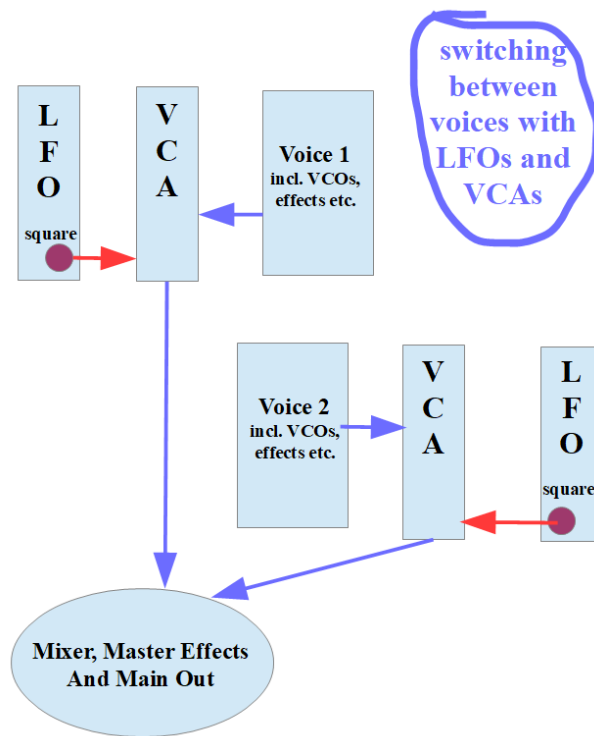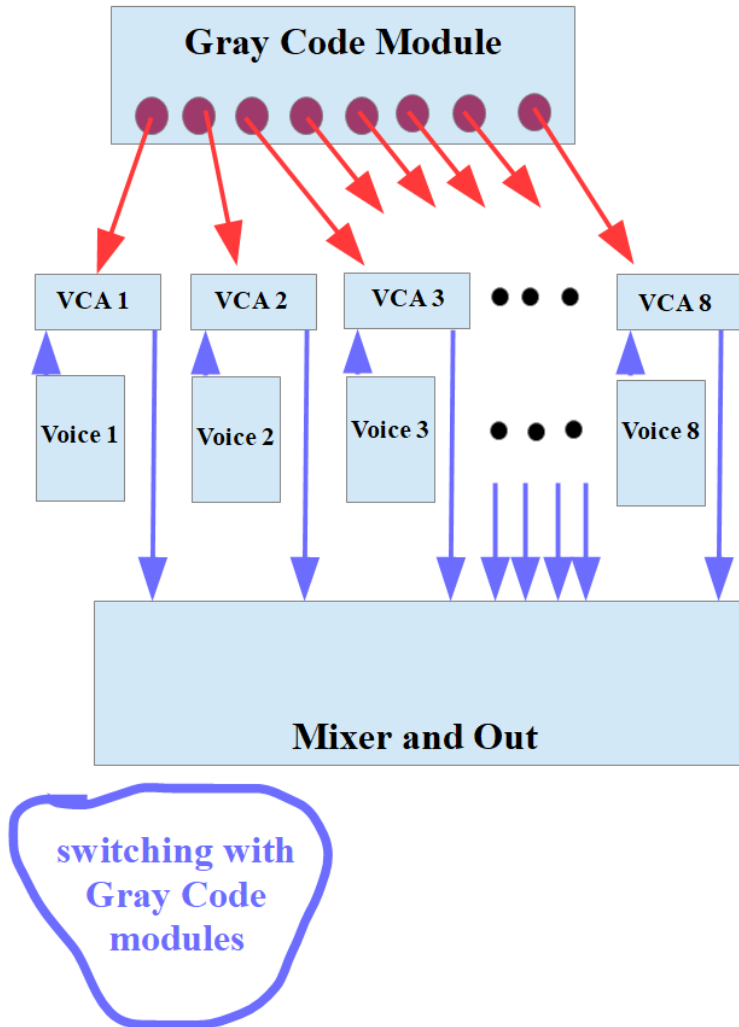