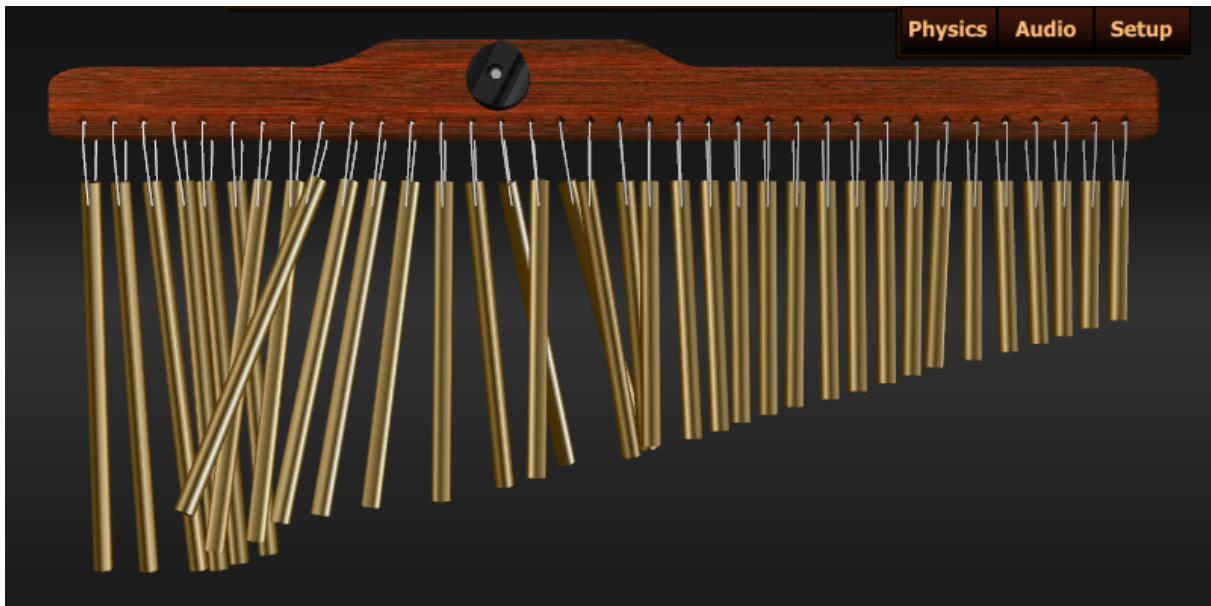# QuikQuak
Audio plug-ins

BarChimes

User guide

Bar Chimes are percussive instruments often used in a wide range of musical styles. They produce that twinkling or sparkling sound often used by percussionists to add atmosphere and a touch of 'magic' to compositions.

They consist of a row of tuned solid metal bars that hang on strings from a wooden beam. When moved, usually with a sweeping action, the bars will swing and collide in a chaotic manner, creating that recognisable shimmering sound from all the random collisions and interactions.

The BarChimes plug-in physically emulates a set of bar chimes, using complex kinematic physics algorithms. Great care has gone into translating the physics of gravity, friction, and weight of the bars, including their appearance. The sounds of the bar interactions are created using editable partials and length frequencies, including percussive hits, decay elements, and spectral alterations.

Installation

BarChimes is a stereo effects plug-in, for Audio Unit and VST compatible hosts. As there are many different hosts, please consult your hosts' manual for FX usage and routing.

PC: The file you download is in a simple plug-in format. Once you have 'unzipped' it you will have a file with the plug-in name and extension '.dll'. Copy this file directly into your plug-in folder. This folder is host specific but often found somewhere like "C:\Program Files\Vstplugins." Please consult your host's manual for plug-in locations if not.

Mac: The zipped file contains a basic package installer, this will place the VST and Audio Units (AU) versions in a standard place. Which is "HD/Library/Audio/Plug-ins/" the Component sub folder from there is for AU, and the other is VST. You are free to move these to any location.

Note: Some hosts do not recognise new plug-ins, and a complete rescan is needed to pick up on their existence.

Registering:
Clicking on the REGISTER button on the top left of the interface brings up the registration window. You must buy a key to unlock the evaluation copy. Use the 'SHOP' button to bring up the on-line shop, or simply go to: quikquak.com/shop_go.html
Once you have received you key through email, enter the requested details into the Registration window. Use your computer's copy/paste mechanism to prevent possible errors.

