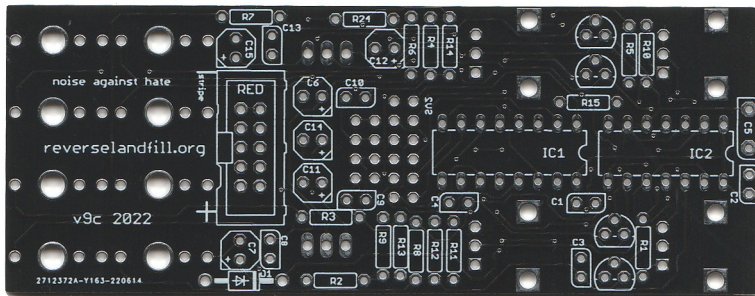


# Noise Oscillator Build Document. V9 – 2022



The Noise! Synthesizer is a CMOS IC based instrument.  
The synth has 4 squarewave oscillators that modulate each other and go through a clock divider.  
After that, the separate divider outputs are routed to a patchbay where you can decide which ones go to the 4 output jacks

## *Start with the **Resistors**:*

**Note that some of the resistors are placed close together. Be careful not to make solderbridges!**

Start with the 4x **100r** resistors **R1, R10, R11, R12**  
Solder the resistor and cut off the legs with a sidecutter.

Next, solder the rest of the resistors:

4x **1K** → **R2, R3, R4, R24**

4x **10k** → **R9, R13, R14, R15**

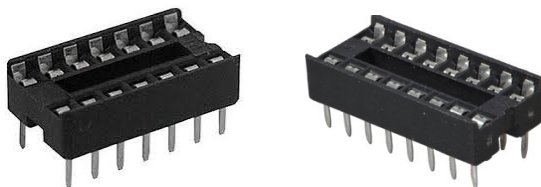
4x **1M** → **R5, R6, R7, R8**

## ***Diodes:***

**D1** is a reverse power protection, the **1N4001**

## ***IC sockets and the IC's:***

Take the foam with the two IC sockets and the IC's. There is *one* with 16 pins and *one* with 14 pins!



These IC-sockets are to make the placement (and possible removal) of the IC's easier.  
Take out the *two* IC-sockets. Attention! These sockets have a direction. See the semi-circle gap?  
On the PCB you can see this marking as well. Place the 16-pin IC socket in **IC1**.  
Flip over the PCB and solder two legs, one in the upper row, one in the lower row, diagonally from each other.  
Flip the PCB back to the other side to check if the IC-socket is flat to the PCB.  
If not, push the socket lightly to the PCB and reheat the two soldered legs. It should click to the PCB.  
Place the 14 pin IC socket in **IC2** and use the same method as before to solder it in. Solder all remaining legs.

The **CD4040 (clock divider)** has 16 pins, the **CD4093 (quad NAND)** has 14 pins.  
Bend the pins so that they are in a 90 degree angle. Push them in carefully but firmly.

## ***Transistors:***

These are the 2n3904 transistors. (they are unmarked on the pcb) Mind the orientation!  
They act as CV input buffers. Carefully insert the legs and solder them in.

### Capacitors:

There are a lot of capacitors in the kit.

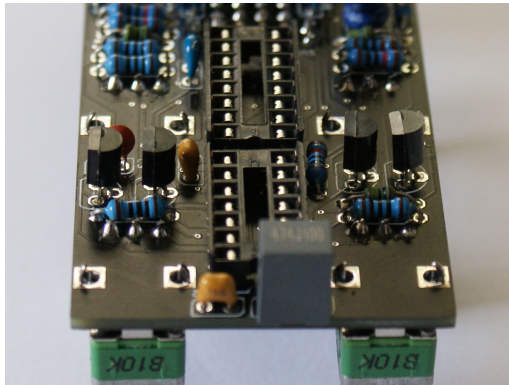
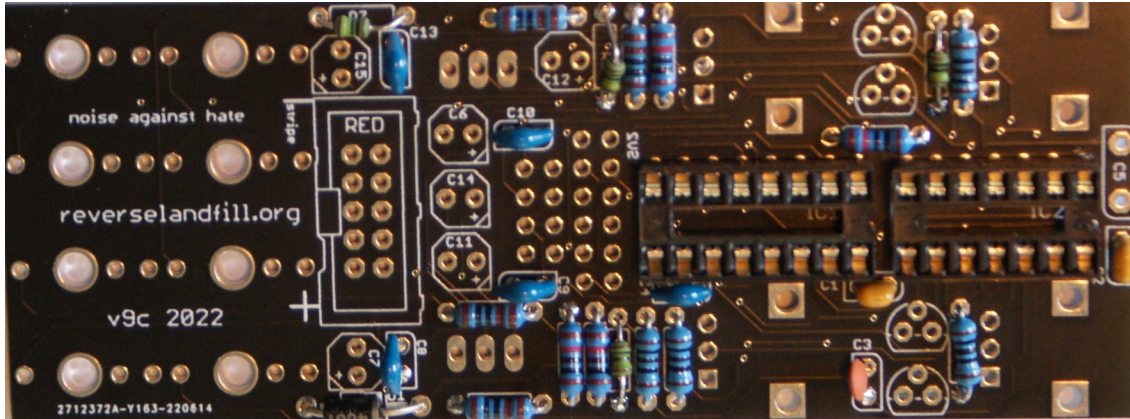
They determine the frequency range of the oscillators and stabilise the power and outputs.