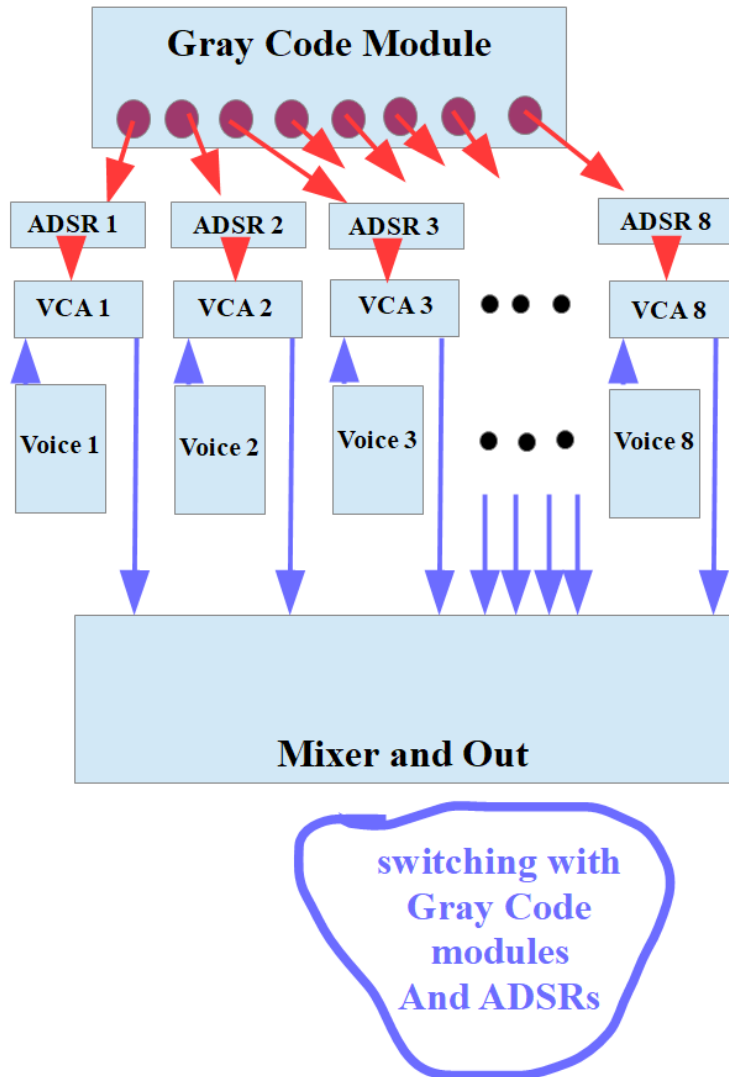# Chapter 2.3:
Voices

