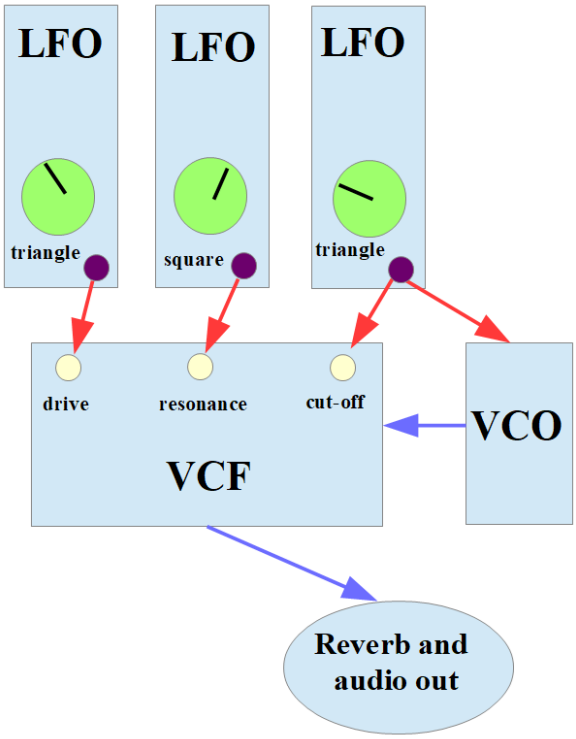
Chapter 2.2:
Timbre

Chapter 2.2.1:
Filters

Yes, of course filter. Simple. Common. Boring. No need to say a single word about it any more.
Really?
Let me start quite simple indeed. I take a VCO, feed its audio output into one filter, but modulate all three parameters (cut-off frequency, resonance and drive) with 3 different LFOs running at three different frequencies. I use the triangle outputs of two LFOs to modulate the drive and the cut-off frequency, but I use the square output of the third LFO to modulate the filter´s resonance. This third LFO runs at the highest frequency of all three LFOs. I sent the result through a reverb module to the main audio out. What I get is a continuously changing sound, nearly typical filter sweep, enriched by the asynchronous drive modulation plus some water drop like sounds here and there caused by the (square wave caused) sudden jumps of the resonence. The following graphic and the preset “filter_1.vcv” (presets are available in the e-book – see https://dev.rofilm-media.net) show the patch, and the video behind the next link demonstrate it a bit more.

