

Electronics Preamplifier “ALPA MII”

By Paul Langemeijer, co-project with Alfred Homsma

Last change: 2020-08-30

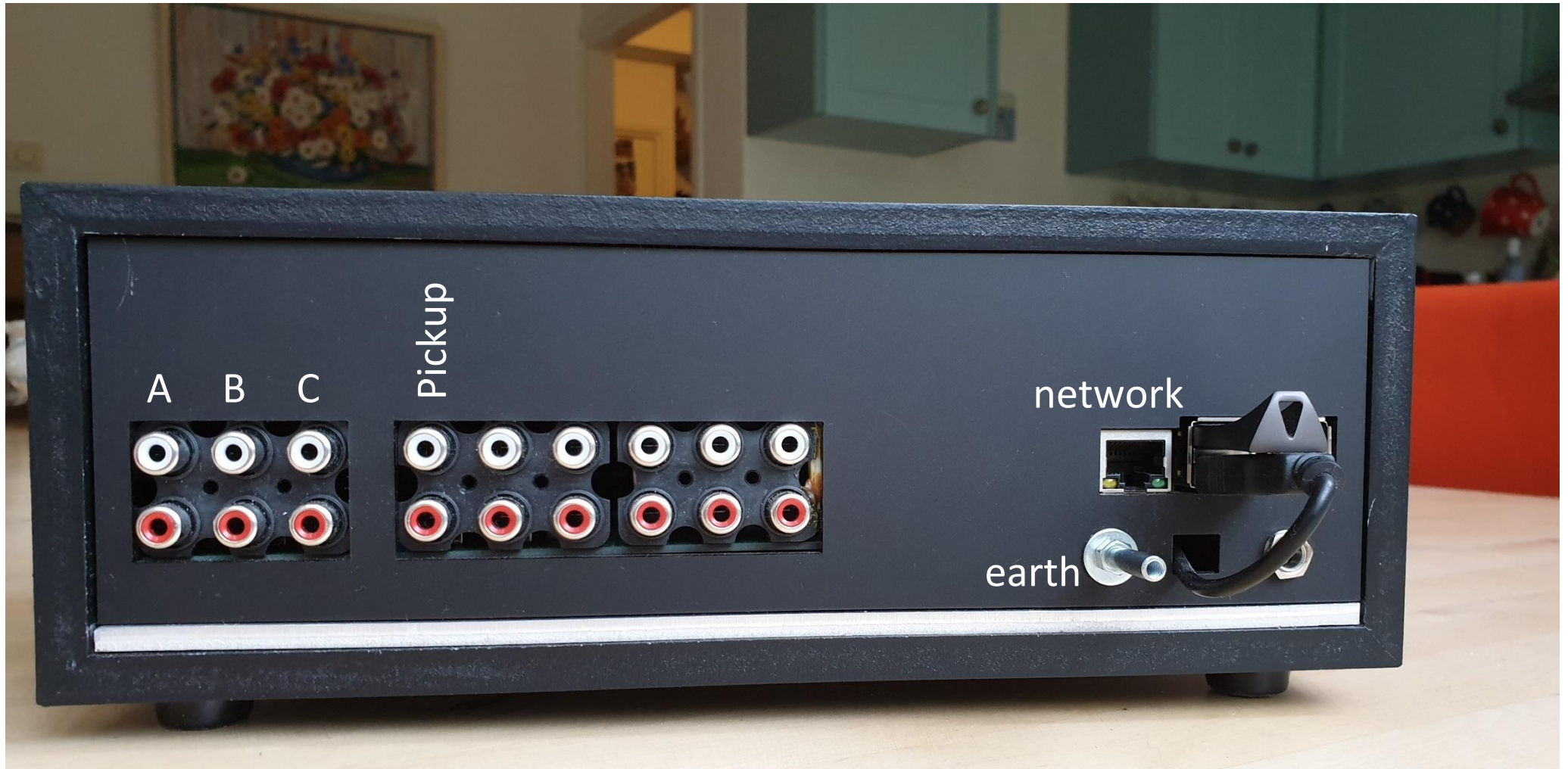
Analog PCB Version 2.1, Digital PCB Version W377971SN17



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Rear view



Missing yet: text for inputs and outputs

Introduction

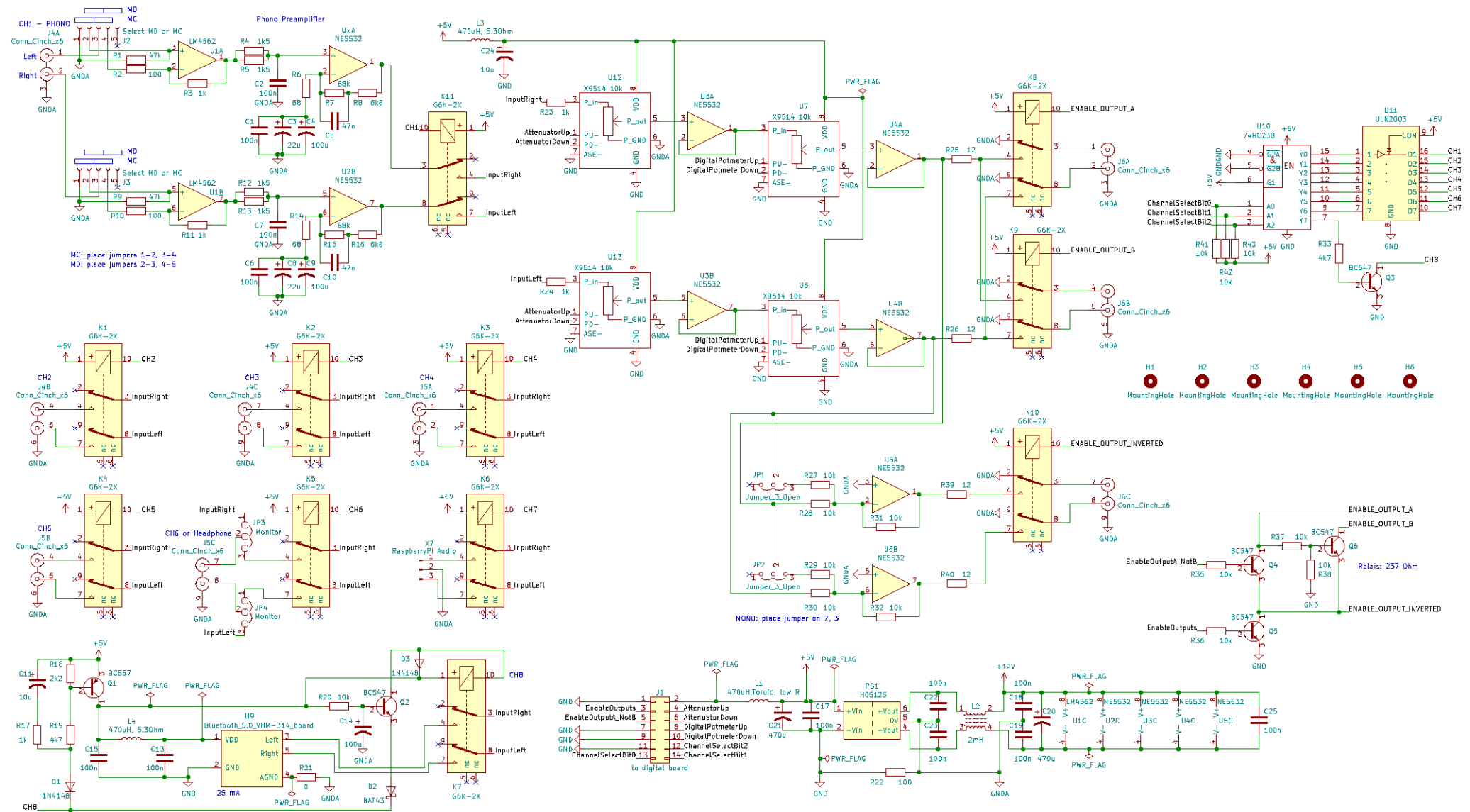
Loudspeakers that have built-in amplifiers may need a preamplifier when there are multiple music sources.