Getting started

Playing style:
BarChimes is a percussion instrument and is not designed to directly translate MIDI note to actual frequencies. In other words, a MIDI piano keyboard configuration is used to play the chimes but not in the traditional sense.
The 'natural' notes (white keys on a piano keyboard) are used to interact with the bars. This enables continuous 'sweeps' from a midi keyboard, and also allows for two handed sweeps in different directions.
One C# note (default C#4) is used as a dampener key. When held down this cushions and centres the bars, effectively making them quiet. Release this key, and the bars will swing back into their steady state.
The 'Setup' panel has a list of presets you can click through, note that the last two presets will ring on their own due to the wind settings (wind as in blowing, not as in clock!).

FIRST RUN WARNING:
When first running the plug-in this warning is displayed.
BarChimes' output volume is equivalent to any other plug-in synthesiser, but it contains clashes of high frequency content.
This is primarily a background musical percussion instrument, so please use sensible levels in your host software and amplifiers.
High frequencies at high volumes can damage your hearing, maybe permanently with prolonged exposure.

Controls

Bar lengths:
 If you hover the mouse pointer over a bar, a slider appears allowing you to adjust its length. Length is directly linked with pitch, and the current note is displayed above each slider. There are 36 bars in total that you can configure this way. Note, if one of the group panels are open you cannot adjust the remaining visible bars.
When adjusting a bar it may twitch slightly when moving, this is due to the physics algorithms adjusting to the new length, but it settles down quickly.

Panels:
 At the upper right of BarChimes' interface are three drop-down tabs. Click on the tab to reveal the control panels. Click on the name tab gain, the up arrow tab, or an adjacent tab to close the currently displayed panel - it's easier than sounds and is very intuitive.

Setup panel

Presets:
 A list of presets can be selected here, simply press the black preset buttons. Presets are a good starting points to discover what the plug-in is capable of. Press the name panels to edit them. All the presets are saved with the host's project file.

Dampener key:
 When held down, this cushions and centres the bars, effectively making them quiet, but not in a completely abrupt way. Release this key, and the bars will swing back into their steady state. This parameter allows you to choose from a selection of different MIDI assignments.

Base input octave:
 This parameter allows you to shift the starting input point for first (left hand) bar. It defaults at C3.

Wind only on transport play:
 When using the wind parameter, the chimes will blow about continuously as your host software calls the effect processes of BarChimes. This option stops the wind if the transport bar of your host is not playing.

Base input octave:
 This parameter allows you to shift the starting input point for first (left hand) bar. It defaults at C3.

Visual collisions:
 While not effecting the sound at all, this option demonstrates the power of each bar's collisions during play. Also adds and degree of aesthetics along with it!

Audio panel

Decay time:
 This selects the decay envelope of the main chime ring. This is a fixed exponential decay, that is relative to the bar's physical size. Longest decay time is to the right.

Percussive decay time:
 This selects the initial hit decay envelope. This is shorter than the 'Decay time' in general and gets combined with it. Its main influence is on the percussive noise sound.

Stereo panning:
 The left to right aspect of the layout is placed across the stereo field. A 0% setting will mean every will be from the centre. 100% means that the left most bar will be at hard left, and the right hand bar will be at hard right.

Boost frequency:
 You can influence an overall boost frequency. It's bandwidth is fixed, but has been designed to simply allow wide tonal boosts from 3 to 12KHz

Low frequency roll-off:
 Sometimes you may want just a very light twinkle effect, so rather offsetting all the chimes to higher frequencies, use this to roll-off some of the lower end ringing.

Percussive noise gain:
 When the bars are initially struck a wide band of frequencies are present in the sound, use this value to adjust the harshness of the strikes.

Global pitch offset:
 This value internally overrides all of the bar's frequency setting. The value is in semitones, and ranges -12 to +12, giving you a two octave offset.
Note that the note values of the actual bars are not effected.

Size to gain bias:
 When set to 50% this slider forces all bars to be played with the same general gain values. At 0% the larger bars have higher volumes. Set to 100% gives the smaller bars a greater volumes. Note that this has nothing to do with its left to right position on the beam, and is purely a size association.