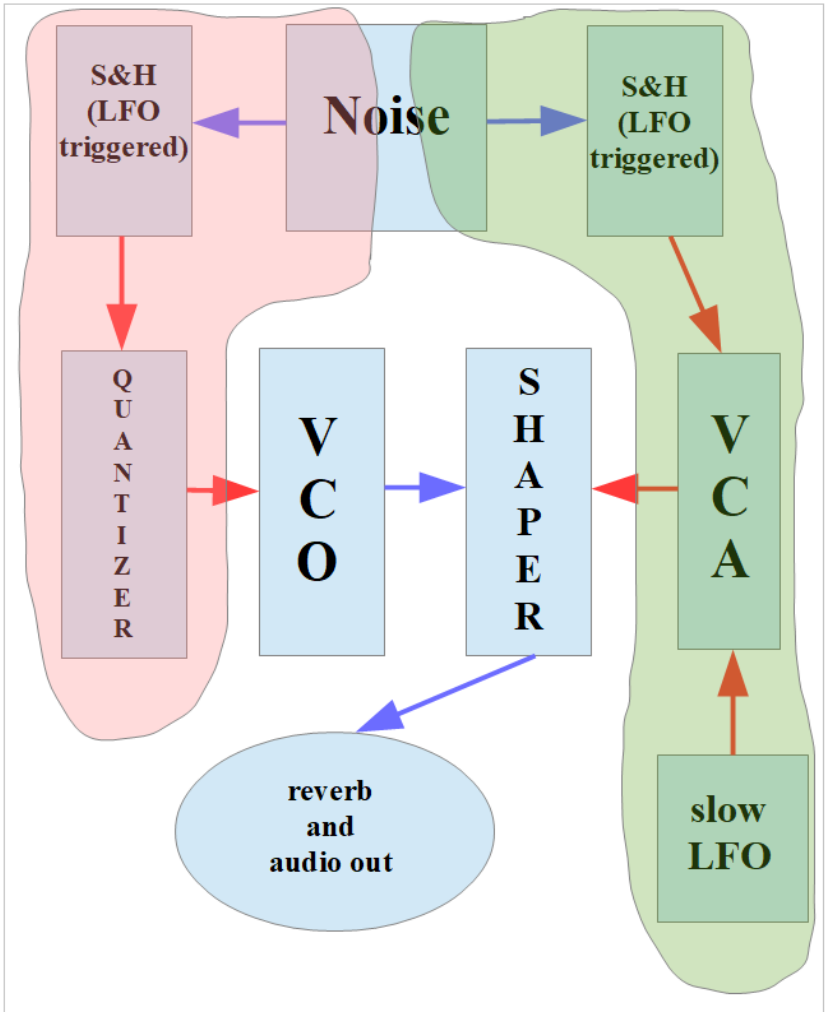


Even without the LFO-VCO connection the patch brings some quite nice reults (the “water drops” get more remarkable e.g.). And the preset “filter_2.vcv” may well serve as a “base camp” for developing sound scapes for a catastrophic film (with fire fighters and approaching aliens or so – well).
And like with all examples in this chapter 2: in “real live” you will modulate in far more complex ways using the networks and units from chapter 1.
There are quite a couple of specialised filters out there, and it cannot be the matter of this book to talk about all of them (in chapter five I´m going to introduce a few more though. So let me mention only the wide spectrum for formant like filters mimicking voice like sounds. The preset “filter_3.vcv” (presets are available in the e-book – see https://dev.rofilm-media.net) is an example.
The video behind the following link demonstrates all what has been said about filters in this chapter.
https://youtu.be/W_Vwt6OsYr8

Chapter 2.2.2:
Shapers

Let´s be honest: there are quite a lot examples of generative music, which get boring after some time (except for the producer of those pieces). And there are even theories out there in the www (wild world of weird things), that there must´n happen too many really different sonic goings on, and the changes shall be only smooth and between quite similar sonic events. Well, I don´t think so. And a well dosed application of wave shapers and wave folders can make a huge difference here, can set the accents, which “keep the listener awake”. When I said “well dosed” I mean the principle “less is more”.
The following example consists of two modulation paths, one of which fades a wave shaper in and out. The wave shaper itself is modulated by a sample and hold module. The process of fading in and out of the whole modulation path happens quite slowly here.
The other modulation patch creates a random melody, and is driven by a second sample and hold module.

And here is the whole block diagram:
The preset “shaper.vcv.” and the video behind the following link demonstrate the patch.
https://youtu.be/sYqZ701APp8



Chapter 2.2.3:
Partials (additive)

We can – of course we can – also modulate the onboard functions of a VCO. Some of them – often called "additive" VCOs – allow us to change the amplitude, the tuning and the phase of individual partials of the generated sound. I´m not going to explain the matter of additive synthesis, partials, harmonics, overtones, partial phase etc. in details here. This is a matter for filling a whole book. If you need help to understand what a partial in a spectrum does (or even: what it is!), please contact me. Otherwise I suppose you know at least the basic of additive synthesis.
And in the following example I´m going to modulate only the amplitude of certain partials in the spectrum of the VCO´s sound, because at least that is, what all of the so called additive VCOs allow us to do.
In general we can say, that modulating a lot of partials at the same time tends to result in quite chaotic developments of the resulting sound, structures which I´d like to call kind of "destructive" and contra-productive for the whole piece. More often than not it´s a good idea to modulate a certain partial or a certain group of partials together with the pitch of the module (sound), and in the same cycles (but not necessarily in the same direction, both up, both down etc). The preset "additive.vcv" and the video behind the following link use a quite exotic looking additive VCO, but you can use any other VCO, that allows you to modulate single partials or certain groups of partials (only odd, only even, partial 1-10 and partial 11-20 etc.).
https://youtu.be/U62bvCfEGcY

