

by Norman Weinberg

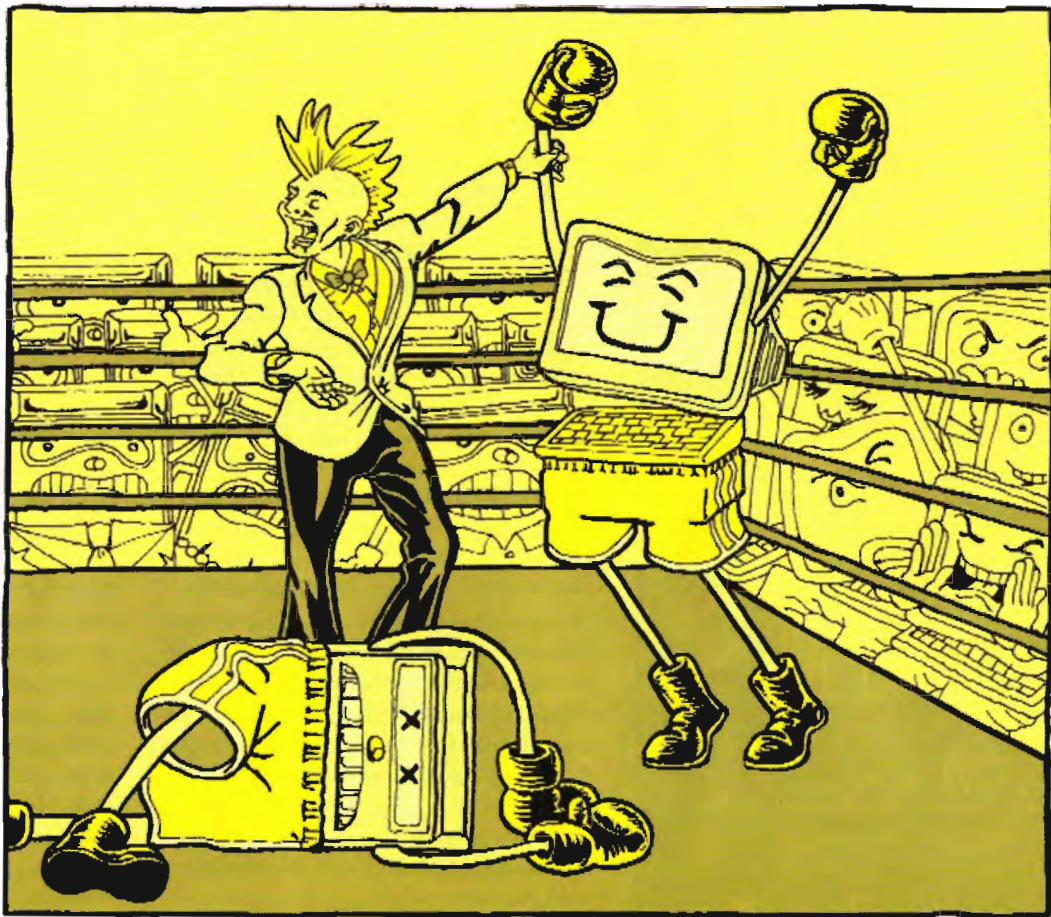
DIY FROM YOUR COMPUTER WITH POWERFUL SOFTWARE

Could it be that the age of hardware synthesis is drawing to a close? In the early days of desktop computers, futurists were pushing the paperless office, saying that all documents would soon exist only as digital files. As it turns out, working on virtual pulp rather than the real thing saved thousands of trees. But offices are still producing mounds of paper copy.

As musicians, we might be moved into a version of the paperless office (a totally virtual audio environment) by default. During a recent web expedition, I discovered that E-MU Systems, long a big-time sampler manufacturer, no longer offers a hardware sampler. A visit to the Yamaha and Roland sites exhibited a similar trend. The days of the dedicated hardware sampler are now over (I'm not talking about "music workstations" or DJ boxes that may contain basic sampling as a token feature).

