## PCB LAYOUT - MCU BOARD (BOTTOM VIEW)



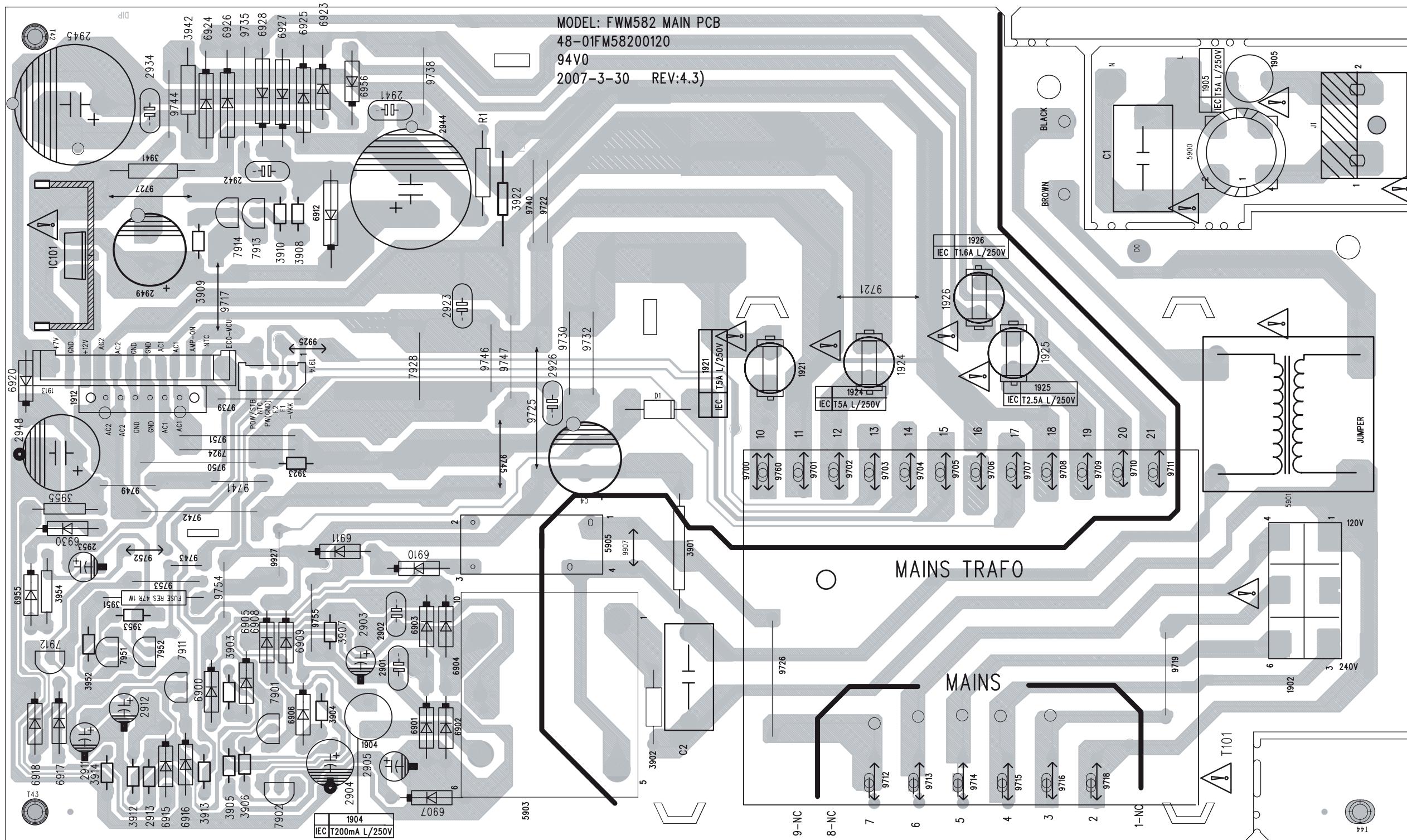
# CIRCUIT DIAGRAM - MCU BOARD PART1

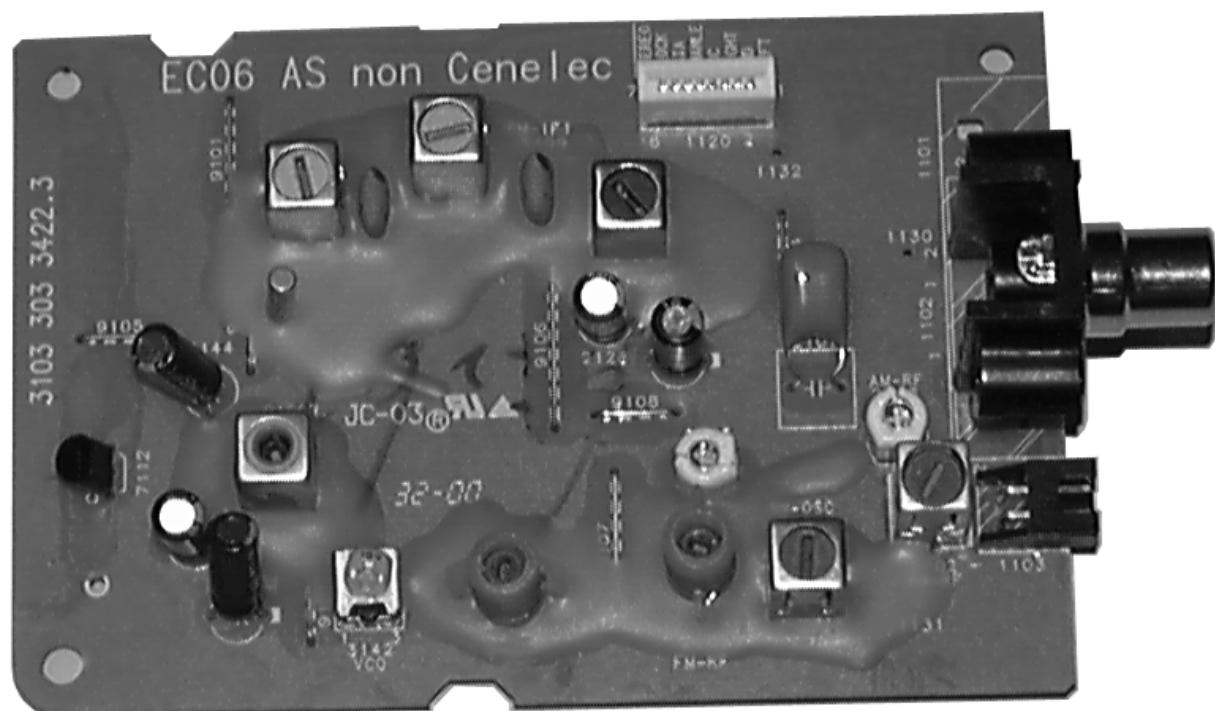


## CIRCUIT DIAGRAM - MCU BOARD PART2

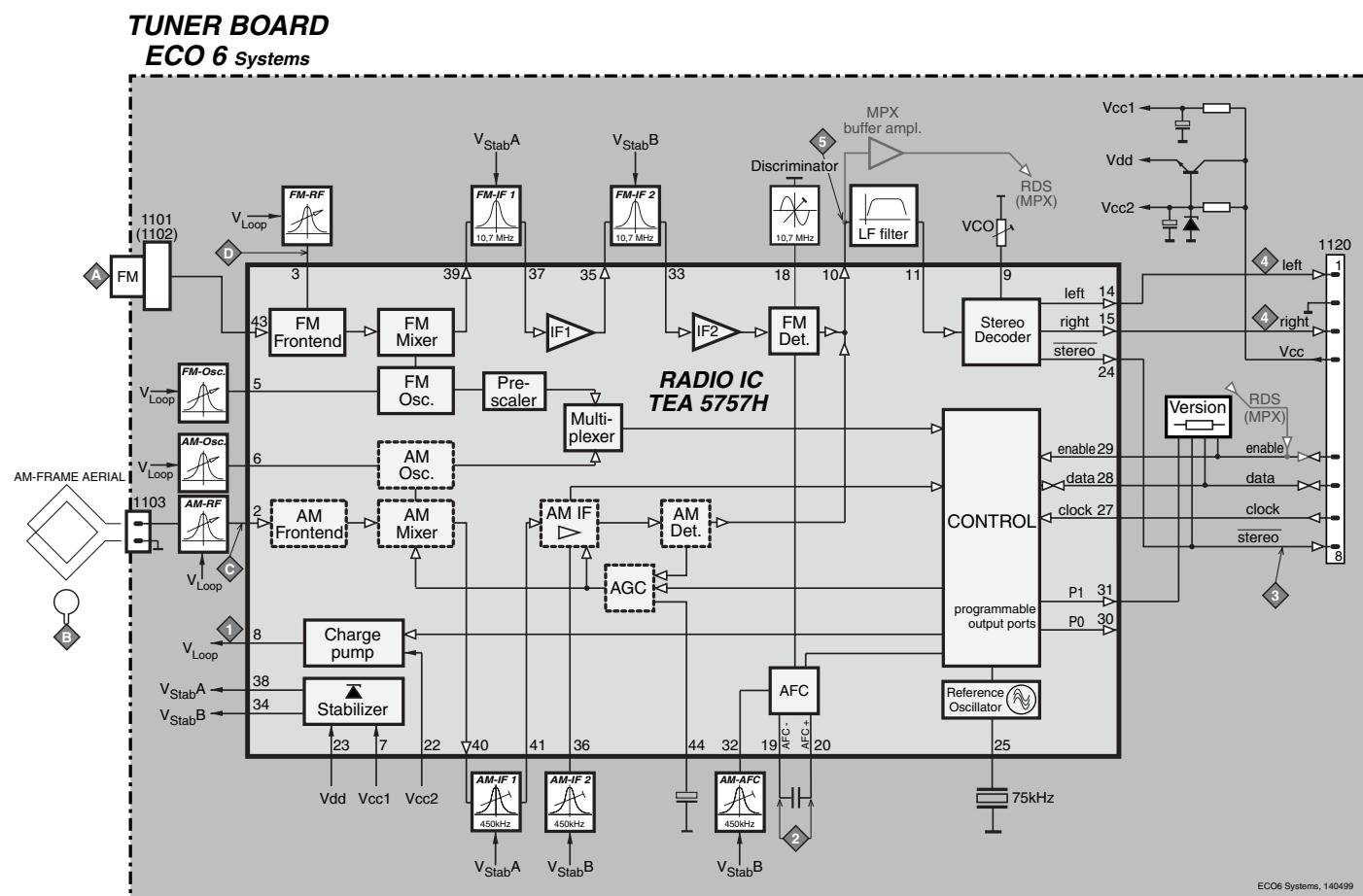


## LAYOUT DIAGRAM - MAINS BOARD (TOP VIEW)





## BLOCK DIAGRAM

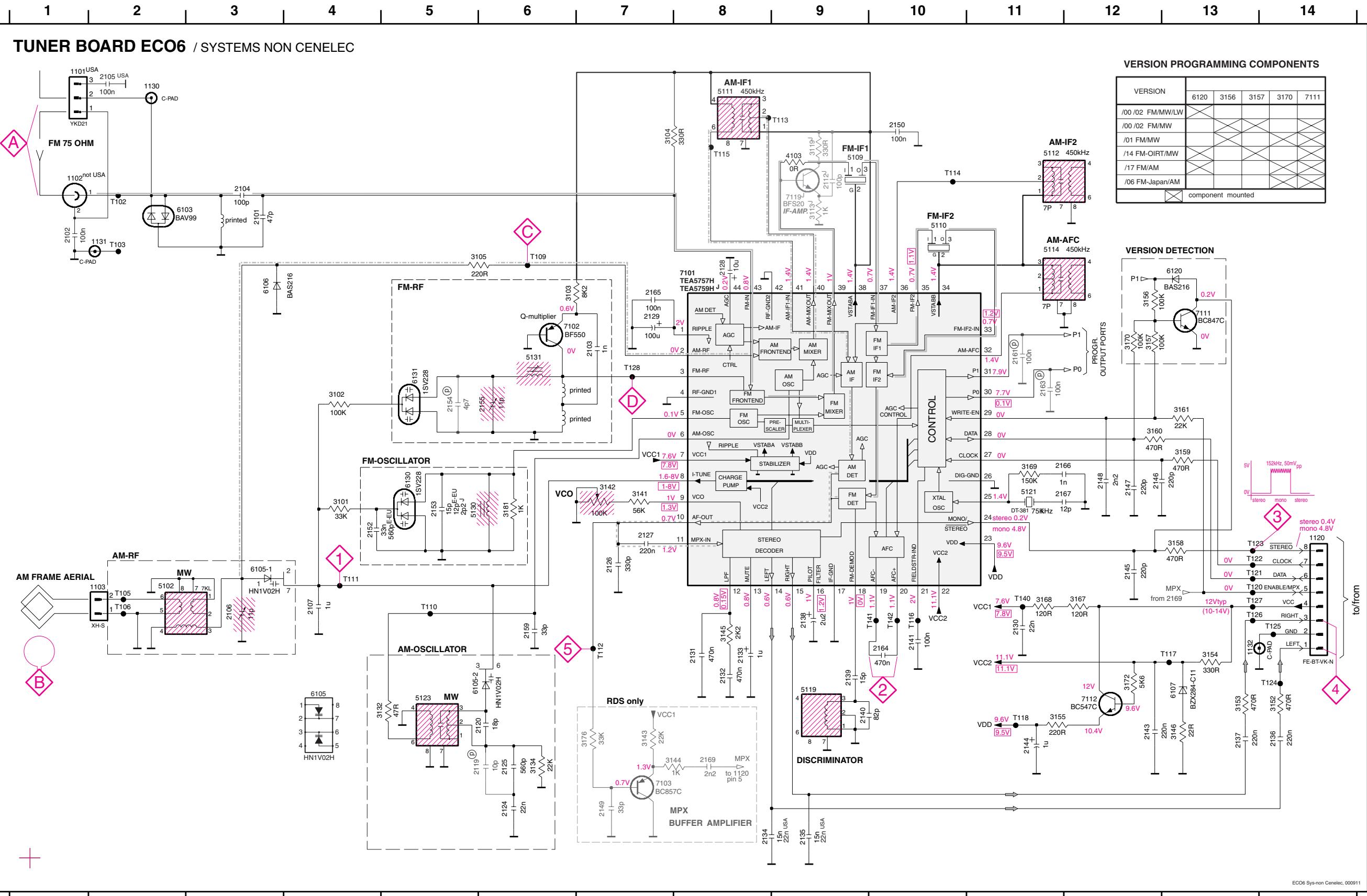


# ECO6 Tuner Board

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

## TABLE OF CONTENTS

Blockdiagram .....	7A-1
Schematic Diagram .....	7A-2
Component Layout .....	7A-3
Adjustment table .....	7A-3
Electrical Partslist .....	7A-4

