

Tubbutec OrganDonor

Installation manual for Solina String Ensemble



Tools you will need:

- Soldering iron
- Wire stripper
- Metal drill 3.5mm (or similar)
- Metal drill for a 15mm hole (stepping drill for example)
- Center punch
- Screw driver

Included in the kit:

- OrganDonor Main Board
- 5x organ Donor Switch Board, 3x 16pin Connector, 2x 20pin connector
- Voltage regulator (7815), capacitors (100nF + 330nF), shrinking tube
- Analog switch connection: 3x 16p – 40cm, 50cm, 90cm, 2x 20p – 26cm, 72cm
- Interconnect cables: 2x 4cm, 1x 23cm, 2x 38cm
- Midi connector assembly
- Power connector
- Learn button
- 12x plastic spacer, 4x screw 2,9x6.5mm
- Midi socket drill guide
- 2x M3 bolt, 2xM3 nut for midi socket

Principle of operation

OrganDonor uses analog switches to simulate keyboard presses directly. Normally this would require to solder two wires for each key. Luckily this can often be avoided by grouping common signals. OrganDonor features solder jumpers to connect common signals on the back of each analog switch board. We already connect these jumpers for you.

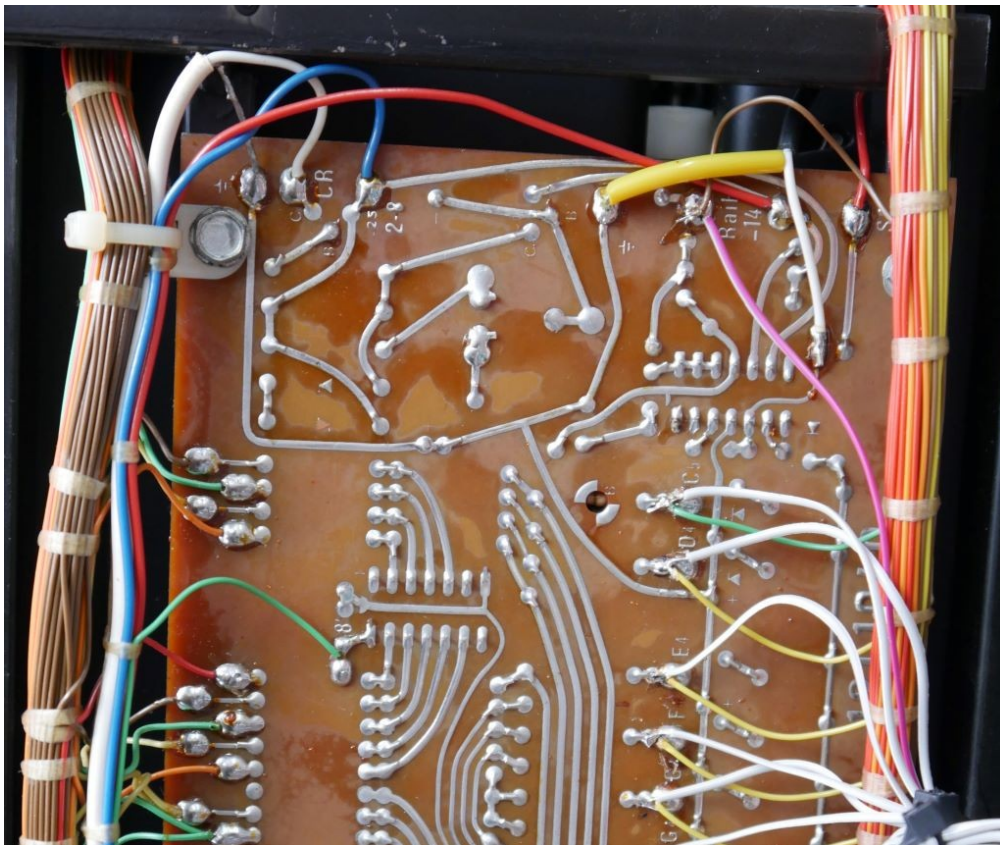
In the case of the Solina String Ensemble there is one common signal for the String section (all 49 keys), and one common signal for the bass section (lower 20 keys). This allows for different configurations: you can trigger the keys via one MIDI channel (strings and bass at the same time), or you can split MIDI channels, for example MIDI channel 1 for the strings and MIDI channel 2 for the bass.