We start with the *two orange or yellow* capacitors; **C1 and C2**, they are **100nF** (104)

The **470pF** goes in **C3**. This is a slightly smaller orange disk with the code "471".

**C4, C8, C9, C10, C13** are **330nF**, a blue blob. (334)

The bigger rectangular shaped **470nF (or 390nF)** film capacitor is placed at **C5**.



## **Flip the PCB around. It is time for the pots, jacks, headers and switches!**

### The Potentiometers:

These parts are variable resistors. With these you can adjust the frequency of the oscillators.

You have four of these.

Insert them into the PCB, but don't solder them yet.

### Jacks:

Insert all 8 jack sockets, don't solder them yet.

### Switches:

Remove the nuts and rings and set the lever in the middle position.

insert the 2x SPDT sub-micro switches (on-off-on), don't solder them yet.

### Frontpanel:

Attach the PCB to the frontpanel. Fasten a nut to one of the potmeters, this will hold the panel connected to the pcb while you get ready for the next steps.

Now solder one pin of each potmeter, jack and switch.

Check if all parts are aligned with the panel and pcb.

Then solder the rest.

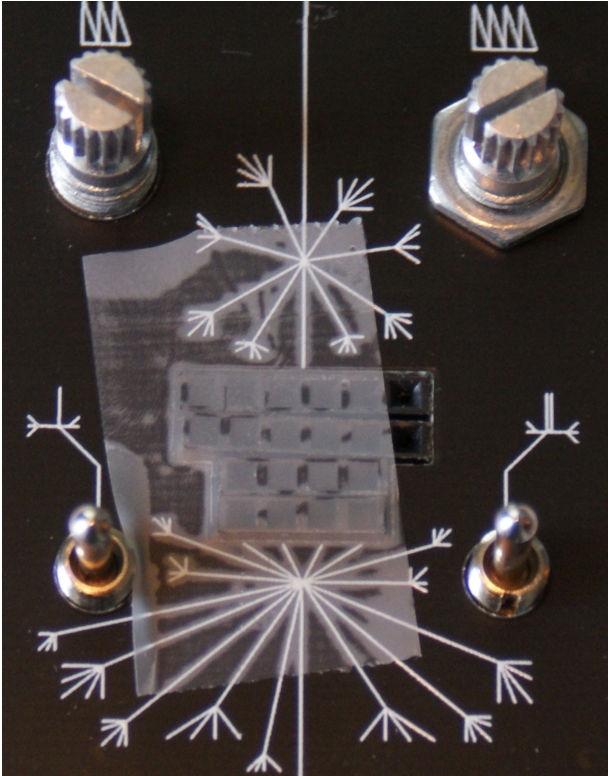
## Remove the panel

### Headers:

The headers make the patchbay. Place the long pin female headerstrips , 2x 6pin and 2x4pin on the pcb.

