



Guitar Effects Chain



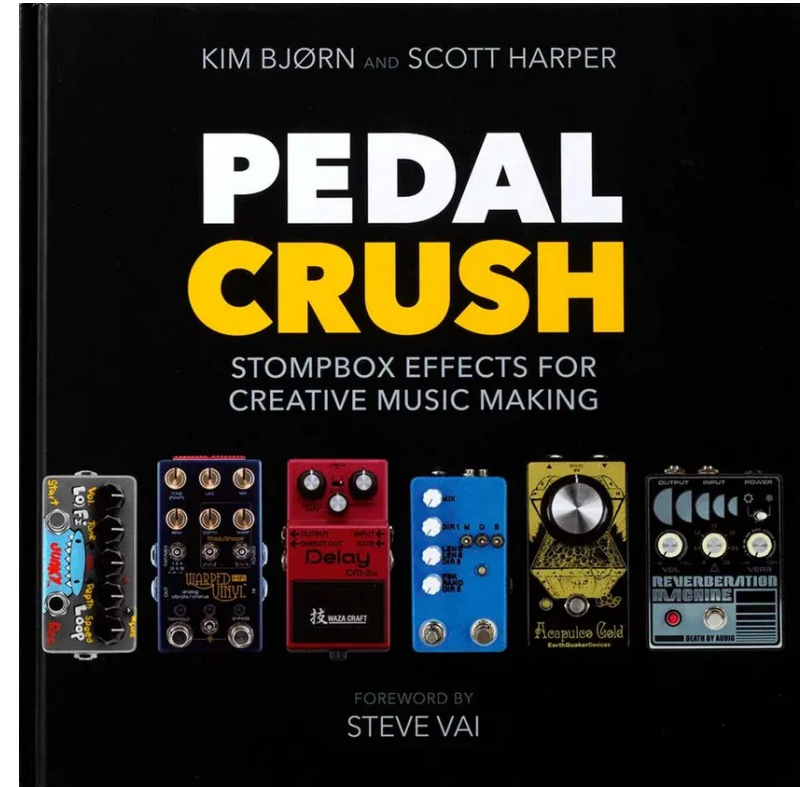


References

Book about pedals, pedals and people building pedals :

