

3x CV Comparators PCB v6 Build Guide

For the Gijs Gieskes 3TrinsRGB-1c
M.Verhallen 2023

Each Comparator channel (total of three) has 2×1 signal input, 1 CV input, 1 bias potmeter and 2×2 outputs (positive and negative result)

The module is powered by the 3TrinsRGB patchbay. (HIGH and GND)

The module is designed to accept Eurorack CV voltages. (+10 volt envelopes and -5v +5v LFO signals)

Negative voltages will be clipped and the input voltage is scaled to 0 to 2.5v.

This new version (v6) has a 8HP black panel and a large pin patchbay for easy patching.

The CV inputs are normalised to the next channels, so you can control all three channels with one CV input patched, or each channel separately with all channels patched.

The HIGH and GND patch points can be used to link several Triple Comparators or other expanders, or for certain patch uses.

Features:

3x Bias potmeter

3x CV jack normalised downwards

patchbay with 2×3 inputs, 2×6 outputs, 3x HIGH, 3x GND

Specifications:

Power usage: powered by the 3TrinsRGB1-c

Reverse polarity protection

8HP Black panel

Depth: 25mm

Signals: Video and CV

Resistors:

5k1 : R1, R2, R3

1k: R4, R5, R6, R7, R8, R9

10k: R10, R11, R12

100k: R17, R19, R21

47k: R18, R20, R22

Diodes:

Then solder the 3x 1n914 (d1, d2, d3) diodes and the 1n4001 (d4) Check the orientation! Black stripe goes on the white stripe of the pcb

Capacitors:

The c1 100nf capacitor helps stabilising the power to the 74HC14 IC.

The 10uF c2 is also for the power, I use a small 16v electrolytic.

The 10uF long leg is the PLUS, see markings on the PCB.

IC socket:

Take care of the orientation!

The socket has a notch that has to correspond with the PCB marking.

Solder the IC socket. First two opposite pins. Then check if the socket is flat to the pcb.

If not, heat the soldered pins and push the socket to the pcb. It should click flat to the PCB.

Transistors:

Solder the 3 transistors. (t1, t2 and t3). Take care of the orientation markings.

These components are heat sensitive!

First solder one leg of each, let them cool a bit and continue with the rest.

IC:

Bend the legs of the IC on a flat surface, so that the legs are in a 90 degree angle.

This way the IC will fit into the socket. Beware of the orientation! (The notch)

Push the IC carefully but firmly into its socket.

The other side of the PCB:

Potmeters:

Place the 3x b10k (or b20k) potmeters, don't solder yet!

Connectors:

Place the 3x thonkiconn jacks, don't solder yet!

in1 (cv1), in2 (cv2) and in3 (cv3)

Pinheaders:

Place the 2x 12x1 pinheaders, don't solder yet!

Panel:

Place the panel and fit a nut over the middle potmeter to keep the panel in place.

Stick a piece of cellotape over the rectangular pinheader hole. Push the pinheaders in so that the top ends stick to the tape. Make sure they are aligned correctly.

Now solder 2 pin of each pinheader (on both ends, so pin 1 and pin12)

Remove the tape and check if the alignment is good. If not, you can correct this by heating the soldered pin and move the header until it straightens.

Now solder the other pins.

It sometimes helps to snip off the already soldered pins. This will allow for more reach with your soldering iron.

Solder 1 pin of all the potmeters and jacks. Then check if they are all aligned to the pcb & panel.

Now solder the rest of the pins.

Fasten the nuts of the pots and jacks.

Testing:

Power:

The compator PCB has to be powered by the 3trinsrgb-1c.
Patch the HIGH to the HIGH, GND to GND

Note: the Bias potmeters have a wide range. Set the knobs to the middle position and make small adjustments from that point.. The effective range depends on the patch you make.

Patch examples:

Connect slow envelopes or LFO's to the CV inputs and try these patches:

video 2 shape:

vid to in1, output to RCV or GCV or BCV

color bar displacement:

F01a to in1, output1a to Rsin, output1b to GCV (lfo range switch to the right)

wobbly mirror:

Rout to in1, output1a to GCV.

F01A to RCV Bout to in2, output2a to GCV.

F01B to BCV Oscillator

TYPE switches to the right.

LFO RANGE switch to the right, LFO TYPE switch in middle position.

Set all pitch knobs to low rate vertical, lfo to slow triangle wave.

For extra fun, patch out1b to G

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.

External PCB to module sales are not allowed (and ethically questionable.)

Credits:

CC-BY-SA

Part of the module was inspired by the schematic of G.Gieskes (used with permission)
and voltage control tips by L.Larsen

The rest of the design is by:

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