Alango MuRefiner™ WINAMP plugin components

MuRefiner is a set of integrated DSP technologies for music and entertainment applications enhancing user audio experience. MuRefiner WINAMP plugin includes the following components:

- **Stereo normalizer** – improves perceived stereo effect by dynamically optimizing (widening or narrowing) stereo image according to user preferences, listening environment and the audio signal.
- **Spectral compander** – adds details and brightness to the sound by reducing short-time spectral variance.
- **Bass corrector** – dynamically increases the bass line while simultaneously limiting it to prevent speaker and amplifier overload.

All processing can be enabled or disabled simultaneously by pressing "Enable/Disable" button. Each individual block can enabled/disabled by checking/unchecking the corresponding check box.

Volume

Volume slider sets the digital gain of the input signal. If your loudspeakers are loud enough, it is recommended to keep it below 0dB (e.g. -10dB) to provide some "room" for processing. Otherwise, the output signal may be slightly compressed to fit into the maximal digital range after the processing. If you want to extract maximal power from your speakers, you can set the maximal value. Nothing bad shall happen.

Stereo Normalizer principals and controls

Stereo normalizer processing is based on a so-called "stereo index" that is calculated dynamically during playback. The stereo index has the following properties:

- Its value is 0 for a pure mono signal
- Its value is 1 for a one channel signal (left or right channel only)

- Its value is 1 when the right and left channels contain independent signals (ultimate stereo)
- Its value may be greater than one (for example when the right and left channels are inverse signals)

MuRefiner dynamically modifies the input stereo signal so that the stereo index calculated of the output signal corresponds to the target value. The target value is controlled by Stereo Normalizer Mode and the corresponding slider value.

Stereo Normalizer modes

- **Change value to:** in this mode the output signal stereo index will be kept close to the target one defined by the slider. The stereo effect will be expanded if the stereo image is narrower that the target, or shrunk otherwise. Use this mode to normalize the stereo effect and optimize it for your speakers or headphones. Zero value corresponds to mono output.
- **Always expand to:** in this mode only stereo expansion to the target value is possible. No stereo image change is performed if the original stereo index is greater than the target. Use this mode to normalize the stereo effect for your speakers without modifying it if it is already wide enough.
- **Always shrink to:** in this mode only stereo narrowing to the target value is possible. No stereo image change is performed if the original index is smaller than the target. This mode is useful for headphones when the audio content is too wide.
- **Change value by:** in this mode the signal stereo index is increased or decreased by a value according the slider setting.
- **Change value by:** in this mode the produced stereo image has stereo index resulting from multiplication of the current stereo index by the slider value.

Spectral Compander controls

Spectral compander decreases short time difference between different frequency regions by amplifying weak frequencies making sound brighter and more explicit. It is controlled by two sliders:

- **Allowed difference (in dB):** means that if the difference between spectral regions is less than the specified value, no processing is performed. Try to increase it if, for example, amplification of mid and high frequencies is too large or vice versa.
- **Power:** defines "aggressiveness" of the processing. The larger the value, the higher amplification of weak frequencies. Try to decrease it you feel that the output spectrum is over-compressed and vice versa.

Bass corrector

Bass corrector allows you to increase the amount of low frequencies without overloading your speakers or amplifier. It is controlled by two sliders:

- **Bass gain (in dB):** low frequencies are dynamically amplified according to this value. A special care is taken so that the output signal is not clipped.
- **Bass limiter (in dB):** defines a threshold above which the low frequencies are compressed to fit into the range. Try to enable this if you feel that your loudspeakers are overloaded distorting sound. Start from zero and gradually reduce it till the distortions are acceptable.