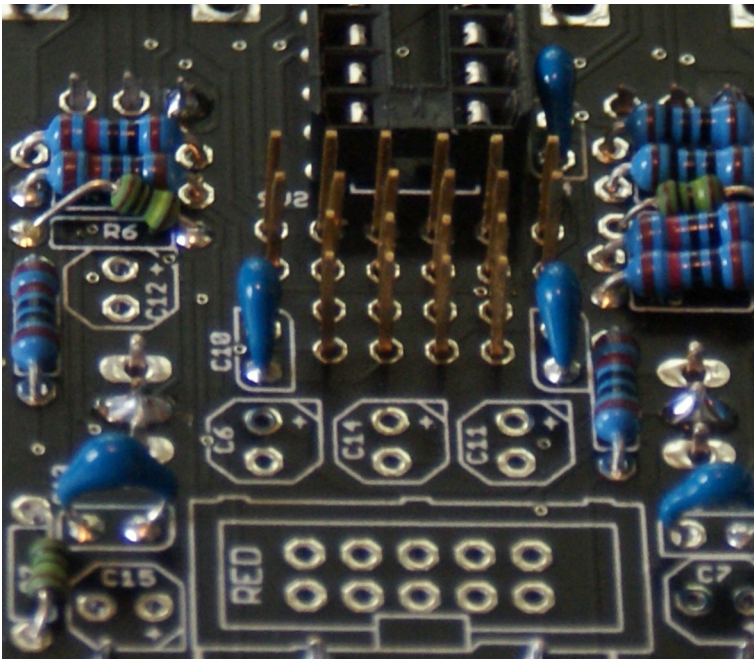
Now place the panel again and tighten one nut to hold the panel in place.

Stick a piece of tape over the header panel gap and slightly push the headers so that they stick to the tape.



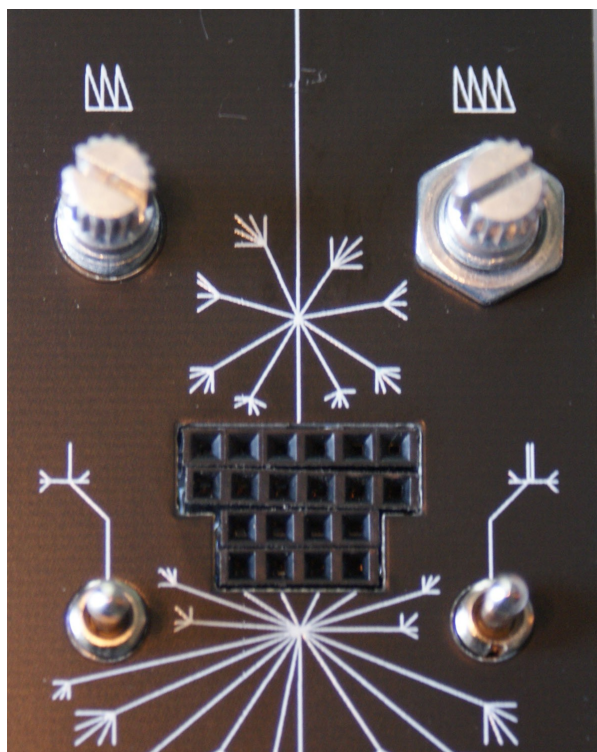
The headers must be flush with the panel.

Now carefully solder one pin at the left side of each header.





Remove the tape and check if the headers are flush and aligned with the panel. If not, reheat the pins and push the header into the right place.



Now solder the opposing pins of each header

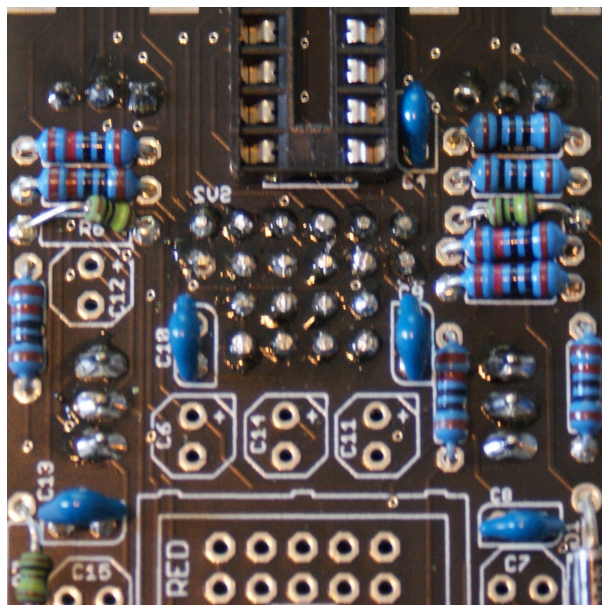
To be able to reach all of the pins with your soldering iron, use this method:

solder the first 1x4 header and snip off the remaining leads.