**LEGEND**

①...for provision only  
USA ... for USA version only  
E-EU ... for East European version only  
J ... for Japanese version only

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

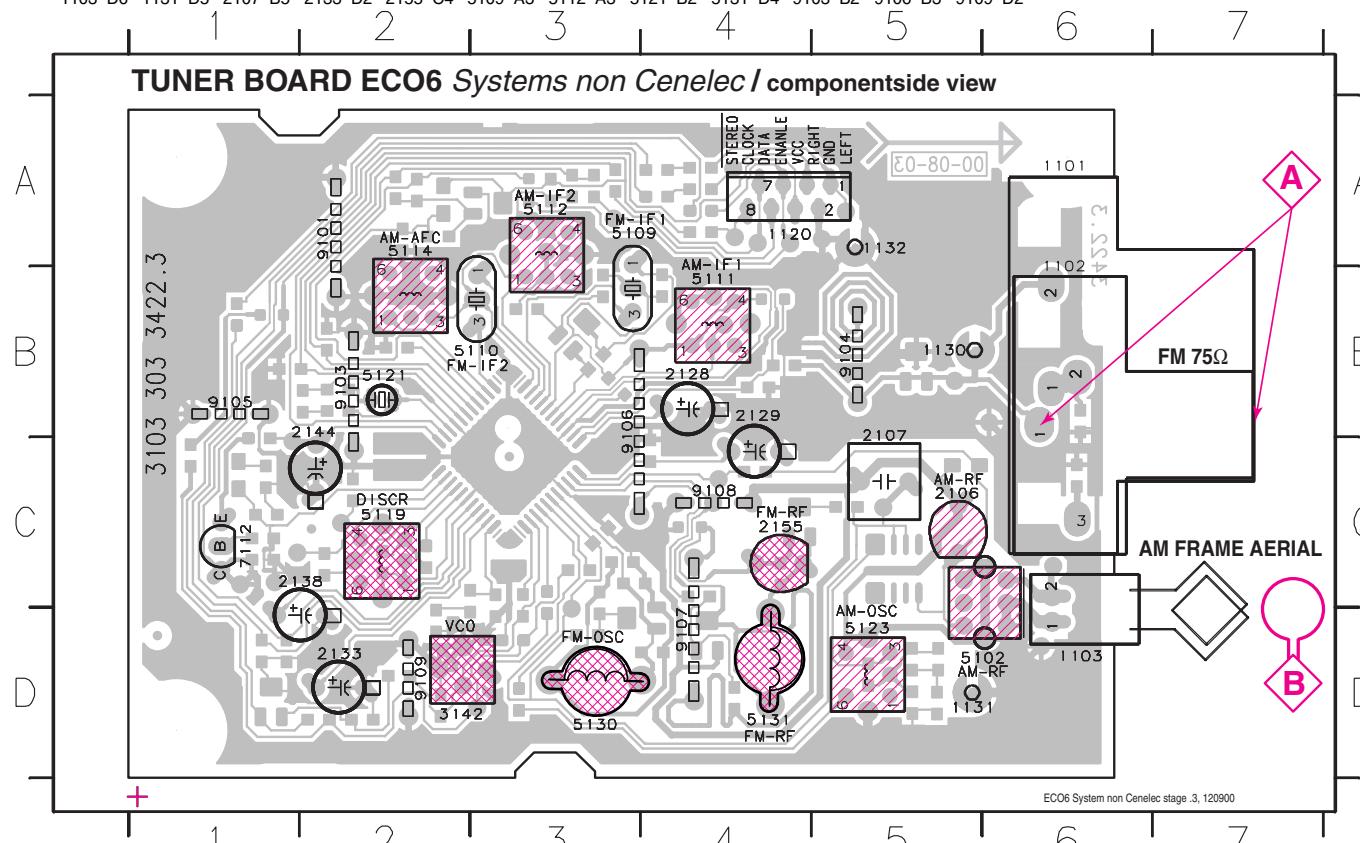
**Signal path**

— FM  
- - - AM  
--- MPX (Audio Frequency)  
➡ AF - left/right

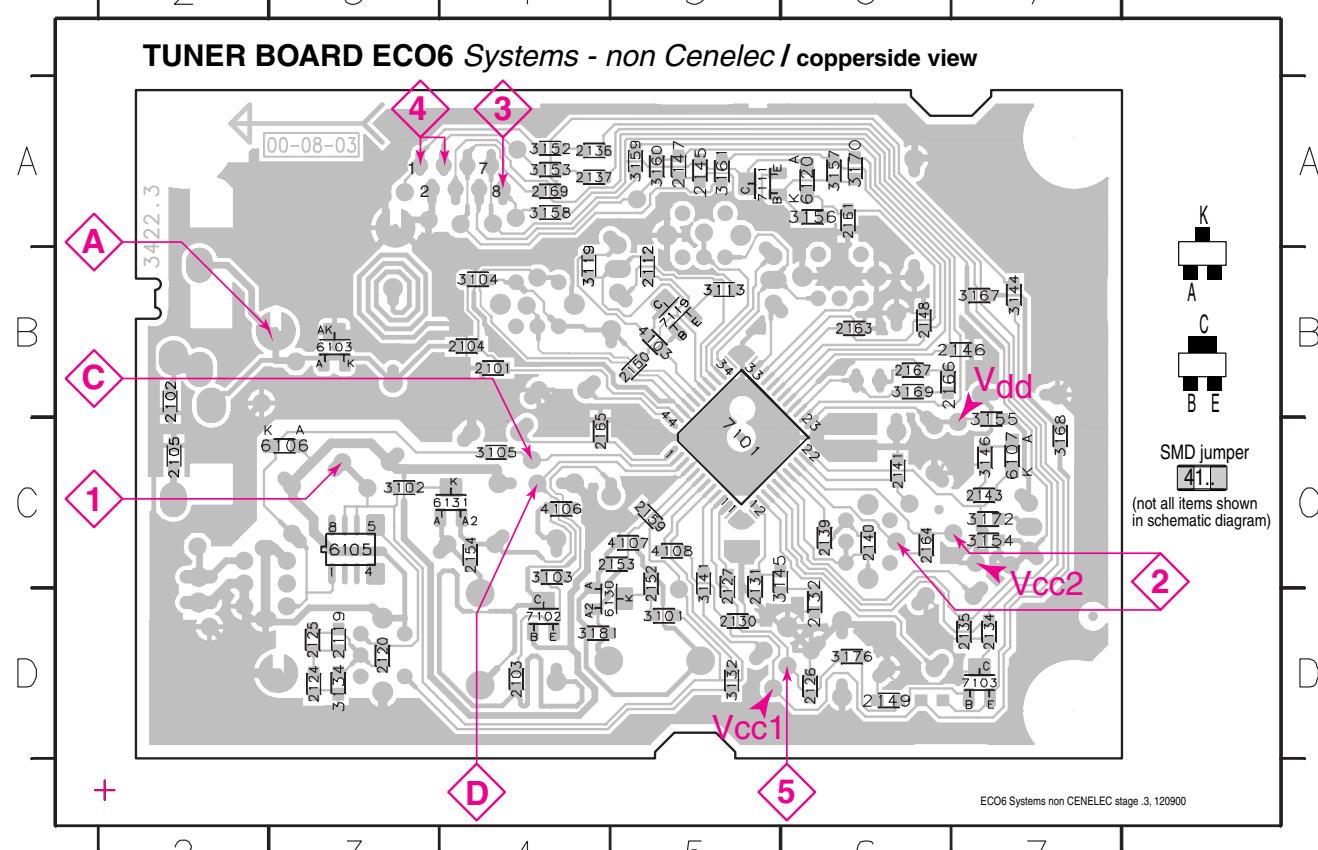
1101 A1
1102 B1
1103 F2
1104 E14
1105 A2
1106 G5
1107 C13
2101 B3
2103 C7
2105 A2
2106 F3
2107 F4
2119 H6
2120 G6
2124 H6
2125 H6
2127 E7
2128 E8
2129 C7
2130 F11
2131 G8
2132 G8
2133 G8
2134 H8
2135 H9
2136 G14
2137 G13
2138 F9
2139 G9
2140 G9
2141 F10
2143 G12
2145 F12
2146 E12
2147 E12
2148 E12
2149 H7
2150 A10
2152 E4
2153 E5
2154 D5
2155 D5
2159 F6
2161 C11
2163 D11
2164 F10
2165 C7
2166 E11
2169 H8
3101 E4
3102 E4
3103 C6
3104 A7
3105 B6
3132 G5
3134 H6
3141 E7
3142 E7
3144 G7
3145 F8
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3156 C12
3157 D13
3158 E13
3159 D12
3160 D12
3161 C13
3162 F12
3168 F11
3169 E11
3170 C12
3172 G12
3176 G7
3181 E6
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5110 B10
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5112 A11
5114 G9
5121 E11
5123 G5
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5131 C6
6103 B2
6105-1 F3
6105-2 G5
6106 C3
6107 C13
6120 C13
6130 E5
6131 D5
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7A-3

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



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



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

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	
<b>VARICAP ALIGNMENT</b>							
<b>FM</b> 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)	
			1700kHz	5123		8V ±0.2V	
			530kHz	check		1.1V ±0.4V	
			1602kHz	5123		6.9V ±0.2V	
			531kHz	check		1.1V ±0.4V	
			279kHz	5122		8V ±0.2V	
			153kHz	check		1.1V ±0.4V	
			1602kHz	5123		8V ±0.2V	
			531kHz	check		1.1V ±0.4V	
<b>FM IF</b>							
FM	10.7MHz, 45mV continuous wave	D	IC 7101 shortcircuit to block AFC	21	5119	2	0 ± 3 mV DC
<b>FM RF</b>							
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX	
	87.5MHz (65.81MHz)	mod=1kHz $\Delta f = \pm 22.5\text{kHz}$	87.5MHz (65.81MHz)	5131			
<b>VCO</b>							
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>	
<b>AM IF</b>							
<b>MW</b> 450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc		C	IC 7101 36 220Ω 100nF	5111	5	max.	
		$\Delta f = \pm 10\text{kHz}$ $V_{RF} = 0.5\text{mV}$ (as low as possible)	IC 7101 40 220Ω 100nF	5112			
AM AFC <b>MW</b>		C		5114	2	0 ± 2 mV DC	
<b>AM RF</b> <sup>3)</sup>							
<b>MW</b> <sup>4)</sup> FM/MW/LW- and FM/MW-version ( 9kHz grid) 531 - 1602kHz	1494kHz	B	1494kHz	2106	5	max.	
	558kHz		558kHz	5102			
<b>LW</b>	198kHz		198kHz	5103			
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	$\Delta f = \pm 30\text{kHz}$ $V_{RF}$ as low as possible	1500kHz	2106		max.	
	560kHz		560kHz	5102			

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

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

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

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

4) MW has to be aligned before LW

↑ Repeat

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# CD BOARD

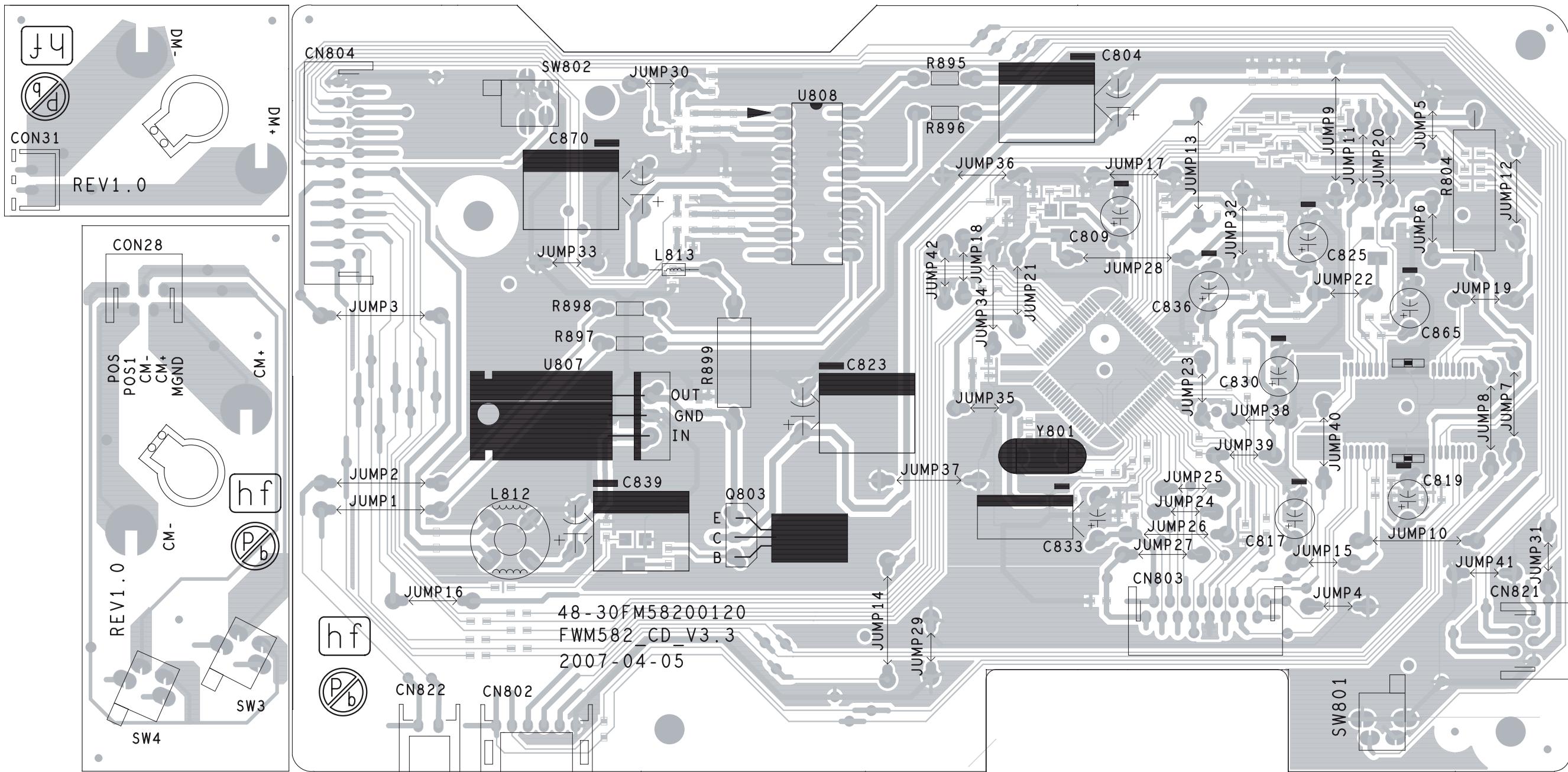
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**TABLE OF CONTENTS**

