NONLINEARCIRCUITS

FILTER PANEL USER GUIDE VERS. 1

Usual Stuff:

Blue jacks are inputs

Red jacks are outputs

Red wire +12V, Black wire 0V, Green wire -12V

IT'S 555...

This is a set of five 555 based one shot circuits. Each has CV and pot controlled pulse width and the pulse for each can be set up by pot to be negative going or positive at any desired amplitude, or off when the pot is set to the centre. The circuit is supposed to be driven by a signal from a VCO. This enables the creation of five pulses that can be individually manipulated to create a complex and harmonically rich waveform. A slower clock signal will give clicks and glitches (A voltage controlled glitch module….you *are* lucky). As the pulse-widths can be individually controlled (or controlled en masse by "CV all"), this waveform can be continually can be continually morphed to get new sounds.

When the 5 pulses are quite thin the effect is similar to that of a resonator. The controls allow a wide range of pulse width (0-100%) so fatter, thicker sounds can also be created.

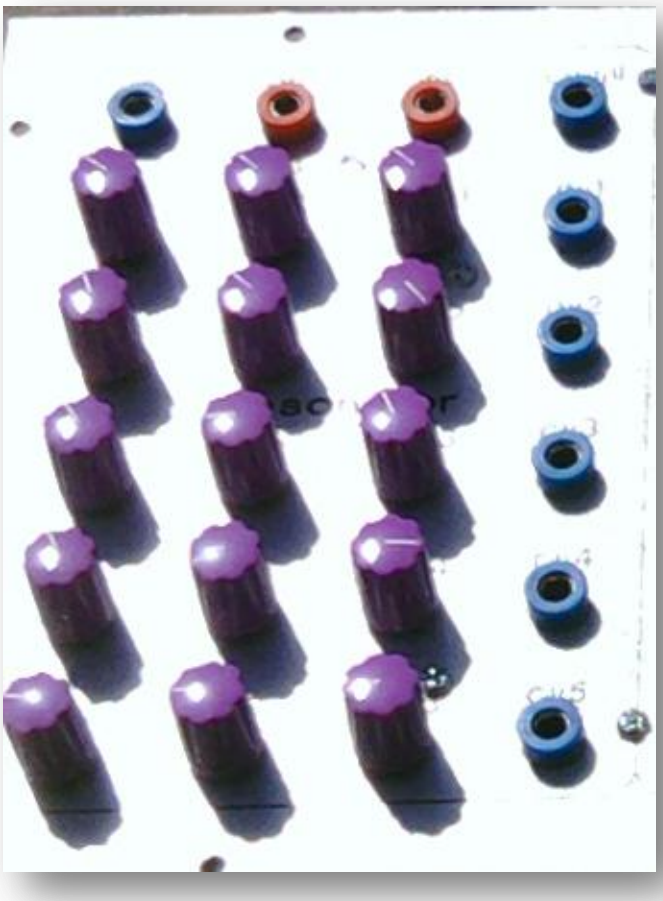
Depending upon the pot settings, this module will oscillate without any input. This means it can be used as a voltage controlled noise source and a voltage controlled drone module. Some settings of the "init1" pot will stop this oscillation and lock up the module. Connecting a signal from a VCO to the input will get it cycling again.

This video gives a demonstration of how the pulses can be adjusted. This was an early version of this module and only two of the five stages were capable of the wider pulse-widths. The current version allows all stages to have the 0-100% range.

http://youtu.be/6euYTx8Tg8w

To use this module is simple. Connect the output (inverted or regular) to a mixer and have a listen. Tweak the pots to hear how the sounds change. Connect LFO or other CV signals to some of the CV inputs and listen some more. The "env1-5" pots control the effect of CV signals. The "init1-5" pots set the pulse widths. The "amp1-5" pots set the amplitude of the pulses from-5V to +5V, so at the midpoint the pulse will be zero, effectively off.

Connect a signal from a VCO to the main input, control the VCO with a CV signal and listen to the output of the “it’s 555…”. It will track the VCO very nicely.



