



# Guitar Effects Chain



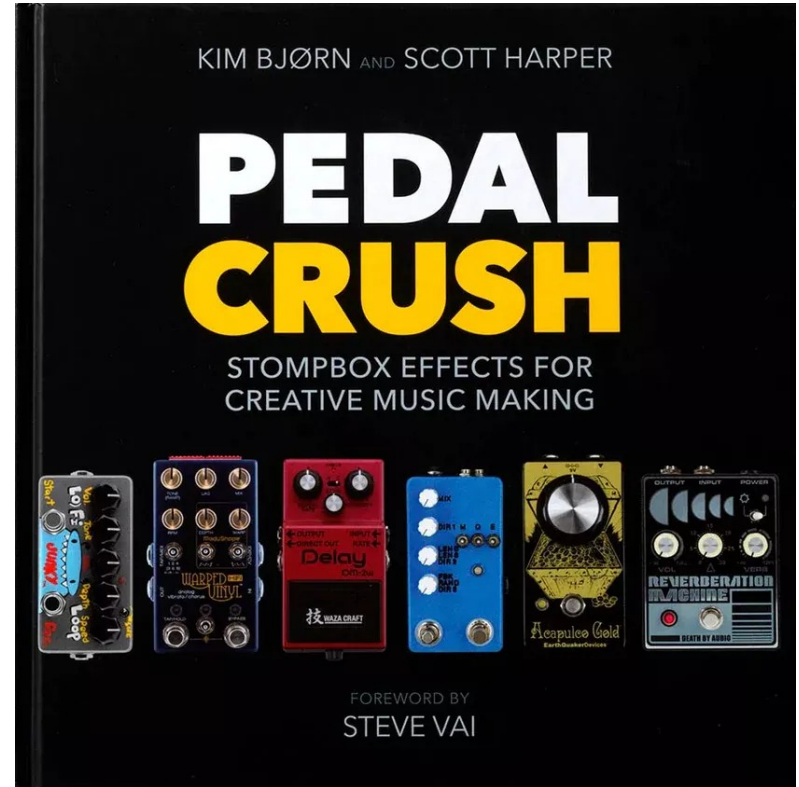


# References

Book about pedals, pedals and people building pedals :