Pedal Crush

A lot of good information in this book



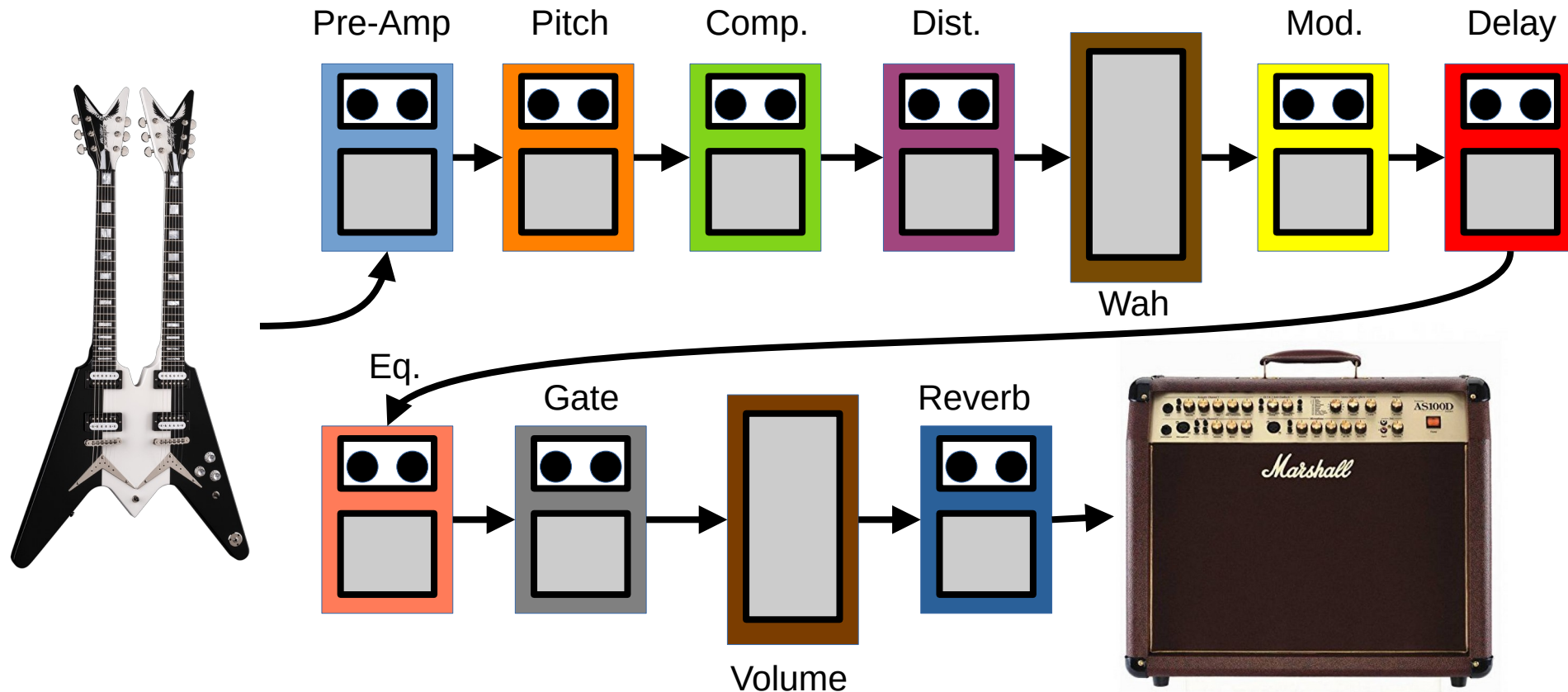


Plugins used

- **mod-pitchshifter / mod-gxpitchshifter** : pitch shifting plugins. The gx version is a modified version of mod-pitchshifter useable with Guitarix
- **spectra.lv2** : A spectrum analyser from x42 as a LV2 plugin
- **sisco.lv2** : an oscilloscope from x42 as a LV2 plugin
- **lsp-plugins-lv2** : some LV2 plugins. A nice spectrum analyzer is available in the package
- **guitarix** : a lamp amplifier simulator. A complete Guitar amplifier with nice effects
- **lv2-calf-plugins-gui** : some nice plugins. We will use the compressor.
- **raysession** : a jack session manager
- **audacity** : a powerful sound recorder
- **Carla** : a plugin rack. We will use carla to manage the oscilloscope and the spectrum analyzer



