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JANUARY 2007

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2007 EDITORS' CHOICE AWARDS

Our 26 Favorite New Products

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MIDI GUITAR MASTER CLASS

REVIEWS

MOTU UltraLite
McDSP Project Studio
M-Audio Sputnik
and 5 more

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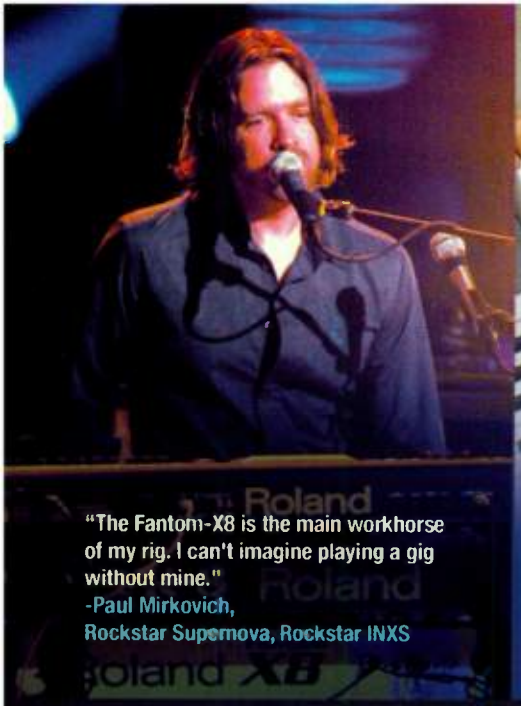

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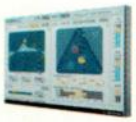

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Electronic Musician
January 2007

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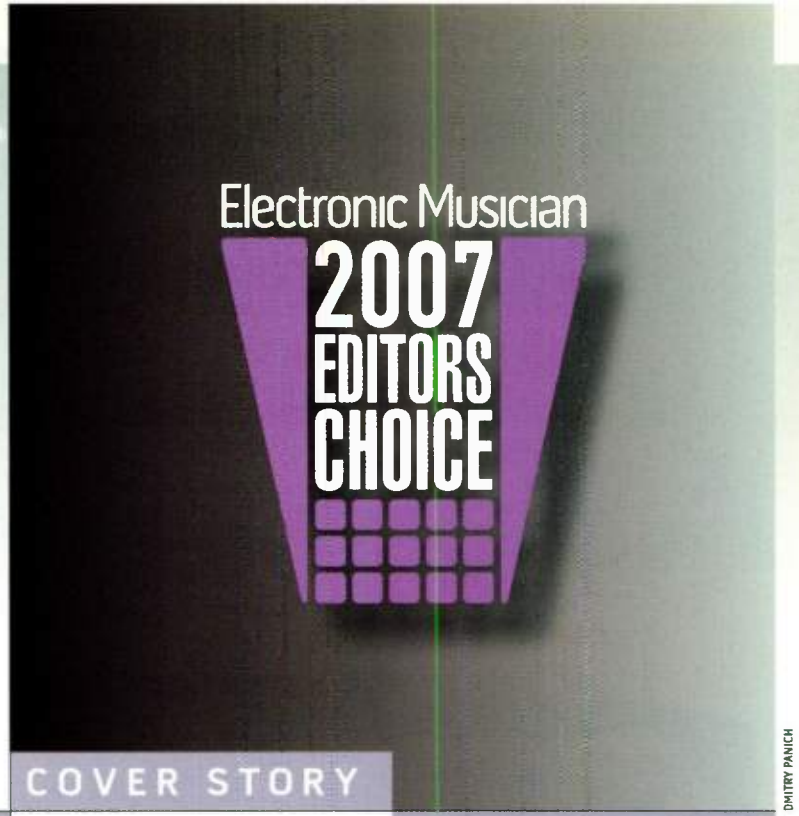

DMITRY PANICH

FEATURES

COVER STORY

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MX200

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Get on The Bus, Gus

The fourth quarter of each year is always intense for the EM editorial staff. Holidays notwithstanding, we simultaneously produce our monthly issues of EM; the November/December issue of our quarterly for music teachers, *Music Education Technology* (see www.metmagazine.com); and our annual *Computer Music Product Guide*. We also produced the second edition of our newsstand-only *Personal Studio Series* magazine, which focuses on tips and techniques for using Steinberg Cubase 4 and virtual instruments.

To top it off, we also put together what is always our biggest story each year—the EM Editors' Choice Awards (see p. 42). It's a kick to go over all of our product coverage, talk with editors and authors about the leading products, and make our choices. On the other hand, we are crawling out on a limb by saying that the products are the best we've tested, and I'm always a bit nervous that the limb will break off and send us tumbling because a product that looked great when we reviewed it will turn out to be a turkey in the long run.

JULIE BIRUM

When the annual selection process is completed, however, I always look at the list of winners and feel relieved. Indeed, I feel very good about our choices this year. We tested some genuinely excellent products, and we're pleased to bring you our choices for the best of the best.

Speaking of hot new products, the Winter NAMM Expo in Anaheim is the biggest U.S. show for personal-studio products, and it's happening January 18 through 21. We're teaming up with the *Remix* and *Mix* editors to bring you lots of video-based product demos from NAMM, exclusive celebrity and "musician on the street" interviews, a live show blog, and a good dose of "you are here" show ambience. That's in addition to a preshow product guide (from the editors of *Mix*); our usual in-depth, online postshow report; and regular product coverage in our "What's New" section. To better deliver the multimedia coverage, we're creating a special NAMM microsite that can be reached from the EM, *Mix*, and *Remix* home pages.

Last but certainly not least, I mentioned in the October 2006 "First Take" column that an editorial blog was forthcoming. Well, it is now up and running! Called The Bus, the blog is cowritten by Senior Editors Gino Robair and Mike Levine, Associate Editor Geary Yelton, and yours truly, so you will get a variety of opinions, advice, links to resources on the Web, and inside views of the industry.

Furthermore, you can comment on any of our entries. In fact, that's one reason we named it The Bus, as in "sends" and "returns." We'll send you our ideas and observations; you can process them and then give us your related ideas in return. To ensure that we stay on topic and avoid flaming, the comments are moderated. But with that understood, we invite you to give us your views.

So enjoy our Editors' Choice Awards and NAMM coverage. And please get on The Bus by reading and commenting on our posts. We need your feedback to make this a fresh way for us to exchange ideas and discuss issues and events in the world of electronic music, sound design, and music production in the personal studio.

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Editor in Chief

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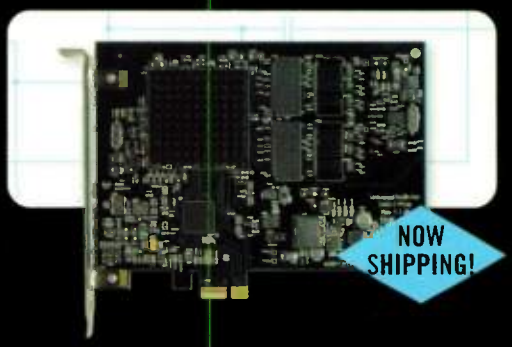

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JAZZ & BIG BAND

Electronic Musician
2007
EDITORS
CHOICE

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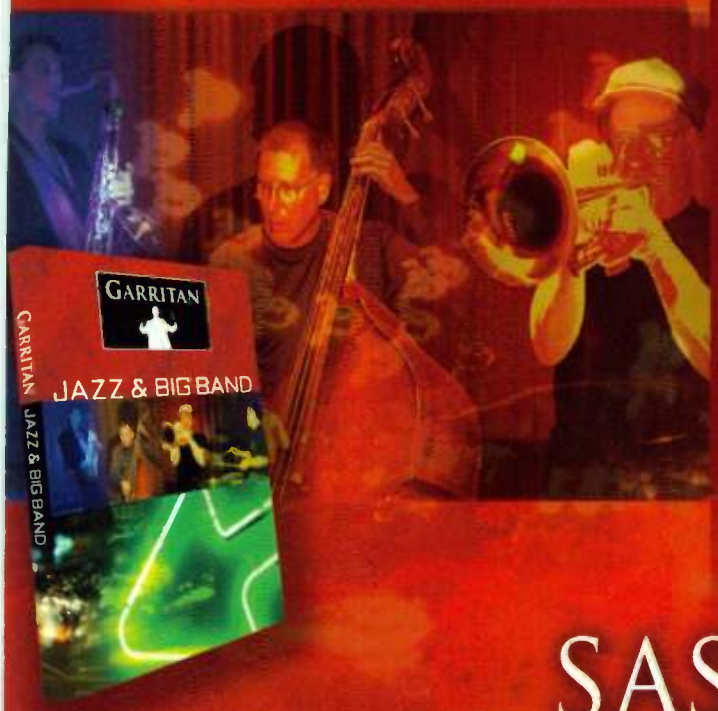

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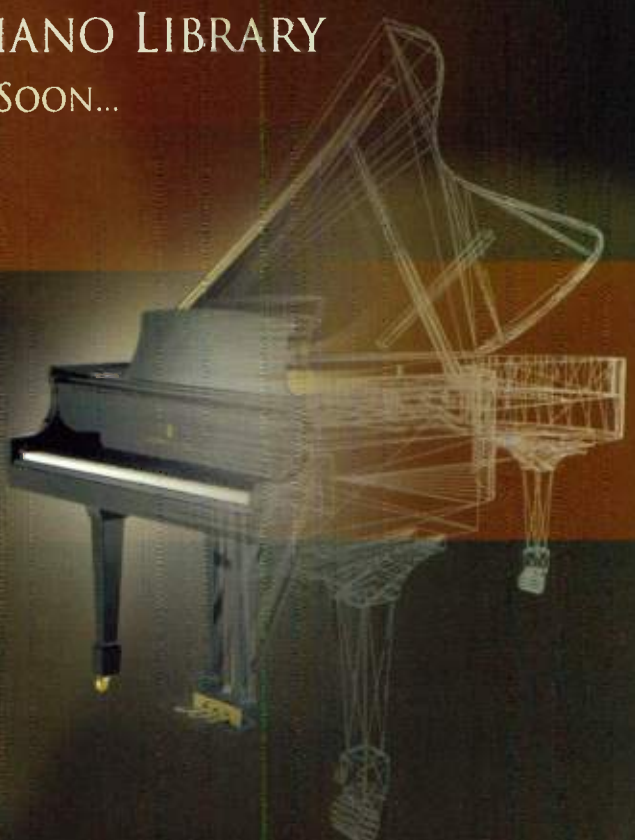

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It's time to start a new musical journey. It's time to take your Steinway wherever inspiration takes you.

DMITRY PANICH

Letters

Rumor Has It

I was interested by your article about MySpace in the July 2006 issue of EM (see "Working Musician: MySpace for Musicians"). I have heard, however, that since it was bought by News International, MySpace has inserted a clause in its terms and conditions stating that it owns the copyright to any material on the site, including presumably your songs if you upload them. Is that true, and if so, should it not be more widely publicized?

Mark Metcalf
via email

Author Fran Vincent replies: Mark—What you've heard is an urban legend that has been circulating on the Web, stemming from a misunderstanding of the MySpace terms of use. MySpace does not own the material you upload onto your profile. When you upload your copyrighted content—be it music, pictures, video, or text—onto the MySpace servers, you agree to allow MySpace a limited, nonexclusive license to display, modify, and distribute that content within the scope of the MySpace service.

Without this license, MySpace would not be able to allow others to view your content, because it wouldn't have permission to display and distribute it. As with any nonexclusive license, you still own the copyright and are allowing someone else to use it on a limited basis. You do not give up the copyrights to any of the material. The old MySpace terms of use were recently amended to state that MySpace does not claim any ownership rights.

All About Logic

I was interested to read about the topic of grid alignment in "Making Tracks: Six Degrees of Quantization" (see the November 2006 issue of EM), but I didn't get much from it since it was primarily about Apple Logic Pro. I use MOTU Digital Performer and Digidesign Pro Tools. If these other programs had been covered or the article had been more general, I would have gained much more from it.

Joseph Akins
Asst. Prof., Recording Industry
Middle Tennessee State Univ.

Joseph—Your point about using Apple Logic for my illustrations is well taken and highlights an ongoing struggle to balance giving specific, concrete examples with appealing to as broad a cross-section of our readers as possible. Indeed, most digital audio sequencers do provide tools for aligning audio to the grid, and the February 2005 "Making Tracks" column (available at www.emusician.com) described a similar technique using MOTU Digital Performer. Beyond trying to use a variety of products for our examples, we will continue to strive to include enough general information to apply the techniques in other environments. —Len Sasso

Gear Shift

I'm sorry you have eliminated the "Final Mix" column. Larry the O's column was always thought-provoking and usually about us, the musicians. It was about rounding us out as performers, salespeople, musicians, producers, and sometimes just people.

You need that perspective, or else your magazine runs the risk of becoming another gearhead sourcebook. In fact, it's almost there now—the November 2006 issue has 51 pages of gear reviews and gear-specific articles and only 6 pages of general information, including the "Pro/File" column. Sadly, *Electronic Musician* is often more "Electronic" than "Musician."

While every magazine is driven by advertisers and gear manufacturers, maybe you forget that we subscribers count too! Give the gear advertisers their due, but please bring back Larry the O for your faithful purchasers.

Charles A. Jordan
via email

Charles—Personal-opinion columns come and go in every magazine, and "Final Mix" had a long run. Ultimately, the EM editors decided unanimously that it was time to move on. We didn't fold it to make room for more gear coverage, though; we have other plans for that space, which we are still developing. —Steve O

Error Log

November 2006, "KorgpadKontrol," p. 102. The Akai MPD16 standalone USB MIDI controller does support Aftertouch. For more information about the MPD16, visit Akai's Web site at www.akaipro.com. EM

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By Geary Yelton

Boss Micro BR

One of the most talked-about product introductions at the Summer 2006 NAMM show was the Boss Micro BR ($319.50), a palmtop multitrack recorder only slightly bigger than an iPod. Now available from Roland (www.rolandus.com), the Micro BR features 32 virtual tracks, onboard rhythm patterns, multi-effects processing, and the ability to time-stretch audio (including MP3 files) without affecting pitch. The pocket-size device can record two tracks simultaneously and play four tracks simultaneously, with eight V-Tracks for each playback track.

With a ¼-inch high-impedance input, a built-in tuner, and effects presets with more than a dozen amp models, the Micro BR is especially suitable for guitarists. A total of 293 factory-programmed rhythm patterns provide accompaniment, and an SD slot lets you store data on inexpensive Secure Digital cards. Ins and outs include a stereo minijack mic/line input, a stereo minijack output, and a Mini-B USB port. The Micro BR also has a built-in microphone and a 16×2–character LCD. It records and plays 16-bit WAV files at a sampling rate of 44.1 kHz, records MP3 files from 64 to 192 kbps, and plays MP3 files at rates as high as 320 kbps. It runs off of either an optional AC adapter or two AA batteries, which will give you as many as six hours of continuous MP3 playback.

Korg K61P

One of several recent products from Korg (www.korg.com) is the K61P ($450), a USB MIDI keyboard controller and sample-playback instrument. Combining an unweighted 61-note keyboard with 24 internal sounds and onboard chorus and reverb, the K61P is suitable for standalone performance or for controlling MIDI hardware and software instruments. Its collection of sounds features a high-quality stereo grand piano, five additional acoustic pianos, five electric pianos, six organs, two harpsichords, two string ensembles, Clavinet, vibraphone, and a mixed choir. The K61P can be powered by USB or by an optional AC adapter.

For use as a MIDI controller, the K61P has two knobs, two switches, a slider, and a footswitch input—all user assignable—as well as pitch-bend and modulation wheels, octave-transposition buttons, and Korg's exclusive ClickPoint controller (an assignable *x-y* joystick that also functions as a single-button mouse). Like the previously released K25, K49, and K61 controllers, the K61P lets you choose from four Velocity curves, including a fixed Velocity for organ. It also offers intonation presets such as stretch tuning for pianos, Werckmeister for organs, and Kirnberger for harpsichords. The K61P comes bundled with Korg's M1 Le soft synth, editing software for Mac and Windows, demo versions of several software titles, and preferred pricing on Korg's Legacy Collection, Digital Edition.

TC Electronic Konnekt 24D

TC Electronic (www.tcelectronic.com) is shipping the Konnekt 24D ($625), a 192 kHz–capable FireWire audio interface that incorporates Fabrik C and Fabrik R, two DSP effects previously available only as PowerCore plug-ins. Fabrik C is a channel strip with 4-band parametric EQ, a scalable de-esser, and full-band or 3-band compression. Fabrik R is a reverb processor that delivers hall, plate, club, and live algorithms. A software control panel affords access to all signal-routing and effects parameters. In addition to integrating with your Mac or PC, the Konnekt 24D operates as a standalone mixer and effects processor, and you can network as many as four units.

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Next Month in EM

Cover

DIY Mastering

This do-it-yourself guide will get you on the right track to mastering music in your studio. We'll cover monitoring, importing and sequencing audio files, choosing the right type of processing, and premastering.

Features

Producing Voice-overs

Get the inside scoop on creating voice-overs for commercial spots from the perspectives of the producer and the engineer.

Production Values: Gil Norton

English producer Gil Norton has a knack for making albums with strong production values but a homemade vibe. In this interview, Norton talks about his production techniques and about recording *How We Operate*, the latest CD by British roots rockers Gomez.

Columns

Making Tracks: Controlling the Chaos

Create varied multitrack percussion parts with Stylus RMX Chaos Designer.

Sound Design Workshop: Sampler Tips and Tricks

Ableton Live 6's new Sampler instrument offers some great sound-design features, including a range of tones that use granular-synthesis techniques.

Square One: Checking the Specs

We'll help you understand the technical jargon of microphone specs sheets so you can buy and use your mics with confidence.

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EMspotlight

Happy Music with Perrey and Countryman

Best known for his influential release *The In Sound from Way Out* (Vanguard, 1966) with Gershon Kingsley, Jean-Jacques Perrey pioneered the use of cartoonish tape-loop rhythm tracks. In this exclusive interview, Perrey and his American collaborator, Dana Countryman, discuss the techniques used to create *The Happy Electropop Music Machine* (Oglio, 2006), a relentlessly cheerful CD reminiscent of the kitschy Moog-synth records of the '60s and '70s. By Gino Robair. emusician.com/em_spotlight

On the Home Page

EM Web Clips

A collection of supplemental audio, video, text, graphics, and MIDI files that provides examples of techniques and products discussed in the pages of *Electronic Musician*.

EM Guides Online

Get detailed specs on thousands of music-production products with our free online Computer Music Product Guide and Personal Studio Buyer's Guide.

EM Show Report

The 2007 Winter NAMM show is the biggest annual musical-instrument expo in the United States. Visit emusician.com for a report on the exciting new recording gear, music software, and electronic musical instruments unveiled at this year's show.

EM get on the bus

The Bus is the exciting new blog by EM editors Steve Oppenheimer, Mike Levine, Gino Robair, and Geary Yelton. Found exclusively on emusician.com, The Bus will include tips and tricks on a variety of recording topics, cover the latest technologies and industry trends, and offer a behind-the-scenes look at trade shows, product demos, and the creation of *Electronic Musician* magazine.

http://blog.emusician.com/the_bus

EM news

A weekly update on new hardware and software releases, manufacturer contests, and pertinent industry news.

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EM newsletter

Sign up for our free online newsletter, eMusician Xtra, for up-to-the-minute information about new products, software upgrades, and more.

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Download Scorch at Sibelius.com.

By Geary Yelton

Boss Micro BR

One of the most talked-about product introductions at the Summer 2006 NAMM show was the Boss Micro BR ($319.50), a palmtop multitrack recorder only slightly bigger than an iPod. Now available from Roland (www.rolandus.com), the Micro BR features 32 virtual tracks, onboard rhythm patterns, multi-effects processing, and the ability to time-stretch audio (including MP3 files) without affecting pitch. The pocket-size device can record two tracks simultaneously and play four tracks simultaneously, with eight V-Tracks for each playback track.

With a ¼-inch high-impedance input, a built-in tuner, and effects presets with more than a dozen amp models, the Micro BR is especially suitable for guitarists. A total of 293 factory-programmed rhythm patterns provide accompaniment, and an SD slot lets you store data on inexpensive Secure Digital cards. Ins and outs include a stereo minijack mic/line input, a stereo minijack output, and a Mini-B USB port. The Micro BR also has a built-in microphone and a 16×2–character LCD. It records and plays 16-bit WAV files at a sampling rate of 44.1 kHz, records MP3 files from 64 to 192 kbps, and plays MP3 files at rates as high as 320 kbps. It runs off of either an optional AC adapter or two AA batteries, which will give you as many as six hours of continuous MP3 playback.

Korg K61P

One of several recent products from Korg (www.korg.com) is the K61P ($450), a USB MIDI keyboard controller and sample-playback instrument. Combining an unweighted 61-note keyboard with 24 internal sounds and onboard chorus and reverb, the K61P is suitable for standalone performance or for controlling MIDI hardware and software instruments. Its collection of sounds features a high-quality stereo grand piano, five additional acoustic pianos, five electric pianos, six organs, two harpsichords, two string ensembles, Clavinet, vibraphone, and a mixed choir. The K61P can be powered by USB or by an optional AC adapter.

For use as a MIDI controller, the K61P has two knobs, two switches, a slider, and a footswitch input—all user assignable—as well as pitch-bend and modulation wheels, octave-transposition buttons, and Korg's exclusive ClickPoint controller (an assignable *x-y* joystick that also functions as a single-button mouse). Like the previously released K25, K49, and K61 controllers, the K61P lets you choose from four Velocity curves, including a fixed Velocity for organ. It also offers intonation presets such as stretch tuning for pianos, Werckmeister for organs, and Kirnberger for harpsichords. The K61P comes bundled with Korg's M1 Le soft synth, editing software for Mac and Windows, demo versions of several software titles, and preferred pricing on Korg's Legacy Collection, Digital Edition.

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IE-30

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- 26dB isolation
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Native Instruments FM8

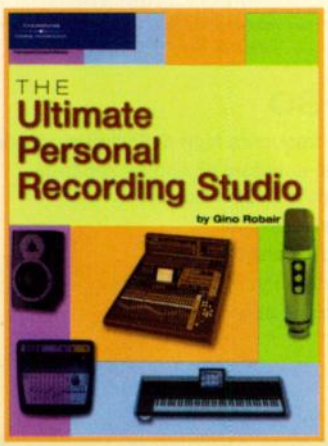
In celebration of its tenth anniversary, Native Instruments (www.native-instruments.com) has updated several software instruments, among them the frequency-modulation synthesizer FM7. Now called FM8 (Mac/Win, $339), its synthesis architecture has been extended and its sound library has been expanded to include two libraries that were previously available as separate products—FM7 Sounds 1 and 2. Registered FM7 users can upgrade to FM8 for $119.

No longer resembling Yamaha's DX7 in appearance, FM8's revised user interface is white and gray. Its various functions have been reorganized, with a choice of Easy Edit, Expert, Attribute, and several other parameter pages. Its sophisticated arpeggiator furnishes a 32-step matrix and 48 templates, and an onscreen rack lets you choose from 12 effects, including 10 new algorithms. FM8's KoreSound-compatible Browser makes it easy to access the 960 factory patches.

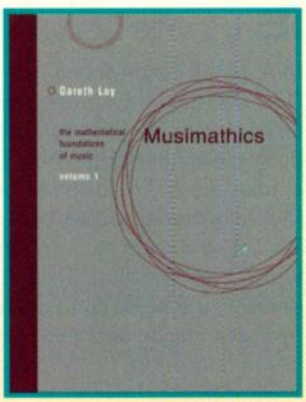
An enhanced high-resolution sound engine supports 24-bit sampling rates as high as 96 kHz. New sound-morphing capabilities allow you to transition between four different patches. You can connect operators in an FM matrix and perform detailed editing in independent operator pages. Additional FM8 features include two modulation LFOs, 32-stage graphical envelope generators, and the ability to use one operator as a filter and another as a noise generator.

Get Smart

Publisher **Thomson Course Technology** (www.courseptr.com) has released a new book by EM senior editor Gino Robair called *The Ultimate Personal Recording Studio* ($29.99). It's a comprehensive update and expansion of his previous book, *Making the Ultimate Demo*, published in 2000. Borrowing heavily from EM articles by Brian Knave, Neil Brighton, and 11 other authors, the 351-page book explains how to acquire basic recording skills, set up a cost-effective studio, and produce polished recordings. Twenty-six chapters reveal session-tested tips on organizing and connecting your studio gear, selecting and optimizing microphones, and applying professional techniques for recording vocals, drums, piano, bass, and other instruments. You'll learn to effectively apply processing and create the best possible mix. No matter what your skill level, you'll find useful information that can help you improve your studio work flow.



Author Gareth Loy takes an innovative approach to interpreting the scientific principles of psychoacoustics and music theory in his 500-page hardbound book *Musimathics: The Mathematical Foundations of Music*, vol. 1 ($50). The book, published by **MIT Press** (www.mitpress.mit.edu), begins with musical fundamentals and progresses from investigating essential properties of acoustics and aural perception to discussing harmonic motion, vibrating systems, information theory, and related topics. Loy explains how math reveals the hidden connections between various aspects of music, and he reinforces his explanations with hundreds of diagrams and equations. He also outlines an original music-programming language called Musimat. Aimed squarely at musicians who want a deeper understanding of the relationship between art and science, *Musimathics* teaches mathematics and physics as they relate to performance, composition, instrument design, and audio engineering.



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SoniVox Muse

It's fortunate that the price of hard disks has fallen, because sound libraries grow larger with every new sample-playback instrument that appears. One of the latest to roll out is Muse (Win, $595), a Tascam GVI-based virtual instrument from soundware developer SoniVox (www.sonivoxmi.com), formerly known as Sonic Implants. Muse runs standalone or as a VST- or RTAS-compatible plug-in and comes standard with a whopping 38 GB of 24-bit, 48 kHz content that encompasses a far-reaching array of musical styles and applications. Because it's built on GigaStudio 3 technology, Muse supplies GigaPulse impulse responses for reproducing acoustic environments and uses iMIDI rules for expressive performance.

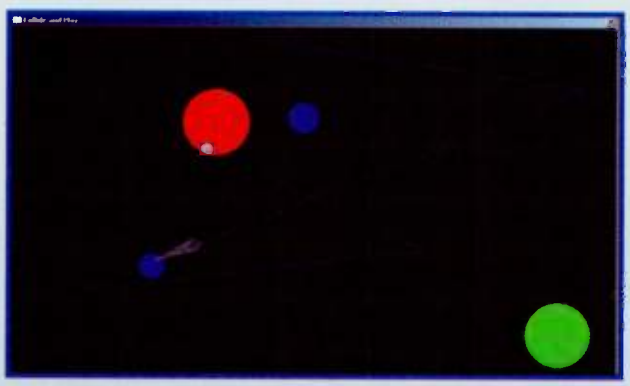
SoniVox describes Muse as the ultimate toolkit for computer-based musicians. Its enormous assortment of multisampled programs includes modular drum kits with more than 100 presets, over 50 unique ethnic instruments, a collection of analog and digital synths, pop brass ensembles, and electric and acoustic keyboards, guitars, and basses. The library also contains a 4 GB General MIDI sound set, more than 4 GB of Combi patches, and over 14 GB of solo and ensemble orchestral instruments from SoniVox's Complete Symphonic Collection. And if you're a Mac user, don't despair—an OS X version is in the works.

Download of the Month

KVR AUDIO DEVELOPER CHALLENGE 2006

KVR Audio held the first of what will surely become an annual competition among independent music-software developers. The competition was open to anyone willing to create a plug-in or standalone music application in any open-standard format for any platform. The only requirements were that the contribution be newly created, not violate any copyright laws, and be free to KVR Audio members. The inducement, aside from worldwide fame, was a kitty of donations by KVR members; at the time of this writing, the prize fund was more than $2,000, to be divided among the top three winners.

Thirty-one developers stepped up to the plate, and the offerings were, as you might imagine, varied. Some of the developers, such as U-he and NuSofting, were well known; others were newcomers. Steinberg's VST plug-in format and the Windows platform were strongly favored; there were only five Mac plug-ins and four standalone products. You can peruse and download the applications from the KVR Audio Web site at www.kvraudio.com. You need to be a KVR Audio member to download, but membership is easy to set up and free.



Instruments and effects processors dominate the field, with 14 of each on offer. The three exceptions are an MPEG1 movie player that syncs to any audio host, an unusual 2-dimensional onscreen keyboard for exploring scales and chords, and a standalone pattern sequencer and instrument host called Matryx.

The instruments range from conventional to off-the-wall. A grand-piano plug-in, a slew of hybrid synths favoring the subtractive model, and several drum machines are among the conventional offerings. Pondular is the most unusual of the synths. It is played by keyboard, but its sound is modulated in real time by a graphical matrix of squares through which events propagate like ripples in a pond. You get onscreen control of the size of the matrix as well as the friction and viscosity of the rippling. Host permitting, you can use automation or MIDI Control Changes to determine how the rippling affects the synthesis engine. Collide and Play is a standalone graphical synthesis engine. You create balls and lines by clicking with the mouse, and the balls play and process samples as they bounce off the lines. The results are unpredictable and lots of fun (see **Web Clip 1**).

The effects include a couple of loopers, and I especially liked the multitrack, easy-to-use uLoop. You'll find an assortment of EQs, filters, and dynamics processors, as well as a smattering of sound-munging effects, a harmonizer, and amp and mic-placement simulators. Although certain user interfaces are more polished than others and there were some entries out of the 31 that I couldn't get to work, you'll find a lot to like here.

EM WEB CLIPS

—Len Sasso

From valve warmth to transistor trash.
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M-Audio ProFire Lightbridge

For those who want to record 34 tracks simultaneously, M-Audio (www.m-audio.com) has begun shipping the ProFire Lightbridge ($499.95), a 34×36–channel FireWire-to-Lightpipe audio interface. It was designed to interface computer-based audio software with digital mixers, ADAT recorders, and other gear that has Lightpipe connectivity. Lightbridge uses FireWire to link as many as four Lightpipe devices with your Mac or PC, giving you 32-channel Lightpipe I/O at 44.1 or 48 kHz. Using S/MUX, it can also handle 16-channel Lightpipe I/O at 88.2 or 96 kHz.

In addition, the ProFire Lightbridge offers stereo coaxial S/PDIF and word-clock I/O by means of a breakout cable, which also has MIDI In and Out ports that accommodate MIDI Time Code (MTC) and MIDI Machine Control (MMC) protocols. For flexible monitoring, a dedicated level knob controls two balanced ¼-inch analog outputs; a separate level knob controls a ¼-inch headphone output mounted on the front panel. The ProFire Lightbridge is a compact tabletop device in a half-rackspace chassis. An optional mounting tray is available.

