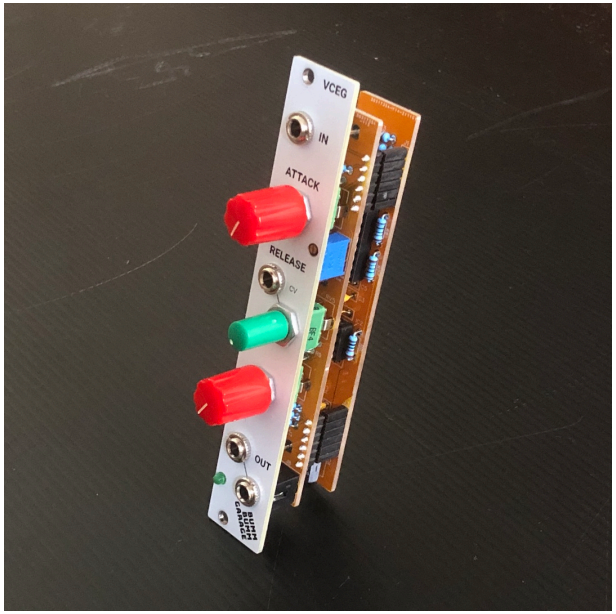
Build Doc: Voltage Controlled Envelope Generator (VCEG)

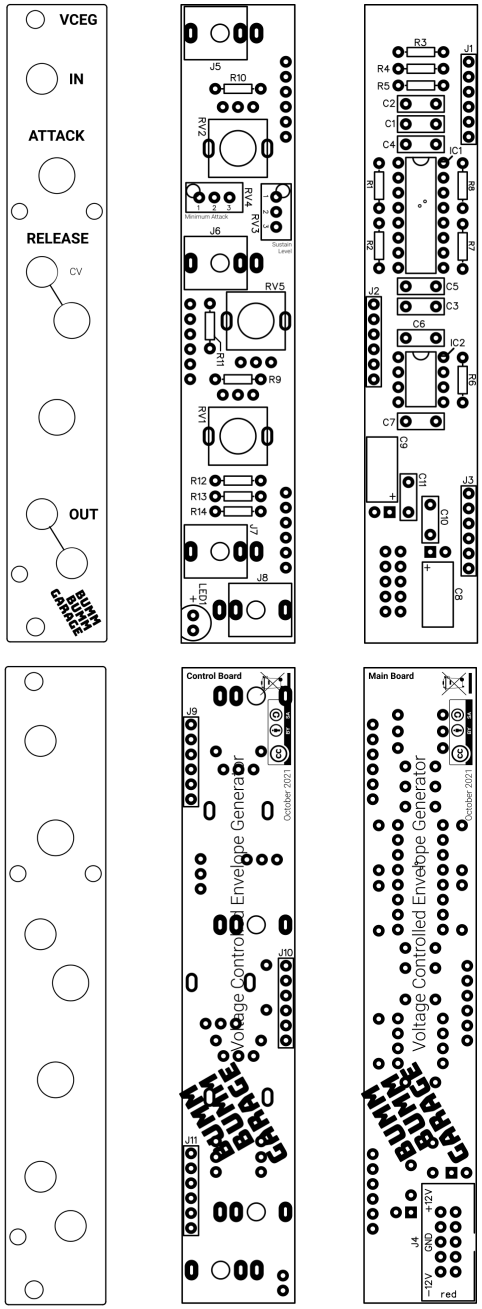


I designed this envelope generator for my techno rack. In this context I mostly have fastly repeating trigger signals that just need some release to create the bass or lead tone.

If you're using attack to mute and unmute voices quickly as I do, there's a little trimmer screw at the front to permanently set the minimum attack. This way you can avoid pops at the beginning of the tone when turning it on quickly.

The circuit itself is very simple, because it's built around an AS3310 (envelope generator) chip that works gracefully clean.

Have fun with it! Steffen.



1. Build The Module

Take a look at the pictures of the assembled module on the project page: https://www.bummbummgarage.com/modules/voltage-controlled-envelope-generator-vceg. Make yourself a plan of how you want to proceed.

There are three basic principles I follow for worry-free assembly of a module:

1. **Start with the flattest components** (diodes, resistors) and build your way up (capacitors, IC holders, potentiometers). This way each component will lie flat when you flip the board over for soldering.

2. **Test each component** if you can. The time you spend doing this costs so much less than the uncertainty when something is not working somewhere. If you don't have a multimeter yet, I recommend you to get one and learn how to check electronic components.

