

## SNOW buildguide v2.3 updated 03-2023

SNOW is an analog video noise module, with 5 outputs.

It features two separate transistor based noise sources, each with offset and gain control.

Each source has two outputs: offset noise and filtered noise. The filtered noise can be attenuated by the gain control. (the offset control is blocked by the highpass filter)

There is also a comparator output, with a dedicated offset knob and a switch that selects the noise1 or noise2 input. This control knob sets the voltage offset which has a keying effect on the amount of black and white in the image.

The pcb is tightly packed, with all the resistors, mounted “standing up”.

We start with the these parts, the 1n5711 diodes.

### **Diodes:**

Place the 2x 1n5711 diodes at d1 and d2. Take care of the polarity , the white line must match with the black stripe on the diode.

### **IC sockets:**

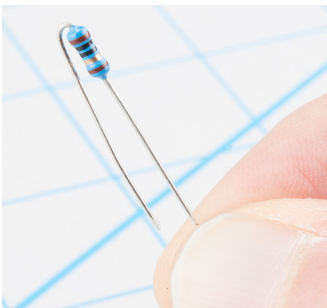
Place the 4x 8pin IC sockets U1, U2, U3, U4.

Flip the pcb over and solder one pin of each socket. Now check if the socket is aligned correctly.

If not, reheat the pin and carefully press down on the socket. It should click into place. Now solder all pins.

### **Resistors:**

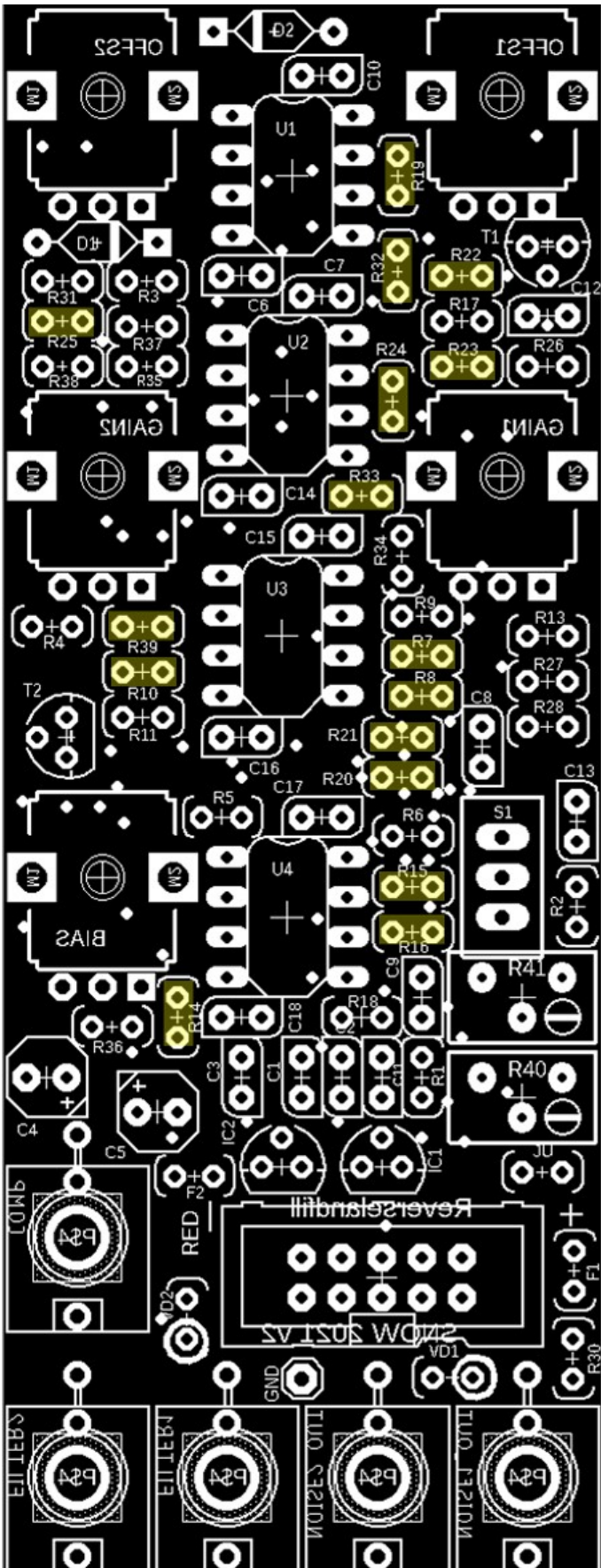
All the resistors are mounted standing up, like so:



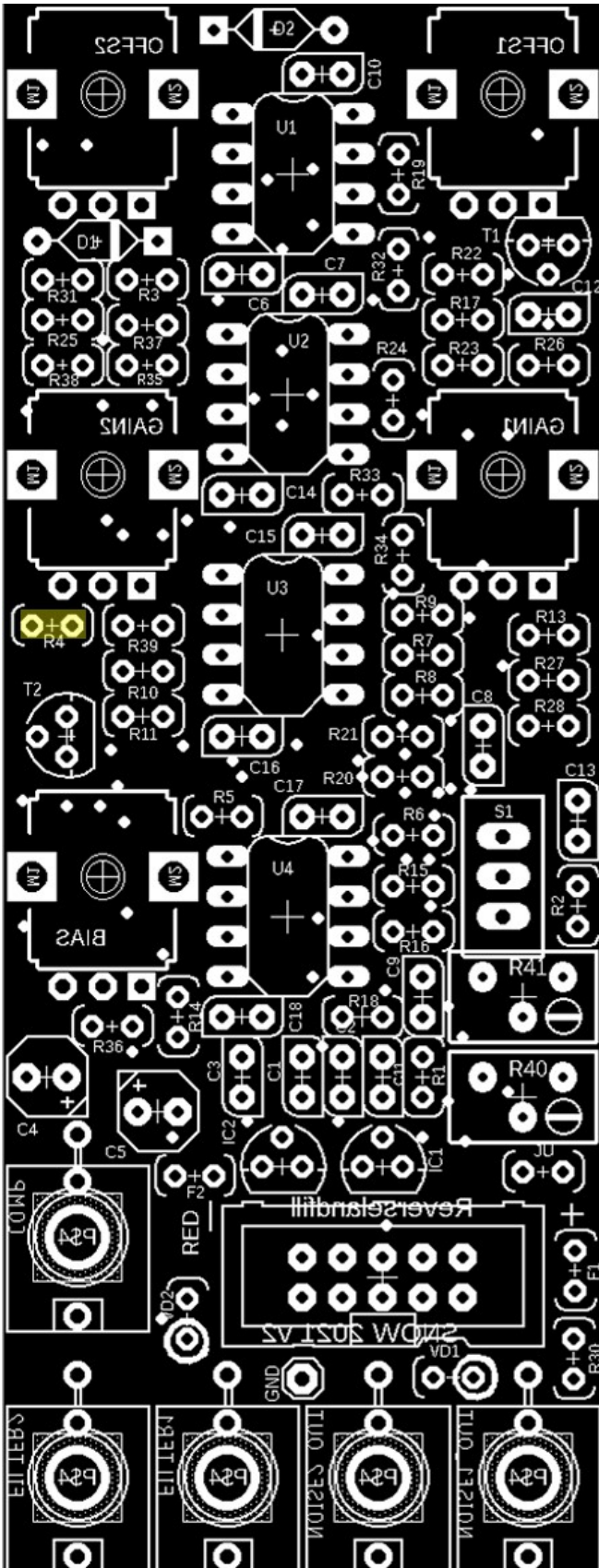
Place the resistors and first solder one pin of each. Now turn the pcb over check if the resistors are aligned correctly to the pcb. If not, reheat the soldered pin and carefully press down on top of the resistor. When they are all seated correctly, solder the rest of the pins.

Below are all resistor placements:

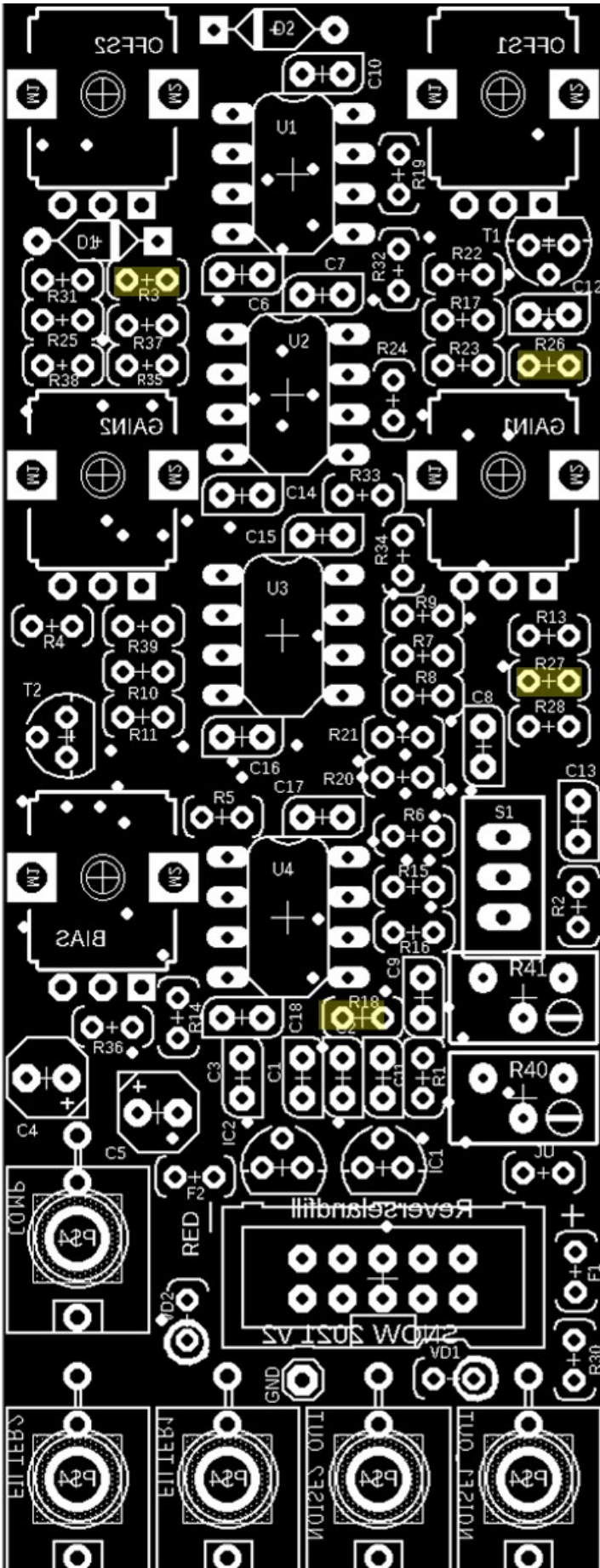
1K: (16x) r7, r8, r10, r14, r15, r16, r19, r20, r21,r22, r23, r24, r25, r32, r33, r39