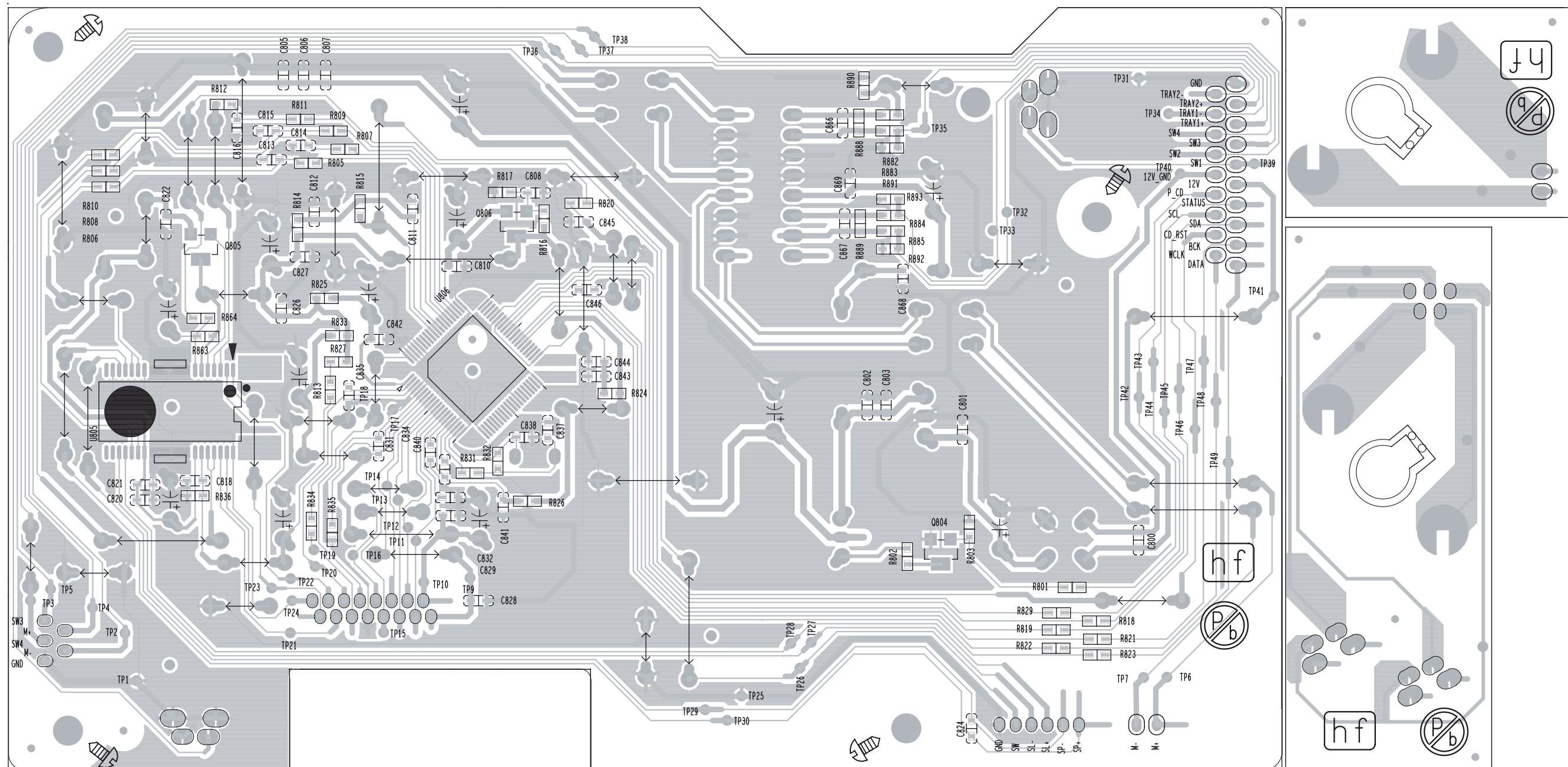
PCB Layout .....	8-2 to 8-3
Circuit Diagram .....	8-4 to 8-5

Remark: This chapter is only for reference, the whole CD Board Ass'y can be ordered with  
12nc: 9965 100 03995

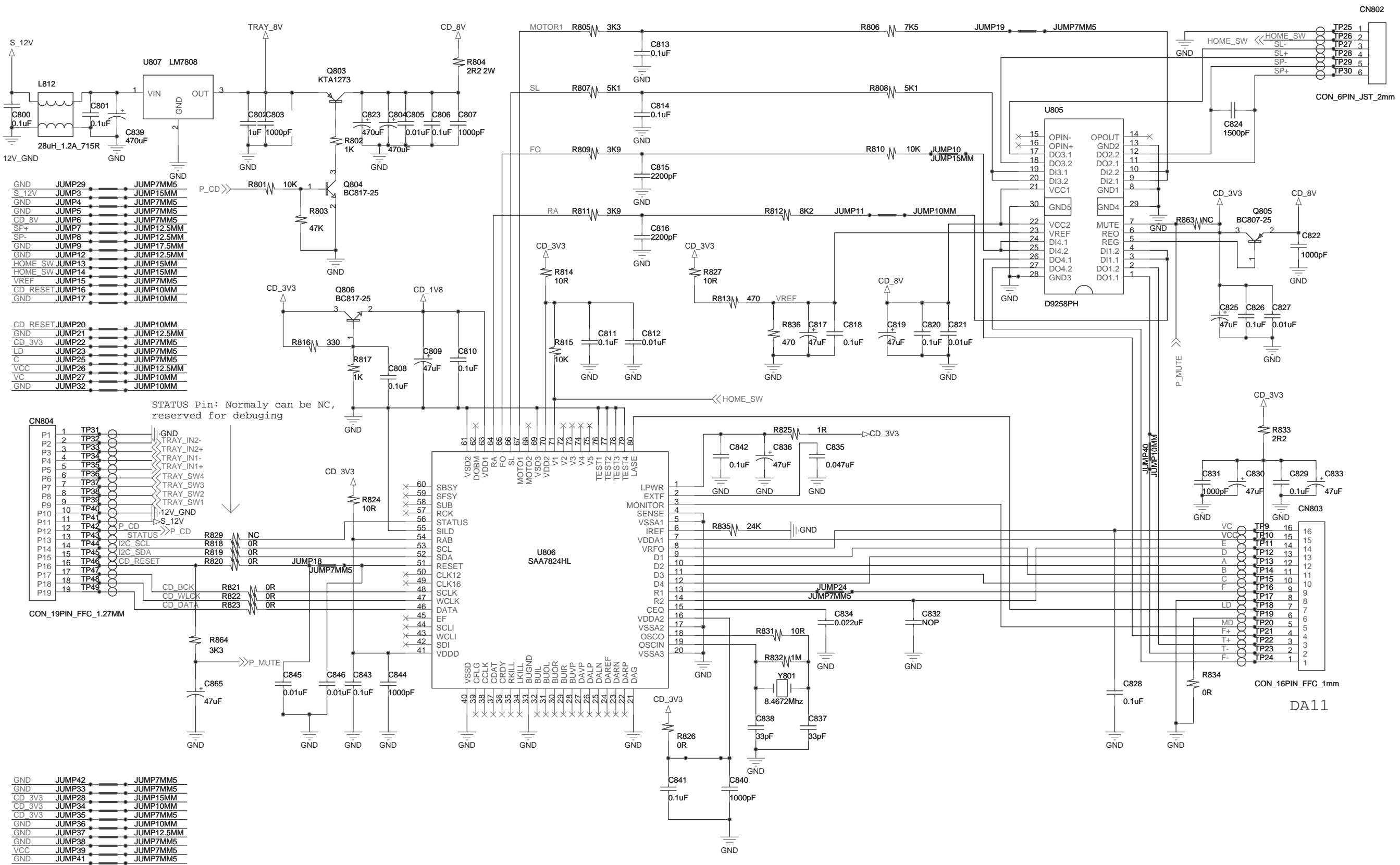
## LAYOUT DIAGRAM - CD BOARD (TOP VIEW)



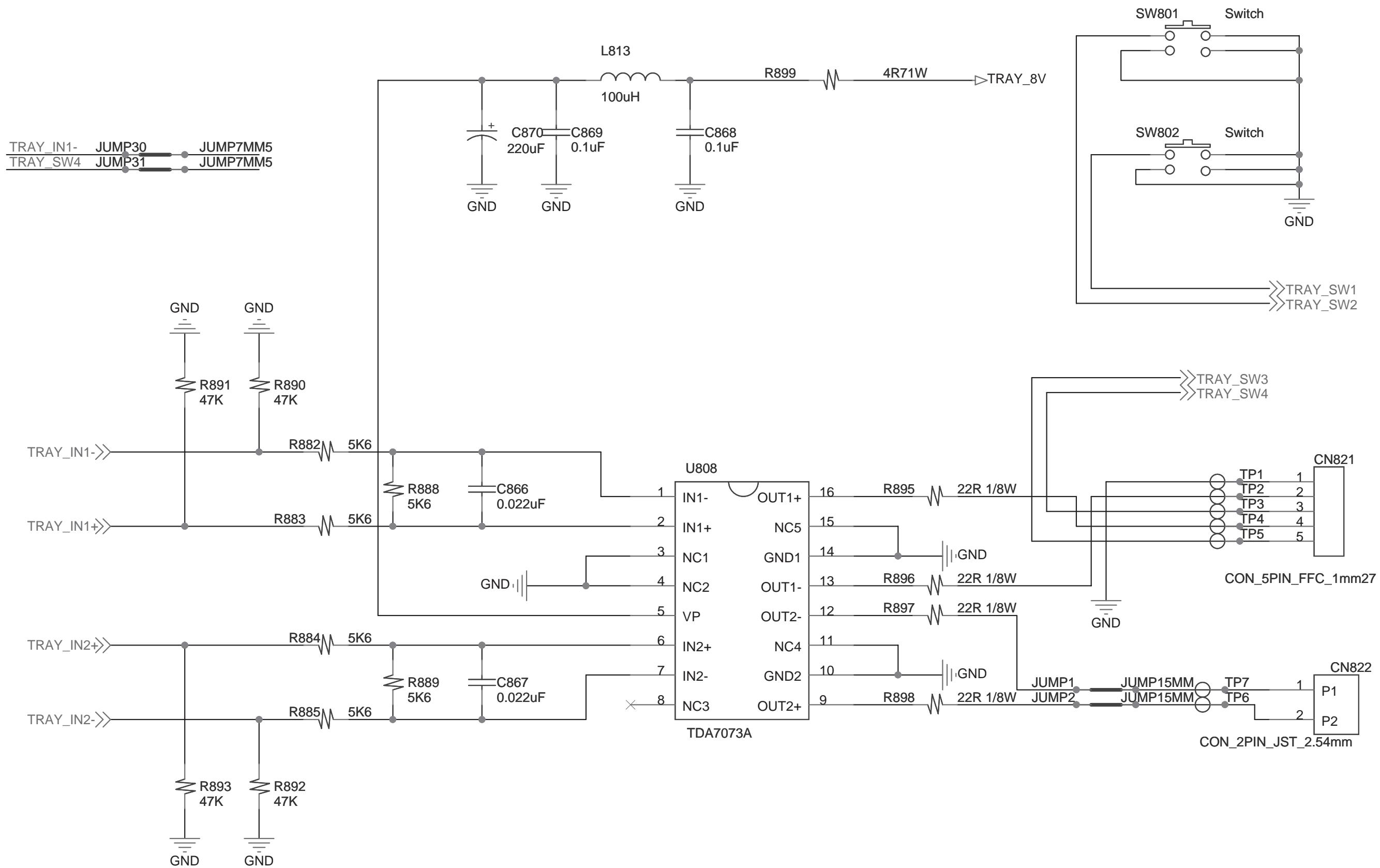
## LAYOUT DIAGRAM - CD BOARD (BOTTOM VIEW)



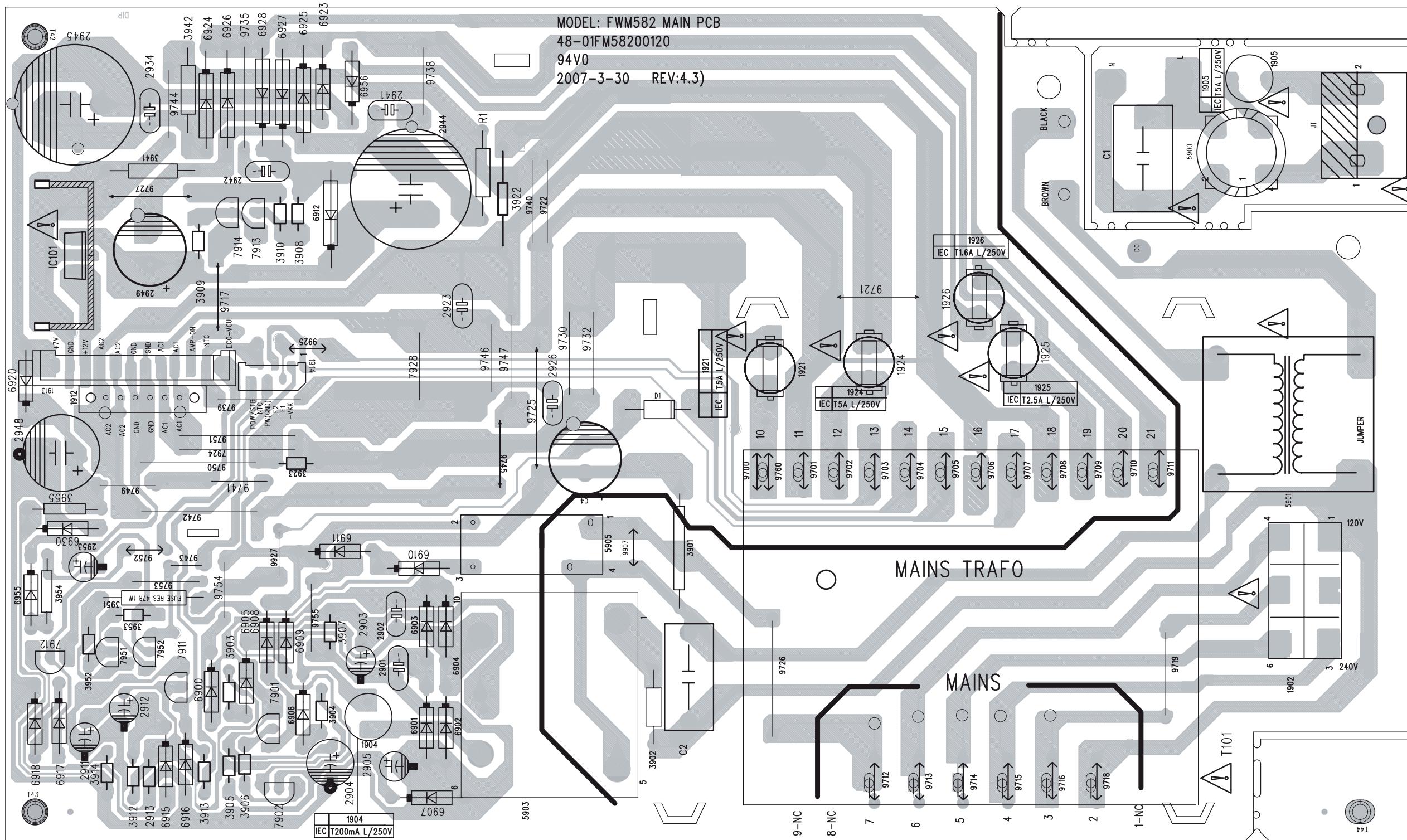
## CIRCUIT DIAGRAM - CD BOARD (PART1)



