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- TUTORIALS
  Main Tutorials

- INTERVIEWS
  Spotlight

- ONSTAGE
- EDUCATION
- BONUS MATERIAL

REVIEWS   Software
Product Specs
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Pro/file

Most Popular

You are here: Electronic Musician » Aux Software » Noises Off

Noises Off

Aug 1, 2008 12:00 PM, By Mike Levine

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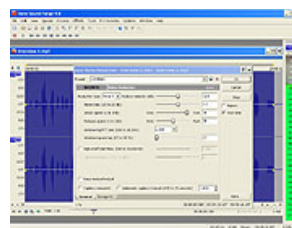**TIPS FOR GETTING THE BEST RESULTS FROM AUDIO-RESTORATION SOFTWARE**

BONUS MATERIAL
Bonus Material: Denoise in the Name of the Law

Bassist and producer Kevin "Brandino" Brandon (brandino.com) describes a massive audio-restoration job he did, making a CD (*A Voyage Again/Con Mucho Gusto;* N' House Records, 2006) from a cassette master of a live performance by jazz pianist Milcho Leviev from the Don Ellis Big Band, which was recorded back in the '80s. The playing was great, but the audio was quite noisy. Brandon and engineer Michael Gunderson turned to the software tools in Sony Sound Forge to clean it up (see **Web Clips 2a and 2b**).

They first used a pretty heavy dose of Sony's Noise Reduction (see **Fig. 4**), which is a broadband-noise reducer, but found that a subtler approach was necessary. "I listened back and discovered it was too clean," Gunderson says. "It took some of the life away from the material."

They then started over with a more gradual approach, applying denoising in layers, using both Noise Reduction 2.0 and the (fixed) noise-reduction algorithm in Sound Forge's Audio Restoration tool. "First I did one pass of Audio Restoration using a minimal to moderate setting, and it seemed to clean up the noise floor, but there still was some tape hiss," recalls Gunderson. "So I did three passes of the Noise Reduction 2.0 to really strip away the tape hiss, using a very minimal setting each time. At this point you might wonder about any sound degradation. I would say it was minimal at best."

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FIG. 4: Sony Sound Forge 9 with the built-in Noise Reduction effect open.

Because audio quality is always paramount in music recordings, you have to be even more judicious in your use of AR processes than you might be in spoken-word applications. Be sure to solo and compare the track both processed and unprocessed. Be extra careful to apply settings that don't noticeably degrade audio quality.

Ho Hum

Sometimes you're up against electrical hum, which is much more predictable in terms of its frequency and behavior than broadband noise typically is. The hum removers in AR software generally use EQ to notch it out, with presets at the basic hum frequencies of 50 or 60 Hz that extend up to harmonics of those frequencies. If your noise is electrically based, the hum remover can be very effective.

Jason England is a sound editor for film and television who uses BIAS SoundSoap Pro to deal with a range of noise problems, including hum. "I need something that's just click and go. The hum-and-rumble remover, you just turn it on. As an audio person you already have an idea of the frequency that you want to hit, and then you just slide it and do it."

Even if you don't have AR software, you can use conventional EQ to try to reduce hum and rumble. For hum, set a steep cut with a very narrow bandwidth at 50 or 60 Hz and see if that helps. You can also use a highpass filter or brickwall filter to get rid of rumble. A good starting point for the former is to begin rolling off at about 60 Hz. With the brickwall filter, start out at 40 Hz. Of course, you'll want to experiment to find the best possible setting.

Pop Goes the Click

Pops, clicks, and crackle can plague an audio recording. The latter two are particularly problematic when transferring from vinyl. Luckily, AR programs and plug-in suites are all equipped to deal with these intermittent pests. Often you can set a click-and-crackle remover plug-in to run across the length of a track and automatically remove them.

But as with broadband-noise-reducing software, setting the remover correctly takes some work. Some people will listen to the noise-only signal and tweak the settings until they hear only clicks and crackle, and no source signal. Crowe takes a different approach.

He likes to listen to the full signal when setting the click remover in DC Seven. He finds a short, representative section, maybe 15 seconds long, and loops it. "I want to hear the same thing again and again and again. My ear gets used to it," Crowe says. "I then adjust it with my mental focus on the clicks until I make them all go away. And then I bypass the filter, and instantly, while it's playing, it stops filtering. And then I hear all the clicks come back, and then I shift my mental focus to the target signal, the music, or whatever. And then I pop the filter in and out, in and out, while I'm listening. And if I can't hear any degradation in the target signal, then I've reached my point."

But clicks and crackle don't occur just on vinyl. England is often bedeviled by RF static that gets onto the dialog audio after being picked up in the actors' wireless lavalier mics. He uses BIAS SoundSoap Pro to help remove these impulse noises.

England applies SoundSoap Pro's click-and-crackle remover differently depending on the severity of the problem. "I might zero in on that one little area where there was a little static," he says, "but sometimes it's the whole take that's staticky, and I might just process the whole take."

As with denoisers, overly high settings on a click remover can reduce transient response. So if you're declicking a rhythmic track, use moderate settings if possible. (For more about click removal, see the **online bonus material** "Click Away.")

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