

## Portabellabz 208 PCBs build notes

These build notes are for the **promotional offer PCBs** only.

The PCBs are tested and error free. In case assistance is needed please refer to the [build thread](#) on the Muffwiggler forums.

**I do not offer individual support** for this build, related e-mails or private messages will be ignored but I'll reply as long as I can help on the build thread, thanks for your understanding.

Happy building !

### BOM

The BOM and build instructions are the same as

<https://electricmusicstore.com/blogs/build/12614717-stored-program-sound-source-model-208>

The BOM needs in extra

- **2 x 470ohms and 2 x 10k resistors** for the noisy headphones output fix on the motherboard

- **2 x pA726 BOM** <http://www.portabellabz.be/images/pa726/pa726.pdf>

**On board 7, R45 100k** angled trimpot instead of 20k eases tracking calibration and **C5 47µF** works fine.

The **standoffs** for the 208 panel mounting should be **M3 15mm**, not 17mm, to ease the switches nuts and transfer card mounting.

Use **4066** instead 4016 should help avoid issues, unless on IC2 card 8 where a 4016 is needed.

I prefer **soft LEDs** over the bright ones and use Mouser part 696-SLX-LX3044HD, but that's personal taste. These work fine with the BOM series resistors value, which should be increased if very bright LEDs are used, the 70s LEDs were not very bright.

Mount **ICs to sockets** is highly recommended to ease troubleshooting.

Pics of the cards with **components layout and values** are on <http://www.portabellabz.be/images/208/cards.zip>

### Clearance

Some traces come close to some pads or holes but don't do contact with them, this never was a problem in my builds, anyway I recommend to **solder carefully and neatly** using a good iron with thin solder tip and double check for solder bridges.

### Transfer card

The transfer card between the PCB and panel edge connectors is a bit short but is ok.

**Before soldering it** to the panel edge connector, insert it thoroughly into the PCB edge connector with the motherboard mounted to the panel, place the panel edge connector and solder a few contacts as a reference.

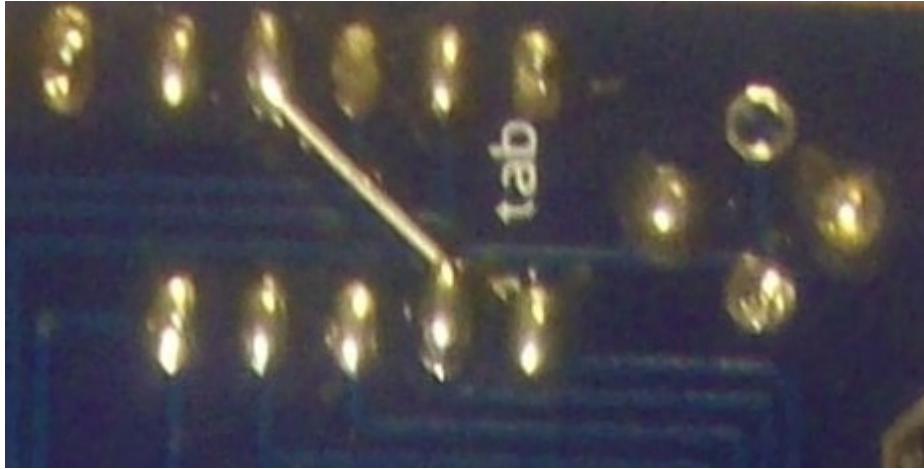
Then remove the panel edge connector and the transfer card and do final soldering.



## pA726

The **pins 2 and 7** of both pA726 chiclets need to be shorted, this can be done on the boards 6 and 7 or on the rear of the pA726, at your best convenience.

