Reviews, Reviews, Reviews—18 of 'em!

NOVEMBER 2007

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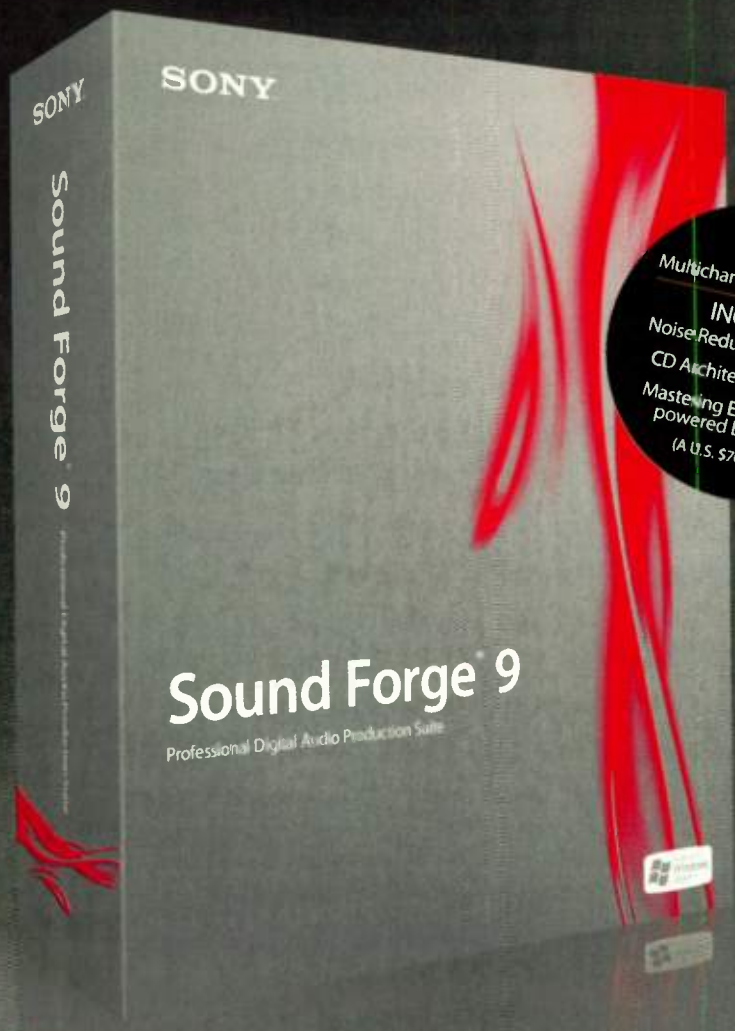


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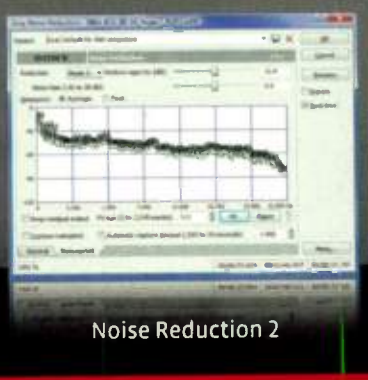
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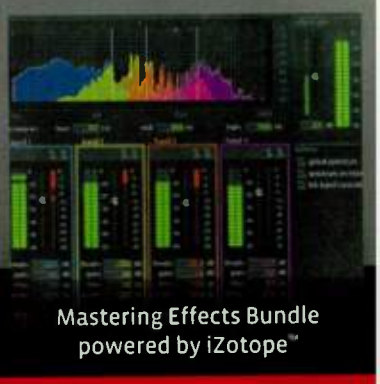
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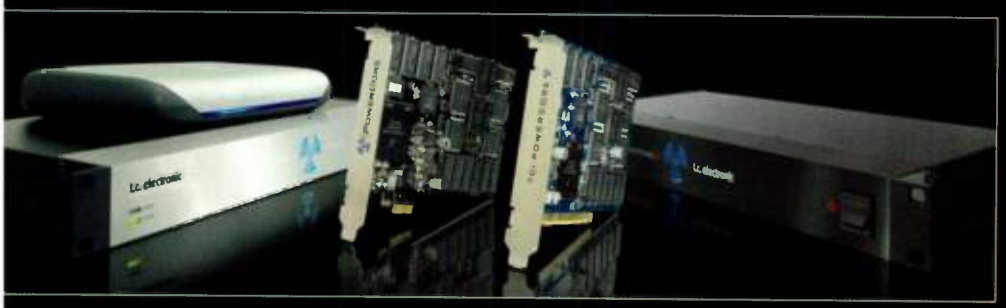

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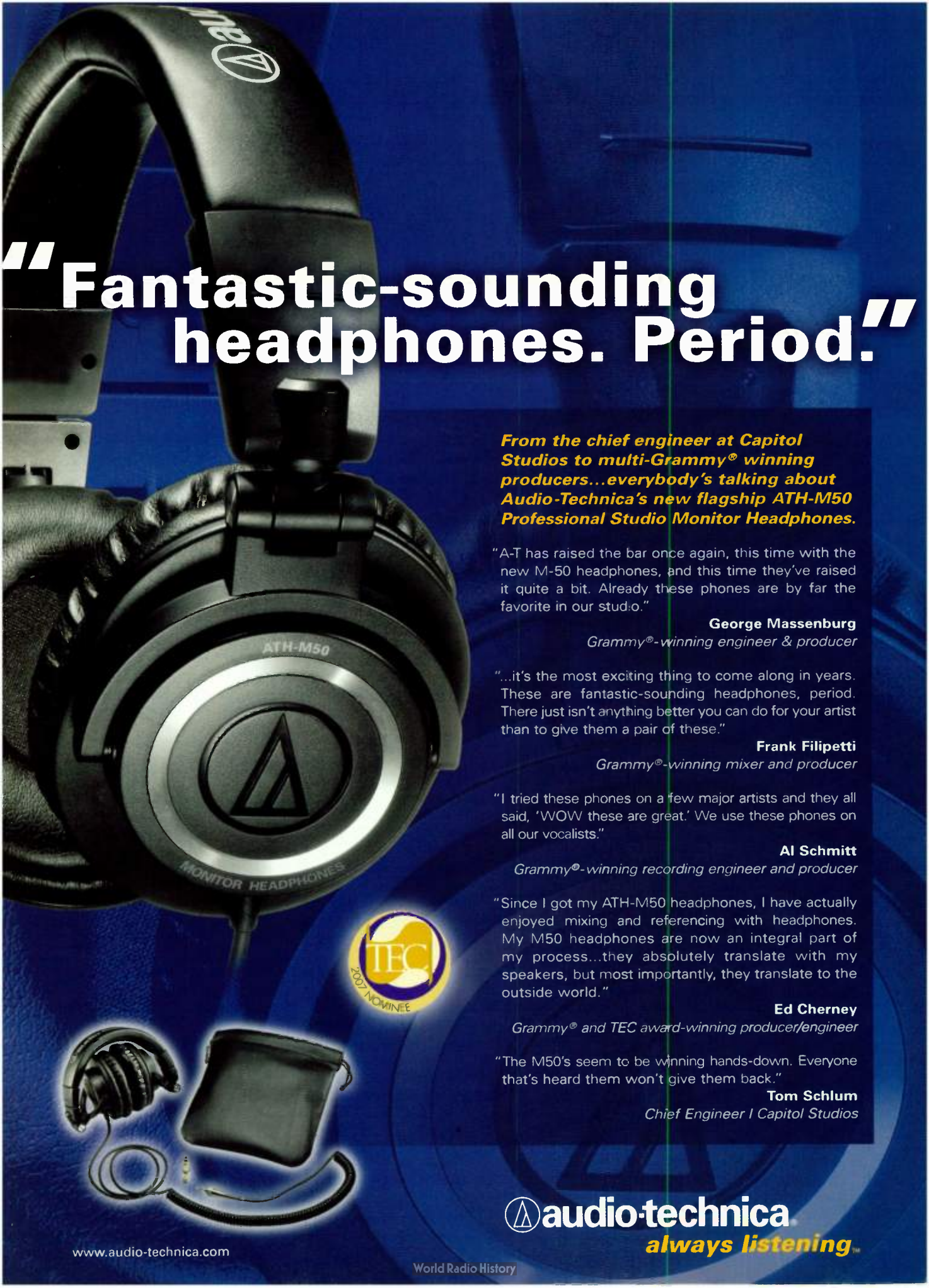

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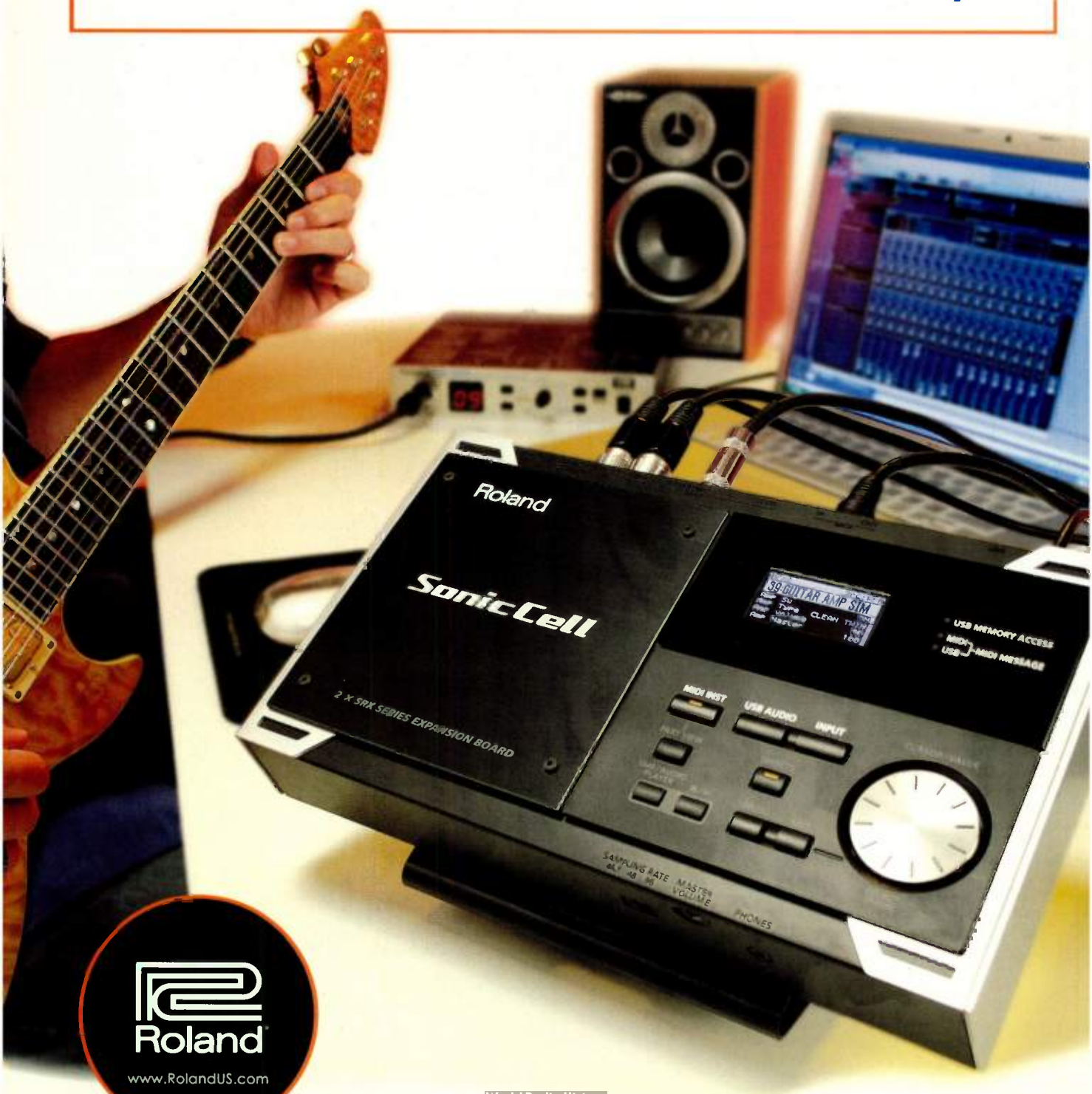