Pedal Crush

A lot of good information in this book



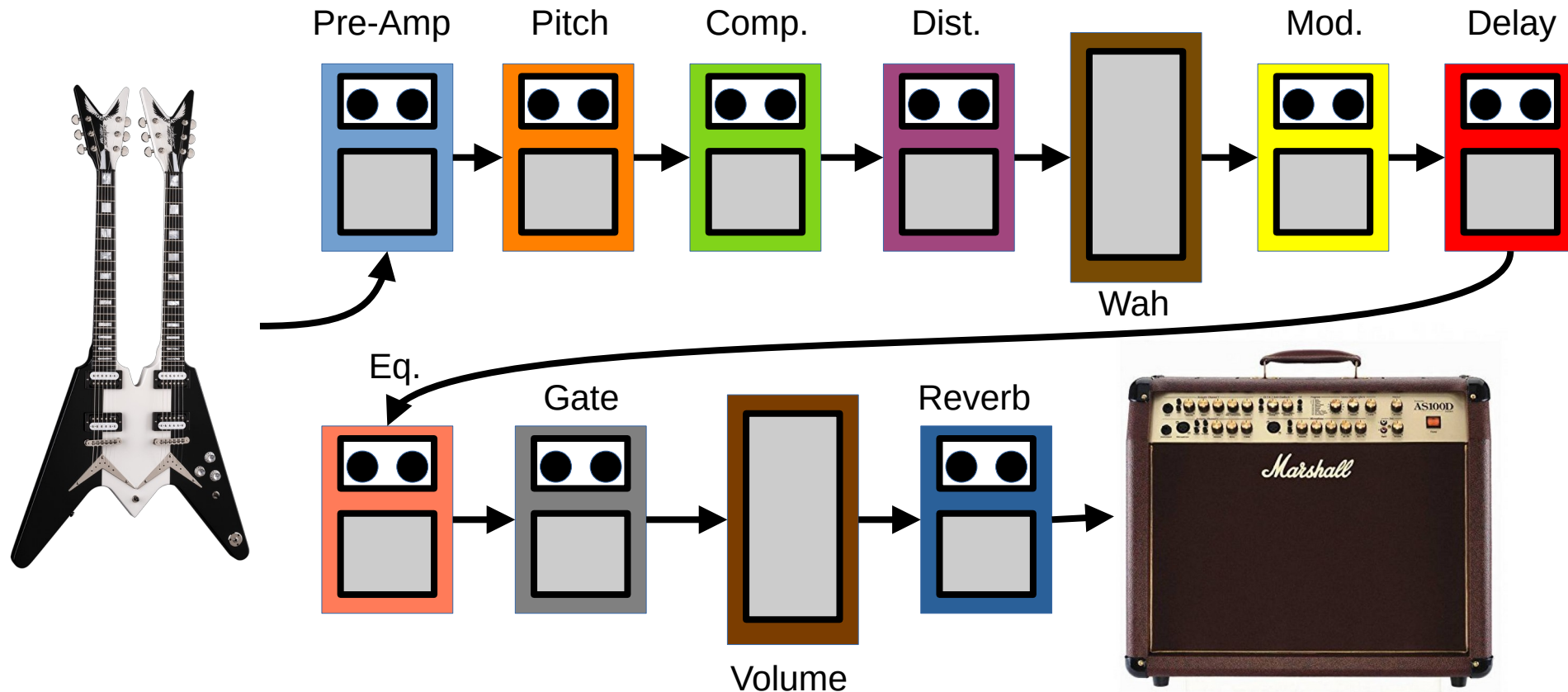


# Plugins used

- **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







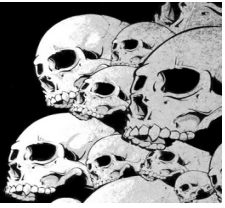
# MIDI Pedal Board



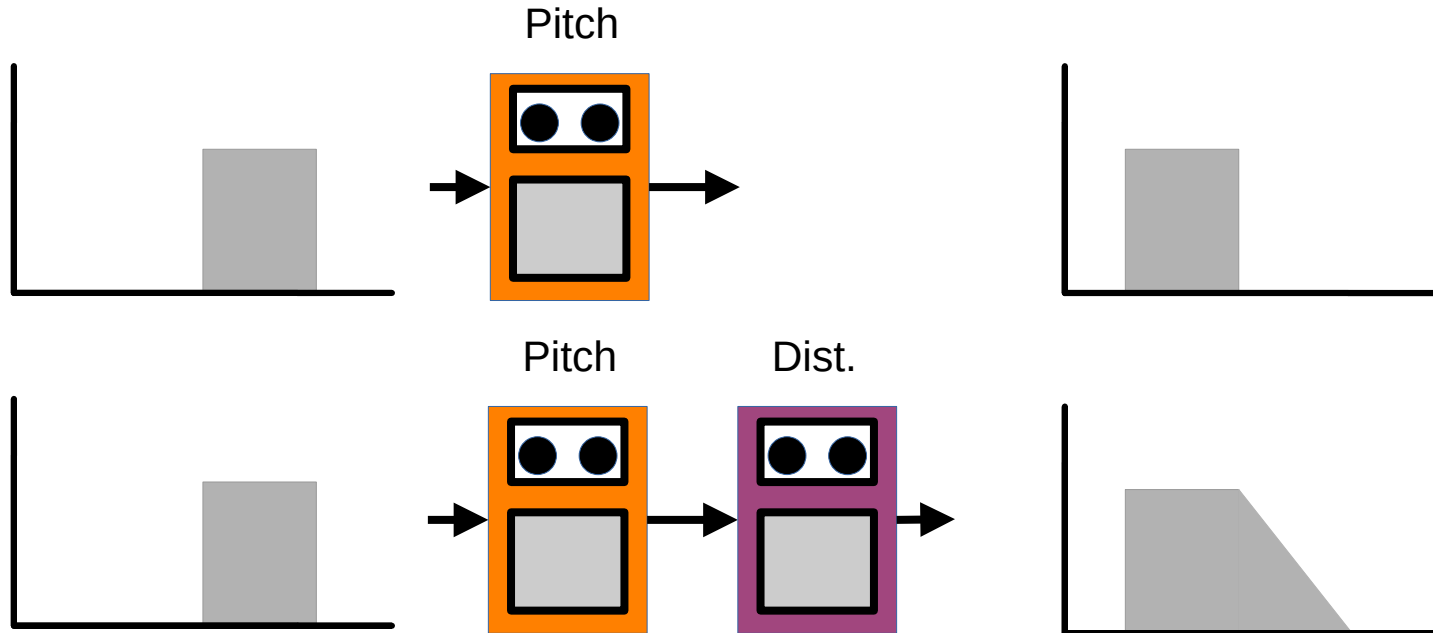