Overview

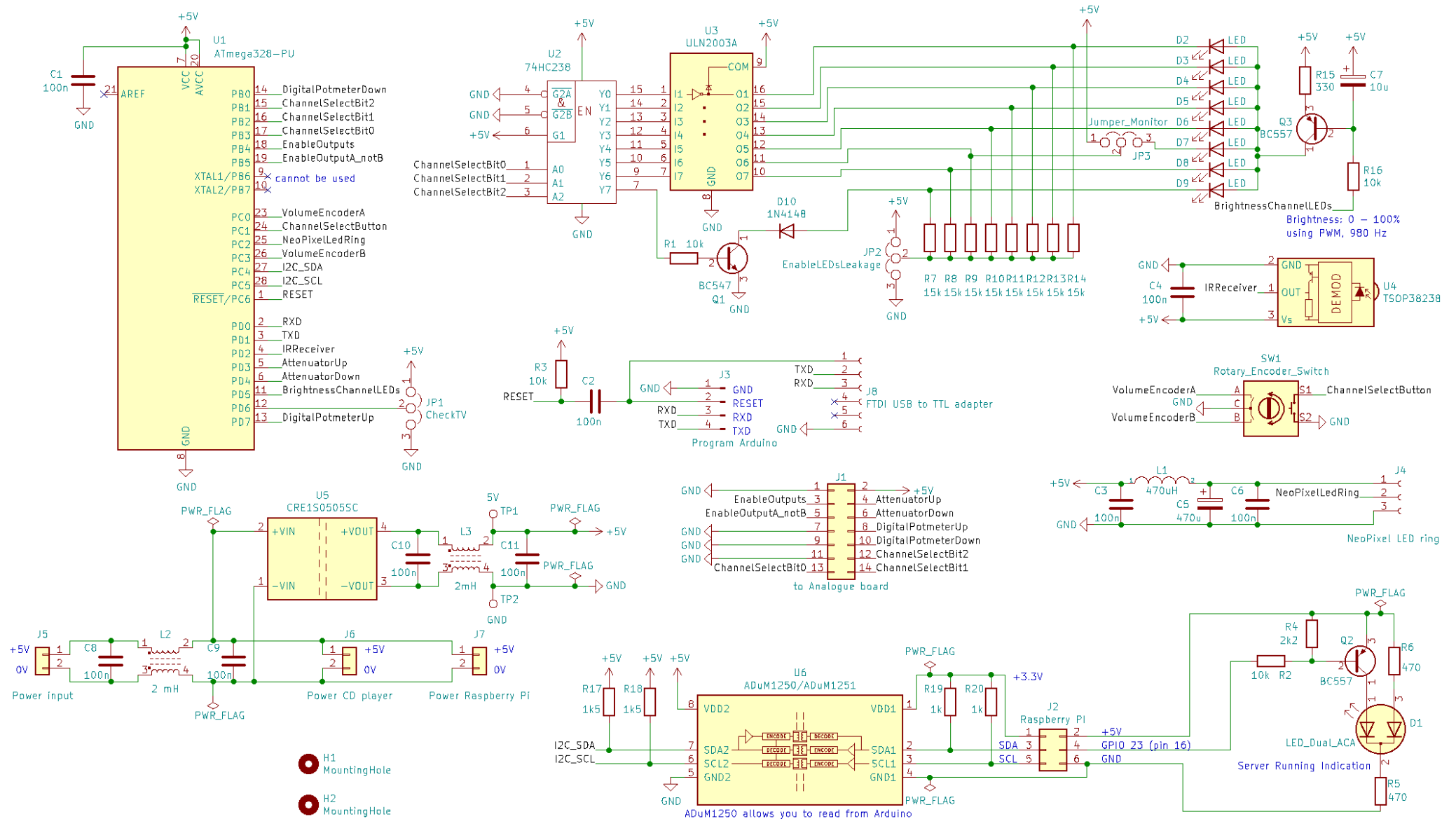
- 8 input channels (relay switched):
 - Channel 1: phono input for MD or MC elements (selectable by jumpers)
 - Channel 2-6: auxiliary inputs
 - Channel 6 can be configured (by jumper) as pre-out for a headphone amplifier
 - Channel 7: connected to internal Bluetooth receiver
 - Channel 8: connected to internal media server (Raspberry Pi)
- Each input channel can have a preconfigured attenuation (via Raspberry Pi).
- 3 outputs (relay switched):
 - Channel A or B selectable via InfraRed commands (default channel A is selected)
 - Channel C: always available (e.g. for subwoofer). Can be set to mono by jumpers
- Channel selection by push button on front panel or via InfraRed commands
- Support for various InfraRed remote controls, e.g. Philips, Sony, NEC.
- Volume and attenuation control using XICOR X9514 digital potentiometer with 32 steps
- Volume control by rotary encoder or via InfraRed commands
- Volume indicator by NeoPixel LED ring (24 LEDs). Volume and channel LED's are turned off after one minute of inactivity.
- Built-in media server (Raspberry Pi):
 - Logitech Media Server software
 - HifiBerry DAC Pro or DSP board; power supply modified to achieve high-end performance
 - Music files stored on internal SD card and/or external USB memory stick
 - Spotify support using Spotty plugin
 - Plugin to allow streaming from Spotify app on smartphone or tablet
 - Internet radio
 - CD player controlled by Logitech Media Server plugin
 - A LED on the front panel indicates if Raspberry Pi has started
- No tone or balance control
- Power supply by 5V/3A net adapter