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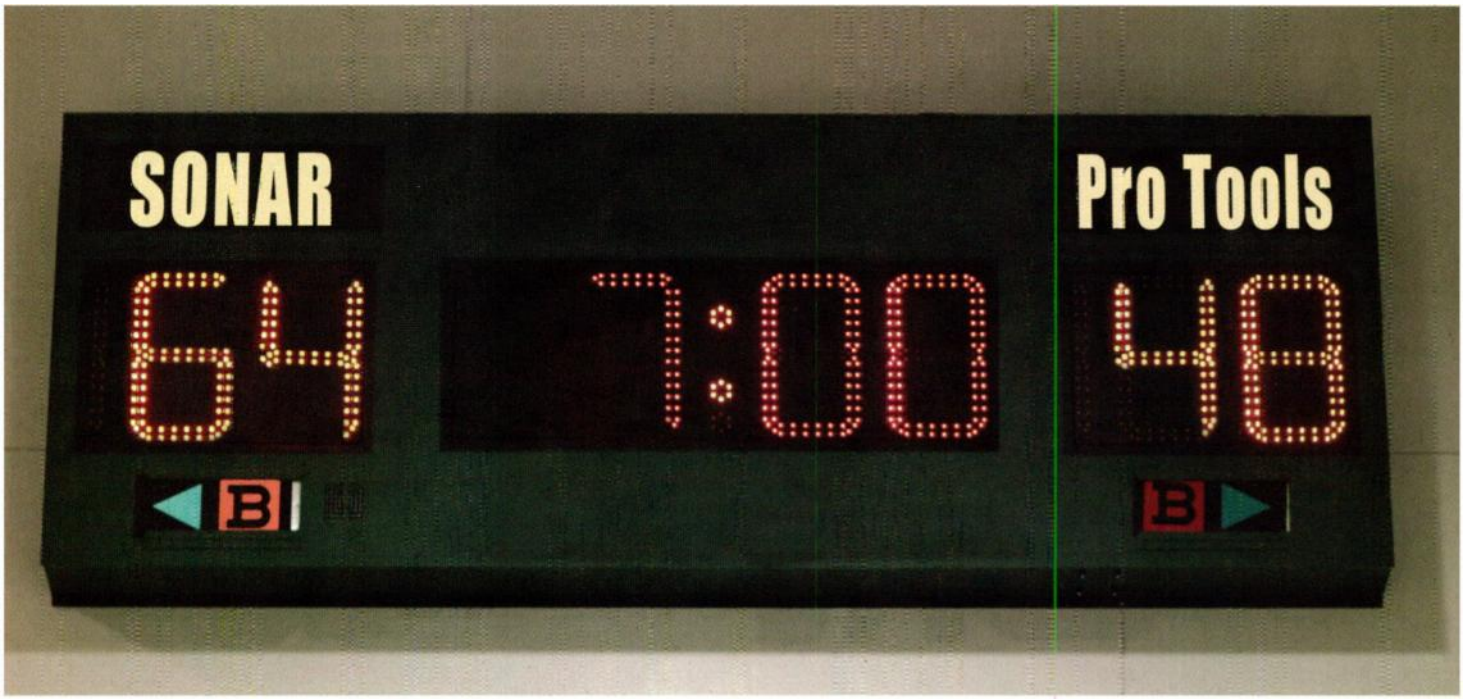

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Electronic Musician
November 2007

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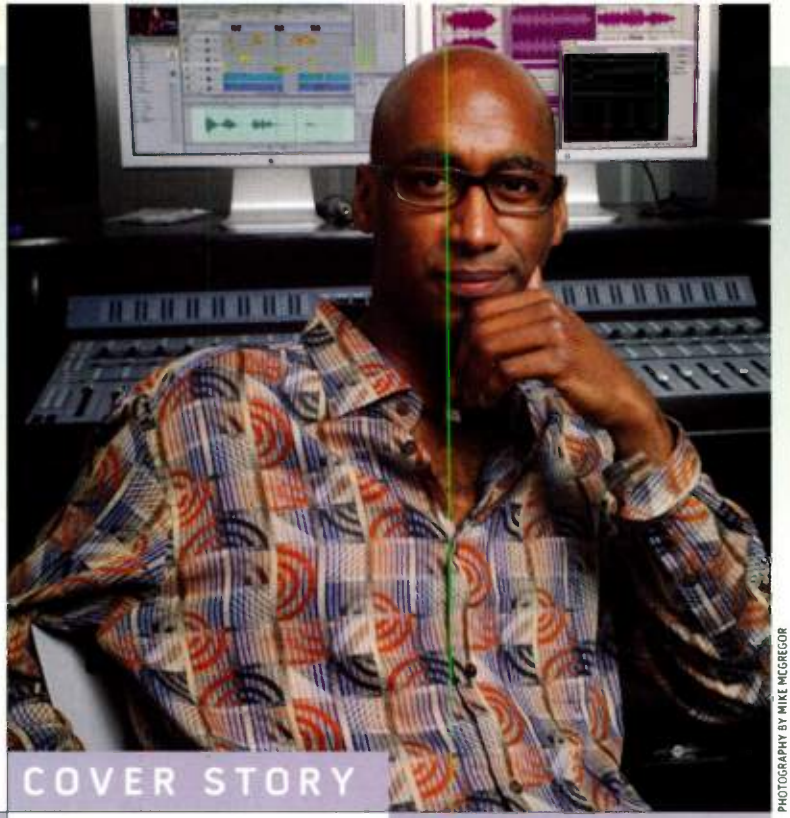

PHOTOGRAPHY BY MIKE MCGREGOR

COVER STORY

FEATURES

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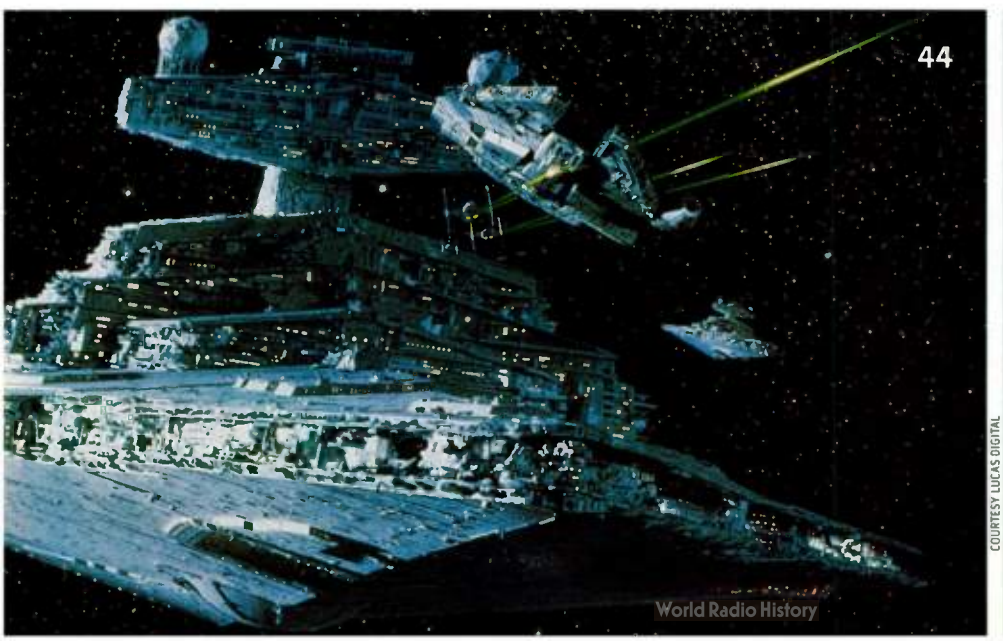

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Moog Music MF-107 FreqBox effects processor

Propellerhead Software *Abbey Road Keyboards 1.1* (Mac/Win) ReFill sound bank for Propellerhead Reason

Source Audio Hot Hand Wah and Wireless Adapter effects processor

Ultimate Sound Bank PlugSound Pro 1.0.0 (Mac/Win) sample player

sE Electronics Reflexion Filter portable sound absorber

Pro Audio Vault Blüthner Digital Model One (Mac/Win) sampled-piano virtual instrument

Nady Systems TRM-6 tube ribbon microphone

Iced Audio AudioFinder 4.5.7 (Mac) audio-file browse, search, and edit utility

***Music, Money, and Success*, 5th ed.** music-business book

By Musicians, for Musicians

Since founding editor Craig Anderton launched EM more than 20 years ago, our primary objective has been to champion the do-it-yourself spirit in the personal studio. Over the years, EM has expanded its focus beyond kit-building projects to include all levels of audio production. And as new ways of working materialize, we're here to help you, the musician, get a handle on them so you can fulfill your creative goals when they involve technology.

Our authors and editors filter out the marketing hype, educate you about the latest hardware and software in our reviews and roundups, and teach you how to use those products through tutorials, columns, and master classes. But it's always in service of the music—the products we cover are merely the tools that help us make and deliver music.

I feel strongly that *Musician* is the most important part of the magazine's name. Over the next few months, EM will focus more and more on the work of musicians in their studios and, in particular, how they deal with the issues that are important to music making. For instance, check out this month's featured artist, drummer extraordinaire Omar Hakim. As an A-list percussionist, he has been doing remote recording sessions for more than a decade—well before it was practical to exchange large audio files over the Web. Hakim's dedication to the craft of recording makes him a prime example of the tech-savvy musician that EM will focus on in the coming issues.

JANE RICHEY

Sure, it's fun to geek out over a sexy new monitor, microphone, or soft synth, or drool over some obscure vintage piece. But we're not a magazine for collectors; EM is for artists who are interested in expanding their knowledge and skill set. So even though the engineers and recording artists we interview may have an impressive mic closet or synth collection, our emphasis will always be on how to solve practical musical and technical challenges in the personal studio.

For instance, in this month's recording feature about large-diaphragm dynamic mics, Myles Boisen concentrates on a common type of transducer that is frequently taken for granted and gives you specifics on how and when to use it. Although he names a few of the mics he prefers, the crux of the article is about practical applications. So even if you don't have this kind of mic, you'll still take away some useful tips on recording.

During my nine years at EM, I've particularly enjoyed seeing how far musicians will stretch to achieve their musical dreams. All of our editors started out as instrumentalists, but they honed their DIY tech chops so they could record their music or sound great live without having to rely on someone else to make it happen. The same goes for our freelance authors, such as Boisen, Michael Cooper, and Eli Crews, each of whom has a byline in this issue. Not only do they work as professional musicians *and* record outside clients in their studios, but they also enjoy sharing their expertise with others, putting to rest the myth that "those who can, do; those who can't, teach."

Consequently, the features, columns, and reviews in every issue of EM represent dozens of years of experience. I hope you find our work both educational and inspiring. Keep in touch!

Gino Robair
Editor

Electronic Musician

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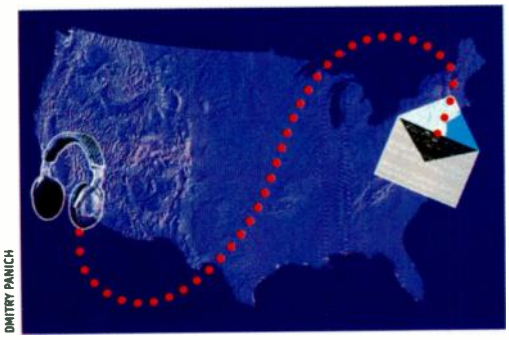

DMITRY PANICH

Letters

A Real Podcast

Thanks so much for finally creating an RSS feed for "EM Cast." At a breakfast with Steve Oppenheimer at the last Winter NAMM, I bugged him about making it a true Podcast rather than just providing MP3 files for download from the Web site.

Keep up the great work!

Slau
via email

Where Are the Workstations?

I just finished reading the great article by the EM staff called "Build a Personal Studio on Any Budget" (see the September 2007 issue of EM), and I thought it was very informative. But you left out one affordable and flexible personal-studio possibility: the all-inclusive "workstation" studios that are available from Roland, Tascam, Korg, and others. The Roland/Boss BR Series comes to mind. They are great digital recorders, with built-in effects and CD burners, all with high-quality end results. There are many musicians out there that like these types of units because they are easy to use, the quality is high, and the recording procedures are very familiar.

To make your article complete, you should have included a unit in each price range in addition to the other computer-based systems.

Mitch Schecter
via email

Serious Appreciation

I just wanted to drop a note and say how much we appreciate having *Electronic Musician* as part of our collection here at the Center for Popular Music at Middle Tennessee State University. We really enjoy receiving your magazine, and our researchers have truly enjoyed using your publication for their studies.

Again, thanks so much.

Amy Hunsberger
Middle Tennessee State University
via email

Real-World Work

I enjoy your magazine—I find it filled with very useful real-world articles and reviews.

I was very excited to read about your expanding coverage on sound for picture with an emphasis on work being done in personal studios. Steve Oppenheimer said it best in "First Take: Get the Picture" when he said, "Today, thanks to the tremendous power of computers and software, you can produce pro-quality sound for independent films, animation, industrial videos, local TV, video games, and video for the Web—all in a personal studio." (For more on audio for picture, see the May 2007 issue of EM.)

My situation offers further proof of that statement, except that I also produce pro-quality sound for many big-budget studio films here in my modestly equipped personal studio. The film sound landscape has changed drastically over past years, opening up huge opportunities for the right person(s) with the right equipment. While the big-budget films are becoming fewer and fewer with their big budgets shrinking (except in a few cases), powerful computers and less expensive editing software such as Apple Final Cut Pro have opened up a world of sound jobs for medium- and low-budget films. They don't have the budget for time on a huge dubbing stage, but they can pay me handsomely for my expertise and equipment and studio to give them every bit as good a sound job for a fraction of the cost. The trick is to work efficiently, know where to cut corners, and know your equipment and studio's strengths and limitations.

Here in my converted two-car garage, I deliver sound design and effects for many of the high-profile projects that I work on, already predubbed, so that the track count is not insane, and so that my vision for the way a particular moment should sound can be achieved very quickly without going through a gazillion tracks. I can do this because I know exactly how my mixes from my studio will translate to the big dubbing stage.

On medium-size projects that will have a final mix on a dub stage, I often provide temp mixes for preview screenings in addition to the usual sound-editing tasks, which saves the production company hundreds of dollars per hour. Because of the savings I'm able to offer them, they will often do two or three preview screenings, whereas on a dub stage, they would only have the budget to do one. These preview screenings are held at the same theaters that show blockbuster films to the public, so it's always fun to attend and see how my mix holds up.

On low-budget projects, I can offer a top-to-bottom sound job utilizing my resources and expertise,

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Next Month in EM

COVER

Game Audio Overview

So you want to work for a game audio company? Here's what you need to know, including the gear and technical chops required to do the job, as well as what the day-to-day work flow is like.