Just think about that. High-power software samplers such as Tascam's GigaStudio, MOTU's MachFive, Native Instruments' Kontakt, E-MU's Emulator X, and Steinberg's HALion have taken over. An examination into the rack-mount sound module market shows a comparable move away from hardware machines. The bottom line: there are plenty of dedicated samplers and sound modules available. For the most part, they're soft.

WHAT IS SOFT. In a nutshell, a soft synth or sampler is nothing more than software code that instructs a personal computer to handle all the audio management activities that used to be done inside dedicated hardware machines. When running a virtual synth on your computer, the computer typically handles incoming MIDI messages from a controller, crunches the numbers that produce the audio, mixes audio signals together, and then sends the sound to audio outputs. The computer's monitor most often displays an



on-screen interface for hearing the sounds, and a layout of controls to select presets or interact with the various parameters for user programming.

GEAR REQUIREMENTS. Newer computers are able to run software synths right out of the box. A virtual rig could be nothing more than a laptop and a pair of headphones. Load the software into your computer, use your mouse and keyboard to control the interface, and monitor through the phones. When going all soft for the studio or live performance, you're going to want to add a MIDI interface to bring MIDI messages from your electronic kit or multi-pad into your computer. You'll also want to use a sound card that is designed to produce a high quality audio signal. Depending on your needs and budget, the MIDI and audio interfaces could be combined into a single external unit or even built into a card that is placed inside your computer.

IS SOFT BETTER? It's easy to see why going all soft has turned out to be the wave of the future. Here are just a few of the reasons: In the long run, virtual software is much less expensive than hardware. Once you've made your initial computer investment, high-quality soft synths are an outstanding value. In fact, there are several philanthropic programmers who have created freeware instruments that you can download off the net (legally). Soft synths are easier to program than hardware machines. Rather than working on a module's small LCD screen, a virtual synth can make use of the computer's entire monitor.

Software synths also have higher quality audio. Several programs can take advantage of all of the advanced features of your sound card, including 24- or even 32-bit resolution and a 96kHz sampling rate. Soft samplers are not limited to firing sounds that have first been loaded into RAM. Instead, many are

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capable of streaming samples directly off the hard drive, making it possible to fire dozens of cymbal samples with full decay tails (no looping required) and layer scores of strokes under a single note. Additionally, working with virtual synths makes setup faster, easier, and more convenient. You'll need a single MIDI cable from your controller, a USB and/or firewire cable to connect your interfaces to the computer, and two audio cables to carry your sound to your sound system.

CrossTalk, the University of Arizona's electronic percussion ensemble, recently made the transition from hardware to software. The group had four E-MU 6400 samplers, an Extreme Lead, an Audity, a Roland JV-1010, a JP-8080, a Yamaha EX5-R, and a Korg MS200R. Now the group runs through two Audio MIDI Mall computers running GigaStudio Software. That's it! Two computers have replaced ten sound modules. The result is a system that sounds better, is easier to control, and is actually more stable.

STANDALONE OR PLUG-IN. Most virtual synths come in two basic styles: standalone and plug-in. When running one of these programs in standalone mode, the entire computer is given over to operating that one software program. In standalone mode, you simply imagine that your computer is no longer a computer. Your computer *is* the instrument. The MIDI interface serves as the MIDI-In jacks, and the sound card serves as the outputs.

When running a virtual synth as a plug-in, it works in conjunction with a software host such as Cubase, Logic, Performer, or even Live. This allows the host software to interact with the virtual synth just as it would with a hardware synth. Running plug-ins has several advantages: You can run several plug-ins at once, creating a virtual rack of synths and samplers; you can run virtual instrument plug-ins along with audio effects such as sophisticated EQ, reverbs, and compressors; and you can automate synth parameters and functions from inside a sequencer.

FORMATS. If you're not familiar with virtual synths and audio plug-ins, getting started may seem a little foreign. Since the instruments only "exist" as software, you can't touch them and you can't physically connect the MIDI-Out of your electronic kit to the MIDI-In of a virtual synth. Instead, you route signals (both MIDI and audio) from one location to another inside the computer. Once you set this up a couple of times, it becomes very logical and easy to understand. Don't be afraid to experiment.