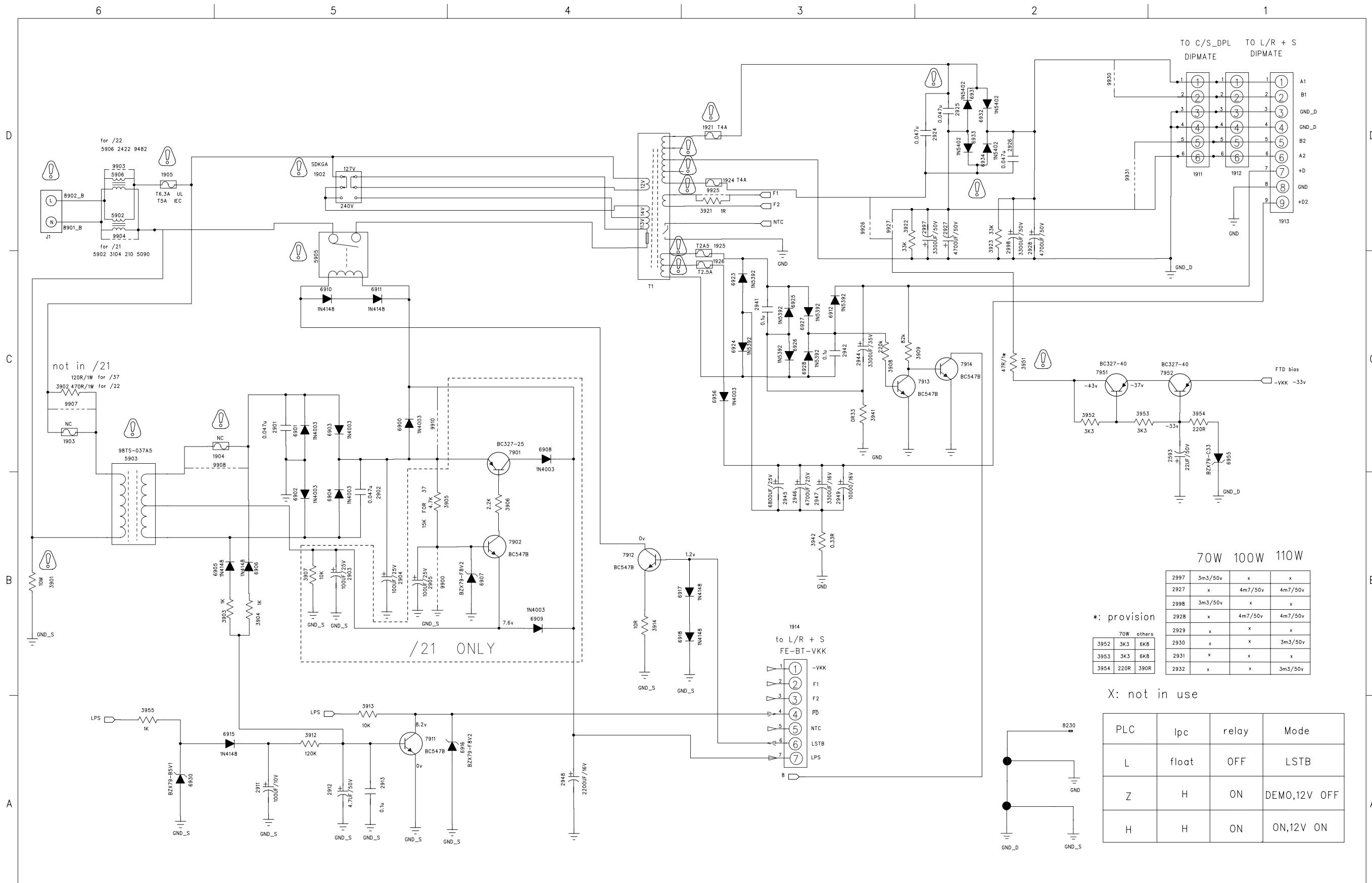
## CIRCUIT DIAGRAM - CD BOARD (PART 2)



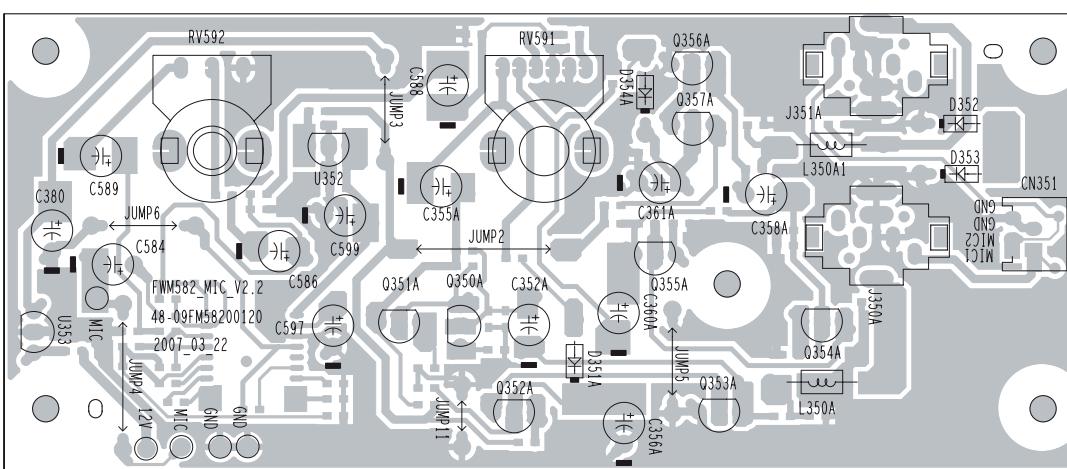
## LAYOUT DIAGRAM - MAINS BOARD (TOP VIEW)



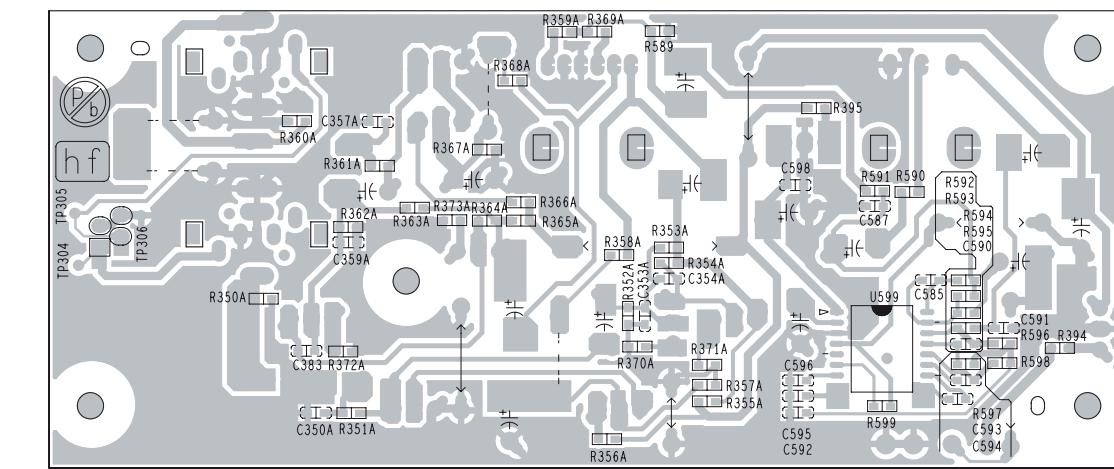
# CIRCUIT DIAGRAM - MAINS BOARD



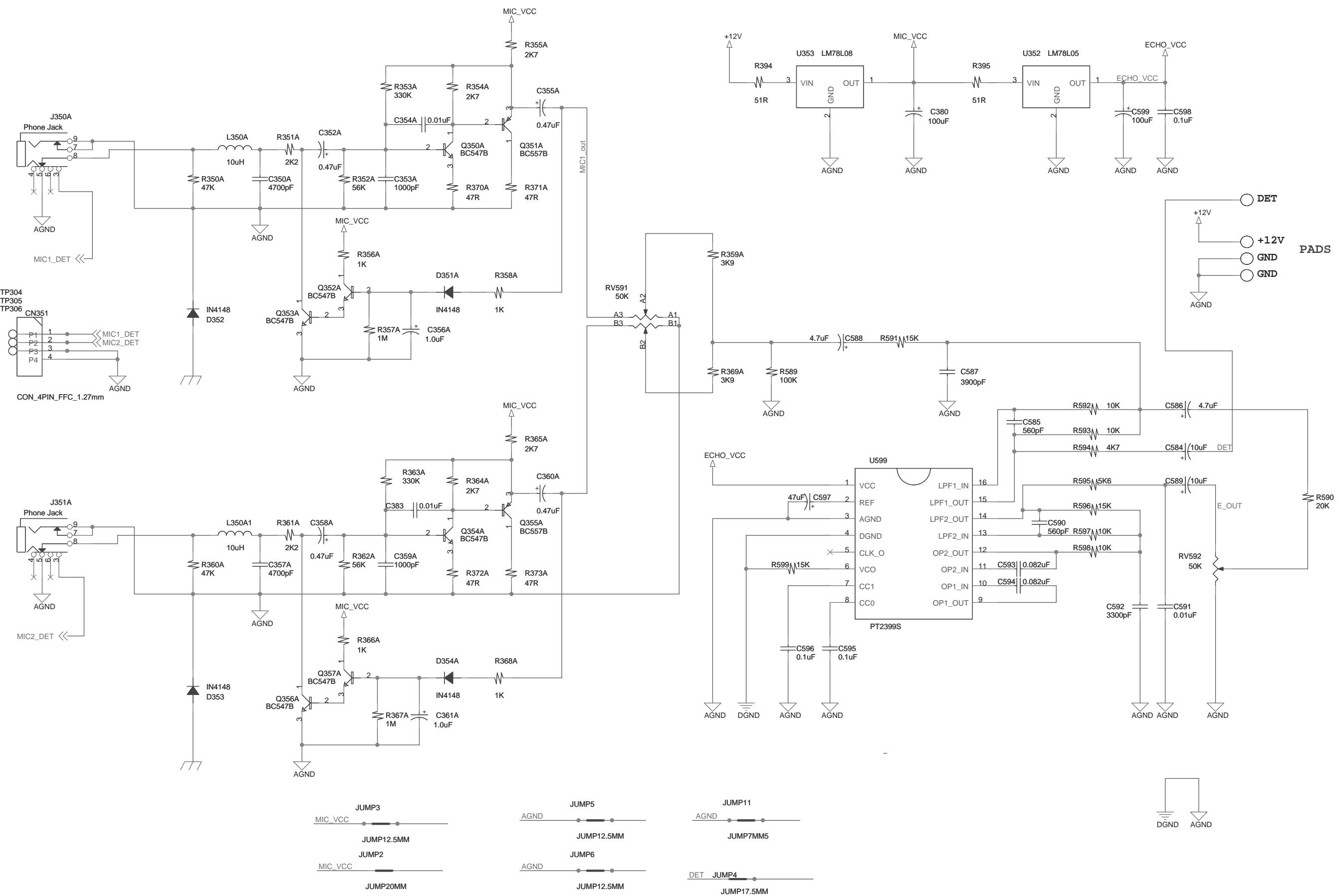
### LAYOUT DIAGRAM - MIC BOARD (TOP VIEW)



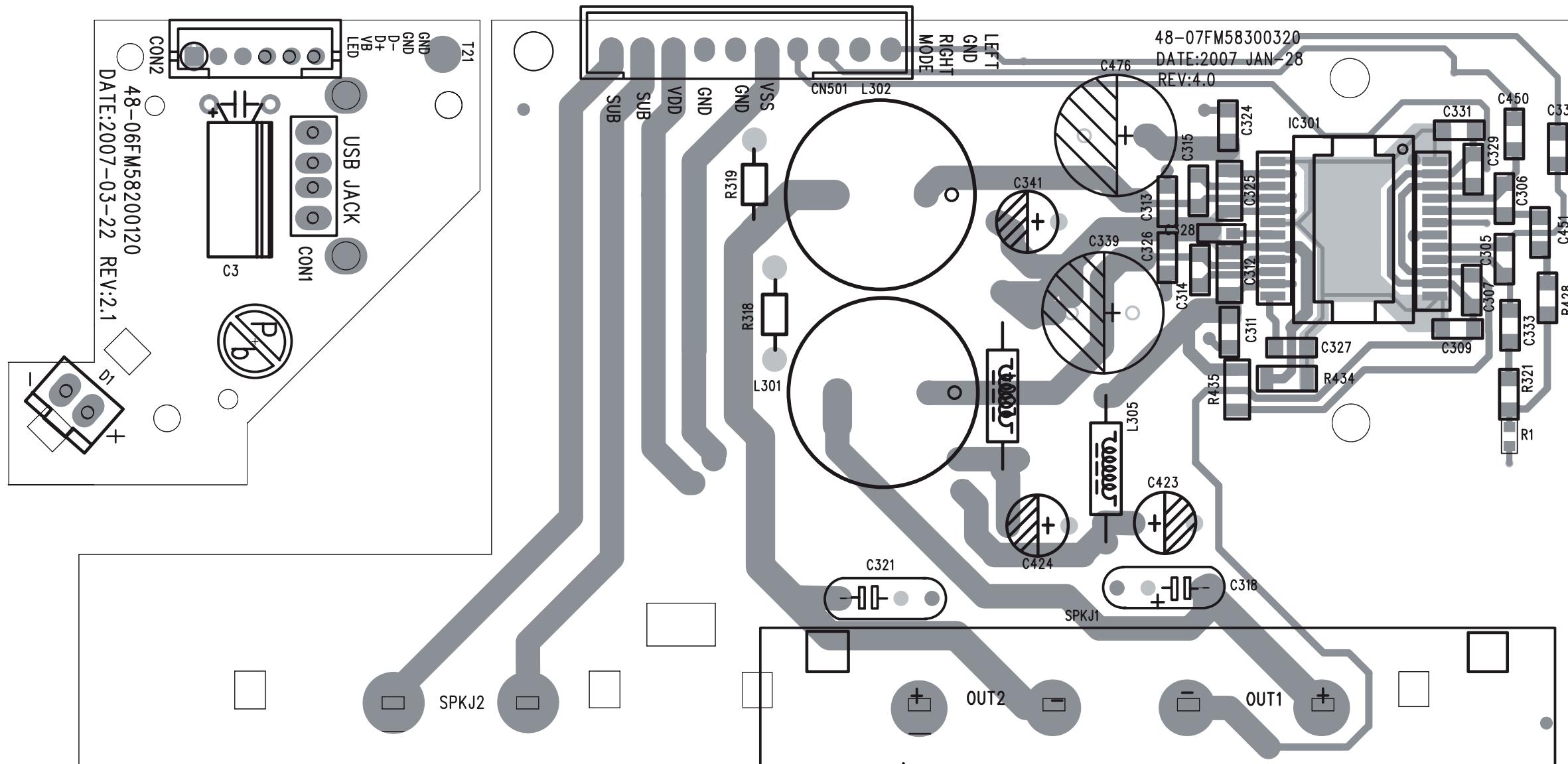
### LAYOUT DIAGRAM - MIC BOARD (BOTTOM VIEW)