FEATURES

Podcast Production

In this hands-on tutorial, Senior Editor Mike Levine discusses the latest software tools for creating professional-sounding Podcasts and offers practical production techniques.

Using Software Audio Analysis Tools

What are you listening to? Metering and analysis applications can help you understand what's really going on in your tracks. Learn what the common analysis plug-ins do and how to interpret their data.

COLUMNS

Making Tracks: I Get Surround

This tutorial demonstrates how to set up and manage a good-quality surround mix, with examples created in Digidesign Pro Tools.

Square One: Equalization

Learn about the various components of an equalizer, how they work, and how they can be applied to improve your sound.

Music Business Insider: Pandora

Tim Westergren, founder of the Internet radio service Pandora, talks about what his company has to offer musicians.

. . . and much more

Letters

usually providing a much more "film" sounding soundtrack than the client would have ended up with, leaving me with an ecstatic director and return business when he or she comes back to me with his or her next film and bigger budget.

Anyway, kudos to the magazine's vision in covering this area of growing sound opportunity for those with a little know-how and some decent equipment.

Scott Sanders
EarCandy Studios
via email

Good Timing

I deeply appreciate your article "Timing is Everything" (see the August 2007 issue of EM), as it has helped me logically organize the layers and layers of information that I have gathered over the years.

Needless to say, the technologies that surround digital clocking must be controlled precisely in order to achieve a consistent and stable signal throughout the music studio. The research and interviews presented in this tutorial should be considered essential knowledge to any sufficiently complex recording environment. Thank you for remaining a magazine that provides research and answers for the tough topics. Suggestion: next, take on the multitude of SMPTE issues.

Kentyn Grey
via email

Visible Grids

I am a subscriber to EM and thoroughly enjoy reading your magazine. I was checking out the article about quantizing audio drum tracks in Apple Logic Pro (see "Making Tracks: Slice, Move, and Glue" in the April 2007 issue of EM) when something caught my eye. In step 3 of the "Step-by-Step Instructions" section, I can see a tempo grid line passing through the audio region; however, I can't figure out how to make the grid visible through audio regions on my Logic 7 system. This would be very helpful information, as it makes a huge difference in the difficulty of aligning transients to the tempo grid. Do you know how to make the grid visible through audio regions?

Matt Emerson
Russell Springs, Kentucky

Matt—I think you're probably asking about the Arrange window grid behind the audio regions. If so, that is toggled in the Arrange window's View menu using the entry near the bottom named Grid. The white line passing vertically through the whole picture is the Song Position Locator (SPL). I hope this helps. —Len Sasso

OurSpace

You have one of the most well-written, informative, yet enjoyable and educational magazines I've read in a long time. Keep writing, and I'll keep reading.

Maya
www.myspace.com/elevatorium

Thank you so much for the support. What you do is so important for people like me who are trying to get the best out of studio recording. I hope to start recording directly from my digital piano into my laptop soon, so I will need to do lots of research!

Natasha Miren
www.myspace.com/natashamiren

Thank you, my friends, for a wonderful mag. I've been reading it for longer than I care to tell. Rock on!

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KLAUS D. MUELLER

EMspotlight

From Analog to Digital with Klaus Schulze

With his complex sequencer lines and hypnotic soundscapes, German synthesist Klaus Schulze was an influential force on the electronic-music scene in the early '70s. In this interview from the archives, Schulze describes how he composes, talks about working with acoustic instruments, and explains why every musician should learn to play the drums. By Ben Kettlewell. emusician.com/em_spotlight

SHOW REPORT

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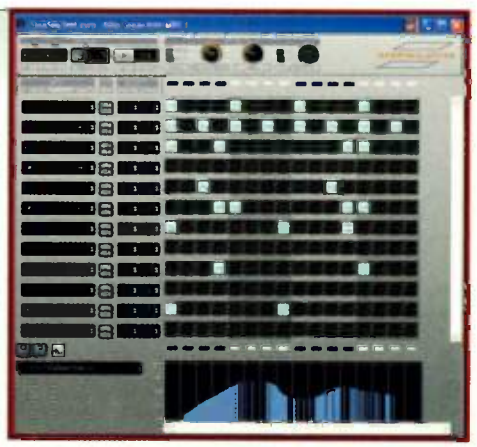
By Len Sasso

Dave Smith Instruments Prophet '08

To everyone's (or perhaps no one's) surprise, Dave Smith Instruments (http://davesmithinstruments.com) announces the return of the Prophet. The 8-voice Prophet '08 ($2,199) is firmly rooted in the present, although its completely analog signal path—two oscillators, resonant lowpass 2- or 4-pole filter, and VCA—uses new Curtis ICs, similar to those found in the original Prophet-5, -10, -600, and -T8 synths, to reproduce the famous Prophet sound. Each program has two layers, which you can split or stack and route to the same or separate outputs. The instrument has a 5-octave, semi-weighted, Velocity-sensitive keyboard with Aftertouch, and pitch and mod wheels. The hand-signed Special Edition ($2,699) includes a patch editor-librarian (Mac/Win, $49.99).

The Prophet '08 really steps away from the past in the modulation department. Poly-Mod is superseded by a full-featured modulation matrix. You can route the synth's 4 LFOs, 3 envelope generators, 4 note-gated 16-step sequencers, and a variety of MIDI messages to 43 destinations. You also get a latching arpeggiator that you can sync to an incoming MIDI Clock. When 8 voices are not enough, you can daisy-chain 2 Prophet '08s together to play as a single 16-voice synth.

Cakewalk Sonar 7 Producer Edition



Sonar 7 Producer Edition (Win, $619) brings a bevy of new features to Cakewalk's (www.cakewalk.com) flagship digital audio sequencer. On the MIDI side, the most exciting advance is a new step sequencer with 16-steps-per-beat resolution and 64-beat patterns. The sequencer supports odd time signatures, Velocity offset and scaling, and flexible drum mapping and MIDI routing. Multiple controller lanes in its Piano Roll View editor and new user-configurable Smart MIDI Tools sets round out the MIDI upgrade.

The most requested advance on the audio side is internal sidechaining for the Sonitus:fx Compressor, Sonitus:fx Gate, VC-64 Vintage Channel, and sidechain-compliant VSTi plug-ins. Other audio enhancements include integration with external hardware, featuring automatic plug-in delay compensation; Dim Solo to lower unsoloed tracks by 6, 12, or 18 dB; and support for new file formats (Sony Wave-64, AIFF, CAF, FLAC, and SDII). The 64-bit linear-phase mastering plug-ins LP-64 Multiband (a compressor/limiter) and LP-64 EQ add the final touch to your mixes. Version 1.5 of the Roland V-Vocal VariPhrase processor adds pitch-to-MIDI conversion. Z3TA+, Rapture LE, Dimension LE, and DropZone beef up Sonar's complement of virtual instruments. You also get integrated CD ripping and burning as well as Cakewalk Publisher 2.0 to create customized streaming music players for your Web site.

Propellerhead Software Reason 4

PropellerheadSoftware(www.propellerheads.se) is now shipping the highly anticipated Reason 4 (Mac/Win, $499). The flashiest new item is the semimodular synth, Thor. It starts with six types of oscillators and four types of filters that you allocate among three oscillator and three filter slots. You can modulate anything with anything using Thor's modulation matrix, and the built-in step sequencer has a note lane and two controller lanes. A large bank of patches from pro sound designers helps get you started.

The RPG-8 arpeggiator module complements Reason's Matrix step sequencer with features such as selective note muting and Single Note Repeat toggle. The multichannel ReGroove Mixer lets you dial in timing and accent grooves for real-time manipulation of note sequences.

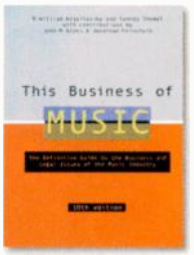
Reason's built-in sequencer gets a welcome redesign. Sequencer tracks now have separate lanes for notes, automation, and performance data. All data is organized in clips that you can move, copy, split, and merge. You select tools from a floating tool palette that also provides access to editing functions such as quantization and transposition. Programming enhancements for the Combinator (predevice transpose and data filter) and NN-XT (multisample edit and chromatic automap) round out Reason 4's new feature set.

BackLine Engineering RiffBox

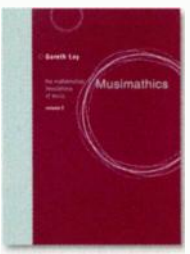
BackLine Engineering (www.backline-eng.com) announces firmware update 5.0 for its RiffBox audio-looping stompbox ($399). The update adds five much-requested features: abort recording by footswitch, autostart for manual recording, toggling between record and playback, loop length from MIDI note count, and MIDI-triggered layer erase. As always, the free update is a MIDI SysEx file that is downloadable from the company's Web site.

The RiffBox's claim to fame is its ability to detect individual note transients as well as rhythm and pitch patterns, and then to start loop playback with perfect timing based on those patterns without the user having to stomp at the exact moment. In rhythm-detection mode, it looks for a repeating pattern of attack transients, whereas in pitch-detection mode, it looks for a repeating pattern of pitches or for a note whose pitch matches the first note's. In all, you get 77 operating modes, including standard stompbox, delay and doubling effects, layering, half-speed, reverse, and stop or fade after a certain loop count. You can sync to an external drum machine, and you can change loop length in real time. The RiffBox records in 16-bit, 48 kHz stereo or mono, yielding 40 or 80 seconds of recording time. Audio memory is volatile, but the RiffBox remembers 100 presets, capturing all settings.

Get Smart



Since 1964, *This Business of Music* ($29.95) has been a practical resource for understanding the complexities of the music industry. Now in its tenth edition, the 528-page hardbound book provides valuable up-to-date information to artists, agents, songwriters, publishers, labels, and lawyers caught up in the ever-changing world of musical entertainment. Written by M. William Krasilovsky and Sydney Shemel (with contributions by John M. Gross and Jonathan Feinstein) and published by **Billboard Books** (www.billboardbooks.com), this new revision addresses ongoing technological advances and how they continue to transform the creation and marketing of music. Chapters cover industry trends, artist contracts, foreign distribution, rights and royalties, copyright protection, licensing for media, piracy, payola, and numerous other topics.



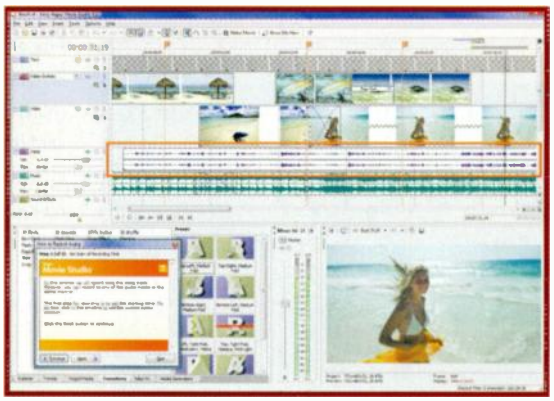
In *Musimathics: The Mathematical Foundations of Music*, vol. 2 ($50), author Gareth Loy continues to explore the intricate relationship between math and music. Beginning with a foreword by John Chowning (inventor of FM synthesis), the list of topics includes digital filtering, sampling, spectral analysis, audio compression, the wave equation, and the wavelet transform. For mathematically inclined composers, musicians, and audio professionals, this 562-page hardbound text from **MIT Press** (www.mitpress.mit.edu) provides a rigorous but intuitive introduction to the theoretical underpinnings of digital audio.

—Geary Yelton

Sony Creative Software Upgrades

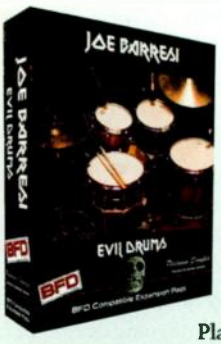
Sony Creative Software (www.sonycreativesoftware.com) has released major upgrades to its midlevel music and movie production tools. Acid Music Studio 7 (Win, $59.95) offers unlimited MIDI and audio tracks, simultaneous multitrack recording, in-line MIDI editing, multiple audio clips per track with automatic crossfading, and both MP3 and ATRAC AA3 encoding. More than 3,000 Acidized loops, 1,000 MIDI files, 90 DLS-compatible virtual instruments, and 25 DLS-based projects help get you started. The program also supports VST plug-in instruments and effects. Its full spate of mixing, MIDI editing, and CD-burning tools takes you well beyond entry-level desktop music making.

Vegas Movie Studio 8 Platinum (Win, $119.95) is to video what Acid Music Studio 7 is to audio. You can import and edit video on multiple tracks in almost any format, including high-definition HDV and Sony AVCHD. You get tools for compositing, color correction, audio time-stretching, and surround mixing. You can work in any aspect ratio with multiple



file formats and frame rates, and you can send a full-screen preview to a secondary Windows display. The program comes with more than 1,000 sound effects and DVD Architect Studio 4.5 for DVD burning. Both programs are Windows Vista and multicore-processor compatible.

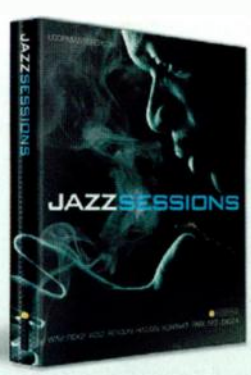
Sound Advice



Platinum Samples (www.platinumsamples.com) is now shipping the second expansion library in its Master Engineer Series for FXpansion BFD, *Joe Barresi Evil Drums* ($249.95). Barresi is best known for his engineering and production work for artists ranging from Weezer and Tool to Bad Religion and Queens of the Stone Age. Featuring drums played by Bobby Jarzombek of Riot and Halford, MIDI grooves played by Pat Wilson of Weezer, and samples recorded with as many as 250 Velocity layers, *Evil Drums* delivers Barresi's take on what makes drums rock. It supplies six full kits with additional kicks and snares recorded direct to analog tape. Like *Andy Johns Classic Drums*, the new collection requires BFD 1.5 and from 30 to 70 GB of free hard-disk space for installation.

