



Dear customer,

Thank you for your purchase of the VCF303 eurorack filter module.

The VCF303 is a clone of the Roland TB-303 filter which also includes the envelope generator and accent circuit of the TB-303 in order to get an authentic sound. It also features CV control over the cutoff frequency and an overdrive knob for driving the input section.

While I'm sure many of you will be using this to make "acid" style sounds, don't forget to explore using it as a source of other patch types. I'm sure you'll be pleasantly surprised with the results.

Please take your time to read the installation instructions and to try out the patch examples.

Your module comes with 12 months free technical support for the original purchaser, just drop an email to [info@dinsync.info](mailto:info@dinsync.info) if you have any questions or problems.

Again thank you for your purchase, it's much appreciated. And don't forget to keep an eye on <http://www.dinsync.info> for the forthcoming OSC303MKII which will appear sometime in the very near future.

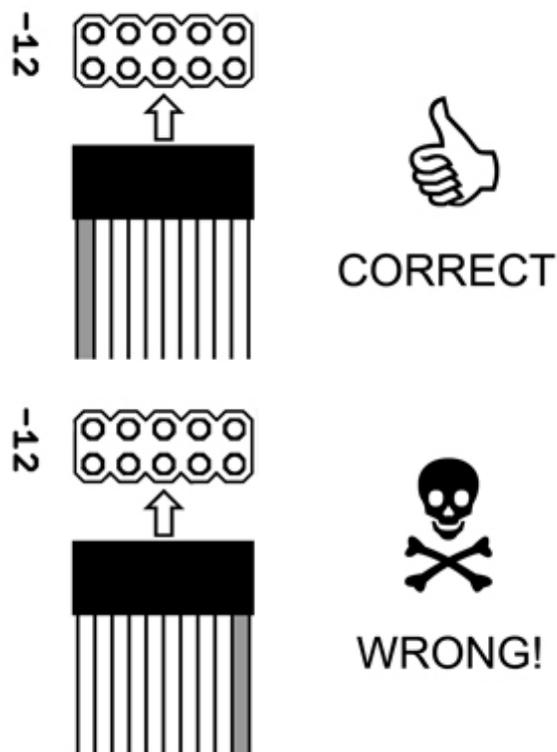
Paul

## Who reads manuals anyway?

I know right? but please at least read the installation and quick start.

## Installation

The VCF303 has reverse power protection, so plugging the power cable in backwards should result in no damage to the module itself. However plugging things in backwards is never a good idea and could potentially damage other parts of your system. The protection is there in case of plugging the power cable in backwards by accident, please still take care to check the orientation of the cable when connecting it for the first time.



*figure 1 - the correct and wrong way to connect power*

Before installing please power off your modular case. Connect one end of the cable to the module as shown in **figure 1**. Connect the other end of the cable to your modular case bus board, please check your case's manual for the correct orientation. The stripe on the cable should be connected to -12. After you have connected the power you can mount the module using the included screws, the VCF303 requires 12HP of cabinet space.

# Quick Start

While standard usage is pretty straight forward, please first set the overdrive and volume levels to zero. The reason for doing this is that the output with full overdrive and maximum volume is capable of very high levels which could cause clipping to anything after the module in the signal chain.

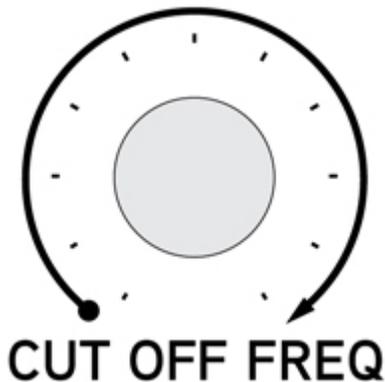
Next connect the signal to be filtered to the INPUT jack and connect the OUTPUT to your mixer or vca. Connect a clock input to ENV TRIG and/or AC-TRIG.

Turn the volume to about halfway and adjust the other controls (except overdrive) to taste. You should now be hearing that familiar rubbery liquid filter sound.

To get the most from your VCF303 please read the following sections which describe the feature set and their interactions with each other in more detail.



## Filter Section



The CUT OFF FREQ knob adjusts the cutoff point of the filter. Turning the knob to the right allows more high frequency content to pass, resulting in brighter timbres.