Guitar Effects Chain





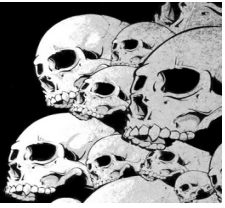
MIDI Pedal Board



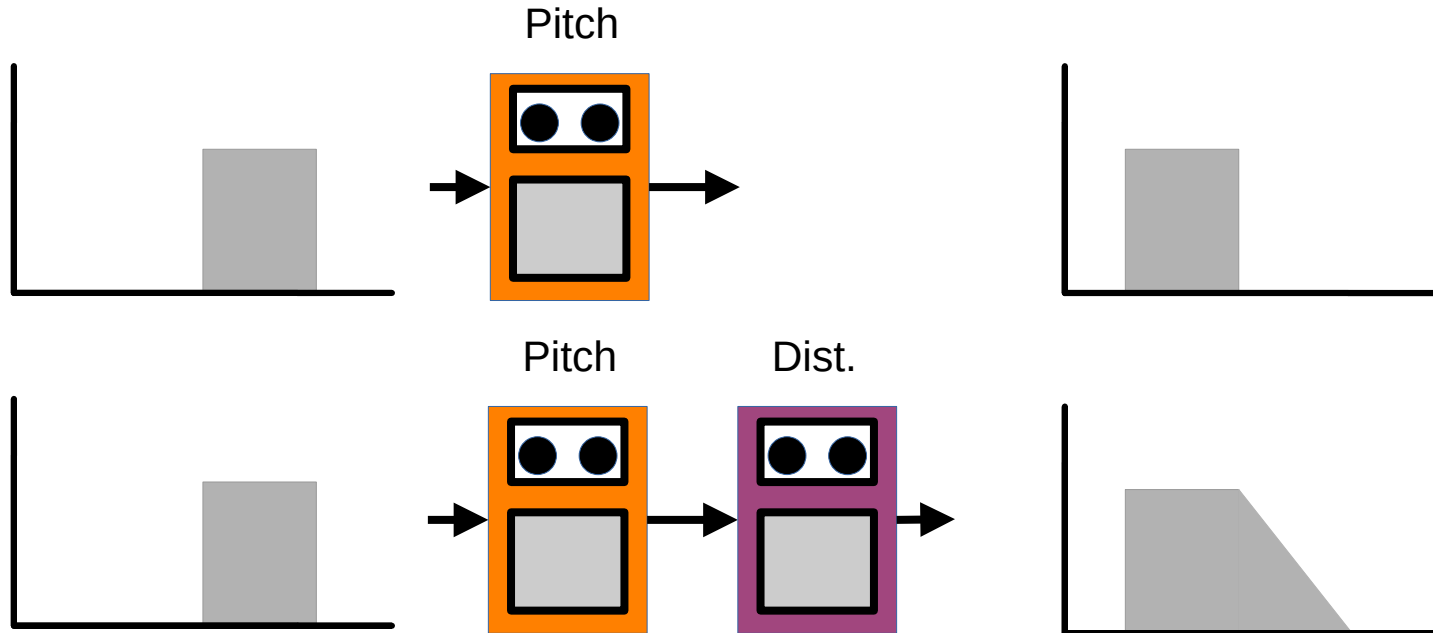
Line6 FBV
Express MKII



Behringer
Fcb1010

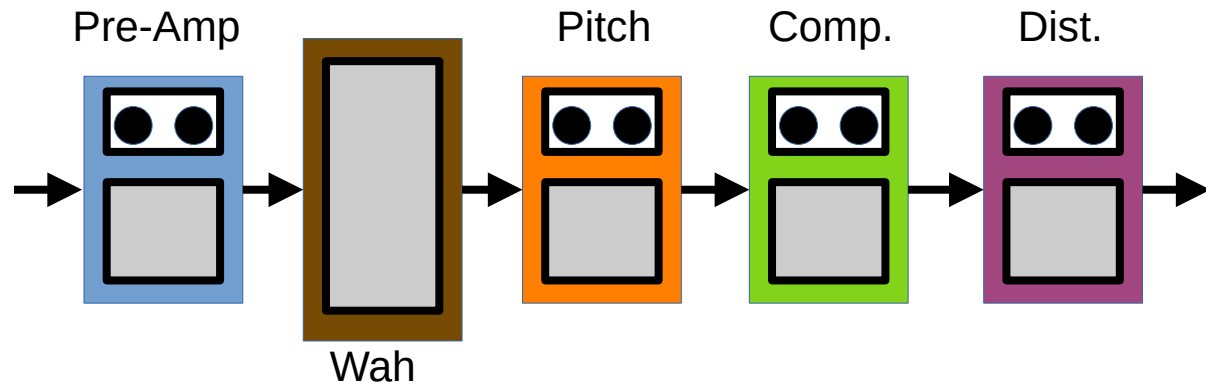


Pitch Shifter Effect

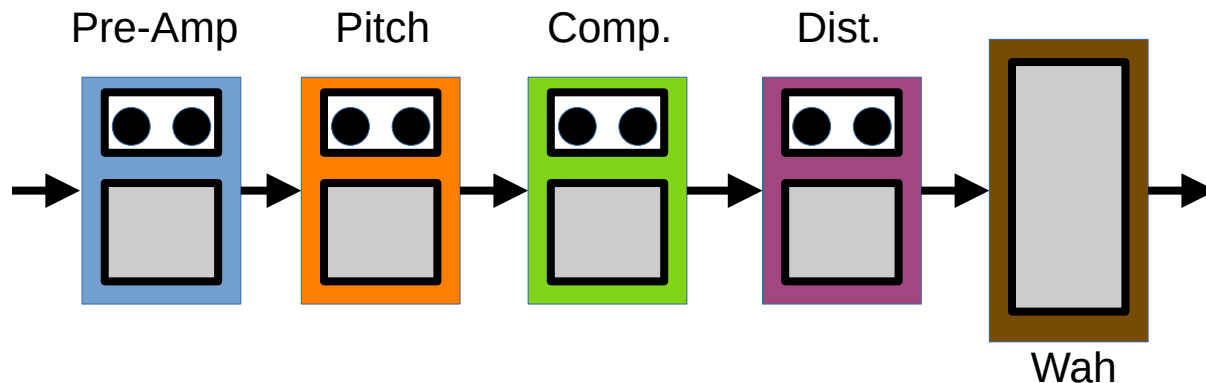




Wah Pedal Position



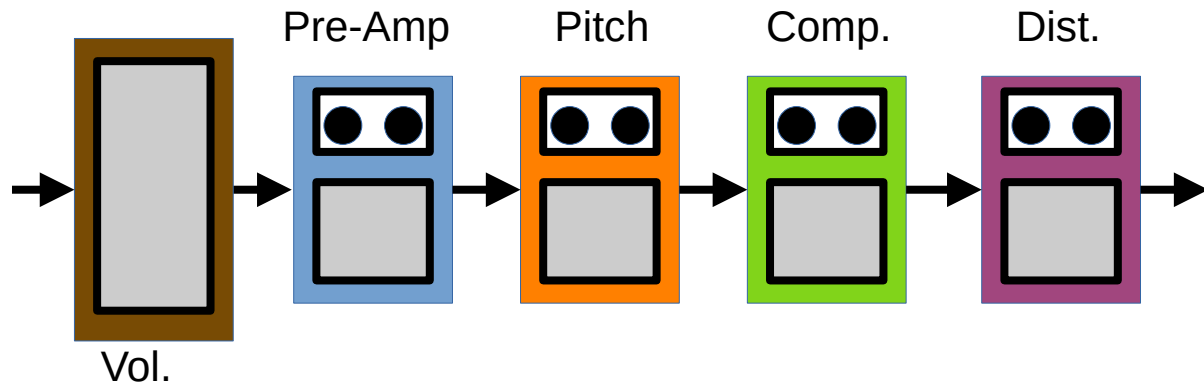