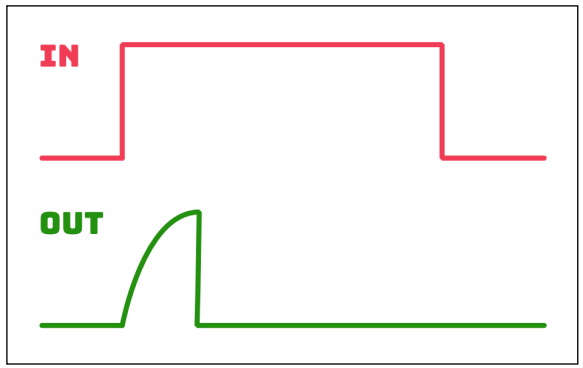
3. **Fix control elements to the front panel before soldering them**. To do this, place the components (pots, audio jacks, LEDs, etc.) in the holes provided and put the front panel on top. You don't solder them yet, but fix them with the appropriate screws at the front first. Then you solder. This prevents tensions during the final assembly, which could possibly break the solder joints.

A speciality of the VCEG are the decoupling capacitors C8 and C9 on the main board. They have to be bent at their legs to fit between the two PCBs. First put them through the PCB and bend them over so that they lie flat. Then fix them with a clamp or some tape and solder them.

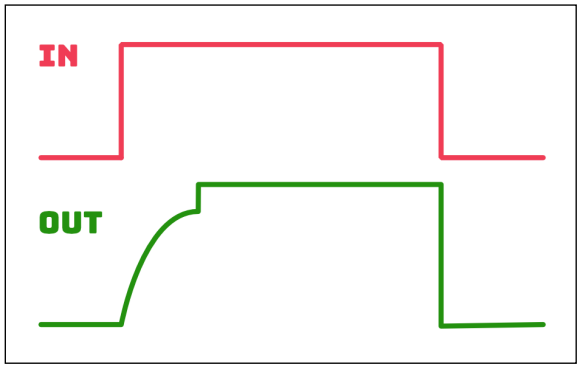
2. Calibrate The Output

Below the attack potentiometer there are two trimmer screws. The left one defines the minimum attack. The right one sets the fixed sustain of the envelope. Depending on the factory settings of the trimmers, you may not see or hear anything at first when you feed the VCEG with triggers or gates. Don't panic. This is how you proceed:

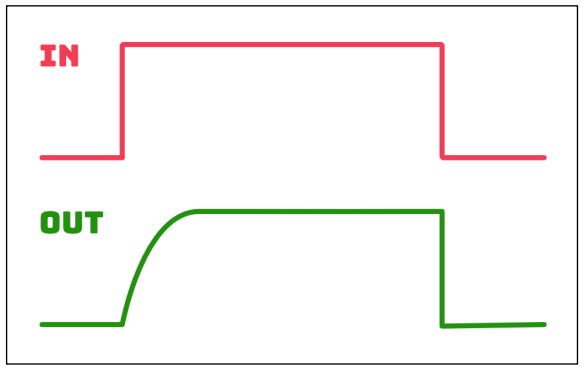
1. Turn **both screws to zero** (counterclockwise). Some trimmers click slightly when this position is reached.
2. Turn the **attack poti to ~30%** (half ten on the clock), the **release knob to zero**.
3. Now **feed the module with repeating gates** (at the IN). The LED now lights up only until attack has reached its peak, because sustain is at zero.



4. Next, **turn the sustain screw** until it clearly exceeds the level of the maximum attack. You can see the jump after the attack very fine on the LED or better on the oscilloscope, if you have one. Alternatively, you can hear it clearly if you use the envelope to control the volume of an oscillator via a VCA.



5. Now **turn the sustain screw to the left** until the transition after the attack feels seamless and there is no more jump (visually or in volume).



6. Last but not least you can **adjust the minimum attack** with the left trimmer. For me this works best with the ear. Control the volume of an oscillator via a VCA and set the attack knob to zero. **Turn the attack trimmer screw clockwise** until the click at the beginning of each gate or trigger disappears.

3. Have Some Envelope Fun

For a quick start, here are two ideas for using the voltage controlled envelope generator. These are the main use cases I followed when developing the module:

1. **Bass lines with variable hits**: https://youtu.be/kLFvXCiCb9g
2. **Filter on chords**: https://youtu.be/B0mmiwY81mQ

4. Send Me Your Feedback

If you have any thoughts, complaints or requests regarding the assembly or the use and sound of the module, please let me know via support@bummbummgarage.com

Thank you very much!