Another kind of modulating, of changing the whole development of a patch is switching on and off different voices. We can achieve this with a (square wave) LFO-VCA combination or with dedicated switches (e.g. Gray Code modules).

But a far more interesting way to switch between and merge whole voices (audio paths) is using ADSRs together with the VCAs, and patching the LFOs or the outputs of the Gray Code module(s) into the gain inputs of the ADSRs.

Gray Code Module

ADSR 1 ADSR 2 ADSR 3 ADSR 8

VCA 1 VCA 2 VCA 3 ● ● ● VCA 8

Voice 1 Voice 2 Voice 3 ● ● ● Voice 8

Mixer and Out

switching with
Gray Code
modules
And ADSRs

The preset "voices.vcv" (available with the e-book – see https://dev.rofilm-media.net) and the video behind the following link demonstrate a patch like this, with 5 voices, 4 driven by a Gray Code module, and one by a little LFO network.
https://youtu.be/Q1nqJUbmh7I

Chapter 2.4:
Rhythm

Let me set the structure of this chapter as follows:

Part 1: rhythm is more than percussion plus bass
Part 2: switching versus morphing
Part 3: delaying beats and polyrhythms

I´ll start part 1 with an imperfect patch: An LFO triggers a sample and hold module, which modulates a non-percussive voice.
The same LFO feeds a Bernoulli gate, which triggers a percussion module.
What I want is, that both, the voice and the percussion generate their sounds following the same beat (the beat of the LFO), but at random times (the percussion) and at random pitches (the voice). Here is the graphic:
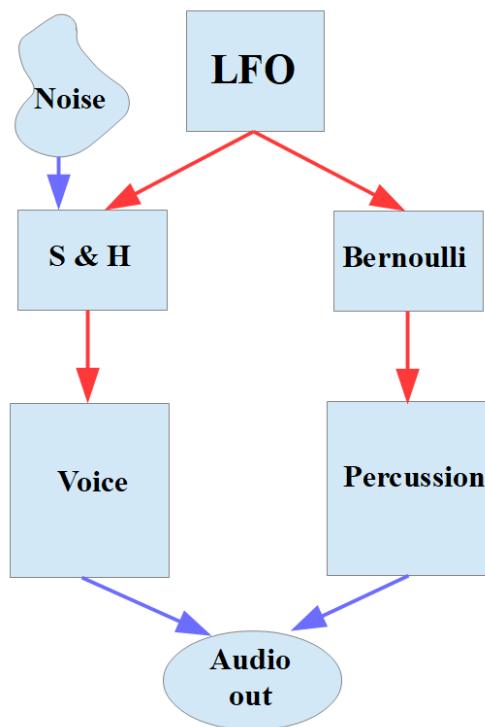
This patch is used in the preset "imperfect.vcv" (available with the e-book – see https://dev.rofilm-media.net) . The video behind the next link shows its behaviour (compared to the next one, "perfect" version).

Why is this patch imperfect?

Well, it is not – as long as it´s not a part of a larger whole, of a larger patch. The problem is the LFO. In the moment, when I want to use this patch as a part of the "rhythm section" of my piece, I would have to use this LFO and nothing else as the centre, as the heart of all rhythmic goings on. Otherwise its sounds would rarely fall on a common and shared beat with the rest of the rhythm section and the whole beat.
When it comes to rhythm (even when it comes to polyrhythms – see a bit later in this chapter) even randomly interspersed sonic events should fall against a measure of the wanted/adjusted beat (at least most of the time – see the part about delayed beats). The improved (more useful) version of the patch looks like that therefore:
Clock modules offer more, better and easier to use functions to synchronize and even to change measures, beats and speed (BPM) than LFOs. The preset "clock_1.vcv" represents the improved patch, and the
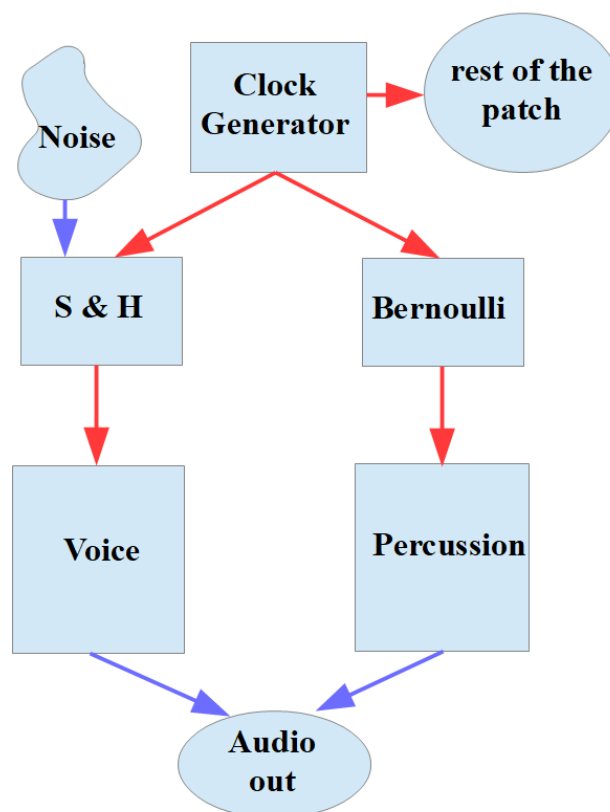
video behind the following link demonstrate both, the imperfect one and the improved one.