In the pre-amp we have a quasi-sinusoid from the guitar. The wah pedal which is a filter will just filter a quasi-sinusoid and will behave more or less as a volume pedal.



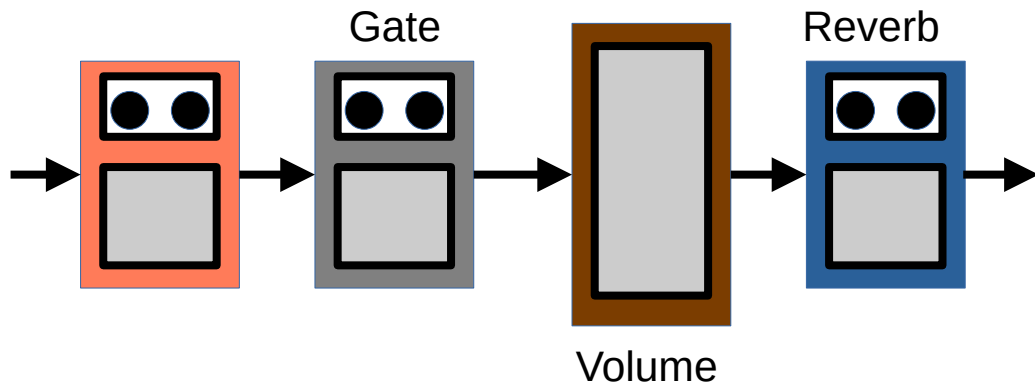
After the distortion pedal, the signal has a richer specter and when processed by the wah, the wah effect will be more pronounced.