Preliminary measurements

As the power supply design of the Solina is subpar you need to perform some voltage measurements before you start installing OrganDonor. First measure the supply voltages. The rails are marked on the power supply board, so that should be clear. If the voltages differ too much from the nominal values please consider reworking your power supply, especially the electrolytic capacitors and the carbon composition resistors.

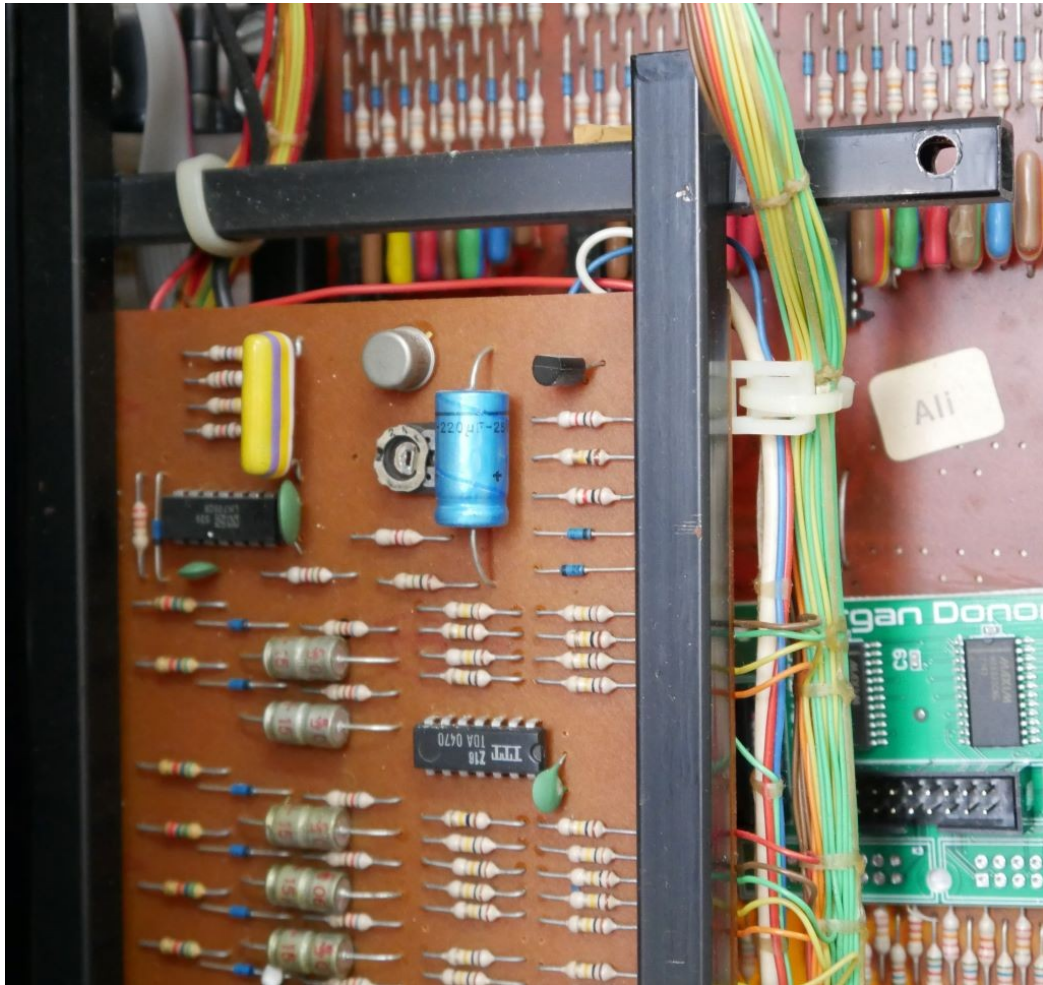
Write down your measurements of the -15V supply.

Next step is to measure the keyboard rail voltage. Connect your DVM ground lead to a ground point and measure the rail voltage (the point where the red striped wire connects, top of the picture, marked "Rail" on the pcb).



If the rail voltage is higher than the -15V supply voltage all is good (ie if your -15V supply measures -15,6V and the rail voltage measures -14,3V).