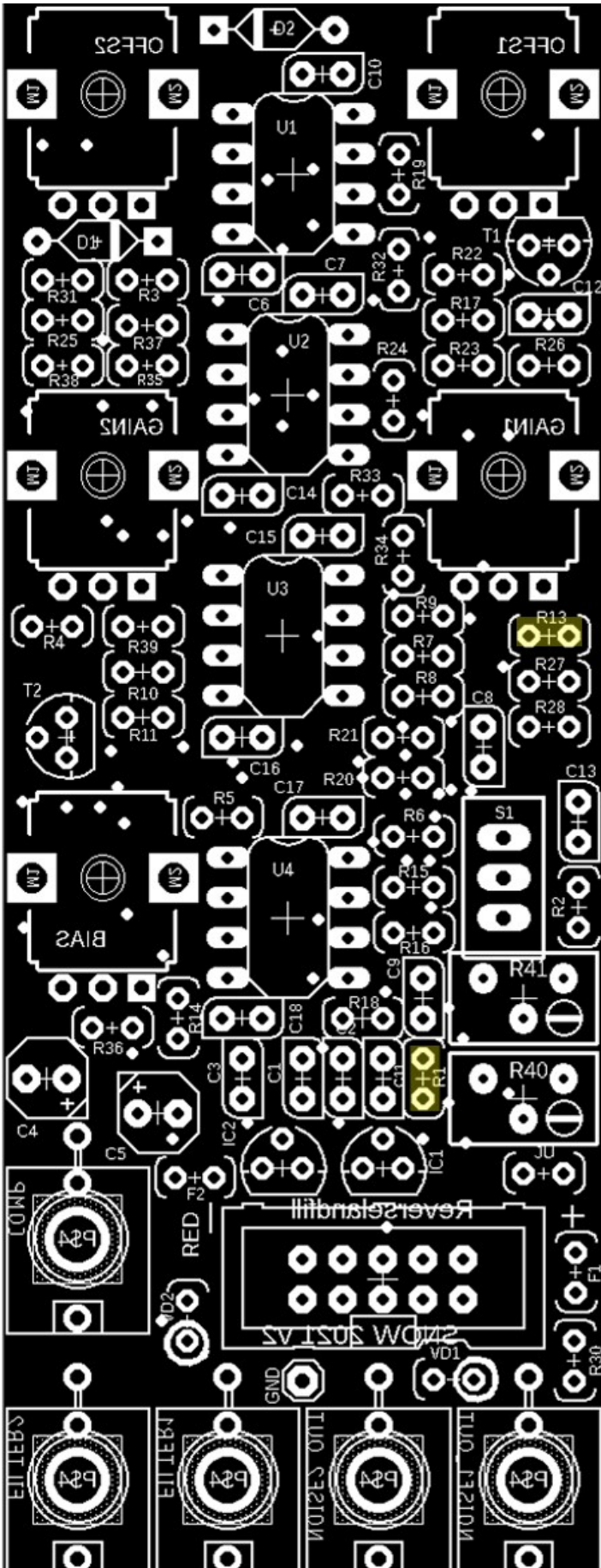
3K9: (1x) r4



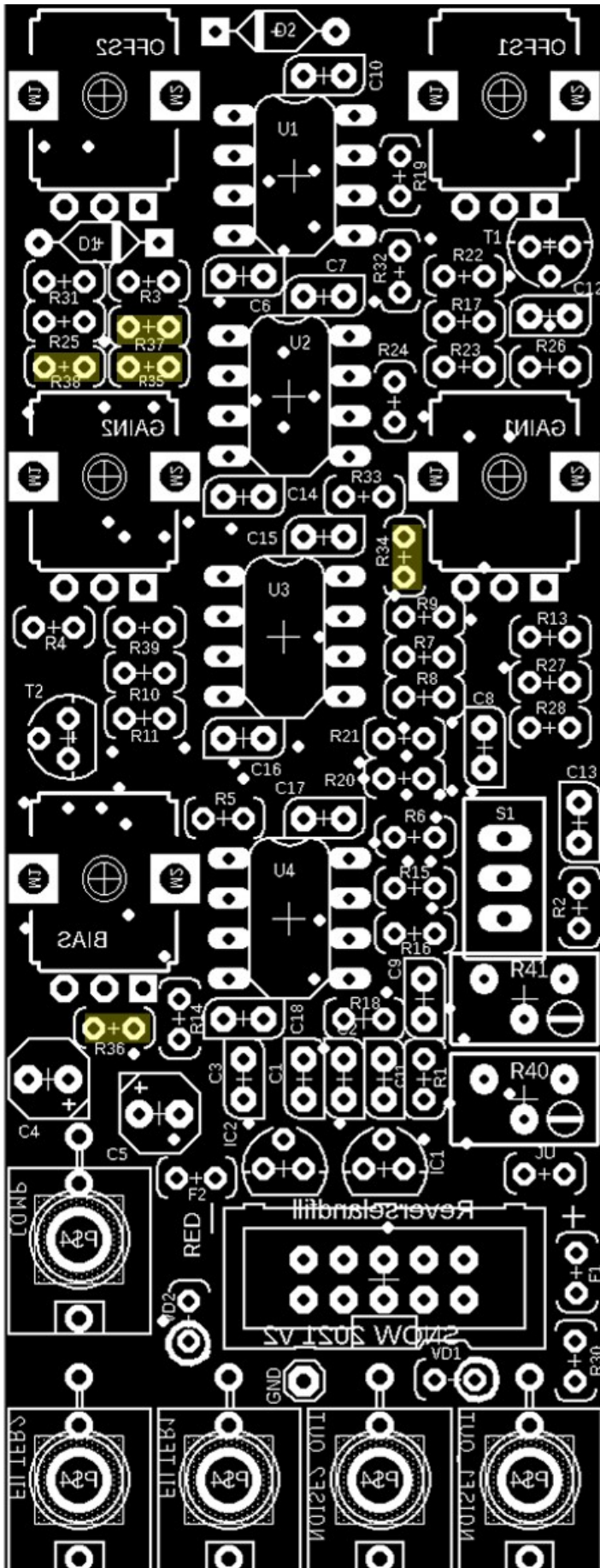
10K: (4x) r3, r18, r26, r27



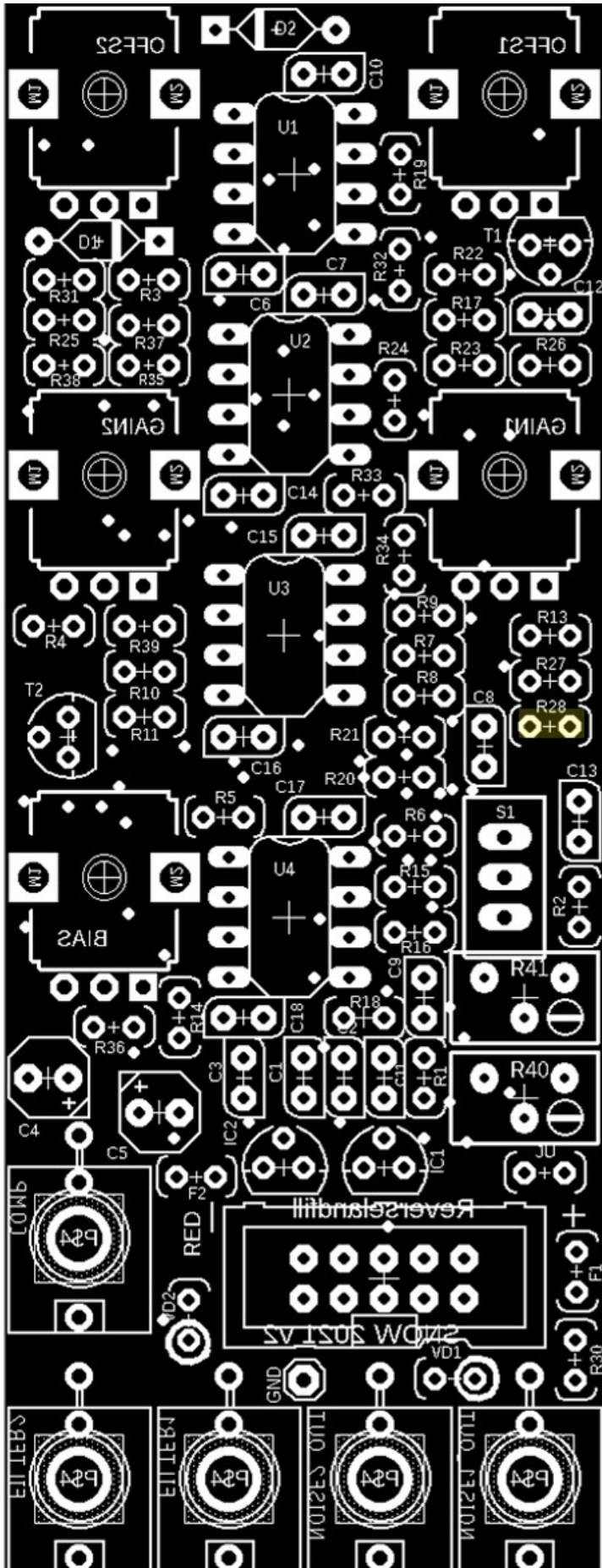
15K: (2x) r1, r13



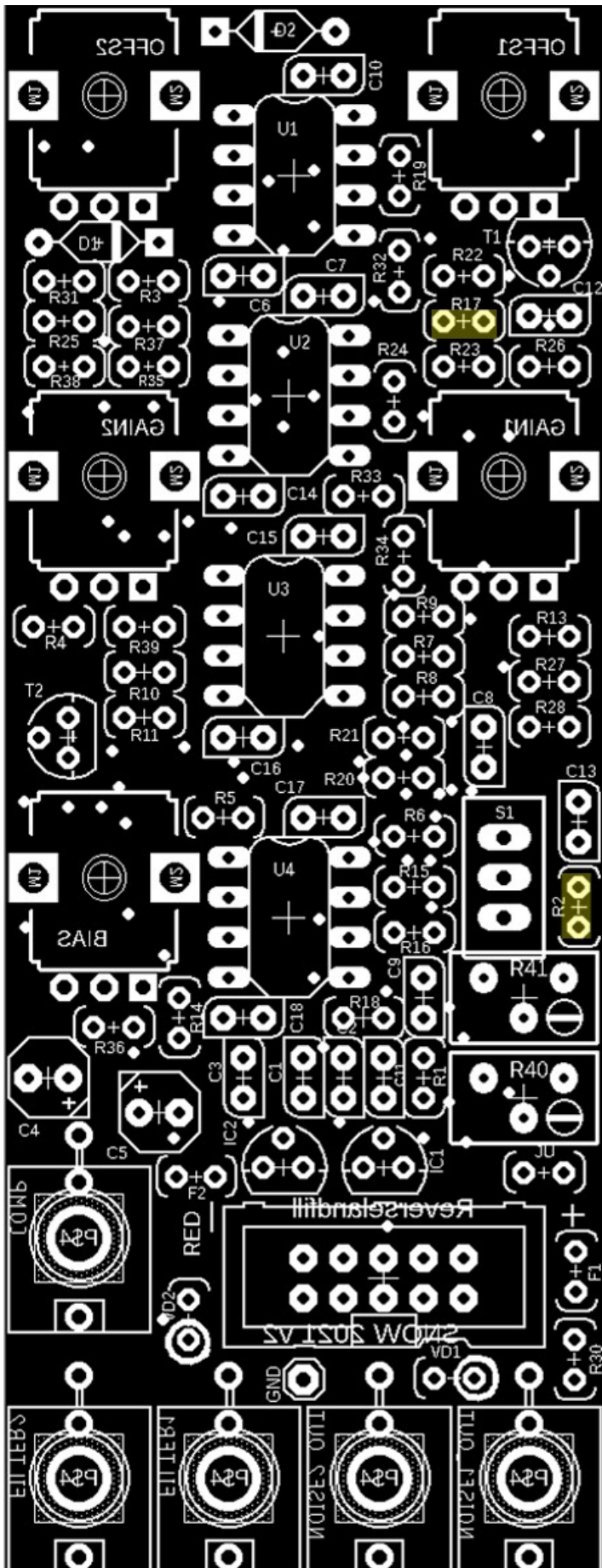
20K: (5x) r34, r35, r36, r37, r38



30K: (1x) r28