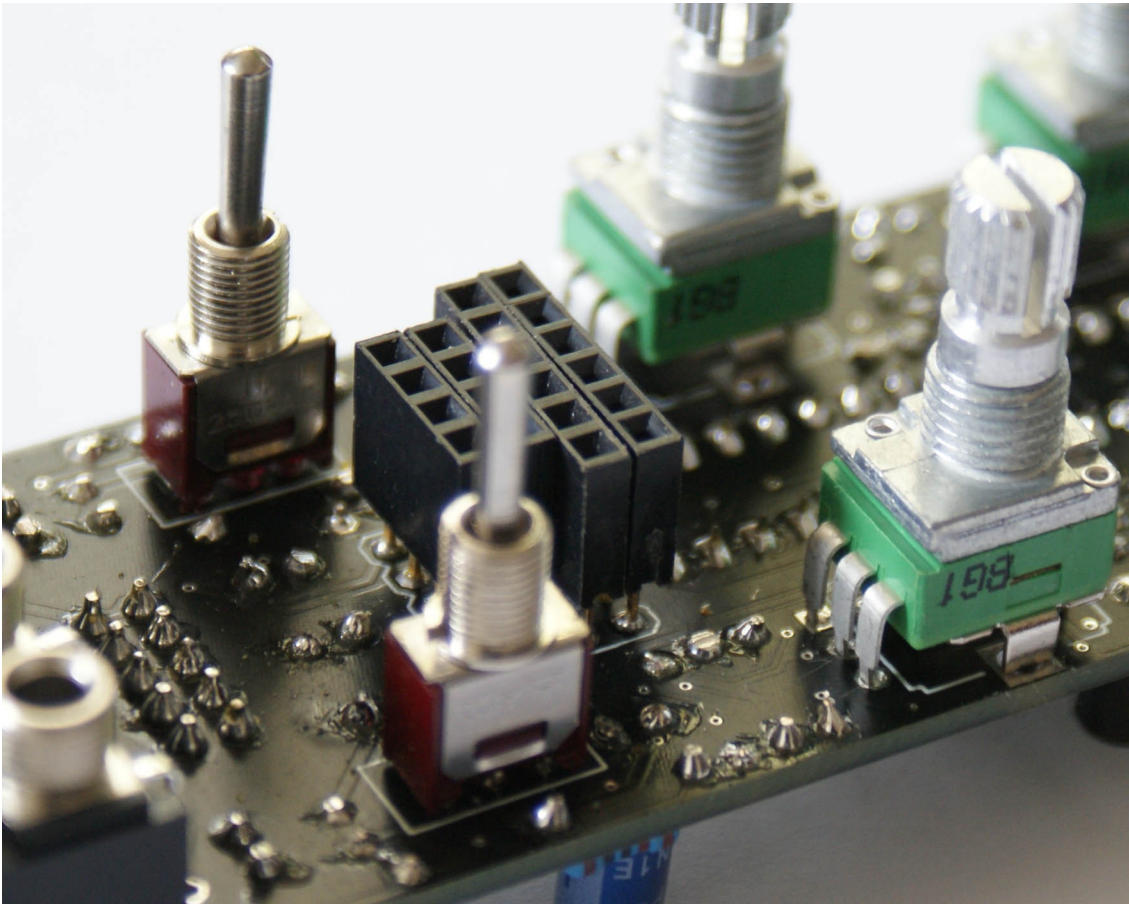
Now do the next 1x4 header, snip off the leads again and move up to the next header.

Repeat snipping off the soldered pins and finish the last header.

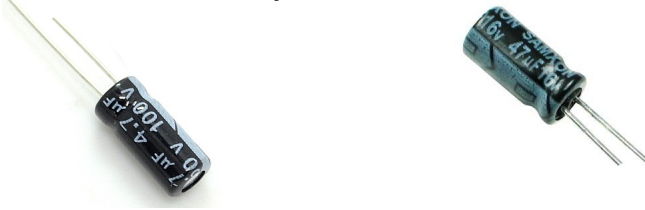
Check your solderwork to see if all headers look good.



## ***Remove the panel***



## **Now for the bigger capacitors:**



These parts have a **polarity**. The long leg is the PLUS, The short leg is MINUS.  
The value of these components is printed on the side as well.