Line6 FBV  
Express MKII



Behringer  
Fcb1010

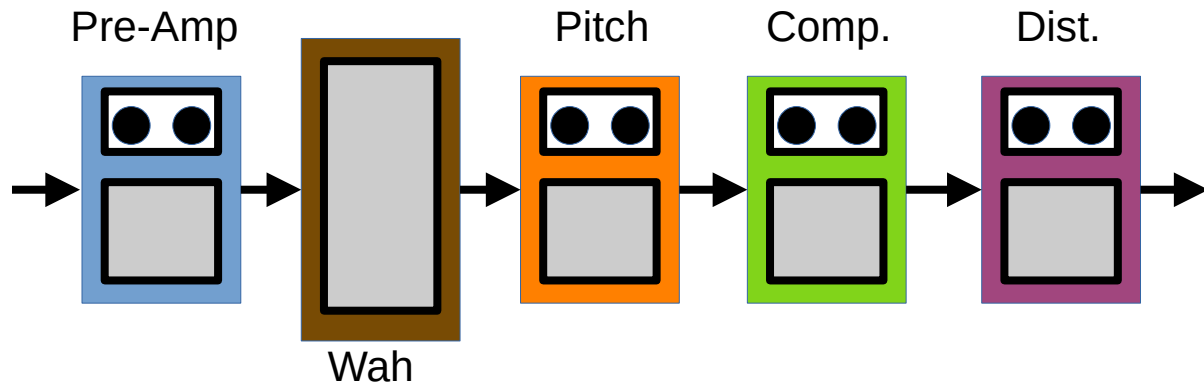


# Pitch Shifter Effect

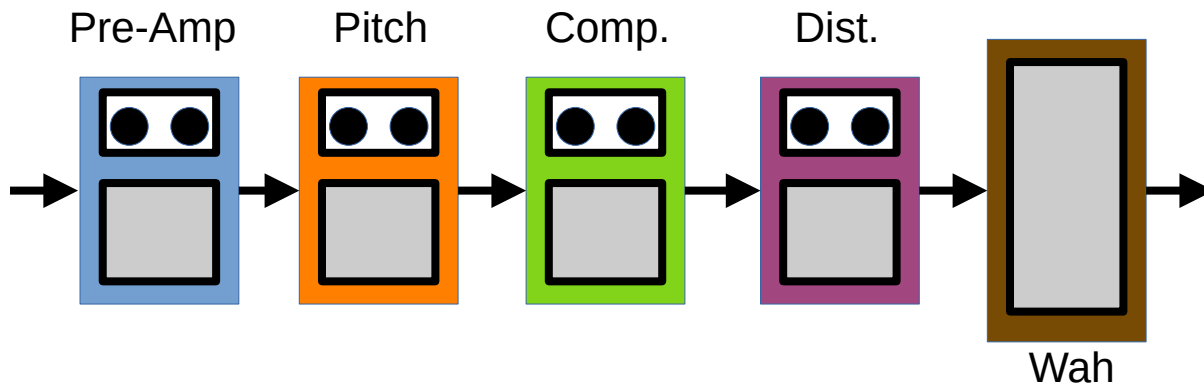




# Wah Pedal Position



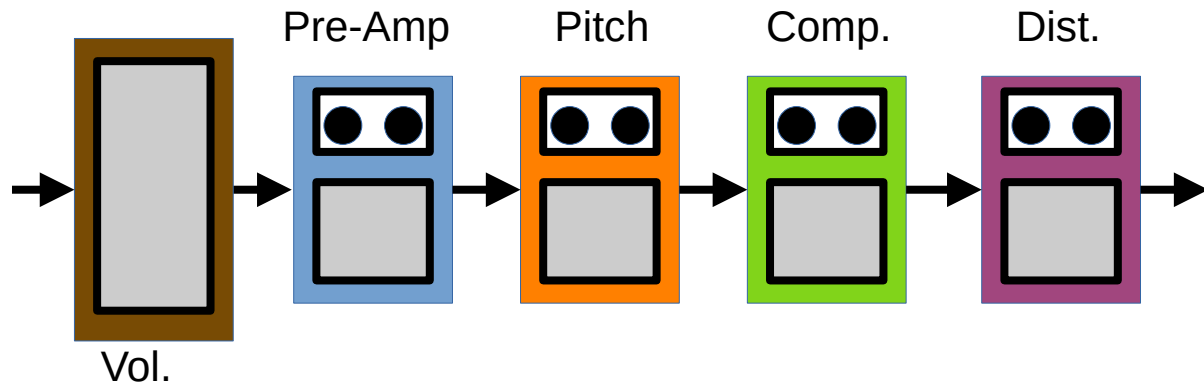
In the pre-amp we have a quasi-sinusoid from the guitar. The