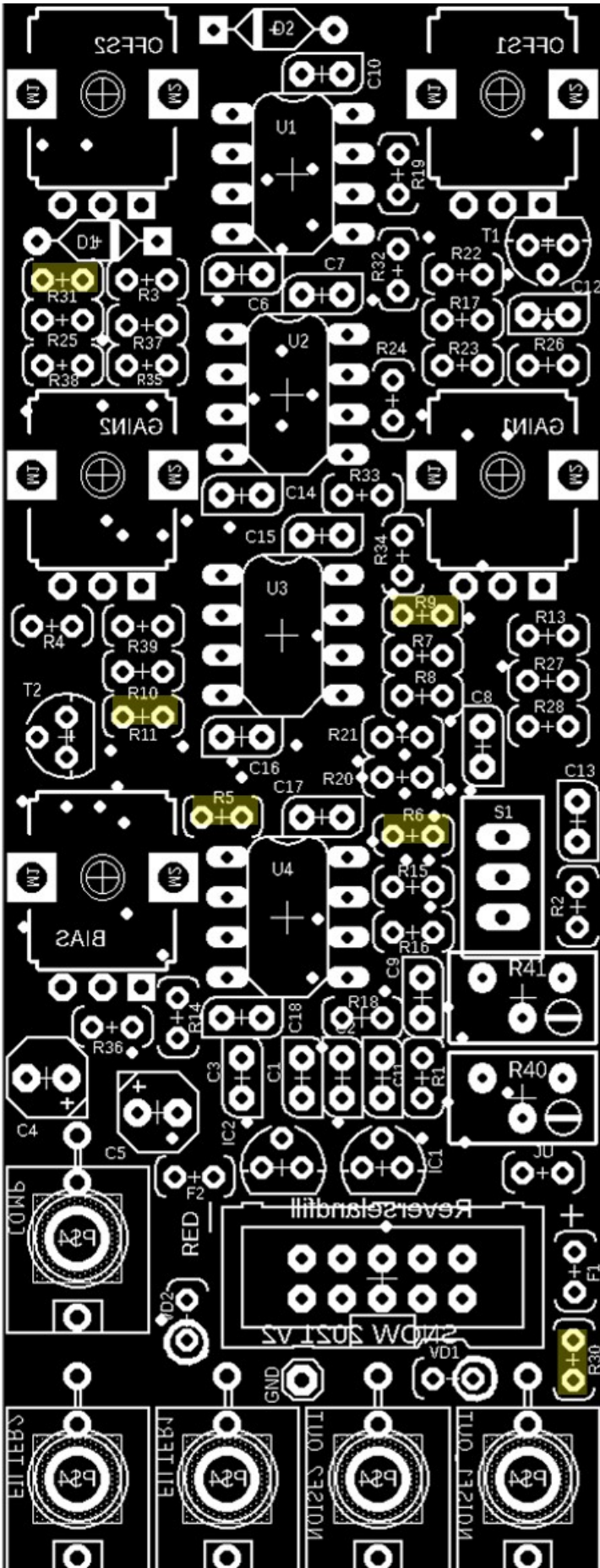


100K: (2x) r2, r17





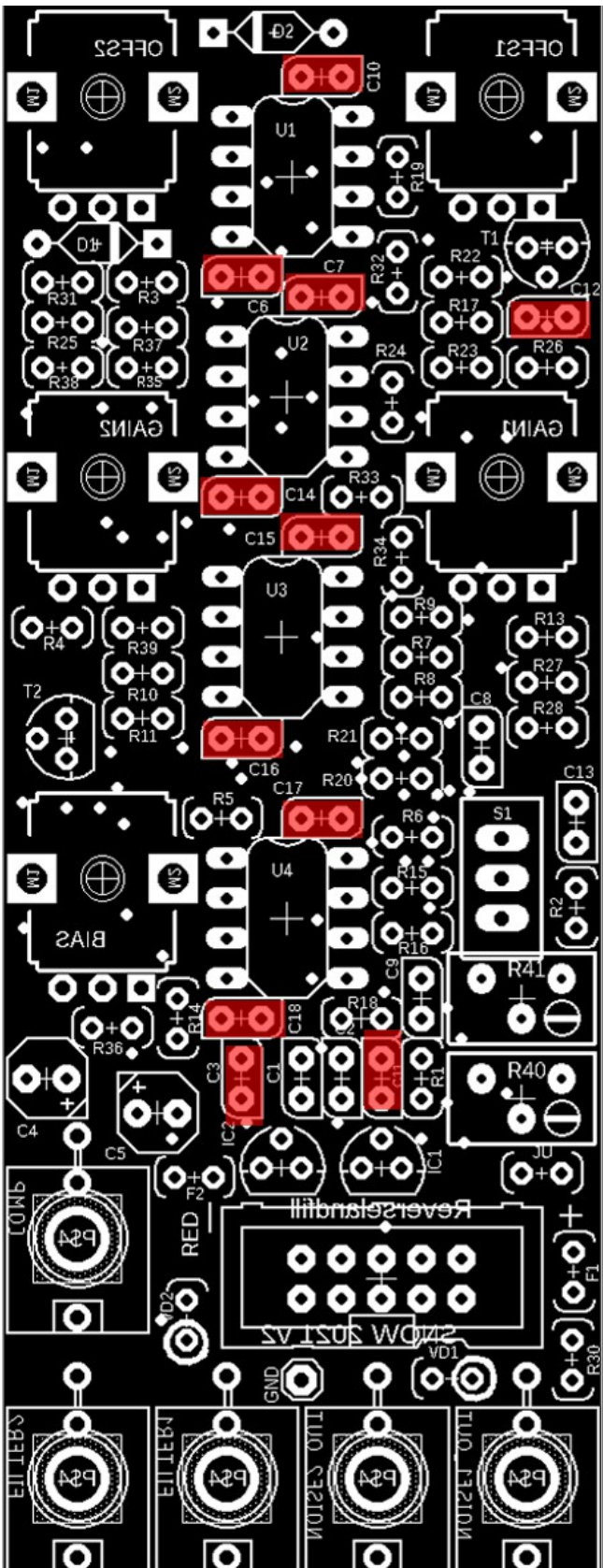
499R: (6x) r5, r6, r9, r11, r30, r31



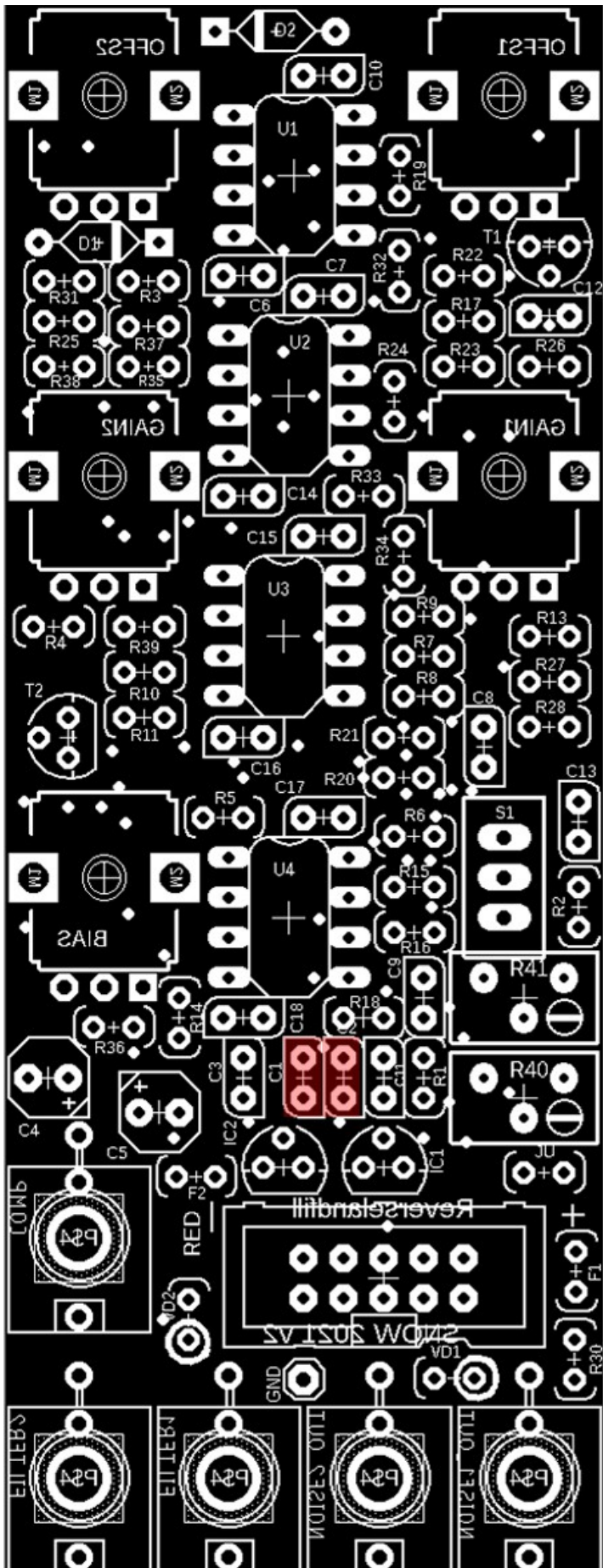
**Small capacitors:**

The yellow 100nF capacitors in the kit are also mounted “standing up”.