However, if the rail voltage is more negative than the supply voltage you need to adjust the rail voltage using a trimmer on the pcb.



To get access to the trimmer you need to open the middle frame holding the pcb. Then adjust the trimmer until you are safely inside the needed voltage range.

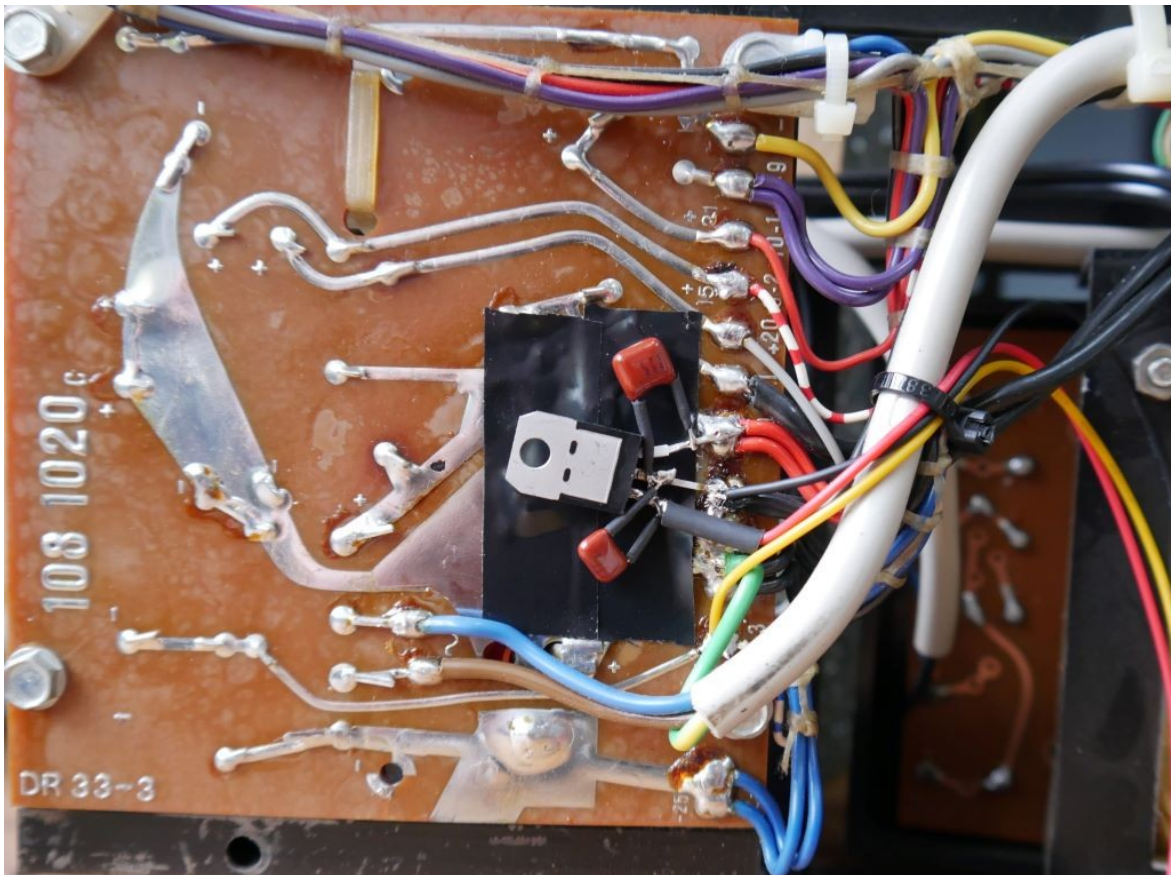
Installation

First you need to install the 15V voltage regulator. Prepare the regulator as follows:

the 330nF capacitor gets soldered between the input and ground terminals of the regulator (use shrinking tube), and the 100nF gets soldered between the output and ground terminals.

The input terminal gets soldered to the 25V connection, the ground terminal to the ground connection, and the output terminal gets bent up slightly as the wire coming from the OrganDonor main board gets soldered to it.