Volume Pedal Position



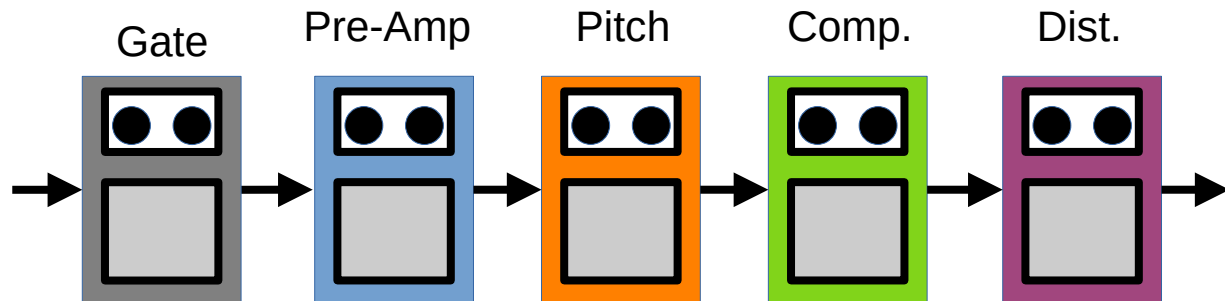
Placed at the beginning of the chain, the volume can have an impact on the sound. Compressor and distortion are tuned for a given level of signal.



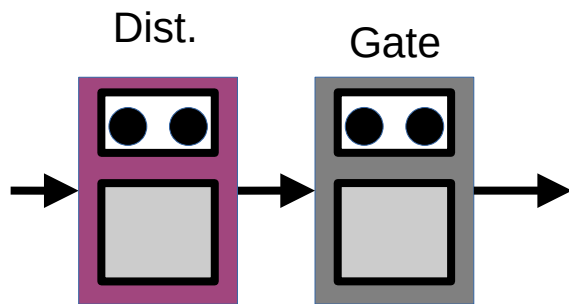
At the end of the chain, the identity of the sound will be preserved if we reduce the level of signal via the volume pedal.



Noise Gate Position



Placed at the beginning of the chain, the volume can have an impact on the sound. Compressor and distortion are tuned for a given level of signal.



At the end of the chain, the identity of the sound will be preserved if we reduce the level of signal via the volume pedal.