FabFilter Timeless

Software developer FabFilter (www.fabfilter.com) has released Timeless (Mac/Win, $129), an AU- and VST-compatible plug-in that takes tape-delay emulation to a new level. With independent left and right delay lines, 2 versatile multimode filters, and 24 drag-and-drop modulation slots, Timeless delivers sounds no Echoplex or Space Echo ever could. It has more than 100 presets of time-based effects, from chorus and flanger to resonators and spectral distortion. Delays and LFOs can run free, sync to the host's tempo (with a user-adjustable offset), or respond to tap tempo. Smart interpolation algorithms ensure that parameter changes occur smoothly; when you shift the delay time, for example, you'll hear transitions similar to those you'd hear with a real tape delay.

Timeless provides two types of delay: Tape and Stretch. Changing the Tape delay time changes the delayed sound's pitch (like real tape), and changing the Stretch delay time will not. Maximum delay time is five seconds. The filters have selectable slope, resonance, and characteristic (such as Raw or Easy Going), as well as an interactive graphical display. Timeless also has two LFOs and a sophisticated ADSR generator with factory and user presets. All parameters respond to MIDI Control Change commands by means of a MIDI Learn feature.

Sound Advice

Andy Johns Classic Drums ($249.95), a 6-DVD sample library for FXpansion's virtual drummer BFD, is the debut collection in the Master Engineer Series, from soundware developer Platinum Samples (www.platinumsamples.com). World-class recording engineer Andy Johns, whose credits include landmark albums by Led Zeppelin, the Rolling Stones, and Jethro Tull, has produced a BFD expansion pack that captures his favorite drums, cymbals, and kits in tremendous detail. He recorded the samples using a Neve 8028 console and a Studer 800 24-track recorder, with no compression and only the console's preamps and EQs. *Classic Drums* supplies four levels of detail to best suit your needs and computer resources, ranging from the 30 GB Small level, with a maximum 20 Velocity layers, to the 70 GB SuperSize level, with a maximum 250 Velocity layers. The collection also has more than 200 MIDI grooves. EM

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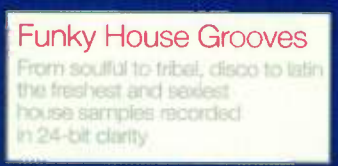

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STEVE JENNINGS

Bring 'Em Back Alive

By Rusty Cutchin

Pro tips for recording live performances onstage or in the studio.

Recording live bands has changed a lot since 2-track tape recorders first allowed overdubbing, but in many ways, the song remains the same. Instruments must be miked appropriately or recorded direct to achieve optimum results. Recording engineers must isolate drums and other acoustic sources, without inhibiting communication between musicians, to prevent sounds from spilling into other performers' mics. Vocalists require balanced mixes in their headphones or stage monitors to stay on pitch and to benefit from the energy generated by singing live with the band.

This article presents several tips for recording a band during a club or concert performance and live in a studio environment. Although a full discussion of tasks such as selecting mics and setting up consoles for live recording is beyond the scope of this article, many such techniques have been explored in past issues of EM (available online at www.emusician.com; see the sidebar "For Further Reading"). Some of the processes I will discuss are familiar to studio veterans, but quite a few new tools—including low-cost, high-quality microphones, mixers, and digital interfaces—have improved these techniques.

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2 Will Get You 7.1

By Scott Wilkinson

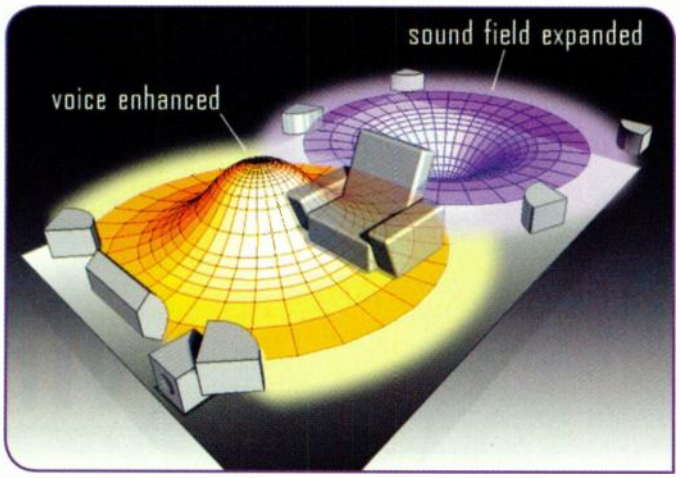
A new technique expands 2 channels to 7.1.

Surround sound is one of the biggest advances to have been made in audio reproduction for quite some time. But what about all the existing 2-channel content? Is there a way to expand it to fill a multichannel surround-sound system? Many have tried to devise algorithms that derive center and surround channels from a 2-channel source, but most of those algorithms produce less than satisfying results.

Sonic Focus (www.sonicfocus.com) is taking a different approach to the problem. Instead of manipulating the signal's phase and delay in various ways to simulate the extra channels, the company has developed an algorithm called Extrapolator that uses physical modeling to synthesize a multichannel sound field.

Extrapolator is part of a software-based, floating-point DSP engine called BlackHawk, which includes several functional elements. Unlike many other DSP algorithms, BlackHawk does not reduce the dynamic range of the input to allow headroom for the processing math in order to avoid clipping distortion. Instead, the Sonic Focus algorithms are based on a look-ahead analysis, which allows a greater dynamic range and lower distortion.

The input signal first encounters the SmartStream block, which uses four sophisticated fast Fourier transform (FFT) algorithms to analyze the audio waveform in real time. This allows BlackHawk to select which of the 20 available DSP algorithms will be applied to the signal.



COURTESY SONIC FOCUS

FIG. 1: Sonic Focus's Extrapolator uses physical modeling to create a virtual front sound field that emphasizes the vocals and solo instruments, and a virtual rear sound field that minimizes those elements and adds detail to the background sounds and ambience.

The next block is called Adaptive Dynamics Refinement System (ADRS), which identifies the qualities that are typically lost in digital compression schemes (such as MP3, AAC, and WMA) and reconstructs that information in an effort to reverse the effects of lossy compression. It also separates the vocal and solo instruments from the background and ambience information.

Then the signal enters Extrapolator, which creates two virtual acoustic environments: one in front of the listener and the other behind (see Fig. 1). The front sound field emphasizes vocals and solo instruments, and the rear sound field adds detail to the background effects and overall ambience while minimizing the vocals and solo instruments. Using physical-modeling techniques, the algorithm can simulate various acoustic environments while avoiding the *picket-fencing* effect (vector-based dropouts at certain positions in the sound field) common to surround-sound simulators that rely on phase and delay. In addition, Extrapolator does not depend on preencoded matrix information, which means it works with all forms of audio.

The resulting 5.1- or 7.1-channel signal passes through another new algorithm called StudioEQ, the final element of the BlackHawk DSP signal chain. StudioEQ has 8 channels of 32-bit, real-time equalization for final mastering. The algorithm uses tube modeling based on high-end studio equalizers to generate filters of any shape, a feature not available on low-cost EQs until now. Upon leaving StudioEQ, the signal can drive a 5.1- or 7.1-channel surround system.

BlackHawk can be implemented on various hardware platforms. For example, Sonic Focus is working with Analog Devices to port it to the latter's chip sets. It can also run on the latest generation of general-purpose processors under the upcoming Windows Vista operating system. It will be optimized with SIMD (Single Instruction, Multiple Data) streaming and parallel instructions for multicore processors, and the projected overhead is less than 15 percent of the CPU's bandwidth.

Sonic Focus intends to demonstrate a prototype of BlackHawk at the Consumer Electronics Show in January 2007, with commercial products to follow later in the year. The new algorithms could usher in a whole new era of high-quality multichannel audio from low-cost tools—a trend I heartily applaud. EM

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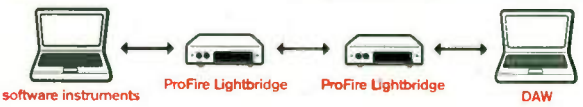

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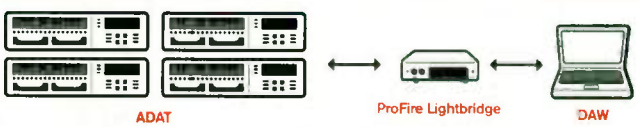

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STEVE JENNINGS

Bring 'Em Back Alive

By Rusty Cutchin

Pro tips for recording live performances onstage or in the studio.

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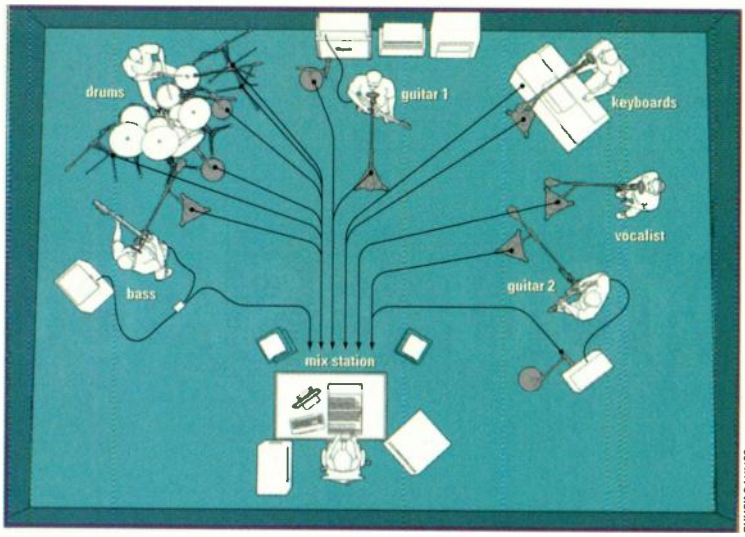
Get Set

The person in charge of recording also has plenty to do before the Record light goes on. Whenever possible, the engineer should check out the band beforehand to get a sense of what will be needed in the studio or at the band's next performance. Common tools to control sound in a studio, such as acoustic panels, baffles, and pop screens, may not be available or desirable for live performance (see Fig. 2). Mics used onstage are likely to be different from those used in the studio, especially if the band plays loudly.

Onstage, "Black 47 uses a combination of drum machine, rocking guitars, uilleann pipes, and a horn section," says Lerman. "There are a lot of open mics around, so I might use a [cardioid dynamic] mic like a [Shure] Beta 57 or hypercardioid-pattern mics to cut down on bleed. But in the studio, I use ribbons and condensers set to figure-8."

The band's makeup will dictate the arrangement of players in the studio. If you're recording a band with two amplified guitar players, for example, those players will require more isolation than if you're recording a band with one guitarist and a keyboard player. You can usually plug keyboards direct into the recording system (most often through a mixer) and route them back to the players' headphones, avoiding the signal bleed that must be controlled with multiple guitar amps. Electric bass is often recorded direct as well, without miking the player's amp.



CHUCK DAHMER

FIG. 4: A circular setup is an effective way for groups to perform and record live in relatively small studios. With the musicians facing one another and all the mics pointing outward, band members can communicate easily and the likelihood of significant bleed will be minimized.

The more musicians whose instruments require mics, the more care must be taken to position the players in the studio. However, eliminating all bleed into nearby microphones is an unattainable goal. "In a project studio, unless you put a wall up between people, you'll never get rid of spillover," says Lerman. "For me it's a performance issue, not a technical issue. The best thing is to rehearse the band fully, so you don't have to worry about bleed."

COURTESY CLEARSONIC MANUFACTURING

FIG. 3: Portable isolation panels known as gobos can help control reflections on stages and in rooms that don't have isolation booths. When drums threaten to overpower other players, acrylic plastic panels can help solve problems with spillover.

Go Solo

Common sense suggests that the complications of recording a live band are significantly reduced if the artist is a soloist, such as a singer-songwriter. In the studio, that may be true on a technical level, but the more intimate nature of most solo performers' music means the recording will be more vulnerable to quieter noises from a squeaky chair, a bumped mic stand, or fingers on guitar frets, as well as other extraneous sounds that might otherwise be masked by a band's volume. Darlington recommends walking all around the room and listening for subtle, unwanted sounds while the artist runs through the material to be recorded. "That allows me to check that the overall room sound is as good as it can be, even before selecting the mics I'm going to use. It also lets the singer get properly warmed up, so that the first take is likely to be usable, instead of wasting recording time when the vocalist isn't really ready to sing."

An inexperienced solo performer will be in much better shape to begin recording after this warm-up

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can focus on singing while the other musicians wait for the next song.

Chaos in Control

Accurately controlling the dynamic range of live performers, whether metal or mellow, often requires using compression on drums, vocals, and bass. Recording in a club or other performance space without at least minimal compression may make it harder to control levels and makes it essential that the band has full command of its own balance onstage.

For individual instruments, most engineers agree that in the studio, a high-quality mic preamp or channel strip can work wonders. A single mono or stereo unit won't help much on, say, a multiple-mic setup for drums, but it can sure help a focused track like a lead vocal shine.

As a band grows louder during the course of a performance, carefully monitoring individual instrument tracks becomes more important. In a best-case scenario, the recordist has separate feeds from each instrument mic to a multitrack recorder, which allows controlling levels independently of the band's soundperson or front-of-house (FOH) mixer.

Nonetheless, taking a board feed from the FOH console is one of the simplest ways to record a live performance. When the house sound company has all the proper gear in place, that method is probably the most direct route to take. The recording engineer will lose the ability to construct a more controlled mix later on, however, and is stuck with whatever combination of music and ambience the live sound crew provides. Alternatively, an experienced engineer can also capture a band's sound with a simple stereo mic setup.

For the Record

In most cases, the traditional method of routing microphones and direct signals to a mixing console and assigning channels to a multitrack recorder is the most efficient strategy. But many engineers agree that the type of recorder you use is less critical than it once was. Because digital recording has leveled the playing field, live-music recordists are using all manner of machines, from stereo CD-R and DVD-R recorders to mobile Digidesign Pro Tools rigs, to capture live performances. The engineers I interviewed agreed that the choices a recordist makes with microphones and their placement, the use of mic preamps and audio interfaces, and the handling of room sound have a greater impact on the final product than the type of recording device you use.

Beyond specifications such as 24-bit resolution and selectable sampling rates, the recorder you use is either a matter of personal preference or already installed in the studio or venue where the band will be playing. As you're well aware, recording gear continues to shrink in size while expanding in power. Recordists can use a top-shelf laptop computer with a multitrack audio application or a well-configured personal digital studio to capture the same quality of sound that once required a truckload of multitrack analog recording gear. The most important consideration is how you handle the signals being recorded.

Dead or Alive

To fully capture and enhance the sound of a well-prepared live ensemble, you'll achieve the best results in a recording studio with an expertly treated room that's big enough to allow multiple setup and isolation options. A well-equipped studio should have a full range of mics, from dynamics to condensers to ribbons. With experience, you'll learn to select the best mic to place on each instrument and vocalist. And everyone in the room will know exactly what it means to avoid garbage in, garbage out. EM

Rusty Cutchin is a former associate editor of EM and a producer, engineer, and music journalist in the New York City area.

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When a soloist performs onstage, the challenges of a live venue can become more problematical than the ones facing a larger ensemble. With quieter music, the room sound and the audience's behavior may become more critical to the recording. In a club, stereo or wide-pattern mics can pick up sounds coming from the bar or kitchen. You might have to dampen a squeaky or boomy stage floor with carpet. Feedback from acoustic guitars is harder to control onstage, yet many engineers prefer a miked acoustic to even the best sound-hole pickups or piezo transducers. Occasionally, the artist's own instrument is not up to par, and someone might need to round up a substitute for the recording. As with a larger band, the key to handling such challenges is preparation. There's no substitute for a thorough familiarity with the artist, the instruments, the material, and the recording space.

Los Gobos

When recording an ensemble, although you can completely isolate the instruments by using overdubs or sampled sounds to build an arrangement, "the goal with a live band is to capture the performance as it sounds in the room," says Skye. "A certain amount of bleed—for example, a little hi-hat on the snare drum track—is normal." Only when a major mistake or series of mistakes by one player causes continual retakes by the entire band does bleed become a major problem, and then only if the engineer hasn't separated the instruments properly. An overdub can often mask the bleed from the original take.

Often the most difficult instrument to control in a small studio is a drum set, because of the volume and the number of exposed mics needed to capture the kit's full sound. Carefully placed baffles and gobos (mobile acoustic panels) can help control bleed to mics on the kick, snare, and hi-hat (see Fig. 3). In a tight space, drum overheads can double as room mics to capture the overall ambience as well as the sizzle of the set's upper frequencies.

Another way to control bleed (and enhance communication between musicians) is to set up the band in a circular arrangement (see Fig. 4). Most mics will be directed toward the circle's perimeter, reducing their sensitivity to all but their assigned sound sources. If mics such as drum overheads are exposed, or if they have broad pickup patterns, a high-quality noise gate can help to minimize spillage. As a last resort, for recorded passages when the main instrument isn't playing, you can digitally edit out audible sounds from other instruments.

Of course, if you're recording the band at a club, you'll be at the mercy of the environment. You probably won't be able to use absorbing panels around the drums, but as Darlington points out, the popular Plexiglas or acrylic shields that drummers use are a big help in isolating other instruments from drum mics and drums from other instruments' mics. "The shields are more reflective than an acoustic panel in a studio," he says, "but they mostly surround the kick, snare, and hi-hat, which are close-miked anyway. It's not usually a problem if overhead mics pick up stage sounds. Sometimes it adds to the excitement of the recorded performance."

Vocal Ease

Usually the most critical assignment is recording live lead vocals. As Lerman notes, cutting vocals live doesn't have to be a tedious series of full-band retakes. "You wouldn't want to put a female singer by a drummer's cymbals, but it's not so bad if you put a singer by an acoustic piano, because the spillover won't be as loud or as likely to produce unwanted [sounds]. With a rock band, you want to point the singer's mic away from the band" to avoid instrumental sounds bleeding into the vocal mic.

In many live situations, vocalists will be using handheld dynamic mics and won't want to lug a large-diaphragm condenser around the stage. Handheld condenser mics may lend a subtle richness to certain vocalists onstage, and standard studio condensers may work perfectly well for mellower bands and performances. Many engineers have no problem with standard high-quality dynamic mics like the Shure SM58, especially on rock gigs, because the somewhat contained sound usually works pretty well on hot vocal sources.

For some live recordings, a standard procedure is to record the band first and later overdub the vocals. You can record a temporary scratch track during an early take to serve as a guide vocal for the other musicians to accompany if there are subsequent takes. When you've finished recording the instrument tracks, the vocalist

FOR FURTHER READING

"Making Tracks: Good Audio Housekeeping," March 2005 issue of EM
"Ribbon Mic Summit," August 2006 issue of EM
"Successful Techniques for Recording Vocals," online at www.emusician.com

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Nonetheless, taking a board feed from the FOH console is one of the simplest ways to record a live performance. When the house sound company has all the proper gear in place, that method is probably the most direct route to take. The recording engineer will lose the ability to construct a more controlled mix later on, however, and is stuck with whatever combination of music and ambience the live sound crew provides. Alternatively, an experienced engineer can also capture a band's sound with a simple stereo mic setup.

For the Record

In most cases, the traditional method of routing microphones and direct signals to a mixing console and assigning channels to a multitrack recorder is the most efficient strategy. But many engineers agree that the type of recorder you use is less critical than it once was. Because digital recording has leveled the playing field, live-music recordists are using all manner of machines, from stereo CD-R and DVD-R recorders to mobile Digidesign Pro Tools rigs, to capture live performances. The engineers I interviewed agreed that the choices a recordist makes with microphones and their placement, the use of mic preamps and audio interfaces, and the handling of room sound have a greater impact on the final product than the type of recording device you use.

Beyond specifications such as 24-bit resolution and selectable sampling rates, the recorder you use is either a matter of personal preference or already installed in the studio or venue where the band will be playing. As you're well aware, recording gear continues to shrink in size while expanding in power. Recordists can use a top-shelf laptop computer with a multitrack audio application or a well-configured personal digital studio to capture the same quality of sound that once required a truckload of multitrack analog recording gear. The most important consideration is how you handle the signals being recorded.

Dead or Alive

To fully capture and enhance the sound of a well-prepared live ensemble, you'll achieve the best results in a recording studio with an expertly treated room that's big enough to allow multiple setup and isolation options. A well-equipped studio should have a full range of mics, from dynamics to condensers to ribbons. With experience, you'll learn to select the best mic to place on each instrument and vocalist. And everyone in the room will know exactly what it means to avoid garbage in, garbage out. **EM**

Rusty Cutchin is a former associate editor of EM and a producer, engineer, and music journalist in the New York City area.

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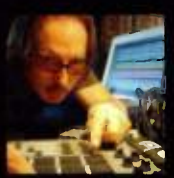

– **Butch Vig**
(Artist/producer: Garbage, Nirvana, Smashing Pumpkins, Sonic Youth)

"M-Audio wanted to create a serious studio monitor that would make people sit up and take notice... the EX66s might just fast track them into the big boys' league."

– ***Sound On Sound* Magazine**

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Three cheers for the finest new products we tested in the past year!

By the EM Staff

Traditionally, we start our Editors' Choice Awards article with a paragraph about how the editors fought like wild animals when choosing our winners. But this year, our meetings were comparatively placid. As always, we had lots of fine products from which to choose, but with a few exceptions, we were able to come to quick agreement right down the line.

In some cases, notably monitor speakers and field recorders, the winner was a slam dunk. In others, such as digital audio sequencers and hardware synths, we debated several products but one candidate kept rising to the top. In the end we settled on 26 awards in 24 categories, with well-deserved ties in the 2 signal-processing-software categories (individual and bundle).

Each year we give our Editors' Choice Awards to the finest products and upgrades that we tested in the past 12 months. We can't test every new product, but we work hard to check out the most promising candidates. Our awards categories change each year to reflect what's happening in personal-studio products: for instance, last year we gave one award for ribbon mics and one for condensers because it was a banner year for ribbons, whereas this year we chose only one mic. On the other hand, last year we chose one hardware synth, and this year we gave separate awards for analog and digital synths.

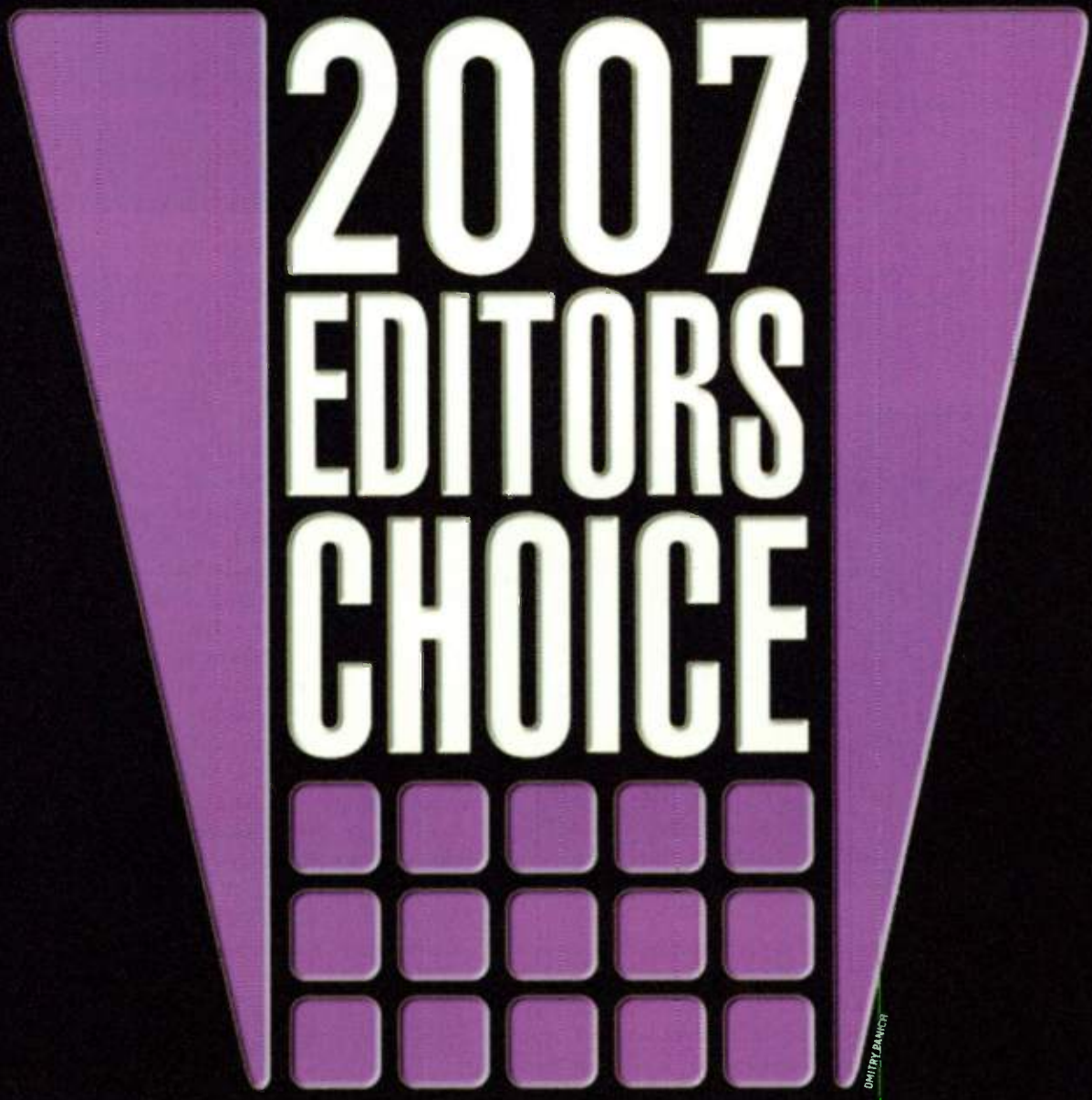
All of the winning products have been field-tested by EM's editors and a select group of top authors. We also solicited opinions from the editors of sister publications *Mix* and *Remix*. The final selections were made by EM technical editors Steve O, Mike Levine, Dennis Miller, Gino Robair, Len Sasso, and Geary Yelton, with much-appreciated help from *Remix* technical editor Markkus Rovito. All award-winning products have been covered in EM reviews or feature roundups, or the review is in progress and our tests are far enough along that we feel confident about our conclusions (see the sidebar "The Award Winners in Review").

To be eligible for an Editors' Choice Award, products must have shipped between October 1, 2005, and October 1, 2006, when we began editing our January issue. We also considered several products that shipped so close to the 2006 Editors' Choice Awards deadline that it was not possible for us to test them in time for that year's awards. Similarly, if a product shipped too close to the end deadline for us to properly evaluate it this year, we'll make it eligible for next year's award. We give an award to a software upgrade only if we think it offers major and significant improvements over the previous version.

And now, hats off to the winners of the 15th annual EM Editors' Choice Awards!

Electronic Musician

2007 EDITORS CHOICE



DIMITRY PANICH

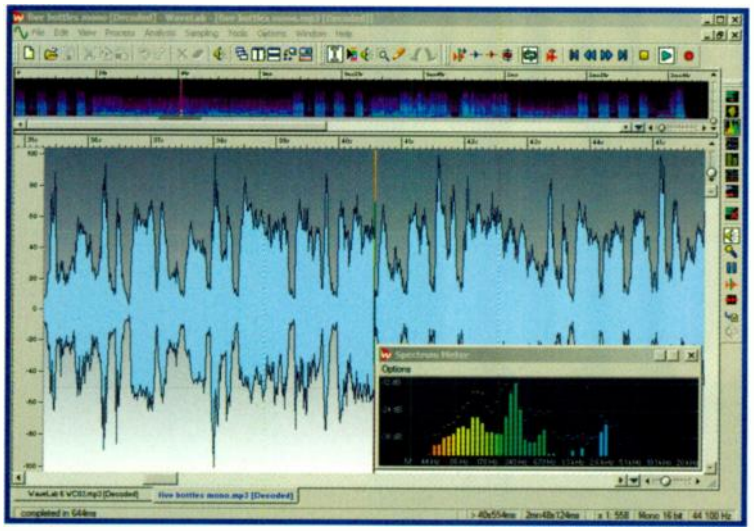
Audio-Editing Software

Steinberg WaveLab 6.0b (Win, $699)

We were amazed at the number of enhancements Steinberg added to WaveLab 6. Among its many new recording and monitoring options are improved metering, an audio-input plug-in that lets you apply Master Section effects as you record audio, and an external-gear plug-in for easily creating effects loops with hardware processors. There are now three display modes—Wave, Spectrum Editor, and Loudness Envelope—any two of which can be on the screen simultaneously. For example, you could have a standard waveform showing in the main window while a sonogram view appears above it.

WaveLab 6 has raised the bar in other areas too. The new Dirac pitch-shifting and time-stretching algorithm produces excellent results, and the Crystal Resampler, a high-end sampling-rate converter, is as good as any we've heard. Using the Effect Morphing feature, you can gradually fade an effect in or out over the length of an entire file or crossfade between two different effects on the same audio clip.

Even more radical results are possible with the Spectrum Editor, which allows you to process any arbitrary range of frequencies and times independently. (Adobe's



Audition 2 introduced this feature before WaveLab 6, but we particularly like Steinberg's implementation.) Other new features, such as batch renaming and autocreation of files from clips, are great for maintaining and organizing samples on your drive. The main drawback we found is that WaveLab 6 now requires a hardware dongle.

Whether you're recording, editing, mastering, or composing, WaveLab is an all-purpose media-production powerhouse. We can't wait to see what Steinberg will think of next.

Audio Interface

MOTU UltraLite ($549)

MOTU may be best known as the developer of Digital Performer, but a large chunk of its business is manufacturing and selling audio and MIDI interfaces. With classic products like the 2408 and 828mkII, the Massachusetts-based company has shown that it knows how to build affordable front ends that provide a good blend of quality and features.

Such is the case with the UltraLite. Weighing in at 2 pounds, the half-rack audio-and-MIDI interface makes a perfect complement to a laptop-based recording system. But it isn't just the UltraLite's compact size that's noteworthy; it also has an impressive feature set. To begin with, you get dual FireWire ports, allowing daisy chaining of more than one UltraLite; 24-bit, 96 kHz operation; a pair of good-sounding mic preamp/instrument inputs on combo jacks, with individually switched 3-way pads and phantom power; six balanced TRS line ins; ten balanced TRS line outputs; S/PDIF I/O; and MIDI I/O.

MOTU also bundles its CueMix Console software (Mac/Win) for configuring up to four separate low-latency stereo monitor mixes through the UltraLite's outputs. Rounding out the bundle is AudioDesk, a capable audio-recording application that borrows many features from Digital Performer.

To sweeten the deal, the UltraLite can function as a standalone digital mixer; all mixing functions can be accessed from its front panel. You could even bring it on a solo club gig, using it to mix your voice and instrument while feeding a standalone recorder and the house P.A.