**100NF: (11x) c3, c6, c7, c10, c11, c12, c14, c15, c16, c17, c18**



330NF: (2x) c1, c2



**1nF: (2x) c8, c13**

**47nF: (1x) c9**

**Diodes and ferrite beads:**

The 1n4001 diodes are mounted “standing up”. The white circle on the pcb must match the line on the diode. Place the diodes at VD1 and VD2. Place the ferrite beads “standing up” at f1 and f2.

**Transistors:**

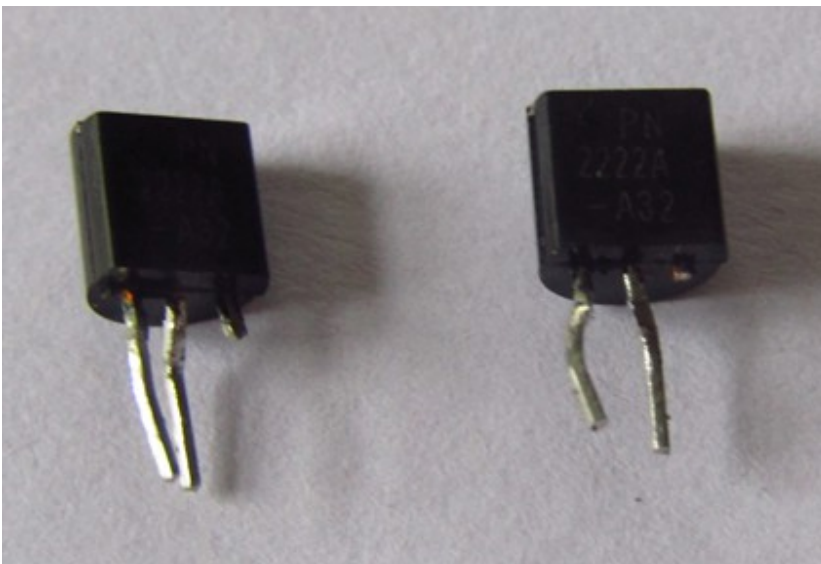
There are 4 transistors in the kit: 7805, 7905 (which are voltage regulators) and 2x 2n3904 (these are the noise sources). The 2n3904 in the kit are tested for their noise amount and offset scale. If you build this module and buy the parts yourself, I recommend that you mount the noise transistors on female headers. Doing this, you can test several transistors to select the best ones.

T1 and T2: 2n3904 or 2n2222

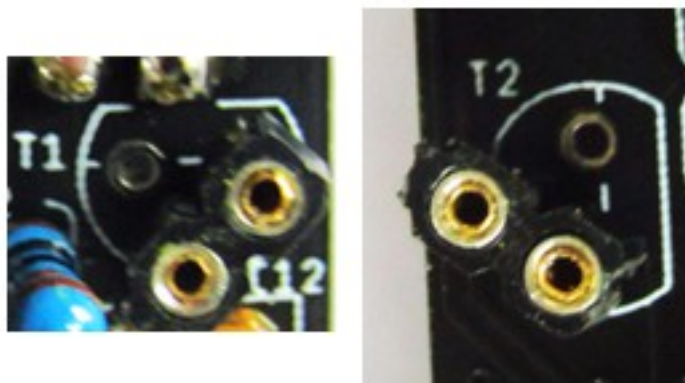
All transistors have different noise qualities.