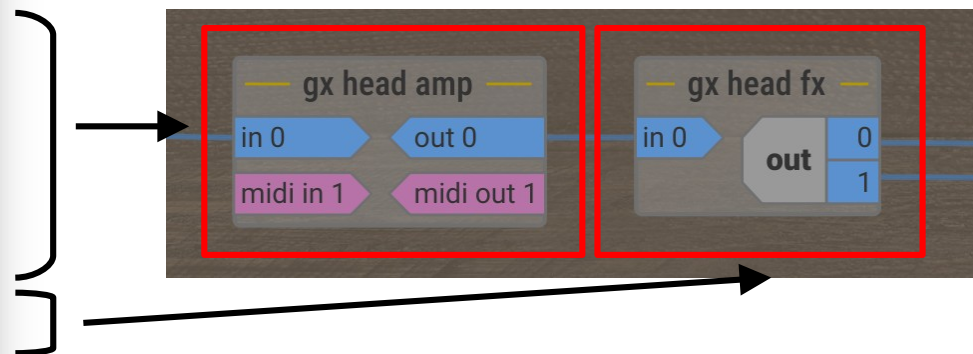


Guitarix Rack Structure



Mono Effects

Stereo Effects





Guitarix Default Racks

Level of the
threshold
compressor
at the top of
the rack

Clipping
level at the
bottom of
the rack



Level of the
noise gate
at the top of
the rack

Gain of the
preamp at
the bottom
of the mono
rack



Guitarix Default Racks

Gain
at amp
input

Gain
at amp
output

Lamp
configuration
selection

Allow freq
below 31 Hz



Mix
level

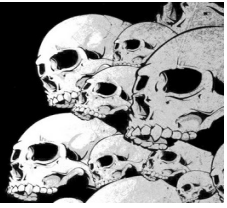
Gain
of the
lamp
stage

Bass
level

High
frequency
boost

Amp
internal
reverb
level

Hiss
remover



Guitarix Default Racks

Convolver : to imitate the style of a given band

Amp Impulse : to imitate an amplifier style

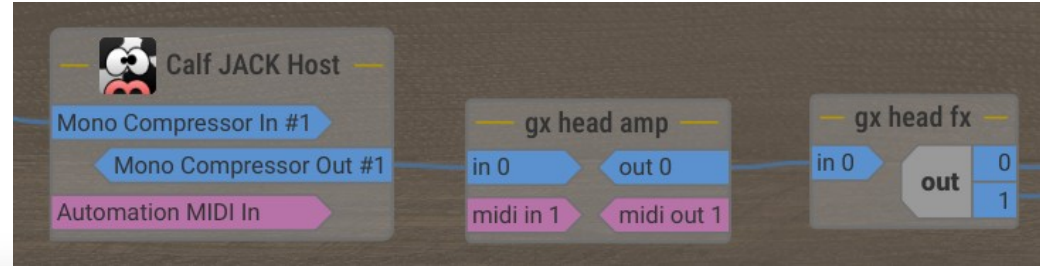


Compressor Experiment

We use the compressor from Calf plugins. This one has a nice GUI which eases the tuning of the compressor.

We then use audacity to generate a special signal using Generate -> Silence + Generate -> Tone to show the compressor behavior.

This signal is sent to calf / compressor and audacity records the audio of calf / compressor





Compressor Experiment

The first part of the signal is above the threshold and the second part is below. I set a huge release and a huge attack level.

With the attack set to a non nul value, the output signal start with the original level and then reach the level defined by the compressor at the speed defined by the attack level/

With the release set to a non nul value, at the amplitude change, the compressor keeps its gain and apply the gain to the low amplitude and slowly reach the unity gain and the speed defined by the release level.





Compressor : Tuning

How to tune the compressor :

- Play some tapping or legato notes and set the threshold so that the notes are above the threshold in the Calf compress graph
- Play some notes using the pick and set the compressor level to reduce the level difference between a legato or tapping note and the note played with the pick.





Distortion

- Use scopes to see the shape of the signal as you add effects (compressor, distortion, an overdrive, etc ...)
- Use spectrum analyzer to check the shape of harmonics too. Clipping on higher level harmonics may happen.



Distortion

Here is a A (440 Hz) played on a guitar with a lot of distortion. As you can see the first harmonic has a level above the fundamental. So, when you set a distortion some clipping may happen of higher order harmonics. So keep a margin on the sound level