From **Nine Volt Audio** (www.ninevoltaudio.com) and one of the original sound designers for Spectrasonics Stylus RMX comes *Beat Bandit: Hans Scheffler Edition* ($79.99), a DVD-ROM (also available as a download) that offers a REX-based loop library of global electronic rhythms. Using analog drum machines to generate beats and tones, Scheffler has assembled a unique collection of grooves that work in a variety of musical genres. *Beat Bandit* is organized into 60 Beat Suites in construction-kit format, each furnishing full mixes and variations with individual instruments muted and soloed. You also get 50 MIDI files, a QuickTime video tour, and plenty of kits and Multis programmed specifically for Stylus RMX.

Supplying 3 GB of samples and loops, *Jazz Sessions* ($149.95) promises to add swing, soul, and attitude to your recordings. More than 3,000 individual WAV files capture the sounds of seasoned jazz players doing



what they do best. The DVD-ROM contains almost 1,900 REX2 loops and more than 3,000 Acidized WAV files, as well as patches for HALion, Kontakt, EXS24, and NN-XT. You get over 450 drum loops, 130 percussion loops, 160 drum samples, 140 fretless bass parts, 160 brass section riffs, 96 Hammond organ loops, and plenty more. *Jazz Sessions* was created by **Loopmasters** and is available from Big Fish Audio (www.bigfishaudio.com).

—Geary Yelton

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X2 Digital Wireless XDR95

X2 Digital Wireless (www.x2digitalwireless.com) has just released the XDR95 24-bit digital wireless system ($899). The system consists of the body-pack XDT4 transmitter and the rackmount XDR4 receiver. The incoming analog signal is converted to a proprietary 24-bit digital format, and then alternate samples are transmitted on two separate RF channels. That allows interpolation between adjacent samples to fill in any dropped samples caused by interference from spread-spectrum devices. Two internal and two external antennas feed the XDR4's four separate receivers. The receivers recognize only the digital data sent by the transmitter; all other RF sources are ignored. No compression or other digital processing is used, and the company claims 10 Hz to 20 kHz frequency response with 118 dB dynamic range and 0.03 percent distortion (THD). The typical range is 300 feet line-of-sight.

The compact XDT4 transmitter weighs in at 0.3 pounds. It relies on a 9V battery for power, and you get slightly longer battery life using single-frequency mode when spread-spectrum interference is not a problem. The input jack is a ⅛-inch TRS connector. The AC-powered XDR4 receiver comes with rackmount hardware and a front-mounted half-wave antenna kit. You can use its unbalanced ¼-inch TRS and balanced XLR outputs simultaneously.

ManyTone Music ManyBass

ManyTone Music (www.manytone.com) has released the latest in its series of multisample-based synths. ManyBass (Mac/Win, $139.95) makes it easy to play realistic bass parts with a keyboard controller, but maximum realism still requires some careful MIDI editing. The plug-ins are provided in VSTi and AU format. The accompanying sampled-bass library is 2.4 GB, which makes it a rather long download, but a DVD version is available ($15 extra). A bundle that includes three additional sampled-bass libraries costs $199.95.

ManyBass puts as much of the bass under your fingertips as possible by using the full MIDI note range with key and Velocity switching. You can keyswitch among up to four different multisampled layers, and most multisamples use Velocity switching to select different playing effects. A typical multisample arranges effects (slides, harmonics, mutes, and so on) across the bottom 30 notes, allocates 4 notes to keyswitching, and splits the remaining nearly 8 octaves between 2 articulations (sustained and staccato, for example). Besides the traditional synth modules, you get an amp/cabinet simulator and a multi-effects block.

Download of the Month

CHARLIE ROBERTS CONTROLAID AND MIDISTROKE

Software designer Charlie Roberts offers several free music and media utilities for Mac OS X on his Web site (www.charlie-roberts.com). MIDIstroke and ControlAid are two of my favorites.

MIDIstroke transforms incoming MIDI messages to computer-keyboard keystroke sequences to control concurrently running applications. Apple iTunes and Iced Audio AudioFinder are good examples; it takes just minutes to set up MIDIstroke to trigger these applications' keyboard shortcuts remotely. You can then sit back with your compact MIDI control surface and run the show. You can get more creative by combining a keyboard shortcut application such as Startly Technologies QuicKeys with MIDIstroke to trigger virtually any menu command in any application.

ControlAid performs another useful MIDI mapping task: it reroutes incoming MIDI Note and Control Change messages to the channel of your choice. That's useful when you want to remotely control more faders, knobs, or buttons than your control surface can manage.

For instance, with the 8 knobs and 1 slider on an M-Audio Oxygen8 and ControlAid, you can manage volume, pan, and aux sends on 16 mixer channels and have several knobs left over for other purposes. You assign one knob or slider to select the target channel, and you set up MIDI remote in the target application to control each mixer channel strip with the same MIDI Control Change messages on a different MIDI channel. Similarly, you can dedicate drum pads or an octave of your MIDI keyboard to triggering clips in an application such as Ableton Live, and then use the 16 MIDI channels to expand the number of clips you can trigger. Other ControlAid tricks include using the mouse as an *x*-*y* MIDI controller, creating multiple MIDI output messages for a single MIDI input message, and triggering notes from the computer keyboard. EM

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THE FUTURE OF SOUND

Think Small

By Scott Wilkinson

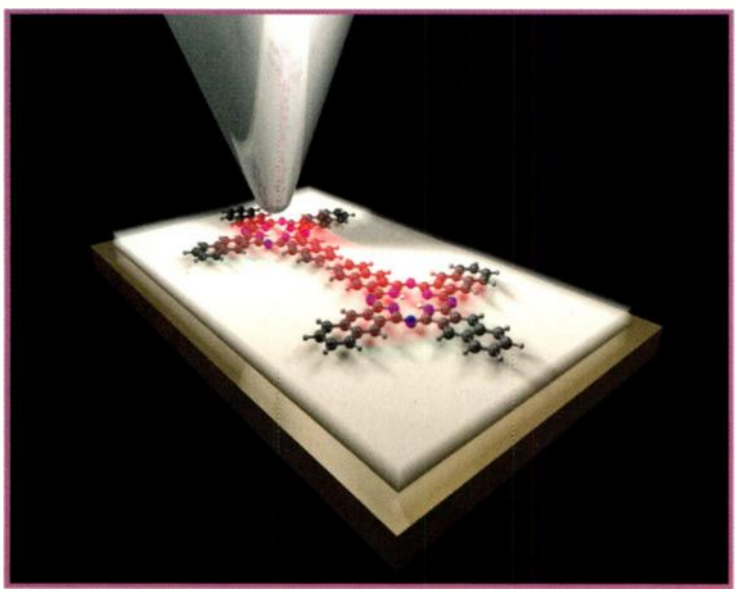
How about a supercomputer in a grain of sand?

Every electronic musician knows that digital technology decreases in size as it increases in power. Intel cofounder Gordon Moore quantified this trend in his now-famous prediction that the number of transistors in a square inch of integrated-circuit material doubles every couple of years. Now known as Moore's law, his prediction has held true since it was first stated in 1965.

But how long will it continue to hold true? If IBM scientists have their way, it could be a while. Teams at the IBM Almaden Research Center (www.almaden.ibm.com) in San Jose, California, and the IBM Zurich Research Lab (www.zurich.ibm.com) in Switzerland are working on separate projects that could point the way to atomic memory elements and molecular logic gates.

The Almaden team is exploring a property of atoms called magnetic anisotropy, which refers to the fact that under certain conditions, an atom's spatial orientation can be controlled and measured. Ultimately, putting an atom in one orientation could represent a 0, while putting it in a different orientation could represent a 1.

Up to now, no one has been able to measure a single atom's magnetic anisotropy, but with the help of a scanning tunneling microscope, which was invented by IBM scientists 20 years ago, the Almaden team has successfully positioned and measured the anisotropy of individual iron atoms on a specially prepared copper surface.



COURTESY IBM

FIG. 1: A scanning tunneling microscope probes a pair of naphthalocyanine molecules with two hydrogen atoms at their centers. When the atoms change position, the entire molecule is electrically switched on and off, creating a rudimentary logic gate.

"One of the major challenges for the IT industry today is shrinking the bit size used for data storage to the smallest possible features, while increasing the capacity," says Gian-Luca Bona, manager of science and technology at the Almaden Research Center. "We are working at the ultimate edge of what is possible, and we are now one step closer to figuring out how to store data at the atomic level."

Meanwhile, the Zurich team is working on another thorny problem: creating molecular switches that can function as transistors. Molecular switches have been demonstrated before, but they tended to change shape during the transition from one state to the other, making them unsuitable as logic gates or memory elements.

Using two hydrogen atoms within an organic molecule called naphthalocyanine, the team has created a stable switch that retains its shape as it turns on and off (see **Fig. 1**). Interestingly, this discovery was made by accident; the original intent of the research was to study the molecule's vibrational characteristics. But the team discovered that naphthalocyanine can behave as a switch without changing its shape.

"One of the beauties of doing exploratory science is that by researching one area, you sometimes stumble upon other areas of major significance," notes Gerhard Meyer, senior researcher in the nanoscale science group at the IBM Zurich lab. "Although the discovery of this breakthrough was accidental, it may prove to be significant for building the computers of the future."

It will be many years before any commercial products emerge from these developments, but they point the way toward atomic and molecular computing and storage. Imagine packing 150 trillion bits of data into a square inch of space, 1,000 times the density of current technology. That's the equivalent of 30,000 full-length movies or the entire contents of YouTube in a device the size of an iPod. Or how about a nanoprocessor the size of a dust mote?

Such advances in computer technology could enable heretofore unimaginable musical tools, like virtually unlimited audio storage in memory chips the size of postage stamps and real-time DSP operating on a nearly infinite number of super-high-resolution tracks. I don't know about you, but I'd sure like to see something like that in my home studio. EM

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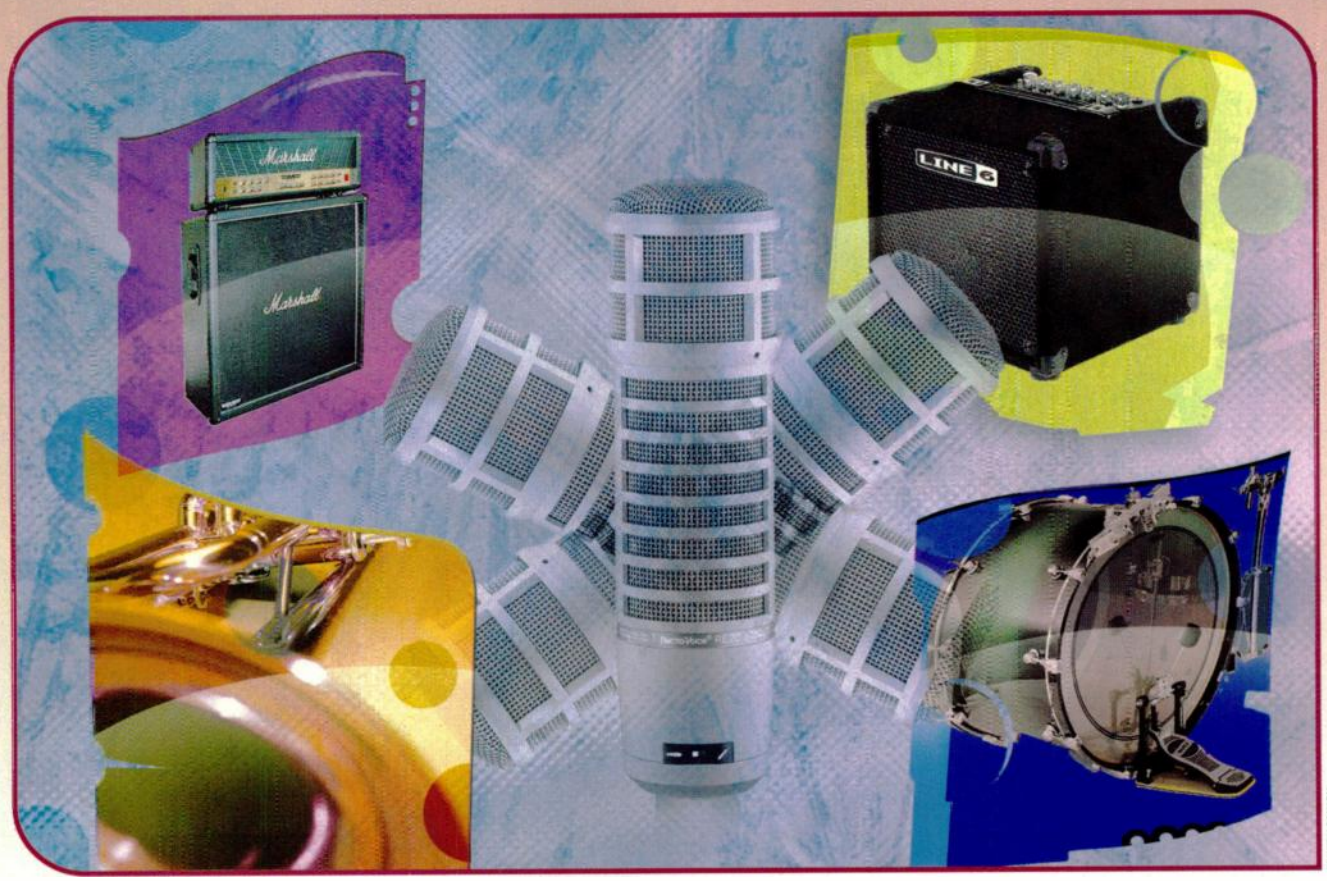

DMITRY PANICH

Capturing Big Sounds

By Myles Boisen

Large-diaphragm dynamic mics aren't just for kick drums.