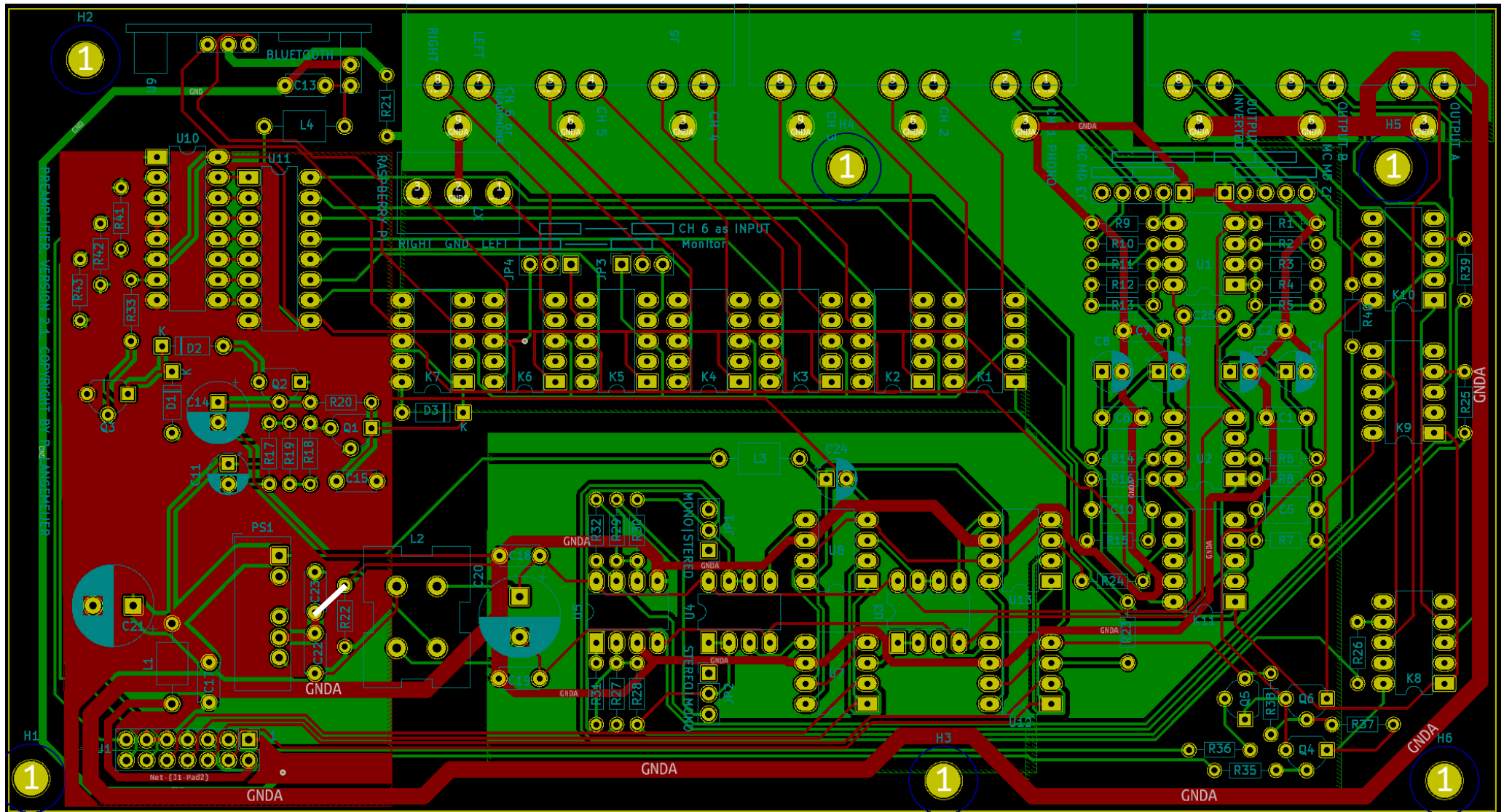
Schematics

Analog board schematics



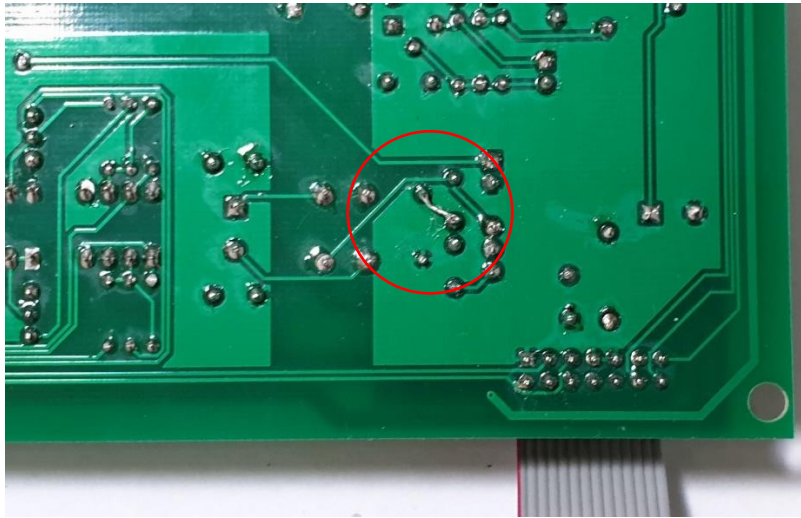
Digital board schematics





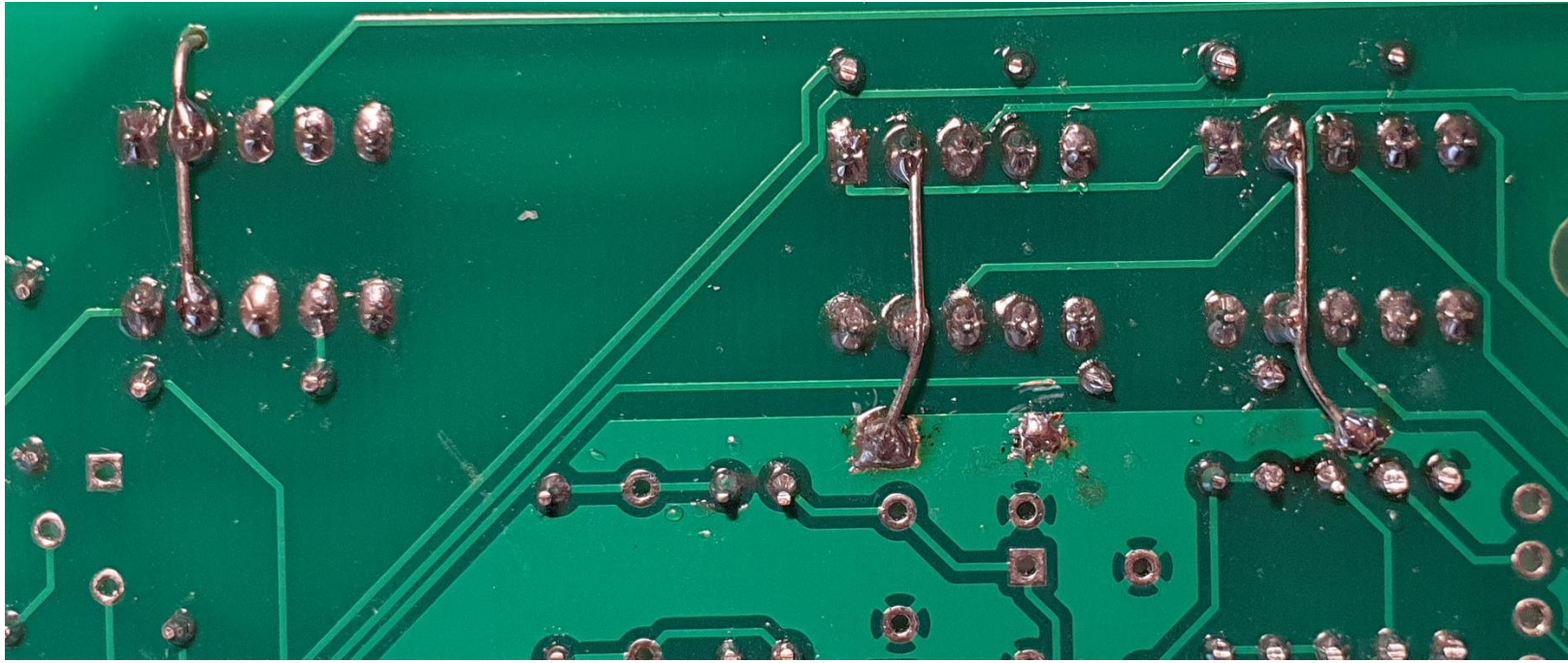
Required changes on PCB for version 2.1:

- wire (white line) needed (missing on PCB in this version).
- Pin 2 and 9 of K8, K9 and K10 connected to GNDA

