

The CV/gate Card for Buchla 208 and Music Easel

Hi

Thank you very much and congrats for purchasing the CV/gate Card.
You'll definitely enjoy how it expands your 208 or Easel.

Features

- **gate in** minijack : for incoming gate signals between +5V and +15V
- **LED** displaying the incoming gate signals
- **pulse out** banana : Buchla pulse to patch to the 208 pulse input - can be wired internally to the 208's pulse in

- **CV in** minijack : for 1V/oct incoming CV
- **CV out/in** banana : patch to the 208's voltage from keyboard input with multiturn trimmer to scale to 1.2V/oct or 2V/oct - also works as an input to the MO and CO scaling circuits when the bypass switch is to the left
- **bypass** mini slide switch located on the PCB behind the panel : switch to the left if the 208 is calibrated to 1V/oct to bypass the scaling circuit so that the incoming CV is available as is on the CV out/in, the MO and CO direct CV scalers are still working
- **MO CV** switch : connects scaled CV internally to the MO, adjust with trimmer and multiturn trimmer for fine tune
- **CO CV** switch : connects scaled CV internally to the CO, adjust with trimmer and multiturn trimmer for fine tune

- **rear edge connector** : to plug another card, like on the other Portabellabz expansion cards

The CV/gate Card works with all 208 revisions except the 208r rev1 whose program card slot is different, however with a small adaptation of the 208r rev1's slot wiring it may work.
Each card is checked and calibrated on my own Easel prior to ship however it may need slight adjustment to fit each individual 208, Easel or controller.
The card's CO and MO CV outputs available via the switches have a wide range in order to match any 208 and calibration, so that each owner can calibrate the card according to the actual 208 it will be used with.
For each switch there's a single turn trimmer to the rear of the PCB to scale the amp gain roughly and a multiturn trimmer on the panel like on the ToolBox and VCS3 Card for fine tuning.
Don't be afraid, this calibration should be done only once and is straightforward, it takes a few minutes only and no special tools or skills are required : a pair of small screw drivers, a tuner or a good ear and the 1V/oct CV/gate controller or midi interface. Calibration is easier with a keyboard and is detailed for it but a sequencer can be used as well, simply adapt the steps.

Pulse out scaling

Unscrew the rear panel, insert the card into the 208's slot, patch the external controller's gate out to the gate in minijack and the pulse out banana to the 208's pulse input.
Set the sequencer, envelope and pulser trigger source switches to keyboard and the envelope mode select switch to transient.

Depress a key of the keyboard.

It should fire the sequencer, envelope and pulser.

The envelope and pulser should behave in transient mode and their length shouldn't be related to how long the key is depressed, if it is adjust the trimmer located above the pulse out banana in order to get correct behaviour.

Some may prefer a sustained behaviour of the pulser and keep it on as long as the key is depressed, this is possible with a fine adjustment of the trimmer, keeping the envelope working well in both sustained and transient modes.

CV out/in 1.2V/oct scaling

Let the 208 warm up for 10 minutes to stabilize the oscillators. Unscrew the rear panel, insert the card into the 208's slot, patch the external controller's CV out to the CV in minijack and the CV out/in banana to the 208's voltage input.

Set the CO and MO key switches to the top position.

Monitor either the CO or MO output.

Play several intervals on the keyboard and adjust the multiturn trimmer located above the CV out/in banana to get in tune over about 5 octaves.

You can also use a multimeter to measure the voltage on the CV out/in banana.

Play the keyboard's lowest note, the voltage should be 0V.

Play 5 octaves higher and adjust the trimmer to get an exact 6V output.

Check the lower octaves, should be 1.2V, 2.4V, 3.6V, 4.8V. A drift of 1 or 2 mV is ok.

The oscillators of a good working properly calibrated 208 track in tune over 5 octaves with minimal drift, if you can't calibrate the card in order to get this range, your 208 requires adjustments, refer to the manufacturer's instructions.

MO and CO CV switches scaling

This scaling should be performed after the CV out/in scaling is done (or bypassed if your 208 is calibrated for 1V/oct), scaling the CV out/in afterwards will impact the CV switches scaling.

The procedure is the same for the MO and CO and 2 trimmers are to be adjusted for each : firstly the single turn trimmer located next to the switch on the back side of the card and then the multiturn trimmer located above the switch.

Let the 208 warm up for 10 minutes to stabilize the oscillators. Unscrew the rear panel, insert the card into the 208's slot, patch the external controller's CV out to the CV in minijack and set the card's MO CV and CO CV switches to the top position.

The 208's key switches should be in the bottom position and no other CV should control the oscillators.

For each oscillator, play several intervals on the keyboard and adjust the single turn trimmer.

Then fine tune the CV with the multiturn trimmer to get in tune over about 5 octaves.

If the multiturn trimmer is off range, readjust the single turn trimmer.

Optional internal pulse out wiring via the card slot

Those who are not afraid to solder in their 208 and likely void warranty can wire the card's pulse out directly to the 208's pulse input via the card slot so that patching is no longer needed.

It is a straightforward non permanent modification.

On the 208 : run a cable between any N/C contact of the card edge connector (contacts 5 and 6 of both rows in 208p, 208r rev2, 208e) and the pulse input banana jack.

On the CV/gate Card : run a cable between the pulse out pad and the corresponding contact of the rear edge connector.

In the late 208e and in the 208c, contacts 5 and 6 of the card slot may be already in use and no longer available for this purpose, check by yourself or ask Buchla before doing this mod.

Disclaimer

Ensure that the Easel or 208 is powered off before inserting or removing the card into the program card slot. Do not insert it backwards.

I assume no liability for personal injury or damage to equipment or loss of use caused directly or indirectly by the use of the CV/gate Card or any info shared in this manual.

Happy patching !

C.