**Mount method:**

Snip off the right leg of the transistor like this:  
Trim the remaining legs to about 5mm length.



Use a good 1x2 pin female pin socket and place it like this:



Insert the prepared transistors.

You can test the noise output later, when the module is ready.

Replace the transistors if the output is too gray or dark, or when the comparator output works incorrect.



When you have selected the perfect transistors, you can apply a bit of hotglue to hold them securely in place.

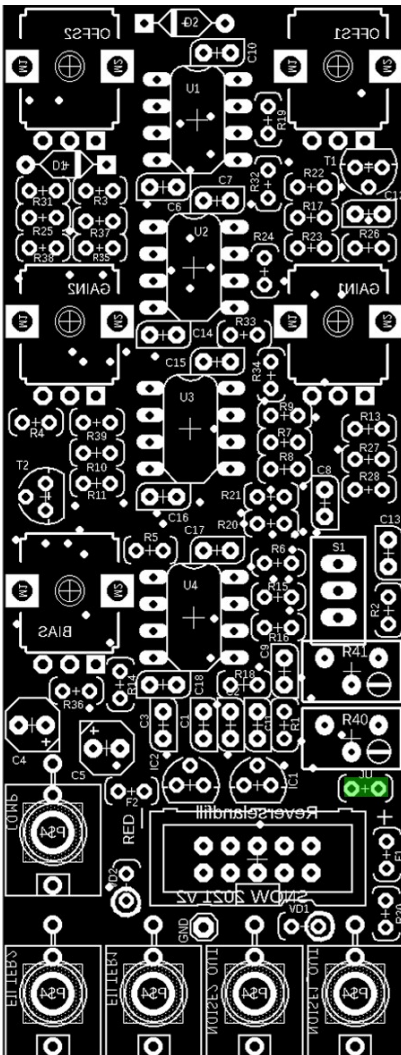
The next two transistors are voltage regulators. Make sure you solder them in the correct place!

IC1: 79L05

IC2: 78L05

**JUMPERpin: (1x) male 2pin header, JU**

Solder one pin and make sure the header is aligned correctly. Solder the other pin and install the female jumper.



**Trimpots:**

Mount the two 1k trimpots. Turn the pcb over and solder one pin. Check if they are aligned correctly. If not, reheat the pin and press then into place. Then solder the other pins.

**Powerheader:**

Place the 10pin shrouded powerheader . Make sure the open gap is facing down, towards the jacks.

**Big Capacitors:**

Mount the 2x 10uF electrolythic capacitors in c4 and c5 and solder them in place.

**IC's:**

Bend the legs of the LM6172 IC's so that they are in a 90 degree angle. Fit them into the IC sockets, while making sure the notch on the IC matches the marking on the PCB. Push the IC firmly into place.

You are done with this side on the PCB.  
Next: the pots, jacks and switch.

Place the pots, jacks and switch on the PCB. Install one of the nuts on the switch.  
Now place the panel . Install one nut on a pot, turn the PCB over and solder one pin of each pot, jack and switch.  
The switch pads can be hard to reach, make sure you don't melt the trimpots!

Now check if the pots, jacks and the switch are aligned correctly.  
If so, solder the rest of the pins.

Mount the rest of the nuts and turn all pots fully CCW. Install the knobs.

And you are done!

### **Testing:**

Before powering the module, check if you have installed the female jumper, that all IC's are facing the correct way, that the polarised parts are place in the correct direction.

### **Trimpot adjustment:**

Turn both trimpots fully CW, and then two turns CCW. This is the rough setting. We will do the finetuning later!

Place the module in your video rack and power it up.

Turn all pots (except for the comparator fully CW and check output 1.  
(by patching it to an RGB Encoder)  
Look at your video Monitor. You should see noise.

Trimpot 1 (the lower) sets the gain of Noise1. Adjust the trimpot so that you see dots of noise in several shades of gray.

Trimpot 2 (the upper) sets the gain of noise2. Noise2 has a different look, wider dots / short lines. Adjust the trimpot in the same manner.

Note: there is no wrong setting, so choose what you visually like. You can always change it later!

Note2: if you have mounted the noise transistors on headers, this is the time to select the best transistors. If the image is too dark or too grey, select another one!

The noise outputs should look something like this: (with the offset pot at about 12 'o' clock)



**MODDING:**

The jumper is a place where you could place CV control over the comparator offset.  
See the schematics for more detail.

Filter setting can be adjusted. You could even make a bandpass filter if you switch the capacitor and resistor at the filtered output locations.

Experiment with other filter settings at these locations:

**Noise1 source filter:**

c13 and r28

**Noise1 filtered output:**

c8 and r14

**Noise2 source filter:**

c12 and r26

**Noise2 filtered output:**

c9 and r18

**This project is Open Source.**

You can use the schematic to make your own boards, but please:

-Mention my name "Reverselandfill" or "M.Verhallen"

-Only do non-commercial runs. Private use only.

[www.reverselandfill.org](http://www.reverselandfill.org)

email: [martijn@reverselandfill.org](mailto:martijn@reverselandfill.org)