BLEEDING GATES

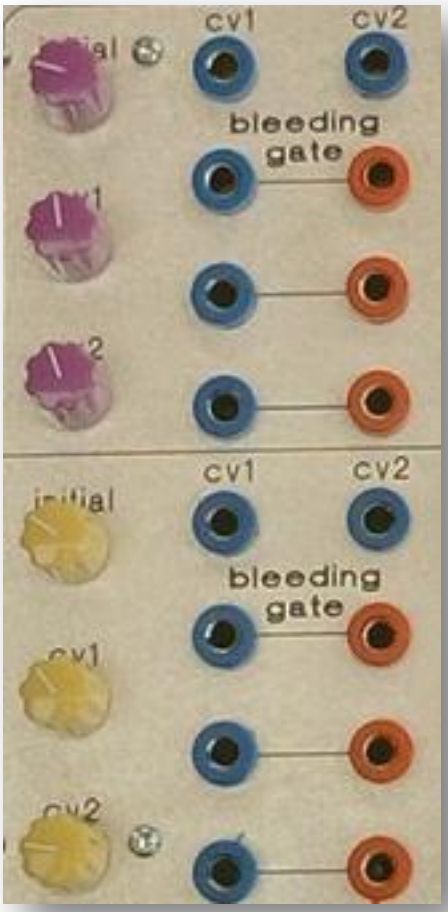
There are two separate Bleeding Gates on one PCB. Each has two CV inputs, an initial level pot and three channels to pass signals thru. All three channels are controlled by the same CV and initial pot controls, but the channels are otherwise independent of each other.

Simplest way to view it is one module has three VCAs and all three are controlled by the same CV and pot settings. As the name implies they are not particularly good VCAs, the output signals ride on the CV voltages quite nicely, it haemorrhages CV. This is considered a feature to exploit rather than a situation to avoid. There are plenty of good VCAs in the world, so it seemed a good idea to make a module that has the characteristics good VCAs don’t. It *can* be used as a VCA, if you want to.

Try using it as a CV processor, feed the three outputs from a Jerkoff into the three signal paths and then use a LFO or EG as the CV source. Maybe feed one of the Bleeding Gate outputs into its own CV input and mult it to the input of the Jerkoff. Use the other outputs to CV your VCF or VCO.

It can also be used as an audio processor. The audio rate signal on the CV input will AM (amplitude modulate) the audio on the signal inputs.

To be honest, I am still learning to use this module, it is crude (it almost qualifies as a Lunetta circuit) but quite unique. It is based on two archaic CMOS 4009 hex buffer/inverter chips. The 4009 differs from other inverters as the amplitude of the output is controlled by the voltage on the Vcc pin, this voltage is set by the initial gain pot and the CV signals applied to the module.



DOUBLE JERKOFF

A Dual chaos module based on the jerk circuits developed by Prof. J Sprott. The pots really do control the amount of jerk and wiggle in the output waveforms. The input signal can be anything you like although audio rates will have little effect (try tho, it won't hurt) Feeding it gates or triggers will get the output signals to sync with other modules. The tightness of the syncing is controlled by the input

pot. The modules self-oscillate at most pot settings, so can be used without applying any input signals at all.

It is very easy to use this module, try it as an interesting and complex CV source. Good for controlling cutoff on VCFs, VCOs and mixing with envelopes to liven up a patch.

They are built to oscillate at approx. 2.5Hz when the pots are set to their midpoints, this frequency can be varied up and down depending upon the pot settings and input signal.