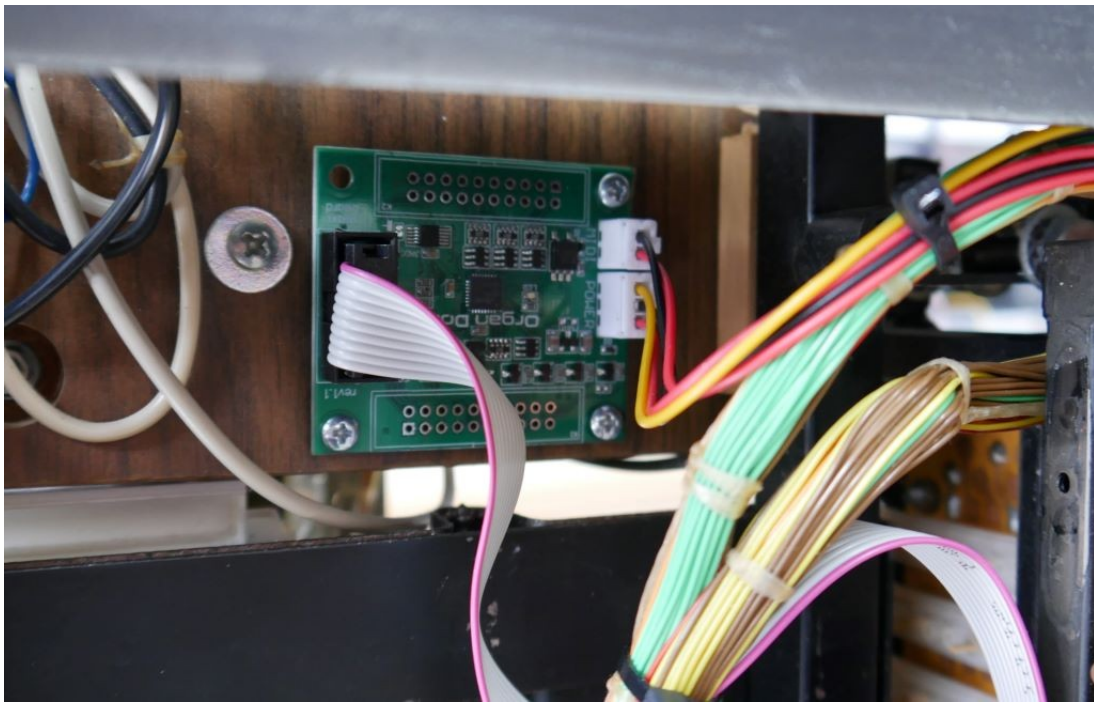
Please use insulating tape between the pcb and the regulator, see picture.



Main board installation

Before installing the main board and the switch board you need to swing the pcb assembly open. To do that you have to unscrew 2 screws that are holding the frame in place.