Dynamic microphones, the blue-collar workers of the recording and live-sound world, have a well-deserved reputation for reliability and tough construction. Within the broader category of dynamic transducers, and the focus of this article, are those with large diaphragms. Although there is no strict industry standard for what constitutes a large diaphragm as it relates to dynamic mics, typically any diaphragm that is ¾ inch or more in diameter qualifies as large.

Large-diaphragm dynamic mics are known for delivering superior bass response, and many major microphone companies market such products specifically as bass drum mics. (For a comprehensive comparison of seven popular bass-drum mics, see "Kickin' It" in the February 1999 issue of EM, available online at www.emusician.com.) It is commonly believed that a larger diaphragm automatically picks up a greater proportion of low-end frequencies or a warmer sound; however, this is not quite true. In fact, it is technically possible for a sophisticated small-diaphragm condenser mic to provide a flat response down to 20 Hz. But the most cost-effective method of getting better lows out of a dynamic mic is to increase the diaphragm size and then boost low-end coloration through design principles. (In general, dynamic mics are affordable due to their simple mechanical design and relative ease of mass production.)

Although there are a few exceptions, large-diaphragm dynamic mics are usually front address, have a cardioid pattern, are bigger in size than a typical dynamic vocal mic, and are meant to be

stand mounted for use with stationary instruments, rather than held in the hand. Because of the increased size and advanced design features, they also tend to be the most expensive type of dynamic transducer.

Dynamic mics function as a loudspeaker in reverse. The diaphragm is a moving induction coil—basically a flat disc or a shallow cuplike assembly with wire wrapped around its circumference. In response to sound pressure arriving at its surface, the diaphragm moves relative to a permanent magnet situated underneath it (see **Fig. 1**). The movement of the coil within a magnetic field generates a small electrical current.

Due to the relatively high mass of the diaphragm, dynamic mics tend to be less responsive to subtle sounds when compared with condenser or ribbon microphones. Many dynamic mics have tight cardioid patterns, which, combined with lowered sensitivity, make this kind of transducer ideal for reducing off-axis bleed in loud environments and in small or crowded studios. Overall, dynamic mics are rugged, maintenance-free, and ideally suited to the abuses of location recording and live sound. (For more information on dynamic mics, see "Square One: Vive la Différence" in the March 2006 issue.)

Added Color

Dynamic mics tend to be less flat and more colored in their frequency response than condenser mics. And compared with ribbon and condenser mics, the mass of a dynamic diaphragm simply can't offer the fastest possible transient response. These qualities make the dynamic mic less than ideal for situations where sonic fidelity is a priority, such as in classical or audiophile recording.

Dynamic mics are rarely my first choice for tracking acoustic guitar, percussion, piano, and the like. These delicate sonic sources usually pair best with the high resolution, sensitivity, and accuracy of a condenser mic.

However, it is important to consider that the most expensive mic, such as a condenser or ribbon, may not be the best-sounding choice for a particular style of music. Consequently, dynamic mics make an interesting creative tool for miking amplifiers or other sources in situations where an ear-catching sonic signature takes precedence over hi-fi realism. Top engineers who have every kind of mic at their disposal will often use a Shure SM57 (www.shure.com) on snare or a Sennheiser MD 421 (www.sennheiserusa.com) on toms, simply because it is a sound they prefer and can dial in quickly. Sometimes the slower transient response of these mics can be an advantage as well, providing a type of peak compression and a vintage vibe on drums, vocals, and guitar amps.

Dynamic mics are also well suited for use in high-humidity environments or where there is a lot of moisture, such as when close-miking harmonica, flute, or vocals. The ability to handle high sound-pressure levels (SPLs in excess of 150 dB), plosives (the blasts of air associated with vocalizing the letters *p*, *b*, *t*, and *d*), and wind is another advantage dynamic mics have over other kinds of transducers.

Additional Features

Some large-diaphragm dynamic mics have enhancements that are beneficial for studio recording. For example, the Sennheiser MD 421 has a 5-position adjustable low-end rolloff switch located near the XLR connector. This filter is designed to reduce the proximity effect when doing vocal work in studios and in radio broadcasting. But it also is effective when close-miking instruments. The Electro-Voice RE20 (www.electrovoice.com) also has a switchable single-position low-cut filter built in.

Stedman (www.stedmancorp.com) makes a few interesting variations on large-diaphragm designs. Its LD 23 and LD 50 models are both conventional-looking large-diaphragm mics that can be handheld. The Stedman N90 is a side-address dynamic that not only looks like a large-diaphragm condenser mic, but also offers condenser-like specifications.

Heil Sound (www.heilsound.com) also has a large-diaphragm dynamic with the appearance and flat frequency response of a side-address condenser. In addition, Heil makes two mics, the Commemorative Classic and the Classic Pro, that resemble vintage ribbon mics on the outside but have large-diaphragm dynamic elements on the inside.

Audio-Technica (www.audio-technica.com) makes a unique kick-drum mic, the ATM 250DE, that includes dynamic *and* condenser elements with two separate outputs. (The AE2500, a similar mic, was reviewed in the November 2003 issue.)

Preamp Makes a Difference

In any discussion of miking, it is always important to consider the role of the microphone preamplifier. At times in my testing of preamps for EM reviews, I have been very surprised by the way a humble dynamic mic can open up when connected to a high-quality tube or solid-state preamp, resulting in markedly improved sound quality. Typical results in these cases include an

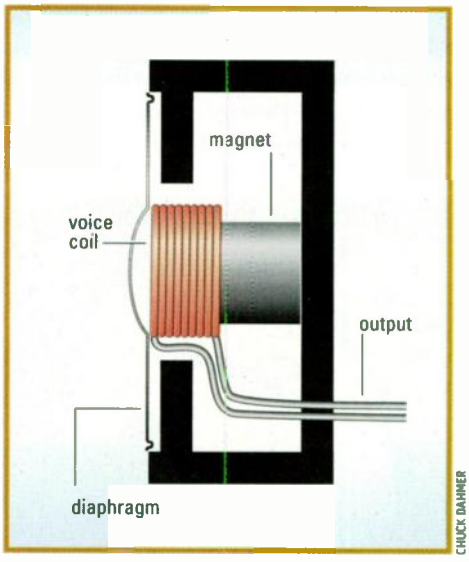

FIG. 1: In a moving-coil dynamic mic, the diaphragm is attached to a coil of wire that vibrates within a magnetic field. That induces an electrical signal in the wire that corresponds to the incoming acoustic waveform.

expansion in the pickup of the high- and low-frequency range, richer midrange harmonics, and a more immediate presence on percussive transients.

Proper loading—the complex impedance interaction between a mic and a preamp—can also make a big difference in the sound of a mic. A deluxe preamp with switchable input impedance will offer two or more loading options that may affect the timbre, as well as the output gain, of the connected transducer.

The Obvious Choice: Drums

The powerful low-end response and superior isolation of many large-diaphragm dynamic mics make them a favorite for miking drums, the bass drum in particular.

Inside the bass drum. There are a number of variations in placement on a kick drum. Positioning the mic inside the drum shell—pointed at the beater and close to the beater head—yields a sound that will consist primarily of punchy lows and a well-defined, often clicky, beater attack. When soloed, this type of sound can appear to be deceptively thin and not at all representational of a real bass drum in a room. But when added to a full complement of drum mics, such a close-miked kick tone is often perfect for a range of rock, dance music, and contemporary roots-music styles.

Moving the mic further from the beater head increases the proportion of shell resonance. This generates a more realistic tone, with a fuller midrange and less attack. Adding tone in this manner often makes it more of a challenge to get the kick drum track to cut through a dense mix. But this approach may be more sonically and musically appropriate for a project where the bass drum is not necessarily a central or prominent feature.

Positioning the mic in the center of a hole cut in the drum's front head delivers a fairly realistic tone with a lot of character, but the resulting sound is often lacking in defined attack unless the drum is well tuned and somewhat dampened with a pillow or blanket inside (see Fig. 2). However, with proper tuning and the right beater choice, a drum can have a focused sound at the hole, making this a viable recording method for rock and other styles (see Web Clip 1 and "Capturing the Kit" in the July 2004 issue).

FIG. 2: Miking the hole in a bass drum's front head results in plenty of character, but success lies in how well the drum is dampened and tuned.

MYLES BOISEN

Outside the kick drum. For bass drums without a hole in the front head, close-miking the center of the front head gives the greatest amount of resonance and low end. Moving the mic toward the edge of the head increases the amount of attack and higher harmonics while downplaying the inherent boom of a drum. I often use an intermediate position, at a distance of 2 to 6 inches from the center, to balance low end and attack. Typically, I will roll off some of the low end from a kick drum track recorded in this manner when it comes time to mix.

For most of the bass drum recording I do, the Sennheiser 602 is a fantastic tool. The 602's handling of highs and lows gives me exactly what I need in most circumstances to get a sharp, punchy kick sound with little or no repositioning. This mic also has the ability to extract a usable tone from substandard or poorly tuned bass drums. (For more information on recording bass drum, check out "How to Record a Kick Drum" in the July 2002 issue.)

Toms. The principles mentioned for recording a solid-head kick drum apply directly to the use of large-diaphragm dynamics on rack and floor toms. Positioning the mic closer to the center of the head yields a resonant, bassy tone. Moving the mic toward the edge of the head picks up more of the complex harmonics of the drum and a higher proportion of stick sound.

Two additional issues come into play for this application. The first is obvious: keep your mics out of harm's way by not putting them too close to the center of the head, where the drummer strikes. Unless the drumheads are brand-new, there will be an obvious wear pattern on the head that will let you know immediately where the drummer tends to hit the tom.

The second issue is isolating the toms from cymbal and snare bleed. Dynamic mics tend to be less sensitive to off-axis pickup, but the leakage that does get through can be highly colored, creating problems in the mix. Gating the tom mics is one solution to the problem. Another is careful placement that maximizes the rejection of other components of the kit. When possible, avoid placing tom mics directly underneath cymbals. Position the mics so that the cymbals or other drums are oriented toward the rear of the mic, 180 degrees off-axis.

Beyond the Drum Kit

Any source with significant low-end content is a good candidate for a large-diaphragm dynamic mic. Let's look at some of the more common applications.

Bass cabinet. A large-diaphragm dynamic can be an excellent choice for miking an electric bass cabinet, especially when excessive volume raises concerns about using a condenser mic. Pointing the mic directly at the center

of the speaker cone tends to emphasize treble response, upper harmonics, and pick and string sound. A rounder and bassier tone results from moving the mic toward the outside edge of the cone. A balanced tone can often be achieved simply by placing the mic between the center and the edge of the cone, and then angling it slightly toward the middle to increase high-end definition (see **Fig. 3**).

Bear in mind that many bass speakers these days have low-frequency ports, and often high-frequency tweeters as well. These features need to be taken into account and can either be emphasized or de-emphasized with mic placement.

Acoustic bass. I have found that a condenser mic is generally the best choice for recording acoustic bass, due to its faster transient response and better high end. However, a large-diaphragm dynamic can also deliver a satisfactory stand-up bass sound. And due to its lower susceptibility to feedback, this type of mic may be the best choice for a bass in live-sound reinforcement.

Miking the instrument in front of the bridge typically offers the most balanced and representational sound. But usually this kind of placement has to be at a distance of one foot or so to accommodate bowing. Miking the bass in front of the f holes provides more gain and better isolation but tends to favor a boomy and uneven timbre, with some notes coming out much louder than others.

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FIG. 3: In this photo, an Electro-Voice RE20 points between the center and the edge of the bass speaker. Note how it's angled slightly toward the middle to increase high-end definition and achieve a balanced sound.

Electric guitar. One of my favorite guitar mics is the large-diaphragm Sennheiser MD 421. The tonality of this mic, which blends high-end cutting power with

low-end punch, seems perfect for many of my guitar recording needs. All of the aforementioned tips for recording a bass cabinet are also applicable here.

A great guitar-amp recording trick is to use the 421 and a ribbon mic side by side, directly in front of the speaker cone and about four to six inches back from the amplifier's grille cloth. To reduce the effects of phase cancellation, the diaphragms of the two mics should be as close together as physically possible.

Angling each of the mics slightly toward the outside edge of the speaker and then panning the two guitar tracks apart in the mix produces a stereoized sound that is bigger, airier, and more commanding than the conventional single-point guitar sound. This mic technique can also add excitement to any source run through a conventional amp: organ, synth, electric piano, amplified acoustic instruments, and samples.

Brass and sax. Condenser mics often have an exaggerated high-end response, which can make them less than ideal for recording brass instruments such as tuba and trombone. Dynamic mics (and ribbon mics as well) tend to soften the high-end sizzle on these instruments, making them easier on the ear when close-miking.