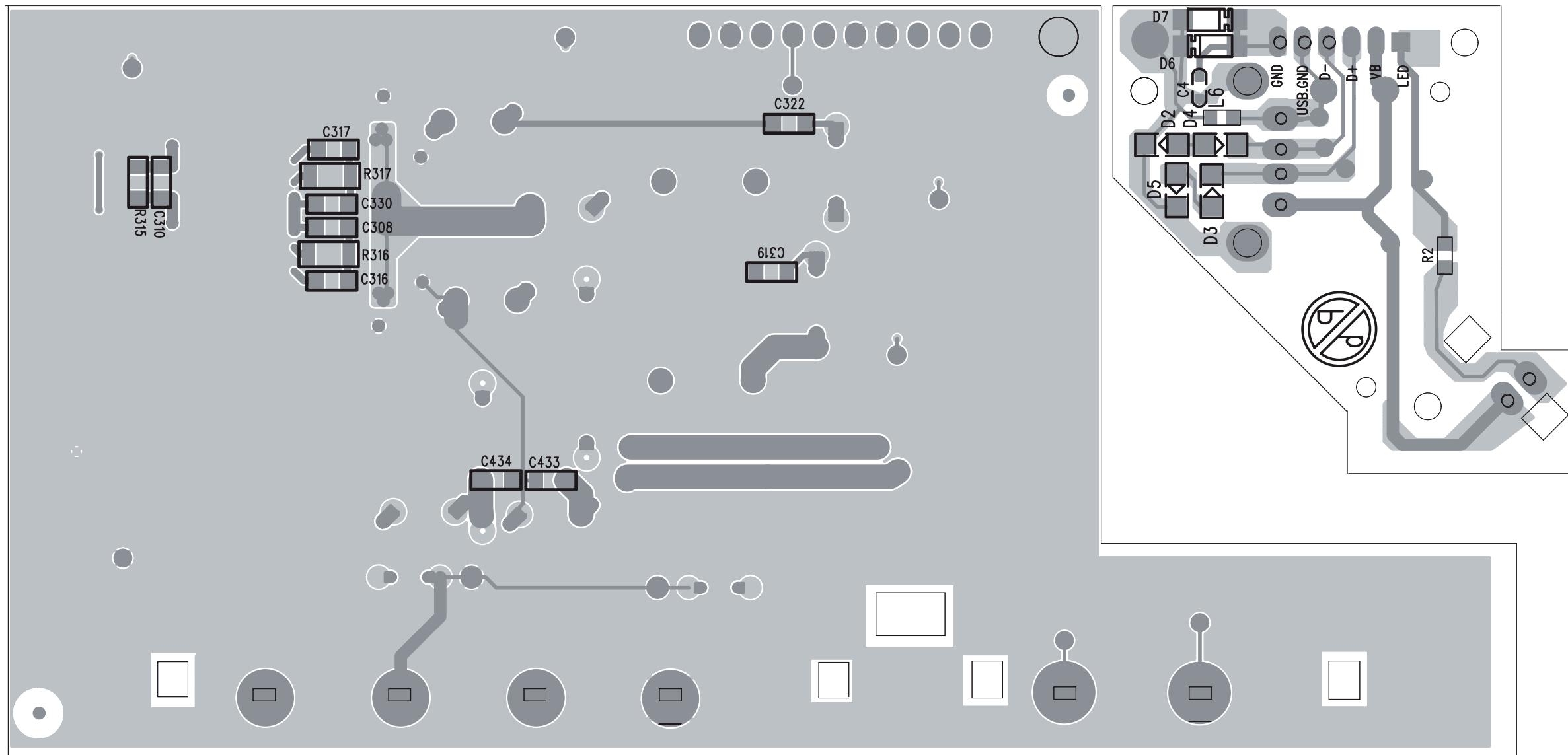


## CIRCUIT DIAGRAM - MIC BOARD

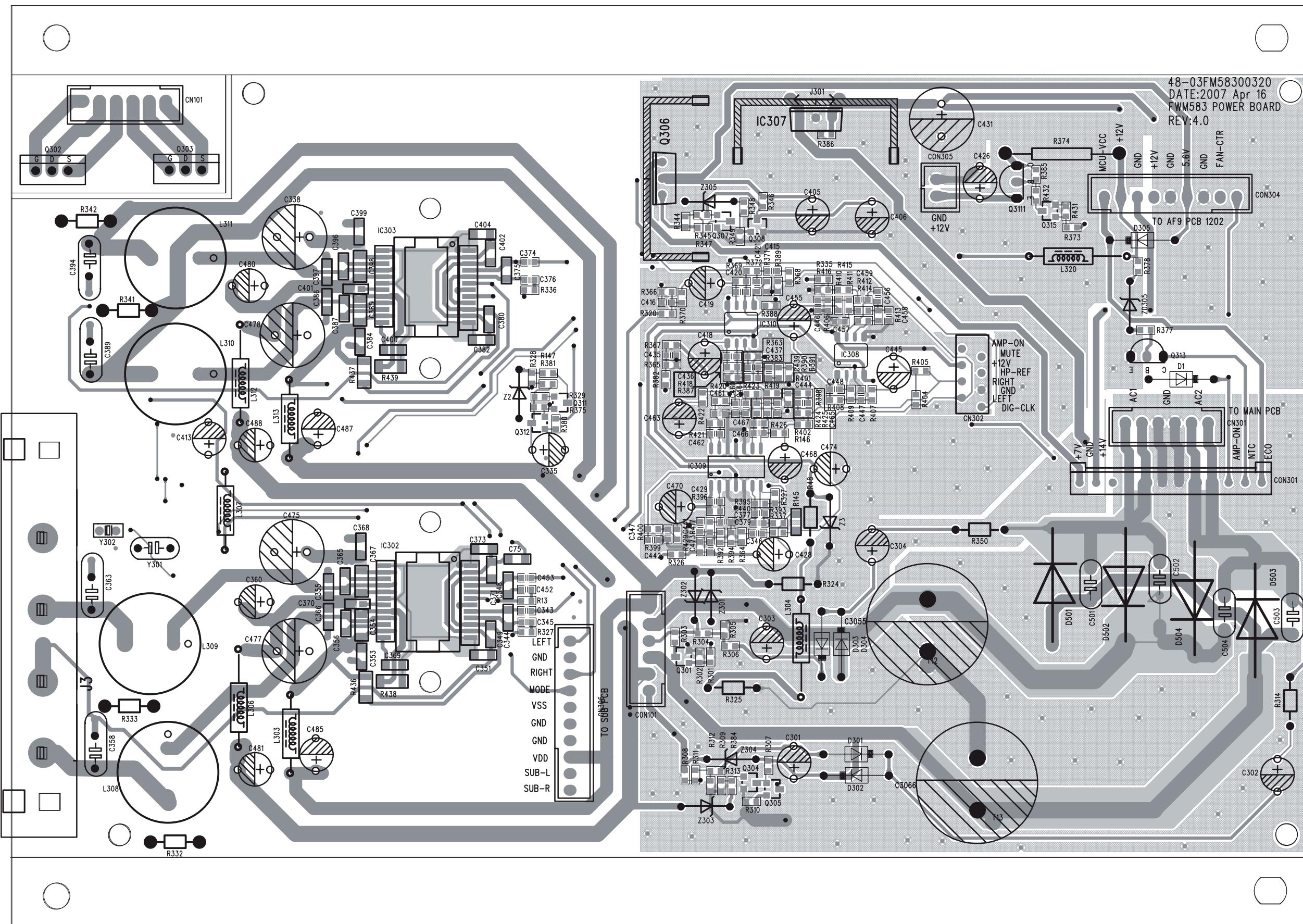


## LAYOUT DIAGRAM - HIGH AMP & USB JACK BOARD (TOP VIEW)

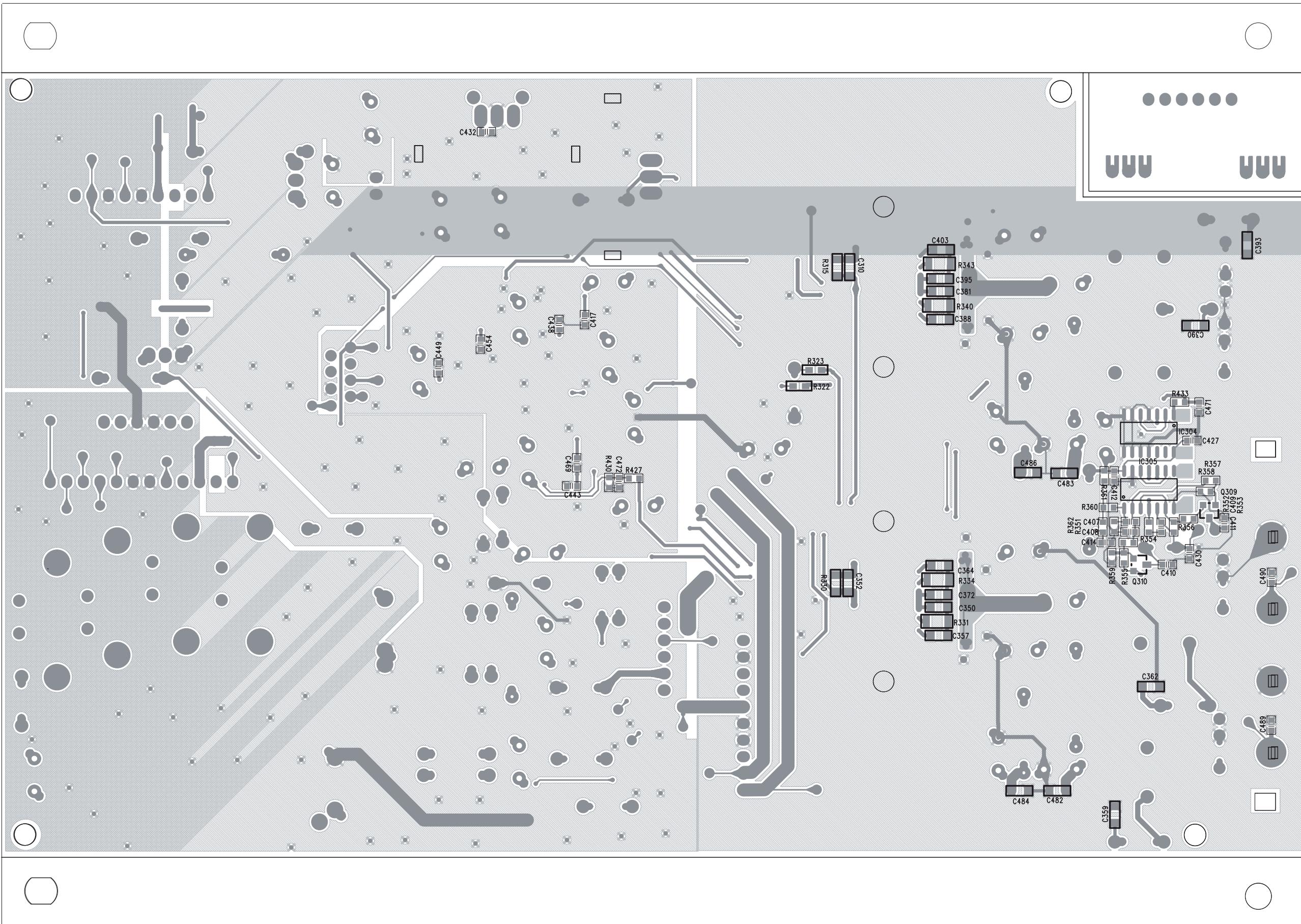


**LAYOUT DIAGRAM - HIGH AMP & USB JACK BOARD (BOTTOM VIEW)**

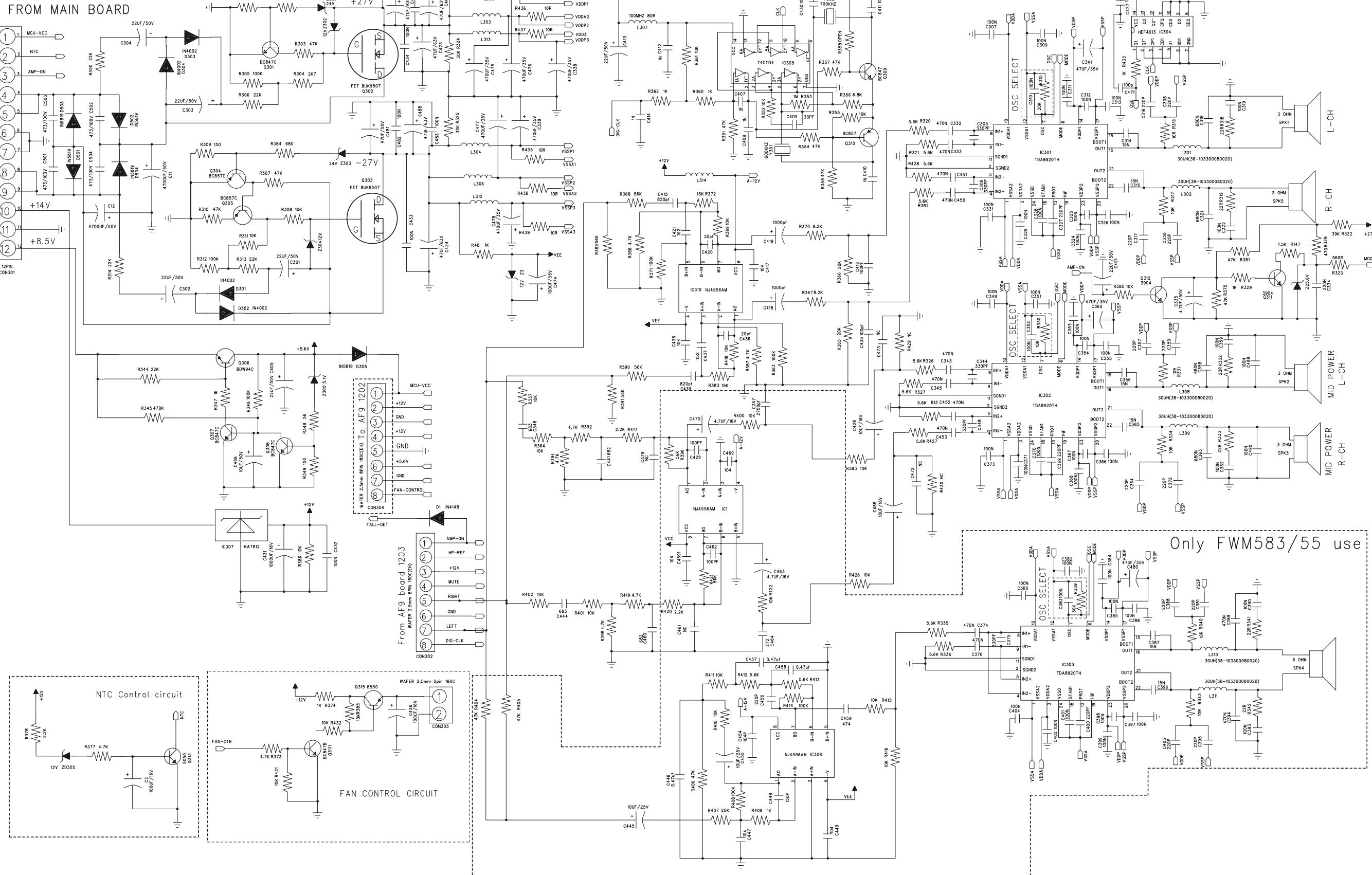
## LAYOUT DIAGRAM - POWER BOARD (TOP VIEW)



## LAYOUT DIAGRAM - POWER BOARD (BOTTOM VIEW)



## CIRCUIT DIAGRAM - HIGH AMP BOARD &amp; POWER BOARD



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**BRIEF INTRODUCTION OF THE AF9 BOARD**


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The AF9 Board consists of the following features :

a. TDA7468D IC

TDA7468D IC (7501) which includes functions such as source selection, loudness control, dynamic bass control, treble control, volume control and muting function. Sound features such as ALC, DBB, DSC and IS are controllable via I<sup>2</sup>C Bus from the microprocessor.

The TDA7468D IC caters for 4 input sources namely TUNER, TAPE, CD and AUX. It also has a Mic mix input. In our application, software will switch the input source to previous source MUTE during STANDBY mode and some other occasions where noise from other input source is undesirable.

Note that the input to the TDA7468D IC must be ac coupled to prevent 'pop' noise.  
Input networks are included to provide appropriate attenuation for various sources.

b. SIMPLE MIC MIXING

The AF9 Board has provisions which can be configured to cater for one of the following:  
MM : which caters for Mic mixing with additional Mic amplifier board.  
NM : non Mic mixing.

c. DOLBY PRO LOGIC (DPL) INTERFACE

The AF9 Board has provisions which can be configured to cater for DPL.

d. LINE OUT

Line out cinch socket for connection to external amplifier.

e. SUB-WOOFER OUT

Sub-woofer out cinch socket for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND

Incredible surround effect using transistor circuit to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER

Headphone amplifier to drive 32 ohm to 1kohm headphone.

h. CD STANDBY CONTROL

