

# PLUGGED IN



## Audio Editing Software

MAKING YOUR OWN SONIC "PAINT"

BY **NORMAN WEINBERG**

**W**hat does music – and drumming in particular – have to do with paint, you wonder? Just bear with me through an analogy, and you'll see.

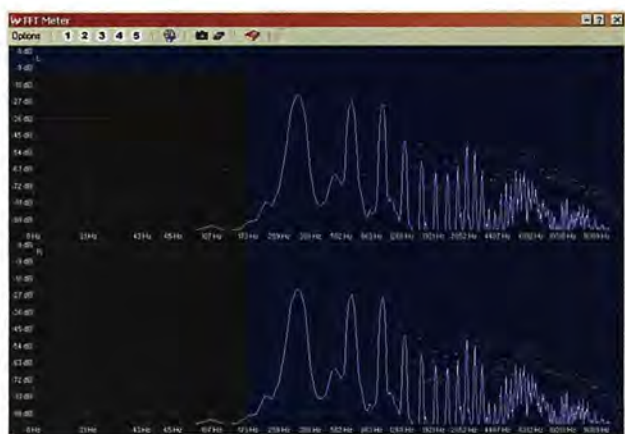
Many visual artists are perfectly content to visit a local art-supply store and buy a few tubes of cadmium red, lamoriniere green, or phthalo blue. For other visual artists, however, an integral part of the overall

creative experience is making and mixing their own paint, because doing so allows the most possible control over the paint's exact color, thickness, and smoothness. While not the easiest skill to master, the final

product is well worth the effort.

So if making music is like painting, then sounds are like colors. As an electronic musician, it's perfectly okay to visit your local music store or jump online to get sounds that have been created, edited, designed, and formatted to fit your software and hardware. Right out of the box, these sonic materials sound great and are easy to work with. But making your own sounds – either from scratch or altering others' sounds – offers the musical artist an amazing amount of control and a sonic signature that cannot be duplicated by other means.





**FIG 1.** Wavelab's FFT Meter let's you view harmonic spectral content in real time



There are a couple of software tools on the market that can help you design an individual sonic identity, all while working in a software environment that is built exclusively for doing the job right. We are going to explore some of the features, tools, and techniques common to high-end audio editors such as Peak (bias-inc.com), Sound Forge (sony-mediasoftware.com), and Wavelab (steinberg.net).

## AUDIO-EDITING BASICS

Similar to a digital audio sequencer, a full-featured audio editing program will let you record directly into the software. Typically, you tell the software to look to your audio input (either on the computer or an external digital-audio interface), set the sample rate and sample bit-depth, adjust the input level, and hit the Record button.

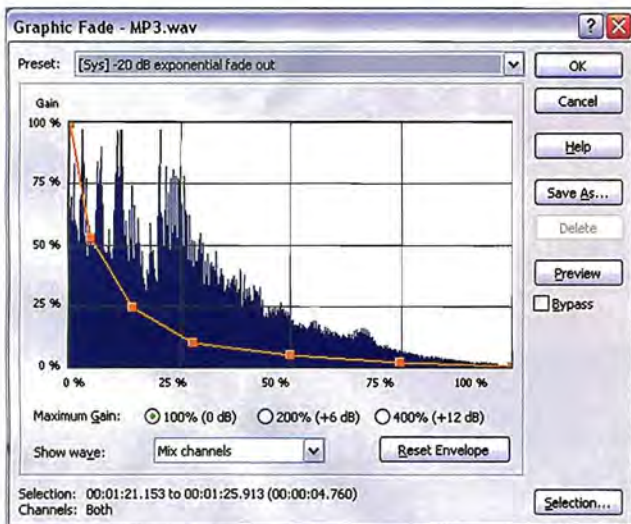
Your "total studio environment" software may let you edit sounds, but it's often a pain in the butt. For example, to create an excerpt from an MP3 file, one popular full-featured digital audio program opens the MP3 file but changes its format to AIFF. Once the file has been trimmed, it can't be saved back as an MP3. Yipes! Nearly any audio editing software has both the tools and the working environment that makes the manipulation of sound a pleasure.