Positioning the mic at the edge of the bell, rather than aiming it down the center of the bore, captures a more complex sound with superior low end and less harsh highs (see Fig. 4). Low brass instruments can also put out deafening SPLs, which a dynamic mic can easily handle.

The Sennheiser MD 421 and Electro-Voice RE20 are large-diaphragm mics commonly used on saxophones and brass. When a suitable condenser mic is not available, this type of microphone makes a good alternate choice for studio work.

The aforementioned transducers are also staples of any decently equipped live-sound setup. A large-diaphragm dynamic provides needed low-end heft, due to increased proximity effect as well as the boosted bass response of the mic itself. These mics also work well for less common wind instruments such as bass flute and bass clarinet.

Vocals. It's no secret that the huge, booming tone of a classic radio announcer is created by working a large-diaphragm dynamic mic as close as possible to deliver maximum intelligibility and proximity effect. Most condenser mics are too susceptible to popping for this kind of trick, and ribbon mics may well be damaged or destroyed by plosives this way.

In the studio, rock and rap vocalists in particular may be most comfortable with the freedom of movement and familiarity that a handheld dynamic mic provides. And for beatboxing, a dynamic mic is the only way to go. The resulting sound, though it may lack the transparency and air of a condenser mic, is often punchy, well defined, and easy to place in the foreground of a mix.

Dynamic mics make an interesting creative tool where an ear-catching sonic signature takes precedence over hi-fi realism.

MYLES BOISEN

FIG. 4: Position the mic at the edge of the bell of a brass instrument to capture low end while mitigating harshness.

Unconventional Uses

I have put large-diaphragm dynamics to work on a number of unusual jobs. These include miking the lower rotating bass speaker of a Leslie cabinet, tracking a didgeridoo, and using one as an experimental drum-room mic.

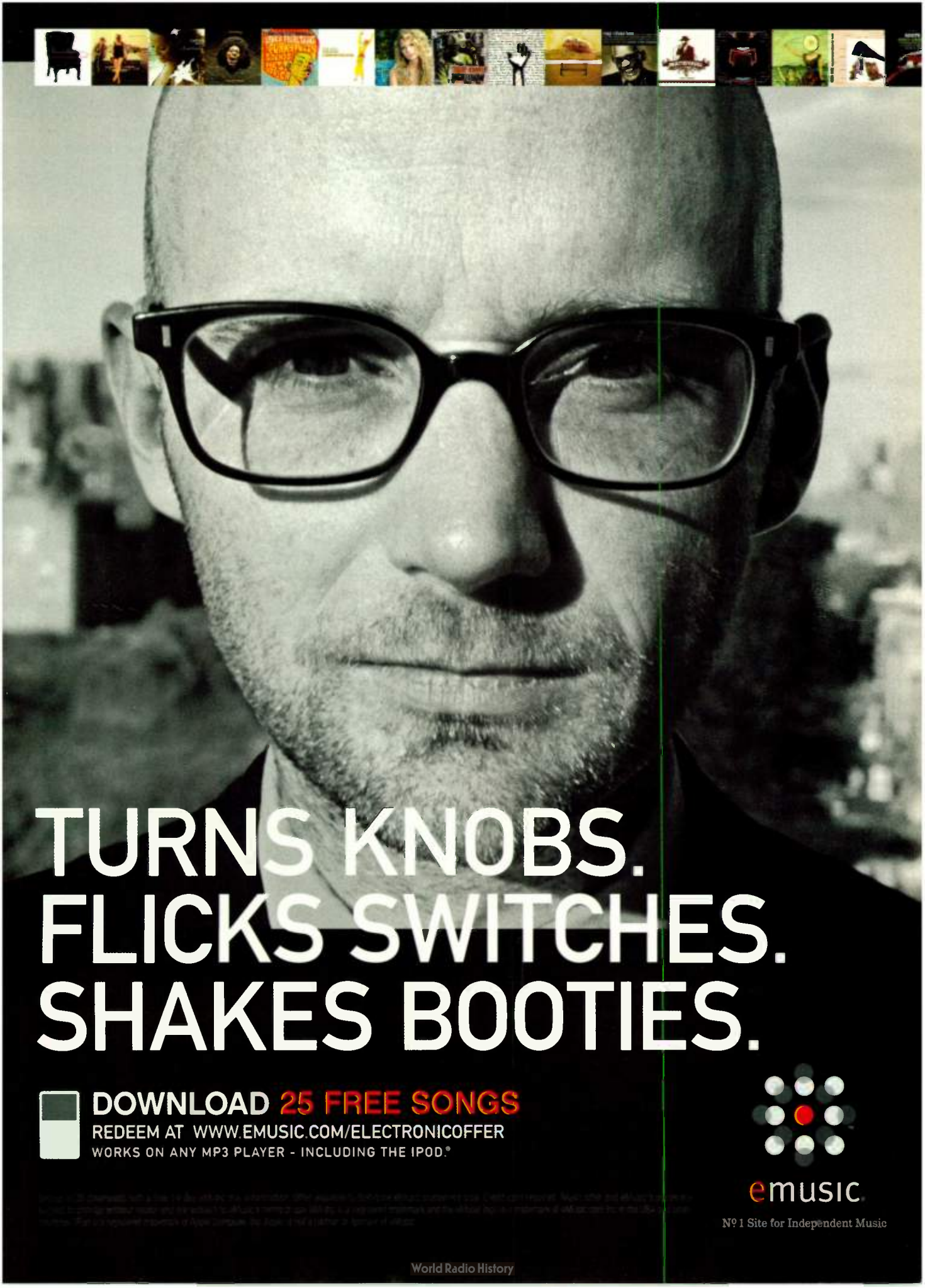
I obtained unusual coloration using a large-diaphragm dynamic as an ambient drum-room mic: I placed it inside the shell of a floor tom, which was laid on its side on the floor a few feet away from the drum kit. This technique tends to emphasize a few boomy low frequencies. But with some attention to placement and drum tuning, it can add a unique and hugely resonant timbre to the sound of the kit. I have also gotten some wild sounds by placing drum-room mics inside metal tins, canisters, and garbage cans.

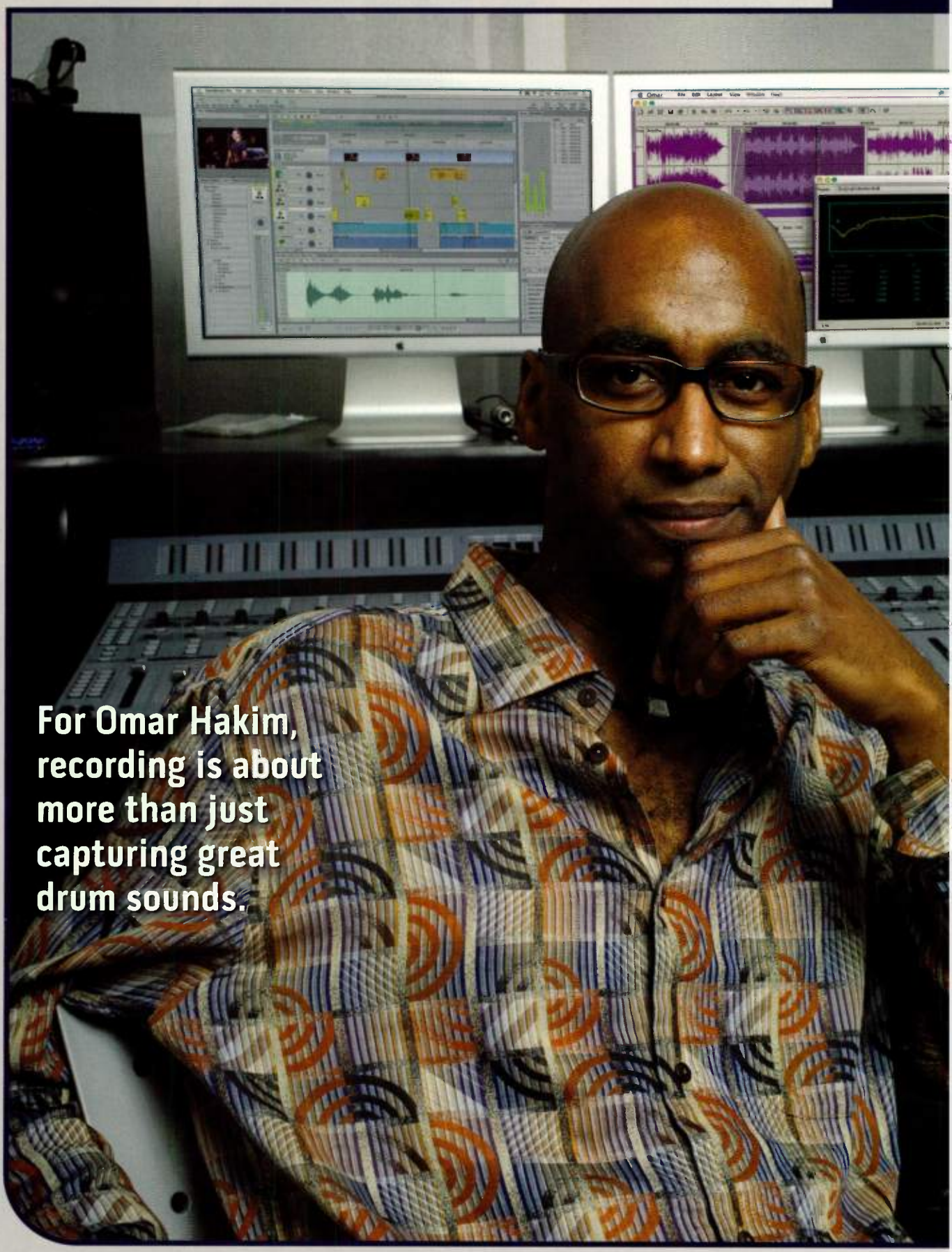
Big and Bad

Although it's tempting to think of large-diaphragm dynamic mics as being for bass drum and other limited uses only, they form a versatile class of transducer with numerous potential applications for recording. Some models offer superior sonics and deluxe features applicable to instrumental and vocal use. And while dynamic mics have a reputation for being rugged and affordable rather than sonically sophisticated, in many cases they offer distinct advantages over the delicacy and flat response of condenser and ribbon mics. EM

EM WEB CLIPS

Myles Boisen runs Guerrilla Recording and the Headless Buddha Mastering Lab in Oakland, California. He can be reached through his Web site at www.mylesboisen.com.





PHOTOGRAPHY BY MIKE MCGREGOR

WITHOUT MISSING A BEAT

By Mike Levine

As one of the world's elite drummers, Omar Hakim has worked with everyone from Sting to Michael Jackson to Weather Report to Miles Davis. He's known for playing a range of styles, including jazz, funk, R&B, and rock.

Hakim is also a composer and will soon be releasing a new solo album, much of which he cowrote with keyboardist Scott Tibbs, with whom he performs frequently.

Hakim has been into personal-recording technology since his teenage years. Currently, he has a studio located in a loft in suburban Westchester County, just north of Manhattan. Its most unique feature is a modular, acoustically treated and soundproofed room that he purchased and had placed in the middle of his loft. Hakim uses the structure, which weighs 12,000 pounds, as his live room for recording his acoustic drum kit, and as his control room (see **Fig. 1** and **Web Clip 1**).

In addition to conventional studio work, Hakim does frequent remote drum sessions from his studio, works on his own projects, and of late has begun mixing outside projects as well. His setup allows him to record both his acoustic and electronic kits, and it offers balanced acoustics for mixing. I recently had the opportunity to visit the studio and interview Hakim.

What are the dimensions of your recording room?

The interior dimensions of the room are 12 by 16 feet, with an 8-foot ceiling. The company that manufactures it is called Industrial Acoustics. It's modular, and made from 2-foot and 3-foot pieces that actually fit together like a puzzle. The room is floated, it's actually on floated bars.

Could it be moved?

It could be moved, it could be torn down and moved. It's not cheap to move it, because it takes a crew of guys.

I see that your electronic kit is outside of the sound room.

I can keep the [Roland] V-kit out here because there's no sound issue with the neighbors. Typically I do MIDI parts and V-Drum stuff out here. And then I can take the V-Drum brain into the main room and dump the data into my main system.

Which is . . . ?

A [Digidesign] Pro Tools HD 3 system. This system out here is a Pro Tools LE setup. And I'm actually upgrading to an 003 interface today.

You do a lot of remote session work.

I've been doing that for more than 10 or 12 years. In the early to mid-1990s I had an [Alesis] ADAT system. I used to get the VHS tapes in the mail. And I can't tell you how many sessions I put my drums on ADAT tapes, spread over two tapes, and I FedExed that over to a producer on the West Coast or wherever, and he flew them into his system and they ended up on albums. I've been a big supporter of technology and new technology.

Have you always been tech savvy?

Even before home studios were the thing. My friend and I used to jury-rig recording systems together at my mom's house. We'd pull together different gear like a Tascam P.A. board and an Otari 4-track tape deck, and we'd wire our own patch bays and make our own cables. We used to do this as teenagers and in our early twenties. It was a fun thing to do and we were learning at the same time. So for me, when the home-recording thing started to take off, I was already in that mind-set of trying to create high-quality recordings at home. Then eventually the computer became the centerpiece of the home studio. I had the early versions of computer sequencers and MIDI interfaces and all that stuff. So I've been in this game since the '80s, really. When Pro Tools came along, and I saw the power of the whole TDM concept, and plug-ins, and working in the box, I was an early adopter.

