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Experimenting with SoundFonts

Apr 1, 2005 12:00 PM, By Kurt Heiden

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SoundFonts are like a gift that keeps on giving. For commercially-minded musicians, SoundFonts can open the door to a potential market of millions through the creation and sale of sample libraries. For beginners, using SoundFonts can serve as an ideal way to learn about sampling and synthesis. And for just about anyone, they can be an excellent resource to add to an audio arsenal.

In addition to being a very flexible format, SoundFonts are a great way to share your music with others. You can send a MIDI file and a SoundFont bank via email using less bandwidth than most MP3 files, and the fidelity will be better because there isn't any compression taking place. Think of the MIDI file as your score and the SoundFont bank as your orchestra, and then bundle the two together so that the recipient hears your music as you intended.

Another great benefit of SoundFonts is that they let you completely reconfigure your hardware using just a few mouse-clicks. You can turn your generic General MIDI (GM) sound card into an E-mu Proteus 1, Vintage Keys, or Planet Phatt module, all for less than $100. That's not a bad deal.

In this article, you'll discover that using and creating SoundFonts is simple. Thousands of sound banks, several bank editors, widespread application support, and the overall flexibility of the SoundFont format could make it the perfect "instrument" for your studio.

Checking the Compass

SoundFonts are a sampling file format developed by E-mu in the mid-'90s. SoundFont banks require a synthesizer or sampler (used as an engine) for playback and software to load them into the instrument and to edit them. Until recently, the synth or sampler had to be hardware from Creative or E-mu (for example, the Sound Blaster Live or Audigy line of sound cards and E-mu's Audio Production Studio). Software instruments, however, now have many of the same capabilities.

When a SoundFont bank gets loaded into a SoundFont-ready program, that program reads (parses) the sample and parameter data in the file and communicates it to the hardware, where it is rendered instantaneously into sound. Like any other patch, the sounds in the SoundFont bank are then accessible by your MIDI sequencer or controller.

The SoundFont file format is currently supported by Apple for software rendering in QuickTime 5 or higher, and is supported in hardware by nearly all Sound Blaster cards since 1997. Because Creative Labs has about 90 percent of the Windows sound-card market, there's a good chance that your studio already has SoundFont capabilities in one form or another.

Sailing Back

At first, the SoundFont format was proprietary, and all development had to go through Creative Labs or E-mu. That clearly dampened proliferation of the format. After surviving challenges by rival sampling formats DLS and DLS-2, the format was opened up for development without license in the late 1990s.

SoundFont bank files contain audio samples and parameter information about how the audio is to be processed. The first version of the SoundFont file format (SoundFont 1) was designed only for the E-mu 8000 chip used on the AWE-series sound cards. Banks in that format, which used an SBK file extension, are no longer supported, and most, if not all, have been updated to the SoundFont 2 format. SoundFont 2 added dozens of new features, including essentials such as Instrument layering and Preset-level parameter changes. SoundFont 2 files have the extension SF2, and most current SoundFont bank editors, including Creative Labs' Vienna 2.3, will convert SBK banks to SF2. The current specification is SoundFont 2.1, which also uses the SF2 extension. Note that Vienna requires SoundFont-capable hardware from Creative or E-mu to

function, and older, AWE-series cards do not support the format beyond SoundFont 2.0.
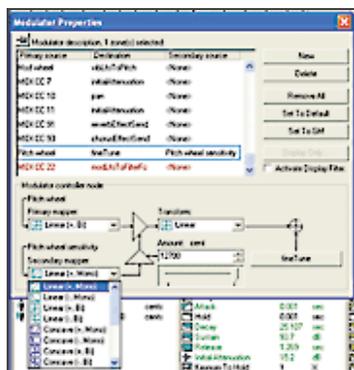

FIG. 1: Creative�s Vienna SoundFont editor allows you to assign multiple controllers to a destination and provides access to the full range of SoundFont features.

SoundFont 2.1 introduced incredible new features that take users to the limits of the MIDI specification and in some cases, beyond. For example, it allows up to 16 MIDI controllers to control up to 34 different parameters within a single Instrument. Each of the controllers can have its own curve coefficients (see **Fig. 1**, lower left, and the section in this article called "Below Deck"). That capability is accessible when creating or editing banks with Vienna 2.3; unfortunately, however, there are currently no Mac-based SoundFont editors that give access to the multiple-controller function.

In addition to the extra controller assignments within a bank itself, additional MIDI controllers, called E-mu Enhanced Controls, are made available on CC 21, CC 22, CC 23, and CC 24. Those Control Change messages can be called from any MIDI sequencer by sending controller data on the appropriate CC number and used for things such as assigning an LFO to Filter Cutoff. (A great example of that can be found at Creative's SoundFont Tutorial Web site at www.soundfont.com/tutorials/whysf21-4.html.) You can also create a keyboard split in which Pitch Bend messages impact the top half of the split with different curve characteristics than the bottom half. With SoundFont 2.0 or DLS2, you would need to use two MIDI channels to accomplish that, but SoundFont 2.1 delivers the goods on a single MIDI channel.

*(continued)*

SIDEBAR
Commercial Collections
Browse the back pages of an issue of EM or visit music sites on the Web, and you'll find a huge world of ready-made SoundFont banks available for purchase. These include a wide range of sounds such as classical, pop, and ethnic instruments; vintage Roland synths; and electronic dance collections. There are some free banks online, but you generally get what you pay for.

A great place to start looking for quality banks is directly from the source that invented the format: www.SoundFont.com, the official home of SoundFonts at Creative/E-mu. That is where you'll find SoundFont versions of classic E-mu sound modules like the Proteus and Planet Phatt. You'll also find third-party banks, including a 4 MB Bösendorfer Piano, and banks of Sequential, Moog, Oberheim, and Roland synths.

Another great source is Sonic Implants, which offers a host of reasonably priced, professional-quality banks. Sonic Implants' catalog includes synths, pianos, guitars, brass, basses, and even vocals. For dozens of free SoundFont banks, be sure to visit www.Hammersound.net. Also look to www.samplecraze.com for European SoundFont libraries, www.analoguesque.com/soundfonts.asp for vintage synths and drums, and www.houseofsamples.com for a vast array of sample collections and SoundFont utilities. While at House of Samples, check out the link to the Free Samples site, where you can find some unusual samples to use as the basis for your SoundFonts.

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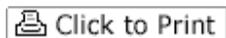
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