CD Standby Control circuit which switches on the supply to CD servo control IC, digital out buffer IC, HF circuit and the laser light pen in CD mode only.

i. ATTENUATION NETWORK

Attenuation network is provided at the output of the AF9 Board for interfacing with power board of different output power.

j. CD DIGITAL OUT

CD Digital out cinch socket for connection to external digital audio decoders.

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# AF9 BOARD

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## TABLE OF CONTENTS

Brief Introduction of the AF9 Board .....	12-1
AF9 Board - Component layout .....	12-2
AF9 Board - Chip layout .....	12-3
AF9 Board - Circuit Diagram (Part 1) .....	12-4
AF9 Board - Circuit Diagram (Part 2) .....	12-5

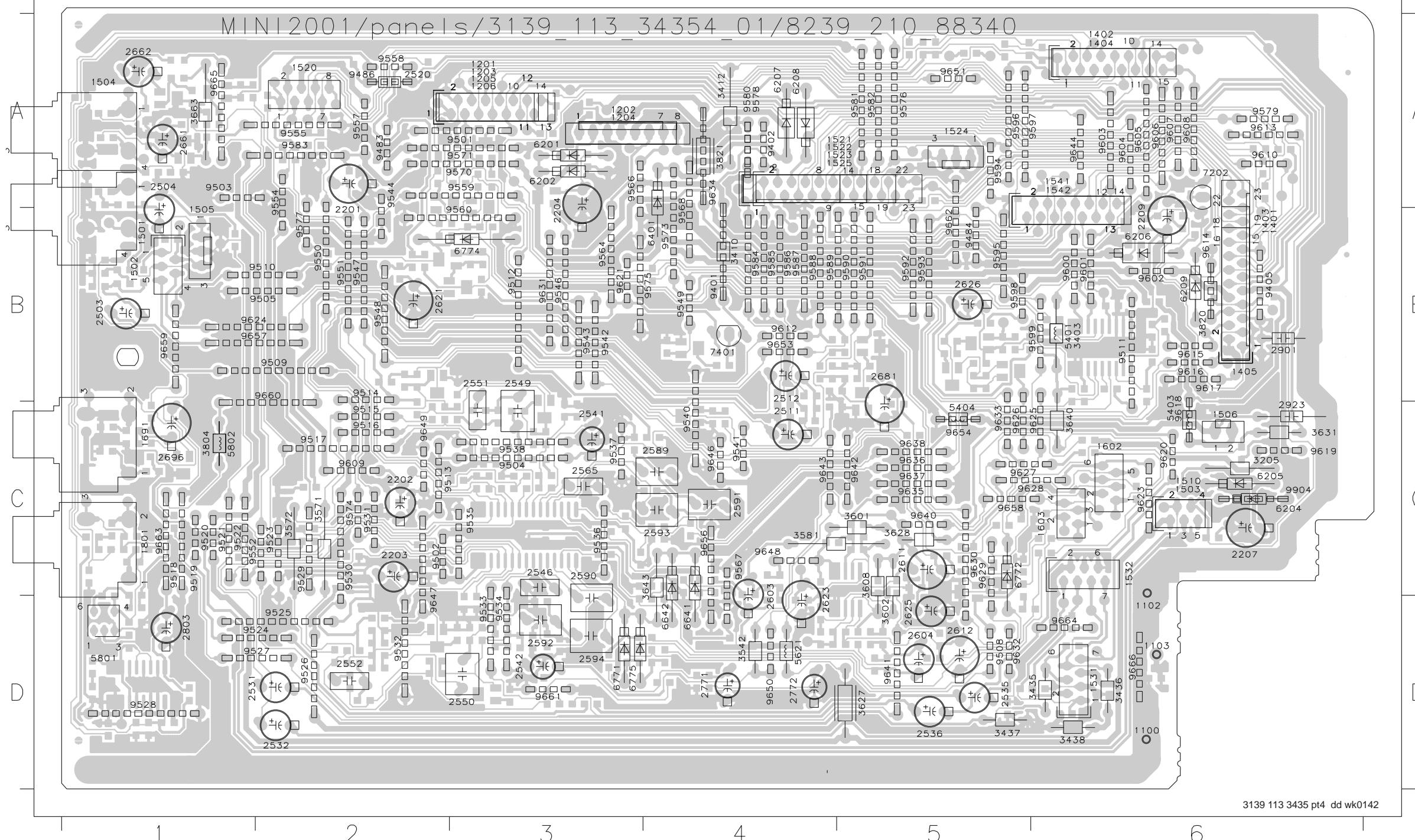
**CHIP LAYOUT**

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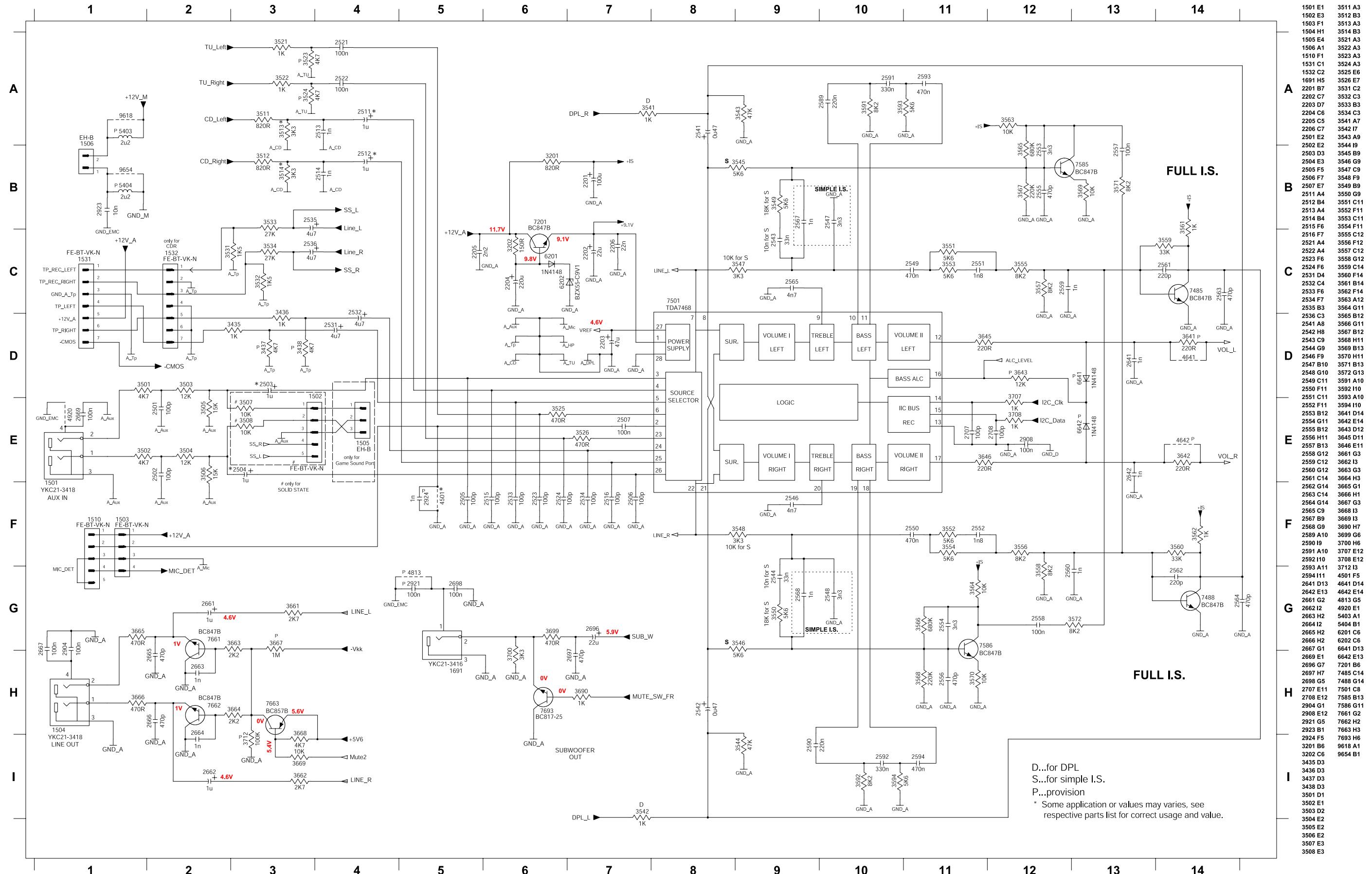
## COMPONENT LAYOUT

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1103	D6	1505	B1	1801	B1	2541	D5	3403	B6	3630	C5	9403	A4	9549	B2	9606	A6	9639	C5	9659	B1
1201	D3	1506	C6	2201	C2	2542	D5	3410	B4	3631	C6	9404	A2	9550	B1	9607	A6	9640	C4	9660	B2
1202	A3	1507	C6	2202	C3	2543	D5	3412	B6	3632	C4	9405	A2	9551	B2	9608	A6	9641	C4	9661	B3
1203	A3	1508	C6	2203	C3	2544	D5	3413	B6	3633	C4	9406	A2	9552	B1	9609	A6	9642	C4	9662	B3
1204	A3	1509	C6	2204	B3	2545	D5	3414	B6	3634	C4	9407	A2	9553	B2	9610	A6	9643	C4	9663	B3
1205	A3	1510	C6	2205	B6	2546	D5	3415	B6	3635	C4	9408	A2	9554	B2	9611	A6	9644	C4	9664	B3
1206	A3	1511	C6	2206	B6	2547	D5	3416	B6	3636	C4	9409	A2	9555	B2	9612	A6	9645	C4	9665	B3
1401	B6	1521	A2	2207	B1	2548	D5	3417	B6	3637	C4	9410	A2	9556	B2	9613	A6	9646	C4	9666	B3
1402	B6	1522	A2	2208	B1	2549	D5	3418	B6	3638	C4	9411	A2	9557	B2	9614	A6	9647	C4	9667	B3
1403	B6	1523	A2	2209	B1	2550	D5	3419	B6	3639	C4	9412	A2	9558	B2	9615	A6	9648	C4	9668	B3
1404	B6	1524	A2	2210	B1	2551	D5	3420	B6	3640	C4	9413	A2	9559	B2	9616	A6	9649	C4	9669	B3
1501	B1	1541	C6	2511	C4	2552	D5	3601	C5	3641	D5	9414	B2	9560	B1	9617	A6	9650	C4	9670	B1
1502	B1	1542	C6	2512	C4	2553	D5	3602	C5	3642	D5	9415	B2	9561	B1	9618	A6	9651	C4	9671	B1
1602	C6	2513	D5	2520	C4	2554	D5	3603	C5	3643	D5	9416	B2	9562	B1	9619	A6	9652	C4	9672	B1