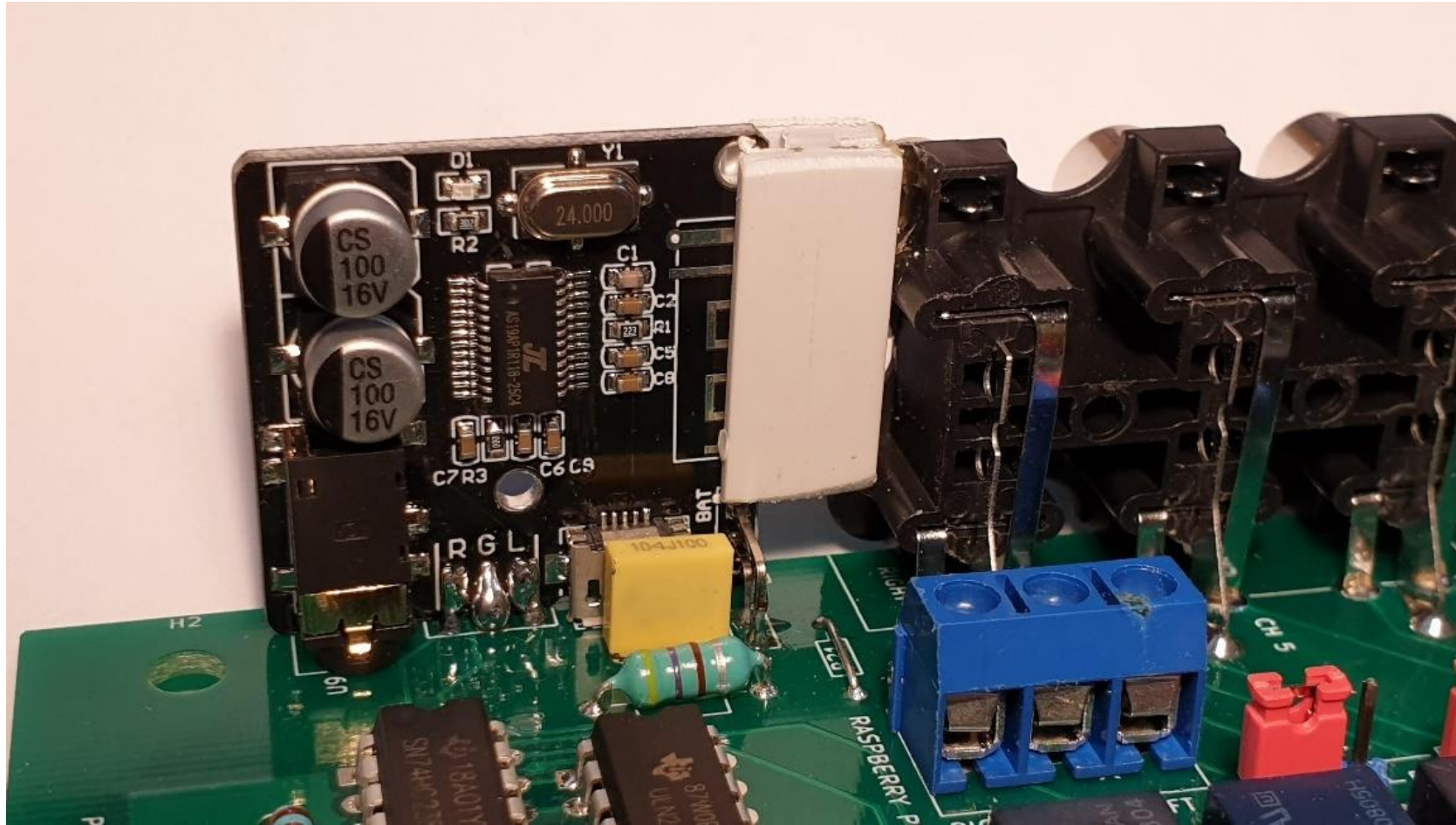


Extra wire needed (C22, C23 connection to ground).

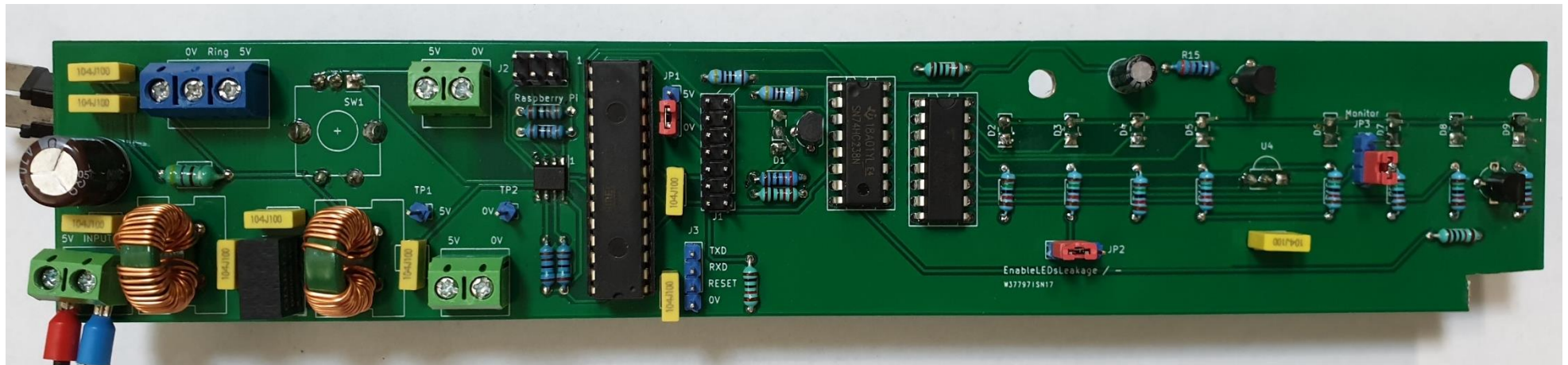
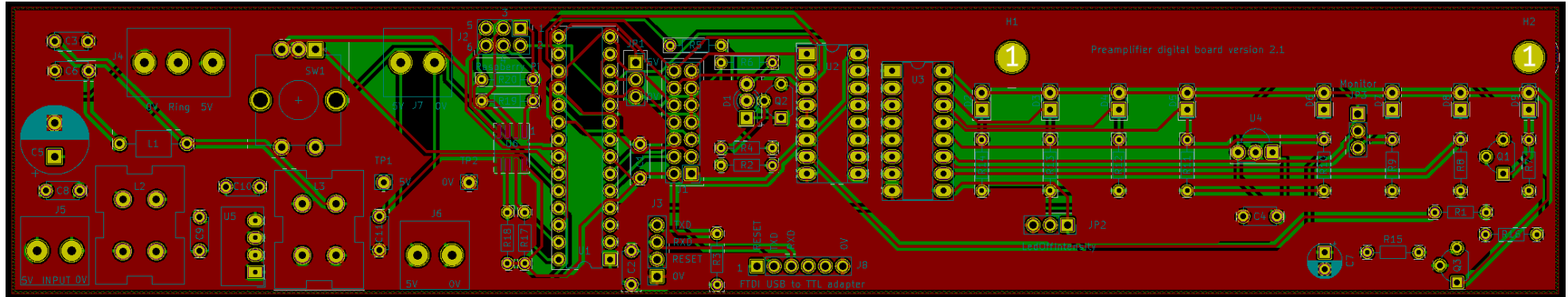
Ground pins 2 and 9 of K8, K9 and K10:



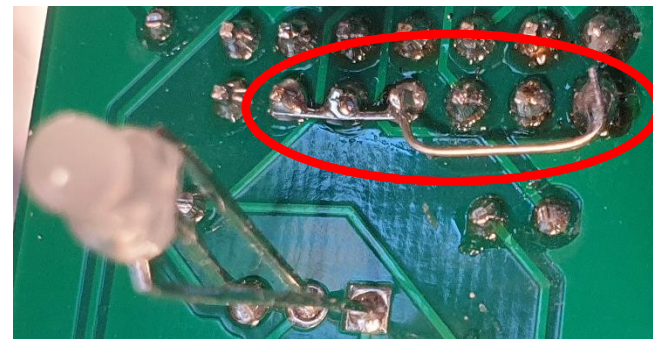
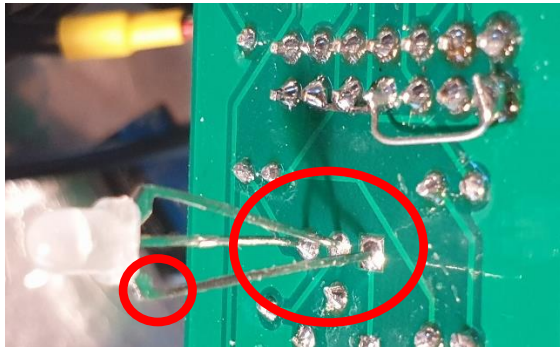
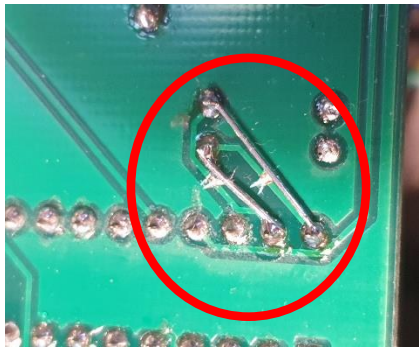
How the Bluetooth board is mounted

