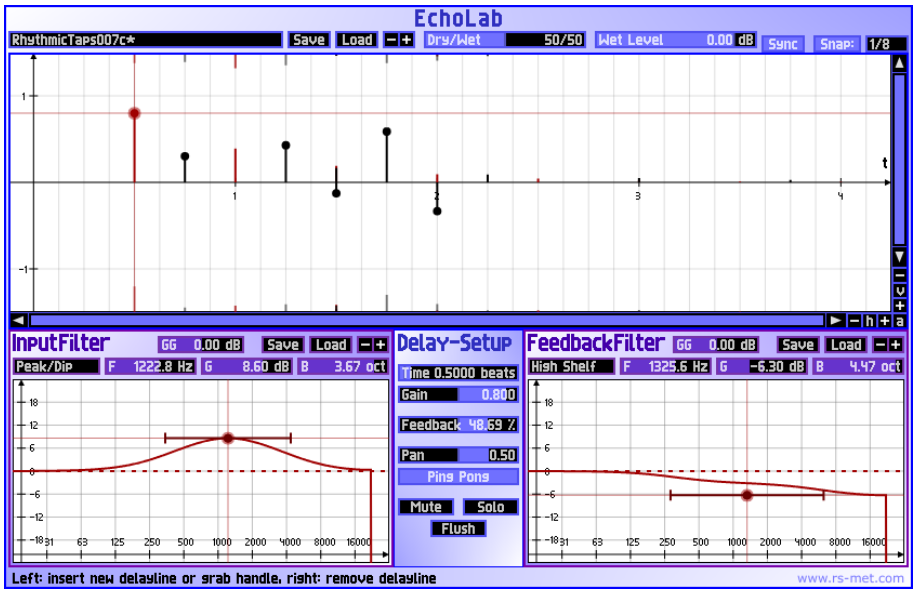
EchoLab - User Manual



What is EchoLab?

EchoLab is a plugin for creating a wide variety of delay and echo effects. It provides an arbitrary number of delaylines each of which may have feedback, may be placed independently in the stereo panorama and may be switched into 'ping-pong' mode (which means alternating panorama positions for successive echos). Moreover, each delayline has two filters associated with it - one sitting in its input path, the other one sitting in its feedback path. These filters themselves are made up from a series connection of an arbitrary number of stages and the frequency response of each such stage can be chosen from 8 different characteristics. Given that architecture, EchoLab allows for utmost flexibility in setting up rhythmic, filtered echo-patterns which form an essential ingredient in many styles of electronic music.

Preset management and global controls

At the top of the user interface, you will find the preset management section which shows you the filename of the current preset (if any) and provides buttons to load, save and step through presets. These buttons are replicated in both of the filter editors in the lower half of the interface in order to allow for saving and loading 'sub'-presets for each of the filters. The 'Dry/Wet' control will adjust the ratio between the dry (original, incoming) signal and the wet (delayed) signal. Furthermore, the 'Wet Level' slider allows for controlling the overall level of the wet signal.

The graphical delay-editor

The upper half of the user interface shows a graphical editor in which the user can insert, remove and modify individual delaylines. So what is a delayline? A delayline is a signal processing element, that delays the incoming audio signal by some prescribed amount of time (say d) and outputs the signal after

that amount of time, hence creating an echo. With feedback around the delayline, further delayed copies of the input signal will appear even later, creating a whole series of echos appearing at times $d, 2d, 3d, \ldots$ with decaying amplitudes (in case the amount of feedback is below 100%, which it should always be). In the delay-editor, each such delayline is represented by a spike, emanating from the time axis with some dot on top of it. This dot serves as a handle to adjust the delay time (represented by the position along the horizontal time axis) and the overall output amplitude (represented by the position along the vertical amplitude axis). By holding down the control-key, it is also possible to modify the feedback (via vertical movement) and panorama (via horizontal movement). When a delayline has feedback, you will see a whole series of such spikes, each representing an arrival of an echo due to feedback - but these secondary spikes will not have that dot-like handle as these are rigidly connected to the arrival of the first echo from the respective delayline. From the upper and lower borders of the delay-editor, you will see these spikes replicated, but here they will also take into account the panorama position: spikes emanating from the upper border indicate echos appearing on the left stereo channel, whereas spikes emanating from the lower border indicate echos appearing on the right stereo channel. When you have selected one of the delaylines (by left-clicking on its dot handle), its series of spikes will appear in red - otherwise in black. To sum up: the graphical delay-editor serves mainly to adjust the delay-times and the amplitudes of the delaylines in some visually intuitive way. At the bottom right of the editor, you will find some buttons to zoom into and out of the plot in horizontal and vertical direction and the scrollbars allow you scroll to the region of interest when zoomed in - just like scrollbars usually work. At the top left of the editor, you will find some widgets that affect some global behaviors of the editor:

Sync: Switches tempo synchronization of the delay times on/off. If switched on, the delay times shown in the editor will be represented in beats, otherwise in seconds.

Snap: This button switches a 'magnetic' grid for the delay times on/off. Switching the grid on will be very helpful in creating rhythmic patterns that are exactly aligned to musical notes (such as 8th, 16th etc.). The box right next to that button selects the resolution of the grid in terms of a fraction of a beat (or second).

The editor for delayline parameters

In the middle of the bottom half is an additional editor where you can edit all the parameters of the currently chosen delayline with exact numeric feedback - including the parameters mentioned above plus some more. These parameters are:

Time: This is the delay time either in beats or in seconds (depending on whether or not 'Sync' is active).

Gain: The amplitude of the output of the selected delayline as a raw multiplication factor (not in decibels).

Feedback: The amount by which the output of the delayline is fed back to its input, expressed in percent. High values will make the amplitudes of successive echos decay more slowly.

Pan: The panorama position of the delayline's output signal.

Ping Pong: Switches the delayline into so called 'ping-pong' mode. In this mode, successive echos will be alternating between the pan-position as set up via 'Pan' and the opposite position thereof. In this case, the 'Pan' parameter will determine the panorama position of the first echo.

Mute: Mutes the output of the selected delayline. This is useful to temporarily switch off the contribution from a particular delayline without removing it entirely.

Solo: Switches the selected delayline into solo mode in order to audition its contribution individually.

Flush: Wipes out the content of all delaylines - might be useful when a signal is circling around the delaylines for a long time.

The filter editors

In the left and right sections of the lower half, you will find the editors for the two filters, sitting in the input- and feedback-path respectively. You may insert and remove filter stages by left- and right-clicking in a similar way as you insert and remove delaylines in the delay-editor. Each such filter stage may be any of the following 8 types: Peak/Dip (aka parametric equalizer), low-shelving, high-shelving, lowpass with 6 dB/oct, (resonant) lowpass with 12 dB/oct, highpass with 6 dB/oct, (resonant) highpass with 12 dB/oct, notch (aka bandreject or bandstop). Depending on the mode of the selected filter stage, you will have a subset of the following parameters available:

F: The characteristic frequency of the filter (available for all modes).

G: Gain of the filter - available for peaking and shelving modes and the 12 dB/oct lowpass/highpass modes. In peaking mode, the gain represents the gain (or attenuation) at the characteristic frequency. In low- and high shelving modes, it represents the gain at low and high frequencies respectively. In the 12 dB/oct lowpass-/highpass-modes, it represents the gain at the cutoff frequency, where values above -3.01 dB will give rise to resonant filters.

B: Bandwidth of the filter, given in octaves (available for peak, notch and shelving modes). In peak mode, this will be the width between the two frequencies at which the gain (in dB) is at a half of the peak value. In notch mode, it will be the width between the two -3.01 dB frequencies at both sides of the stopband. In low- and high shelving modes, it will determine the transition width (steepness of the curve) between the affected and the unaffected frequencies. With values lower than approximately 1.9, there will be some overshoot above and below in the shelving characteristics (this kind of behavior is known as 'tipping'). The bandwidth parameter (if applicable) will also be represented in the visual editor by a horizontal line with handles at its left and right to modify the bandwidth.

GG: Finally, there is a global gain parameter which just applies a gain to the whole signal. This will be useful for compensating for overall gain changes due to the filtering.