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



## SOURCE SELECTION &amp; SOUND PROCESSING CIRCUIT



1501 E1	3511 A3
1502 E3	3512 B3
1503 F1	3513 A3
1504 H1	3514 B3
1505 E4	3521 A3
1506 A1	3522 A3
1510 F1	3523 A3
1531 C1	3524 A3
1532 C2	3525 E6
1691 H5	3526 E7
2201 B7	3531 C2
2202 C7	3532 C3
2203 D7	3533 B3
2204 C6	3534 C3
2205 C5	3541 A7
2206 C7	3542 I7
2501 E2	3543 A9
2502 E2	3544 B9
2503 D3	3545 B9
2504 E3	3546 G9
2505 F5	3547 C9
2506 F7	3548 F9
2507 E7	3549 B9
2511 A4	3550 G9
2512 B4	3551 C11
2513 A4	3552 F11
2514 B4	3553 C11
2515 F7	3554 F11
2521 A4	3555 C12
2522 A4	3556 F12
2523 F6	3558 G12
2524 F6	3559 C14
2531 D4	3560 F14
2532 C4	3561 B14
2533 F6	3562 F14
2534 F7	3563 A12
2535 B3	3564 G11
2541 A8	3565 B12
2542 H8	3567 B12
2543 C9	3568 H11
2544 G9	3569 B13
2546 F9	3570 H11
2547 B10	3571 B13
2549 C11	3572 G13
2550 F10	3573 A10
2551 C11	3574 H10
2552 F10	3575 A10
2553 B12	3576 D14
2554 G11	3642 E14
2555 B12	3643 D12
2556 H11	3645 D11
2557 B13	3646 E11
2558 G12	3661 G3
2559 C12	3662 I3
2560 G12	3663 G3
2561 C14	3664 H3
2562 G14	3665 G1
2563 C14	3666 H1
2564 G14	3667 G3
2565 C9	3668 I3
2568 G9	3669 I3
2569 A10	3690 H7
2590 I9	3699 G6
2591 I10	3700 H6
2592 I10	3707 E12
2593 A11	3708 E12
2594 I11	3712 I3
2641 D13	4501 F5
2642 E13	4641 D14
2661 G2	4813 G5
2662 H2	4920 E1
2663 H2	5403 A1
2664 I2	5404 B1
2665 H2	6201 C6
2666 H2	6202 C6
2667 G1	6641 D13
2669 E1	6642 E13
2696 G7	7201 B6
2697 H7	7485 C14
2698 G5	7488 G14
2707 E11	7501 C8
2708 E12	7585 B13
2904 G1	7586 G11
2908 E12	7661 G2
2921 G5	7662 H2
2923 B1	7663 H3
2924 F5	7693 H6
3201 B6	9618 A1
3202 C6	9654 B1
3435 D3	
3436 D3	
3437 D3	
3438 D3	
3501 D1	
3502 E1	
3503 D2	
3504 E2	
3505 E2	
3507 E3	
3508 E3	

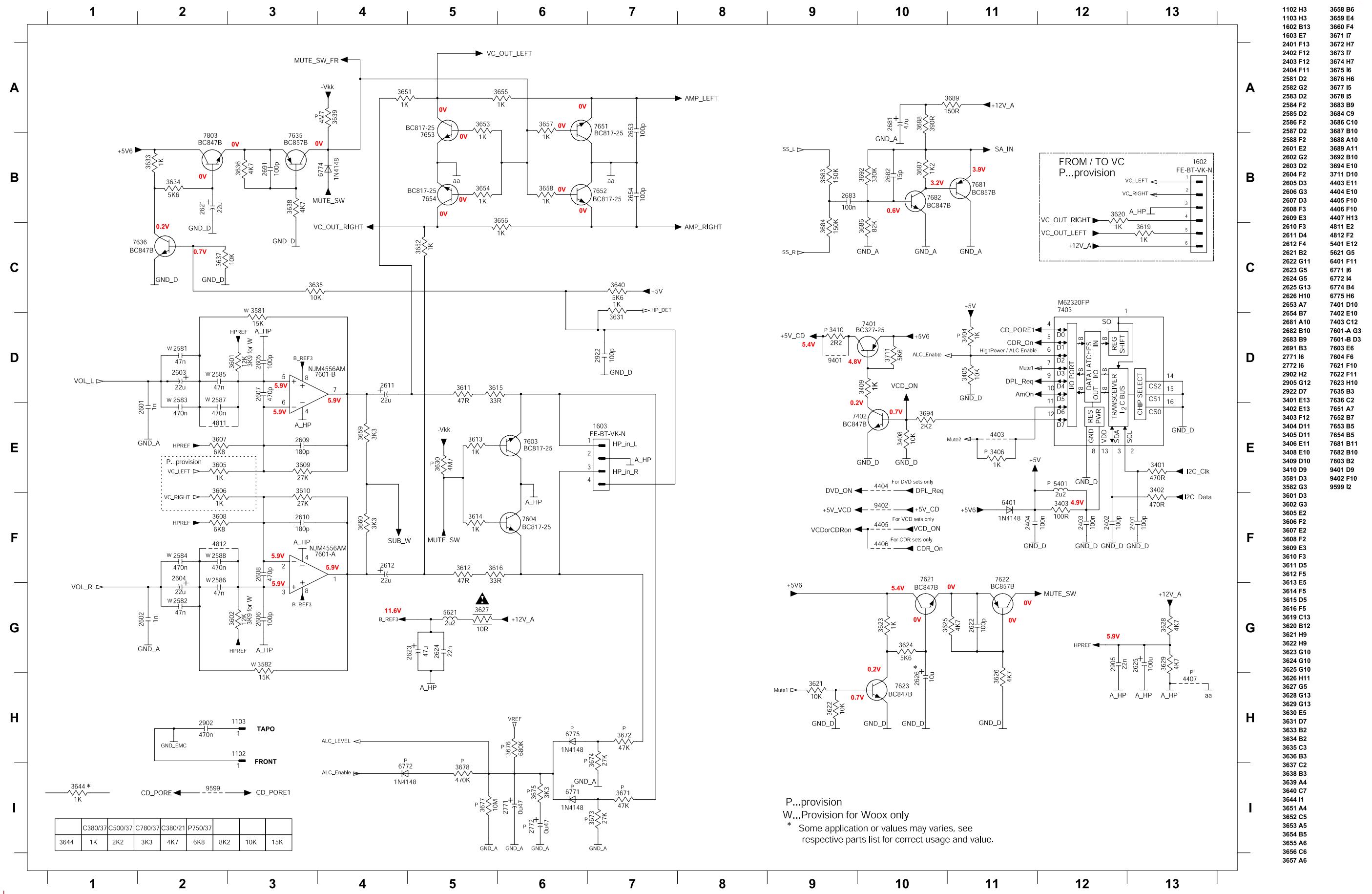
D...for DPL

S...for simple I.S.

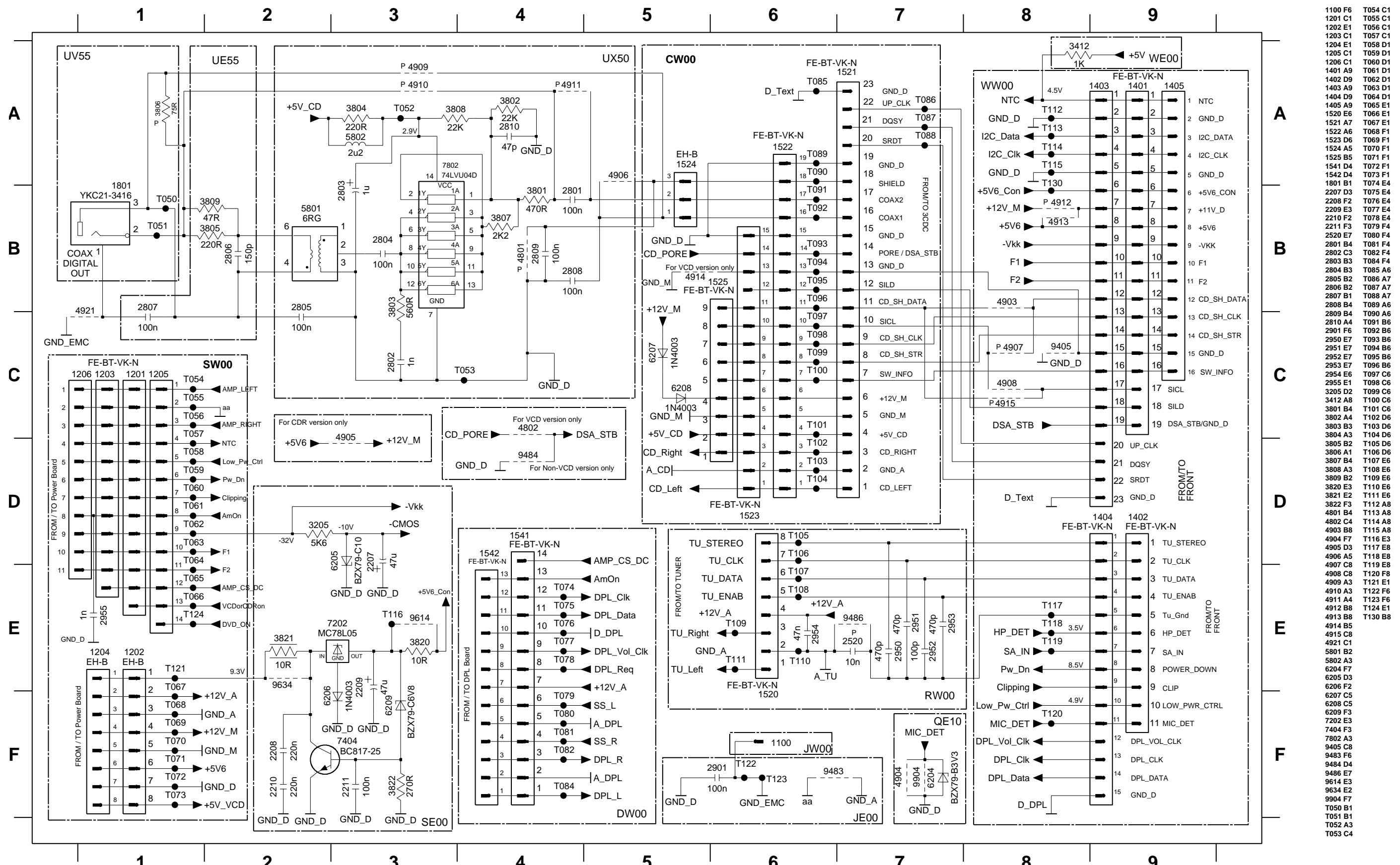
P...provision

\* Some application or values may varies, see respective parts list for correct usage and value.