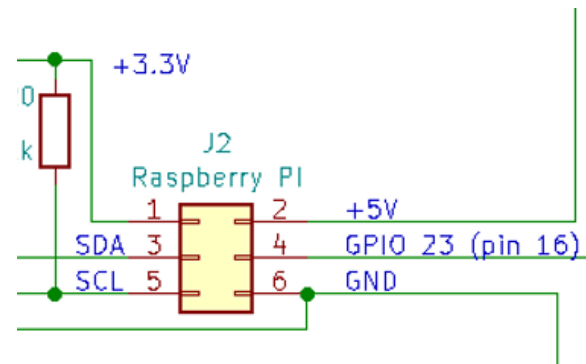
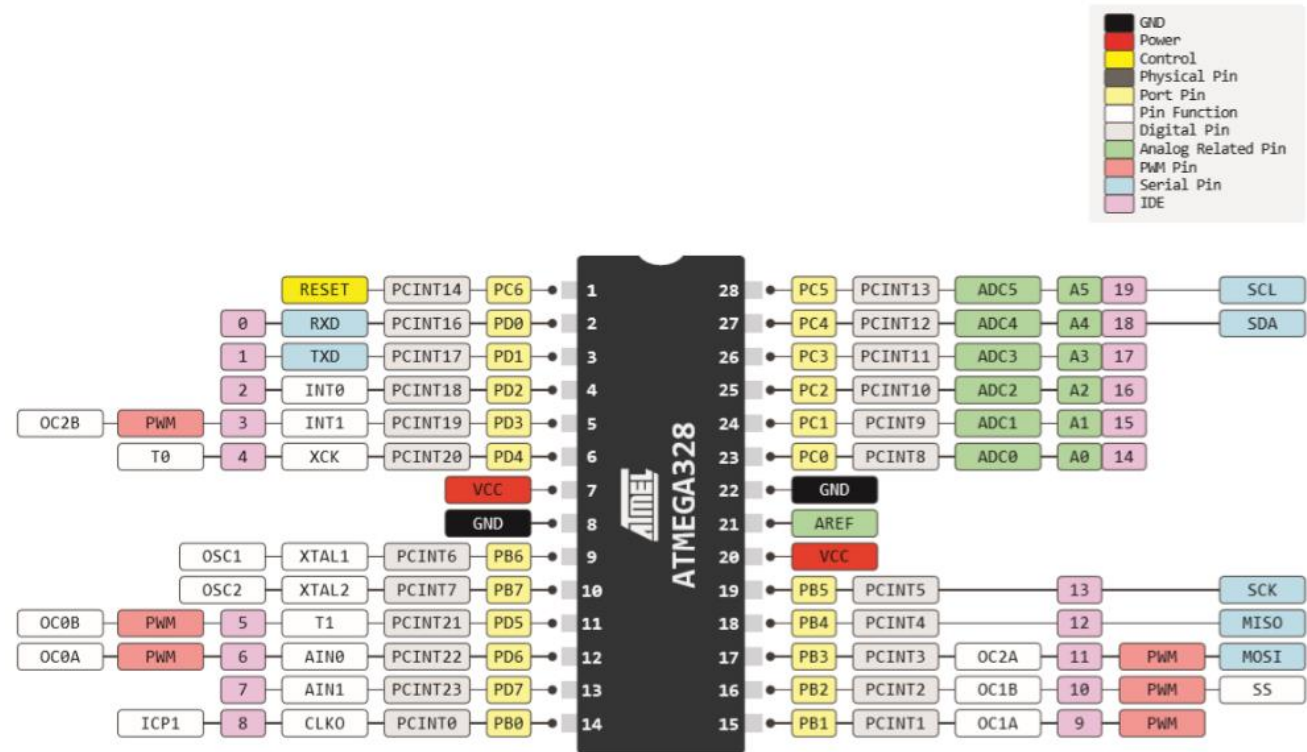
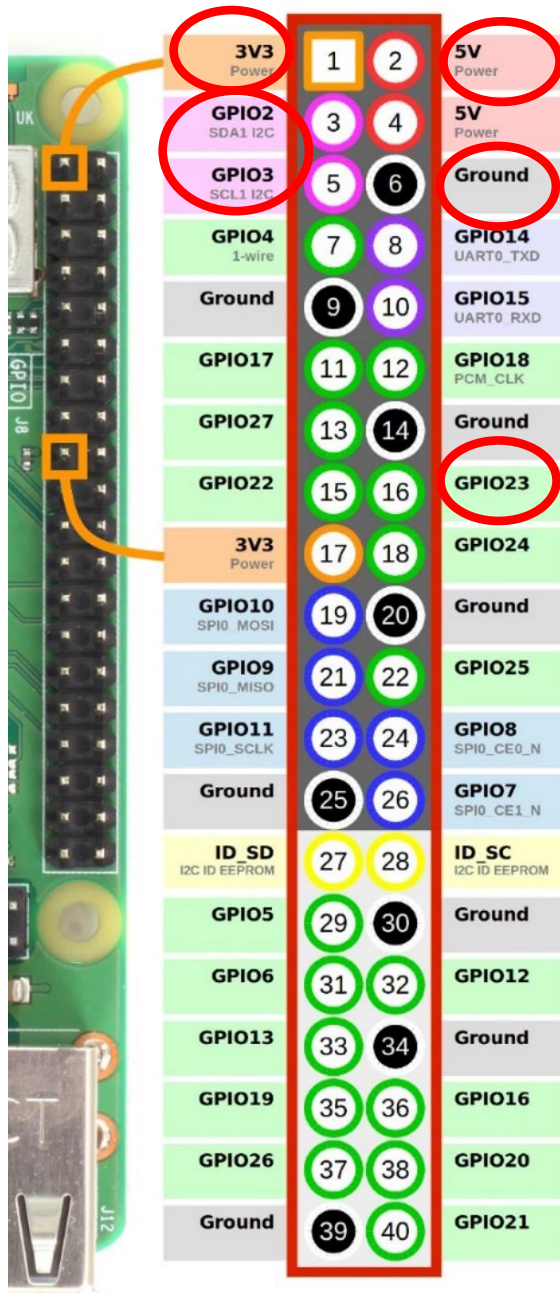