You use both an acoustic kit and your V-Drums for recording. Is it a big transition to go between the two types of kits?

It's not much different than a guitarist going from a beautiful Taylor guitar, Martin guitar, or whatever to his favorite Strat or Tele. You are making a physical adjustment, but there are things that happen with that electric instrument that will never happen with the acoustic version of the instrument. That's been my experience with the V-Drums.

What's the advantage of the V-Drums?

I could have a drum set [on the V-Drums] where one of the cymbals could be a gong, the bass drum could be a djembe, the snare drum could actually be some weird, high-pitched African drum. I can mix and match the drum set into different things. I can also have a program change in the middle of the song, and actually play the body of the song with one kit and play a drum solo with a different kit. So from that standpoint, there's a lot of power, sonic power, that I can't get with an acoustic kit. But of course with an acoustic kit, there's the immediacy of the vibration of the air and the cymbals, and there's still a little bit more of my personality that comes through. But the electronic drum experience for me has been equally satisfying because the focus now is the sonic possibility, rather than the expectation for my electronic set to feel and play like my acoustic kit.

It seems like sampled cymbals never sound as realistic as real ones recorded acoustically. Do you ever record your drums with the V-Drums but track your cymbals acoustically?

Actually, I haven't had to. I guess because in the back of

my mind, if I'm using an electronic drum set, I'm going for something. And I don't want it to necessarily sound just like a cymbal. I have amazing cymbals. So at that moment I'd rather just put up a real one. But when I am making electronic music, and I am using the V-Drums as an instrument, I will use the internal cymbal sounds, which actually are very good. This is the second-generation, top-line V-Drum kit, the TD-20 (see **Fig. 2**). The first one was the TD-10. The cymbals are greatly, greatly improved in the TD-20. So I've been able to use the cymbals, and I think when Roland added the position-sensing concept to the ride cymbal, that gave it a little more realism.

Let's talk about miking your acoustic kit, starting with the kick drum. Do you place the mic inside the drum?
Yes, I put it inside the drum. Not dead center, a little off. It might be halfway inside the drum and maybe midway between the center of the drumhead and the inner shell.

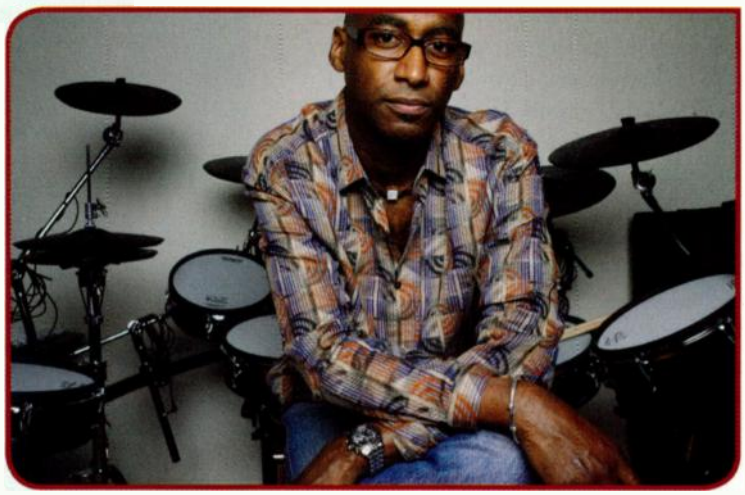
Do you have a lot of muffling in it?
Yeah, I do. Not a ton, but I do. Sometimes I'll use pillows, and sometimes I'll use some internal muffling devices.

Where do you position the snare mic?
For the main snare, I like to mic top and bottom. And I'll use either everybody's favorite standby, a [Shure SM] 57, or an AKG D 22. Sometimes I also use an Audio-Technica ATM63; it's also a dynamic mic, which is sort of like their version of a 57. It's a slightly different sound, but really cool if I want a variation. I also like a Shure Beta 56 on the snare. Sometimes I'll use that on my piccolo snare, which I usually don't have to mic bottom and top because it gets a lot of snare sound.

Do you have problems with leakage?
No, because the way I'm positioning the mics, I'm not looking for everything to be so separate. I'm looking at my instrument as one thing.

So you don't want to gate it anyway.
For tracking, I try to get a very good kit sound with no gating. Sometimes after the fact, I do have to apply a little gating to tighten things up. But most of the time I prefer to capture my sound as close to the way I hear

it as possible. And also, the way I tune, actually, the vibration and the harmonic overtones are all sympathetic to the instrument [see the sidebar "Hakim Talks Drum Tuning"].



MIKE MCGREGOR

FIG. 2: Hakim likes to use his Roland V-Drum kit for recording combinations of drum and percussion sounds not possible on a conventional acoustic kit.

So you're going for a more cohesive kit sound?

Lately I've been using a stereo mic setup behind me, stereo in front of the kit, and then an ambience mic maybe 10 or 12 feet away. And then maybe the only close mics would be kick and snares and hi-hat. Because I've noticed that when I'm mixing my drums, I'm leaning toward the overall sound of the kit rather than the individual sounds. I look at the kit as one whole instrument. So the best representation of my kit is actually the overall stereo one. So I've been having fun using less mics.

So you find that you're getting the main part of your drum mix out of the overheads and then just supplementing it?

Yeah, overheads and the close ambient mics. And then I'm supplementing it with the close kick mics, the close snare mics, and the hi-hat.

You use two sets of overheads?

No, I'm using an overhead behind me—usually it's a 1-point stereo mic—to just kind of capture my perspective. The other is in front of the kit. But there are times when I will use overheads above the cymbals. For certain things I may even use a separate mic for the ride cymbal.

FIG. 1: A look through the door into Hakim's Industrial Acoustics modular, floated sound room, which was built inside his suburban New York loft apartment.

Do you ever have phase problems between the different overhead and room mics?

I do. The ones behind me and the ones directly in front of the kit—I have to throw them out of phase. And it's fine. If I fool around with the position, I get a really nice big sound. And then maybe ten feet away I put some stereo ambience mics.

And just put a little of those in the mix?

Yeah, and it's nice, it's a nice vibe.

Let me change gears a bit and talk about programmed drum parts. It's always a struggle for nondrummers to make programmed drums sound realistic. Any tips?

I've recently heard the latest versions of [FXpansion] BFD and [Native Instruments] Battery, and they are so amazing sounding, really amazing.

MIKE MCGREGOR

Sure, but even with good sounds, one still has to program the parts.

To get yourself to start thinking like a drummer, that's what we're really talking about. It's no different from guys playing orchestral strings on a keyboard. You don't always play triad chords if you really want the thing to sound like an orchestra, because orchestrators don't write string arrangements that way. Usually the harmonies are very wide and very spread out. Part of the idea of dealing with, say, a sample of an orchestra is to also approximate the harmonic concept so that you can fool the ear. It's not just the sound, but it's the use of the sound. It's all about the context that sound is in. That's the issue with the drums, it's the same thing. It's like, how

do we contextualize those sounds?

For example, you can't have certain things happening simultaneously if you want it to sound like a real drummer was playing it.

Precisely, it's like the three-armed drummer—the hi-hat that keeps going during the drum fill *[laughs]*. You know what I mean; unless you use the foot hi-hat sound. You have to remember that drummers only have two arms and two legs, that snare on two and four goes away during the drum fills. Those sort of things. However, I will also say I heard some very creative programming where those things were not necessarily taken into consideration, but the results were still quite cool and fun. I guess as long as you get the results you're happy with, that's really all that matters.

I suppose one of the other problems is that you don't get the sympathetic vibrations happening between drums when you have separate MIDI-fired samples happening.

Exactly. So maybe a cool suggestion would be to take that MIDI drum set, maybe send it to a pair of speakers, and then mic the speakers and pull it back into your system. For me, that's what I do here for the acoustic drums. Because I can't successfully set my drums up out here [in the main part of the loft] without disturbing the neighbors. But what I can do is take a send of the drums and send it to the stereo system, and I can put the mics out there and create ambience after the fact.

You're doing that to create a bigger sound than you can get in your recording room.

Yeah, because my room is all close-miked. And even if I have an ambience mic 6 feet away from the kit, it's still tight ambience. I have high ceilings [outside the sound room], so I can take advantage of it. I have my stereo system out there, and I just send a feed of the drums out to it. What's fascinating is that I can do that with a MIDI kit as well. I can get the acoustics of the room.

When panning your kit in the mix, I assume you place your snare and kick up the middle, but do you pan the other elements really wide?

It depends. I try to pan my kit the way you see it, from the drummer's perspective. Because for me, it's very hard sitting in between two speakers and hearing the hi-hat on the right. I'm a right-hand drummer, so I'm used to the hi-hat being on my left. I know a lot of engineers pan the kit from the perspective of looking at it. I like to do it from the other way. I know some engineers that actually do that now: pan from the drummer's perspective.

Do you think the perspective really matters to the listener?

I don't think they notice it most of the time. I think that most listeners, especially pop-music listeners, are really keying in on the vocal. And I think that sometimes musicians tend to forget that. Like I've heard a lot of musicians' demos where they're the singer, and they don't really feature their vocal. If they're a guitar player, their guitar is sometimes louder than the vocal. You know what I mean. If they're a keyboard player, maybe the keyboards will be louder than the vocal. And I have said, if you're going to be a lead singer, you need to reexamine the placement of your lead vocal versus your instrument. And whether it's a cosharing of the space, whether that lead vocal is down the middle, or whether, if you're a guitarist, you're going to play the lead vocal a little to the right and the guitar a little to the left, it doesn't have to be certain things dead center and everything spread. You've got this whole left and right perspective that you're dealing with and everything in between. I'm not opposed to having something here and an effect returning in a different place in the mix, and that sort of thing. Pro Tools gives you the ability to get inside of a mix and really do creative things. Not only volume, mute, panning, and a lot of things for the master faders, but also the aux faders. You have that power, too. I'm not opposed to having fun with the aux sends and returns inside of mix automation as well.

Let's talk about your upcoming CD, *We Are One*. You cowrote some of the material with Scott Tibbs, right?

My collaboration with Scott Tibbs has been really wonderful. He's such a talented keyboardist and pianist. So I've

OMAR HAKIM: A SELECTED DISCOGRAPHY

Sting, *Bring On the Night* (reissue; A&M Records, 2005)
Bobby McFerrin, *Beyond Words* (Blue Note Records, 2002)
Omar Hakim, *The Groovesmith* (OH-Zone Entertainment, 2000)
Victor Bailey, *Low Blow* (Zebra Records, 1999)
Chic, *Live at the Budokan* (Sumthing Else Records, 1999)
Michael Jackson, *HIStory: Past, Present and Future, Book I* (Sony, 1995)
Urban Knights, *Urban Knights* (GRP Records, 1995)
Miles Davis, *Amadala* (Columbia Records, 1989)
Omar Hakim, *Rhythm Deep* (GRP Records, 1989)
Joe Sample, *Spellbound* (Warner Brothers, 1989)
Anita Baker, *Giving You the Best That I Got* (Atlantic/Wea, 1988)
Miles Davis, *Tutu* (Columbia Records, 1986)
John Scofield, *Still Warm* (Gramavision, 1986)
Sting, *Dream of the Blue Turtles* (A&M Records, 1985)
Weather Report, *Domino Theory* (Columbia Records, 1984)
David Bowie, *Let's Dance* (EMI Records, 1983)
Weather Report, *Procession* (Columbia Records, 1983)
David Sanborn, *As We Speak* (Warner Brothers, 1981)

been using some of his music. And we've also written some music together. And that's been a really fun experience for me, just having someone with his experience and his savvy when it comes to the technical thing. And he's an amazing arranger as well. So to have him to bounce off of and to work with has been a tremendous amount of fun for me.

Did you record all of it here, or only your parts?

I've been recording my parts, and the other guys, the guitarist (Chieli Minucci), the bassist (Jerry Brooks)—I have a harmonica player (Gregoire Maret) in the band as well. All of those overdubs have been done here, and the drums. Scott's stuff, because he lives in L.A., was done out there.

HAKIM TALKS DRUM TUNING

Tuning the drums correctly is key for recording them, right?

If you tune the drums right, you don't have those issues of weird vibrations and beating—pitch beating—between drums. All that means is that the pitches of the two drums aren't vibrating sympathetically. So that means that the tuning has to be the proper interval between the two drums. When the intervals are harmonious, then basically all the drums in the kit ring as one whole instrument.

So you just have to make sure that the drums aren't hitting some weird quarter tones.

Exactly, because when the intervals are right, you don't have to gate, unless it is for a specific effect or result.

What kind of intervals do you use typically?

A minimum of a third apart. I've even done minor thirds, fourths, fifths; it depends. It depends on the gig, how many drums I'm using. If I'm using less drums, the intervals are going to be wider. If I'm using more drums, it all depends on the range of that drum. Because the drum definitely has a tuning range that I'm dealing with. Most drums have an optimum tuning range based on their size and the shell material. And depending on the type of drumhead you put on it, the ability to stretch it a little bit above or below its typical tuning range is possible.

The issues are obviously different when tuning electronic drums. Do you ever tune those to match the pitch of a song?

I have the option to do that with certain tunes, but I don't necessarily do it. Most of the time, particularly if the song is calling for a drum set, I'm going for impact and tone and how it relates to the mood of the song.

Do you ever do that kind of pitch-specific tuning on your acoustic kit?

I totally do. I've even done tours where I'll tune the drums for the music, and I try to find a good general tuning that works with everything. And then after I've done that, I will identify what those pitches are, and I will make a reference document so that the tech can actually tune the drums accordingly. I guess because I play guitar and piano, I can easily identify what those notes are. And actually, having that reference makes it easier for me to tune drums quickly.