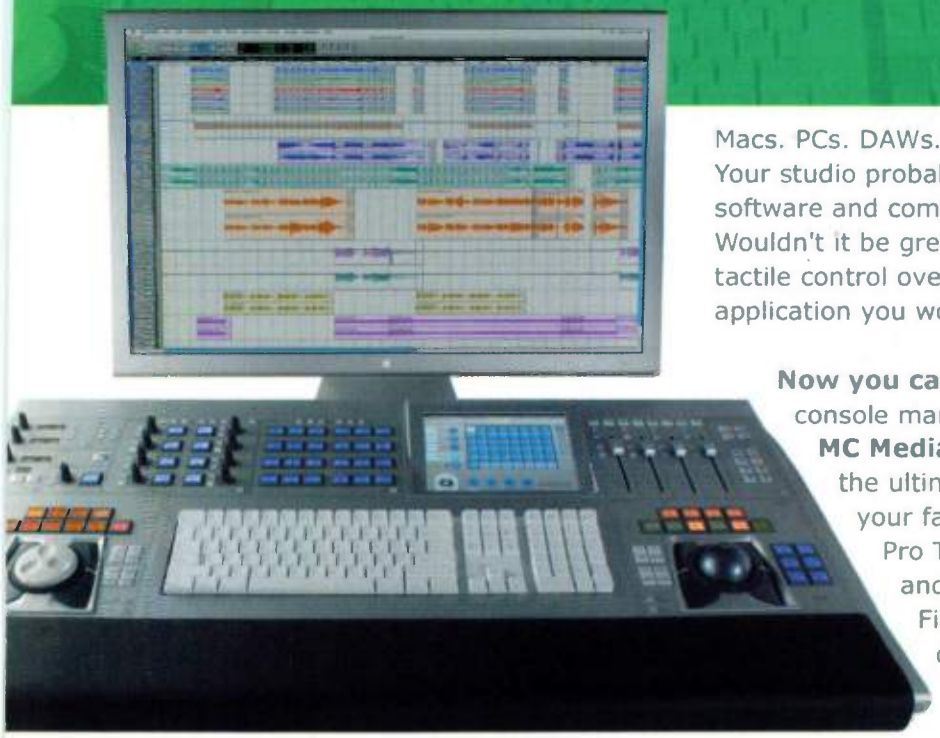
Whether you're toting it around as part of a portable rig, using it in your studio, or both, you'll find a lot to like about the MOTU UltraLite.

Digital Audio Sequencer

Cakewalk Sonar 5 Producer Edition (Win, $799)

Several sequencers received major upgrades this year; MOTU Digital Performer 5.1, in particular, got a long look from the editors. But Cakewalk

Everything. Under control.



Macs. PCs. DAWs. Soft synths. Samplers. And more. Your studio probably contains a wider variety of software and computer platforms than ever before. Wouldn't it be great to have perfectly integrated tactile control over every computer and software application you work with?

Now you can. Euphonix, the world-renowned console manufacturer, has delivered the **MC Media Application Controller.** It's the ultimate worksurface for controlling your favorite software apps, from Pro Tools® and Logic® to Nuendo® and more. Hell, use it with Final Cut Pro® or Photoshop®, or your web browser if you want. Because if there's one thing we all need, it's a little more control.

The Euphonix MC includes a full sized keyboard with trackball and jog wheel, plus 56 LCD SmartSwitches, 4 faders, 9 rotary controls, and a monitoring section. ***Works with ANY software application on Mac or PC.***

Euphonix MC

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Sonar 5 Producer Edition was a huge advance that demanded recognition. The new-features list is so long, we'd need a full page to cover just the basics.

At the top of the list is Sonar's new 64-bit, double-precision floating-point engine. This high-resolution processing results in much more accurate edits and improved sound on reverb tails, effects, multitrack mixes, and more. Best of all, you don't need a 64-bit version of Windows to use it.

Sonar's tools will appeal to users of all stripes. Roland's V-Vocal pitch- and time-correction technology is now part of the toolkit. The PerfectSpace convolution reverb is useful for adding room ambiences to your audio and for creating outrageous cross-synthesis effects. Sonar 5 brings clip-based effects, editing, and automation to the table, as well as new automation features such as tempo-sync patterns and freehand envelope drawing. Soft-instrument users will appreciate the new Psyn II subtractive synth and Pentagon I vintage analog synth, and loopologists will find lots of uses for the new Roland GrooveSynth and RXP REX Player drum machine and groove box.

We could go on about the new bus and synth waveform preview with per-track markers or the integrated in-line audio and MIDI editing and arranging, all in the main Track view. But you'll just have to check out the rest of the story for yourself. That's even easier now that Cakewalk has reduced the price of the new Sonar 6, which was released too late to be considered for this year's award.

Download of the Year

Audio Damage Plug-ins (Mac/Win, $49)

The winner of the Download of the Year category is chosen from the software featured in the Download of the Month section of "What's New," which highlights a downloadable product that is inexpensive, unusual, and likely to still be around by the time the issue appears. Although we were very happy with Psychic Modulation's effects and with Cycling '74's M 2.6 (the latest resurrection of a classic algorithmic-composition tool), Audio Damage's effects plug-ins won by a nose.

The Audio Damage collection emphasizes emulations of classic hardware boxes ranging from the Moog Modular 914 Filter Bank module to the Mutron Bi-Phase and the (Radio Shack) Realistic Electronic Reverb. It also offers unique creations, such as the Discord 2 pitch-shifter and delay module, a tempo-based gating sequencer called BigSeq, and the do-it-yourself, modular multi-effects processor Ronin, which the company uses for internal development.

All of the Audio Damage effects sound great except for Ratshack Reverb, which was designed to sound awful. Furthermore, they're all good values, and each is easy to use or justifiably complex.

Drum Machine/Module (Software)

Submersible Music DrumCore 2 (Mac/Win, $249)

When Submersible Music DrumCore was released for the Mac in 2004, it employed an innovative approach to drum looping and included a well-designed librarian and a full-featured drum sampler. But some notable shortcomings hid its true potential. With the release of version 2, which is cross-platform, those shortcomings have been addressed and then some. The software excels as a MIDI drum

We're Going Places

STAGEPAS 500... Yamaha's newest ultra-compact PA system follows closely in the footsteps of its smaller, market-leading counterpart, STAGEPAS 300. The differences, you ask? Higher power, more channels, additional features, and even greater sonic performance, for those more demanding applications.

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module, as a sampled drum library, and as a librarian.

DrumCore 2 comes with a large, clearly categorized library of audio and MIDI drum hits, clips, and loops recorded by top professional drummers. A wide variety of popular genres are represented, and you can import REX2 and Acid files, which is new in DrumCore 2. Importing files is a big deal because you can manage them with DrumCore's librarian and use its clever Gabrielizer to process them.

DrumCore 2 introduces two crucial ReWire improvements: tempo sync and multiple audio outputs. It uses a proprietary slice-playback technology for adapting its audio loops to your ReWire host's tempo. When using DrumCore 2 as a drum sample player, you can route each of its drum module outputs to a separate ReWire audio bus. That makes it much easier to integrate the drum module with DrumCore's audio loops.

DrumCore 2 represents a significant step forward. It's hard to find anything not to like about this multipurpose soft drum machine.

Dynamics Processor

FMR Audio Really Nice Levelling Amplifier RNLA7239 ($249)

Following up on its popular RNC1773 Really Nice Compressor and RNP8380 Really Nice Preamp (the latter won a 2004 Editors' Choice Award), FMR Audio has come out with a product that chooses attitude over transparency. The RNLA7239, dubbed a "Levelling Amplifier" to denote its potential for sonic coloration, is a stereo dynamics processor that has a few tricks up its sleeve. For example, the RNLA7239 includes a Log Rel button that automatically accelerates the release time in relation to the amount of gain reduction. This allows you to restore punch on instruments with fast transients, such as electric guitars and drums.

The RNLA7239's front panel is simple and straightforward, with controls for Threshold, Ratio (up to 25:1), Attack, Release, and Gain (±15 dB), as well as a gain-reduction meter to die for. The unit even offers true bypass.

The rear panel offers unbalanced ¼-inch I/O and a separate sidechain jack. The inputs act as inserts when you plug a TRS cable into them, so you won't need Y-cables to hook this baby up to your mixer's insert jacks.

Of course, what really matters is the sound. Reviewer Orren Merton wrote that the RNLA7239 can yield a mild and somewhat transparent compression or completely squash your tracks, or it can impart a "pleasant thickness and roundness." With a list price under $250, the RNLA7239 is a no-brainer for any studio that uses outboard dynamics processing.

Field Recorder

Sony PCM-D1 ($1,999)

Picking a winner in the Field Recorder category was easy; our two reviewers lavished unequivocal praise on the Sony PCM-D1, and the choice was unanimous. One look at this recorder and you know you want it, though a glance at your line of credit may provide a reality check.

The PCM-D1's beauty is more than skin-deep: it sets up fast, is easy to use, and has some of the clearest metering on the planet. We tested it in the wilds of Alaska as well as in the studio and concert hall. Our reviewers used it for gathering sound effects, narrating travelogues, and recording music. We used its built-in mics and attached high-quality external mics. In all cases, it produced a bright, clear, detailed sound and matched or exceeded Sony's published specs. Aside from some qualms about the implementation of the PCM-D1's novel approach to peak limiting, and a few quibbles, such as wishing for a prerecord buffer and phantom or plug-in power for external mics, the deck excelled.

The PCM-D1 design team included performing musicians, and Sony clearly paid attention to their views. The result is a product of clever design and uncompromised quality.

Instrument Controller

Novation ReMote 25 SL ($599)

When you're shopping for a compact USB MIDI keyboard with a built-in control surface, you have seemingly endless choices. Nevertheless, selecting this year's award winner was easy. The Novation ReMote 25 SL has everything you need to control software instruments and sequencers. You get 25 Aftertouch- and Velocity-sensitive

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keys, 8 Velocity-sensitive trigger pads, and 56 assignable controls that include 32 buttons, 8 knobs, 8 sliders, and 8 rotary encoders. The 25 SL also has dedicated transport and octave-transpose buttons, two backlit 144-character displays, a pitch-bend and modulation joystick, and an assignable *x-y* touch pad.

Like all controllers in the ReMote series, the 25 SL features Novation's exclusive Automap system, which automatically reconfigures the assignable controls to conform to the software or MIDI hardware you want to control. Whenever you switch from sampling in Native Instruments Kontakt 2 to sequencing with Ableton Live, for example, Automap recognizes your software and swaps templates accordingly. After that, pressing a button or clicking your mouse instantly switches ReMote control between applications and instruments. The 25 SL gives you dozens of preinstalled Automap templates and makes it easy to program your own.

The ReMote series offers several models to suit your setup. If you need more keys, you can choose from the 37 SL ($749) or the 61 SL ($899). And if you want the control surface alone, the ReMote Zero SL ($499) forgoes the keyboard, touch pad, and joystick but supplies everything else.

Microphone

M-Audio Sputnik ($699.95)

This year M-Audio surprised us with the Sputnik, a tube microphone that is voiced with two classic mics in mind: the Neumann U 47 and the AKG C 12. The Sputnik's price is good for a multipattern large-diaphragm mic, even without the tube circuitry, and it is aimed squarely at the personal studio. Throw in the power supply, cable, shockmount, and flight case, and you've got a package that perks up an editor's ears.

Offering cardioid, figure-8, and omni patterns, as well as a –10 dB pad and an 80 Hz highpass filter, the heavy-duty Sputnik is designed to cover a wide variety of recording tasks. Our reviewer, Babz, found that it excelled on vocals, noting that the Sputnik was clean, quiet, and capable of a smooth sound, rich in harmonic detail. It fared quite favorably when going head-to-head against one of its expensive vintage counterparts.

Multipattern large-diaphragm mics are always a welcome addition to the personal studio, and there are plenty to choose from. But the Sputnik captured the 2007 award for offering vintage tube-mic sound in a multipurpose mic for well under a grand.

Miscellaneous Hardware

sE Electronics Reflexion Filter ($399)

Every once in a while a product comes out that makes you ask, "Why didn't I think of that?" The Reflexion Filter is just such an item. Clamped to any mic stand, this portable baffling system surrounds your microphone with a 7-layer absorptive and diffusive panel that reduces the amount of room ambience reaching the mic while minimizing coloration artifacts. The Reflexion Filter can fit big microphones, with plenty of space left for large shockmounts. A movable mounting post that can support heavy mics allows you to horizontally position the mic within the baffle to fit your needs.

Although it is designed for use as a mobile vocal booth, the Reflexion Filter can also be used for instrumental recording when mic bleed or the acoustics of the tracking room are an issue. We tip our cap to sE Electronics for delivering a unique and welcome solution to the age-old problem of dodgy acoustics in personal studios.

Monitor Speaker

JBL Professional LSR4326P ($1,399 per pair)

The JBL LSR4326P won its Editors' Choice going away because it offers an innovative solution to a problem that vexes many personal-studio recordists: working in an inadequately treated acoustic environment. The LSR4326P's Room Mode Correction (RMC) feature measures a room's acoustics and calculates an EQ curve designed to give the monitors a flat response in that space.

JBL debuted this technology in 2003 with its LSR6300 monitor series, but that series was a bit pricey for the personal-studio market. The LSR4326P is a lot more affordable. It features a 6-inch woofer and a 1-inch tweeter housed in an active biamplified enclosure with both digital and analog inputs. (The LSR4328P, which features an 8-inch woofer, is also available, as is the LSR4312SP subwoofer.)

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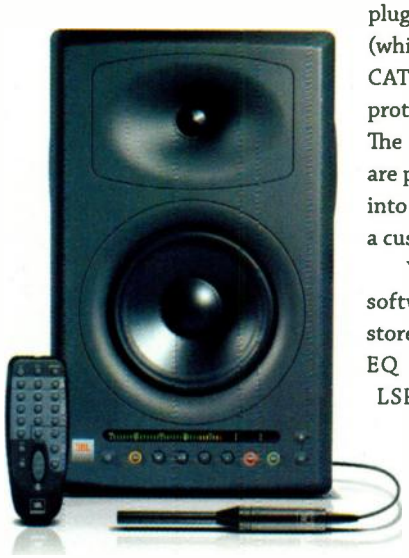
When you buy a pair of LSR4326Ps, they come with an accessory kit that includes, among other items, a measurement mic. To activate the RMC feature, you simply plug that mic into one of the speakers (which are networked together with a CAT5 cable, using Harman's HiQnet protocol) and press the RMC button. The LSR4326Ps then emit tones that are picked up by the mic and fed back into the monitors' electronics, where a custom EQ curve is generated.



You also get JBL's Control Center software (Mac/Win), which lets you store presets, mute monitors, change EQ frequencies, and more. The LSR4326Ps connect to your computer using USB.

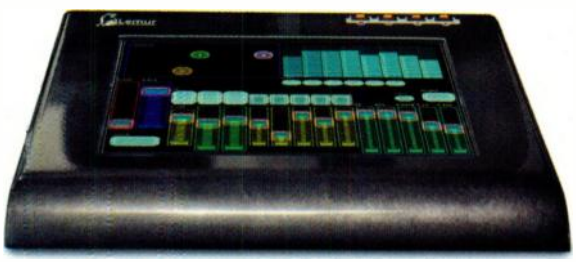
Cool features would be meaningless if the speakers didn't sound good, but they sound great. Not only was our reviewer quite impressed with their sonic characteristics, but he found that the RMC EQ helped make his mixes more accurate.

Most Innovative Product

JazzMutant Lemur ($2,695)

Few people like to mix with a mouse, and there are a lot of nice control surfaces around. But the JazzMutant Lemur is easily the most unusual and versatile control surface we've seen. The Lemur uses a multitouch screen, which means you can configure it to recognize ten or more points along its surface simultaneously. Not only can it send and receive MIDI data, but it also supports the faster and higher-resolution OSC protocol, which is becoming the communication format of choice for applications that need a high level of real-time control.

It's easy to create your own custom interfaces on the Lemur's large 12-inch LCD. Using the flexible JazzEditor software (Mac/Win), you combine objects—faders, pads, switches, buttons, monitoring elements, and more—to create the layout and look that best suit the task at hand. You can even program objects to respond as if they possessed real physical properties; for example, they can have friction—that is, resistance to your movements. You can also switch between layouts during a session or live performance with the push of a button.



Objects can use mathematical expressions to process data, so single notes could become complex arpeggios or automatic harmonizations, and you can route multiple objects to the same destination, creating very elaborate data streams. The Lemur comes with a number of software templates and can also emulate popular control surfaces such as the Mackie Control, which means you'll be up and running in no time.

Automated stereo and surround mixing, complex and powerful synth-parameter automation, lighting control, and real-time sequencer tempo adjustment are just a few of the Lemur's many applications.

Music-Production Workstation

Roland SP-404 ($449)

Most music-production workstations have been geared toward power users, so it's worth noting when a company makes a model for the technologically inexperienced musician, yet experienced users find its portability and feature set attractive.

The SP-404 combines a stereo sampler, a pattern sequencer, digital effects, and a drum-machine-style interface in a lightweight but sturdy package. It offers a built-in mic for quick and easy sampling, as well as a pair of RCA line inputs and a ¼-inch microphone jack. The RCA inputs can also be used to process external signals using the SP-404's nearly 30 onboard effects. The effects include delay, filter, pitch-shifting, and processing geared toward DJs, such as a stutterer, record scratching, and a low-frequency sine wave.

Other features include a MIDI In port, support for a 1 GB CompactFlash card, 12 pads for triggering samples and patterns, and dedicated buttons for Gate, Loop, Reverse, and Hold. The SP-404 will run on AA batteries if you can't find a place to plug in the wall wart. Although it doesn't have the bells and whistles of the more expensive products in the SP line, the SP-404 has endeared itself to beginners as well as advanced users who want to take a rugged, portable groove workstation everywhere they go.

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Portable Digital Studio

Korg D3200 ($1,799)

From the early days of cassette-based 4-tracks to today's hard-disk multitrackers, the studio-in-a-box concept has attracted lots of loyal users. Now many portable digital studios are truly self-contained, giving users the facilities to complete virtually every stage of the recording process, including tracking, mixing, and disc burning.

Korg has a history of making portable recorders, so it's no surprise that the D3200 is a well-designed unit. At its 24-bit setting, it offers 12 tracks of simultaneous recording and 16 tracks of simultaneous playback (at either 44.1 kHz or 48 kHz). By lowering the resolution to 16-bit, you can increase the count to 16 recording and 32 playback tracks.

Features include a 40 GB hard drive; a 4 × 4 Knob Matrix, which changes control assignments to correspond with whatever edit screen is active in the LCD; a mixer with 44 channels and 12 buses; and 12 input channels, 8 of which have XLR mic inputs.

The Session Drums feature gives you access to a wide selection of drum patterns, with individual level controls and humanization options. You can put together drum sequences that play along with your song but don't use up any of the audio tracks.

Up to 11 of the D3200's built-in effects can be used at once. Not only do you get staples like reverb, delay, and modulation, but you also get a selection of Korg's modeling effects. A USB port facilitates the transfer of files to and from a computer, and you can import audio from CDs and burn CDs of your final mixes.

We were also impressed with the D3200's ease of use and reasonable price. This is what a portable digital studio should be.

Preamp (Mic/Instrument)

Chameleon Labs 7602 ($799)

Modeling classic studio gear is a difficult task, especially if you are trying to hit a price point low enough to fit a personal-studio budget, and the original parts are no longer available. But Chameleon Labs is on target with the 7602, which was designed to re-create the sound of the venerable Neve 1073 preamp for under $1,000.

The 7602 offers 3-band EQ, four highpass-filter settings, a front-panel DI input, phantom power, a polarity switch, and an EQ bypass switch. As a 1U device, it doesn't physically resemble a 1073, but it does offer features that allow you to easily set up a 1073-like sound—or go in other directions.

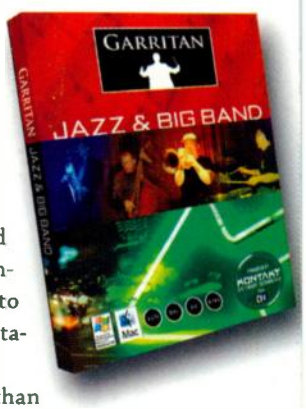
The preamp provides the versatility required in a personal studio, rendering a full-bodied, natural sound on vocals, electric guitar, and acoustic instruments. In addition, the DI delivers plenty of gain, low end, and presence. The 7602 can also get nasty, and the EQ section can be used to shape the distortion.

When going toe-to-toe against a 1073, the 7602 can get surprisingly close in sound. However, a preamp should be judged on its own merits, and this is where the 7602's value is evident. With a quality sound and boutique design (including discrete Class A power with hand-wound transformers and point-to-point wiring), the 7602 is a knockout.

Sample Player (Software, Ensemble)

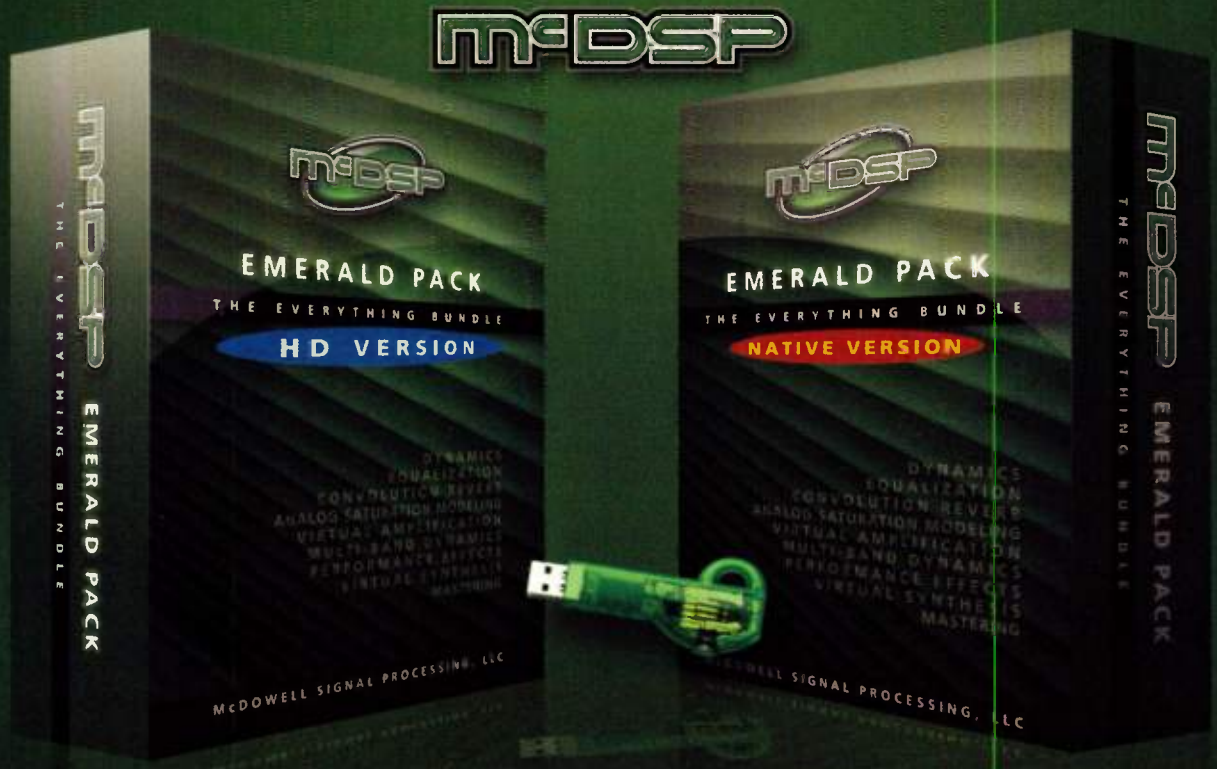
Garritan Jazz and Big Band (Mac/Win, $259)

Composing and arranging for jazz band just got a whole lot easier with the release of Garritan's Jazz and Big Band sample library and player. This "band" has groove power that will lift you out of your seat, with wailing saxes, screeching trumpets, and howling trombones, as well as a full rhythm section that never drops a beat. Rounding out the ensemble is a vast assortment of Latin and other percussion. Like previous Garritan releases, Jazz and Big Band uses Native Instruments Kontakt Player, which loads into your favorite sequencer or notation software.



You'll find much more than just stock horns in this collection. Standard doublings, such as flute and clarinet for the sax players and flügelhorn for the trumpets, will add color and variety to your charts. And if you're looking for something completely

PROFESSIONAL AUDIO PLUG-INS



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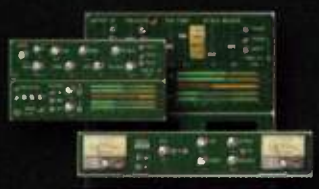

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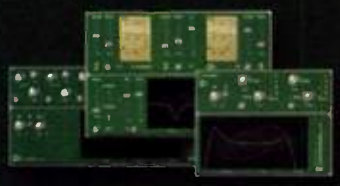

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different, sopranino (sounding a fourth above a soprano) and subcontrabass (sounding two octaves below a tenor) saxes have you covered on the high and low ends.

Don't expect to install the software and simply dial up the hottest licks around. As with any instrument, you'll need to spend some time shedding to get the most out of this collection. That's because Jazz and Big Band uses a "performance-driven" approach to articulation that requires that you shape and sculpt the performances. A healthy dose of MIDI controller data is often needed to create convincing musical passages. But whether you're composing a smokin' swing or bop chart or arranging an ultrasmooth fusion or cool score, Jazz and Big Band will be the only sample library you'll need. Here's a tap on the stand to the Garritan crew!

SAMPLE PLAYER (SOFTWARE, SOLO INSTRUMENT)

Native Instruments Akoustik Piano (Mac/Win, $339)

The solo-instrument side of the Sample Player category had a number of viable contenders, but we all agreed that Akoustik Piano represented a stellar

achievement in piano-sampling technology that had to be acknowledged. It is simply the best sampled piano we've come across.

In the October 2006 cover story, "Software Eighty-Eights," we reviewed several of the best software sampled pianos. Although all of the programs we examined had something to offer, Akoustik Piano stood out from the pack in terms of sound, playability, and ease of use. In particular, its 9-foot Steinway Concert D knocked our socks off.

We consider ease of use very important, and Akoustik Piano's simple, single-panel interface manages to put all controls under your fingertips without creating mass confusion. You just pick a piano, choose a room ambience, and start playing. If you're not entirely happy, you can add a little EQ, lower the "lid," change the dynamics a bit, or adjust the room size and mic placement. It doesn't get much simpler or better-sounding than this.

SIGNAL-PROCESSING SOFTWARE (BUNDLE)

McDSP Project Studio (Mac/Win, $495)
SoundToys Native Effects (Mac, $495)

In the past, many of the best third-party plug-ins for the Digidesign Pro Tools platform have been available only for TDM systems. Pro Tools LE and M-Powered users have been excluded from a number of the coolest effects. That changed this year with the release of two excellent and versatile RTAS/AudioSuite plug-in bundles: McDSP Project Studio and SoundToys Native Effects. So good were both of these identically priced collections that we decided to anoint them as cowinners.

McDSP plug-ins have long been a favorite of top-of-the-line producers and engineers. The Project Studio bundle comprises "LE" (light) versions of seven of the company's classic plug-ins, but don't let that fool you. Although the LE versions offer fewer configurations, they use the same algorithms as the flagship

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The H4 comes with a 128MB Secure Digital (SD) card. With a 2GB card you get 380 minutes of CD quality audio or a staggering 34 hours in MP3 format. Use the USB interface to move your recordings to a Mac or PC.

Night vision is provided by a back-lit LCD which allows you to monitor all aspects of operation. Powered by 2 AA batteries, the H4 provides four hours of continuous recording. And we've included an AC adapter, USB cable, windscreen and tripod adapter.

IT'S A 4-TRACK RECORDER!

In 4-track recording mode, songwriters and musicians can use the combination XLR-1/4" phone jacks to record vocals, guitars, bass and keyboards. We've also included our most incredible guitar and bass modeling effects, which accurately reproduce the most famous amps ever made.

IT'S AN AUDIO INTERFACE

The H4 is also a USB Digital Audio Interface that enables you to record instruments and vocals *directly* to your computer. And it comes with Cubase LE, a 48-Track Digital Audio Workstation to edit, mix and master your recordings on either Windows or Mac OS.

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versions, so the effects that you do get are identical.

All seven plug-ins are excellent. CompressorBank LE offers a wide range of classic compressors, while FilterBank LE gives you several flexible EQ configurations. Analog Channel LE features emulations of analog tape machines, Revolver LE is a convolution reverb, and Chrome Tone LE offers guitar-amp simulations. Finally, Synthesizer One LE is a virtual instrument, and ML4000 LE is a mastering limiter.

The Native Effects bundle provides full versions of six of SoundToys' best plug-ins. You get FilterFreak, which gives you numerous cool filter effects; EchoBoy, a classic Pro Tools plug-in that models analog delays and more; PhaseMistress, which emulates a range of classic phase shifters; Tremolator, a versatile tremolo and autogating plug-in with MIDI sync; Crystallizer, for reverse echo effects; and Speed, a pitch- and tempo-shifting processor.

Both Project Studio and Native Effects are awesome and aggressively priced bundles, and they're both deserving Editors' Choice Award winners.

Signal-Processing Software (Individual)

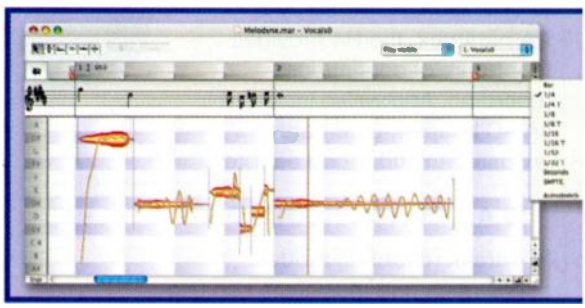
Celemony Melodyne Studio 3 (Mac/Win, $699)
The Sound Guy SFX Machine Pro (Mac/Win, $149.99)

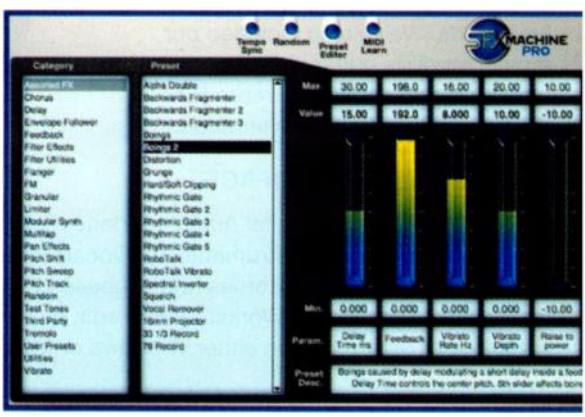
We're always reluctant to allow ties for an Editors' Choice Award, but when faced with two stellar products as different as Celemony Melodyne Studio 3 and The Sound Guy SFX Machine Pro, we just couldn't leave one out. Since its introduction in 2001, Melodyne has evolved into the go-to choice for pitch correction and vocal munging. SFX Machine Pro is a lesser-known but no less illustrious effects processor capable of sounds you'll hear nowhere else.

