fircomp

Clean compressor with perfect curves

Clean compressor with punchy attack, musical release, and optional lookahead smoothing, for tracks or busses. Zero/low latency and low CPU. Warm distortion at extreme settings.

Fircomp is a free Jon V audio effect plugin. For more information and updates visit: **jonVaudio.com**

Features

- Simple UI and fast workflow
- Attack stage tuned for punch. True zero attack (same-sample) when "0.0 ms" is selected
- Dual parallel release stage with musical, highly program-dependent behaviour. Avoids needing to use multiple compressors in series!
- Easy sidechain filtering options for common mixing situations
- In *Zero Latency* mode, uses intelligent gain smoothing to lower distortion
- In *FIR LA* mode, uses digital FIR lookahead gain smoothing with perfect timing and no artefacts, resulting in the minimum possible distortion
- Low CPU DSP code written in a mix of C++ and SSE intrinsics. Insert on every track without a second thought!
- Fully 64-bit audio path used for all DSP calculations
- Zero latency with lookahead off. Compensated latency of 64, 128, or 256 samples depending on the host's sample rate (approximately 1.3 to 1.5 ms of latency)
- No phase shift or changes in frequency response.
- Supports sample rates of 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz. At sample rates above 192kHz, FirComp may function correctly, but will not sound as smooth.

The Juce splash screen

Fircomp currently uses the excellent Juce framework (juce.com) for the GUI and cross-platform support. However, it does not use any Juce code for the DSP / audio processing, which uses all-original code written in highly optimised SSE intrinsics for Intel CPUs.

As this is a free plugin, the Juce splash screen will be shown briefly at the bottom right of the plugin for a few seconds. Clicking on this splash screen will take you to the Juce website which is an excellent resource.

Controls

Enabled / Bypassed button

This is a soft bypass control which disables compression, but keeps the same latency. When the compressor is bypassed, all controls will be greyed out, but still adjustable. Note that makeup gain will also be bypassed. This allows you to quickly compare the dry/wet signal at the same perceived volume.

Dry / wet slider

When this slider is all the way to the right, it indicates that the signal is 100% wet, for normal operation. Move the slider to the left to mix in some of the dry signal. The UI will fade out as this slider moves left, to act as a reminder. The dry/wet slider has no effect on the values shown on the gain reduction meter.
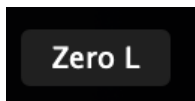
Zero L / FIR LA button

Fircomp has two "modes". In both modes there is no phase shift or change in frequency response, and the attack and release behaviour is almost identical.

Zero L: This is a standard zero latency mode for compression. In this mode, fircomp behaves as any other "zero latency" compressor. However, it does some intelligent digital gain smoothing which reduces distortion somewhat. In addition, an attack time of 0.00ms in this mode is still a true zero / same sample attack - just not as clean!

FIR LA: This mode introduces a small amount of latency, and uses advanced digital FIR gain smoothing or "lookahead". This lookahead has the minimum possible distortion for the amount of latency introduced, and has sample-accurate timing.

Sidechain Filter selector

Fircomp is a standard full band compressor: the compression action always works equally across the whole spectrum, like a volume control. However sidechain filtering affects what the compressor *listens* to when deciding how much gain reduction to apply. Sidechain filtering is not directly audible.

Four preset sidechain filter settings have been chosen to very quickly accomplish standard mixing tasks. These are:

Off: No sidechain filtering whatsoever. Useful for drums, bass, or when using fircomp as a hard limiter.

Natural: 200 Hz 12dB/Oct hipass filter. Useful for instruments and vocals. Inspired by equal loudness contours of the human ear.

De-harsh: 1.5 kHz 12dB/Oct hipass filter. Recommended as a quick fix for tracks that have a harsh or piercing upper mid range.

De-ess: 7 kHz 12dB/Oct hipass filter. For using fircomp as a vocal de-esser. Vocal esses or noise based consonants (such as s, t, ch, x, z, etc) usually happen with very little time-overlap with vowel sounds (oo, aa, ee, etc). This means that a full band compressor is ideal: you don't want to change the tone of

your esses, you just want to quickly turn down the volume when they happen. Fircomp's de-ess filter has been located where the *difference* in volume between consonants and vowels is biggest for most vocals. This setting is best used with the fastest possible attack and release times.

Ratio selector
The compression ratio controls the transfer graph of input gain vs target output gain. Lower numbers mean gentler compression when the input is over the threshold.

