Tubbutec OrganDonor

Installation manual for **Oberheim 4 & 8 Voice FVS-1** systems
All credits for the installation, testing, documentation and writing this manual go to Rob Rosen (Rosen Sound LLC) www.rosensound.com

Synopsis:
The OrganDonor installs into the FVS-1 without much hassle. The hardest part is mounting the PCB's to the keyboard frame.

Installation will be different depending on the era of your FVS-1 keyboard. Earlier units have only 1 common bus and later ones have a more "standard" type of diode matrix system for the keys. Photos in this doc are of the earlier variety. Schematics are at the end of this document.

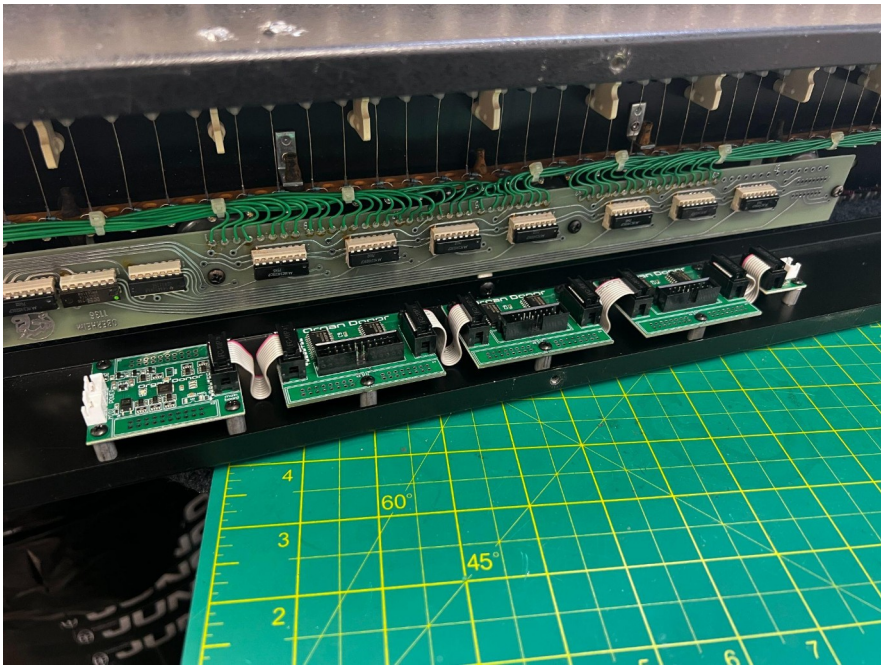
Installation:
Plan out the mounting scheme of your choosing for the 5 PCB's.

Self-adhesive plastic standoffs are included in the kit, so you don't need to drill the case.

However, if you want a more sturdy solution you can use metal standoffs like shown.
First place the PCBs onto the metal frame and mark the holes with a sharpie.

Once the holes were plotted, a center punch was used.
Finally, holes were drilled to fit 4-40 screws. If you're metric, this would be closest to M3.

Short screws were used to mount 4-40 threaded standoffs to the frame. I used ⅜" length but 8 to 10mm would be good if metric hardware is to be used.



Once the boards are mounted, it's time to wire the OrganDonor!

The OrganDonor can operate with symmetrical supplies up to 20V, so the FVS-1's 18.5V is within range for the OrganDonor. Most systems may have unused outputs on the supply and if you're crafty you can make a cable harness from the supply to the Organ Donor.
Mouser Numbers for cabling:
Crimp Pins: 538-02-06-2103
4P Housing to connect to FVS-1 PSU: 538-03-06-2042

With the above, you should be able to make your own harness if your FVS-1 has extra PSU outputs.
If your unused outputs are unpopulated however, these mouser numbers will be all you need to populate them.
Mouser Numbers for PCB:
4P Housing: 538-03-06-1042
Pins: 538-02-06-7103

These Obeherim's use Red for V+, Black for Gnd, and Blue for V-. Splice this appropriately with the 3 wire harness provided by Tubbutec for your OrganDonor which is Red for V+, Black for Gnd, and Yellow for V-.