This video shows how the Jerkoff responds to different input signals, it can be seen that the rising edge of the input signal has the greatest effect upon the circuit. You can also see how different the outputs are to each other.

http://youtu.be/opmle8adHrs

This video shows how the jerk and wiggle of the output signal can be controlled and demos the Jerkoff in use with a VCO and VCF.

http://youtu.be/xQ48O4yjtME

SPAM FILTER

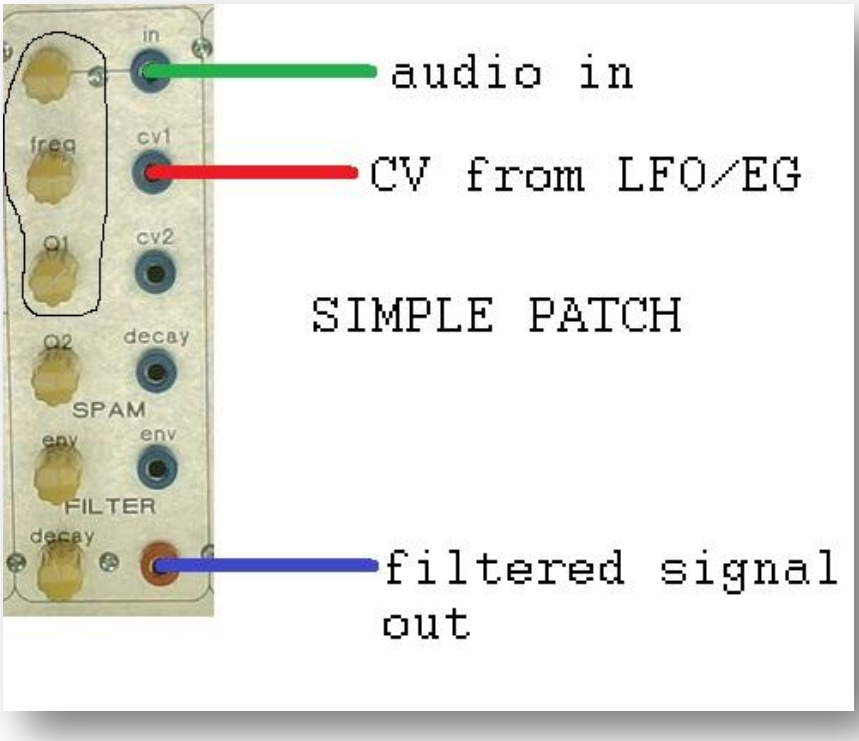
This is a variation of the TB-303 transistor ladder VCF, which, of course, can trace its pedigree back to the Moog version. The spam in the title refers to the ubiquitousness of this filter type.

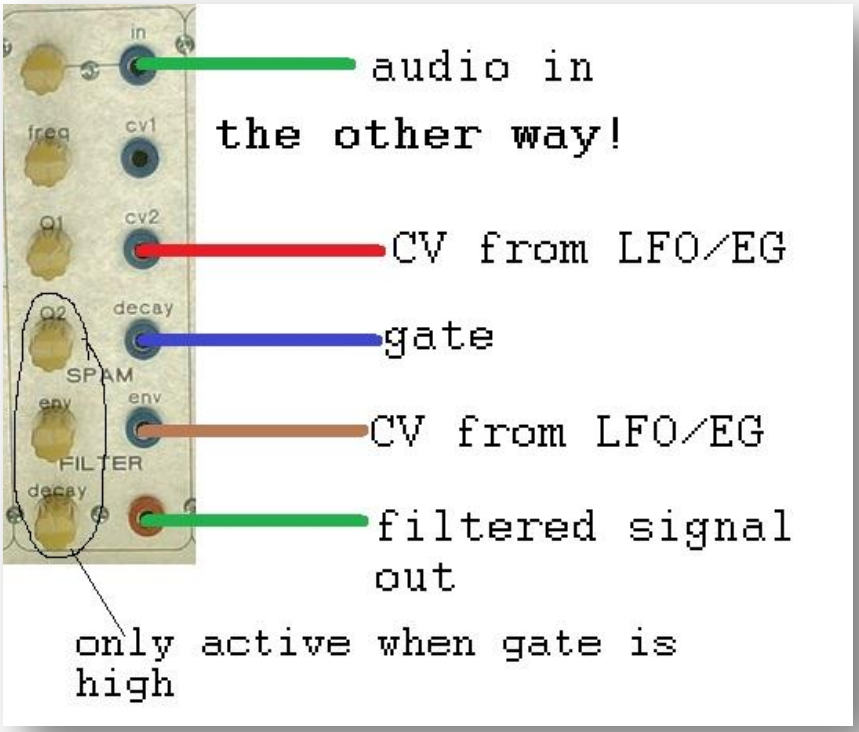
There are two ways to operate it:

Simplest is connect an audio signal to “in”, adjust the input level pot to suit. Adjust “freq” and “Q1” pots to get the sound you like. Insert a CV signal into “cv1”.