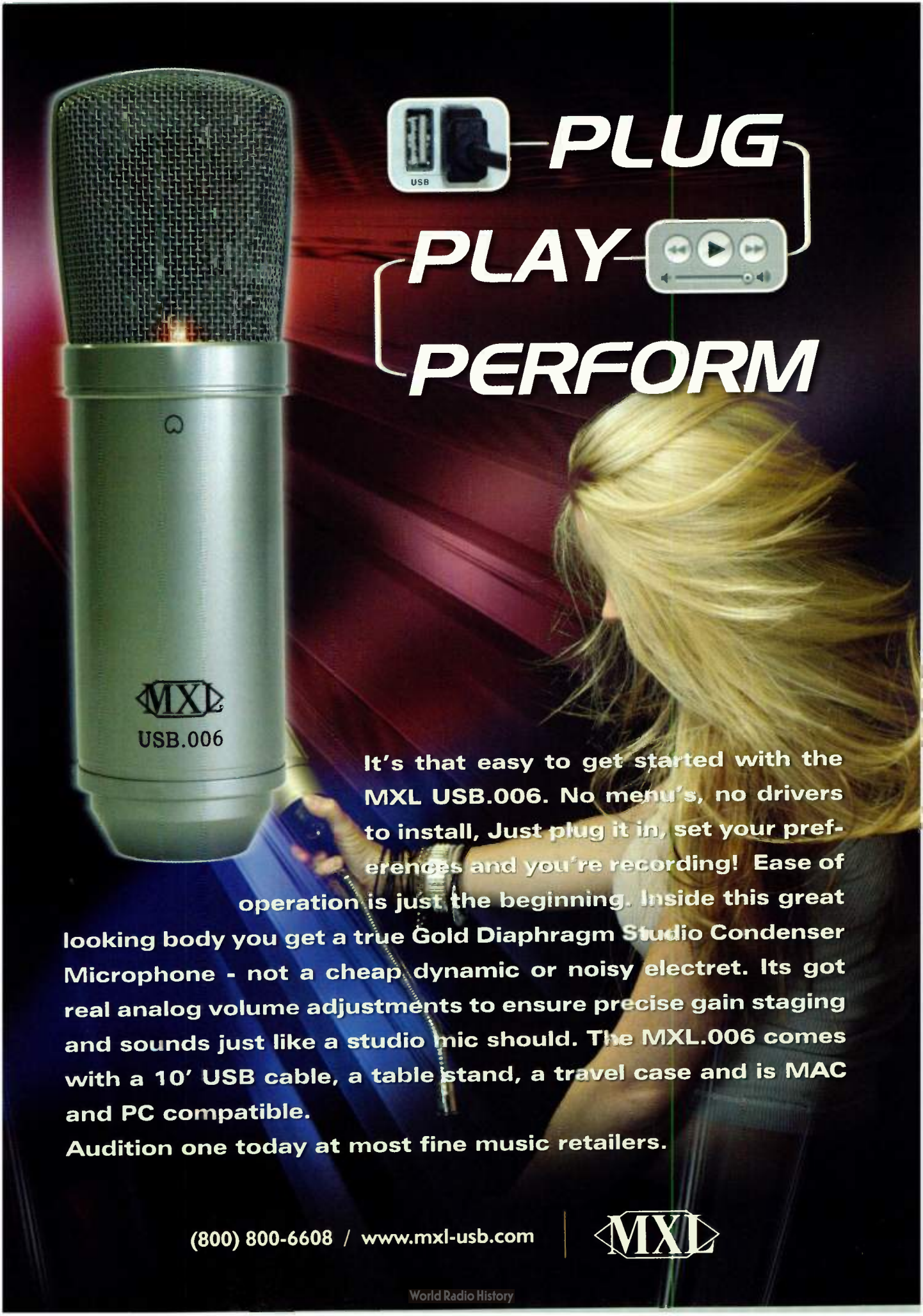
Melodyne Studio 3 is a one-stop shop for manipulating both monophonic and polyphonic vocal parts. Working with polyphonic parts is new to version 3 and was a major factor in our deliberations. Although designed primarily for working with vocals, Melodyne also works well on other pitched instruments, such as winds and brass.

One of the more revolutionary aspects of Melodyne's design is its adaptation of the MIDI-editing paradigm to audio parts. Melodyne analyzes an audio file and lays it out as events (called Blobs) along a horizontally scrolling piano-roll editor. You edit the Blobs as you would MIDI note events, moving them vertically to change pitch and moving or stretching them horizontally to affect timing. You can even change tempo and have event durations automatically adjust to match. By default, Melodyne preserves the formant structure and amplitude envelope of a Blob, but you can modify those parameters. That and a host of other features take Melodyne beyond the realm of vocal repair, making it an impressive creative tool.

SFX Machine started in 1997 as an Adobe Premiere–format audio-processing plug-in for the Mac. Even as a non-real-time effect, it was so impressive that it garnered a 1998 Editors' Choice Award. We were pleased when the real-time, cross-platform SFX Machine RT appeared in







2003, but it lacked the preset editor of the Premiere version. You still got a slew of effects, but you could no longer get under the hood. Loyal users howled, and in 2006 the editor was reintroduced in SFX Machine Pro. The factory presets, now numbering 350, are great, but being able to build your own presets again was key to our choice.

SFX Machine Pro's factory presets run the gamut from straightforward filter- and delay-based processes to pitch-shifting and pitch-following effects to sound-effects generators. You'll find a well-balanced collection of off-the-wall effects; utilities like gating and removing DC offset; and old standbys like auto-wah and sample-and-hold. In short, SFX Machine Pro has something for just about everyone.

SOUND LIBRARY

Harm Visser Creative Physical Modeling Toolbox for Reaktor 5 (Mac/Win, $189)

Harm Visser's *Creative Physical Modeling Toolbox for Reaktor 5* fills a big gap in the Reaktor Ensemble universe. More than 130 Ensembles are organized into 14 categories such as standard orchestral families (Brass and Percussion, for example), articulations (Bowed Strings and Plucked Strings), era (WoodWind_Medieval), and synthesis method. The Ensembles based on traditional instruments are often strikingly realistic, though you may need to do some tweaking to the Brass group.

The real fun begins where traditional instruments leave off. Visser has created a number of hybrid instruments that you won't find on any concert stage, and it's easy to build your own. The Plucked_Wind Ensemble, for instance, will be useful to sound designers and computer-music composers, and the various scraping and scratching creations in the Bounce Roll Scrape category can add realism to your tracks.

Visser uses modal synthesis, one of several modern approaches to physical modeling, to create his virtual instruments. Each model contains multiple resonators to re-create the vibrating components of the original instrument, and Visser calculates the proper frequencies by analyzing actual acoustic instruments. He uses the cross-platform program Praat (www.praat.org), which is in the public domain, so you can undertake your own explorations. But right out of the box, *Creative Physical Modeling Toolbox* gives you a huge collection of customizable tubes, bars, bows, and bells to enhance your Reaktor workshop.

SYNTHESIZER (HARDWARE, ANALOG)

Cyndustries Zeroscillator ($995)

Analog modular synths are back with a vengeance, and 2006 was a banner year, with numerous new companies and modules. However, one particularly innovative module, the Cyndustries Zeroscillator (ZO), goes where no module has gone before. Designed with FM synthesis in mind, the ZO offers "through zero" exponential and linear modulation capabilities, which introduce phase artifacts that intensify and broaden the oscillator's timbral palette. Add to that a wealth of modulation inputs, a variable sync mode, and the unique Time Reversal mode, and the ZO is already a must-have module. But there's more.

The ZO has ten audio outputs, four of which are morphable quadrature outputs that are 90 degrees out of phase with each other. The waveforms of the quadrature outputs can be continually adjusted—manually or with a control voltage—from a triangle wave, through a sine wave, to a square wave. Not only do the quadrature outputs offer interesting sonic potential, but they can also be put to other uses, such as controlling four VCAs for quad panning effects.

Cyndustries also had the audacity to release the ZO in five different module formats—the only company to attempt such a feat—so that nearly every modular user can have access to this powerful and rich-sounding oscillator. Although it's priced on the upper tier for synth modules, the ZO is well worth the investment, both in sound quality and craftsmanship.

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SYNTHESIZER (HARDWARE, DIGITAL)

Access Music Virus TI Desktop ($1,995)

Since 1997, one of the most popular and successful families in the world of electronic music has been the Access Virus series of digital synthesizers. They sound magnificent, and Access Music continues to offer firmware updates that expand the capabilities of even the oldest models. The most recent generation, dubbed the Virus TI, includes three instruments: the Virus TI Keyboard ($2,765), the Virus TI Polar ($2,765), and the rackmountable Virus TI Desktop. To be honest, we could have given the award to the whole series. We chose the TI Desktop mainly because we appreciate its compact form factor for tabletop or rack applications, and at $770 less than the keyboard models, it gives the best bang for the buck.

All three models bring innovative features to the product line, most notably software that allows you to work with the Virus TI as an instrument plug-in on your computer. (*TI* stands for Total Integration, a concept that fuses the advantages of hardware and software.) The TI series also features wavetable synthesis and a new HyperSaw engine that can generate nine parallel oscillators per voice, in addition to the classic analog modeling that has been the mainstay of previous models. Access has given the Virus TI twice the processing power of the previous generation and twice the polyphony; greatly expanded program memory, digital audio I/O, and USB ports; an improved display; an enhanced arpeggiator; and a Multi mode that lets you edit all 16 parts without affecting the original Single programs. The Virus TI even functions as an external effects processor and a 2-in/6-out audio interface for your computer.

The AU- and VST-compatible Virus TI plug-in makes controlling the keyboard or desktop synthesizer just like working with a soft synth. It affords complete control of the hardware and delivers new capabilities, from graphically tweaking oscillator waveforms to storing an unlimited number of patches. You can program and edit sounds with one hand on the mouse and another on the front panel. When you save and reload a sequencer file, the software saves and reloads all Virus TI settings.

In a synthesizer family that has grown more powerful with each new generation, the Virus TI represents the most significant upgrade to date.

THE AWARD WINNERS IN REVIEW

All of our award winners have been reviewed in our pages or soon will be. For products with reviews still in progress, we have completed enough tests to feel confident about our conclusions; most, if not all, of these reviews will be published in the next two issues. An article title in parentheses indicates that the product was covered in a feature or a department rather than in a review. All other entries indicate reviews of the award-winning version. Published articles are available for download from the EM archives at www.emusician.com.

Access Music Virus TI Desktop	July 2006
Arturia Prophet-V 1.0	December 2006
Audio Damage plug-ins ("What's New: Download of the Month")	September 2006
Cakewalk Sonar 5 Producer Edition	March 2006
Celemony Melodyne Studio 3	in progress
Chameleon Labs 7602	May 2006
Cyndustries Zeroscillator ("Analog Renaissance")	June 2006
FMR Audio Really Nice Levelling Amplifier RNLA7239	June 2006
Garritan Jazz and Big Band	June 2006
Harm Visser *Creative Physical Modeling Toolbox for Reaktor 5*	November 2006
JazzMutant Lemur	March 2006
JBL Professional LSR4326P	November 2006
Korg D3200	March 2006
M-Audio Sputnik	January 2007
McDSP Project Studio	January 2007
MOTU UltraLite	January 2007
Native Instruments Akoustik Piano ("Software Eighty-Eights")	October 2006
Novation ReMote 25 SL	in progress
Roland SP-404	May 2006
sE Electronics Reflexion Filter	in progress
Sony PCM-D1	December 2006
The Sound Guy SFX Machine Pro	in progress
SoundToys Native Effects	in progress
Steinberg WaveLab 6.0b	September 2006
Submersible Music DrumCore 2	in progress
Vienna Symphonic Library Vienna Instruments Symphonic Cube	in progress

SYNTHESIZER (SOFTWARE)

Arturia Prophet-V 1.0 (Mac/Win, $249)

If you aren't lucky enough to own both a Sequential Circuits Prophet-5 and a Prophet-VS, have no fear: Arturia's Prophet-V 1.0 is a dead ringer for those two classic synths, and you don't need to be a gearhead to appreciate its amazing authenticity. Prophet-V provides a dedicated display for each of the two hardware

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devices it models and a third display that combines aspects of the two on a single screen. Its flexible modulation options will send you into analog nirvana, and with more than 50 programmable synthesis parameters, you'll be transported to a tweaker's paradise.

Each of the individual emulation modes is stunningly close to the original. The V models the original Prophet-5's analog circuitry down to the last wire. Its two oscillators are coupled with a white-noise generator, an ADSR, and a multiwave LFO. The wavetable-based VS offers 96 sampled waveforms as sources for its 4 oscillators, and the original's joystick, used for vector synthesis, is included in Arturia's emulation.

The Hybrid mode goes beyond anything the original hardware could do. Its straightforward audio matrix lets you enable or disable audio modules from each of the two synths, and its modulation matrix lets you interconnect ins and outs from the control modules of both synths on a single screen. This is one soft synth that will keep you busy for a long time.

Virtual Orchestra

Vienna Symphonic Library Vienna Instruments Symphonic Cube (Mac/Win, $10,990)

There are a lot of ways to get a virtual orchestra onto your desktop, but if you're looking for a no-compromise, state-of-the-art approach, Vienna Instruments Symphonic Cube, from Vienna Symphonic Library (VSL), is the way to go. This massive sample library consists of more than 800,000 individual samples (550 GB), arranged into 10 Collections, and includes everything you'll need to emulate an orchestra in your studio.

Symphonic Cube offers a huge number of both standard and extended articulations. You'll find nearly every type of string-bowing style, a massive number of wind-playing techniques, and a vast collection of percussion sounds (hits, rolls, flams, and more). In addition to the single samples, there are ready-to-play musical passages, including glissandos, grace notes, and octave runs.

Tying it all together is a user interface with which you design and configure samples for playback from your MIDI tracks. You'll have to get used to some unusual terminology (such as *Matrix* and *Cells*) when working with Symphonic Cube, but the overall architecture is very logical and quickly becomes second nature.

Don't assume you need a conservatory degree to make good music with this collection: Symphonic Cube includes your own "personal orchestrator" (which VSL refers to as "Performance Detection" algorithms) that picks the correct sample for the musical passage in question. For example, the Speed Control parameter can switch between two or more samples based solely on the tempo of the notes in your music. Or you can configure the program to choose different samples based on repeated-note patterns, musical intervals, and more. Key- and Velocity switching are just so old school!

We gave a good, long look to MOTU's Symphonic Instrument, which is our favorite new under-$1,000 virtual orchestra, but Symphonic Cube is simply the last word on the subject. And as of this writing, VSL has just released a major upgrade to its user interface, which

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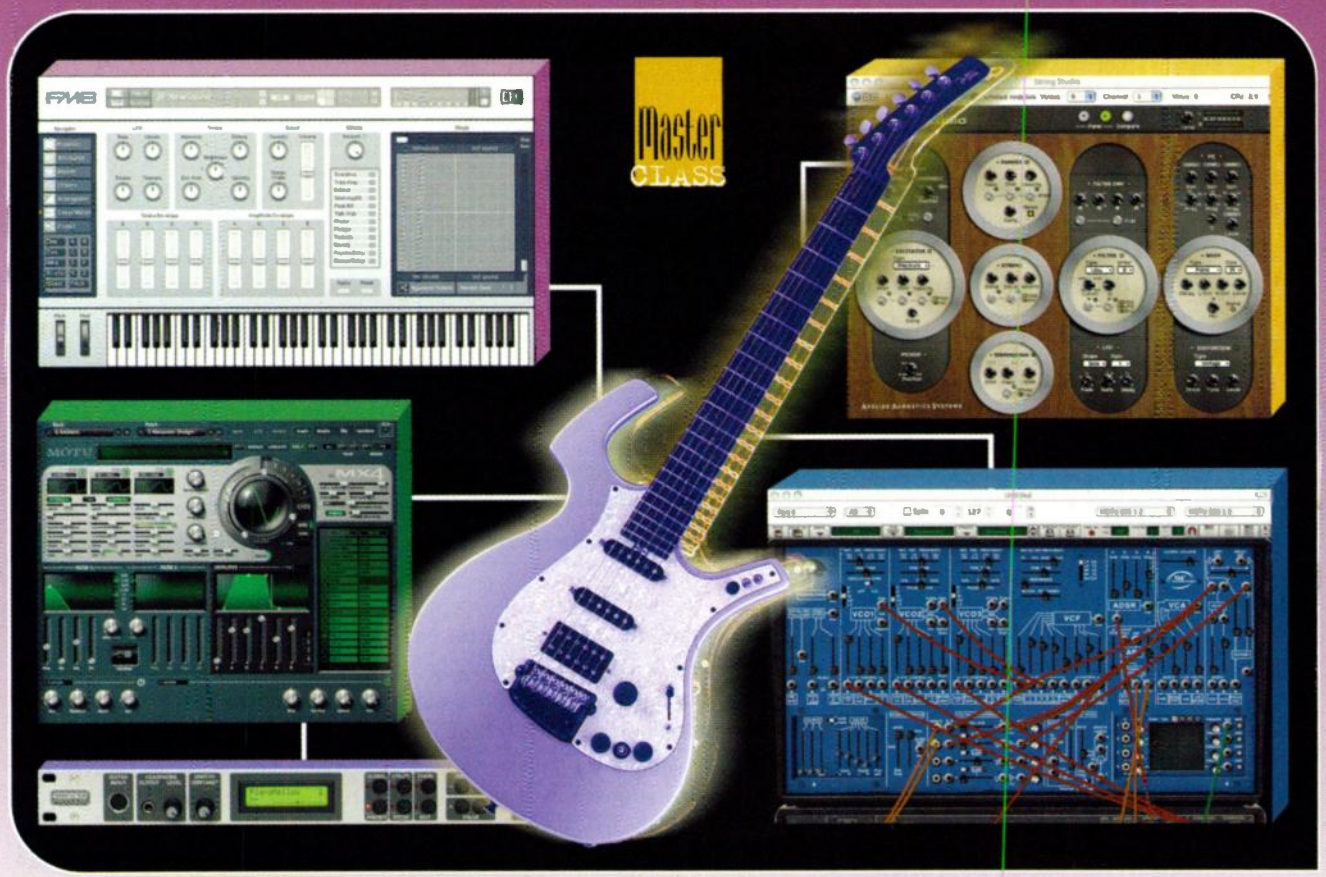

LAURA WILLIAMS

The Rite of Strings

By Marty Cutler

How to program soft synths for MIDI guitar and vice versa.

It's quite an awe-inspiring experience to pick up a guitar and play sounds that could never come from a guitar alone. The convergence of guitar, synthesizer, and MIDI promises new dimensions of creative expression and beautiful sonic complexity. Surprisingly, many guitarists with chops and credentials far better than mine admit to abandoning guitar synthesis in frustration, often with the complaint that the technology doesn't live up to its claims of accuracy, speed, and expressiveness. Their frustration often arises from a lack of understanding about synthesis and MIDI. To paraphrase a well-known comic strip, "Music technology is not for wimps." That said, it has never been easier to gain control over a vast array of synthesizers, sequencers, effects, and other MIDI technology that can take your music and creativity to unexpected places. MIDI guitar converters track better than ever and offer as much if not more expression than the average keyboard.

What follows is a grab bag of tips and advice for anyone contemplating the merger of guitar and synthesizer, and for the seasoned pro in search of new ideas. To skilled keyboardists and synthesists, some of my advice may seem obvious, but remember that I am approaching synthesis from a guitarist's point of view. Nonetheless, keyboardists can glean useful information about guitar techniques as they apply to MIDI and synthesis. (For more information, check out "Six-String Synthesis" in the May 2002 issue of EM, available online at www.emusician.com.)

Gater Aid

It's helpful to examine the fundamental differences between the ways that keyboards and guitars trigger MIDI data. MIDI keyboards are essentially a series of switches. Press a key, and the

keyboard will generate MIDI Note On and Velocity messages; release the key, and it will generate a Note Off message.

Guitars, however, go through a more complex process in order to generate MIDI notes. First, a converter needs to translate a vibrating string into MIDI data (for more details on the process, see "The World on a String" in the May 2001 issue of EM, available online at www.emusician.com). Guitar techniques can confound the unambiguous language of MIDI protocol. MIDI guitars send note data for as long as the converter can sense the vibration of the strings; consequently, some strings (usually the lower-pitched ones) may vibrate longer than you want them to, or they may ring for a shorter time than you intend. Some guitarists lift their fingers from the strings in order to damp notes, and the fretting hand moves around when changing fingering positions. Either action can inadvertently set strings into motion and trigger additional MIDI notes. Not to put too fine a point on the comparison, but unless you are incredibly clumsy, lifting a finger from your keyboard's middle C will not accidentally trigger other notes.

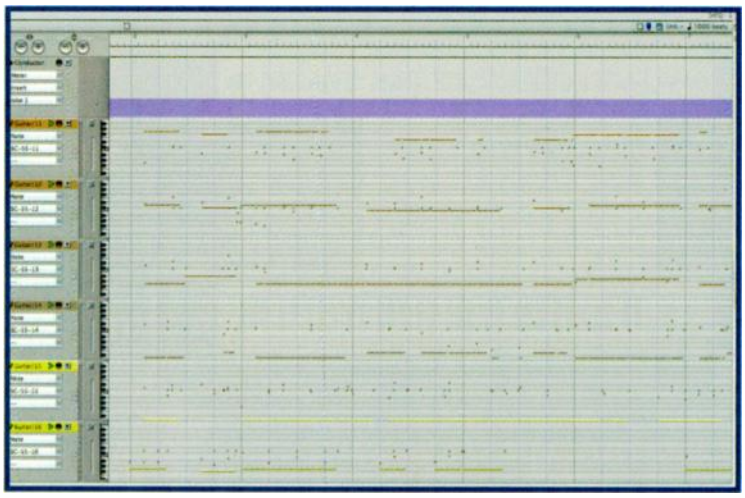

FIG. 2: MOTU Digital Performer's Sequence Editor lets you combine and edit multiple tracks as if it were a single Graphical Editor window.

Guitarists have developed a wealth of techniques for controlling their instruments, and I have found it most useful to borrow from the pedal steel guitarist's bag of tricks. The pedal steel can be characterized by its languid, rich sustain and often slow, violin-like attack. Nevertheless, masters of the instrument can fire off intricate bebop solos and seamlessly switch to gorgeous, sustained padding without changing any instrument settings. It's all in the picking hand, and one technique (often called blocking) translates quite well to MIDI guitar.

All nonessential picking fingers remain relaxed but curled under the palm of the hand. You damp notes (and consequently send MIDI Note Off messages) by rocking your picking hand as you play so that you damp the strings with the meaty edge of the palm near the base of your pinkie at some rhythmically appropriate point. You can also alternate the pinkie edge with the thumbside edge of your palm. The technique takes a bit of practice to perfect, but it works well whether you use a flat pick, fingerpicks, bare fingers, or any combination. As you develop more coordination in the technique, work on changing chord positions while the notes are damped to minimize false triggers. (For more tips on how to maximize tracking, see the sidebar "Stay on Track.")

FIG. 1: Although this Subtractor patch in Propellerhead Reason 3.0 has a slow attack, you can set the Amplitude Attack knob in the Velocity section's lower-right corner to speed up the envelope's attack segment with higher Velocities.

Envelopes Rule

One of the most frequently mentioned concerns of MIDI guitarists is that the synthesizer doesn't respond quickly enough for rapid note passages. Most often, delays can be attributed to the guitarist attempting to play the head of a Mahavishnu Orchestra tune with a tuba patch or some other sound that has an inappropriately slow attack. Stop and think for a moment: how many tuba players can negotiate the passage in question without risking a hernia? MIDI guitar is not at fault here; keyboardists attempting that same passage with the same patch would face the same problem. Synthesizers take on certain sonic properties only if they are programmed that way. Thus, sounds with a slow attack segment will repeat that behavior with each note, and no rapid-fire barrage of 64th-note triplets is going to make them more responsive.

To achieve more-satisfactory results, you have several options: play fewer notes (almost always good advice), choose another sound, or tailor the one you're playing to suit your style. It isn't hard to adapt a synthesizer program to your playing needs, but be aware of a significant catch-22: adjusting the sound may obscure or even eliminate some of the characteristics that attracted you to it in the first place. For example, speeding up the attack of a slowly evolving pad sacrifices motion for a

faster response. The best option here is to choose an instrument that lets you control envelope rates with picking dynamics (Velocity). If you play softer, the attack remains slow, but with more forceful picking, it speeds up (see **Fig. 1**). If you have a spare oscillator, you might be able to add an attack transient that gets out of the way quickly. Of course, you could always blend your guitar's output with the synth too.

Please Release Me

The release stage of the envelope can also create problems when you want to play faster passages: if one note doesn't get out of the way of the next note soon enough, the performance can be garbled, with the tails of notes slowly receding into silence. Remember: the programmed release stage of the envelope supersedes the physical release of the string; therefore, in order to avoid smearing the part, simply abbreviate the release stage of the patch.

Of course, nothing is better for sequencing realistic acoustic guitar parts than a guitar controller, but if you need to sequence guitar parts, avoid patches that use sampled string-noise artifacts in release loops unless you can invoke them with a Control Change (CC) message. While you are trying to lay down a part, nothing is more confounding or annoying than fret noise and string snaps automatically popping up—it's often hard to tell them apart from a bad case of glitching. If you want to add playing artifacts for realism, it's best to invoke them with CCs after laying down the track.

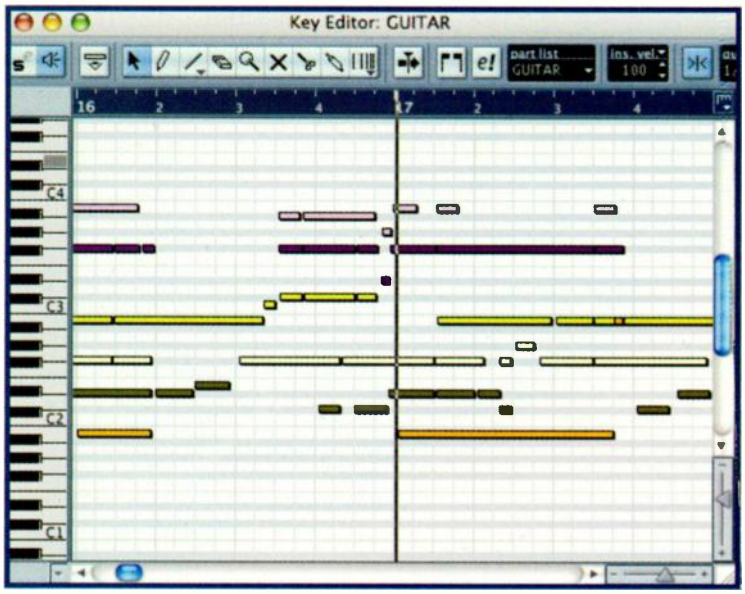

FIG. 3: A single track in Steinberg Cubase SX3 can handle all six MIDI channels from your guitar. Fortunately, you can color code each MIDI channel and string in its Graphical Editor.

If Six Were One

It's hard to explain the particular appeal of monophonic lead instruments, but even the most powerful, high-end synths with oodles of polyphony feature sounds that restrict playing to monophonic lines. The sustain of the synth, coupled with a gliding, legato behavior, seems to encourage wide intervallic leaps and more hornlike phrasing than if you were simply playing guitar or a polyphonic synth. It's very different from playing monophonic lines on guitar and requires a few modified techniques, but trust me, it opens up plenty of new ideas for expression. The trick is to use a subtle amount of the synthesizer's glide (or portamento) to create smooth and continuous transitions from note to note without any semitone stops at intermediate frets.

Here again, you need to be aware of the way the synthesizer is programmed; for example, you might want to speed up the portamento time so that gliding from one pitch to another doesn't sound too exaggerated. If more than one note is ringing, the synth may glide to a different note than you intended, depending on whether the monophonic patch is set for low-note or high-note priority. Consequently, some of the previously mentioned blocking techniques can ensure that sustained notes don't glide to the pitch of another string that may still be vibrating.

STAY ON TRACK

Apart from playing technique, other factors govern your MIDI guitar rig's performance. Here's a short list to ensure that your guitar will track as accurately as possible. First and foremost: use a well-maintained guitar with true intonation and good frets. Avoid extremely low string action and extremely light strings. Keep your guitar in tune and change strings often; it's not easy for a MIDI converter to judge pitch correctly if your string is a few cents sharp or flat. Likewise, if dirt, grit, and wear are warping the shape of your strings, they just won't track properly. And when it comes to tracking, magnetic hexaphonic add-on pickups are very good, but guitars with built-in piezoelectric pickups have the edge. Crosstalk between pickup poles and adjusting and readjusting pickup height are no longer issues, and you just can't track any better than with strings sitting smack-dab on the pickup. Check out instruments from Brian Moore and Godin Guitars. If you want to add a piezoelectric system to an existing guitar, check out GraphTech and RMC Pickups.

Your MIDI converter's sensitivity settings can also help. For example, Terratec's Axon AX 100 mkII lets you set a global threshold so that lightly excited strings will not send MIDI notes. A relatively quick-and-dirty remedy for unintended MIDI data is to tweak your synthesizer's Velocity curve so that notes resulting from false triggers are inaudible. Generally speaking, glitches have lower Velocities than the notes you intentionally play, so setting a curve that requires a high-Velocity threshold to produce sound will suppress glitch notes.

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Guitar Meets Sequencer

Recording MIDI guitar tracks into a software sequencer requires a bit more forethought than the average keyboardist needs to confront. First, you must determine if you will record MIDI data over a single MIDI channel or use one channel per string. You have many more options if each string's output has a dedicated MIDI channel, but that requires advance setup in the guitar controller as well as the host program. Most obviously, you will need to consider the way in which the sequencer handles multiple MIDI channels. If you are using software synthesizers, you'll have to think about setting them up for multitimbral performance.

For the MIDI guitarist, there are two basic ways a sequencer can handle multiple-channel recording of MIDI data; both approaches have their pros and cons. MOTU Digital Performer (DP), for example, operates on a single-MIDI-channel-per-track basis. That means you will need to set up six tracks, one for each string and its associated MIDI channel. Although it may seem a bit unwieldy from a visual standpoint, there is a major advantage to this type of setup: you can use DP's real-time MIDI Effects plug-ins to easily transform your MIDI guitar input in a variety of flexible ways. You can quickly transpose any individual string and simultaneously harmonize it to virtually any imaginable scale while applying a customizable arpeggiator. You can create polyrhythmic, multitimbral monsters. Furthermore, DP's Device feature lets you stack synths, so each string could have custom synthesizer layers. Of course, multiple tracks

FIG. 4: Here is a multitimbral patch I created in Native Instruments Kontakt 2. Each part uses the same bass patch assigned to one of the six MIDI channels of the guitar, and each part is restricted to single-note polyphony. In addition to conserving CPU cycles, this setup helps the samples perform like a real bass, with successive notes on the same string cutting the previous note short.