Turning the knob to the left closes the filter and less high frequency content is passed, resulting in duller timbres.

As on the original TB-303 it is not possible to close the filter completely from the knob alone.



The CV input jack allows voltage control of the cutoff frequency. Use this jack with LFO's or audio rate modulations. If you use an offset generator with this input you will be able to take the cutoff frequency beyond that of the TB-303. This will enable you to close the filter completely, or open it more than the standard range.

This jack is not attenuated, so in some cases, ie with an LFO it may be necessary to attenuate the signal before it reaches this input jack.

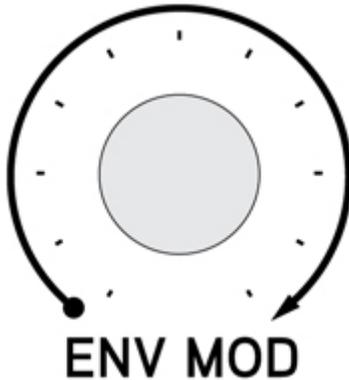


When the RESONANCE knob is turned up harmonics at the cutoff frequency are boosted.

As more resonance is added the overall timbre becomes thinner and more "acidic".

With little or no resonance the overall timbre becomes thicker and more chunky. Try some no resonance basslines with an OSC303 for some lush bouncy tones.

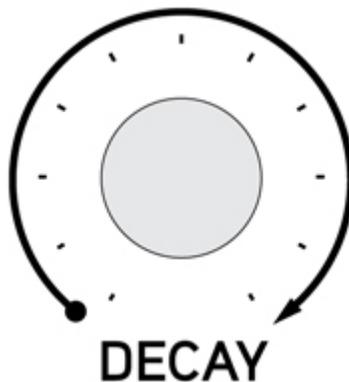
## Envelope Section



The ENV MOD knob controls the amount of signal from the envelope generator that reaches the CUTOFF circuit.

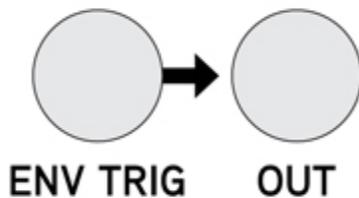
As with the TB-303 it is not possible to completely turn off the envelope modulation.

If this knob is adjusted without an envelope being triggered it will provide an offset for the cutoff frequency.



The DECAY knob controls the length of the decay of the envelope.

Due to the way the ACCENT circuit works, this knob will have no effect at all while an accent trigger is held. This is one of the quirks that give the TB-303 its signature sound.



Use the ENV TRIG jack to control when the envelope fires. For standard 16th note TB-303 style sequences this jack will work best when driven from a constant 16 pulse clock signal.

ie: a new envelope triggered for every new note played.

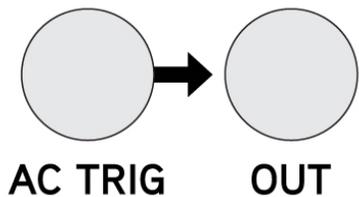
The envelope can be tapped at the OUT jack for other purposes, and the module could be used as a simple envelope generator.

**NOTE:** The front panel LED shows the envelope activity.

## Accent Section

The AC TRIG jack controls when an accent is fired. The accent works best when timed in conjunction with the envelope generator. When accents are triggered, the envelope decay is cut short (ie the decay pot no longer works).

To best understand the relationship between the accent and the envelope it's better to think of the accent trigger as controlling an internal switch which allows the shortened envelope to enter the resonance circuit.

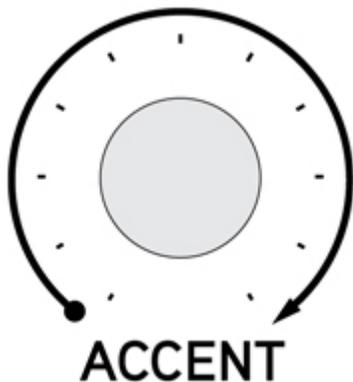


While the accent jack is high, the ENV DECAY knob will not have any effect.

Using short triggers on the AC TRIG will not work as well as timed gates. See **figure 2** for a description of how best to trigger this jack for standard basslines.