It's also absolutely essential that your editing software play well with others. You won't use the program if it doesn't open or save files in the formats required for your work. Common formats are AIFF, WAVE, MP3, SDII, and AAC, but some software programs can work with dozens of different file types. The more compatible formats, the better!

Besides the file type, the most important aspects of a file are the sample rate, the bit-depth, and whether or not the file is mono or stereo.



**FIG 2.** By moving the slider and using either real or imaginary harmonics, you can design some totally unique tones with the Harmonic Rotate window inside of Peak



**FIG 3.** Sound Forge lets you specify sample rates from 2,000Hz to 192,000Hz





There could be many reasons why you might want to change one or more of these attributes. By changing a stereo sample to mono, you might better be able to load your sounds into an electronic drum brain, or save memory and processing power during live performances. Once you change a mono sample into stereo, you could choose to modify the left or right channels individually, turning a totally engaging sound from a dry and boring mono file.

CD-quality audio is considered to be 16-bit, but higher bit rates are becoming more and more common. Files created, edited, and processed

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at higher bit rates often sound better because the software doesn't have to "round off" for a number of different sonic operations. Each time a file's data structure is rounded off, the quality is slightly degraded. Lower bit rates make a file sound grainier, fuzzier, and distorted. Depending on your application, that might be just what you're looking for. Some audio editors support a very wide range of sample rates. Sound Forge, for example, lets you specify rates from 2,000Hz to 192,000Hz. Lowering the sample rate will lengthen the sound and make playback slower, whereas changing to a higher sampling rate will play it back faster.

#### LEVEL TWEAKING

An audio file needs to be at the proper level and volume in order to be effective. Here are of a few of the ways an audio editor will let you tweak the level.

**LEVEL NORMALIZE.** When this process is applied to a file, the overall amplitude is affected. When normalized, a sound's level is brought up to a specified maximum value. The most common use of normalization is making a file as hot as possible without clipping. By normalizing to a specific point, you can be certain that a number of different sounds share the same maximum level. This is the perfect tool if you're trying to match

the intensity of a number of different snare drum strokes, for example.

**GAIN CHANGE.** This process also affects the overall amplitude of a sound, but unlike the normalize process, a gain change can introduce clipping. Depending on the software, you can specify a gain change in terms of a percentage or in decibels. In most cases, clipping (especially digital clipping) is a bad thing. But drummers make a living by work-

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ing with noise, so we're more likely than most to embrace clipping as a positive aspect to the sound.

**LOUDNESS NORMALIZE.** This particular tool is found in Wavelab and is a two-part process. Like a gain change, it increases the loudness of a file, but it also includes a peak limiter that is used to keep the file from clipping. The end result is a much louder file overall without clipping.

**PAN NORMALIZE.** Also a feature of Wavelab, the pan normalizer can be called into play when it's necessary that both channels of a stereo file be at the same level.

**LEVEL ENVELOPES.** Editing a sound through a level envelope is very similar to working with envelopes on a synthesizer. By setting up break points in rates (the rate of change in time) and levels (the value reached by the change), you can easily adjust a file's overall level over time. You can think of this as a little like a programmable volume knob.

**FADE-IN & FADE-OUT.** Creating automatic fades can be used to smooth single sounds. Be sure to experiment with the curve-type of the fades: You may discover that a logarithmic or exponential curve sounds much better than a simple linear curve. This is a great tool to smoothly fade long sounds such as cymbals or complex pads. It's also a great tool for creating a more professional image on the Web. Generally, online audio clips are limited to 30 seconds (as either a teaser or to avoid copyright infringement hassles). Too many sound clips seem to just begin and end abruptly without any regard to the jarring effect this may have on the listener. Creating a short fade-in of about a half-second and a slightly longer fade-out makes the listening experience much more enjoyable. If the software has the ability to batch process files, you can perform this sort of function offline on hundreds of files in one quick operation.

## SOUND ADJUSTMENTS

If a file needs some adjusting in terms of pitch, length, or harmonic identity, there are additional tools that you can apply to make the necessary changes to your sound.