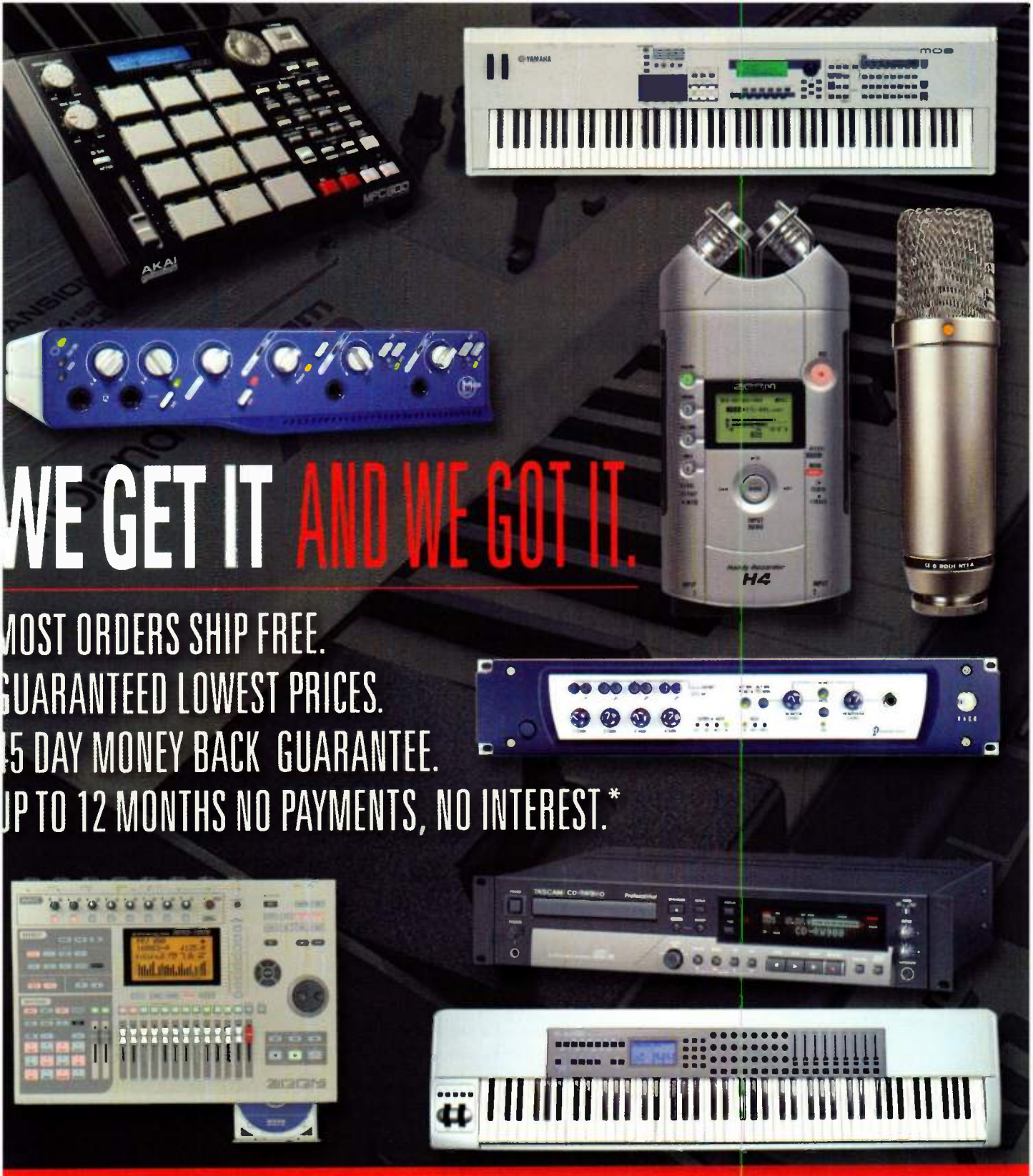
TUNER CASSEROLE

Ever since the demise of Roland's GM-70, the ability to store customizable MIDI tunings has been missing from guitar-to-MIDI converters (with the exception of Yamaha's G10, which used a proprietary controller instead of a real guitar). With version 5.26 of the Terratec Axon's firmware, customizable tunings have returned, topping a list of improvements (as of this writing, the current firmware is 5.42). The Axon's editing software offers a drop-down list of alternate tunings you can load and store in a preset, and you can add your own custom tunings to the list.

For controllers without open-tuning capabilities, Mac OS X users can download Phi Software Open Tuning 1.5.1 (see **Fig. A**). As with the Axon, you can choose from a long list of presets or customize and store your own. You can easily map any MIDI guitar's individual string output to play standalone soft synths directly or synths loaded into sequencers with Apple's IAC bus. If you want to use your controller on a single MIDI channel, you can create tunings by assigning MIDI Note Numbers to transposition zones; that offers intriguing possibilities for other single-channel controllers such as keyboards and wind controllers. You can download a free trial copy or purchase a full working copy for $29 at www.open-tuning.com.

FIG. A: Phi Software Open Tuning 1.5.1 lets you transpose the MIDI output of individual MIDI guitar channels and perform a variety of MIDI mapping tricks.

You have at least two ways to achieve alternate tunings in your sequencer software. As long as your guitar controller is transmitting on an individual-string-per-channel basis, you can map notes to a new note. MOTU Digital Performer—because of its channel-per-track setup—does this easily. Some tinkering with the MIDI-mapping features of other sequencers (such as Apple Logic's Environments window) can provide the same result. Naturally, most multitimbral soft synths provide a transposing capability for each part, so you can create alternate tunings if your sequencer doesn't offer real-time transposition.



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can be difficult to manage if you are cleaning up glitches or fine-tuning note durations. Fortunately, with the advent of the Sequence Editor window, DP lets you view multiple tracks in a unified piano-roll–style editor (see Fig. 2).

A String of Polyphonies

Digital audio sequencers such as Apple Logic, Steinberg Cubase, and Cakewalk Sonar favor multichannel MIDI tracks. On the plus side, it is absurdly simple to record the individual MIDI output of all six strings. Editing is equally simple, especially if you color code the note display of the piano-roll–style window by MIDI channel. That way, each color will also represent one of the six strings (see Fig. 3). However, creating elaborate multitimbral setups as described for DP can be a convoluted affair.

Setting up a multitimbral virtual synth is usually a relatively simple process; if your target instrument is not multitimbral, you can always load multiple instances of the instrument (if your processor is up to the task). With DP's multiple-track scheme, you simply instantiate a multitimbral synth and assign the desired patch or patches to successive tracks and MIDI channels. In Logic, for instance, you assign a Multitimbral Audio instrument to a track, and set the track's MIDI input to All. You can then assign the patch or patches for each MIDI channel on the synth's multitimbral setup. If you want to send your guitar's MIDI output to different virtual synths, assign the MIDI inputs of individual tracks to each string's designated MIDI channel; you can then use Logic's arpeggiators, transposition, and other MIDI processors for individual strings (for more information about string transposition, see the sidebar "Tuner Casserole").

To further minimize glitching, it's often best to limit multitimbral synths to monophonic performance for each string and channel. That way, the synth is limited in note choices. As an additional benefit, the instrument is more effective for playing clear solo lines, because with a single-note priority for each string, each successive note on the same string will stop the previous note, just like a guitar. Consequently, you will avoid the tails of long envelopes bleeding into your next note when playing on the same string. Most multitimbral soft synths provide easy access to voice-allocation parameters in order to conserve CPU cycles, and you can usually save your setup as a multitimbral patch (see Fig. 4).

Cleanup on Track Three

Glitches recorded in sequencer tracks can pose a different set of problems. If you're recording tracks with a software synth, unwanted notes can eat up available polyphony when you most need to conserve processor overhead. If you decide to change patches, the unwanted notes could become audible again or create other playback problems. Fortunately, most modern-day sequencers offer a terrific set of tools to remove musical blemishes. For example, Sonar offers a Deglitch function that's set up to surgically remove any data you don't want to keep (see Fig. 5), and Digital Performer's Split Notes command permits the use of similar criteria for removing unwanted notes. It takes a bit of practice to figure out what doesn't belong, but I can completely clean up an entire performance in seconds with either of those programs. In DP, using an event resolution of 480 ticks to a quarter note, I can select all notes with a duration of less than 50 ticks for removal and be done with it. Likewise, you can set a range of Velocities, and the programs will dutifully remove anything less than your minimum amount. Either method works well, but I prefer to cull notes by duration, because I may accidentally play an intended note too softly.

Having established several ways to clean up and fix your playing before, during, and after the fact, let me remind you that MIDI can

easily become a playground for the obsessive-compulsive, and too much cleanup and precision can result in sterile tracks. A tiny amount of unevenness and glitching is a very human thing. That is especially obvious (and a bit ironic) if you need to deliver sequenced guitar parts. I'll wager that if you listen to any of your favorite guitar hero's tracks in isolation, you'll find plenty of sonic warts. For that reason, leaving that ghosted note you accidentally brushed while changing chord positions can actually contribute to the realism in the track.

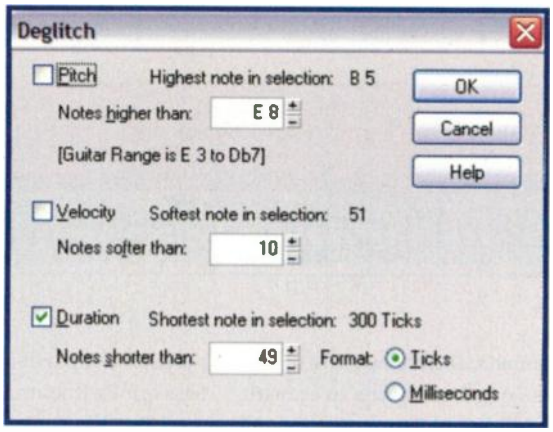

FIG. 5: Cakewalk Sonar 5.2's Deglitch feature is specifically tailored to remove spurious notes from MIDI guitar tracks.

Sure, the sequencer will let you set uniform durations for all the notes you played; however, one of the beauties of playing guitar is that each vibrating string has an independent life span, and some strings will naturally fade to silence sooner than others. Even if you are not trying to capture a realistic performance from your MIDI guitar, unrelenting uniformity can be exhausting to the ear.

Extra Hands

Some MIDI guitar controllers, such as Terratec's Axon AX 100 mkII, provide a wealth of built-in modulation controls that are ideal for animating virtual synthesizers. Software synthesizers make modulation especially easy with MIDI Learn features and automation capabilities that practically invite complex sonic motion. The Axon's modulation sources include fretboard position, picking distance between bridge and neck position, the Pickup Control Wheel, two footswitches, and two expression pedals. Roland's GR-20 and Yamaha's G50 are also viable contenders. However, if your MIDI guitar controller is a bit underimplemented in the controller department, you have other options.

One truly terrific aspect of synthesis that stems from its early days is the concept of modularity—linking components that shape the instrument's expressive capabilities. In that sense, your MIDI sequencer can become a powerful component of a synthesizer system without recording a single note. As I mentioned earlier, you can use your synth's real-time MIDI processing for a great number of tricks. In addition, you can record lots of other types of MIDI data and use your sequencer as an adjunct LFO, envelope generator, or some other modulation tool for live performance. Record whatever CC messages you need into your sequencer tracks, and just let your sequencer play them back during your performance. You can either create tempo-synced effects or, for less predictability, ignore the tempo completely and just let the sequencer run free as you play. Most modern sequencers offer lanes to edit and "paint" virtually any number of MIDI messages.

Using a guitar to play synthesizers has always been and may always be a more complicated craft than using keyboards. At last, however, with greatly improved tracking and response time, the rewards easily outweigh the effort. There has never been a better time to play MIDI guitar. EM

Marty Cutler coauthored MIDI for Guitarists *(Music Sales) with guitarist and friend Bob Ward in 1988. MIDI guitar has come a long way since then.*

Rigged Up

By Len Sasso

Use your Guitar Rig 2 plug-ins on any track.

Using guitar amps, cabinets, and stompboxes to process instruments ranging from horns to acoustic and electric keyboards has a long history onstage and in the studio. You can carry this time-honored tradition into the digital domain with guitar-amp-simulator and stompbox plug-in effects such as Native Instruments Guitar Rig 2, IK Multimedia AmpliTube 2, and Line 6 Amp Farm 3. You can creatively weave these effects into your mixes as sends and inserts.

I'll use Guitar Rig hosted by Ableton Live 6 to illustrate several ways to enhance and abuse bass, drum, electric piano, synth, and flute tracks (see **Fig. 1**). You can use the same techniques with any full-featured guitar-effects plug-in and digital audio sequencer. Special thanks to Big Fish Audio for allowing me to use several clips from its excellent sample collection, *Nu Jazz City*, for my examples. See **Web Clips 1 and 2** for the full mix with and without effects processing.

Basic Bass

Using Guitar Rig on a bass track, while not particularly adventurous, adds definition and motion to the sound. I used Guitar Rig's Fretless preset from the factory Bass bank to add character to an acoustic bass clip. The preset starts with EQ boosts of roughly 10 dB at 175 and 1,182 Hz, which is followed by a cabinet and mic simulator, and then by a chorus. I left the preset's spring-reverb and volume-pedal effects turned off. Changing the choice of cabinet and the mic position are particularly effective ways to change the bass color without radically altering the feel.

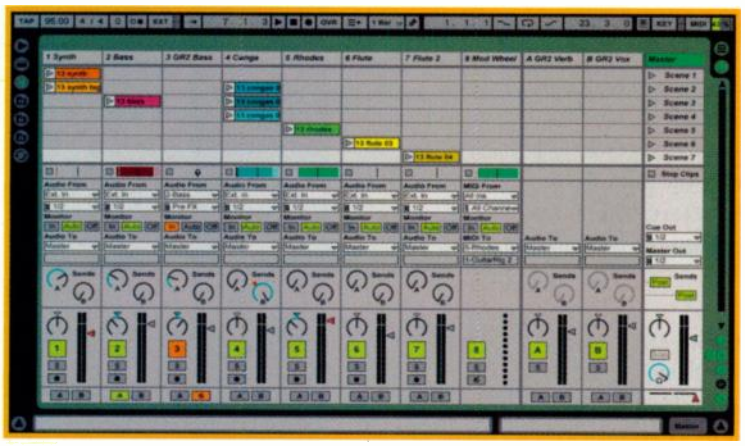

FIG. 1: Live 6's Session view with red dots indicating Crossfader, volume, and send automation.

I put the Guitar Rig Fretless effect on a separate track whose input is taken from the bass track. I assigned the two tracks to the A and B sides of Live's Crossfader, respectively, and then automated the Crossfader so that the raw bass crossfades to the processed one over the course of the mix.

A small amount of each bass track and a substantial amount of the ambient synth track are routed to send bus A, which houses the '60s-style reverb preset Big Hall/Dirty from the FX bank. That starts with a 600 ms feedback-delay line whose feedback is modulated by an LFO. The delay is followed by extreme compression (25:1) and a spring reverb. MIDI-controlled pitch pedals are inserted before and after the delay line, and at the end of the signal path.

The Voice in the Drum

The absence of a vocal track leaves plenty of room for a simulated vocal effect. For that, I fed the conga track to send bus B, on which I had inserted an instance of Guitar Rig 2 loaded with the Robotone preset. Robotone uses a chorus followed by three phasers to achieve a whispering effect.

Two short flute clips carry the melody, and although they can stand on their own, I was looking for something a little edgier. For the more aggressive of the two, I used the Ultra AC Box preset, and for the more melodic one, I used Crunchy FX; both clips were from the Contemporary Mix bank. Ultra AC Box uses distortion followed by an amp and cabinet simulation to magnify the breathiness of the flute. Crunchy FX uses two amp simulators in parallel to create an airy, multitap sound. One of the simulators is followed by a chorus effect and a multitap delay.

Bumpy Rhodes

For the electric piano track, I created a combination tremolo and vibrato effect called Tremolato (see "Step-by-Step Instructions" on p. 78). This effect is useful for electric piano loops without tremolo and for sampled virtual instruments whose implementation of tremolo and vibrato you find unsatisfactory. I started by placing Guitar Rig's Tremolo and Chorus + Flanger effects on opposite sides of the Crossover Mix module and set the Chorus + Flanger to Pitch Modulation mode. That

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STEP-BY-STEP INSTRUCTIONS

1

Create an empty preset and drag a Crossover Mix module from the Tools tab of the Components view into the modules rack.

2

Drag Tremolo and Chorus + Flanger modules from the Mod tab of the Components view into the Low Channel and High Channel slots of the Crossover Mix module. Set the Chorus + Flanger to Pitch Modulation mode.

3

Assign the MIDI Mod Wheel to the Crossover Mix Frequency knob by right-clicking on the knob. If CC #1 is not listed, select Learn.

4

Drag an Input Level module from the MDF tab of the Components view to the bottom of the rack.

5

Click-and-drag the Assign button to the Tremolo module's Rate knob. Click-and-drag the Assign button to the Chorus + Flanger module's Speed knob.

6

Click on the Targets button and adjust the modulation amount for the Tremolo and Flanger rates to taste. Negative values cause the rates to increase as the sound dies out.

applies tremolo to the low frequencies and vibrato to the high frequencies. By adjusting the crossover frequency, you can have all tremolo or all vibrato and use the crossover-balance fader to balance the effect when both tremolo and vibrato are present.

Finally, I used an envelope follower (the Input Level module) to modulate the tremolo and vibrato rates. The modulation amounts are both negative, so as the sound dies out, the rates increase. With this, as with any other crossover-based effect, you can swap the high-band and low-band processes by dragging modules from one side of the crossover to the other. That leaves all modulation and MIDI-controller routings in place. EM

EM WEB CLIPS

Len Sasso is an associate editor of EM. For an earful, visit his Web site at www.swiftkick.com.

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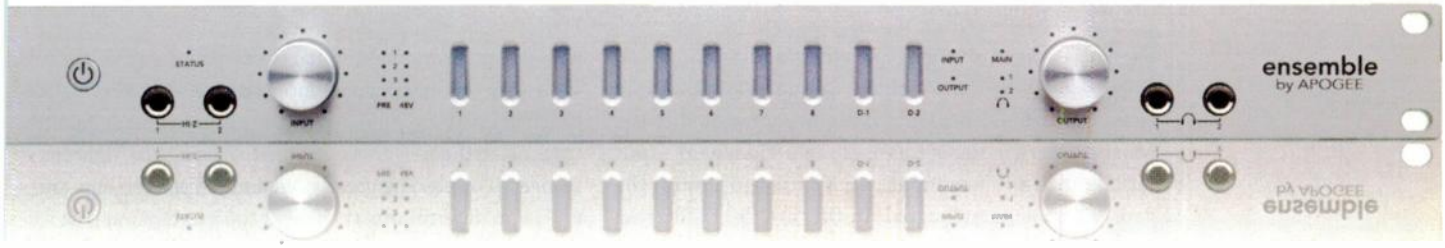

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Golden Gates

By Eli Krantzberg

Bring out your best sounds with creative gating.

Noise gates are among the oldest audio-production tools. They mute a signal falling below a certain level, called the threshold, to remove unwanted noise. Most modern noise gates include a sidechain input (also known as a key input). That's used to control the gate with a separate signal. In this article, I'll discuss a variety of musically creative ways to use noise gates and sidechains.

Acoustic kick drum tracks rarely have the depth and low end heard on modern commercial recordings. To beef up a kick drum track, use a synth or signal generator to create a low-frequency sine wave and insert a gate effect on its output. Route the kick drum to the sidechain input as well as to the main mix or drum submix. The sine wave will now be triggered by the kick drum signal. Set the gate effect's hold and release controls to fairly low values to keep the duration of the sine wave short, and you will have a nice, fat low end to beef up the kick drum (see **Web Clip 1**). The pitch of the sine wave can make a big difference, so experiment.

FIG. 1: A phaser is inserted between two gate effects. The different settings on the two gates allow the phaser-processed portion of the signal to be shorter than the nonprocessed part.

Punchy Snares

You can also use gates to add punch to a snare drum track. Subgroup a copy of the overhead mic tracks to a bus with a gate, and route the close-miked snare track to the gate's sidechain input. Adjust the threshold so that the gate is triggered by the snare hits but not by the lower-level leakage in the snare track. Because the original overheads are intact on separate tracks, you can add further processing to the overhead subgroup to flatter the snare. I often convert the overhead subgroup to mono, add heavy compression, and then blend it back in panned to the center.

Gates can tighten up sloppy performances by making parts start and end in sync. **Web Clip 2** illustrates a sloppy piano part and tight bass part playing similar patterns. A gate on the piano track, with the bass track feeding the sidechain, tightens things up nicely. The gate's hold and release settings are crucial in determining the feel of the gated piano part.

A similar sort of controlled gating will tidy up vocal backing tracks. Group the background-vocal tracks in a submix and insert a gate. Then use the backing track with the best timing as the sidechain input to improve the timing of the whole ensemble. You can also use this technique to keep a bass track locked to a kick drum track.

Pulsing Pads

Insert a gate on a chord, pad, or ambient track and gate that track using a rhythmic pattern or loop for the sidechain. You'll get the precisely controlled rhythmic chopping effect often found in dance music. For rhythmic variation, use a copy of the rhythm track for the sidechain source and shift it in time by a musical subdivision—a 16th note, for example. Don't feed the copy to the main output, of course. For tonal variety, use two gates with different settings and insert a phaser or other effect between them (see **Web Clip 3** and **Fig. 1**).

For some novel panning effects, try two gates in parallel. Start with a mono loop and assign the output to separate buses panned hard left and right. Insert a gate on each bus, set one gate for a slow attack and quick release, and set the other gate for a fast attack and slow release. You get a stereo loop with an intriguing pan envelope.

You can go well beyond the clichéd gated-reverb effect of the '80s when processing a reverb with a gate effect. For instance, bus a drum loop to a reverb followed by a gate whose sidechain is fed by the same loop. That produces a tight reverb envelope following the natural accents of the drum loop. The gate's hold and release controls dramatically affect the length of each burst of triggered reverb (see **Web Clip 4**).

As you can see, gate effects are useful for more than cleaning up noisy tracks. Whenever a track seems a little lifeless, try some creative sidechain gating. You may be surprised by the results. EM

EM WEB CLIPS

Eli Krantzberg is a Montreal-based drummer, vibraphonist, bandleader, and home-studio owner.

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INSTRUMENTS

All Together Now

By Jim Aikin

How multisamples can improve your musical projects.

In the late 1980s, sample-based synthesis was the premier technology that keyboardists used to produce a wide range of realistic sounds. Today, the synthesist has many more choices, including physical modeling for realistic sounds, additive synthesis, and older but still versatile options like modeled analog and FM. But sample playback remains a vital musical resource.

Last month I discussed how samplers produce sound (see "Square One: Get Real" in the December 2006 issue of EM; the article is also available online at www.emusician.com). To recap, a digital recording, or *sample*, is assigned to a particular key on the sampler's keyboard. Depending on which key is played, the original sample may have to be transposed up or down by some number of half steps in order to allow the performance of conventional musical passages. But when a sample is transposed too far, it no longer sounds natural. (What is considered to be "too far" depends on the type of sound that has been sampled.) Keyboardists use a technique called *multisampling* to get a full range of notes while avoiding the problems associated with sample transposition.

Teamwork

With multisampling, separate samples of the same instrument (or some other sound source) are recorded at different pitches. For instance, you might record an acoustic guitar playing every E, G♯, and C over a range of three octaves. Each of these samples can then be assigned to a range of MIDI keys called a *key zone* (see **Fig. 1**). If you play a low E or F, you'll trigger one sample; if you play a G♯ or A, you'll trigger a different sample. Because each sample is confined to a narrow key zone, the sample needs to be transposed up or down by only a few half steps from its original pitch, so it won't suffer from the type of sonic degradation caused by being transposed too far. The keyboardist can play a musical part that covers a wide range without having to worry that transposition will make the sound unrealistic.

But this solution creates a new problem. Let's say you assign one guitar sample (the one recorded at a pitch of E) to the keys E♭ through F♯ and another (recorded at G♯) to the keys G through B♭. If you play the notes F♯ and G one after another, you'll trigger two different samples. If there's a noticeable difference in tone color or volume between the two samples, the two notes won't sound alike (see **Web Clip 1**).

The juncture in this example between F♯ and G is called a *multisample split point*. If you assign a multisample to the keyboard and then play a chromatic scale up or down the keyboard, you'll most likely hear the multisample split points. They may be subtle or obvious. If the mismatch is too glaring, the multisample won't sound realistic, especially when used to play a scale, even though each sample may have been recorded flawlessly.

Developing multisamples in which the multisample split points are unobtrusive is an exacting challenge. That is one reason why sampled-instrument libraries are expensive.

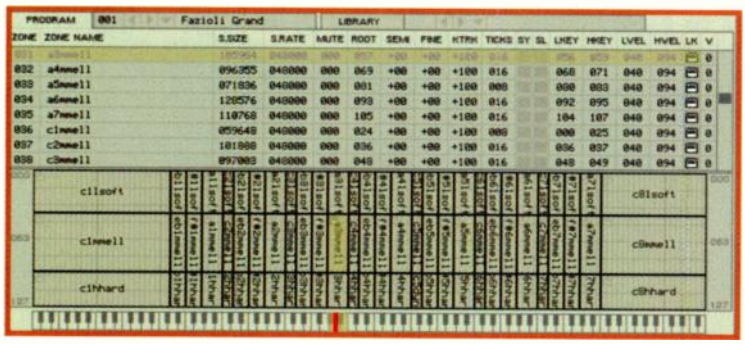

FIG. 1: Shown here are the key and Velocity zones in the Fazioli Grand preset in the DirectWave sampler in Image-Line FL Studio 6. The root key (original pitch) of the selected sample is shown on the keyboard in red. This multisample is a 3-way Velocity cross-switch.

Trade-offs

The larger the key zones are, the more obvious the multisample split points will be. That is because at the split point, the sample in the lower zone will have been transposed up by a few half steps (or a lot of half steps) and the sample in the upper zone will have been transposed down by a similar amount. Because transposing a sample causes sonic changes, the guitar multisample mentioned above will sound too bright and brittle on the F♯ but too dull and thick on the G.

An obvious solution to the problem is to avoid transposing altogether by recording the source material (the guitar, electric piano, or whatever) at every half step. Each key zone then becomes one key wide. If each sample

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is recorded with reasonable care, the multisample split points will be less obvious because none of the samples will need to be transposed.

But that also creates new problems. For one thing, the more samples the developer of the sound library has to record, the higher the cost of the library. In addition, the more samples you assign to the keyboard, the more memory the sampler needs. In the early days of sampling, memory was expensive and assigning a separate sample to every key wasn't practical. Today, memory is much less expensive, but computer-based samplers still require large amounts of memory.

How much memory? If each 16-bit, 44.1 kHz mono sample is 5 seconds long, you'll need about 27 MB to assign a separate sample to each key of a 61-note keyboard. That's not much compared with the memory most newer computers have. The memory requirements of a modern sampler, however, can be considerably greater.

Timbre

When an acoustic instrument is played loudly, it isn't just the amplitude of the sound that changes; there are also changes in the *timbre* (tone color). Typically, a loud note on an instrument is brighter (has more high partials). To a limited extent, we can mimic the effect of playing an acoustic instrument more loudly or softly by sampling a note played loudly, and then using a lowpass filter to remove some of the high partials when a MIDI note with a low Velocity is received. On plucked and struck instruments such as guitar, piano, and percussion, softly played notes also die away sooner. We can mimic that effect by modulating the length of the envelope decay and release parameters using Velocity.

But that approach is imperfect at best. It works adequately with plucked and struck instruments but poorly with bowed and wind instruments. To create a more realistic multisample, record your source instrument playing various notes at various volume levels. You can then assign each sample to a different *Velocity zone* within the multisample. When the MIDI keyboard is played lightly (outputting a Velocity of, say, less than 64), a sample of a softly played note can be triggered. When the MIDI keyboard is played harder (with a Velocity of 65 or greater), a different sample, one of a loudly played note, can be triggered. You can use this technique, called *Velocity cross-switching*, to create a multisample that more closely approximates what a performance would sound like on the original instrument.

But now we've introduced a new transition point between samples. If the player is attempting to play at a medium dynamic level, some of the notes played might have Velocities between 60 and 64, and others might have Velocities between 65 and 70. Because the Velocities are all between 60 and 70, the notes will sound similar. But if the Velocity cross-switch point is between 64 and 65, they'll sound quite different (see **Fig. 2**), and the changes in tone color from note to note will be difficult to control from the keyboard (see **Web Clip 2**).

This problem occurs with many of the sample-playback keyboards and soft synths being built today; to some extent, it's unavoidable. Remember, we want the low-Velocity sample to have a different timbre than the high-Velocity sample. That's what Velocity cross-switching is for. But it doesn't always sound good when the multisample is used to play real music.

The solution is to record more samples at a variety of playing strengths and to assign them to relatively shallow Velocity zones. Many synthesizers today use 4-way Velocity cross-switching, which isn't sufficient; I'd prefer to see 8-way Velocity switching become the norm. But that would add considerably to the cost of the instrument. Creating a multisample that uses 8-way Velocity cross-switching is time-consuming, so purchasing it is expensive. And instead of just 27 MB of memory, you'll need 275 MB for a 61-note multisample that has 8-way cross-switching (for stereo samples, make that 550 MB). And that's starting to push the system requirements of the average computer.

In practice, instrument designers and sound-library developers try to find effective compromises. They try to balance development costs and memory requirements against the musical needs of their customers. Creating good multisamples requires science, but it requires art, too. EM

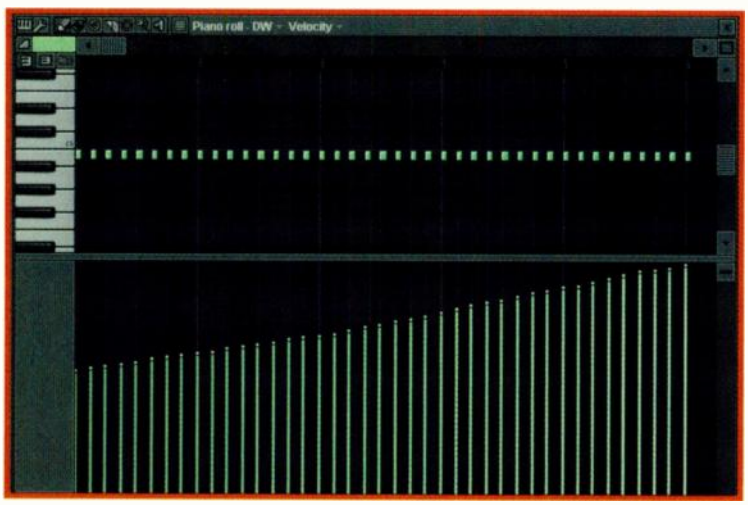

FIG. 2: In the sequence data used to create Web Clip 2, the MIDI Velocity values increase smoothly, as seen in the lower pane. But when the Velocity reaches 40 and then 95, the loudness and brightness of the multisample suddenly increases in an unnatural way.