Chapter 2.2.4:
FM/PM

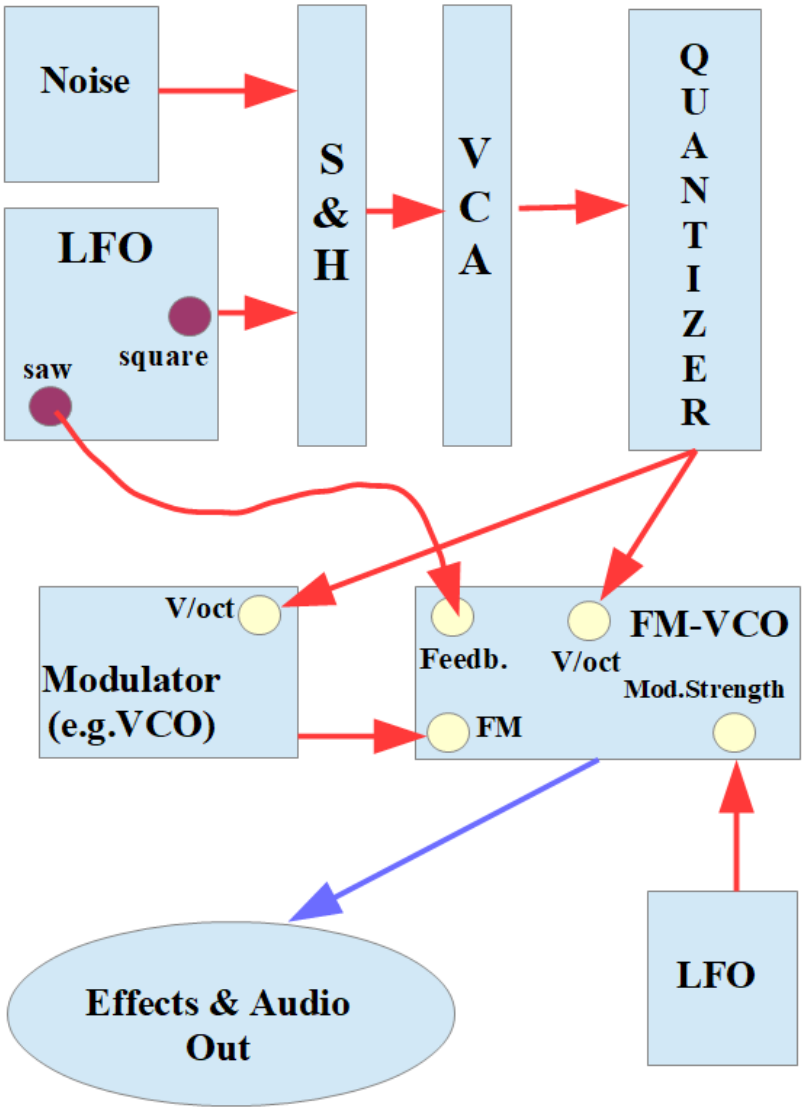
And again: I´m not going to explain frequency modulation and phase modulation in detail here. That matter should be covered in a book of its own. Those of you, who think they need some deeper and detailed information about it may watch my workshop series about it, first part here:
https://youtu.be/EPADttG4GK0

But some advice to make live easier (at least at the beginning) may come in handy. It´s a lot easier to get useful results when you modulate the pitch of the FM oscillator and the output frequency of the modulat**ing** module

the same way and at the same time. And be very careful with the strength of the modulation, which is equivalent to the output amplitude of the modulat**ing** module. Again: less is more. Some FM oscillators limit the modulation strength automatically, but most of them do not.
And a last advice: The feedback of the **modulation** (which will be a dedicated parameter with your module, not a patched feedback) works nicer and is more useful, when changed in jumps (e.g. coming from a quantizer or a sample and hold unit) or fed in only here and there, than changing it in **continuous** cycles (coming from a sine/saw or triangle LFO). Only when modulated with the same phase and frequency as the (quantized) pitch the results can be equally useful.

Well, and here is the diagram of the example, which is also represented by the preset “FM.vcv” (available in the e-book – see https://dev.rofilm-media.net) and by the video behind the following link.
https://youtu.be/3PnFQyfG9FA

The number of on-board parameters of those hundreds of different oscillator modules out there is legion. Let me only mention some more of the common ones, like pulse width modulation and hard-sync I´m going to talk about some more of these parameters in later sub-chapters here.



… to be continued