The AC TRIG jack is normalled to the ENV TRIG jack so that when nothing is plugged into the ENV TRIG jack, sending a pulse to the AC TRIG will trigger both the envelope generator and the accent circuit.

The OUT jack can be sent to an external vca to achieve the typical TB-303 volume increase associated with accents.



The ACCENT knob controls the amount of the shortened envelope that reaches the resonance circuit and the accent OUT jack.

**NOTE:** The accent output jack may need attenuation or boosting depending on the vca used. If you have a vca with only one input you can use a dc coupled mixer to combine your accent output with your adsr before it reaches the vca.

See the patch sections for an example of how to set this up.

Of course you don't need to use the accent out on a vca, you'll still get an accent sound but not the volume increase.

### The correct way to trigger accents



Envelope shape when triggered from clock pulse



Clock pulse



Envelope shape when accents are triggered with gates timed to the duty of the clock rate. ENV DECAY no longer works

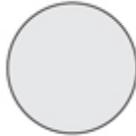
### The wrong way to trigger accents



Envelope shape when accents are triggered from gates or triggers that are too short. ENV DECAY partially works.

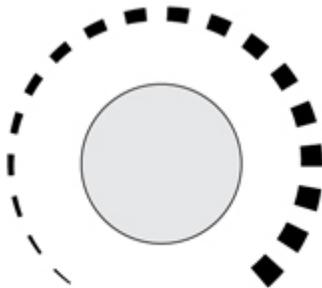
*figure 2*

## Input and Output Sections



INPUT

Connect the signal to be filtered to the INPUT jack. This works best with standard eurorack oscillators but will also work on any normal audio signal.

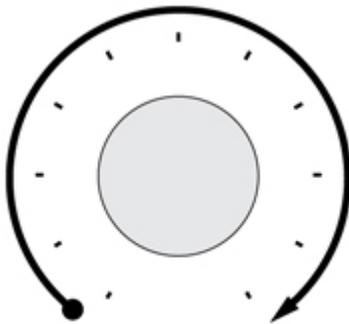


OVERDRIVE

The OVERDRIVE knob overdrives the filter input. The initial 40%-50% of its turn may be subtle depending on the level of the signal connected to the INPUT jack.

Once the overdrive starts to bite, the resonance is suppressed and the overall tone will have a more compressed sound.

**TIP:** a small amount of overdrive will lower the volume decrease associated with increased resonance levels on the TB-303



VOLUME

The VOLUME knob controls the overall output.

The VCF303 has a fixed output level and this knob is simply an attenuator.

**NOTE:** With a strong signal at the filter input, and with OVERDRIVE/VOLUME at maximum the VCF303 is capable of very high levels (up to around 20v peak to peak)

**Be sure to lower the volume level in these cases to avoid clipping to anything in the signal chain after the VCF303.**



OUTPUT

The OUTPUT jack carries the filtered signal, connect this to a vca or mixer.

# Patch Examples

## Basic Acid Patch

additional modules needed, OSC303 (or other oscillator), Sequencer, ADSR, VCA, Clock source.

Connect Sequencer cv out to OSC303 cv in

Connect OSC303 square or saw output to VCF303 input

Connect VCF303 output to vca signal in

Mult clock pulse to VCF303 ENV TRIG, Sequencer clock in and ADSR trigger in

Connect ADSR output to vca cv in

## Advanced Acid Patch

additional modules needed, OSC303 (or other oscillator), Makenoise, Rene, Brains+Pressure points (or equivalents), ADSR, VCA with two cv inputs or VCA with one cv input and a DC coupled mixer, attenuator or gain amplifier (optional), Clock source.

Connect Rene QCV to OSC303 cv in

Set Rene to snake mode (X FUN page)

Set Rene glide on (X FUN PAGE)

Connect Pressure Points top row output to Rene XMOD

Connect Pressure Points second row output to VCF303 AC TRIG

Optionally connect Pressure Points bottom row output to VCF303 CV (if you want sequenced cutoff)

Connect OSC303 square or saw output to VCF303 input

Connect VCF303 output to vca signal in

Mult clock pulse to VCF303 ENV TRIG in, Rene XCLK, Brains clock in and ADSR trigger in

Connect ADSR output to vca cv in 1 (if you only have a single cv input on your VCA then connect ADSR output to DC coupled mixer in and connect mixer output to vca cv in)

Connect VCF303 ACcent out to vca cv in 2 (if you only have a single cv input on your VCA then connect VCF303 ACcent output to DC coupled mixer in)

Depending on the sensitivity of your vca you may wish to place an attenuator or gain amplifier between the VCF303 ACcent out and vca.

