cool edit | pro
version 2

User's Manual

Brought to you by
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Cool Edit Pro™ is a full-featured digital audio editor, recorder, and mixer for Windows 98™, Windows Me™, Windows 2000™, and Windows XP™.

Special

The options in this menu can be used to introduce some processing effects that are both innovative and wild-n-wacky. Have fun and experiment!

Brainwave Synchronizer...

Cool Edit Pro's Brainwave Synchronizer can produce files that, when listened to with stereo headphones, will put the listener into any desired state of awareness. For example, by listening to "brainwaved" files, you can achieve states such as deep sleep, theta meditation, or alpha relaxation. Because of the nature of this function, it only works on stereo waveform data, and to be effective, it must be listened to with stereo headphones.

The Brainwave Synchronizer function spatially locates the audio left and right, in a circular pattern over time. In order to spatially encode the signal, either the left or right channel is delayed so that the sounds will appear at each ear at different times, tricking the brain into thinking they are coming from either side. When this is done at frequencies of 3Hz and above, the brain will start synchronizing at the same frequency, increasing its output of Delta, Theta, Alpha, or Beta frequencies.
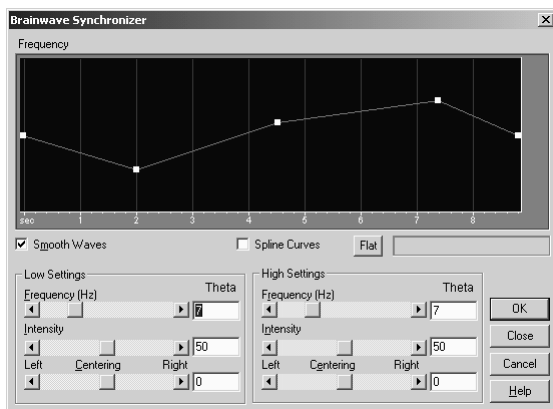
Brainwave Synchronizer Dialog

Frequency Graph

Time is represented along the x-axis (horizontal edge), and frequency along the y-axis (vertical edge). As you go to the right of the graph, you are setting the frequency characteristics of the highlighted sample later and later in time. The settings chosen will vary between the low and high settings depending on where the graph dictates the signals should be. Choose the highest and lowest frequencies that are represented on the graph with the scroll bars located in Low/High Settings, below. The readout below the graph displays the current x, y position of your mouse.

Cycling between 4 to 5 Hz over a 2 minute span works nicely. If large variations are done in short time spans, the effects are not as pronounced. For example, after 5 minutes of listening to Theta waves, the listener will become slightly awake, if 30 seconds of alpha waves are generated, and then returned back to theta. The effect is sort of like shifting gears into different levels of awareness.

For more information about *Cool Edit Pro*'s graph controls (such as how to add and remove control points), see the "Getting to Know *Cool Edit Pro* and Its Main Screens" chapter.

Smooth Wave

When checked, the audio that appears at the left and right channels will be smoothed out. The left and right channels will delay and un-delay following a smooth curve such that the delay difference between the left and right channels will follow a sine wave pattern, even though the brain will hear the audio as traveling around the head in a circle.

When **Smooth Wave** isn't checked, the net delays are the same, but are achieved by holding one channel constant (at no delay) while the other channel is delayed following half a sine wave. The boundary between holding non-delayed and delaying signal is discontinuous in that the dD/dt (difference in delay over time) jumps from zero to a positive delay value without hitting any values in-between. When Smooth Wave is checked, the dD/dt is always continuous, which will cause less noticeable distortion in either channel when heard independently.

Spline Curves

Check this option to generate a smoother, best fit curve instead of a straight line between control points on the graph. When you use spline curves, the line will not ordinarily travel directly through the control points; rather, the points control the shape of this curve.

To get the curve closer to a control point, click to create more control points near the point in question. The more control points there are clustered together, the closer the spline curve will be to those points. Use Spline Curves when you want very smooth curves instead of straight lines (with their discontinuities at the control points).

Flat
Pressing the *Flat* button will reset the graph to its default state, removing all control points.

Low/High Settings
There are two sets of settings for control of brainwave frequencies. Low Settings all correspond to the lower part of the graph (points dragged near the bottom), and High Settings affect the top.

> **Frequency**
> This is the brainwave frequency that will be encoded into the final process. Different brainwave frequencies stimulate the brain into synching to different levels of consciousness (e.g. sleep, meditation, awakeness, etc.) .