Your computer may operate with different

types of audio interfaces when running virtual synths: ASIO, DirectSound, MME, and Sound Manager. ASIO (developed by Steinberg and available for both Mac and Windows machines) stands for Audio Streaming Input Output. It's the most powerful multi-channel, low-latency format available. Whenever possible, you should use the ASIO drivers with all of your audio software.

Plug-ins also come in a variety of formats: DirectX (developed by Microsoft for the PC), MAS (MOTU Audio System for the Mac), RTAS and TDM (for Digidesign machines), VST (Virtual Studio Technology for both Mac and PC), and UA (Audio Units for the Mac). It's common that virtual plug-ins support more than one format. Before buying a new plug-in, make certain that the software is offered in a format supported by your host software.

DEALING WITH LATENCY. Latency, the delay that occurs from the time you strike your pad to the time you hear the sound, can be caused by several factors. Drummers are more aware, and more bothered by latency than other musicians, and it's important to the overall musical experience that latency is too short to be perceived. Here are some hints to help with the latency factor.

Be certain that you've installed the latest drivers for your audio card and your MIDI interface. You can check for new drivers by visiting the manufacturer's website. If you don't have the latest driver on your machine, download and install it. Get the fastest sound card that you can afford and set your buffers to the smallest possible amount. If the buffer is too small, you'll start to hear pops, clicks, and dropouts in the audio outputs. Since dealing with audio and plug-ins is a processor-intensive task, you need to keep your computer clean (defragged, virus-free hard drives, etc.) and use common sense (trash unused extensions and keep your operating system lean) to achieve the very best performance possible.

THREE STYLES OF VIRTUAL FUN!
GROOVE AGENT. This software is unique in that it is designed to emulate a "rhythm-box" drum machine from days gone by. These units were often included on early electronic organs and typically had ten or 20 musical styles such as Rumba, Cha-Cha, Swing, Waltz, Rock, or even "Twist." By selecting the musical style and pushing the play button, a stylistically correct – albeit static – beat pattern would emerge.

Groove Agent brings the concept into present day with 54 styles organized by decades from the '50s to today. When a

groove is called up, the software automatically loads a kit that is representative of the era. For example, the '50s jazz kit is wide open, while the '60s pop kit is highly muffled. If you don't like the sounds that Groove Agent has picked for you, it's a snap to load in totally different instruments and tweak them in terms of velocity offset, tuning, decay, ambience, group volume, and audio output.

Each style contains 25 variations of patterns and a number of different fills. Two sliders are used to control the "complexity" level of patterns and fills. The sliders can be linked to move in tandem or unlinked to provide more variation. In addition to changing the grooves and fills, there are buttons to select between the snare and side stick, add an accent (which is specifically a bass drum and cymbal stroke), change to a half-time feel (very cool), go into "auto fill" mode (automatically adds a short fill when you change from one pattern to the next), and random fill. Additional nuance can be added with the use of the shuffle and humanize knobs, while the limiter and ambience color the sound.

To really make the most of the program, you've got to drive it from an external MIDI controller. When reading MIDI messages, the software has hardwired certain notes and messages so that they can control just about every parameter of the program in real time. MIDI notes 35-69 play the internal sounds, giving you over 30 voices that are available at all times. MIDI note A#3 (70) acts as the accent button. Sending notes 72-96 over an odd-numbered MIDI channel selects between pattern variations. If one of these notes is played with a velocity of 90 or over, you'll trigger a fill. White-keys between 72-83 over an even-numbered MIDI channel toggle muting on and off for the eight different instrumental groups.

Have your creative juices started to churn? With an electronic kit or multi-pad, you can fire patterns and fills with constantly changing variations so that the result sounds more realistic than simply playing loops. Since you can also fire sounds and mute and un-mute instruments directly from your electronic kit on the fly, the number of variations and the real-time interaction you can have with the software is unlike any other sound module. If you want to take it to the limit, you can send MIDI continuous controller information (a good electronic hi-hat can do this) to control the shuffle, ambience, tuning, or other parameters in real time. Playing with Groove Agent in this way is more fun than should be allowed.