To make the voice and the percussion fall together on the same beat more often (the sample and hold module and the Bernoulli gate work independently so far, and its rather seldom that both sound events fall together) I can insert a CV mixer modulated by an LFO´s square wave: one mixer channel is fed by the sample and hold unit, the other by the Bernoulli gate, and one of these channels (either the sample and hold or the Bernoulli gate) is switched on and off by the LFO.
When I patch the output of the CV mixer into the gate input of the voice, sometimes the voice is triggered only by the sample and hold module, and sometimes by both, the sample and hold as well as the Bernoulli gate. The following graphic shows the principle, and the preset "clock_2.vcv" represents the patch. The video behind the following link demonstrate the goings on.

We can change nearly any parameter in a rhythmical way of course. Filter cut-off, filter resonance, distortion, any fx-parameter you can think of. The preset "clock_3.vcv" and the video behind the following link show only one example (of hundred and more possible ones): rhythmically modulating the delay time.
https://youtu.be/hbVN1vjxkJ8

Part 2: switching versus morphing now. Well, even in generative music it´s not always about changing everything and all the time. I´ll talk a lot more about this in chapter 3. Sometimes it´s about two stable rhythms, which don´t change, at least not for a shorter or longer time. No randomness in the rhythms.
Well, not in the rhythms themselves. What is random is the way, the succession, the "frequency" of switching between these two (or more) stable and unchanging rhythms. I can do this switching to and fro using dedicated switch modules, and if I don´t want to hard switch but want to crossfade or blend, well, then I chose a switch with blend functions (or add a crossfader module to the switch). The preset "blend.vcv" gives an example, and the video behind the following link demonstrates it.
https://youtu.be/Nw7uXqhSFAA

Logic modules are also a great help when it comes to switching and/or combining rhythms. We can use them to take random triggers from different sources (e.g. those which we are already using somewhere else in a large and complex patch) and let them switch between whole rhythms according to their logic (AND, OR, NOR, XOR etc.).
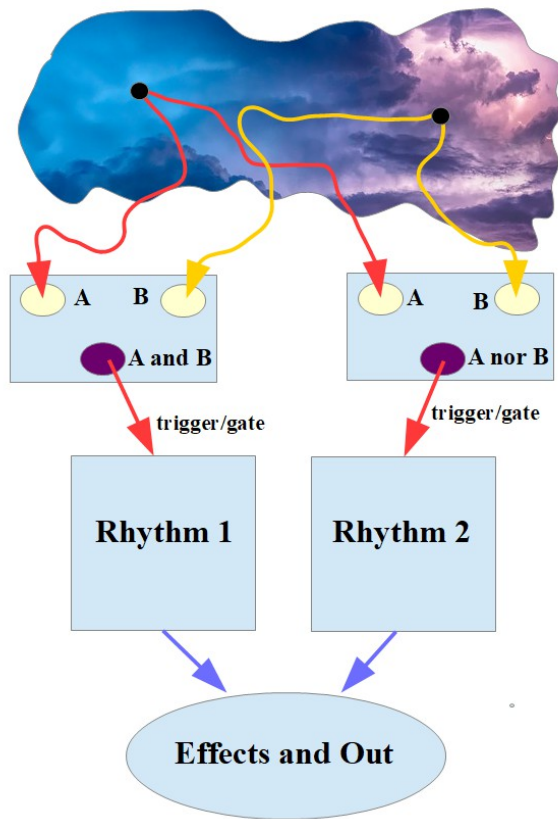
But we can use logic modules to really combine and expand rhythms as well. We can e.g. want an additional voice (bass, brass, whatever) to step in, always when the kick and the snare play together. Or we can want the additional voice (or another one) to step in only when neither kick nor snare are playing, or when only one of them is playing etc. The preset "voiceAdd.vcv" and the video behind the following link show this.