Digital PCB

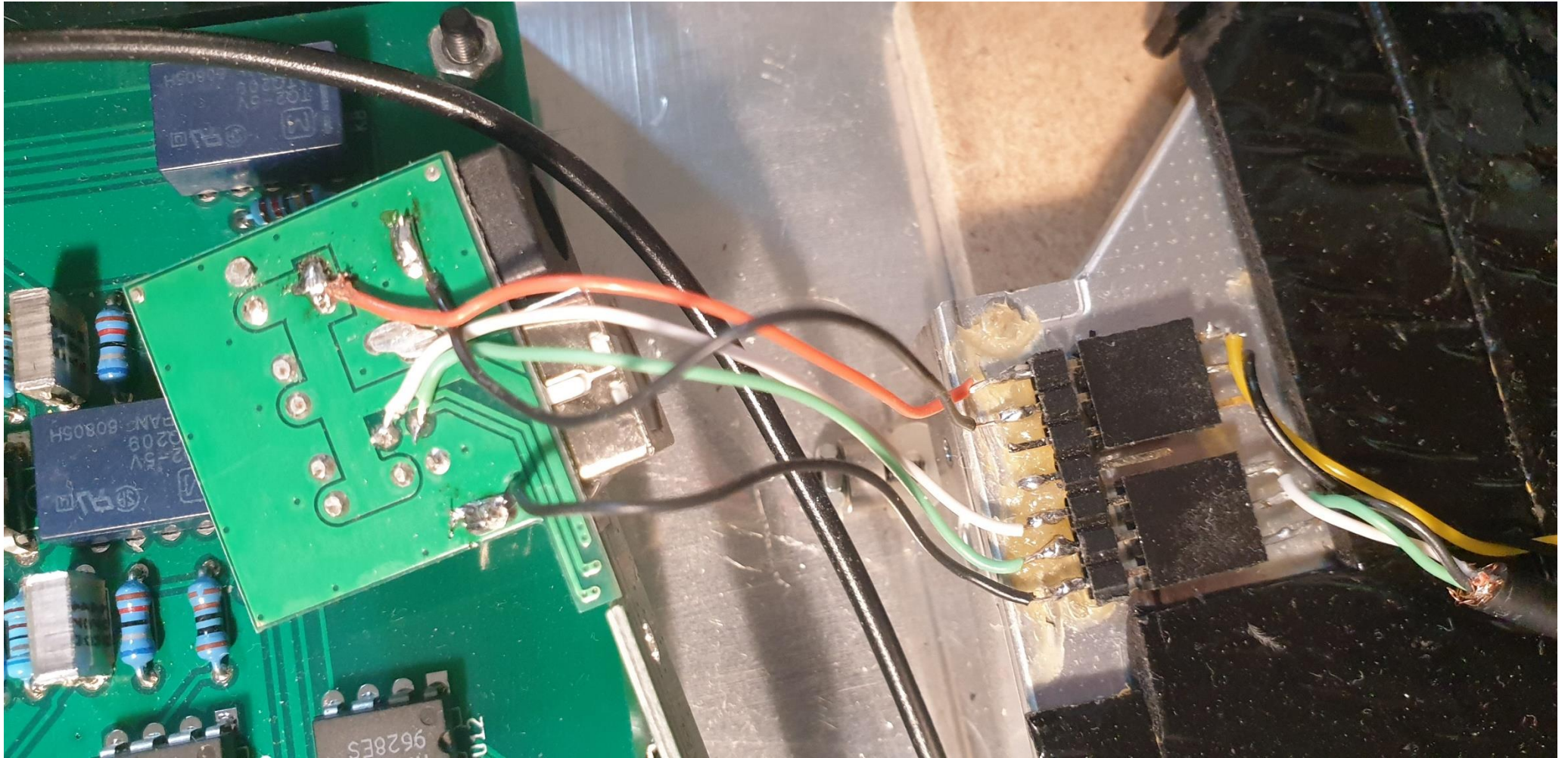


This version (W3779715N17) of the PCB needed some manual fixing.



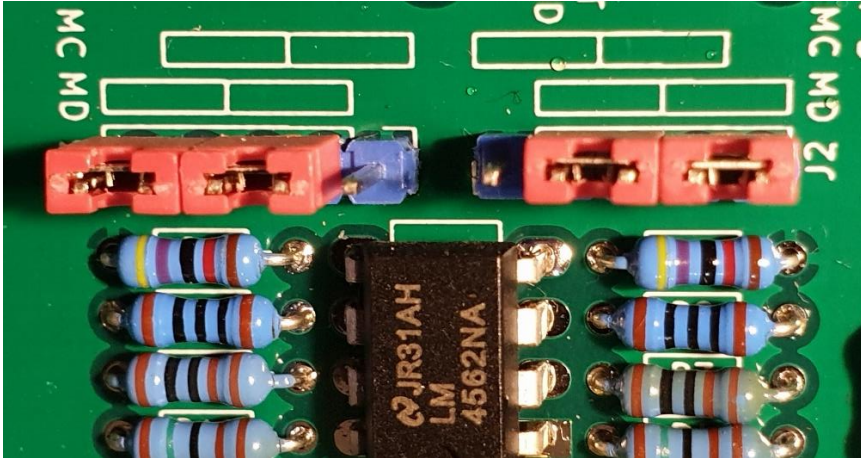


CD player connection



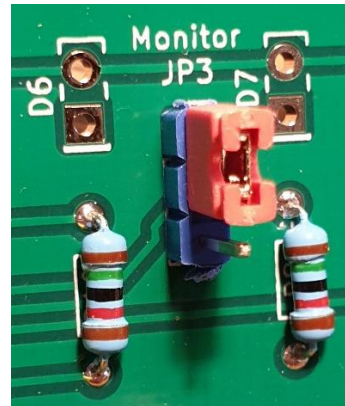
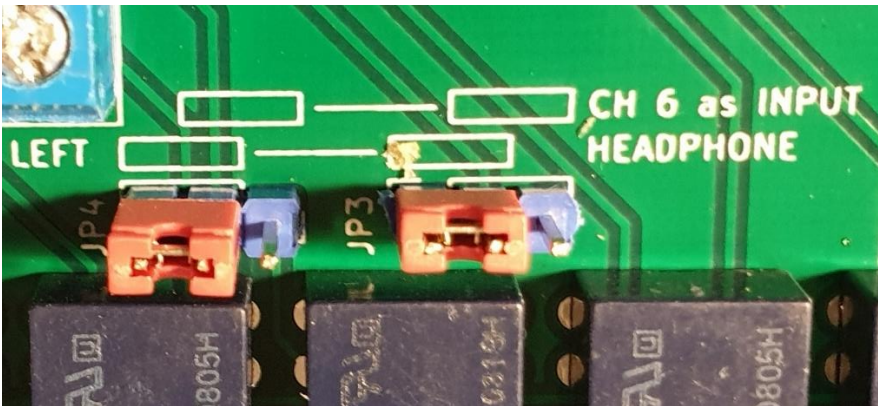
Jumpers

Selecting phono input: MD (magnetic dynamic) or MC (moving coil)



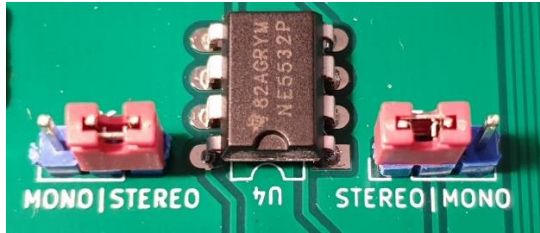
MD is selected in the picture.

Selecting channel 6 as output for headphone



Set jumpers to HEADPHONE and set jumper Monitor on digital board to disable LED channel 6

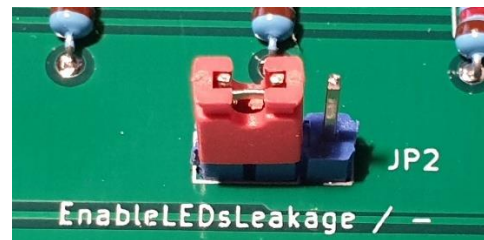
Selecting stereo or mono output



Select stereo or mono for output “Inverted”. This output is always active and is meant to be used by a stereo or mono subwoofer.