# HEADPHONE AMPLIFIER & I<sup>2</sup>C EXPANDER CIRCUIT



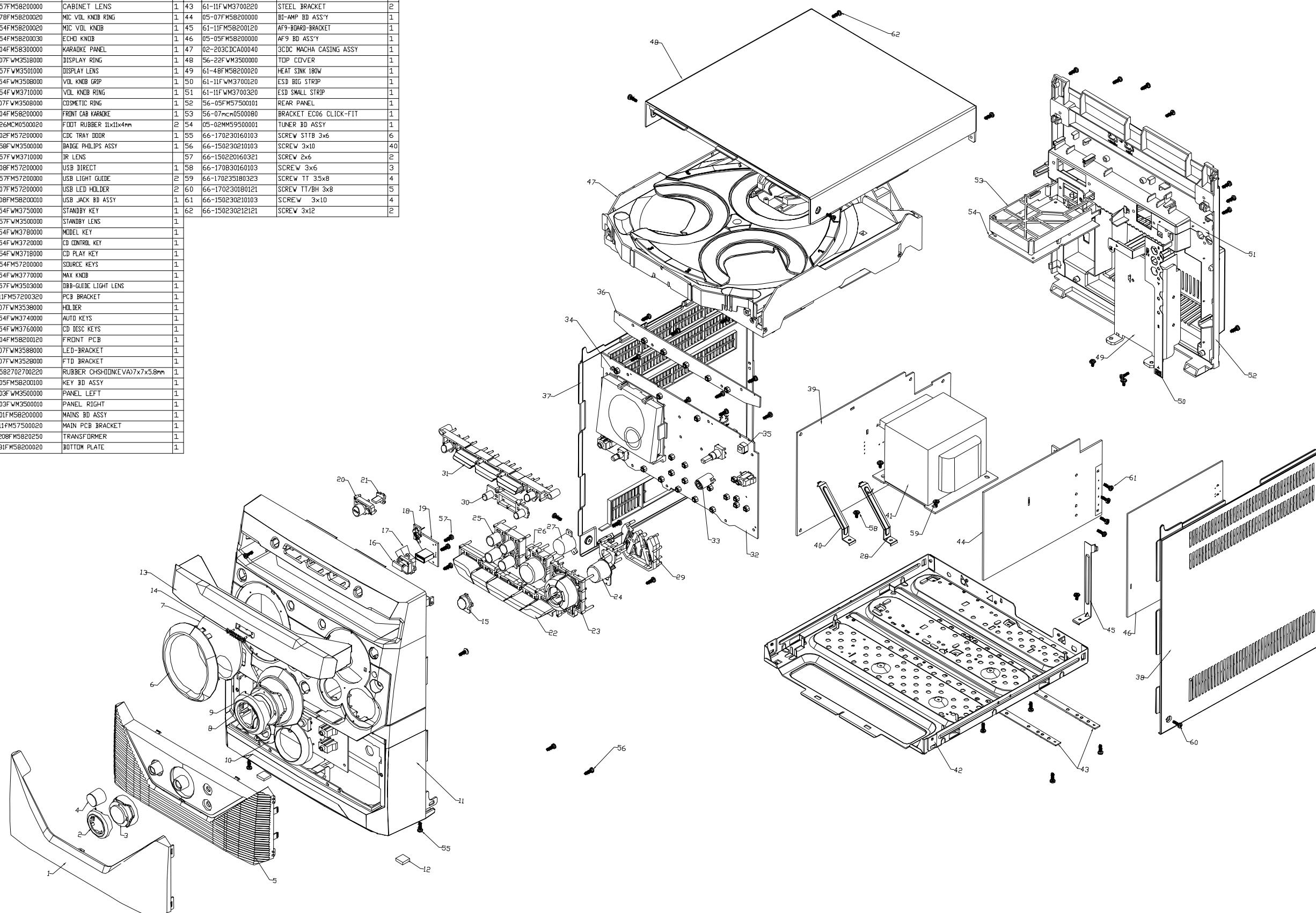
## DIGITAL OUT & INTERCONNECTION CIRCUIT



Updated on 15 SEPT 2003

## ***SET MECHANICAL EXPLODED VIEW***

ITEM	PART NO.	NAME	QTY	ITEM	PART NO.	NAME
1	56-57FM58200000	CABINET LENS	1	43	61-11FWM3700220	STEEL BRACKET
2	56-78FM58200020	MIC VOL KNOB RING	1	44	05-07FMW58200000	BI-AMP BD ASS'Y
3	56-54FM58200020	MIC VOL KNOB	1	45	61-11FM58200120	AF9 BOARD-BRACKET
4	56-54FM58200030	ECHO KNOB	1	46	05-05FMW58200000	AF9 BD ASS'Y
5	56-04FM58300000	KARAOKE PANEL	1	47	02-203CDA00040	3DCE MACHA CASING ASSY
6	56-07FWN35180000	DISPLAY RING	1	48	56-22FWM35000000	TOP COVER
7	56-57FWM3501000	DISPLAY LENS	1	49	61-4BFM58200020	HEAT SINK 180W
8	56-54FWN35080000	VOL KNOB GRIP	1	50	61-11FWM3700120	ESD BIG STRIP
9	56-54FMW37100000	VOL KNOB RING	1	51	61-11FWM3700320	ESD SMALL STRIP
10	56-07FWM35080000	COSMETIC RING	1	52	56-05FM57000101	REAR PANEL
11	56-04FM58200000	FRONT CAB KARAOKE	1	53	56-07mcn0500080	BRACKET EC06 CLICK-FIT
12	58-26CMOD000020	FOOT RUBBER 11x11x4mm	2	54	05-02MM59500001	TUNER BD ASSY
13	56-02FM57200000	CDC TRAY DOOR	1	55	66-170230160103	SCREW STTB 3x6
14	56-58FWM35000000	BADGE PHILIPS ASSY	1	56	66-150230210103	SCREW 3x10
15	56-57FWM37100000	IR LENS	1	57	66-15020160321	SCREW 2x6
16	56-08FM57200000	USB DIRECT	1	58	66-170830160103	SCREW 3x6
17	56-57FM57200000	USB LIGHT GUIDE	2	59	66-170235180323	SCREW TT 3x8
18	56-07FM57200000	USB LED HOLDER	2	60	66-170230180121	SCREW TT/BH 3x8
19	05-08FM58200010	USB JACK BD ASSY	1	61	66-150230210103	SCREW 3x10
20	56-54FWN37500000	STANDBY KEY	1	62	66-150230212121	SCREW 3x12
21	56-57FWM35000000	STANDBY LENS	1			
22	56-54FWN37800000	MODEL KEY	1			
23	56-54FWN37200000	CD CONTROL KEY	1			
24	56-54FWN37180000	CD PLAY KEY	1			
25	56-54FM57200000	SOURCE KEYS	1			
26	56-54FWN37700000	MAX KNOB	1			
27	56-57FWN35030000	DBB-GUIDE LIGHT LENS	1			
28	61-11FM57200320	PCB BRACKET	1			
29	56-07FWM35380000	HOLDER	1			
30	56-54FWN37400000	AUTO KEYS	1			
31	56-54FWN37600000	CD DISC KEYS	1			
32	48-04FM58200010	FRONT PCB	1			
33	56-07FWN35880000	LED-BRACKET	1			
34	56-07FWN35280000	FTD BRACKET	1			
35	58-582702700220	RUBBER CHSHIONKEVA07x7x5.8mm	1			
36	05-05FM58200100	KEY BD ASSY	1			
37	56-03FWN35000000	PANEL LEFT	1			
38	56-03FWN35000100	PANEL RIGHT	1			
39	05-01FM58200000	MAINS BD ASSY	1			
40	61-11FM57500020	MAIN PCB BRACKET	1			
41	18-208FM5820250	TRANSFORMER	1			
42	61-31FM58200020	BOTTOM PLATE	1			



**MECHANICAL & ACCESSORIES PARTS LIST**

1	996510004022	CABINET LENS	B	996510003974	REMOTE CONTROL
2	996510004023	MIC VOL KNOB RING	C	996510003975	SPK BOX L+R
3	996510004013	MIC VOL KNOB	D	994000001192	AM LOOP ANTENNA LAN-031
4	996510004014	ECHO KNOB	E	△994000001478	AC PLUG ADAPTOR
5	996510004010	KARAOKE PANEL	F	△996500037714	AC CORD SET VDE APP 1.8
6	996510004012	DISPLAY RING	G	994000001381	FM ANT (BLACK) 1M
7	994000001308	DISPLAY LENS	L	994000003669	CD MECHANISM DA11VF
8	996510004024	VOL KNOB RING	M	994000004487	16P FFC 1MM L=170MM
9	996510004021	VOL KNOB GRIP	N	996510004002	19P FFC 1.25mm L80mm (AA)
10	994000001281	COSMETIC RING	O	994000004457	5P FFC L=200MM(AA)
11	996510004009	FRONT CAB KARAOKE	P	996510004004	15P FFC 1.25mm L120mm(AB)
13	996510006292	CDC TRAY DOOR	Q	994000001362	8P FFC1.25MM L=160MM
15	996500038473	IR LENS	R	996510004005	4P FFC 1.25mm L180mm (AB)
16	994000004495	USB DIRECT	S	996510004006	12P FFC 1.25mm L250mm (AA)
17	994000004514	USB LIGHT GUIDE LENS	T	996510004007	25P FFC 1.25mm L250mm AB
20	996510004019	STANDBY KEY	U	994000004462	4P FFC 1.25MM L=270MM(AA)
21	994000001307	STANDBY LENS	V	994000001258	6P FFC 1.25MM L=280MM
22	996510006295	MODEL KEY			
23	996510006294	CD CONTROL KEY			
24	996510004016	CD PLAY KEY			
25	996510004015	SOURCE KEYS			
26	994000004512	MAX KNOB			
27	996510000987	DBB-GUIDE LIGHT LENS			
30	996510004020	AUTO KEYS			
31	996510000984	CD DISC KEYS			
37	994000001276	PANEL LEFT	<b>Note: Only these parts mentioned in the list are normal service parts.</b>		
38	994000001277	PANEL RIGHT			
41	△996510004003	TRANSFORMER E186x65 127/240V			
47	996510004001	3CD MECHA CASING ASS'Y			
48	994000001285	TOP COVER			
52	996510006293	REAR PANEL			
54	994000001964	TUNER BOARD ASS'Y			

**ELECTRICAL PARTSLIST**

<b>FRONT BOARD</b>			<b>AF9 BOARD</b>			<b>HIGH AMP BOARD</b>			<b>TUNER BOARD</b>		
D201	994000001234	LED LAMP 3MM (RED)	1501	994000001221	V/RCA JACK 2P	C318	996510006290	M. POLY FILM CAP 0.68UF 63V	5111	996500042436	I.F.T 7mm 7M4A2011N (BLACK)
IR200	994000000325	OPTIC SENSER (OPTO..)	7102	996500038610	TRANSISTORS 2W 8550C	C321	996510006290	M. POLY FILM CAP 0.68UF 63V	5112	996500042434	I.F.T 7mm C712KC-004 (YEL)
J201	994000001244	PHONE JACK 3.5MM	7202	994000002839	IC LM1117S-3.3	IC301	996510003980	IC TDA8920(SOT566-3) 2X100W	5114	996500042434	I.F.T 7mm C712KC-004 (YEL)
JOG200	994000001241	ROTARY ENCODER	7403	994000001247	IC HEF4094BT	SPKJ1	996510003983	SPK JACK (GR/BL/BL/GR)	5119	996500042433	I.F.T 7mm KS2599 (BLK)
SW206	994000001243	TACT SWITCH	7601	994000001201	IC NJM4556AM	SPKJ2	996510006291	SPK JACK PST-202B-03 (B/P)	5123	996500042435	I.F.T 7mm 7M1A2146 (BROWN)
SW207	994000001243	TACT SWITCH	<b>KEY BOARD</b>			<b>MCU BOARD</b>			5130	994000003653	BOBBIN COIL WHITE 1 1/2T
SW208	994000001243	TACT SWITCH							5131	994000003653	BOBBIN COIL WHITE 1 1/2T
SW209	994000001243	TACT SWITCH							6105	994000002454	VARIABLE CAP DIODE HN-1V02H
SW210	994000001243	TACT SWITCH	SW201	994000001243	TACT SWITCH	D100	996510003989	SMD DIODE 1N4148 (1206)	6130	994000001479	VARICAP DIODE ISV228
SW211	994000001243	TACT SWITCH	SW202	994000001243	TACT SWITCH	Q103	996510000317	SMD TRANSISTORS BC817-25	6131	994000001479	VARICAP DIODE ISV228
SW212	994000001243	TACT SWITCH	SW203	994000001243	TACT SWITCH	U10	996510003993	IC V809R	<b>USB BOARD</b>		
SW213	994000001243	TACT SWITCH	SW204	994000001243	TACT SWITCH	U100	996510003994	IC WM8731 SSOP28	7101	994000001321	IC TEA5757H/V1
SW214	994000001243	TACT SWITCH	SW205	994000001243	TACT SWITCH	U101	994000001247	IC HEF4094BT			
SW215	994000001243	TACT SWITCH	<b>POWER BOARD</b>			U2	996510003990	IC SDRAM M12L16161A-7T			
SW216	994000001243	TACT SWITCH				U5	996510003991	IC SST39VF800A-70 8M 3.3V W/SW	D1	996510000438	LED LAMP
SW217	994000001243	TACT SWITCH	104	996500042455	FAN JD4020L-S110 5000R/MIN	U7	996500039353	IC LM1117SJ-ADJ SOT-223	J6	996510000344	USB SOCKET
SW218	994000001243	TACT SWITCH	C3055	996510003982	E.CAP 4700UF 50V +-20% (PH)85C	U9	994000004541	IC M24C02-WMN6	<b>SPK JACK BOARD</b>		
SW219	994000001243	TACT SWITCH	C3066	996510003982	E.CAP 4700UF 50V +-20% (PH)85C	<b>CD BOARD</b>			SPKJ1	996510003983	SPK JACK (GR/BL/BL/GR)
SW220	994000001243	TACT SWITCH	C358	996510006290	M. POLY FILM CAP 0.68UF 63V				<b>MIC BOARD</b>		
SW221	994000001243	TACT SWITCH	C363	996510006290	M. POLY FILM CAP 0.68UF 63V	L812	996510004000	TOROID COIL 28UH +-30% 1.2A			
SW222	994000001243	TACT SWITCH	IC302	996510003980	IC TDA8920(SOT566-3) 2X100W	L813	996510000855	AXIAL INDUCTOR 100UH +-10%			
SW223	994000001243	TACT SWITCH	IC303	996510003980	IC TDA8920(SOT566-3) 2X100W	Q803	996510003996	TRANSISTORS KTA1273			
SW224	994000001243	TACT SWITCH	IC304	996500042457	IC HEF4013BT	SW3	994000004552	DETECT SWITCH	J350	994000001244	V/PHONE JACK 3.5MM
U200	994000004542	IC PT6315	IC305	996500042456	IC 74HCT04D SOP14	SW4	994000004552	DETECT SWITCH	J351	994000001244	V/PHONE JACK 3.5MM
VFD201	996510003978	VFD DISPLAY QG/ZBOE-VFD	IC308	994000001201	IC NJM4556AM	SW801	994000004552	DETECT SWITCH	RV591	996510003987	ROTARY VOLUME F-122KGP B50K
<b>MAINS BOARD</b>			IC309	994000001201	IC NJM4556AM	SW802	994000004552	DETECT SWITCH	RV592	996510003986	ROTARY VOLUME
1902	994000001323	SWITCH	IC310	994000001201	IC NJM4556AM	U805	994000005381	IC D9258PH	U352	996510003984	IC CYT78L05 (TO-92)
1905	△ 994000001223	FUSE RADIAL T5A 250V	Q302	994000004545	TRANSISTORS BUK9507-30B	U806	996510000330	IC SAA7824HL/MIA	U353	996510000880	IC LM78L08
1921	△ 994000001223	FUSE RADIAL T5A 250V	Q303	994000004545	TRANSISTORS BUK9507-30B	U807	996510003997	IC LM7808	U599	996510003985	IC ECHO PROCESSOR PT2399S
1924	△ 994000001223	FUSE RADIAL T5A 250V	Q306	994000004443	TRANSISTOR BDW94C	U808	996510003998	IC TDA7073A/N4			
1925	△ 994000001356	FUSE RADIAL T2.5A/250V	Q311	994000004338	SMD TRANSISTORS PMBT3904	Y801	996510003999	XTAL 8.4672MHz +-30PPM 20PF			
1926	△ 994000001349	FUSE RADIAL T1.6A 250V	Q312	994000004338	SMD TRANSISTORS PMBT3904	<b>TUNER BOARD</b>					
2944	996500042429	E.CAP 6800UF 25V -20%	Q313	996500038609	TRANSISTORS 2W 8050C	1102	994000001353	COAXIAL JACK IF-01A			
2945	996500042429	E.CAP 6800UF 25V -20%				2106	99400000254	TRIMMER 10PF 6MM (WH)			
3941	994000004473	RESISTOR METAL 0.33R 1W +-1%	Y301	996500042460	CERAMIC RESONATOR 600KHz	2155	99400000254	TRIMMER 10PF 6MM (WH)			
3942	994000004473	RESISTOR METAL 0.33R 1W +-1%	Y302	996500042461	CERAMIC RESONATOR 700KHz	5102	994000001212	AM IFT (BLACK) 7MM			
3951	994000004472	RESISTOR FUSIBLE 47R 1W +-1%				5109	994000001208	CER. FILTER SFELA10M7HA00-B0			
5900	994000001226	AC LINE FILTER IND. 400UH 3A				5110	994000001208	CER. FILTER SFELA10M7HA00-B0			
C1	△ 994000001225	SAFETY CAP 275V 0.22UF -20%				Note: Only these parts mentioned in the list are normal service parts.					
IC101	996510003976	IC (SAMSUNG) KA7812E									
J1	△ 996510003977	AC SOCKET 2PIN TC08-275-11									