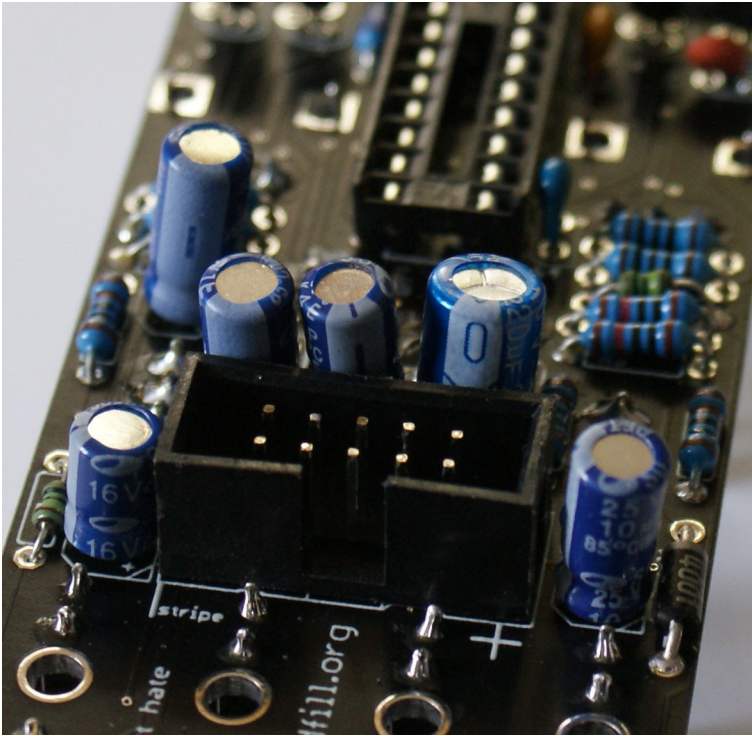
Start with the *three* 10µF value. They go in **C6**, **C7** and **C12**. Long leg goes into the PLUS!!  
(take care to get the right one, there are also *four* 4.7µF capacitors!)

Soldering these can be a bit hard, because of the limited space between the already placed parts.  
Be careful that you don't melt the plastic of the jacks or other capacitors.  
If you can't reach a certain pin, solder one leg, snip it off and then solder to other leg.

Now we do the two 47µF. These go in **C14** and **C15**  
Last comes the 100µF or 220µF, which goes into **C11**.

**Powerheader**

Insert the shrouded 10 pin header. Solder one pin, then check if the header is flat to the pcb. Reheat if necessary. Then solder all pins.



Place the panel again and fasten all the nuts to the pots, switches and jacks.

**Knobs:**

Turn the four potmeters all the way to the left (CCW) and fit the knobs on. Push them firmly in, while supporting the back of the potmeter.

**Insert the IC's:**

Bend the legs of each IC so that they are at a 90 degree angle. The notch should match the PCB marking.

IC 1 = CD4040 (16 pin socket)

IC 2 = CD4093 (14 pin socket)

Push the IC's in firmly.

Now check the pcb for missed parts, bad soldering and polarity of the IC's, diode and electrolytic caps.