The other way to use it is connect an audio signal to “in”, connect a gate signal to the decay input, one of the gate outputs from the bindubba1 sequencer is perfect for this, otherwise it expects a large signal, say from an EG, over 5V. Connect CV signals, such as envelopes, from LFOs or from the Jerkoff to “env” and “cv2”. When the gate signal on “decay” is high the Cv signals on cv2 and env will affect the cutoff and characteristics of the sound, when the gate is low, these are ignored. Pot Q2 is also only active when the gate is high.

Of course, don’t be shy, please try variations of these patches. These are just given as starters, really you can patch in whatever you like!





αρπ FILTER

This is a pretty standard state variable VCF, simply a hybrid of the vintage Electronotes and ARP designs. There must be dozens or even 100s of variations of this filter in various synths. While the ladder filter, discussed above, is famed for its acoustic, almost organic sounds, this one is well known for sounding very electronic and synthetic.

It will happily self-oscillate and can be used as an oscillator if desired.

It is very simple to use, two audio inputs, with attenuators, two CV inputs, with attenuators to control cut-off, band-pass and low-pass outputs. It is not so easy to set the Q and freq pots as the circuit is very wide ranging and these pots also double to tune the module as an oscillator. A delicate touch is required, screwing these pots back and forth WILL hurt your ears and speakers, this module really screams.

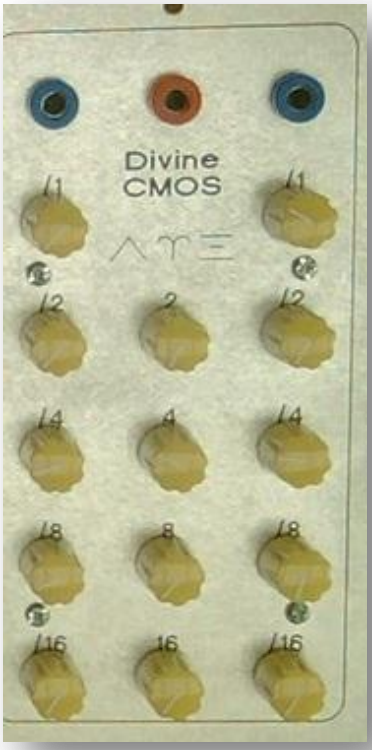
DIVINE CMOS

This circuit takes two input signals and divides them down by /2, /4, /8 & /16. It also XORs the two signals and all of their divisions. All of these signals can then be mixed to create the output waveform. If this is done at audio rates the output is very thick and full of shifting harmonics. If it is done at LFO rates, the output is a complex pattern that can be used as a CV source.

To sum up, it is a dual sub-oscillator, harmonic divider, harmonic ring-modulator and pattern generator.

The best effect at audio rates is to get signals from 2 VCOs that are beating – running at almost the same frequency…but not quite. This gives a continuously shifting and active sound. As the input signals are divided down to /16, it is best to run the VCOs at higher frequencies than usual to be able to exploit all the available divisions.

To use as a pattern generator, connect two gate/trigger/LFO signals to the inputs (or just one – it will still work, but 2 is more interesting). Connect the output to a VCO and adjust the pots to find patterns that will be somewhat unpredictable but quite fun to use.



Feel free to make suggestions on how to improve this guide or ask questions if anything is unclear/poorly explained/glossed over or obviously bullshit

Andrew

Nov 2012