BATTERY 2.0. Native Instruments'

groundbreaking program, Battery, has been a solid performer for the last few years. By the time this issue is printed, Battery 2.0 should be available. In terms of ultimate flexibility, this program could be the one. The Battery drum kit consists of up to 72 "cells," and each cell can hold up to 128 individual samples, allowing for nearly endless varieties of layering, cross fading, and cross switching.

Armed with 9,400 drum and percussion samples (3.5GB), Battery has just about any sound you need right out of the box. If you're looking for more, the program will read and import a large number of audio formats such as .wav, .aiff, Akai, SDII, SampleCell, Gigastudio, and even Rex files.

Each cell has a serious set of controls to optimize your sound. Every sample can be edited in terms of its tuning, pan position, velocity, and root note. A filter/equalizer offers up 15 individual filter types such as low-pass, high-pass, band-pass, phase filters, and 3-band EQ. A compressor controls the individual dynamic range of each cell, and up to eight different parameters can be modulated by a variety of sources and targets.

DFH SUPERIOR. The dfh SUPERIOR package is actually three separate plug-ins: SUPERIOR drummer, SUPERIOR percussionist, and SUPERIOR cocktail. Together, it comprises a huge package of an Install DVD and four double-sided DVD data disks that total 85,000 sound files (35GB). Toontrack's custom plug-in architecture contains left and right strokes with a number of soft strokes, gradient strokes, and hard strokes. For example: a snare drum might contain ten soft hits, 15 gradient hits, and ten hard hits for each hand. That's a total of 70 different samples for a single snare drum – but wait, there's more! Also included is a full complement of cross sticks, rolls, flams, short buzz strokes, and other strokes needed for realistic drum playing and/or programming.

The software contains a unique system in which soft strikes (MIDI velocities of 1-20) are mapped to the soft hits in a random manner so that the same stroke is never played twice in a row. In a similar manner, all velocities of 127 are mapped in a random manner to the hard hits. All velocities between 21-126 are mapped to the gradient strokes. This is a wonderful system, as the samples never become stagnant. If you want to adjust these parameters, dfh gives you the ability to change the threshold values.

The software interface is based on a number of different windows that help you design your virtual kit. One window is devoted to selecting your performance "tools." Here you

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can choose drumsticks, rods, brushes, or felt mallets. Bass drum beaters include felt, wood, and plastic. Last, but not least, you can choose your kit with snares on or snares off.

The most amazing window is the "instrument construction window." If you wish, you can select from five preset kits: Sonor, Fibes, DW, Ludwig, and Premier. Otherwise, you can roll your own kit on an instrument-by-instrument basis. There are plenty of great sounding kicks, snares, toms, hats, rides, and crashes of various types. The Percussionist plug-in incorporates shakers, bongos, congas, cajon, cowbells, cymbals, timbales, tambourines, and more. Each of these instruments has scores of associated samples with numerous articulation variations. The cocktail plug-in is based on a compact Yamaha set; kick, snare, tom, ride, and hats.

A series of check boxes determine which microphones are "live" in order to correctly capture bleed from instrument to instrument. The microphone placements include kick, snare top, snare bottom, five toms, hi-hat, overhead, and ambient. As you can imagine, using a large number of instruments with microphone leakage can result in a major RAM drain. The software offers a number of controls that make adjustments for lower RAM requirements. For example, you might decide to remove the soft hits from the crash cymbals.

Once you've designed your kit, you move to the "main window." In this window, you've got plenty of controls to tweak your sound. You can adjust the pitch of each instrument, each microphone's bleed level, and fade amount. One cool trick is the ability to reverse the stereo perspective of the kit. Normally the program loads kits from the drummer's point of view with hi-hats on the left. If you would rather hear the stereo position from the audience perspective, it's a simple button click away.

THE FUTURE. As you can see, the path is clear. Electronic drummers will be "going all soft" until the typical performance rig is a controller (kit, multi-pad, or alternate-style) and a laptop running standalones and plug-ins. Anything is possible, the sounds are fantastic, and the ease of use and flexibility makes going all soft a good thing. 🙌

CONTACTS

Groove Agent (Steinberg) –
steinberg.net
Battery (Native Instruments) –
native-instruments.com
dfh SUPERIOR (Toontrack) –
toontrack.com



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