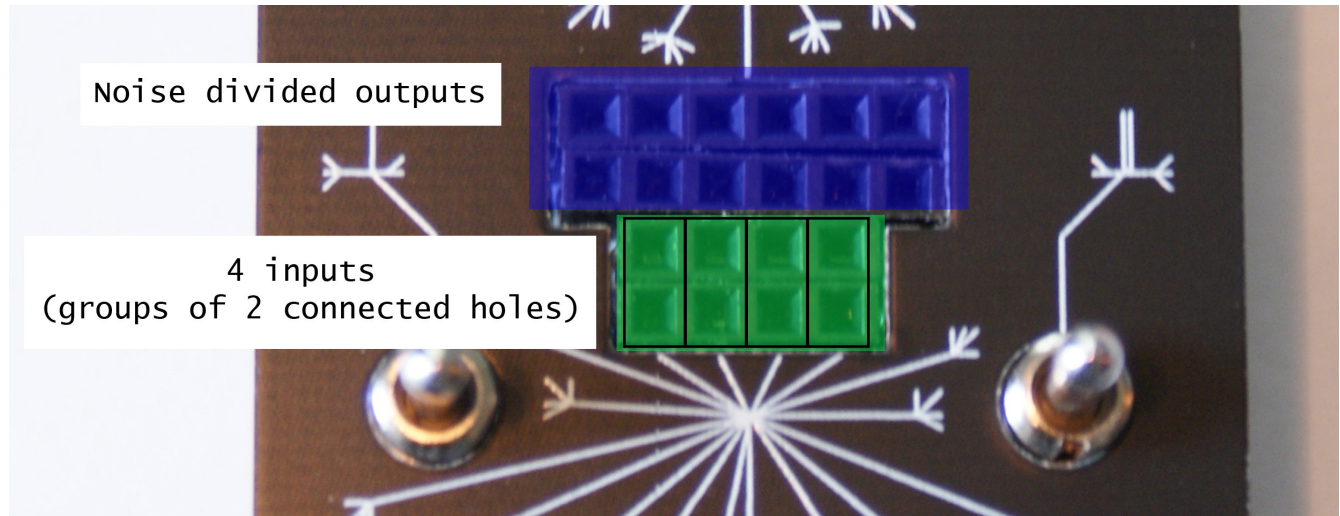


Patch the patchbay with 4 cables.

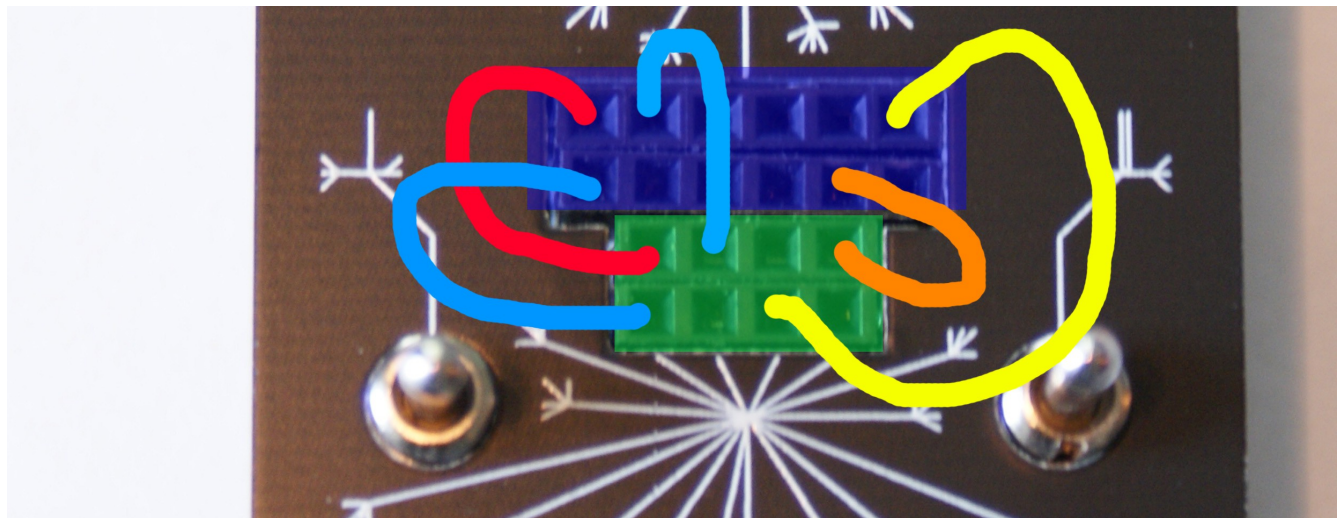
The Blue marked part of the patchbay (in this picture) are the Noise divider outputs (12 different divisions)

The Green marked patchbay are the 4 inputs, which are routed to jack1, jack2, jack3 and jack4

There are two inputs for each jack, to be able to stack divisions together. This gives interesting patterns and sounds.



For example, patch up something like this:



Insert the powercable and power your case.

The bottom row of jacks (marked with the triangles) are the outputs. The other row of jacks are the CV inputs. Test each output and listen to the sound differences.

Unpatch everything and now use only one patchcable. Patch it into input 1 and try all division outputs.

Now add one patchcable and try making different combinations.

Play with the knob settings and switches to get all kinds of noise sounds and tones.

Now patch in some CV signals.

The potmeters work as CV attenuators,  
Experiment !

Have fun with your Noise! Synthesizer!!! :)

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