If you do not want to make cabling for the OrganDonor, then you can simply extend the wiring provided by tubbutec and tap into the 18.5V supply line on the Polyphonic Keyboard module next to the keyboard. The wire colors described above are still accurate.

For the midi jack, you can choose your own position for this. However, most FVS-1's will have hole plugs on the interfacing panel on the rear of the unit. We used one of those, expanding it with a ⅝" stepper bit to fit the Midi jack (expand to 15mm if metric). We then added the holes to screw the flange of the jack into the panel with the provided M3 screws and nuts. Then we extended the midi jack wiring provided by Tubbutec so that it could route to the area we installed the OrganDonor.

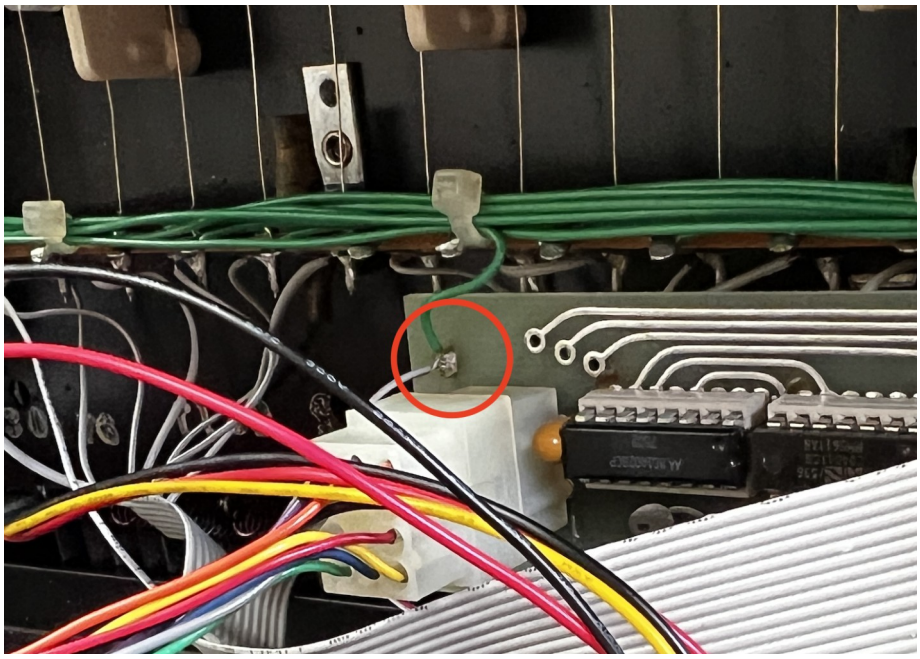
Finally, the bulk of the wiring can be done.
We laid out the PCBs in the following order:

Main Board - 20P Switch Board - 16P Switch Board - 16P Switch Board - Single Switch Board

The bus jumpers are already pre-made from Tubbutec for 1 common bus.

20P switch board:

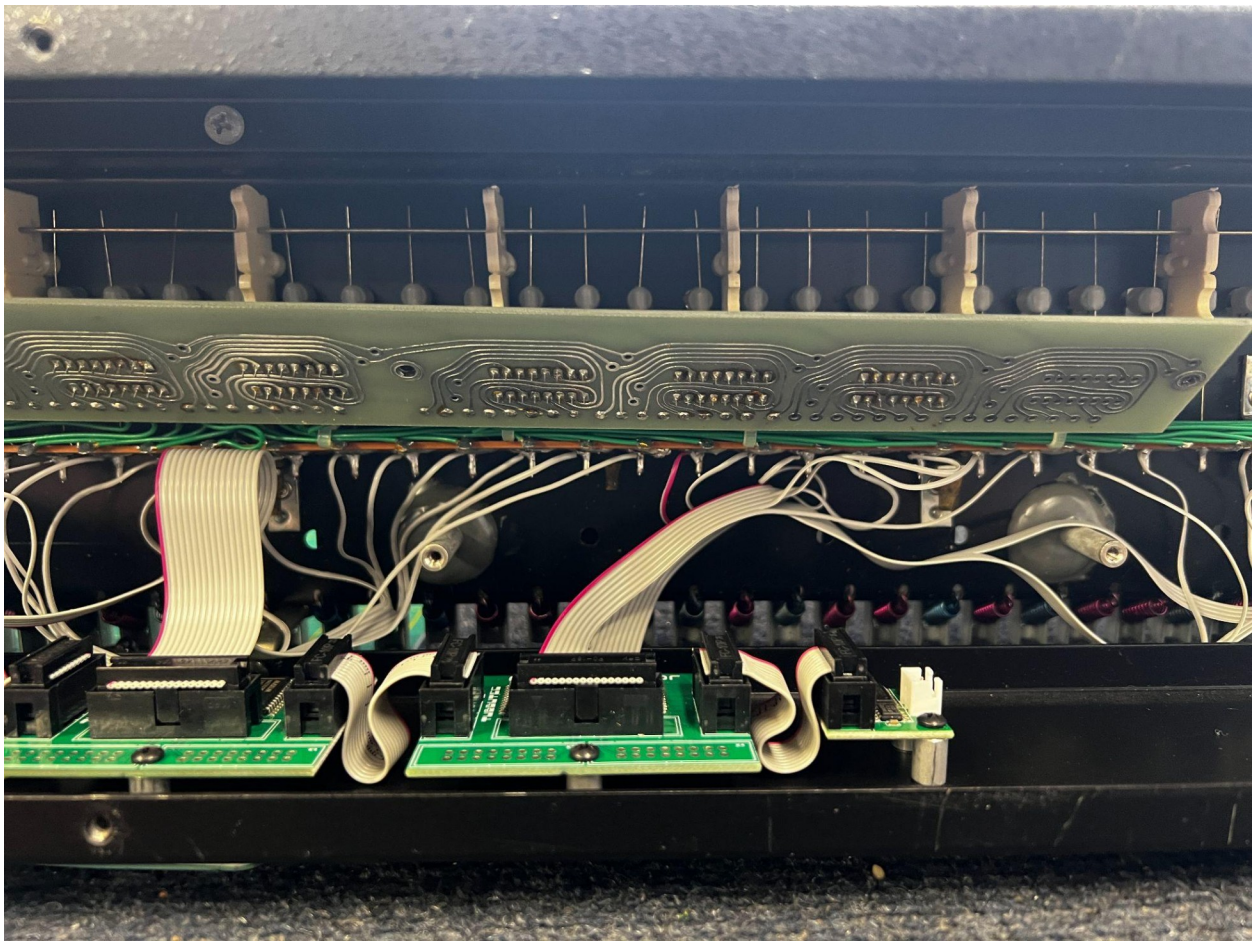
Solder the red wire (Wire 1) to the common bus signal on the PCB circled in red below:



Cut the second wire, it is not needed.