Global pitch offset:
 This value internally overrides all of the bar's frequency setting. The value is in semitones, and ranges -12 to +12, giving you a two octave offset.
Note that the displayed note values of the actual bars are not effected.

Global gain:
 This value allows you to adjust the output gain of the whole system, useful for levelling preset volumes where gains may change depending on various parameter settings.

Physics panel

Gravity:
 This hast a centre value of 9.81m/$\overset{2}{s}$ which is the 'standard constant' for gravity on earth. Low gravity values give the bars a light floating appearance and take longer to setting down to a steady state. High setting give the bars a pulled down effect, and they settle much quicker.
Note that the bar strings are lengthened slightly because of higher gravity settings, this is simply an after effect from the kinetic simulation, and does not effect the sound of the bars.

Time delta:
 The physics of the system runs at a predetermined rate to suite the overall simulation. You can change the update frequency of this simulation with this slider. The values are actually in semi-tone values to allow for better frequency matching with your bar settings.
A setting of -24 would be two octaves, which is one quarter of the basic update speed. -12 being half speed, and +12 being double.

> **+ Audio:**
> Additionally you can opt to affect the frequencies of the bars with the time delta values.

Strike boost:
 When you play the bars, there is a certain amount of forward moment pushed into the bars. The actual effect is relative to the input velocity, but you can change the general influence in a large range with this slider.

Horizontal influence:
 This parameter is not quite the same as 'strike boost.' The horizontal direction is associated with the previous struck bars. So an aggressive sweep will push neighbouring bars at a greater influence. This slider alters the overall sweep effect.
Note, this parameter was created to simulate a passing of stick or finger through the real instrument.

Random hit amount:
 This slider specifies the amount of random velocity given to the user's interactions. Adding a more realistic and less clinical motion. It creates more chaos in the bars, which is very visible from the movement of the animations, during a sweep.

Partial 1:
 A partial is an added harmonic peak to the fundamental frequency, always located at a higher frequency. It's value is in Kilohertz and this stays relative to the bars' base pitch on all frequencies. In other words, it is *not* located at a musically logarithmic position from the fundamental. Using a linear partial offset like this has been found to simulate bar chimes well, and gives a nice metallic discord between the different length bars.

Partial 2:
 A second partial can be added, usually placed some way above the first partial. But they can be both placed anywhere you like of course. It's value is in Kilohertz and this stays relative to the bars' base pitch on all frequencies.

Collision reaction:
 This parameter usually stays in the central position for a realistic simulation. It controls the reaction from the individual bar interactions. Set to 0.0 the bars will not react at all with each other, they simply glide through each other as though they were just projections. The difference here is that still make the collision sound. Set to 1.0 gives the considered realistic reaction. And set to 2.0 can cause unstable over-reactions, which in certain circumstances will never settle down.5

Wind direction:
 BarChimes has a wind simulator. It can be blown in any direction from 0 to 180 degrees from the axis of the beam (the chimes are symmetrical about the beam axis so 180 to 360 are not included).

Wind speed:
 This parameter governs the effect of the wind blowing. 0.0 being no wind at all, and 1.0 creating a gale! The last two presets that come with BarChimes demonstrate the effect of using wind parameters.
* While the processing loop is called by the host software, the wind will be effecting the chimes. This can interfere with a song or sequence, so there is a parameter in the setup panel which only allows the wind to blow while the transport bar is active.

Graphics

The BarChimes physics run directly in the audio processing loop of the plugin. This process is called from the host in chunks. If large chunks are sent then the display will not move as smoothly as expected. Some hosts provide a plug-in buffer size option, so you can reduce this down to about 1024 or so, to show the animations behaving as you would expect. Although graphic speed will not effect the sound, or the simulation.

*Please make sure you have the latest drivers for your graphics card.

Hints and Tips

* Using the back of your fingers to sweep the keys, and you can use both hands in any direction - BarChimes has 36 note polyphony.
* Remember that the sideways movement of the bars is associated with the velocities of the neighbouring bars. It's basically a sweep detector, which helps to simulate movement in the system.
* In most circumstances, keep volumes low. This instrument can create harsh high frequency discord, that may be louder than you think.
* If using as a wind chime effect, use the 'wind only on transport play' option, so it will 'blow' only when the track starts, rather than chiming all the time.
* Have fun!

Regards,

Dave Hoskins

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