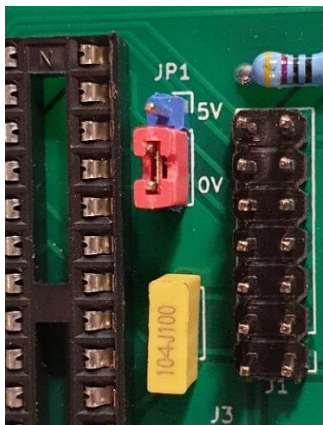
Control channel LEDs off state

With JP2 you can control if the channel LEDs are always on with a very low intensity

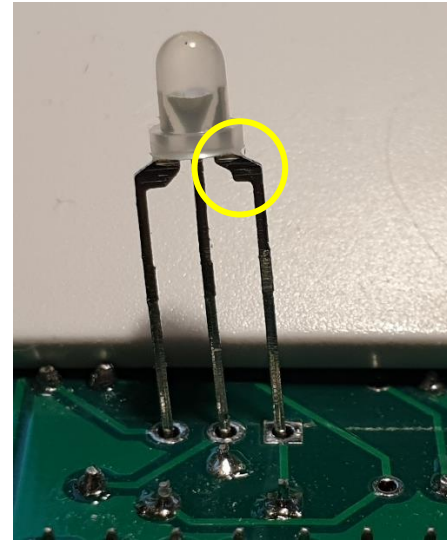
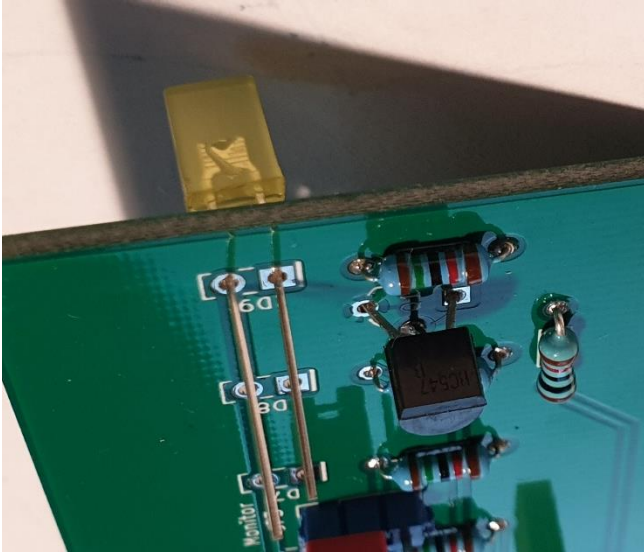


Disabling RC1 IR control for volume

Set JP1 to 5V to disable RC1 (Philips) InfraRed volume control.