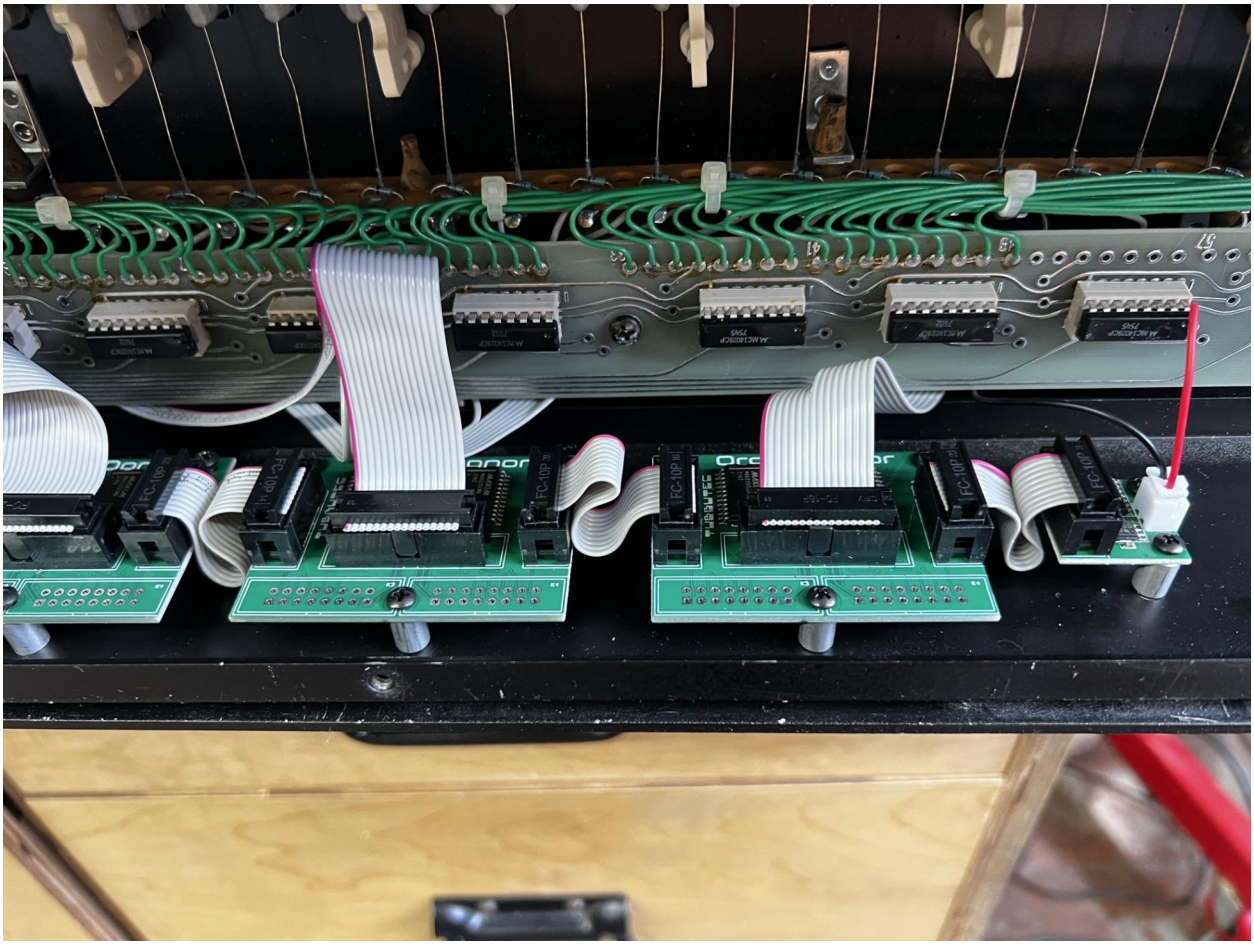
Begin wiring wires 3-18 directly to the J wires under the thin PCB they're soldered to.
You will have to unscrew the Oberheim PCB with the chips on it and flip it up to be able to comfortably solder to the base of the J wires.
Be careful not to accidently desolder the internal key wiring.

Wires 19 and 20 get cut.



For the remaining switch boards, simply continue to solder to the base of the J wires.

The last switchboard (the single switch) will come with a 2 wire harness. Only the black wire is needed and this is soldered onto the J wire for the 49th key (top C). You can cut the red wire so that it is not in your way.