wah pedal which is a filter will just filter a quasi-sinusoid and will behave more or less as a volume pedal.



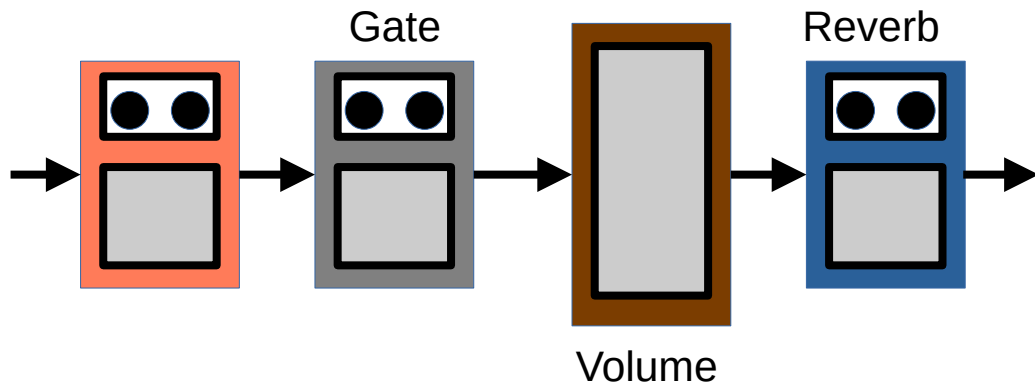
After the distortion pedal, the signal has a richer specter and when processed by the wah, the wah effect will be more pronounced.