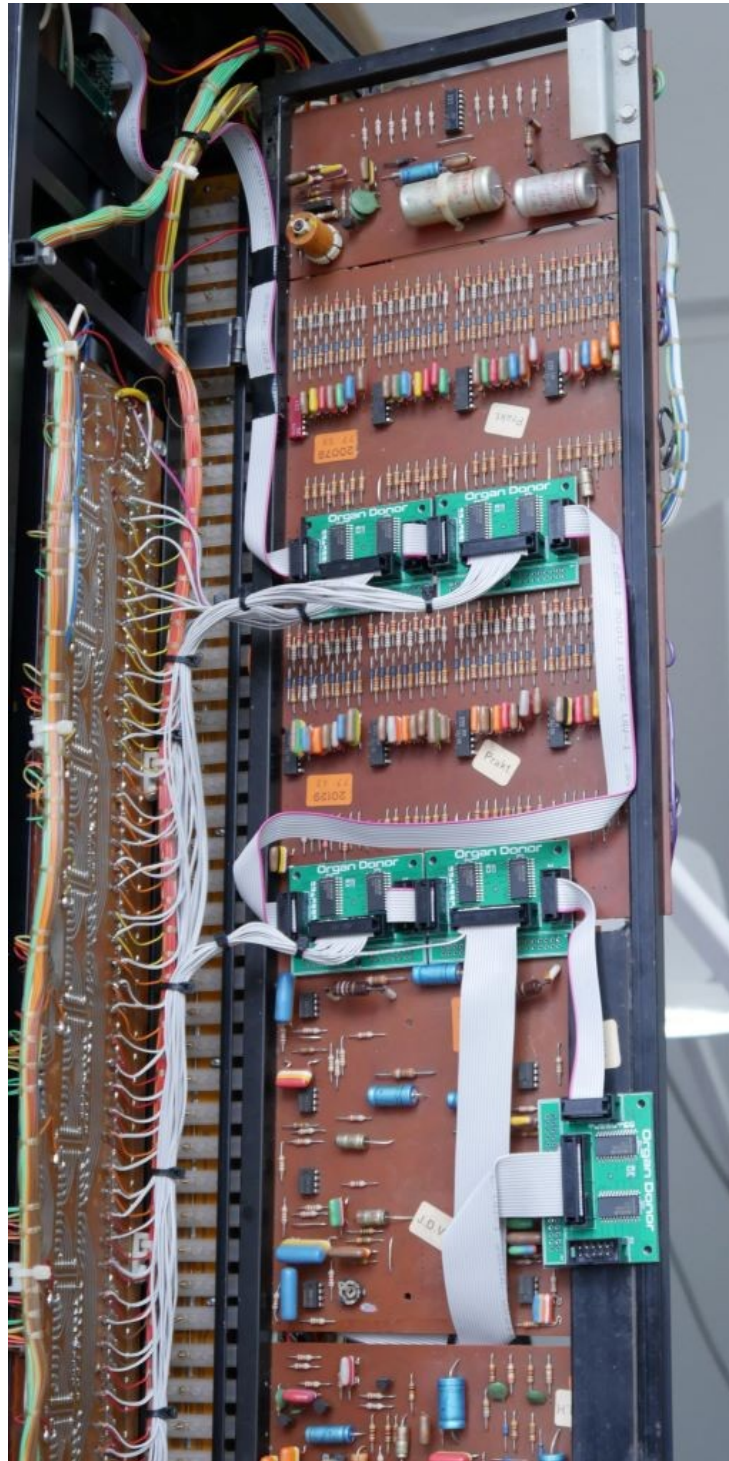
Install the main board with the 4 2,9x6,5 screws as shown in the picture.



Extend the power wire assembly so the wires can reach the psu pcb. Plug in the power wire assembly and the MIDI wire assembly. Route the power wires to the power supply and solder the yellow wire to the -15V terminal, the black wire to the ground terminal, and the red wire to the output terminal of the voltage regulator you installed on the power supply board.

Switch board installation

Mount switch boards 1-4 using the plastic standoffs like shown in the picture, switch board 5 is stuck to the metal frame with double sided tape. Please use insulating tape on the bottom side of switch board 5 before sticking it to the frame.



Install the interconnection cables and the switch cable assemblies.
Cut the cables to length and strip the wires.
Solder the wire to their respective points on the pcb.

Switch board 1:

Wire 1 gets soldered to the common contact on the string section board.
Wire 2 gets cut.
Wires 3-18 get soldered to contacts 1-16 on the string section board.
Wires 19 and 20 get cut.

Switch board 2:

Wires 1-16 get soldered to contacts 17-32 on the string section board.

Switch board 3:

Wires 1-16 get soldered to contacts 33-48 on the string section board.