Jim Aikin writes about music technology for various magazines and Web sites. To get a preview of his new novel, visit him online at www.musicwords.net.

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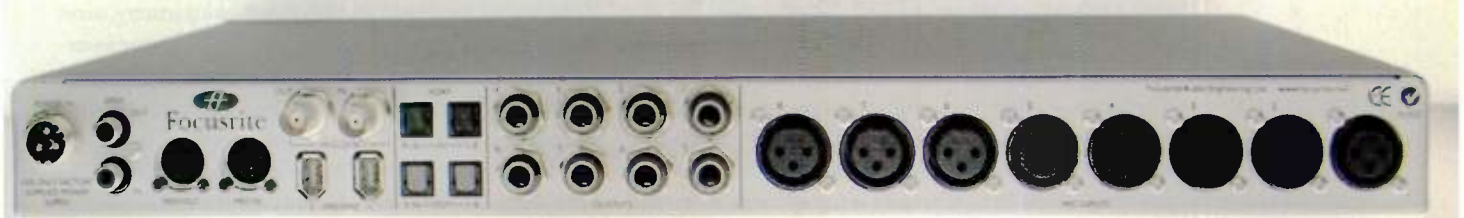

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Copyrights and Wrongs

By Fran Vincent

A guide to protecting your music.

As an artist, your creative works are the lifeline of your business. By protecting them through copyright registration, you can control how they're used and ensure that you receive the income from them that you deserve.

To make the system function for you, you have to understand how it works. To that end, I'll explain a number of important music-copyright issues, such as what constitutes a copyrightable work, how to properly register a work, what rights you have if you're hired by someone to write a song, and what happens to your copyright when you die. But remember, if you have copyright questions, consult a qualified attorney; this article should not be considered legal advice.

Just the Facts

In its most rudimentary definition, a copyright is actually personal property. But like trademarks and patents, a copyright is regarded as intellectual property, which is created from the minds of its authors. Copyright protection applies to literary works, musical compositions and recordings, dramatic works, choreography, and visual arts.

When you own the rights to a song, you control its use. Ownership gives you six exclusive rights: the right to make copies, create derivative works and revisions, publish and distribute your creation, perform the work in public (or display it, in the case of visual art), and, in the case of sound recordings, perform it in public through a digital transmission (currently this refers to songs played on the Web). As an owner, you can even assign the whole copyright or shares of it to others.

For a song to be copyrightable, it must meet three criteria. First, your work must be fixed in a tangible form—it must be written down or recorded, so others can perceive it. Second, it has to be original, meaning that someone else hasn't already created it. And third, it must demonstrate at least a modicum of creative expression.

In the Works

Musicians, songwriters, and recording artists typically encounter two types of copyrightable work: the first is the particular arrangement of notes and lyrics; that is, the song itself. This is usually referred to as a *musical composition*, an *underlying work* (when referenced in relation to a sound recording), or just a *song*.

A song may have multiple writers, lyricists, and arrangers, and the copyright can be split among them on a percentage basis. If you are writing with a partner or you involve others in your creative process, be sure to discuss early on how or if you will divvy up the copyright. Some songwriters assign all or a portion of their copyright to a music publisher who has agreed to market the song for them.

The second type of work you need to protect is the sound recording itself. A song may be recorded by any number of people, so each recorded rendition is copyrightable. Even if you write as well as record the song, you need to protect your composition and your recording with separate copyrights. And, as with a musical composition, there may be others involved in the recording process, such as producers, who are entitled to a portion of the copyright. When an artist is signed to a record label, the label often retains the copyright of the master recording.

Register for Cash

Let's say you've composed a song, gotten it exactly how you want it, and have written it down or recorded it. It's not plagiarized, and it has some creative spark. Under current U.S. copyright law, satisfying these criteria alone means you have a natural copyright and your work is protected. It's advisable, however, to register your song with the Library of Congress as soon as possible to establish a public record of it. In most cases, it must be registered before you can sue someone for infringement or collect compulsory mechanical-license royalties (for more on licensing, see "Working Musician: Show Me Your License" in the September 2006 issue of EM, available at www.emusician.com).

The Library of Congress Copyright Office classifies your new song composition as a Performing-Art Work. Fill out Form PA to register a musical composition only. This is useful for artists who are strictly songwriters. Send the completed form, a nonreturnable copy of your material, and the $45 registration fee to the Library of Congress Copyright Office in Washington, D.C. For compositions, acceptable materials include a *manuscript* (lead sheet, full sheet music, or orchestrations) or a *phonorecord* (tape, CD, MP3 on disc). Make sure you include the entire song—everything you want protected—in your submission.

Your registration becomes effective when the

"I Got a $ix-Figure Indie Label Deal Because I Joined TAXI"

Jenna Drey – TAXI Member – www.jennadrey.com

My name is Jenna Drey. That's me sitting next to TAXI president, Michael Laskow.

For as long as I can remember, I've wanted to be a recording artist. I've studied music my whole life. I've read all the books. I've been to the seminars. In short, I've done all the same things you're probably doing.

Who Hears Your Music?

I'll bet you've also noticed that no matter how much preparation you've done, it doesn't mean anything if you can't get your music heard by people who can sign on the dotted line.

I found out about TAXI a few years ago, and have kept an eye on it ever since. The longer I watched, the more I became convinced it was the vehicle I needed for my music. When my demos were done, I joined. And guess what – it worked!

A Record Deal With Lots of Zeros!

Seven months after joining, TAXI connected me with a great Indie label that's distributed by Universal. The president of the label heard my song, "Just Like That," and just *like* that, I was offered a record deal, and that song became my first single.

Madonna, Bowie, Jagger, and me!

The icing on the cake? The label hired legendary producer, Nile Rodgers (Madonna, David Bowie, Mick Jagger, and the B-52s) to produce it! All these amazing things happened to me because I saw an ad like this and joined TAXI.

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It seems like all the serious artists and writers are hooking up with TAXI. Where else could you find more than 1,200 high-level opportunities for your music every year?

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If you're a songwriter, artist, or composer who wants to succeed in the music business, then do what I did and make the toll-free call to TAXI right now.

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Copyright Office receives it. In a few months you will receive a certificate of registration.

Those who are both writers and recording artists may register their composition and the accompanying recording at the same time and for one fee by using Form SR. In that case, you would send your song on a phonorecord only.

Also use Form SR to register sound recordings only (ideal for performers who don't write their own music). The application process and the fee per submission are the same as for musical compositions. Remember that the material you send for a sound recording must be a phonorecord and can't be a manuscript or audiovisual work such as a movie, music video, or other multimedia format.

All Together Now

Prolific songwriters and performers often worry about the cost of multiple registrations. At $45 a song, it definitely adds up. One option is to register music as a collection for one filing fee, using Form PA (for musical compositions only) or Form SR (for compositions and their recordings, or recordings only). According to the Copyright Office, all the songs (and recordings, if applicable) in a collection must have the same copyright owner(s). Collections of songs don't have to be an entire album; they can be partial albums, suites, movements, or simply a gathering of your music.

Give your collection a title to appear in the Copyright Office's records. While you can also specify the individual titles within the collection, those will not appear in the Office's records unless you register them separately or submit a supplementary registration (Form CA).

Be sure to read the Office's circulars on musical compositions (Circ. 50) and sound recordings (Circ. 56) for details. The easiest way to access forms and circulars is by visiting www.copyright.gov/register/performing.html for musical compositions, or www.copyright.gov/register/sound.html for sound recordings. You can also request forms by calling (202) 707-9100.

Time After Time

The legal duration of a copyright has changed over the past century. Calculations for copyrights registered before 1978 are confusing, so I'll focus on the present here.

Copyrights registered after January 1, 1978, last the life of the composer plus 70 years. The composer can pass a copyright along to his or her heirs or will it to a third party. Subsequent owners can do the same.

Hire Up

If you are commissioned to create a musical work or recording, the rules are slightly different. Be sure to have the requirements of the job outlined before you start so that there are no surprises later. If, say, an advertising agency hires you to write a jingle, the company will likely have you sign a work-for-hire agreement stating that it owns the exclusive rights to the work you create. However, some people, such as film producers, may let you keep all or part of your copyright, allowing you to exploit the work later and benefit from future licensing and performance income.

Get the terms in writing while you're negotiating your fees so you can charge accordingly. In the case of a work for hire, the copyright duration lasts 120 years from the work's creation or 95 years from its publication, whichever ends first.

The Digital Age

Musical compositions have long enjoyed protection for public performances. Songwriters and publishers belong to performing-rights organizations like ASCAP and BMI that disburse monies collected from radio and TV stations, venues, and more. Sound recordings are not treated in the same way, but they do receive limited public performance protection. The Digital Performance Right in Sound Recordings Act (1995) and the subsequent Digital Millennium Copyright Act (1998) give sound recording owners a public performance right through digital transmissions. While this exempts digital radio transmissions from an FCC broadcaster, it does provide some protection for recordings played on subscription services and those that are streamed and downloaded.

U.S. copyright law has changed dramatically over the past 100 years and will continue to do so as new technologies and ways of creating, performing, and transmitting music are embraced by the public. Knowing your rights as a copyright holder and how to protect them will help you safeguard your works so that you can continue to be the beneficiary of your creative labor. EM

Fran Vincent is the president of Retro Island Productions, Inc. (www.retroisland.com) and has taught music and entertainment-industry courses at the University of Miami.

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Be sure you get a copyright notice for all works you publish on paper, all Web sites, and all phonorecords. Although no longer required by law, that is still an important step in protecting your work and providing notice to anyone accessing your music.

Put © THE YEAR and YOUR NAME (and/or PUBLISHER)—for example, "© 2007 Joe Artist/XYZ Publishing"—on sheet music, lead sheets, lyric sheets, and liner notes both on paper and on the Internet.

For your sound recording, put ℗ THE YEAR and YOUR NAME (and THE RECORD LABEL)—for example, "℗ 2007 Joe Artist/123 Records"—on liner notes, CD labels, covers and inserts, and Web pages on which your music is downloaded or streamed.

It is typical to put a © and a ℗ on the back cover of your album and CD label. This shows that you or your record company owns the rights to not only the sound recordings but also to the collection and the order presented on the album. For example, "© & ℗ 2007 Joe Artist/123 Records."

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MUSIC MARCH 14-18 2007 AUSTIN TX

MOTU UltraLite

A FireWire interface with a built-in mixer.

By Rusty Cutchin

The MOTU UltraLite is a half-rack-width, 24-bit, 96 kHz FireWire audio-and-MIDI interface. It's equipped with the company's CueMix DSP feature, which allows the unit to function as a standalone digital mixer. The bus-powered UltraLite can be used with a laptop or desktop computer without its included 9V DC adapter. (You need the adapter if you want to use the unit without a computer or daisy-chain other UltraLites on one FireWire bus.) The UltraLite works with Power Macs (Mac OS X 10.3 or later), Intel Macs (OS X 10.4 or later), or PCs (Windows XP), and with software that supports standard WDM, ASIO, or Core Audio drivers.

FIG. 1: The MOTU UltraLite's unique features include independent 3-way pad switches and phantom power on mic channels, as well as four active and assignable monitor mixes.

Packed in a sturdy, slim aluminum-alloy case that sits solidly on a tabletop or in a half rack-mount, the UltraLite (see Fig. 1) features eight analog inputs and ten TRS outputs along with stereo S/PDIF I/O. Inputs 1 and 2 are on ¼-inch/XLR combo connectors, and the mic preamps come with independent trim controls and switches for phantom power and pad. MOTU includes two software applications with the UltraLite: CueMix Console for configuring routing and monitor levels; and AudioDesk, a recording application that offers Digital Performer–style audio features but no MIDI sequencing.

Dialing Up

Accessing the UltraLite's parameters from its front panel requires a bit of knob twisting. Knobs labeled Page Setup, Cursor, Value, and Main Volume compose the Mixer section. You press the knobs to activate various controls (the Main Volume knob also powers up the unit) and turn them to change values. A wide and readable LCD shows

GUIDE TO EM METERS

5 = Amazing; as good as it gets with current technology
4 = Clearly above average; very desirable
3 = Good; meets expectations
2 = Somewhat disappointing but usable
1 = Unacceptably flawed

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parameters, values, and levels. The front panel also houses a headphone jack with its own volume control.

The rear panel (see Fig. 2) hosts MIDI and S/PDIF in and out connectors along with dual FireWire ports. Having the second FireWire port allows more UltraLites (or MOTU's Traveler, 828, or 896 units) to be connected. (MOTU recommends using the power supply if more than one UltraLite is running on the same FireWire bus.) I/O includes eight output jacks, six line inputs, and the L-R main output pair, all on balanced ¼-inch TRS jacks. The combo connector for the second mic/instrument input rounds out the rear panel.

Three-way mini toggle switches on the front allow pad settings of –36, –18, and 0 dB for each of the two combo inputs. The Trim knobs provide 24 dB of gain in 1 dB increments for a total gain range of 60 dB. The UltraLite can also read and generate SMPTE timecode to or from any analog input or output, respectively. The synchronization features are cross-platform and compatible with any sequencer that supports the ASIO 2 sample-accurate sync protocol. The UltraLite's built-in 8-bus mixer enables low-latency monitoring of multiple inputs through the unit's main outputs, headphone jack, or any other output, with no processor drain.

The included CueMix Console software (see Fig. 3) can control levels, including talkback and listen-back, just like a conventional mixer. When no computer is present, you can still control CueMix features directly from the UltraLite's front panel. Once parameters are set, the backlit LCD shows 8-segment level meters for all inputs and outputs simultaneously.

Monitor Choices

The UltraLite gives you plenty of monitoring and routing choices. Its latency is negligible—about the same as a digital mixer—so you can monitor several input sources while recording without taxing your computer's processor.

Even better, the UltraLite provides four completely independent mixes at any time. You could send these in stereo to the eight outputs for four separate headphone mixes while recording. You can set those up with the UltraLite's front panel or use CueMix Console to adjust levels, panning, and mute/solo settings onscreen. The input trim range is 24 dB on the mic inputs and 18 dB for the TRS and S/PDIF inputs. You can also adjust trim and even phase inversion for each input, but those settings apply across all four mixes.

I appreciated some of the UltraLite's convenience features when

FIG. 2: The UltraLite's extensive I/O includes ten analog outputs and S/PDIF, MIDI, and dual FireWire ports.

FIG. 3: The CueMix Console software allows easy routing, mix recall, and file management, much of which can also be accomplished from the UltraLite's front-panel controls.

using the front-panel controls. When you've selected one of the level parameters to mute a particular channel, you simply press the Value knob, and the channel is instantly muted. With a computer, you can simply mute the channel graphically within CueMix Console.

The CueMix Console window lets you give each of the four mixes a unique name. (Because of size constraints, those names don't show up on the UltraLite display; it just says Mix1, Mix2, and so on.) The output-bus bar displays the destination to which your currently selected mix is being routed. When you click on it, a drop-down menu shows you the routing for all four mixes and lets you make changes.

In CueMix Console, you're informed of the unit's status by the main display at the top of the window. The helpful messages in this window tell you not only the options for your current cursor position, but also what you can do with various modifier keys—for example, holding the Command key to apply an action on one input to its stereo mate.

Mixes can be saved in the UltraLite or in the computer, and you can copy settings from one mix to another. You simply select the desired mix, select Copy, pick another mix, and select Paste. There's no warning screen when you do this, so think before you paste. (But of course you will have already saved that pasted-over mix, right?)

You also get a master mute button in CueMix Console, along with buttons to control the unit's talkback features. You can use the UltraLite's mic inputs to set up talkback and listen-back mics, and then route those mics' signals to outputs that feed a headphone distribution amp. Audio is dimmed when you press the Talkback or Listenback buttons in the CueMix Console window, and a third Link button keeps both active with audio dimmed.

You can assign any of the UltraLite's individual outs, main outs, or the S/PDIF output to the headphone output, or you can select Follow Active Mix in CueMix's Phones menu. That will place whichever of the four mixes you've selected squarely in your cans.

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Portable Precision

I did most of my UltraLite testing on a dual-processor Power Mac G5 running MOTU Digital Performer 4.52 under Mac OS X 10.4.7. As you might expect, DP and the MOTU Audio Setup 1.4.1 utility integrated seamlessly with the UltraLite and CueMix Console.

After navigating the UltraLite's menu hierarchy from the unit's front panel, I concluded that the system would work well with, say, a live singer-songwriter using two mics or a stereo pair configuration in a club or other space where a computer was not available. Because of the UltraLite's versatility, it would be a cinch to take a vocal and guitar mic into its two mic inputs and assign one mix to the headphone output, another to the house, and another to a standalone recorder like a CD-R, with enough inputs left over to handle a guitar processor, a bass, and even a drum mixer. The UltraLite's audio quality is great, and its mic pres are more than adequate and provide lots of headroom and gain.

The unit's basic MIDI implementation does the job. The UltraLite appeared immediately in Audio MIDI Setup and established communication with my Roland Fantom keyboard. Users of non-MOTU applications should have no trouble configuring the UltraLite to run with their software. The clear, concise manual describes setups for other applications.

With a computer and a digital audio sequencing application, the UltraLite is really in its element. It's a useful and cool front end. You can even name your inputs. The combination of MOTU's well-designed hardware and compatible software sets a high standard for compact FireWire setups. Details like +4 dB operation and the ability to easily route mixed audio back to the computer make the UltraLite a pro-quality device in a budget-priced package.

It Ain't Heavy

MOTU's UltraLite packs a lot of punch for its size, in terms of features and audio quality. Although it won't take the place of a high-end analog mic pre, mixer, or converter, its size and all-in-one nature make it an excellent choice in both personal-studio and mobile-recording scenarios.

The system sounds great and is expandable. With AudioDesk and CueMix Console included, it offers almost every feature a computer-based recordist could need, and throws in SMPTE, talkback, and four stereo buses. With MOTU's software, the system operates seamlessly, and the clear, well-written manual provides detailed instructions for use with other Core Audio software and with Windows software, including ASIO (Steinberg Cubase and Nuendo), WDM (Cakewalk Sonar), and GSIF (Tascam GigaStudio) applications. The UltraLite package is a great choice if you're looking for a pro-quality compact FireWire recording system, and the included software makes it especially attractive.

Rusty Cutchin is a former EM editor and a producer, engineer, and music journalist in the New York City area.

PRODUCT SUMMARY

MOTU UltraLite

FireWire audio/MIDI interface
$549

FEATURES	4
EASE OF USE	4
AUDIO QUALITY	4
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Excellent sound. Can be used as standalone audio mixer. Can store four distinct mixes. Extensive I/O capabilities. Independent phantom power and 3-way selectable pads on mic channels.

CONS: Small knobs.

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FIG. 1: The EQ component of Project Studio is FilterBank LE. One of its configurations is E4, which offers high and low shelving filters, a parametric band, and a highpass filter.

McDSP Project Studio (Mac/Win)

A versatile RTAS plug-in bundle for Pro Tools.

By Mike Levine

If you ask professionals who use Digidesign Pro Tools about their favorite effects plug-ins, chances are good that the name McDSP will be frequently mentioned. McDSP's products—particularly its compressors and EQs—are extremely well thought of in the Pro Tools world.

In the past, McDSP has aimed its products (TDM, RTAS, and AudioSuite plug-ins) mainly at the pro audio market. But with the release of Project Studio, the developer has reached out to a wider universe of users without sacrificing sonic quality. It was able to do this by filling Project Studio with "LE" versions of its plug-ins in RTAS and AudioSuite format. The plug-ins have the same algorithms (and therefore the same quality) as their full-version siblings, but with fewer available configurations.

Project Studio features seven plug-ins and is compatible with Mac OS X and Windows XP. You get CompressorBank LE 4.1, which offers emulations of a number of vintage compressors; FilterBank LE 4.1, which gives you several equalizer and filter configurations; Revolver LE 1.1, a convolution reverb; Chrome Tone LE 2.1, an amp simulator; and Synthesizer One LE 4.1, a 3-oscillator synth. Analog Channel LE 3.1, a tape simulator, and ML4000 LE, a mastering limiter, were recently added to the bundle. Those who bought Project Studio prior to July 2006 can add them for $95. The Mac versions of all the Project Studio plug-ins are now Universal Binary.

I installed Project Studio on my dual-processor 2 GHz Power Mac G5; the process was relatively painless. Project Studio employs iLok copy protection, which is simple to use. A snazzy-looking green iLok key is included in the box.

FIG. 2: CompressorBank LE gives you seven different models of vintage compressors to choose from. The compressors all have VU-style meters and McDSP's signature green look.

You Can Bank on It

FilterBank LE 4.1 gives you three of the ten EQ configurations that are in the full version. Although that might not sound like much, two of the three are versatile and full featured, and all three sound very good. The E4 configuration (see Fig. 1) offers a highpass filter, low and high shelving filters, and a fully parametric band. The highpass filter lets you select the center frequency and gives you a choice of two slopes: 6 dB per octave or 12 dB per octave.

In addition to frequency and gain controls, the low and high shelving filters have peak, slope, and dip controls rather than a conventional Q parameter. Those three parameters give you precise control over the shape of the shelf.

The P4 configuration is a versatile sound shaper. It offers four parametric bands, each with Gain, Frequency, and Q sliders. (FilterBank can be instantiated with a knob-based interface, should you so choose.) A pop-up switch gives you access to four different Q modes that can be selected globally for each instantiation of P4. You also get input- and output-level controls. The third configuration is F1, a lowpass filter.

Impressive Compressor

CompressorBank LE 4.1 (see Fig. 2) provides only one of the four configurations from its full version. However, the one that you get—CB4—is a doozy. It offers emulations of classic compressors, including the dbx 165, the Fairchild 670, the Manley Variable-Mu, the Neve 2254E/33609, the Teletronix LA2A, and the UREI 1176LN.

Unlike other plug-in emulations of classic hardware, the CompressorBank models don't try to copy the look of the originals. Instead, they feature the green McDSP graphics.

Depending on which model you select, you get a different set of controls, which aren't always identical to those on the original units but offer similar functionality. All of the compressors have VU-style meters. Although these provide a more vintage look, they're a little harder to read than bar-graph-style meters if you're not used to them, You also get external key input and key listen features for all the compressor models in CB4, making it possible to trigger them from external sources.

When you instantiate CB4, you can choose from a list of the various models or from presets designed for specific instruments and applications. No matter which model a particular preset uses, a pop-up menu lets you switch models from within any of them.

The models in CB4 all sound excellent, and I found myself using them constantly. Not having a collection of vintage compressors to A/B with them, I can't provide direct comparisons. But I can say that each CompressorBank model has unique sonic characteristics and sounds quite good. I especially liked the tube compressor, which was great for fattening up drum sounds.

FIG. 3: The main screen of Revolver LE, a good-sounding convolution reverb with a large library of impulse responses.

Channeling Tape Machines

Analog Channel LE 3.1 is designed to make your track sound like it was recorded on analog tape. The plug-in offers models of reel-to-reel units from such venerable manufacturers as Ampex, MCI, Otari, Studer, Sony, and Tascam. The full version offers variable parameters such as bias and release time, but in Analog Channel LE, those values are fixed. You can vary the input level (which makes the effect more pronounced) and the output level.

The primary use for this plug-in is to put it across the master bus. It adds a warm and subtle crunch to the

sound. I've found that it's best to start your mix with Analog Channel LE inserted, because you may make EQ and dynamics decisions that are influenced by its effect.

On some occasions, I used it instead on individual tracks. For instance, I had success placing it on a snare drum, an electric guitar, and a mandolin. The snare got fatter, as did the guitar (which also got warmer), and the mandolin got warmer. Although the differences between the various tape-machine emulations are subtle, they're noticeable enough to give you a nice choice of sonic flavors.

Revolving Door

Revolver LE 1.1 is a good-sounding convolution reverb. It comes with a varied collection of impulse responses (IRs), which are the sampled spaces and devices that are the grist of convolution reverbs. You get everything from halls to plates to churches to the inside of a vacuum cleaner tube (see **Web Clip 1**).

Although Revolver LE doesn't include all the features offered by the full version, what you do get is roughly similar to what I've seen on many convolution reverbs. There is one major exception: you can't use outside impulse responses like you can with the full version and with most similar products, which for some users (especially those doing sound design) might be problematic. But if you're just looking for a versatile reverb, Revolver LE will suit you fine.

Most of Revolver LE's controls are on its main screen (see **Fig. 3**), and they update in real time. You get a knob for RT60 (reverb time), as well as sliders for wet and dry level, predelay, attack, and low- and high-frequency EQ. A second screen, called Levels, duplicates the wet and dry sliders and also has input- and output-level controls.

Clicking on the System tab in the display window brings up more controls, including settings for low-latency or medium-latency operation (the former uses more CPU). The Tail Cut control lets you save CPU resources by raising the amplitude threshold at which Revolver LE stops processing a given signal.

PRODUCT SUMMARY

McDSP Project Studio

RTAS and AudioSuite plug-in bundle
$495

FEATURES	4
EASE OF USE	3
AUDIO QUALITY	4
VALUE	5

RATING PRODUCTS FROM 1 TO 5

PROS: Excellent value. Same algorithms as on full versions. CompressorBank LE gives you emulations of vintage processors. Good library of IRs with Revolver LE. Realistic amp and speaker modeling with Chrome Tone LE.

CONS: Reverb weak in Chrome Tone LE. Display doesn't update in Synthesizer One LE when you change patches with the RTAS Librarian menu. Revolver LE not capable of loading third-party IRs.

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McDSP
www.mcdsp.com

Amp It Up

Chrome Tone LE 2.1 is a guitar-amp and speaker simulator. It offers realistic-sounding amp tones but has fewer effects choices than the full version. When your guitar signal is routed into Chrome Tone LE, it first goes into the Pre section, which features five different settings for coloring the input signal, and a low-cut filter. Next up is the Noise Gate, which gives you Threshold, Attack, Hold, and Release controls.

After that comes the Compression section, which can be switched in or out of the signal. You get Threshold, Response (attack), Sustain, and Release controls, as well as a pop-up button offering three different ratio presets—2:1, 4:1, and 8:1. Next is the Distortion section, which provides Drive, Freq, Amount, and Level controls, and a choice of nine different frequency curves that govern the signal feeding the distortion.

After Distortion comes EQ, which offers three bands: low shelf, parametric, and high shelf. The final stage is Output, featuring a reverb mix control, a cabinet selector pop-up, and an output-level control. You can choose from eight different cabinet simulations, ranging from 1 × 12 to 4 × 12 (each with "close" and "room" mic settings), as well as two "direct" settings. The cabinets sound quite realistic and offer a lot of tonal alternatives.

I was not impressed with Chrome Tone's reverb. You can't change the room size or reverb type, and the setting that is there (presumably a spring reverb emulation) has too short a decay to be useful most of the time. But overall, Chrome Tone LE gives you plenty of convincing amp sounds, from clean to heavily distorted (see **Web Clip 2**).

One for Synthesis

Synthesizer One LE 4.1 (see **Fig. 4**) offers the same sound engine as McDSP's Synthesizer One plug-in, but with a stripped-down user interface. It's essentially a synth preset player. You can't program sounds from scratch, but you can tweak the ones already there. The synth engine has three oscillators and two filters.

Controls on the front panel's Main Page include Volume, Tune, Transpose, Bend Up, Bend Down, Velocity (you can choose from 3 curves or no curve), and Voices (choose up to 12 voices per instantiation). You also get controls for navigating the presets and pages, and a bank-and-patch display, which for some reason doesn't update when you select banks or patches from the RTAS Librarian menu. It changes only when you select sounds using its own navigation arrows. This can cause confusion when you have one sound selected from the RTAS menu but the display reads out a different patch.

The Voice edit page gives you Detune, Poly Mode (Poly or four different mono mode choices), Unison (how many layered voices per note), and a Glide control with adjustable range. You also get pages for editing the amplitude and filter envelopes and for controlling the arpeggiator.

There are nine categories of presets: Atmospheres, Basses, Brass, Comps, Leads, Pads, Sequences, Drums, and FX. The sound quality is good; I would describe it more as clean than fat. The presets run the gamut from good to mediocre.

I found myself wishing that I had control of the effects and could change waveform types to program my own sounds. Of all the plug-ins in Project Studio, this is the one that I most often wished were the full version.

The Outer Limits

ML4000 LE is a mastering limiter that offers one of the configurations (the ML1) of the full ML4000. You don't get the ML4 multiband dynamics processor.

The mastering limiter is extremely simple to use, with virtual knobs for all four parameters. You set the Ceiling for the maximum level, the Threshold to adjust the level at which the limiter will kick in, the Knee for soft or hard limiting (continuously variable from 0 to 100), and the Release for the time it takes the limiter to reset itself after squashing a peak. The Ceiling and Threshold parameters can also be adjusted with handy arrows that move up and down vertically along the meter display.

I tried out ML4000 LE on a rock mix (see **Web Clip 3**), and it made the track sound big and crunchy. I also tried it on other types of material and found it quite useful for upping the overall level. On a solo piano mix, which had a pretty wide dynamic range, it took a little more trial and error to find the right setting, but that would likely be the case with any limiter. I also had success using the plug-in on individual instruments, such as drums. McDSP provides presets for various limiting situations.

FIG. 4: Synthesizer One LE offers the same sounds as the full version of the plug-in, but with less programmability.

All Bundled Up

I tested the Project Studio plug-ins over a couple of months, and they quickly became mainstays in my Pro Tools LE arsenal. There's no question in my mind that Project Studio is a great value and gives Pro Tools users affordable access to the highly valued sound of McDSP.

The EM editors found Project Studio to be such a good value that it was a cowinner of a 2007 Editors' Choice Award. I can confidently state that this bundle will greatly enhance the plug-in collection of any Pro Tools LE user.

EM WEB CLIPS

Mike Levine is an EM senior editor.

FIG. 1: Mounted directly above the Precision 6D's Dual Concentric drivers is the SuperTweeter, which the company says extends frequency response out to 51 kHz.

TANNOY Precision 6D

An active monitor with bountiful equalization.