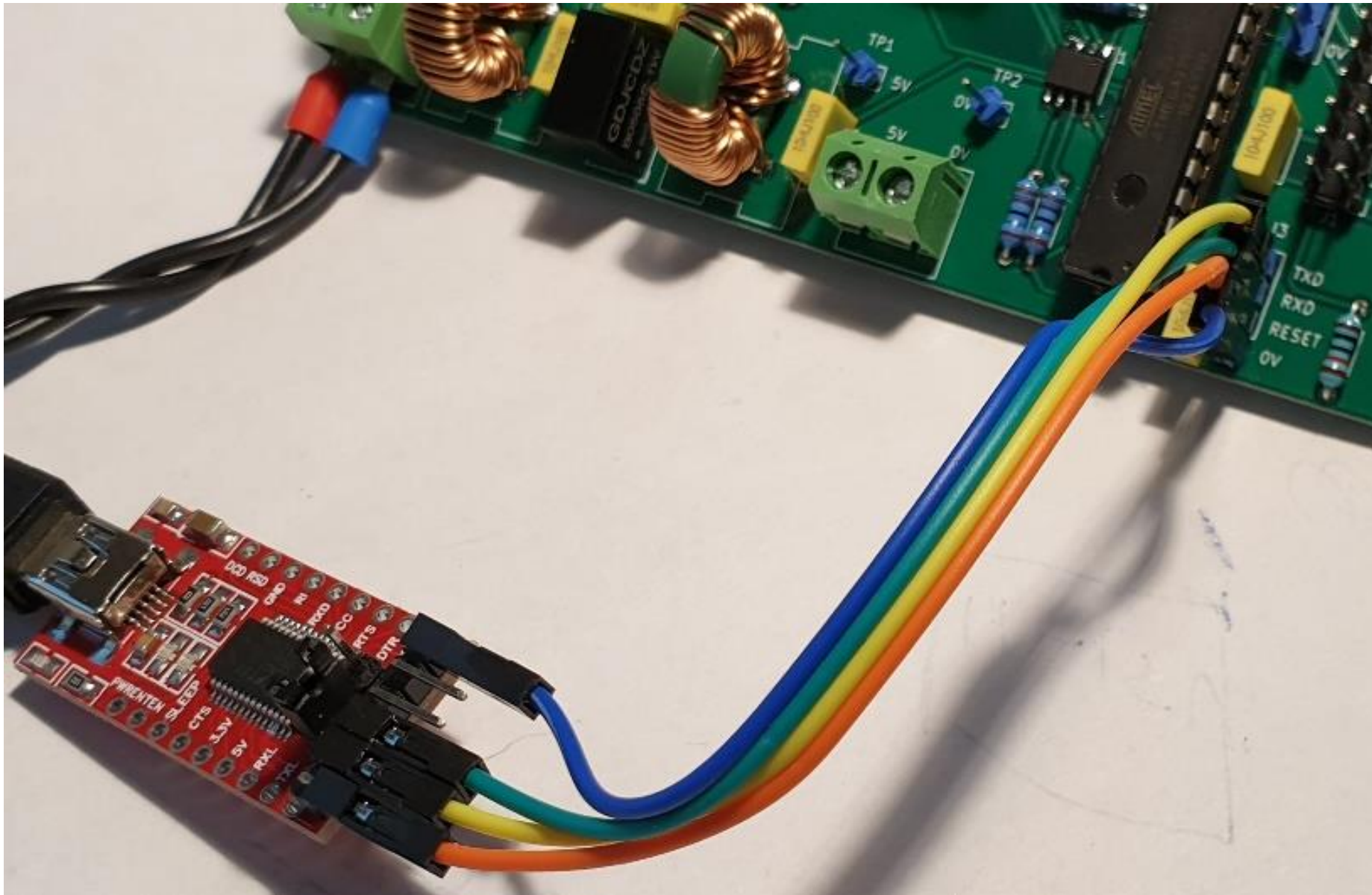


How the LED's are mounted

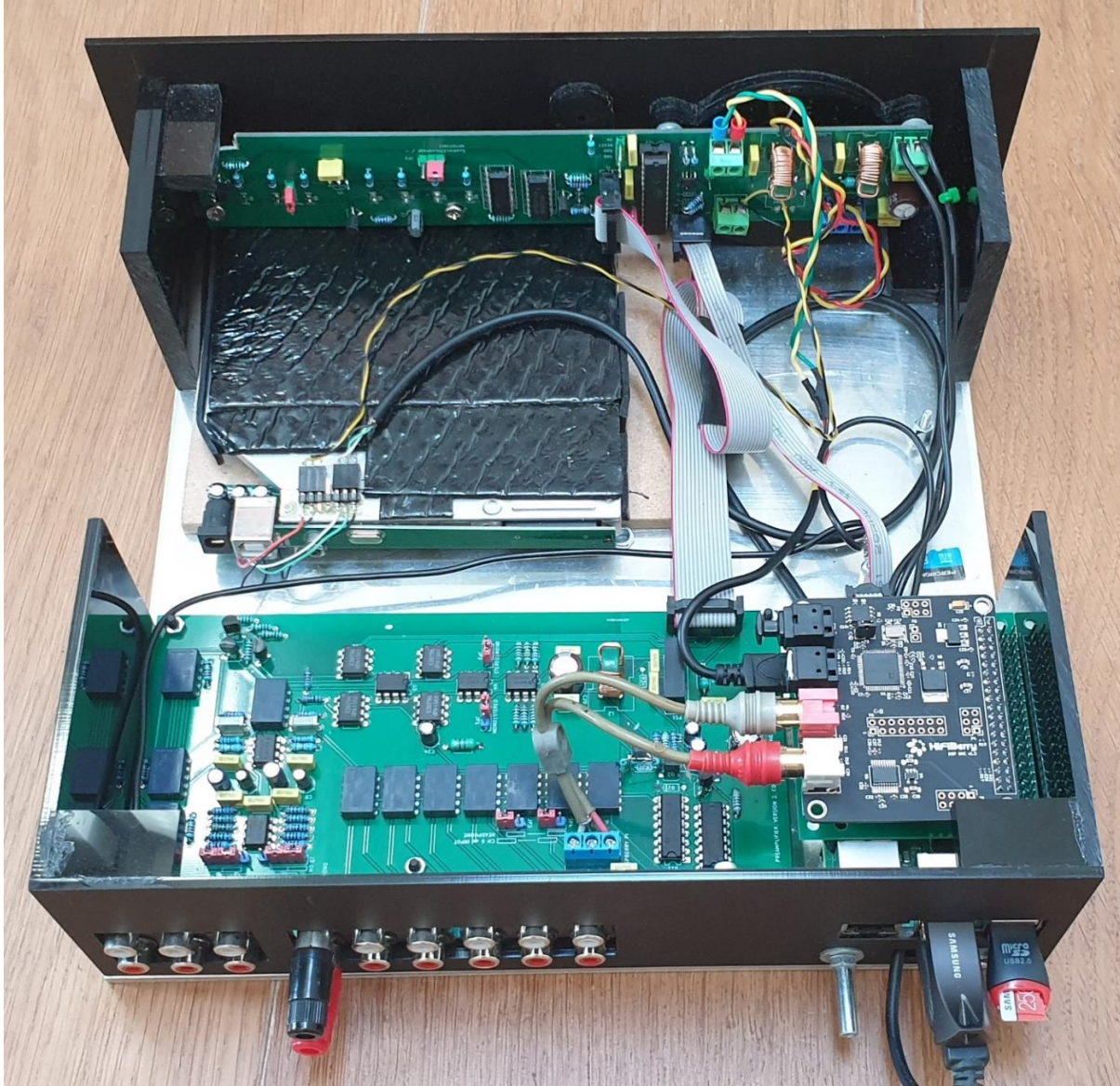


Programming the Arduino

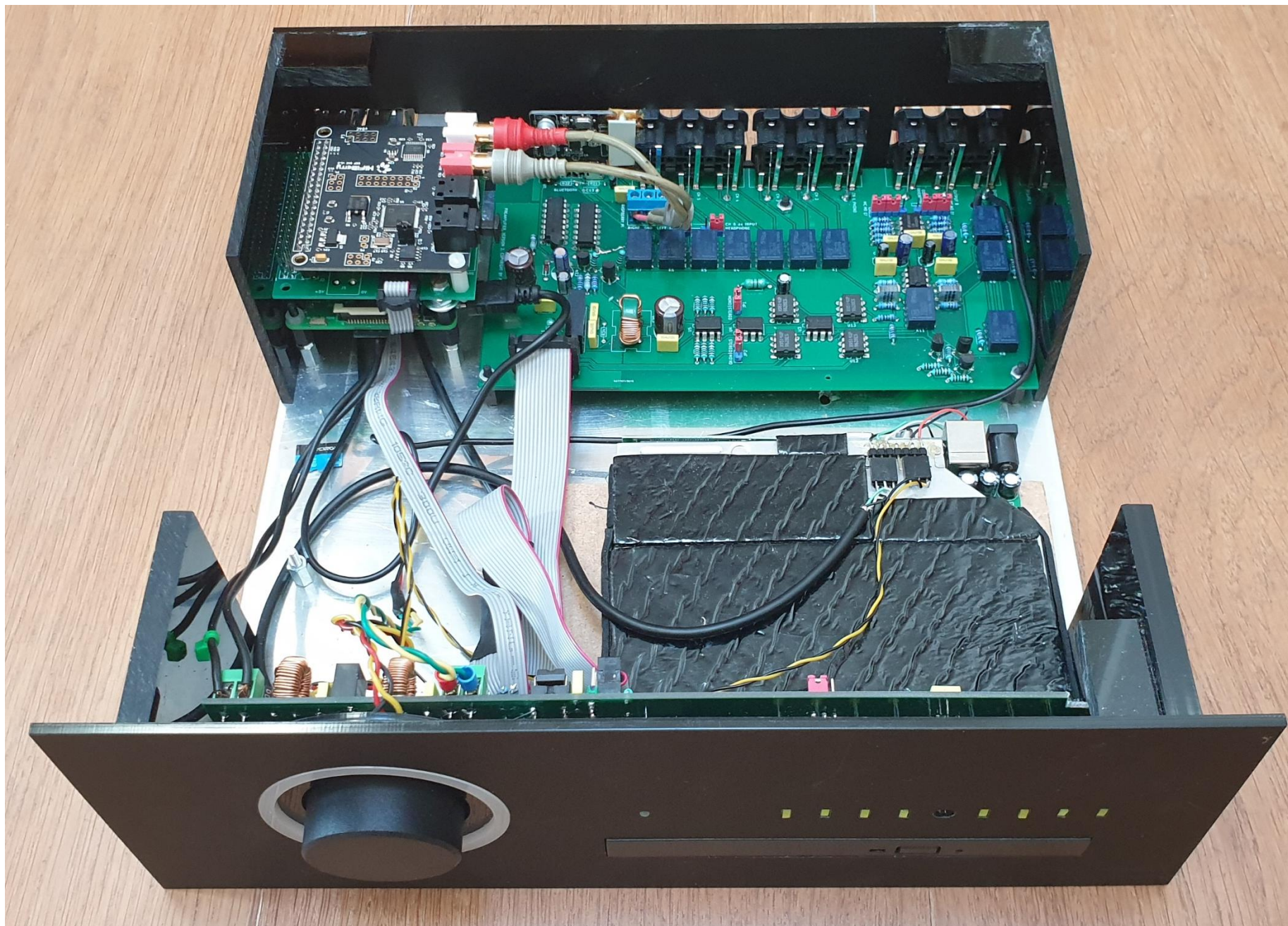
Use a FTDI USB to TTL adapter to program the Arduino.



Inside the cabinet



On the CD player, damping material (as used in cars) is used to reduce noise.



Volume control and display

MCIGICM 5pcs Rotary encoder, code schakelaar/EC11/audio digitale potentiometer, met schakelaar, 5Pin, handvat lengte 15mm

<https://nl.aliexpress.com/item/32798669185.html?spm=a2g0s.9042311.0.0.27424c4dwQCOCd>



NeoPixel Ring - 24 x WS2812 5050 RGB LED

Diymore WS2812 5050 Rgb Led Ring Lamp Licht Met Geïntegreerde Drivers 24 Bit Rgb Led Voor Arduino

<https://nl.aliexpress.com/item/32900076753.html?spm=a2g0s.9042311.0.0.27424c4dPdStOj>

Select outer diameter: 66 mm!



Power supply modification DAC

The quality of a DAC depends upon the stability of the clock (low jitter) and stability of the power supply.

The 5V power coming from the Raspberry Pi is far from noise free.

Although the Hifiberry DAC board has a voltage regulator, this voltage regulator does not suppress high frequency noise very well.

Therefore it makes sense to filter the 5V power before feeding it to the DAC board. This really improves the stereo image.

The PCB can be mounted between the Raspberry Pi and the Hifiberry DAC.

This board also has a connector J3 to connector J2 on the digital PCB.

Optionally you can use J5 to power the Raspberry Pi.