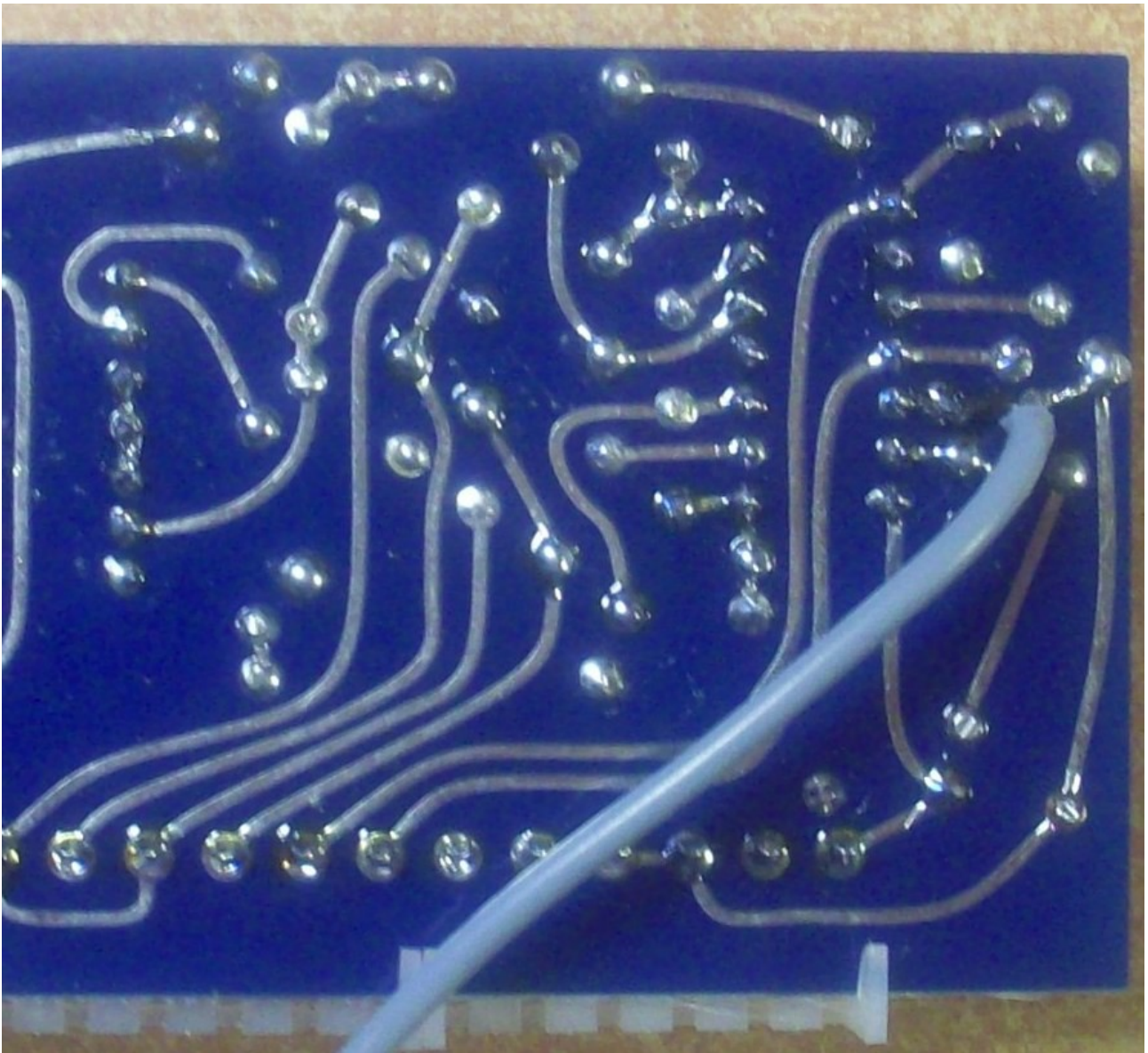
Calibration procedure and BOM are on <http://www.portabellabz.be/images/pa726/pa726.pdf>



## Reverb

Connect the reverb output to card 12 with a **shielded cable**, shielding to ground, signal to IC1 pin 5 (PIN1A pad). The former PCB trace was removed to avoid crosstalk issues. Snip the former reverb black and blue cables to about 15mm from the plug and solder these to the shielded cable, black to shielding (ground), blue to core (signal). Insulate with heatshrink.





## Calibration

A detailed calibration procedure should be available in a near future on my website, but I can't promise on a release date, write this is a big and hard work. Meanwhile please refer to <http://modularsynthesis.com/roman/buchla208v2/208spss.htm>

Both MO and CO are able to track on 5 octaves but this needs a fine calibration and subtle selection on test of R5 and R58 on board 6 and R14 and R44 on board 7.

First of all, calibrate both pA726s as described in their own build notes, In case another  $\mu$ A726 replacement is used, refer to the manufacturer's instructions.

I calibrate the tracking with a 218 but any keyboard or sequencer or midi to CV interface can do the job. To me, proper calibration means all the notes played with the 218 are in tune with MO initial frequency C0 (32.7Hz) and CO initial frequency C1 (65.4Hz). This not an official procedure but my own conclusions after building and calibrating many 208s and other synths. Feel free to adapt this procedure or do otherwise if you like.

Adjust the offset and range trimpots with a frequency counter in a way the frequencies come close to what's written on the panel.

Then adjust the HF (and LF for the CO) tracking trimpots and the panel "(trim)" ones together, using your ears, a frequency meter or chromatic tuner.

Change the aforementioned resistors if the HF trimpot is off range. A small readjustment of the range trimpot may be needed.

The goal is to get all octaves in tune. When the octaves are in tune, the notes between will be automatically in tune.

In my latest build, calibrated for 1.2V/oct. :

Board 6

R58 : 390k

R5 : 91k

Board 7

R14 : 44k (68k added in parallel with 120k)

R44 : 150k

R45 : 100k trimpot

These values are suggestions and might not be ideal in another 208 or with another expo converter, why selection on test is needed for R58 and R44.

R5 and R14 values are ok for 1.2V/oct., should be ok for 1V/oct. and might not be ok for 2V/oct.

Warm up time and calibration adjustment are needed for each resistor change.

A few other tips...

It's better to match the vactrols on boards 10 and 11, or use dual VTL5C3/2.

Vactrols VT4 and VT2 on board 5 need to be selected on test for proper AM performance.

On board 7, R3 should be selected on test, a value between 3k8 and 12k, depending on the vactrol, to set the desired timbre amplitude. I find 4-5 folding is good, as shown on [http://modularsynthesis.com/buchla/208/buchla\\_208.htm](http://modularsynthesis.com/buchla/208/buchla_208.htm) but others prefer more foldings. It's up to the builder to select what best suits his needs.

On board 8 the 2N4399 needs selection on test for proper sine waveshape.

I think this doesn't depend on the part itself only but on the other components in the circuit as well, therefore I use to select parts on test directly in each circuit.