By Michael Cooper

In the cramped control rooms of many personal studios, setting up speakers for accurate monitoring can be a challenge. Monitors placed on shelves, near (or up against) walls, or in corners fall victim to undesirable, varying boosts in bass response. Carpeted rooms or those heavily damped with acoustic foam or fiberglass wall panels usually suffer from muffled high frequencies that obscure detail in the monitors' response.

The Tannoy Precision 6D Active Studio Monitor—one of four models in the company's Precision line of reference monitors—provides a wide range of onboard equalization to help compensate for such acoustic problems. A host of other features, including analog and digital inputs, a highpass filter (for use with an added subwoofer), and an independent sensitivity control for each monitor, add to the product's eminent flexibility.

Designated Driver

At the heart of the 6D's design is Tannoy's Dual Concentric technology, in which a high-frequency driver is mounted in the center of a low-frequency driver so that both are on the same axis. This configuration results in the time alignment of both drivers' acoustic outputs, typically tightening up phase response and improving clarity and transient response. The 6D features a 1-inch titanium-dome tweeter mounted on a 6-inch paper-cone driver.

Mounted above the 6D's Dual Concentric drivers is an additional 1-inch titanium-dome tweeter (dubbed the SuperTweeter) that the company says extends the monitor's frequency response out to 51 kHz (see Fig. 1). A standby switch lets you mute the output of the monitor. Standby mode is useful, for example, to avoid audible *pops* when changing input connections while powered up. In each monitor, a built-in 75W amplifier

The Tannoy Precision 6D provides a wide range of onboard equalization.

REVIEW

powers the 6-inch driver, and a 35W amp powers the two tweeters.

I've Been Everywhere

The 6D's 28.6-pound cabinet weight and relatively compact size allow it to be placed in all but the most confined spaces, and magnetic shielding means it can be set up near a CRT monitor without distorting picture quality. Twenty DIP switches on the 6D's rear panel control various filters that help compensate for imperfect positioning and problematic room acoustics (see **Fig. 2**).

The first four DIP switches (viewed from left to right) can be set to provide a 3 dB boost, flat response, or a 1.5, 3, or 4.5 dB cut in the 45 to 65 Hz band. These are used to tailor the monitor's bottom-end reproduction. The next six DIP switches provide 2, 4, 6, or 8 dB of cut at 200, 400, or 800 Hz to compensate for unwanted upper-bass boost due to various speaker positions, including on shelves, against walls, or in corners.

DIP switches 11 through 14 provide a 1 or 2 dB boost or cut (or retain flat response) in the 1 to 3 kHz band. Engineers editing voice-overs may want to boost response in this band to increase intelligibility, whereas I found that cutting the response here made the monitors sound less "hard" and fatiguing for music-production duties.

The last six DIP switches can be set for 1, 2, or 3 dB of shelving-type boost or cut (or flat response) between 5 and 50 kHz. Personal preference and the degree of absorption in your control room will dictate how these switches should be set.

In addition to the DIP switches, the 6D also provides an 80 Hz highpass filter. In most instances, you'll want to activate it when you are using a subwoofer with a pair or more of 6Ds, in order to avoid too much overlap of bass frequency response from sub and satellites.

The 6D provides both analog and digital input connectors (and a switch to choose which is active), the former on a balanced ¼-inch/XLR TRS combo jack and the latter on a coaxial jack that accepts S/PDIF format audio. A S/PDIF pass-through jack is also provided. To set up a stereo pair of 6Ds for accepting S/PDIF input, route a S/PDIF cable from your audio interface or mixer to the S/PDIF input on one of the monitors. Then patch a second S/PDIF cable from that monitor's pass-through jack to the S/PDIF input on the second monitor. Either monitor can be first in the S/PDIF daisy chain, and a switch on the rear panel sets the speaker for either left- or right-channel reproduction or mono playback.

A detented, rotary sensitivity control serves both analog and digital (post-D/A) inputs (as do the DIP switches). That's a great design because it allows you to control monitor levels independently for each monitor without compromising digital resolution, and the 6Ds' powerful equalization filters are not limited to use with just analog inputs. Other rear-panel features include a bass port, a large heat sink, an IEC power receptacle (for use with the supplied, detachable AC cord), and a power switch.

Tannoy's Activ-Assist software (Mac/Win) can be used to measure the frequency response of the 6D with your particular setup and arrive at suggested settings for the monitors' DIP switches. The software can be downloaded for free from Tannoy's Web site. A software CD, a companion measurement microphone, and I/O cables are available for an additional $115.

Activ-Assist is small enough that it need not be installed on your hard drive. After working through some initial confusion due to key omissions in the software's manual and a missing battery for the Tannoy-supplied mic, I successfully ran the 12.2 MB application from the CD drive of my dual-processor 867 MHz Power Mac G4.

Speaking Volumes

I set up a pair of 6Ds on Acoustic Sciences Corporation (ASC) Monitor Traps, which are part of an ASC Attack Wall placed at the front of my control room. Monitor Traps are 16-inch-diameter tube traps fashioned for use as speaker stands. The Attack Wall consists of a contiguous arrangement of tube traps designed to improve a control room's impulse response.

It took a bit of tweaking to get the 6Ds to sound good in my control room. Listening to my own country mixes and a variety of pop releases by way of the 6Ds' analog inputs, and with all filters set initially for flat anechoic response, I was disappointed by what I heard. The 6Ds sounded midrange-heavy and peaky (that is, not smooth), lacked high-frequency detail, and exhibited ghosty stereo imaging and subpar transient response. Bass instruments sounded fairly tight, if understandably lean for a close-field monitor.

Activ-Assist suggested that I set the 6Ds' DIP switches to boost both the 45 to 65 Hz and 5 to 50 kHz bands 3 dB. That was encouraging because I'd already arrived at those settings just by listening. Additionally, I cut the 1 to 3 kHz band 1 dB in order to mitigate what I still heard as a hard, midrangy sound. This combination of filter settings improved the monitors' spectral balance, but their sound remained a bit edgy and imaging

PRODUCT SUMMARY

TANNOY Precision 6D

active close-field monitor
$859 each
software CD, measurement mic, and cables $115

FEATURES	5
EASE OF USE	3
AUDIO QUALITY	3
VALUE	3

RATING PRODUCTS FROM 1 TO 5

PROS: Provides a good reference for midrange band. Generous allotment of equalization filters improves response in any setup. Independent sensitivity control for each monitor. Analog and digital inputs. Combo jack makes analog connection a breeze.

CONS: Edgy sound is fatiguing at all but low listening levels. Analog input lacking in depth, clarity, and transient response compared with digital input. Pricey.

MANUFACTURER
Tannoy
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was still not great. Nevertheless, the monitors provided a useful "window" into the midrange band of the mix in much the same way that the popular (and now discontinued) Yamaha NS-10Ms do. And with these filter settings, the low notes played on a Chapman Stick on Paula Cole's "Tiger" were clearly audible, though not very prominent.

Switching to the 6Ds' S/PDIF inputs and listening to the same program material, I noticed a fairly dramatic increase in depth, clarity, and transient response and much improved—make that very good—stereo imaging. I got the best results by adding my Tannoy PS-88 subwoofer (a discontinued model) to the setup, while also nulling the 6Ds' 45 to 65 Hz filters and switching on their highpass filters (and retaining the other DIP-switch settings for mids and highs noted earlier). This gave a full-bandwidth response with very good clarity, detail, and imaging and tight, well-defined bass. But as the 6Ds' reproduction of the lower high frequencies still sounded edgy to me, I found it necessary to listen at low volume to avoid ear fatigue. To put this in proper perspective, I can also make that latter statement about my trusty NS-10Ms, which I refer to often while mixing and mastering.

The Precision 6Ds are good performers when using digital inputs and at low listening levels. The monitors are expensive, however, considering the competitive performance of other monitors in the same—or lower—price range. That said, if your control room setup dictates that you place your monitors in extremely compromised positions, you may find that the 6D's formidable arsenal of corrective filters gives you better results than can be obtained from less generously outfitted monitors.

FIG. 2: Twenty DIP switches on the 6D's rear panel activate filters that compensate for compromised speaker placement, such as on a shelf, against a wall, or in a corner.

EM contributing editor Michael Cooper is a tracking, mixing, and mastering engineer and producer. He can be reached through his MySpace site at www.myspace.com/michaelcooperrecording.

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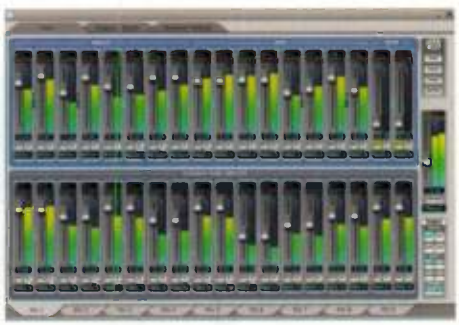

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FIG. 1: CreamWare's Minimax ASB models the sound and look of a classic Minimoog while offering additional features the original never had.

CREAMWARE Minimax ASB

A hardware-based virtual Minimoog.

By Brian Smithers

The CreamWare Minimax ASB is arguably the best Minimoog emulation available. Its sound is undeniably authentic, and the feel of its controls is closer to the original than any software-based virtual Minimoog.

The Minimax is part of CreamWare's new Authentic Sound Box (ASB) series, which includes a Prophet-5, a B-3, and a recently released Prodigy/Odyssey. Each instrument is a hardware synthesizer, a digital emulation of an analog classic housed in a compact desktop box with real knobs and a look that pays homage to the synth being emulated.

The Minimax includes remote control software that allows onscreen editing of all parameters and the ability to archive and upload banks of sounds. The software I received with the unit came only in a PC version, but I downloaded the Mac version from CreamWare's ASB Web site. According to the company, current units ship with a cross-platform CD.

First Impressions

You don't have to be a classic-synth enthusiast to guess that the Minimax is channeling a Minimoog. Its layout, knobs, lettering, and attractive wood frame are all highly reminiscent of the Minimoog (see Fig. 1). One important difference is that the Minimax is 12-note polyphonic, whereas the Minimoog was monophonic.

In addition to MIDI In and Out, the Minimax features a MIDI Thru, making it especially adaptable for live use. The USB connection appears to your Mac or PC as an additional MIDI port, which is a necessity if you want to use the remote control software alongside your sequencer. I found that I needed both the USB and MIDI connections to get the Minimax and its editor software to work simultaneously with a sequencer. (I tried it with Cakewalk Sonar and Digidesign Pro Tools.) The solution I came up with—letting the remote control software have the USB MIDI port and using the hardware MIDI port for my sequencer—is not in the manual (which is poorly translated and not comprehensive) but works fine.

Two unbalanced ¼-inch jacks provide stereo output, and two more provide stereo input (see Fig. 2). If you want to be strictly authentic, you can run the Minimax in mono and it sounds just fine. Because its oscillators are not pannable, its stereo output really is useful only for its internal effects, which include a serviceable stereo delay and chorus/flange. The delay can be set in milliseconds or musical values, but it syncs only to its own internal metronome, not to MIDI Clock. The effects can be bypassed from a front-panel button. Power is supplied by a large wall-wart adapter.

The Minimax ASB's many knobs, buttons, and switches feel solid and work smoothly. However, each knob has a significant dead zone at the top and bottom that CreamWare says is intended to eliminate control jitter. According to the unit's specifications, the dead zones should not exceed

10 percent of the knob's rotation. On my review unit, though, the dead zone encompassed almost a quarter of a turn between the top and bottom of the range and was consistent across all the knobs. Once a knob kicked in, it covered the full range of MIDI values, but there was no reason to set a knob to a value below 1 or above 9 on the faceplate. (Increment/Decrement buttons are also provided for numeric control of parameter values.)

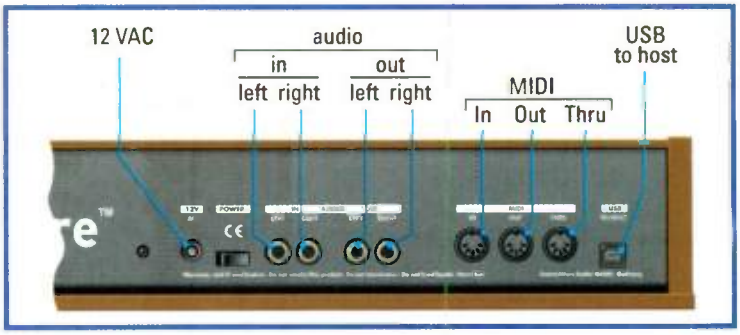
Hands-on Havoc

I have to admit that when triggering sounds on the Minimax, I occasionally found myself totally absorbed in sonic mayhem, abandoning all journalistic detachment in favor of primal knob twisting. The Minimax just begs you to throw down a chord (yes, a chord!), press the sustain pedal, and turn your entire attention to two-fisted filter tweaking.

Despite the 128-value limitation of every knob, I usually didn't hear zippering or discrete changes in the filter controls. I compared the act of tweaking the Minimax, with its knob-based interface, to that of adjusting an excellent software Minimoog emulation using the mouse and the sliders on my MIDI keyboard. The Minimax's knobs made for a much more authentic experience.

Because those knobs send MIDI messages, I assigned one to the software synth's filter cutoff, and it then sounded as smooth as the Minimax. Despite their pedestrian resolution, the knobs feel nice. Note, however, that the software synth can be controlled by high-resolution automation curves in a digital audio sequencer, whereas the Minimax is "stuck" with low-res MIDI controllers, whether from software or hardware.

The limited resolution of the knobs was really noticeable only when I was tuning the filter's resonance to an overtone of the oscillator (see **Web Clip 1**). Even though



CHUCK DAHMER

FIG. 2: The back panel of the Minimax features stereo output, stereo input for processing external signals, MIDI In, Out, and Thru, USB for connection to a computer, and a power connection for the rather large wall-wart adapter.

the Minimoog's knobs were just a bit grungy, the overtone slid into pitch ever so gradually. On the Minimax, it clicked into place from above or below. Once there, the sound was remarkably similar to the real deal, but if you're a serious knob twister, you may be in for occasional disappointments.

The knobs are not continuous rotary encoders but rather old-school "absolute" controls. They can be confusing because their positions are never indicative of the current values of their corresponding parameters, except when you've just turned one. If you design sounds, save them, and recall them as necessary, you won't have a problem. However, as soon as you turn a knob, the parameter jumps to the knob's current position, most often resulting in an audible skip in the sound as, for example, the filter cutoff opens or closes abruptly.

The solution to this problem is a series of LEDs labeled Match, which are found in the lower-left corner of the Minimax. As you twist a knob, the Match display lights to the left or right of center to indicate that the current knob position is below or above the preset's value for that parameter. The display moves toward center as the knob zeroes in on the parameter's value, and the center LED flashes when you match it. All you need to do to enable smooth knob tweaking is to call up a preset, use the Match display to null the knobs you want to adjust, and start playing. It's still better than having to set all 27 knobs on the original Minimoog to get a patch ready to play.

I asked CreamWare why the company didn't implement a "turn-and-catch" autonulling scheme like some control surfaces use. I was told that it had been tried, but that early testing showed a strong preference among musicians for the absolute knob behavior. Thus, my view appears to be in the minority. At least the Match display makes manual nulling reasonably easy.

PRODUCT SUMMARY

CREAMWARE Minimax ASB

synthesizer module
$899

FEATURES	4
EASE OF USE	3
QUALITY OF SOUNDS	4
VALUE	3

RATING PRODUCTS FROM 1 TO 5

PROS: Excellent, authentic-sounding Minimoog emulation. Well-implemented hardware interface. MIDI In, Out, Thru. Valuable nonemulative features, including defeatable Velocity sensitivity, 12-note polyphony, presets, delay, and chorus.

CONS: Manual is poorly translated and not comprehensive. Buggy and inefficient remote-control/patch-management software. Large wall-wart power supply.

MANUFACTURER
CreamWare
www.asb.creamware.com

Remote Possibilities

On glancing at the included remote control software (see Fig. 3), you might be fooled into thinking the Minimax is a software synth in disguise. Every sound-controlling knob and switch on the unit is displayed on the Main page, and you can tweak all of them with the mouse. The Add page,

FIG. 3: The Minimax's remote control software offers patch management and control of certain features that are not accessible from the hardware knobs and switches.

however, contains additional parameters that are not controllable (or are only partially controllable) from the hardware. Besides the effects, these include a handful of parameters that can help carry the Minimax into sonic territory where the Minimoog can't follow.

For example, did you ever wonder what it would be like to play a Minimoog with Aftertouch? A section labeled CV lets you apply Channel Pressure to volume, filter cutoff, and Oscillator 3 amount. Bend range can be adjusted in semitone increments up to a maximum of two octaves, and the Mod Wheel's amount and offset can be set. Here you can adjust such items as the low- and high-note priority when playing in Mono mode, and you can choose to have the envelope retrigger with each note. The Minimax can also be set to Legato mode.

Additional windows offer monitoring of MIDI messages, preset management, and an onscreen keyboard for triggering notes with the mouse or the computer keyboard. Despite these useful features, certain parts of the software don't seem ready for prime time. If you try to trigger notes from the computer keyboard while tweaking a parameter with the mouse, the onscreen keyboard goes out of focus. You then must click on it with the mouse again before you can play any more notes from the computer keyboard, defeating the utility of the feature.

Although you can save comments with presets and also categorize them, you cannot sort the preset list by either of those parameters or, most surprisingly, by name. You can change the order of presets by dragging them up and down one by one, but you cannot select multiple presets for movement or deletion—if you wanted to delete a whole bank, you'd have to hit Delete 128 times.

On the Mac, things are worse. The arrows on the primary window that should switch to the next or previous preset don't work, the onscreen keyboard doesn't support triggering from the computer keyboard, and the windows are not resizable. The application often failed to see the USB connection to the hardware even when Mac OS X's Audio MIDI Setup recognized it, and it crashed each time I quit the program.

Is It Live?

To assess the Minimax's sonic authenticity, I set it beside the genuine article, a vintage Minimoog graciously loaned to me by the Audio Playground Synthesizer Museum (www.keyboardmuseum.com). I also fired up the Minimax's chief software competition. When I isolated the waveforms, the Minimax nailed everything but the narrow pulse wave, as did the virtual Minimoog (see **Web Clips 2A through 2C**).

I ran the filter cutoff control through its full range, and the Minimax sounded remarkably similar to the Minimoog, whereas the soft synth suffered from jittery mouse control. As I mentioned earlier, the soft synth's filter sounded much smoother and more authentic under the control of a Minimax knob. Filter resonance strayed a bit farther from this particular Minimoog at its extreme setting, although the Minimax's resonance still gave a satisfyingly biting self-oscillation.

Knob by knob, the Minimax came as close to the Minimoog as a fine recording does to a live instrument. CreamWare claims it even matched the knob positions, but given the large amount of play in its knobs, that claim doesn't quite hold up.

I created a variety of sounds (see **Web Clip 3**), and I felt the Minimax held up well next to its archetype. In most cases, the biggest distinguishing feature of the Minimoog was its oscillator drift—one point in favor of the Minimax.

The Minimax also scored points over the Minimoog with its 12-note polyphony and MIDI control, which give it capabilities the original never had. Building a searing lead sound and then playing big, fat chords with the sonic flexibility of (defeatable) Velocity sensitivity and Aftertouch is a welcome treat. The ability to recall that sound from among 256 onboard presets is priceless.

If I had both the original Minimoog and the Minimax in my studio all the time, I'd still reach for the Minimoog occasionally—the same as I sometimes reach for a primitive bamboo flute rather than my modern silver flute. I would also choose the Minimax over its software rival, not for any sonic advantage, but just because of its physical interface.

In short, the Minimax sounds and feels about as authentic as any digital Minimoog is ever likely to. It's a good instrument in its current state, and when CreamWare improves the software and documentation, it will have a hit. EM WEB CLIPS

Brian Smithers is Course Director of Audio Workstations at Full Sail Real World Education in Winter Park, Florida. *Special thanks to Joseph Rivers and the Audio Playground Synthesizer Museum.*

FIG. 1: Compact yet equipped with a mighty synthesizer engine, the microX also makes a capable soft-synth controller thanks to its USB interface and assignable knobs.

KORG microX

Triton sound—to go.

By David Battino

If you've been craving the sound of a Korg Triton but can't squeeze another big keyboard into your life or budget, then Korg has a deal for you. The company's new microX (see Fig. 1) packs most of the features of its popular workstation synth line—a 2003 EM Editors' Choice Award winner—into a 5-pound, 2-octave keyboard with a list price of $750.

You don't get the Triton's sequencer, sampling, plethora of effects processors, or hardware expandability, but the microX makes up for that with computer connectivity. Install the editor-librarian software and connect a USB cable, and you can audition and personalize patches from inside any digital audio sequencer that supports AU, RTAS, or VST plug-ins. (The editor also runs standalone.) Communication between software and synth is so fast that it's like having a huge color touch screen or a hardware plug-in; the computer and keyboard become one.

> Communication between software and synth is so fast that it's like having a huge color touch screen.

The microX plays well with other programs too. Pressing its External Controller button gives you three banks of four knobs to control software synths, effects, or mixers. And its new Multi mode provides multitimbral setups that mate perfectly with a computer sequencer, so you can start recording tracks right away.

More than just a sawed-off Triton, the microX shows Korg's renowned attention to sound programming. Clever splits, layers, and arpeggiation let you play expressively on either the built-in keyboard or a full-size external one; the microX is like a sound module with keys. And although the sound ROM contains classic multisamples dating back to the 1988 Korg M1, half of the sample pool is fresh material designed for contemporary styles.

There's a lot to explore in this tiny box. Because EM has covered the Triton series extensively, I'll concentrate on the new features.

Meet My X

The first thing you notice when unpacking the microX is its cheerful orange travel case (see **Web Clip 1**). This plastic clamshell has compartments for the power supply and cables, which unfortunately makes it a few inches

bigger than the limit for carry-on luggage. You could probably sneak the case onto a plane, but on a recent flight I didn't want to risk having to check it, because the case has only a few strips of foam tape for padding.

So I took the microX Operation Guide instead. That got me up to speed, but for the details, I had to dig through several cross-referenced PDFs on the driver disc. Better integration and some tutorial videos would have helped.

The keyboard has a standard synth action, with the keys hinged right at the top of the key bed, meaning that the black keys work best when your hands don't get too close to the back of the case. (Korg notes that the action is the same as on the TR and X50.) I'm picky about keyboard actions, but I got used to this one easily; the factory patches respond well to Velocity. You can select among eight Velocity curves in the Global menu.

Two Octave shift buttons blink faster to show how far you've shifted the pitch. I found I could hold a chord with one hand and then shift octaves to solo with the other, essentially extending the keyboard (see **Web Clip 2**). Pressing both buttons at once resets the octave to the preset value for that patch—a welcome shortcut.

Above the keyboard are four knobs and a button that switches them among three sets of modulation targets. The adjacent External Controller button disconnects the knobs from the onboard synth and calls up a whole new set of parameters—a quick way to tweak external MIDI hardware or software. The microX comes with controller presets for dozens of software synths, but you'll need to peruse a PDF for details; the display shows only the MIDI channel and Control Change (CC) number for each knob.

Next up is the Arpeggio On/Off button, with an LED that blinks on the beat; the main display shows the tempo in bpm. To the left of that are the Audition and Category buttons. While the Audition button is on, each new Program you select calls up an appropriate new riff, which makes finding sounds much easier than with the turn-a-knob, press-a-button routine on other synths (see **Web Clip 3**). Like many other Korg instruments, the microX offers basic patches called Programs and layered patches called Combinations or Combis.

The Category button also helps you find sounds faster. It brings up a menu of 16 sound categories, including Bass, Lead Synth, Drums, and User. You can then try out sounds in that category or flip to a new category. Strangely, there's no User category for Programs, only for Combis. However, you can rename the categories and assign any sound to any category, which offers a handy way to compile a bank of favorites.

You navigate with Page +/– buttons and a stubby little 4-way rocker switch called the ClickPoint that moves the cursor up, down, left, or right in the display. Pressing the switch's center activates the selected field for editing, which you can do by turning the data wheel or nudging the ClickPoint up or down. The data wheel is easy to grasp and lightly detented to help you dial in the right value. I wish the detents were a bit more pronounced, though, and that Korg had provided dedicated increment and decrement buttons.

The glowing red LCD is crammed with information (some characters are a microscopic 3 × 4 pixels), but its high contrast makes it clear even in bright light. Some of the edit modes have more than 40 pages, but a menu button lets you traverse them quickly. And of course, there's the software editor for the big-picture view.

Rounding out the front panel is the spring-loaded joystick, which sends Pitch Bend when you move it horizontally and CCs when you move it vertically. The vertical movements are usually mapped to vibrato (up) and filter effects (down). I discovered that I could play trills by wiggling the joystick rapidly, something I find tough to do on a wheel.

Round the Back: Jacks

The microX has four ¼-inch audio outputs—left/mono, right, and two individual outs, all unbalanced (see **Fig. 2**)—which is surprising for an instrument this size and price. You also get inputs for a footpedal, a footswitch, and a damper pedal. The damper jack supports half pedaling (Korg sells a compatible pedal for $65), and the other two pedals can control a variety of parameters, including tap tempo.

Next up are 5-pin MIDI In/Out and USB MIDI In/Out jacks. Unfortunately, the USB implementation provides MIDI interfacing only for the microX itself; you can't connect other MIDI instruments to the host computer through the microX's standard MIDI jacks. A full MIDI interface, as on Korg's padKontrol, would have been useful. I was also disappointed that the microX doesn't run off USB power or batteries, but that's probably due to the potency of its synthesizer engine.

All jacks are labeled on the top panel, and the headphone jack is at the front of the case, two design features I always appreciate. However, the case is entirely plastic

FIG. 2: The microX's back panel includes four audio outputs, three pedal inputs, MIDI In and Out jacks, and a USB port. The keyboard can't run off USB power, though; an AC adapter is required. The headphone jack is at the front.

and the headphone jack is an ⅛-inch type, so I could imagine a wayward elbow accidentally snapping it off.

Dance Architecture

The microX Program follows the proven Triton signal path: two sample-playback oscillators, each with its own filter and amplifier, feed some effects—in this case, a single insert effect followed by two Master effects and a 3-band EQ. The oscillators can switch waveforms based on Velocity. In Drum mode, you get just one oscillator, but each note can have a different high- and low-Velocity sample and effects-send amount.

You can split and layer up to 8 Programs into a Combi and collect up to 16 Programs in a Multi, a multitimbral setup used for MIDI sequencing. With only 3 effects processors to handle up to 16 channels of audio, I ended up recording each track to the computer either dry or with minimal effects and then using effects plug-ins during mixdown.

A polyphonic arpeggiator (two in Combi and Multi modes) generates everything from drum grooves to guitar strums and bubbling pads. It's no Karma (I tired of the repetition), but it really brings many of the sounds to life.

FIG. 3: Running as either a plug-in or a standalone program, the microX editor-librarian updates the keyboard instantly over USB—and vice versa. This screen shot shows the arpeggiator pattern editor, which would benefit from MIDI note input.

PRODUCT SUMMARY

KORG microX

synthesizer-controller
$750

FEATURES	4
EASE OF USE	3
QUALITY OF SOUNDS	4
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Big Triton sound in a bite-size package. Dual arpeggiators and clever programming compensate for 2-octave keyboard. Multiple outputs. Real-time USB editor-librarian. Includes case.

CONS: Case is too big to qualify as carry-on luggage. Requires AC adapter. USB MIDI interface supports only microX, not external MIDI instruments.

MANUFACTURER
Korg
www.korg.com

Computer Xchange

The microX's four real-time control knobs use the Triton mapping: in Bank A, they control filter cutoff and resonance as well as envelope intensity and release time. In Bank B, they control custom parameters for each Program or Combi. Bank C handles arpeggiator gate time, Velocity (essentially volume), pattern length, and tempo (see **Web Clip 4**).

The mappings get interesting in External Controller mode. With Propellerhead Reason's ReDrum, for example, I discovered that the knobs control pan, pitch, and level for the first four drum sounds, whereas the first ten white keys will trigger, mute, or solo ReDrum's ten drum channels, depending on what octave range the keyboard is in. There are 64 presets for software ranging from Korg's Legacy Collection to Image-Line's FL Studio, and each is editable. I was impressed with the depth of programming.

With the exception of the arpeggiator-editing screen, which I found confusing and twitchy, the software editor really enhanced the microX. Changes you make on either the synthesizer or the computer are instantly reflected on the other device. It's quite a different experience from the typical "offline" editor (see Fig. 3).

I was initially disappointed that the USB interface carries only MIDI data, when other synthesizers manage to send both MIDI and audio over USB. But given that the microX outputs four channels of sound as well as dense MIDI streams, restricting USB traffic to MIDI makes sense. You'll need a few extra cables to record the audio into a computer, but I found that with my audio interface's latency dialed sufficiently low, the hybrid analog-and-USB system felt as tight as a standalone hardware synth. (Surprisingly, I got significantly better sound and latency with my Mac's built-in audio interface than with the USB audio interface I had been using, which suggests that keeping audio off the USB cable was a good decision.)

Mighty Micro Sounds

The Triton series is known for its outstanding sounds, and the microX carries that torch ably. You'll find glassy bells (see **Web Clip 5**), crisp acoustic guitars (see **Web Clip 6**), beefy basses, smooth pads, nasty leads, cutting pianos, opulent strings, succulent filter sweeps . . . nearly every sound seemed to suggest a new song.

When you listen to the multisamples alone, they're often short and thin, but they combine extremely well. That said, the microX wouldn't be my go-to box for orchestral work or acoustic piano; those sounds just seemed to have something missing.

The microX's new waveforms emphasize dance and ethnic timbres, though I found the latter were often so "produced" that they lost realism (see **Web Clip 7**). It's best to add ethnic spices sparingly. However, the dance and electronic sounds are really catchy; I particularly liked the grooving bass splits (see **Web Clip 8**).

X Hits the Spot

Combining a compact USB controller keyboard with a synthesizer makes a lot of sense. In the same amount of space, you get more musical options, as well as getting familiar sounds and controls when you're away from the computer.

The microX walks an interesting line between being a high-end sound module with keys and a compact controller with built-in sounds. Unless you consider software synths, there's no competition anywhere near this price in the sound module category.

As a controller with onboard sounds, the microX has two main competitors: Novation's X-Station and its just-announced XioSynth. Both Novations offer audio interfacing, Aftertouch, battery operability, and more knobs, but they fall far short in synthesis flexibility, being just 8-note monotimbral. That compares poorly with the microX's 62-note polyphony (31-note in dual-oscillator mode) and 16-part multitimbrality.

The closest competition probably comes from Korg itself. For a street price of only $50 more, the Korg X50 pairs the microX engine with a 4-octave keyboard, two controller buttons, many more navigation buttons, and pitch-bend and mod wheels. For all that, it weighs just about four pounds more. However, the X50's sound set, derived from the Korg TR workstation, is more general. It offers 128 fewer Programs, 172 fewer multisamples, and 411 fewer drum samples than the microX, and it's definitely too big to sneak on a plane or keep on a desktop. (It also lacks the microX's innovative External Controller function.) As a compact, rich-sounding, computer-friendly performance synthesizer and controller, the microX stands tall.