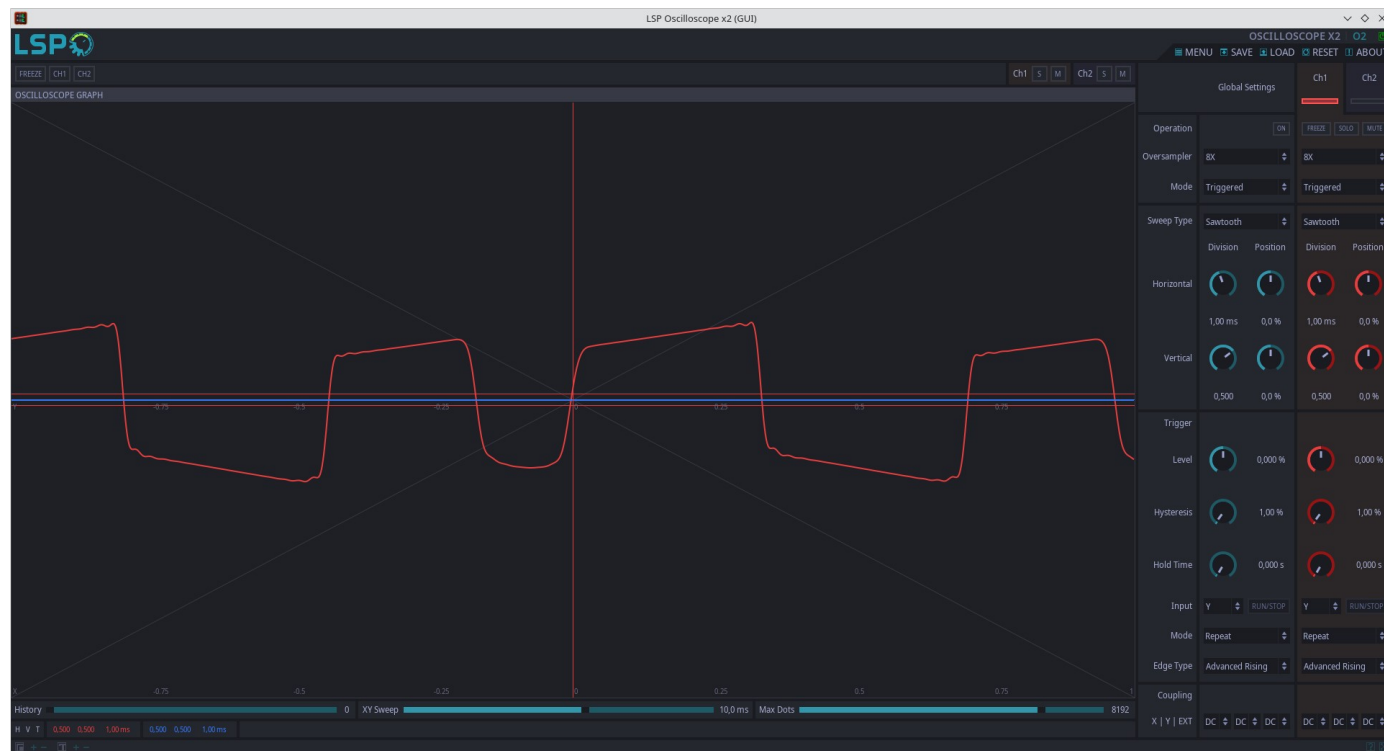
LSP spectrum analyzer





Distortion

Use a scope to check the shape of the sound and see how parameters can change the sound



LSP Oscilloscope





Guitarix Settings

Overdrive : 5.1 / 100 %

Compressor : 4.5 / -51.1 / 2 / 0 / 0

Rat : 0.86 / -4.8 / 0.75

Amp : See after

Wah : ColorSound Wah / 0 / 52

Echo : 150 / 15.0

Volume : 6.3

Freeverb : 0.78 / 0.50 / 40

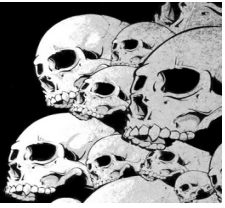
Cabinet : 4x12 / -0.5 / 0.6 / 3.8





Guitarix Settings





Rehearse with TuxGuitar

Applications used :

- **guitarix** : guitar amplifier simulator
- **tuxguitar** : to play GuitarPro scores
- **timemachine** : to record some audio
- **jack_mixer** : to fine tune the audio level between tuxguitar and guitarix
- **ray session** : to start all these applications and reconnect them



Rehearse with TuxGuitar