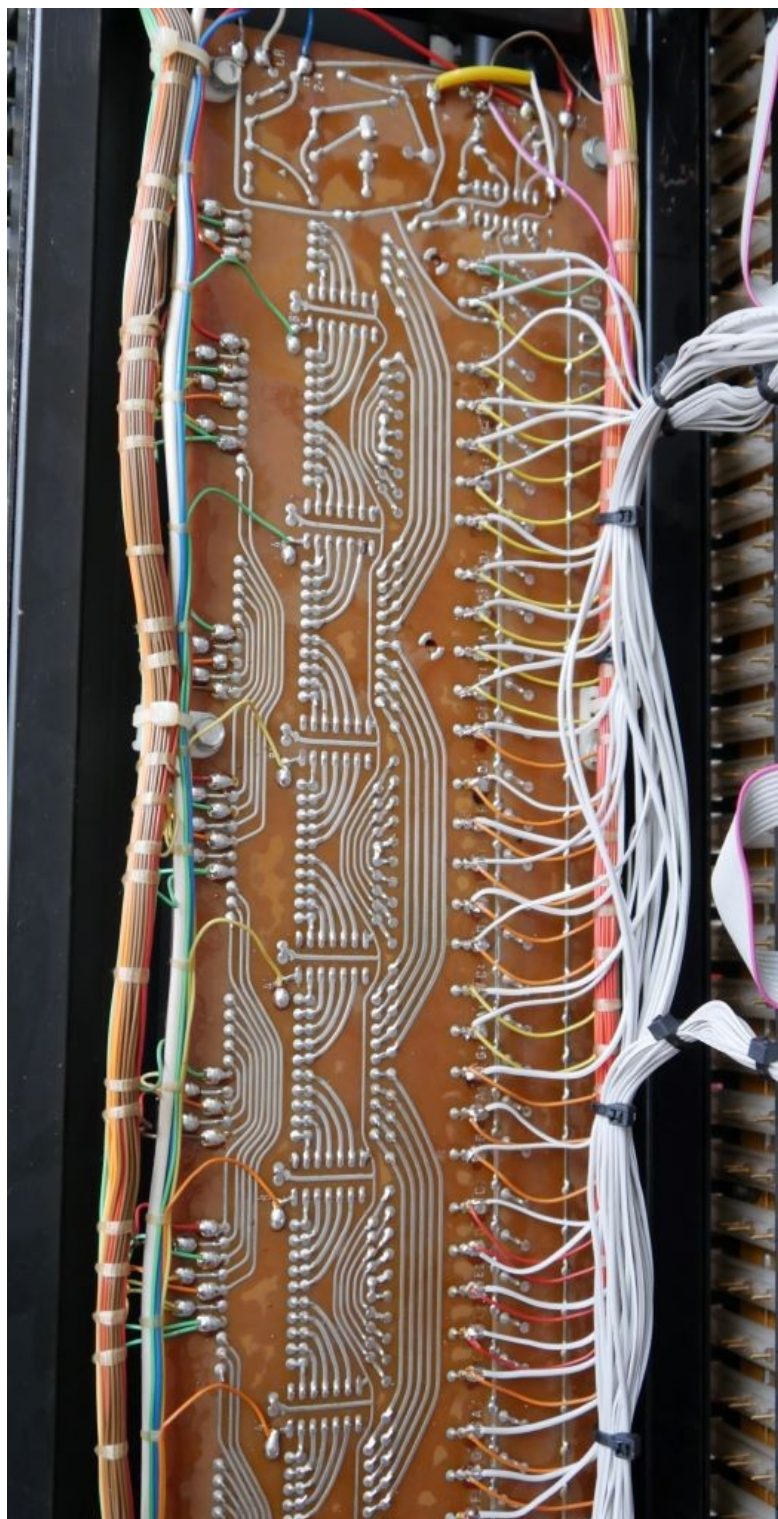
Switch board 4:

Wire 1 gets soldered to contact 49 on the string section board.
Wires 2-16 get soldered to contacts 1-15 on the bass section board.

Switch board 5:

Wire 1 gets cut.
Wire 2 gets soldered to the common contact of the bass section board.
Wires 3-7 get soldered to contacts 16-20 on the bass section board.
The rest of the wires gets tied together. Although now unused they might come in handy for future functions.