**CHANGE DURATION.** This command can shorten a file or lengthen a file without changing the pitch. Most of these processes sound pretty good when making short changes of 10 percent to 15 percent, but try stretching a file by 150 percent to 300 percent and you'll end up with some pretty dramatic stuttering effects. This feature can also be a great tool for slowing down complex songs for transcription or play-along practice.

**CHANGE PITCH.** The complementary function to Change Duration, this command alters the pitch without altering the length of a file. If you're trying to get a drum loop's snare drum to fit with the tune's tonality, this is the tool of choice. In addition to changing the pitch by musical steps, most editing software will let you fine-tune by smaller increments called "cents" (100 cents to a semi-tone). >>

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**HARMONIC ROTATE.** This is a feature of Peak that "allows the frequency spectrum in a selected range of audio to be rotated around a horizontal axis." The end result is that stronger and weaker sections of the frequency content of a file will be applied to other parts of the spectrum. You might not know in advance what you're going to be doing with the sound, but it's always going to be interesting!

**REVERSE.** This musical process hardly needs a long explanation. When a sound is reversed, it simply plays backwards. Cymbals and other sounds with a good deal of decay are highly effective when played backwards. But reversing shorter drum sounds can create something with an entirely different rhythmic feel. Try reversing speech and chopping it up into small fragments. Then use a number of these

### These software tools can help you to design an individual sonic identity that will be yours and yours alone

tools to design totally new snare and cymbal substitutes.

#### BLENDING FEATURES

In addition to working with single sounds, audio editors will let you blend aspects of two different sound files.

**CROSSFADE.** A crossfade is when one sound fades in while another sound fades out. This is a simple way to combine sounds — one after the other — or even to have an entire song fade into another when you're building a set for your next DJ

gig. For more control, you should be able to determine the fade time and the type of curve that's used for the fade.

**MIX.** This command takes one sound and lays it on top of the target sound. It's a quick and easy way to combine two different sounds into a single file. Want to make your drum track sound like you recorded it at the beach? Mix your drums with a flock of seagulls!

**ADDING.** Slightly different than the Mix option, the Add function doesn't change the

overall amplitude of the target file. You can, however, adjust the level of the added material, and in Peak, you can even apply an envelope to the source. Imagine a crash cymbal that was created by adding two or three cymbal sounds together, each with varying rates of level and decay.

**MODULATE.** This feature lets you modulate one sound with another, just like a ring modulator. The end result is a combination of sounds as well as the summation and difference of tones created by the files. If you're looking to create some unique metallic sounds, this may be the tool you need.

**CONVOLVE.** Peak has a unique feature that lets you apply the spectral contents of one sound to another. In a way, this is similar to using convolution reverb. More often than not, convolving two drastically different sounds is more experimental than working with two

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## EXTRAS

If you're giving birth to a new sound, you'll often want to know exactly how it's going to sit inside the mix. Wavelab contains a few extra tools that let you view the characteristics inside a sound, such as a phase scope (which lets you see the amplitude and phase relationship between the left and right channels), a 60-band spectrum meter, a spectrum analyzer, and an oscilloscope.

No matter how many tools and features your editor has, most are also capable of supporting VST (PC) or AU (Mac) plug-ins. By using third-party plug-ins that you can buy or download for free from the Internet, you'll be able to add filters, reverbs, EQ, effects, and other sonic sweeteners to your files.

Depending on your needs, you may also want to take advantage of other features that make digital audio editors more versatile. If you work with loops, you'll find a number of tools that make creating loops a piece of cake, particularly if you need to synchronize your audio to a video track, or create professional tracklists and index points for burning CD and DVD audio discs. A few even include all the necessary tools (such as sophisticated dynamics processors) to perform professional mastering of your audio tracks.

## FINAL THOUGHTS

Many software publishers have downloadable demo versions of software that you can try before you buy. Check a few of them out and experience how they operate and how they can give you a whole new set of audio colors. Designing your own sounds can also be more economical than buying sounds off the shelf. There is, of course, the initial cost of the audio editing software, but it's an expense that you only have once. With a little investment of time, you'll be making sounds that are totally your own and gaining a priceless knowledge of how audio is constructed and manipulated. And who knows? You may even create high-quality sounds that you could sell to other musicians. ■

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