In fircomp, the choice of compression ratio also affects the method used to detect the level of stereo signals.

Standard ratios of 2, 4, and 10: Good for light, medium, or hard compression. For stereo audio, the compressor's level detector uses the average level of the left and right signals after rectification (standard for stereo compression).

Special ratio of Infinity: "Infinity" just means a gradient of zero, like you would find on a hard limiter. In this setting, for stereo audio, the compressor's level detector uses the maximum level of the left and right signals after rectification. This means that the compressor can be used as a hard limiter when attack time is set to 0.0 ms and the sidechain filter is Off.

Knee selector
This acts as a standard compression knee control. Below the threshold, the compression ratio is 1 (no compression) and above the threshold, the compression ratio is set by the Ratio control. Having a larger knee means that the compressor more gently transitions its ratio from 1 to the selected ratio.

Special value of Hard: On the hard setting, there is no knee at all. This is recommended for limiting, de-essing, or punchy drum compression.

Standard values of Medium and Soft: Soft gives the largest knee for gentle or transparent compression, and Medium gives you a good middle ground that will work for most instrument tracks.
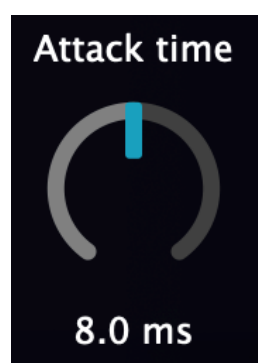
Attack time
Attack time controls how quickly fircomp lowers the volume.

Special attack time of 0.00 ms: With this value, there is no attack stage. The compressor will reach its target gain reduction instantly (in the same sample). This is true in both *Zero Latency* and *FIR LA* modes. If you want to use fircomp as a hard limiter, you should also set the ratio to Infinity and the sidechain filter to Off.

Standard attack times of 0.01 to 30.0 ms: Fircomp uses a slightly punchier variation of a standard attack stage.
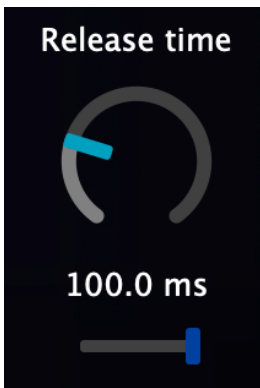
### Release time and program dependence slider

Release time: An overall control of release stage timing. This is not an exact time, as release behaviour is quite complex.

Program dependence slider: With this set to 0%, fircomp's release behaviour is still "program dependent", but only depends on the current amount of gain reduction. As you increase this slider to 100%, the release behaviour also starts to depend on the recent history of gain reduction.
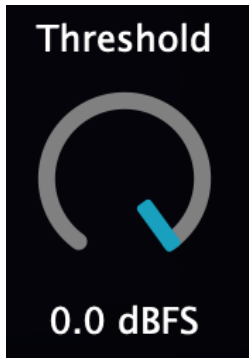
Threshold

This is the standard "amount" control for compression. Lower values (to the left) do more compression, and higher values (to the right) do less.
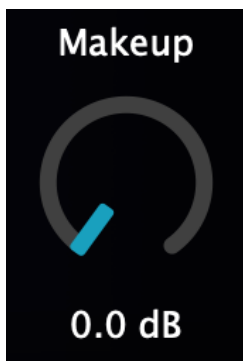
Makeup gain

This is a standard makeup gain control. Compression will always make the signal quieter, so use makeup gain to compensate.

Makeup gain only applies to the wet signal, not the dry signal. Therefore it is ignored when the compressor is bypassed, or for the dry part of the dry/wet mix. This means that we can adjust the makeup gain, while flipping the bypass switch, to maintain the same perceived volume whether the compressor is on or off. This helps to make a better judgement on whether or not the compressor is actually improving the sound.

Makeup gain has no effect on the values shown on the gain reduction meter.

Gain reduction meter

The gain reduction meter shows gain changes from -21 dB, to 0 dB (no compression) on a skewed dB scale which has more resolution for smaller gain reduction amounts. However, gain reduction can extend way beyond this, up to -60 dB of gain change.

The gain reduction meter scale markings are in increments of 3 dB. There are two meters: the filled bar is a peak meter with slowed return to 0, and the white line is a 1 second peak hold. The meter has a decay time of 1000 ms, so for fast release times the meter may appear slower than it is.