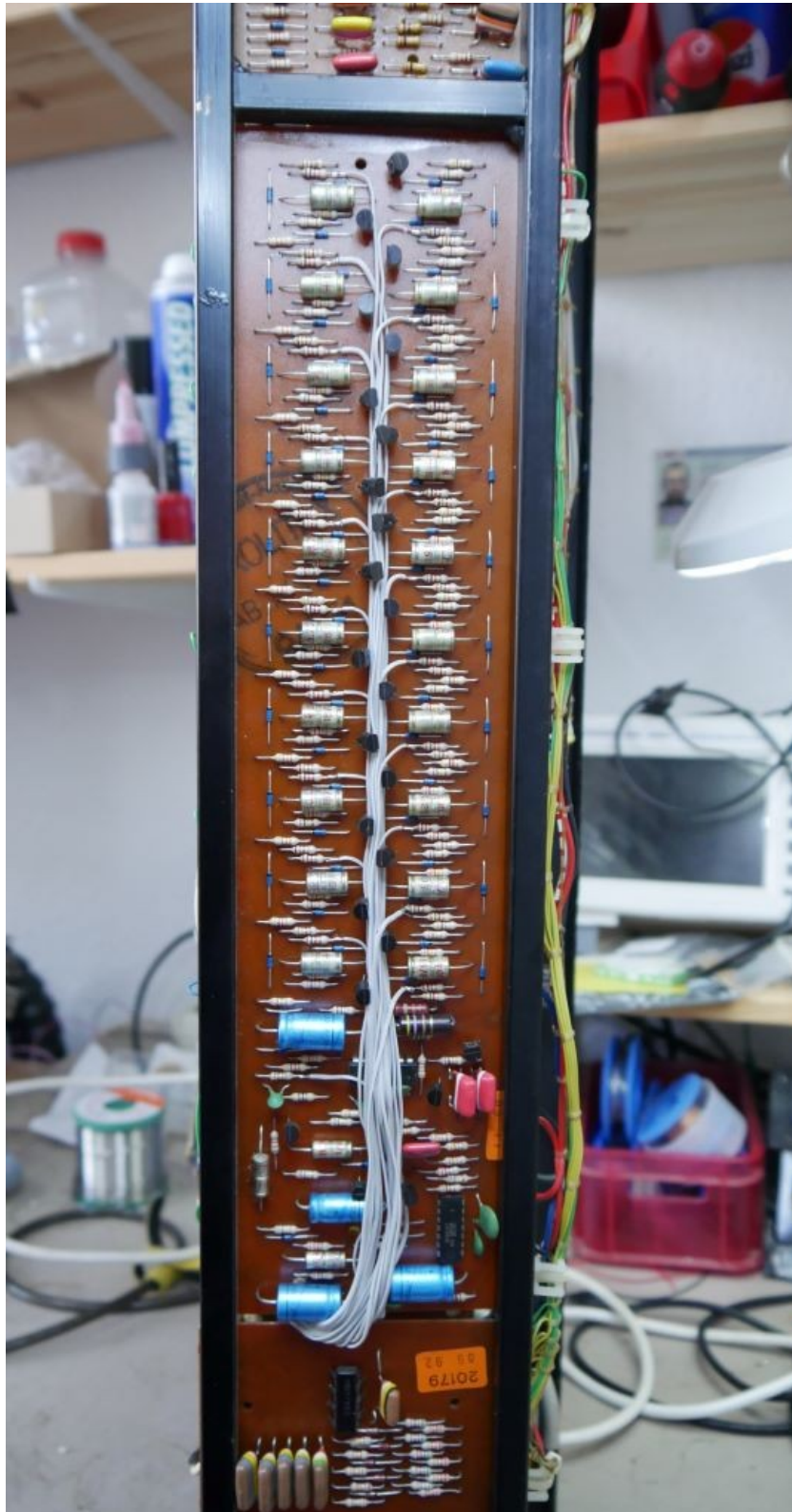
The contact marked Rail on the string section pcb ist the common contact (wire 1 switch board 1).
Then the wires are soldered in order from top to bottom (key contact 1-49).



On the bass section pcb the contacts count as follows:

Top left is contact 1, bottom left is contact 10, bottom right is contact 11 and top right is contact 20.

The single wire on the bottom left is the common contact for the bass section.



Installing the MIDI socket

You can remove the Output 2 socket and widen the hole using a step drill to install the MIDI socket.

Or you could install a 3,5mm stereo jack between the Trig Out and Gate Out jack. This way you won't need to drill a large hole. There are 2 standards for TRS MIDI, choose one and refer to the pin out when installing.



Installing the optional learn button

The optional learn button can be used to set midi channel. It needs to be connected to the IO "2" and "G" pin on the main board. (The back of the main board has labels on it). Wires are not included in the kit.

Press the learn button and while it is pressed send a midi note on any midi channel. OrganDonor will use this midi channel from now. These settings are saved.

Configuration

We already flashed the corresponding configuration file to Organ Donor. There is, however, a software configuration tool available, in case you want to play around with settings and key assignments.

You`ll find the configurator here:

<https://tubbutec.de/files/organDonor/tubbutecOrganDonorConfigurator.html>

This is a browser application, it works with Chrome and Safari right away, Firefox needs to be configured for web MIDI.

The configurator allows you to upload your settings directly from your browser to Organ Donor, save and load settings and export settings as SysEx files for uploading to Organ Donor via another SysEx tool.