👓 For special spatial panning effects, choose wave frequencies of 1Hz or less. A mono source (left and right the same) will appear to move from left to right and back at period of 1/frequency. For example, a frequency of 0.1Hz will pan the audio in a "full circle" over the period of 10 seconds.

> **Intensity**
> This controls the intensity of the brainwave encoding. Higher intensities work well with lower brainwave frequencies. Beta waves should have intensities below 25 or so, while Delta waves work better with intensities above 60.

> **Centering**
> You may choose to have your brain think the synchronization frequencies are coming from the left or right. This may affect the left or right hemispheres more intensely, but that's only a guess.

👓 Mixing a file that has been brainwaved to the left with one that has been brainwaved to the right (in the same frequency range within 2 Hz) has interesting effects.

Noise...

This function generates random noise in a variety of colors. Traditionally, color is used to describe the spectral composition of noise. Each color has its own characteristics.
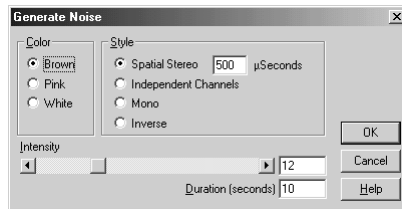
Generate Noise Dialog

Cool Edit Pro inserts noise from the current playbar cursor position, pushing any following audio back in time, and thereby lengthening the duration of the waveform. Selecting an area and generating noise replaces the selection, deleting existing audio.

☞ Use noise as the basis for creating weird sound effects, for creating soothing sounds like waterfalls (perfect for use with *Cool Edit Pro*'s Brainwave Synchronizer function), or for generating signals that can be used to check out the frequency response of a speaker, microphone, or other audio system component.

Color

> **Brown**
> Brown noise has a spectral frequency of $1/f^2$. This means, in layman's terms, that there's much more low-end, and there are many more low-frequency components to the noise. This results in thunder- and waterfall-like sounds.
>
> Brown noise is so called because, when viewed, the wave follows a Brownian motion curve. That is, the next sample in the waveform is equal to the previous sample, plus a small random amount. When graphed, this waveform looks like a mountain range.
>
> **Pink**
> Pink noise has a spectral frequency of $1/f$ and is found mostly in nature. It is the most natural sounding of the noises. By equalizing the sounds, you can generate rainfall, waterfalls, wind, rushing river, and other natural sounds.
>
> Pink noise is exactly between brown and white noise (which is why some people used to call it tan noise, but pink was more appealing). It is neither random nor predictable. It has a fractal-like nature when viewed. When zoomed in, the pattern looks identical to when zoomed out, except at a lower amplitude.
>
> **White**
> White noise has a spectral frequency of 1. In other words, equal proportions of all frequencies are present. Because the human ear is more susceptible to high frequencies, white noise sounds very "hissy". *Cool Edit Pro* generates white noise by choosing random values for each sample.

Style

Spatial Stereo

If you choose this option, *Cool Edit Pro* generates Spatial Stereo noise by using three unique noise sources, and spatially encodes them to appear as if one is coming from the left, the other from the center, and the last from the right. When you listen to it with stereo headphones, your mind perceives sound coming from all around, not just in the center.

To specify the distance from center of the left and right noise sources, enter a delay value in microseconds. About 900 to 1000 microseconds correspond to the maximum delay perceivable. A delay of zero is identical to monaural noise, where left and right channels are the same.

Independent Channels

Select this option to tell *Cool Edit Pro* to generate noise by using two unique noise sources, one for each channel. The left channel's noise is completely independent of the noise of the right channel.

Mono

If this option is chosen, *Cool Edit Pro* generates Mono noise by using a single noise source, with the left and right channels set equally to the same noise source.

Inverse

With this option selected, *Cool Edit Pro* generates Inverse noise by using a single noise source (similar to the Mono option). However, this time the left channel's noise is exactly inverse of the right channel's noise. When you listen to it with stereo headphones, the effect is that of the sound coming from the center of your head instead of out in space somewhere.

Intensity

Adjust this slider to specify the noise's intensity, using a scale from 2 to 40. Or, you can key in the value numerically in the entry box to the right of the slider.

With higher intensities, the noise becomes more erratic, and sounds harsher and louder.

Duration

In this field enter the number of seconds of noise you want to generate.

For very long periods of noise, it's faster to generate a shorter period (say, about 10 to 20 seconds) and delete excess noise at the beginning and end so that the waves are starting and ending at the midpoint. Then copy and loop (using **Edit > Mix Paste**) as many times as needed.