EM WEB CLIPS

David Battino (www.batmosphere.com) is the coauthor of The Art of Digital Music *(Backbeat Books, 2005) and the editor of the O'Reilly Digital Audio site (http://digitalmedia.oreilly.com).*

QUICK PICKS

M-AUDIO

Sputnik

By Babz

EM ★★★★★ hot pick

Despite modern advances in the studio, the quest to capture quality audio often leads back to vintage technology, such as the vacuum tube. And as more condenser microphones hit the stores each year, many aim to emulate the classic high-end tube sound of such venerable transducers as the AKG C 12 and the Neumann U 47. However, M-Audio has gone in a slightly different direction with its new tube-based mic, the Sputnik ($699.95).

The M-Audio Sputnik is a large-diaphragm tube mic that offers classic sound quality at an affordable price.

Rather than setting out to create an exact clone of a C 12 or U 47, the company has bridged the gap between these classics by incorporating what it sees as the best qualities of each into a single-solution mic for the personal studio. This different approach is also evident in the Sputnik's space-age-lollipop look—an exposed disc mounted atop a thick central shaft. And the name itself, taken from the Soviet-era satellite, is evocative of a time when the vacuum tube was king.

The Sputnik has a 1.1-inch diaphragm, uses a 6205M vacuum tube, and offers three selectable polar patterns (cardioid, figure-8, and omni), a –10 dB attenuation pad, and an 80 Hz rolloff switch. The mic comes with a dedicated power supply with a 7-pin cable; a shockmount; a soft cloth bag; and a flight case. The well-designed shockmount allows you to securely mount the mic upright or upside down. The cloth bag is a welcome accessory that protects the mic from dust when it is kept on the mic stand, and the rugged flight case makes for efficient yet stylish transport and storage.

Test Flight

Tube mics are known to be great on vocals, and I tested the Sputnik on a variety of male and female voices. My first stop was the studio of guitarist-producer David Spinozza, where we recorded singer Tabitha Fair during a songwriting session (see **Web Clip 1**). On her voice, which can be both powerful and delicate, the Sputnik delivered results that were smooth, rich in harmonic detail, clean, and quiet, even through six to eight layers of multitrack harmonies. While the mic was generally transparent on female vocals, I did find the need to lower the EQ just a hair in the upper mids on Fair's voice, and with upper-register vocals in general.

Next I was off to Fluid NY, a busy Manhattan ad-music house, where we recorded various male voices and set up an A/B test pitting the Sputnik against the studio's '40s-era U 47. With both mics side by side, we recorded voice-overs with Andrew Sherman (see **Web Clips 2a and 2b**) and rock vocals with singer Ian Jefferys (see **Web Clips 3a and 3b**). How did this $600-street-price mic stand up to a $6,000 legend? Well, when I informed the studio owner of my intent, he warned me that "many a mic has taken this challenge and fallen." Nonetheless, in the end the Sputnik stood up remarkably well. In many cases the differences were subtle and essentially negligible.

The complete answer, however, is a bit more complicated. We found that on a speaking voice that was naturally more robust, the differences were small. But with a thinner, more average voice, the U 47 definitely had the edge, lending it a slightly richer bottom and a tad more sparkle on the top end. But *only* a tad—such differences could probably be addressed with EQ and mic placement.

The Sputnik also delivered impressive results in my tests on saxophone and various acoustic guitars. On acoustic guitar, the mic was a bit more sensitive to placement differences than other condenser mics I've used. I found a wide range of tonalities as I experimented with positioning, but ultimately I zeroed in on a sweet spot that imparted a lush presence. Larger-bodied guitars were a bit boomy, but that was easily tamed with the rolloff switch. On a louder and more distant sound source, such as a tenor sax, the Sputnik provided smooth sound, even as the player moved a bit off-axis.

Does It Fly?

M-Audio deserves kudos for taking a bold and well-researched approach to a new tube-mic design. The company has managed to develop its own look and sonic character with the Sputnik, which delivers a classic sound that stands up admirably next to the best-of-the-best tube mics, but at a fraction of the cost.

EM WEB CLIPS

Value (1 through 5): 5
M-Audio
www.m-audio.com

IK MULTIMEDIA

Ampeg SVX 1.0

By Geary Yelton

Amp-modeling plug-ins have been available to electric guitarists for years. Some include a few presets for bass guitar, but software designed specifically for electric bassists has been nonexistent. IK Multimedia, in collaboration with respected bass-amp manufacturer Ampeg, has corrected that situation by developing Ampeg SVX (Mac/Win, $399). The AU-, RTAS-, and VST-compatible plug-in emulates Ampeg amp heads and speaker cabinets, Ampeg-branded stompboxes, and several popular microphones.

Setting the Stage

I tested SVX in Apple Logic Pro 7.1, Digidesign Pro Tools 7.1, and Steinberg Cubase SX3. My computer was a dual-processor 2.3 GHz Power Mac G5 with 4 GB of RAM running Mac OS X 10.4.8. My bass was a 1993 Fender Prophecy III played through a PreSonus MP20 preamp, a MOTU 2408mk3 audio interface, and Tannoy PBM 6.5 LM amplified monitors.

Installation and authorization were straightforward, though after I'd authorized the AU version, I had to reenter the serial number when I opened the RTAS

Bass players of the world, rejoice: Ampeg SVX is a plug-in that quite effectively emulates amplifiers, speaker cabinets, stompboxes, and a tuner for bass guitar.

and VST versions. SVX's copy protection uses a Syncrosoft USB key.

SVX has four modules—Amp, Cabinet, Stomp, and Tuner—which you select one at a time. At the top of the user interface are menus and buttons for working with modules and presets, and below are meters and level knobs.

Bass Solo

SVX emulates real Ampeg amplification gear: two amp heads, four speaker cabinets, and two combo amps. You can independently select the amps and cabinets of the B-15R and BA-500 combo amps. SVT-CL faithfully duplicates the most recent edition of the classic SVT, the amplifier that launched a thousand grooves. SVT-4 PRO gives you plenty of controls for tailoring your sound, including onboard compression and 9-band EQ. All four SVX amps furnish the same controls and overall tonal character as the original hardware.

The four cabinet emulations model Ampeg's BXT-410H, PB-212H, SVT-410H, and SVT-819E, each with various configurations of 10-, 12-, and 15-inch speakers. Just like the real cabinets, each selection has its own tonal attributes that emphasize bottom, punch, or other qualities.

The Cabinet module gives you a choice of dynamic and condenser mics ranging from the Shure SM57 and Sennheiser MD 421 to the AKG C 414 and Neumann U 87. You can change the mic's position relative to the speaker's center, place it closer or farther from the speaker, and adjust the depth of room ambience. You won't mistake SVX's virtual mics for the originals, but they do offer additional means to vary your bass's tone.

The Stomp module has six slots, each with a menu for selecting from eight stompboxes. The overdrive and octave divider simulate real Ampeg stompboxes, and four others—chorus, delay, compressor, and envelope filter—share their form factor. The bass wah and volume pedal resemble typical footpedals. I'd prefer that the effects directly responded to MIDI Control Changes, but the only way to change their parameters is by using your mouse or sequencer automation. Nonetheless, each stompbox performs well and provides musically useful parameters.

The easy-to-use chromatic Tuner module automatically detects the pitch and displays its note name, value in cents, and deviation from center. A large meter shows the pitch range, with real-time variations indicated in blue; intonation is correct when the center turns a steady orange.

The Lowdown

SVX lets you select individual amps, cabinets, and stompboxes to create and save your own combinations. You can also choose from 78 factory presets divided into two categories. The Amps category supplies variations on each of the four amps, either direct (bypassing the cabinet) or paired with different cabinets and occasional effects (see **Web Clip 1**). The Styles category divides presets into Fingered, Muted, Pick, Slap, and Synth subcategories. Synth presets aren't actually synthesized, but they are effects-heavy sounds that expand the bass's tonal palette (see **Web Clip 2**).

Owning SVX is like owning a collection of Ampeg amps and speakers, without the weight and space requirements. It does an outstanding job of emulating the sonic signature of all four amps, and the stompboxes are terrific. What's more, its CPU demands were never excessive. I'm thrilled to have SVX in my plug-in library, and I expect to use it often.

Considering that no two real amps or cabinets sound exactly alike, even if they're identical models, I'm not very concerned with whether the software emulations sound exactly the same as the original hardware. I just want something that makes my bass sound awesome when I'm recording, and SVX certainly fits the bill. For anyone who records bass guitar using a computer, I wholeheartedly recommend Ampeg SVX.

EM WEB CLIPS

Value (1 through 5): 4
IK Multimedia
www.ikmultimedia.com

PIGTRONIX

OFO Disnortion

By Eli Crews

The Pigtronix OFO Disnortion ($249.99) is a 3-tier analog effects box with three rugged footswitches across the bottom edge of its double-wide chassis. One *O* stands for Overdrive, and its three knobs are Gain, Level, and Tone. The *F* stands for Fuzz, which also has Gain and Level knobs; instead of a variable tone knob, Fuzz has a 6-position rotary switch for Shape. The other *O* is for Octava, which adds an upper octave to your sound. In addition to its own Level knob, Octava also has a Filter control that rolls off the high end entering the circuit.

Each section has a uniquely colored LED above its footswitch, so you know at a glance which effects are active. On the pedal's rear panel are ¼-inch input and output jacks, a connection for the included 15V wall wart, and a ¼-inch Clean output for sending a dry signal without effects.

With independent overdrive, fuzz, and octave-doubling effects, the OFO Disnortion will expand your tonal palette multifold.

Pigtronix pedals handle line inputs just as easily as instrument inputs, so there's no need for reamplification or a direct interface when using them on a mix.

Interstellar Overdrive

Overdrive is the OFO's meat and potatoes; this section is *sweet*. At low gain levels, when I turned up the Level knob a bit, it performed like a subtle boost. With the gain cranked up, it thickened the guitar tone and gave it real teeth, but it never sounded too edgy or brittle (see **Web Clips 1 and 2**). Although the Tone knob is handy, I left it wide open most of the time. As the manual explains, it's really a high-frequency attenuator, unlike the treble-boosting tone control on many distortion pedals.

Fuzz is not what I'd call classic fuzz, à la '60s psychedelia, but I like it quite a bit—especially its ability to run parallel to Overdrive. Fuzz's Shape switch selects one of six EQ curves: Full Range, F.A.T. (Mid Boosted), Smooth, Treble, Mid Scoop, and Bass. Each setting sounds pretty much like what you'd expect from the descriptions. I liked the F.A.T. position best on drums, especially when I coupled the OFO with Pigtronix's EP-1 phaser pedal (see the May 2005 review, available online at www.emusician.com). For guitar, I tended to choose F.A.T., Treble, or Smooth, depending on the application (see **Web Clip 3**). During one session, the Treble setting was my favorite for bass guitar, because it sounded most like the particular brand of bass fuzz I wanted.

The OFO's crowning glory is its Octava circuit. Because it can be switched in series with both or either of the other effects, Octava can twist and crunch your sound in ways you've never imagined (see **Web Clips 4 through 6**). The Filter knob plays an important role in coaxing the perfect sound out of the Octava section, and I had fun finding that sweet spot where just the right frequencies got through.

Any Colour You Like

Pigtronix is one of the increasingly abundant small American companies making specialized stompboxes. I'm excited to see such companies thriving; their success is a barometer for the growing desire of musicians and producers to come up with new sounds. Stock, mass-produced effects processors have their place, but every now and then it's nice to get your hands on effects that only a few people are using.

If all of the OFO's features have piqued your interest, I should mention a few issues. First, for purists who demand true bypass in their pedals, the OFO doesn't have it: the pedal must be turned on to pass a signal through. The manual emphasizes that despite this fact, there is no degradation when the signal bypasses the effects, which I unscientifically confirmed for myself. Second, the OFO runs only on its external power supply and not 9V batteries. Pigtronix claims that the OFO needs all 15 of those precious volts to operate at its full potential. Third, you should thoroughly check all the controls once you get your pedal; I had issues with the Overdrive Level knob on two different units I received for review. Customer service appears to be one of Pigtronix's strong points, though, so have no fear.

Considering the OFO's price and

versatility, it's a pretty solid deal. Rarely have I had a pedal in my studio that's been used on almost every session by almost every type of guitarist. After laying down their tracks, more than a couple of guitarists I've recorded have immediately gone online looking for OFOs of their own. I'd say that's a pretty good endorsement. EM WEB CLIPS

Value (1 through 5): 4
Pigtronix
www.pigtronix.com

MONOTONIC LABS

Type-U73

By Gino Robair

I'm a big fan of simple and unpredictable sound-making devices, and the Monotonic Labs Type-U73 ($109) fits the bill. The rugged Type-U73 was designed for the knob-crazy noise enthusiast—the kind of musician that gravitates toward circuit-bent toys and boutique pedals. In fact, the attractive instrument is the size of a stompbox and is spartan in design, offering only two chicken-head knobs (labeled X and Y), a power switch (with a light), and a ¼-inch line-level output. The Type-U73 is available from Monotonic Labs' eBay store, which is accessible from its MySpace page.

The Type-U73's two oscillators interact with each other in interesting ways, depending on how the controls are set. The Y knob controls the frequency of the main pulse-wave oscillator, while the X knob controls a modulator. The directions say the sweet spot—where, incidentally, the unit is at its most unpredictable—is reached when the controls are almost fully clockwise. That's where I found my most intriguing sounds (see **Web Clip 1**). The output is muted when the knobs are maxed out.

Near the top of the Y knob's range, you get to a point where the sound gets unstable, which is very useful if you're running the Type-U73 through filters and delays. As you sweep the X knob when the Y knob is in its upper range, you get several octaves of discrete pitches in large registral leaps (see **Web Clip 2**). When Y is in the lower pitch registers, moving X sounds like you're sweeping a sync input on a VCO.

If you turn the controls slowly, you'll occasionally cross a dead spot, such as when X is at 12 o'clock and Y is at 3 o'clock. These regions provide valuable timbral shifts that can be sonically fruitful depending on your processing chain.

On its own, the Type-U73 has a pleasing, full sound. However, without any VC inputs, it's somewhat limited to manually controlled theremin-style sweeps or single-note analog-synth textures. But that's what the designer intended. Consequently, it demands to be processed: run it through an interesting signal path, whether digital or analog, and you'll find the Type-U73 to be a musically useful sound source that provides hours of fun. EM EM WEB CLIPS

Value (1 through 5): 3
Monotonic Labs
www.myspace.com/monotoniclabs

EM Marketplace

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ELECTRONIC MUSICIAN CLASSIFIED ADS are the easiest and most economical means of reaching a buyer for your product or service. The classified pages of EM supply our readers with a valuable shopping marketplace. We suggest you buy wisely; mail-order consumers have rights, and sellers must comply with the Federal Trade Commission as well as various state laws. EM shall not be liable for the contents of advertisements. For complete information on prices and deadlines, call (800) 544-5530.

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Hit the road with your Dual Core MOTU Studio

Take Digital Performer 5 and the rest of your MacBook-powered MOTU studio on the road for unprecedented portable studio power and performance.

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The Apple MacBook Pro is built on revolutionary Intel Core 2 Duo, which packs the power of two processor cores (up to 2.33GHz) inside a single chip. This means you now get mind-boggling dual-processor performance that you can stuff in your backpack and sling over your shoulder. Now add support for internal hard drives up to 200GB, 3GB of RAM, FireWire 800 and double-layer burning SuperDrive, and your MacBook Pro portable MOTU Studio delivers unprecedented speed and performance - to go.

FireWire I/O with 8 mic inputs

The new MOTU 8pre delivers eight mic inputs in one rack space, complete with a five-segment level meter, phantom power switch, 20 dB pad switch and trim knob right on the front panel for each input. Now add two banks of ADAT optical digital I/O for eight more channels — even at 88.2 or 96 kHz. Top it off with main outputs and MIDI I/O, and you've got a FireWire audio interface that turns your Mac into a complete studio that can record your entire band. Or, if you already own an optical-equipped MOTU FireWire, PCI or UltraFast USB2 audio interface, the 8pre is the perfect way to add 8 mic inputs directly to your MOTU interface CueMix DSP on-board mixing via 8-channel optical.

NEW

Liquid Technology

The Focusrite Liquid Mix is another Focusrite first and a true one-of-a-kind. Based on the same technology that brought the audio world the acclaimed Liquid Channel, Focusrite now brings Liquid Technology directly into your DP5 studio environment at a much more accessible price. Focusrite Liquid Mix offers emulations of 40 compressors and 20 EQs with a FireWire Hardware controller. Thanks to its built-in DSP, you can have up to 32 channels of modeled vintage or modern compression and EQ with one Focusrite Liquid Mix, with no impact on your native DP5 processing resources. Plus you can control Liquid Mix channels from directly within Digital Performer using Liquid Mix plug-in windows, which keeps your Focusrite processing seamlessly integrated with — and saved with — your DP projects.

The MOTU experts at Sweetwater can build the perfect portable DP5 rig for you. We'll help you select the right components to build a powerful system that lets you take your workflow anywhere, and we can even install, configure and test the entire system for you. Why shop anywhere else?

Waves native processing

Waves has long been synonymous with quality plug-ins, and the Waves Platinum Bundle contains a huge range of top-quality Waves processing for your DP5 studio. The Platinum Bundle now includes Waves Tune LT, L3 Ultramaximizer, and IR-L Convolution Reverb as well as all the plug-ins found in the Waves Gold and Masters bundles. Platinum brings extraordinary signal processing power to DP5, for tracking, mixing, mastering, and sound design. From dynamics processing, equalization, and reverb to pitch correction, spatial imaging, and beyond, Waves Platinum Bundle is a must-have for every MOTU studio.

Ultimate expandable synth

Ultimate Soundbank Plugsound Pro puts a complete "rompler" right inside Digital Performer 5, giving you all the essential sounds you need for your mobile music. Sharing the same UVI engine as the MOTU Ethno Instrument, Plugsound Pro gives you 8 GB of instruments and loops plus powerful effects and performance features, including the innovative drag and drop of audio or MIDI between the plug-in and Digital Performer. An ever-expanding range of add-on sound libraries include retro organs, classic synths, cutting-edge sound FX and textures, modern drum loops, and a just-released collection of must-have retro keyboards.

Legendary drummers

Submersible Music Drumcore delivers access to twelve world-class drummers, such as Terry Bozzio, Matt Sorum, Sly Dunbar and Zoro. The perfect tool for songwriters and composers who need drums quickly in a multitude of styles. Features include an Audio and MIDI librarian (quickly find that perfect groove), "GrooveSets" (for easier songwriting), MIDI instrument (loaded with each drummers' MIDI drumkits) and the "Gabrielizer" (groove generator). Simply drag-and-drop from Drumcore to your Digital Performer 5 tracks or Clippings window.

Komplete control

For DP5 users who want it all: Reaktor5, Kontakt2, Guitar Rig 2 software, Absynth4, Battery3, FM8, B4II, Akoustik Piano, Elektrik Piano, Vokator, Spektral Delay and Pro-53 in a unified interface with hands-on control — Native Instruments KOMPLETE 4 and KORE put an infinite universe of sound at your finger tips. Every preset included in NI KOMPLETE 4, more than 8,500 in total, has been preconfigured and categorized in KORE with searchable musical attributes and hands-on controller assignments. This seamless integration of software and hardware turns Native Instrument's award winning synthesizers and samplers into tactile instruments.

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Sweetwater

Hit the road with your Dual Core MOTU Studio

Compact MIDI controller

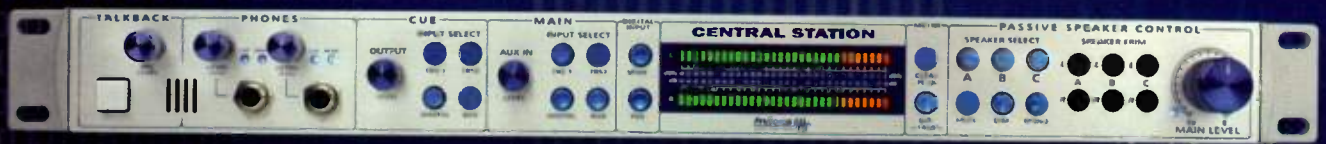
Digital Performer 5 gives you unprecedented control over your MIDI and audio tracks. And what better way to take advantage of this hands-on control than the M-Audio O2, a 25-key ultra-thin USB MIDI controller that goes anywhere you want to make music! Small enough to fit in a bag along with your laptop, the slim-line O2 is perfect for throwing down bass lines, programming drum patterns, triggering effects and tweaking virtual studio parameters - anywhere, anytime. It's easy to assign controllers to match DP5 or your virtual instruments. Plus, the O2 has five internal setup locations so you can switch from application to application. It also integrates with Enigma editor/librarian software for unlimited setup creation and storage.

Professional pad controller

The Akai Professional MPD24 is the velocity sensitive pad controller for musicians and DJs working with sampled sounds. The MPD24 features 16 MPC-style velocity and pressure sensitive pads plus transport controls for interfacing with Digital Performer and your virtual instruments. You get Akai's exclusive feel: either MPC 16 Levels or Full Level features for ultimate pad control. Now add four selectable pad banks totaling 64 pads, six assignable faders and eight assignable and 360 degree knobs for transmitting MIDI Control Change data. Included editor/librarian software gives you complete, intuitive programming and control for DP5 all of your other software titles. The MPD24 provides unprecedented creative freedom for manipulating sampled material.

Advanced waveform editing

Your DP mastering and processing lab awaits you: BIAS Peak Pro 5 delivers award winning editing and sound design tools, plus the world's very best native mastering solution for Mac OS X. With advanced playlisting. Superb final-stage processing. Disc burning. Plus PQ subcodes, DDP export (optional add on), and other 100% Redbook-compliant features. Need even more power? Check out our Peak Pro XT 5 bundle with over $1,000 worth of additional tools, including our acclaimed SoundSoap Pro, SoundSoap 2 (noise reduction and restoration), Sqweez-3 & 5 (linear phase multiband compression/ limiter/upward expander), Reveal (precision analysis suite), PitchCraft (super natural pitch correction/ transformation), Repli-Q (linear phase EQ matching), SuperFreq (4,6,8, & 10 band parametric EQ) and GateEx (advanced noise gate with downward expander) — all at an amazing price. So, when you're ready to master, Peak Pro 5 has everything you need. It's the perfect complement — and finishing touch — to Digital Performer 5.



Control room monitoring

The PreSonus Central Station is the missing link between your MOTU recording interface, studio monitors, input sources and the artist. Featuring 5 sets of stereo inputs (3 analog and 2 digital with 192kHz D/A conversion), the Central Station allows you to switch between 3 different sets of studio monitor outputs while maintaining a purely passive signal path. The main audio path uses no amplifier stages including op amps, active IC's or chips. This eliminates coloration, noise and distortion, enabling you to hear your mixes more clearly and minimize ear fatigue. In addition, the Central Station features a complete studio communication solution with built-in condenser talkback microphone, MUTE, DIM, two separate headphone outputs plus a cue output to enhance the creative process. A fast-acting 30 segment LED is also supplied for flawless visual metering of levels both in dBu and dBfs mode. Communicate with the artist via talkback. Send a headphone mix to the artist while listening to the main mix in the control room and more. The Central Station brings all of your inputs and outputs together to work in harmony to enhance the creative music production process.

Portable hands-on control

AlphaTrack by Frontier Design Group combines intuitive tactile controls in a compact and highly portable package, with native support for Digital Performer. Ride a 100mm, touch-sensitive, motorized fader with true 10-bit resolution for smooth and precise level control. Three touch-sensitive encoders let you adjust your DP track and plug-in parameters while the 32-character backlit display shows detailed feedback in response to your touch. Map your favorite shortcuts from the Commands menu to AlphaTrack's user-programmable buttons. Jog and shuttle with the touch of your fingers using the integrated Scroll Strip. Slide one finger across the Scroll Strip surface and your project's timeline scrolls in response. Drop a second finger onto the strip, and now your fingers control DP's shuttle speed. Zoom through your project with two fingers, then just lift one finger and slide to quickly set the precise position you want. AlphaTrack is powered entirely though its USB connection so it makes the perfect companion to your portable MOTU recording rig.

Accurate monitoring

The Mackie HR-Series Active Studio Monitors are considered some of the most loved and trusted nearfield studio monitors of all time, and with good reason. These award-winning bi-amplified monitors offer a performance that rivals monitors costing two or three times their price. Namely, a stereo field that's wide, deep and incredibly detailed. Low frequencies that are no more or less than what you've recorded. High and mid-range frequencies that are clean and articulated. Plus the sweetest of sweet spots. Whether it's the 6-inch HR-624, 8-inch HR-824 or dual 6-inch 626, there's an HR Series monitor that will tell you the truth, the whole truth, and nothing but the truth.

Hands-on control for the studio

Imagine the feeling of touch-sensitive, automated Penny & Giles faders under your hands, and the fine-tuned twist of a V-Pot™ between your fingers. You adjust plug-in settings, automate filter sweeps in real-time, and trim individual track levels. Your hands fly over responsive controls, perfecting your mix — free from the solitary confinement of your mouse. Mackie Control delivers all this in an expandable, compact, desktop-style design forged by the combined talents of Mackie manufacturing and the MOTU Digital Performer engineering team. Mackie Control Universal brings large-console, Studio A prowess to your Digital Performer desktop studio, with a wide range of customized control features that go well beyond mixing. It's like putting your hands on DP itself.

Venus Hum Goes Organic

By Heather Johnson

Replacing synths with inventive sound design.

For Venus Hum's third full-length release, *The Colors in the Wheel* (Nettwerk/Mono-Fi, 2006), the electronic-pop trio eschewed synthesizers in favor of organic instruments such as acoustic guitar, xylophone, and, well, a Wurlitzer. Okay, so they didn't totally unplug, but they did venture into new territory by exploring traditional sounds in untraditional ways.

The band recorded the album after a tumultuous three-year hiatus that started not long after losing both their MCA Records deal in the United States and their overseas deal with Arista. The saga began with the release of Venus Hum's debut, *Big Beautiful Sky* (MCA), in 2003. The CD was well received and the band toured with Blue Man Group. But during the tour, lead vocalist Annette Strean developed nodes on her vocal chords and was in nearly constant pain. The band was forced to take an extended break.

During the sabbatical, multi-instrumentalist Tony Miracle moved to Los Angeles and then Cincinnati, and during that time assembled about 30 song ideas. In Nashville, Strean healed and retrained her voice and wrote some of her most revealing lyrics. With keyboardist-programmer Kip Kubin adding his own sonic ideas, the trio collaborated by swapping MP3s. They also wrote another batch of songs together at Strean's home. "The songs came really quickly because there was this spurt of energy that happens when we're all together," says Miracle.

Miracle's no-synth idea came much to the chagrin of Kubin. "When we decided to throw the analog synths out the window, basically all Kip had left was a Wurlitzer and a borrowed xylophone," Miracle says. "He thought about the tracks differently than if he had his Oberheim Xpander, which is like his right brain. When you limit your choices, you instantly start thinking of different ways to use the instrument."

On "Genevieve's Wheel," Kubin set to work using Ableton Live on his Apple G4 PowerBook, leaving his ARP 2600 and other analog synths alone. Instead, he searched for man-made alternatives. Miracle says, "He put the mic next to his wife's wedding dress hanging in the closet and recorded the cellophane hitting the beads on top. It sounds like some exotic shaker-type instrument, but it's just Kip fondling this wedding dress!"

Miracle—who used Pro Tools, Live, and Logic Pro during the production of the CD—built one of the tracks using sounds gleaned in various ways from an acoustic guitar. "Hitting the back of the guitar and pitching it down in the computer became the kick or bass drum. Squeaks from the strings used in tiny fragments became the hi-hat, cymbal, strings, or an airy synth sound."

The vocals were tracked at Strean's home studio with a G4 laptop and a Digidesign Digi 002, as well as at the studios of engineer friends Russ Long and Jamie Kenney. "I'm able to work out the kinks myself and lay down really succinct vocal takes," Strean says. The recording chain was typically a Blue Kiwi or Shure SM58 through an Amek 9098 mic pre and a Tube Tech compressor.

The band likens their new CD to designer Todd Oldham's HGTV program *Handmade Modern*, where viewers learn how to make cutting-edge crafts from everyday objects. "That's what this record is about," says Miracle. "We wanted to make a really modern electronic-pop record, but out of homemade instruments. It's hands-on and very DIY." EM

RIFFS

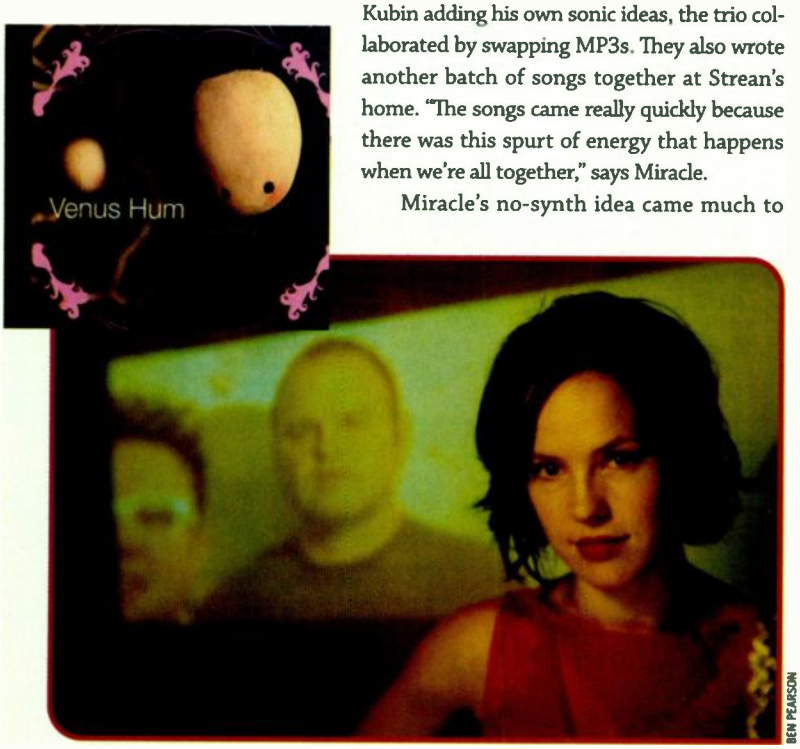
Venus Hum

Home base: Nashville, Tennessee

Sequencers used: Ableton Live, Digidesign Pro Tools, Apple Logic Pro

Sound-design sources: wedding dress, acoustic guitar

Web site: www.venushum.com



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