nonlinearcircuits

1U Signum Build & BOM

Please read the building instructions on page 2 before putting this together.

In the simplest sense, this is a switching module. It is a little different though because it has 3 states rather than just on/off:

$$\text{sgn}(x) := \begin{cases} -1 & \text{if } x < 0, \\ 0 & \text{if } x = 0, \\ 1 & \text{if } x > 0. \end{cases}$$

In this case, the module uses approx 1V, rather than 0V, as the switching point, so that it can be controlled by gates. It is simple to bring it back to 0V for those who think it should be. Also the '0' state is really a result of the diode voltage drops rather than any circuit design trickery, but if it was not there this would not be a signum circuit.

The signal on the bottom input is fed to the switch of the Switch jack (oh yes) so the incoming signal can switch itself without any help.

The three states actually mean there is a flat spot at the switching point, so the circuit can be used for audio but at slow rates there is a click, so it is far better suited for CV processing.
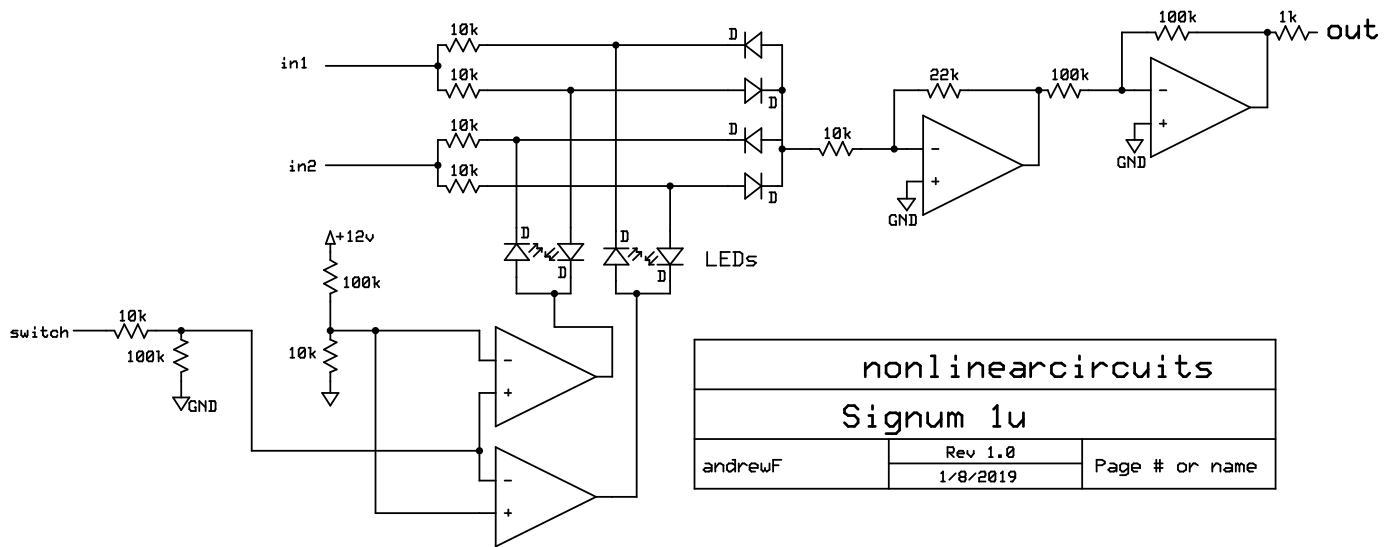
This circuit originally was used as the nonlinear element in the Primal Hyperchaos and two of them in the Hyperchaos Deluxe. I quite like it on its own, so the Signum Hyperchaos brought the signum section to the panel where it could be used as a stand-alone module. This version drops the chaos and just has the Signum. The switching is done by diodes rather than a dedicated IC.

Please note, the PCBs only have eurorack 10 pin power connectors, not the Pulp Logic 3 pin type.

BOM

Component	quantity	notes
Eurorack 10 pin power connector	1	Tayda: A-198 cut to size
Schottky, power rectifier or 10R, optional – for reverse voltage protection...or not. BAT54GWX	2	SMD, Schottky **dot on PCB indicates CATHODE (stripe on component)** Mouser: 841-BAT54GWX
3.5MM SOCKET Kobiconn style	4	Tayda: A-2563
2.54mm single row pin header strip	2x 3 pins	Tayda: A-197 cut to size
3mm LED	4	
LL4148 diodes	4	Tayda: A-1213
TL074 or TL084	1	Soic Tayda: A-1140
1k	1	0805
10k	7	0805
22k	1	0805
100k	4	0805

Other sources for sockets are Synthcube, Modular addict and Thonk.

nonlinearcircuits		
Signum 1u		
andrewF	Rev 1.0	Page # or name
	1/8/2019	

Building

1. Attach components to top PCB (resistors, IC, power connector etc)
2. Solder two 3 pin connectors to bottom PCB, check pictures on next page to make sure they go on the correct side
3. Attach jacks and LEDs to bottom PCB, mate it with the panel and screw on the nuts for the jacks.
4. Make sure the PCB and panel are nicely aligned then solder on the jacks, BUT DO **NOT** SOLDER ON THE LEDS.
5. Attach the top PCB, guiding it thru the LED legs then onto the 3 pin connectors.
6. Solder the 3 pin connectors.
7. Check the LEDs are pressed against the arrow shaped windows on the panel. They should be resting on the arrow heads. Solder the LEDs to the top PCB. Don't bother soldering the LEDs to the bottom PCB, no need.

SIGNUM