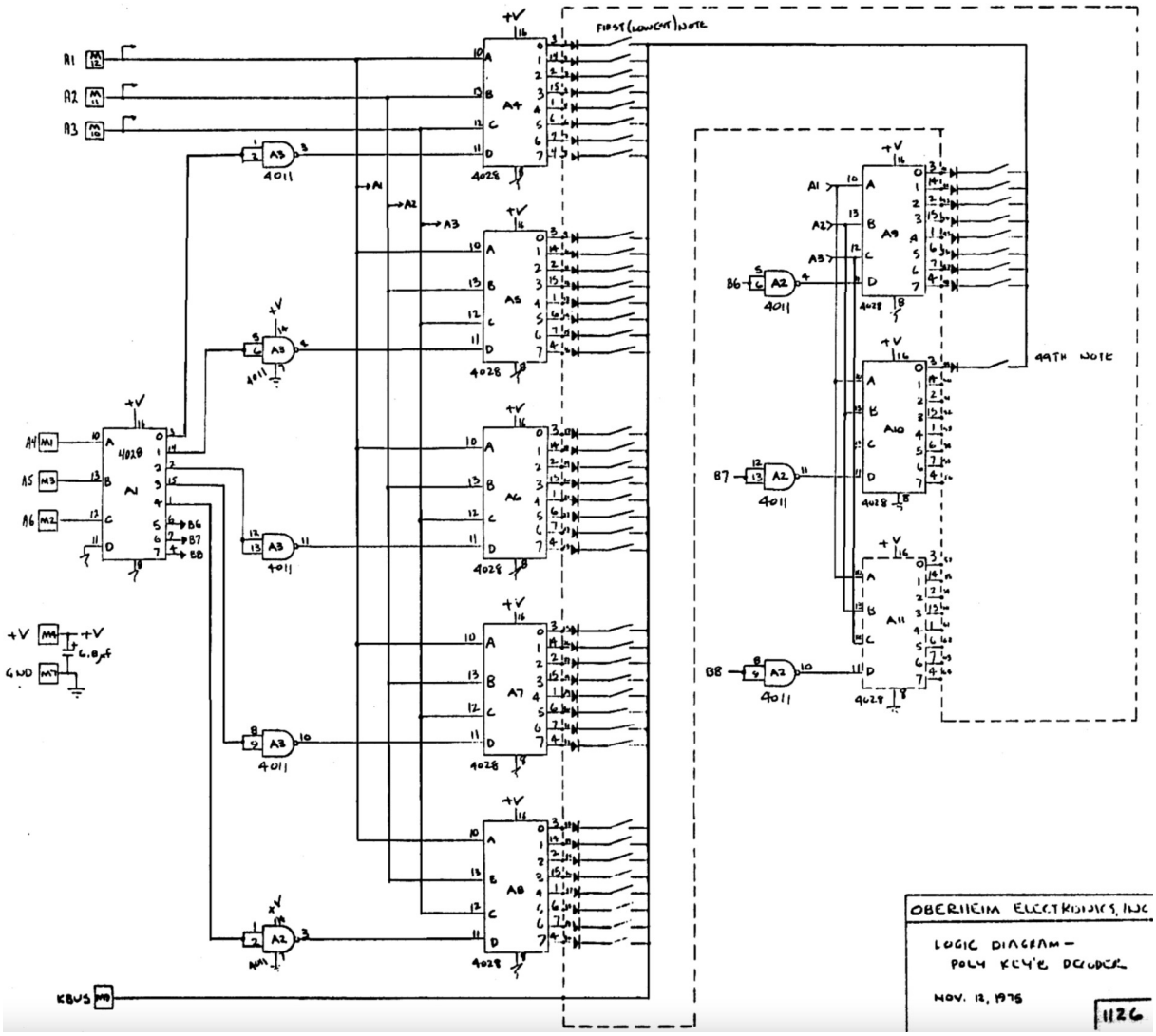


OrganDonor is already prgrammed, so you’re ready to go.