https://youtu.be/iLiCDdhM6Mw
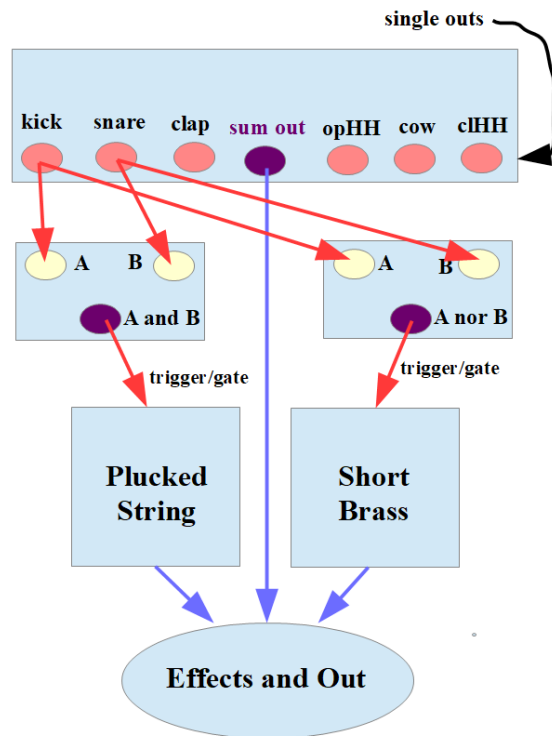
Delaying beats and polyrhythms now (Part 3). I´m going to talk about polyrhythms in chapter 3 a bit more in detail. So let me say it in a simplified version: Always when a ¾ measure meets a 4/4 measure, or a 3/3 measure a 2/2 measure we call it a polyrhythm. There are different "families" of these rhythms, but that´s a matter for chapter 3.
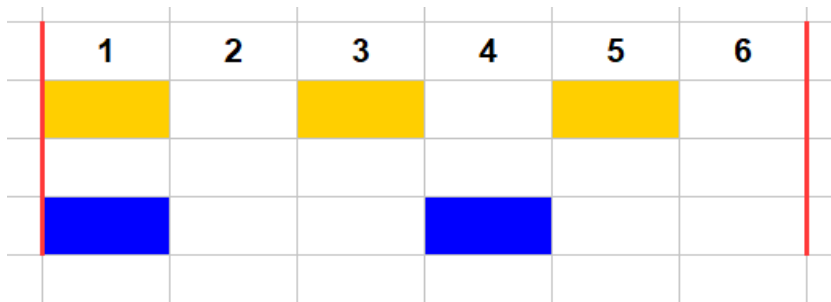

Let me describe only one special technique here: delaying beats in polyrhythms. Of course we can delay beats everywhere, we don´t need a polyrhythm to do so, but with polyrhythms it´s more impressive and sounds less than a mistake (as it does e.g. in a 4/4 measure, if we don´t take care).

Things get interesting, when we modulate the delay time while having set a very short (if at all) feedback. The beat, that I sent through this delay seems to tramp around its regular position, which gives the whole rhythm a disquieting touch.

The preset "poly_1.vcv" and the video behind the following link give a short demonstration of it.
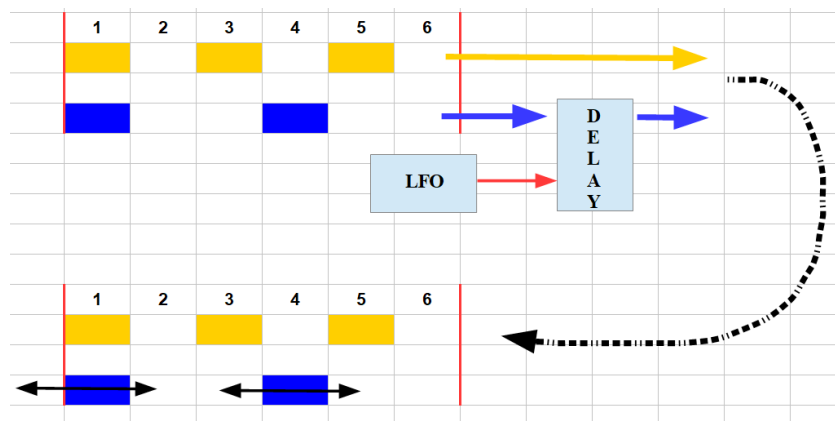
Another way to set up polyrhythms is using two sequencers with different numbers of steps per sequence an merge them, fade them in and out or switch between them to and fro. To introduce randomness I can use the obvious candidates (Bernoulli Gate, Gray Code module etc.) to do the switching and blending.

… to be continued