Use the top row of Pressure Points to control sequencer glides

Use the middle row of Pressure Points to control accents

Use the bottom row of Pressure Points to control frequency cutoff (if connected)

## **VCF303 as Envelope Generator**

Connect trigger to VCF303 ENV TRIG  
Take envelope from ENV out  
The decay knob will control the length of the envelope.

## **Cross Modulation**

Using either the Basic or Advanced Acid patch, connect the unused OSC303 output to the VCF303 CV input.

## **Extended Cutoff Range**

Additional modules needed, Manhattan Analog CVP (or equivalent offset generator)

The VCF303 range is limited to the same as the TB-303. In other words it is not possible to completely close the filter. If you want to get an extended Cutoff range connect the CVP output to the VCF303 CV in.

Set VCF303 cutoff knob to 100%

Set CVP glide to 0%

Set CVP level to 50%

Use CVP offset to control cutoff frequency, you will now find you will be able to close the filter completely and open it beyond the standard range.

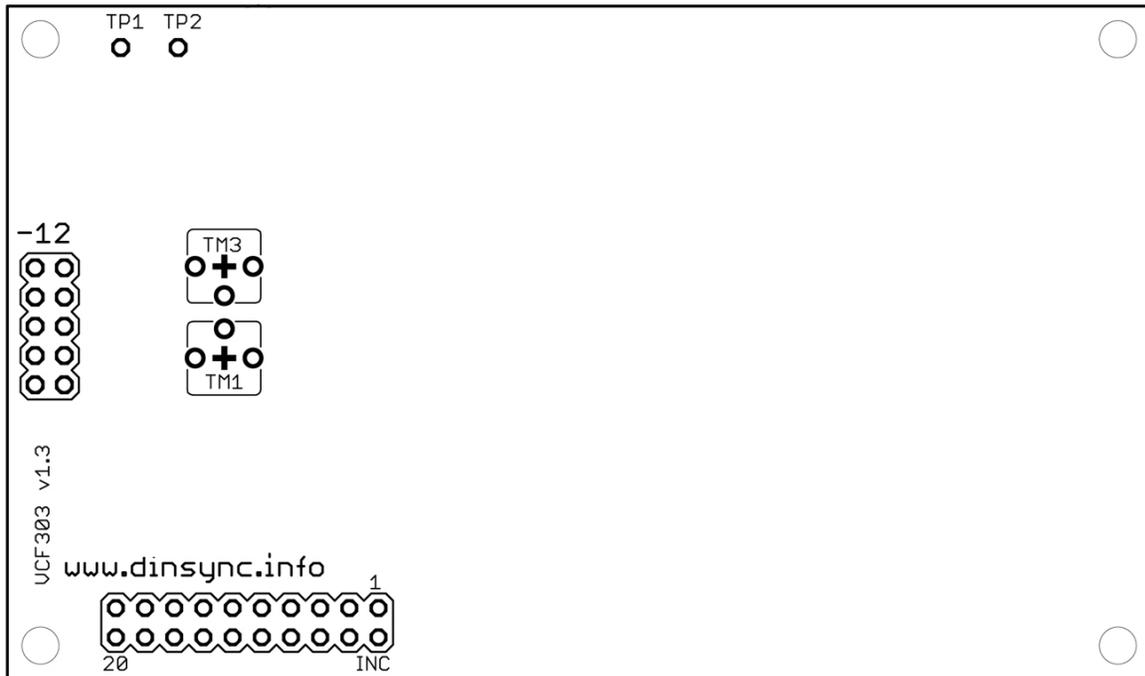
# Adjustment Procedure

Please read all of this section before attempting to adjust the modules internal trimmers, failure to do so may kill many tiny animals but could also potentially kill your module.

This section is intended for those with the necessary skills and experience with calibration adjustments. It is provided as a complimentary supplement and should not be attempted unless you fully understand what's involved. If you misadjust your module it may become quite unusable.