# 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.

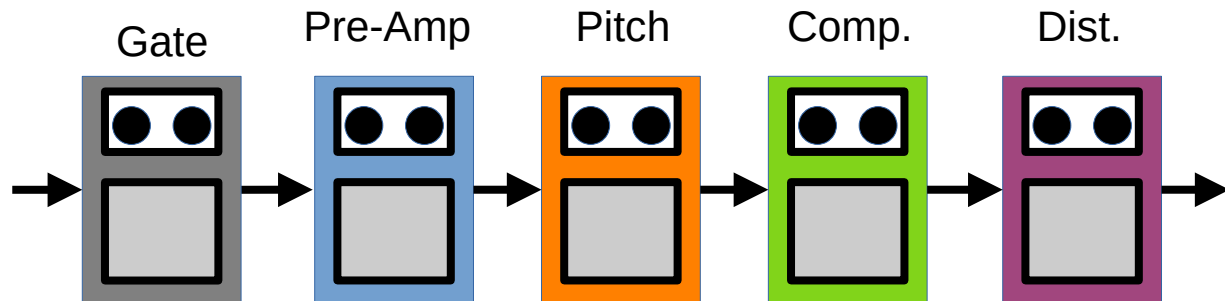


At the end of the chain, the identity of the sound will be preserved if we reduce the level of signal via the volume pedal.

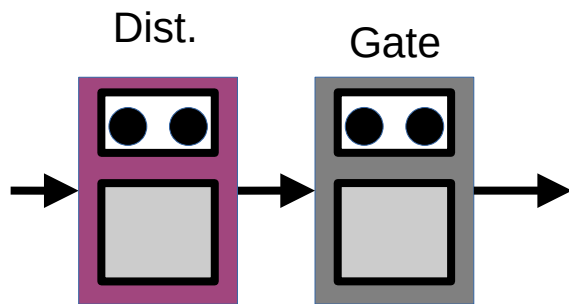




# Noise Gate Position



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.

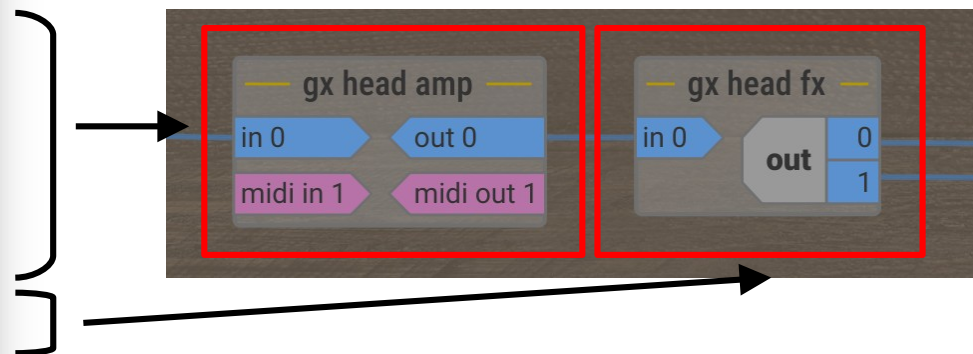


# Guitarix Rack Structure



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

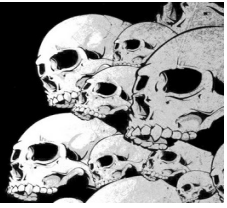
Gain  
of the  
lamp  
stage

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

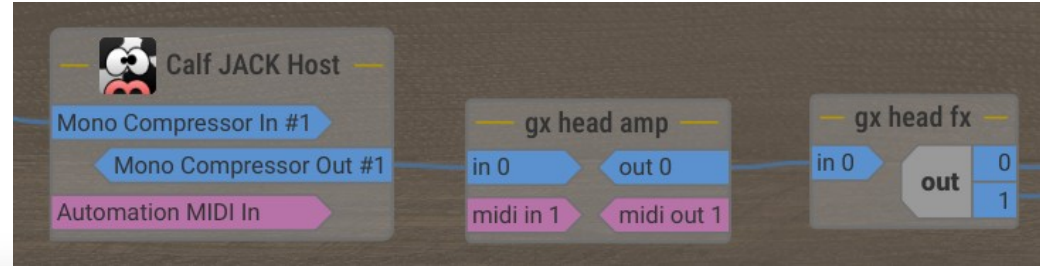


# Compressor Experiment

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 ....