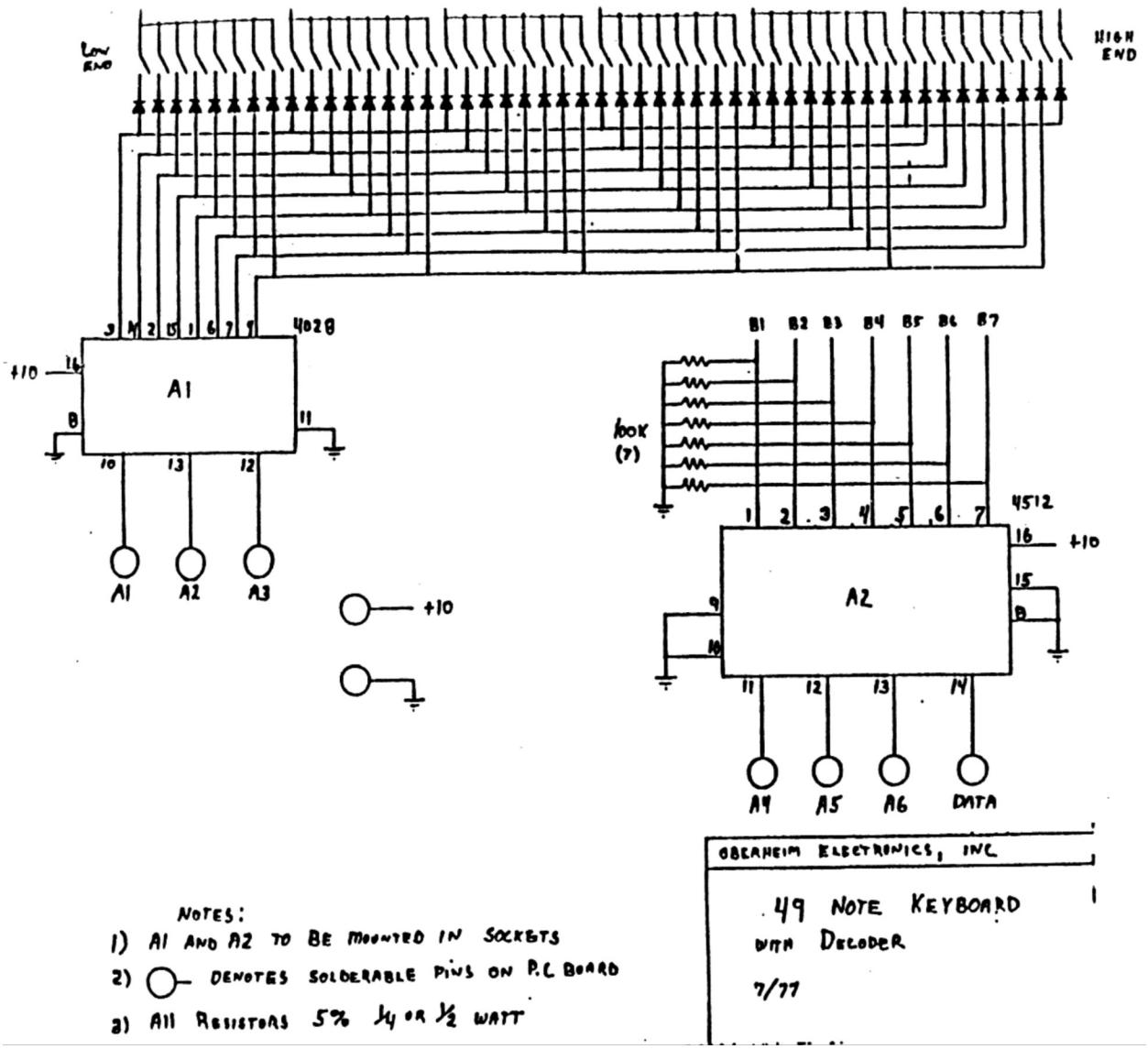
For the older 1 common bus FVS-1 keyboard:

Using the online configurator, you actually don’t need to do anything besides change the midi channel if you want or any custom parameters… the OrganDonor will work right away by just sending the default values.

Schematics for reference:


FIRST (LOWEST) NOTE
99TH NOTE
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
4028
4011
+V
KBUS
OBERHEIM ELECTRONICS, INC
LOGIC DIAGRAM —
POLY KEY'E DCODER
NOV. 12, 1976
1126

Install notes for later FVS-1 keyboards:



For the later type FVS-1 keyboard the hardware configuration is slightly different.
The switch boards will all have 20P connectors, and will have 2 common connections for each switch board (apart from the single switch board obviously)
The 7 bus connections can be had at A2 (CD4512) as pins 1-7 (Pin 7 being for the highest note only)
That would mean:

Wire 1 of switch board 1 gets soldered to B1 in the above schematic, wire 2 gets cut. Wire 19 gets cut, wire 20 gets soldered to B2.

Wire 1 of switch board 2 gets soldered to B3 in the above schematic, wire 2 gets cut. Wire 19 gets cut, wire 20 gets soldered to B4.

Wire 1 of switch board 3 gets soldered to B5 in the above schematic, wire 2 gets cut. Wire 19 gets cut, wire 20 gets soldered to B6.

The red wire of the single switch board gets soldered to B7 in the above schematic.

The next step is to solder the switch contact wires.

Switch board 1:
Wires 3-18 get soldered to the cathode of diodes 1-16 in the diode matrix.

Switch board 2:
Wires 3-18 get soldered to the cathode of diodes 17-32 in the diode matrix.

Switch board 3:
Wires 3-18 get soldered to the cathode of diodes 33-48 in the diode matrix.

Switch board 4 (single):
The black wire gets soldered to the cathode of diode 49 in the diode matrix.