Column by Renzo van Riemsdijk (Masterenzo):

Sampling II: Resolution

Imagine, on the internet you find this great picture. You've decided you want the poster to hang above your bed in large poster size. You send the file to the store that makes posters and a couple of days later you receive a package containing your ever desired poster.
You roll out your poster and what you see is not quite what you expect. All gentle lines have become grainy with small cubes making the lines sort of fluent, but only when you stand at a distance of more than 10 meters.

The tale above about resolution can be seen likewise to resolution in audio and studio land.
I will already give away the morality of this column: use higher resolution files while recording and mixing, but also when working in mastering high resolution files (24 bits or higher) are very important.

But what exactly is resolution?
In last month's column I discussed sample rates. I imagined the sample rate (for CD) as a piece of paper filled with tiny boxes, 44100 in total (on the horizontal axis). Now let's imagine resolution as a working grid, displayed on the vertical axis on that same piece of paper.
When the grid is too small (i.e. resolution too small) it could easily result in a negative influence on the sound. Since this effect is cumulative the negative effect only gets worse with increased processing.
Okay, hold your horses! Cumulative? Yes indeed, by cumulative I mean that one effect has an influence on the next effect etcetera.

It's a bit hard to describe but losing resolution sounds like a sense of diminished depth in your sound. Your recording might also sound a bit "grainy". When you use a dithering plugin capable of lowering the resolution below 16 bits you can do some experimenting and find out what it actually does to your sound.

Globally there are three resolutions that are being used in the land of music: 16, 24 and 32 bits. The latter exists, along with its bigger brother 64 bits, in *fixed* and *floating point*. To explain this I'd need a highly technical recital about internal processing (DSP: Digital Signal Processing). I won't bother you with that extra info. It's the understanding of music that counts. If you want to know more about DSP and fixed and floating point, use our big friend Google.

Here are the three functions:
16 bits: for CD. Music streaming services also make use of music files with 16 bit resolution. Please note that 16 bit files are **not** to be used for further processing. It's an end format, it's only used in mastering.
24 bits: for recording and mix. 24 bit resolution is widely used. It's excellent when you make use of analogue processing via a digital to analog and analog to digital converter. The in- and outputs of these converters are 24 bits, so why not use those 24 bits. 24 bit files can also be uploaded to music streaming services.
32 bits: for internal processing. While working on a mix (with plugins and stuff), save your files as 32 bit. This is the most classy option. This is the way I like to see mixes arrive at my studio!

If you choose to deliver 24 bit files, don't forget to dither 32 bit files down to 24 bits (without noise shaping).

What all that means I'll tell you in next month's column!

Renzo

Renzo (Masterenzo) is a Rotterdam based Dutch mastering engineer. He has worked for Gery Mendes (GMB), The Legendary Orchestra Of Love and Phil Bee's Freedom. More info about mastering and about Masterenzo can be found on his <u>website</u>.