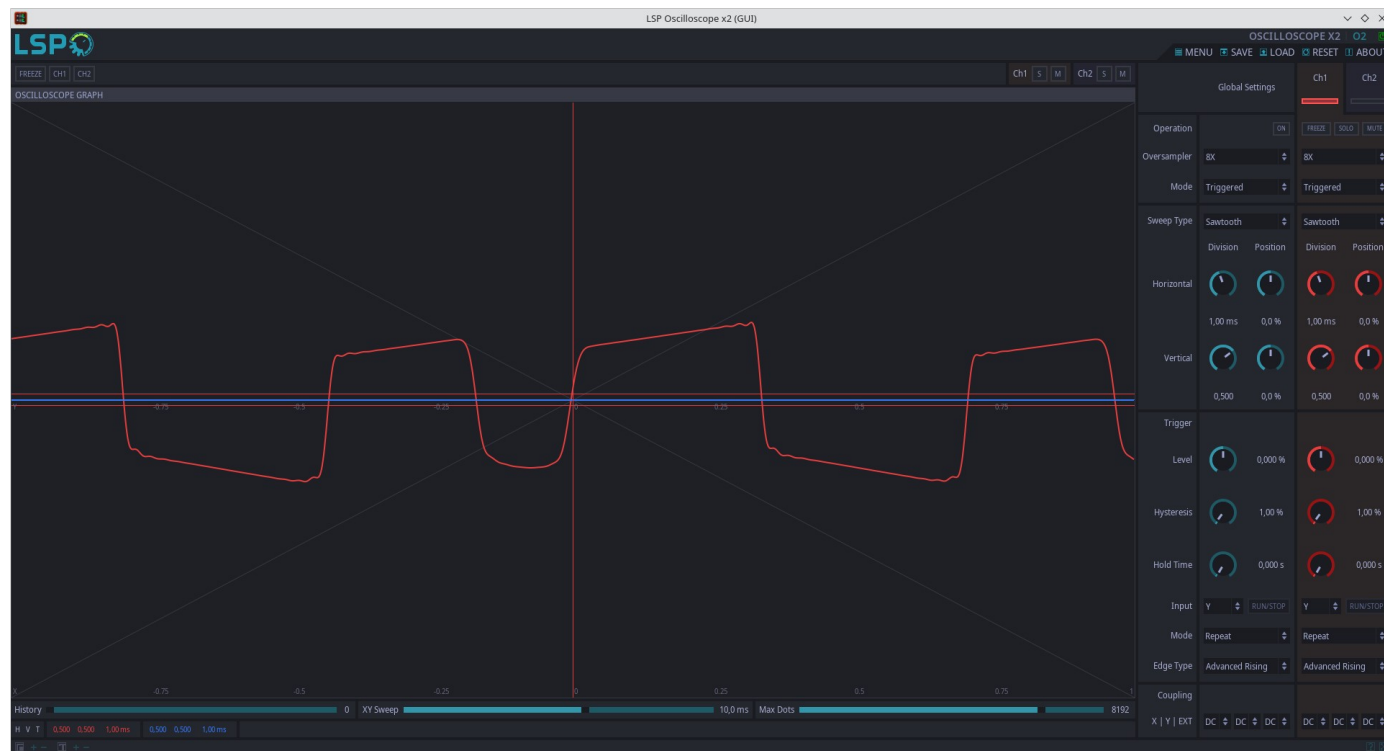
LSP spectrum analyzer





# 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

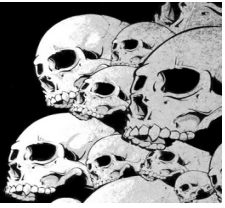






# Guitarix Settings





# 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