In order to correctly adjust your module you will need a digital volt meter and an oscilloscope.

The module has been adjusted and calibrated before shipping, however like all analog devices it may need adjustment in the future or after being in transit.



**figure 3 - location of trimmers and test points**

## Adjusting the reference voltage

The module creates its own reference voltage internally, this needs to be 5.33v.

- 1: First power up the module and allow to warm up for a few minutes at room temperature.
- 2: Get a digital volt meter and connect the red probe to **TP1** and the black probe to **TP2**.
- 3: The meter should read around 5.33v, if it does then you can skip the rest of this section. If not then carefully adjust **TM1** until you read 5.33v (or as close as you can get)
- 4: **\*WARNING\*** The trimmer is quite sensitive and it is possible to dial in over 10v so gently does it, we aren't responsible if you decide to cook your module with more than the recommended amount of 5.33v.

## Adjusting the cutoff center frequency

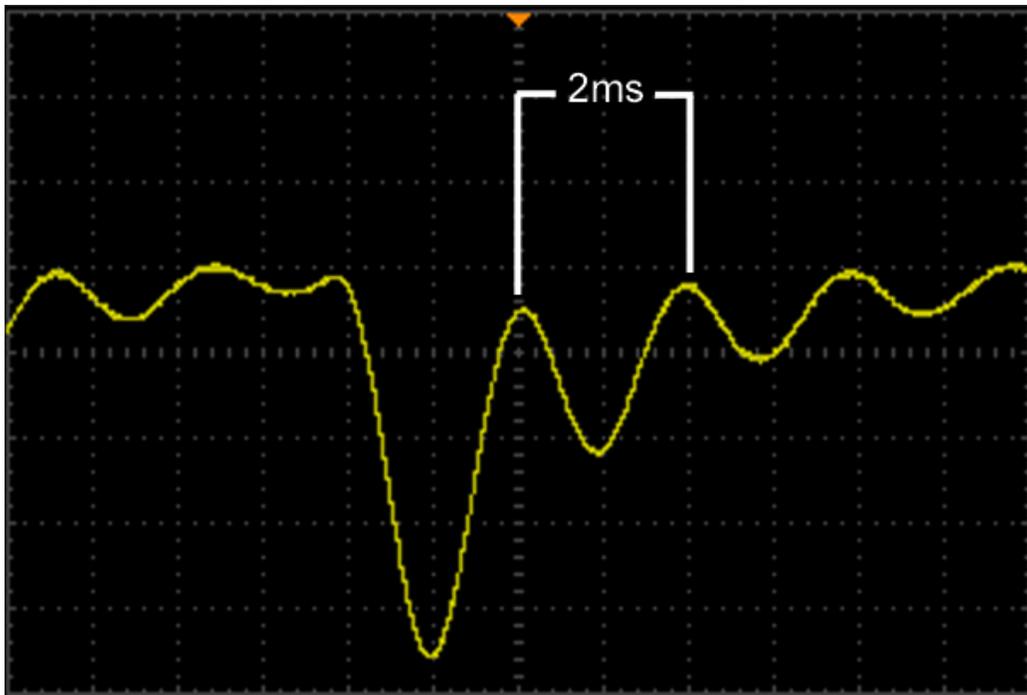
To adjust the center frequency of the cutoff. First turn all front panel controls to 0% and set cutoff to 50%, resonance to 100% and volume to 50%.

Connect a saw waveform (preferably an OSC303) tuned to 110hz to VCF303 INPUT

Connect a trigger to ENV TRIG

Connect an oscilloscope to VCF303 OUTPUT

While triggering the envelope adjust **TM3** to read between 1.8 and 2.0 ms on the first pair of resonant peaks. See figure 4.



*figure 4*

## Acknowledgements

many thanks go out to

Stephen Kwartler from <http://www.pro-modular.com> for the panel design.

Chris “Infradead” Lehfeldt for beta testing.

Additional thanks to Tony at Makenoise and Jason at Manhattan Analog for their permission to use their module names in the patch section of this manual.

## Specifications

Size: 12 HP

Depth: 38 mm (depth is measured from the rear of the faceplate to the edge of the supplied and connected power cable)

Power consumption: 20 mA (<20mA +12, <5mA -12)