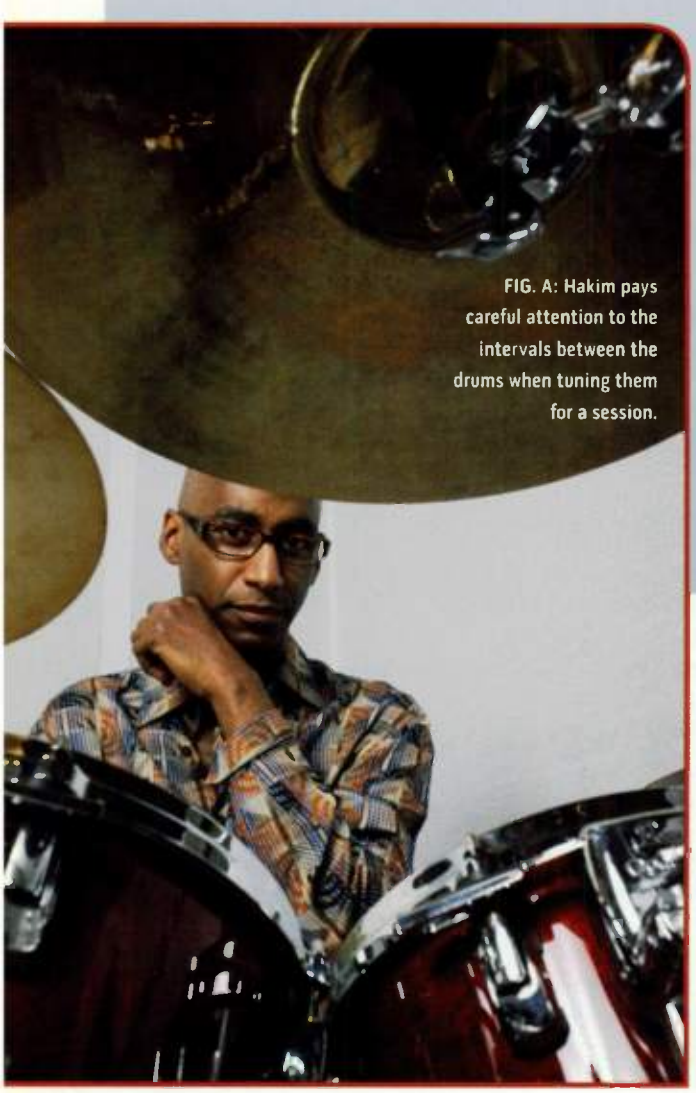


FIG. A: Hakim pays careful attention to the intervals between the drums when tuning them for a session.

MIKE MCGREGOR

PODCAST

The CD will blend a lot of styles together, right?

Even though a lot of people know me as a jazz drummer, quite a few people also know about my work in pop, R&B, and rock music—and I am a fan of all of that music. So it's very natural for me to include those flavors on my own projects. That's why I've got to be careful. I don't want this to really be called a jazz record; it's a record of instrumental music with the spice and flavor of jazz, rock, and funk, and even world music, on a certain level. EM

EM WEB CLIPS

Mike Levine is an EM senior editor.

To hear more of this interview, go to www.emusician.com.

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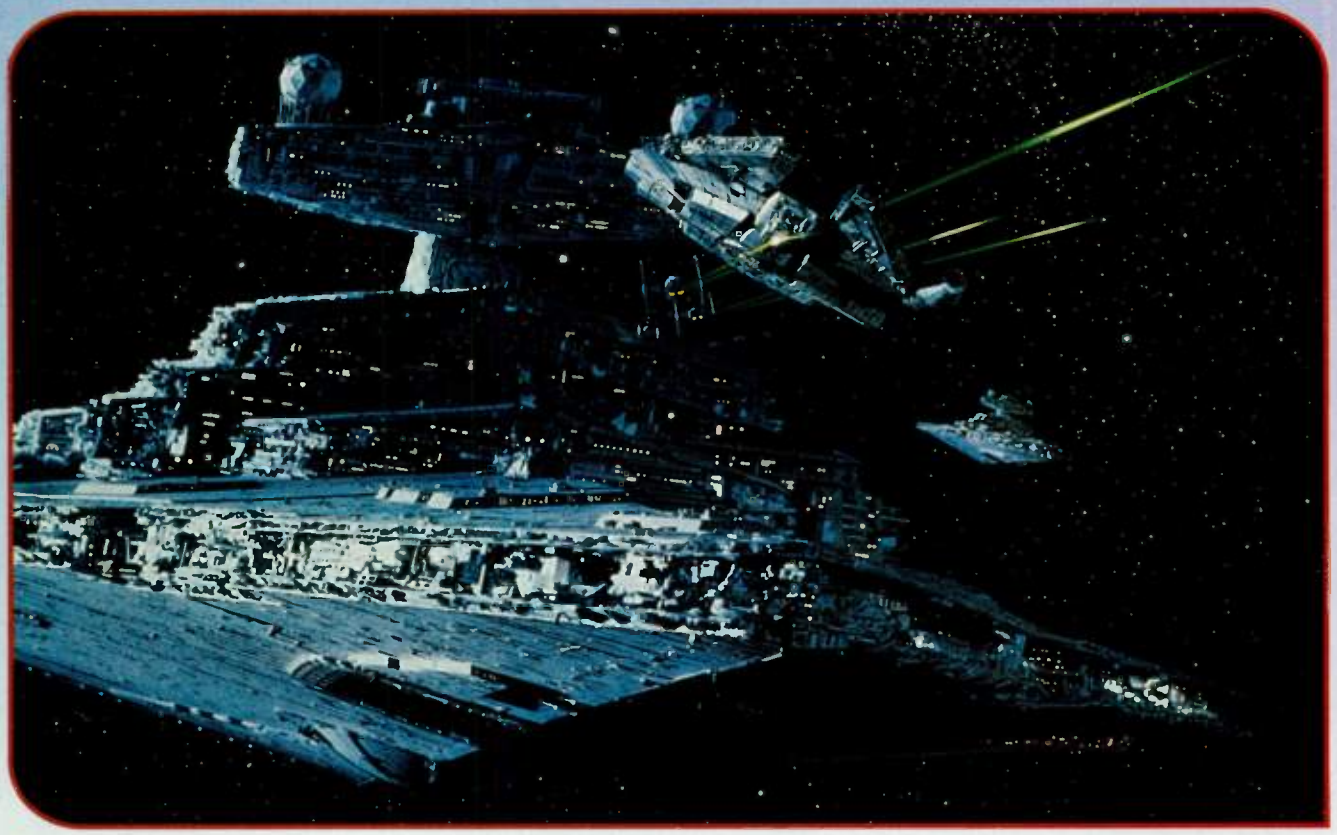

COURTESY LUCAS DIGITAL

Outer Limits

By Brian Smithers

Creating special effects for supernatural sound designs.

The next time someone seems underwhelmed by your creative calling, put them in front of a movie with the sound turned down. Sure, visuals are impressive, but it takes sound to give them real substance. Without the dialog to weave a thread of meaning, viewers would rarely be able to follow a movie's complex plot. Without the music to steer and massage our emotions, most movies would never grab our hearts the way we want them to. And, of course, Foley brings us—consciously and subconsciously—just enough of the sounds of the characters' world to make it seem real without distracting us from the fantasy.

For pure visceral impact, however, it's the sound effects that matter. Nothing makes your heart feel as if it's about to leap out of your throat like the growl of a tyrannosaur or the shriek of an alien. The problem is that you can't always get a dinosaur into the studio—the good ones are booked solid, and their scale is totally unreasonable.

Good sound design brings to life creatures that never existed or that don't exist any longer. It takes ostensibly mundane sounds and makes them sound as threatening (or tragic or exciting) as the onscreen action *feels*. In this article, we'll explore some techniques for creating sounds that are supernatural or surreal. These methods are used in both film and game production. Although the two fields differ greatly in the way sounds are implemented, the characteristics of a good sound are essentially the same for both.

Familiarity Breathes

Although it's natural to be fearful—or at least a bit apprehensive—at the sight of a space alien or werewolf, filmmakers understand that evoking real terror requires something the viewer

recognizes as dangerous. Thus, most movie creatures have fangs, claws, stingers, pincers, or something familiar enough to scare us immediately. It's important that creature sounds take advantage of this familiarity, too. Although a sound you've never heard before might alarm you, a sound that reminds you of a lion's roar will raise the hair on the back of your neck before you even start to deal with it on a rational level.

The flip side of this familiarity axiom is that if the listener hears that the sound of an alien is actually a lion's roar, the illusion is blown. So although it's good practice to build supernatural sounds from natural sounds, it's essential to fool the listener into *feeling* the familiarity without *recognizing* the familiarity. This is accomplished by breaking the original sound's context.

Both multitrack and 2-track audio editors offer an almost unlimited variety of tools for disconnecting a recorded sound from its original context. Cut up a few lines of dialog and shuffle the syllables, and you can create a dead language. Reverse the same lines to create the classic dream sequence. Notable sci-fi villains like *Dr. Who*'s Daleks or the original *Battlestar Galactica*'s Cylons were created by using ordinary dialog as the modulator input on a vocoder. Each of these examples plays on our ability to accept and process the familiar aspects of a human voice while simultaneously pulling us out of our comfort zone by processing that voice in unnatural ways.

Let's start with a bit of alien dialog. Although it's tough to imagine that when we meet visitors from another planet they will speak English, it's important that moviegoers be able to recognize film aliens' utterances as language. Thus, most movie alien sounds begin as normal human dialog.

Hearing Voices

Web Clip 1 is a short conversation between aliens from two separate planets. The raspy voice is my friend Andy trying to coax his two-year-old daughter Sachiko to the microphone; the second voice is hers. I imported Andy's lines into Apple Soundtrack Pro, which is part of the Final Cut Studio 2 suite.

FIG. 1: Time- and pitch-manipulation effects such as Soundtrack Pro's Vocal Transformer usually offer independent control over pitch and formant.

FIG. 2: Sonar's V-Vocal offers a graphical environment for altering pitch, timing, volume, and formant.

Reversing the file made the language unintelligible while maintaining a sense of timing and intonation that is immediately recognizable as conversation. The challenge with reverse dialog is that too many syllables end up as crescendos, giving away the technique. To avoid this, I deleted some of the suspect words, simultaneously rearranging words to create a different flow. In some cases, I unreversed consonants and then grafted them onto the beginning of certain words.

The voice still sounded too human, so I inserted Soundtrack's Vocal Transformer effect and experimented (see Fig. 1). Andy has a nice, deep voice, so I had plenty of flexibility. Like most current pitch plug-ins, Vocal Transformer offers independent control of pitch and formant, allowing you to reduce the chipmunk effect when tuning a vocal. In this case, I embraced the rodents by cranking the formant control up several semitones. It immediately gave the impression of having moved Andy's larynx up to his forehead without actually reducing him to a chipmunk.

To balance the nasal quality of the voice, I lowered the pitch by about an octave and a half. The result is a creature voice with weight befitting a large and powerful body, timbre suggesting an alien vocal apparatus, and phrasing that evokes ordinary conversation. Applying the same processing to dialog with more emotional range would give a result that tracked the actor's performance well.

The other creature voice was somewhat more challenging due to the airiness of Sachiko's voice. I tried several different pitch-shift plug-ins within Digidesign Pro Tools, Cakewalk Sonar, Apple Logic, and Soundtrack before settling on Sonar's V-Vocal. V-Vocal's graphic time manipulation allowed complete freedom over

Sachiko's phrasing (see **Fig. 2**). I stretched and squeezed syllables, even individual phonemes, to shape each line as needed.

I shifted her pitch down about an octave and her formant a little more than half to obfuscate her gender and age. The result retains her innocence, suggesting a naive, daydreaming sort of character. Occasionally, the algorithm struggled to track the little hesitations and chirps that are typical of a two-year-old's voice, so after bouncing the processed vocal to a new clip, I selectively edited out those sounds, leaving some in for effect. Sachiko's native accent is Japanese, and she created some wonderful nonsense phrases, so I had great freedom in editing together the sort of phrases I needed.

As I Live and Seethe

Some of my favorite science-fiction shows imagine organic technology, the sort of thing where a space vehicle is to some degree a living thing. Despite the fact that sound does not travel through the vacuum of space, the spaceships in virtually all movies, games, and television shows are audible to the audience. Most of us choose to overlook the paradox and accept the aural cues as indications of an object's size, speed, position, and even purpose. Hearing the sound of a living, breathing, menacing space vessel in my head, I turned to the vocoder, a time-honored device for blending human and electronic sounds.

I created an audio track for my voice and an instrument track for Native Instruments Vokator (see **Fig. 3**). I used a bus to route the output of the vocal track to the input of the Vokator track and then set Vokator to use that input to modulate its internal synthesizer. Because the vocal track would not be heard directly, I grabbed a ten-dollar mic and started tweaking the sound.

One of Vokator's better features is its ability to morph between settings in response to CC 1 messages, so I created two timbres—one for the ship's approach and another for its departure—and used my keyboard's mod wheel to glide between them as the ship passed by. It took a good deal of fine-tuning to get the right balance of pitched to unpitched sounds in each timbre in order to make the ship sound more mechanical and less musical.

FIG. 3: Native Instruments Vokator is a powerful sound-design tool built around a flexible vocoder architecture.

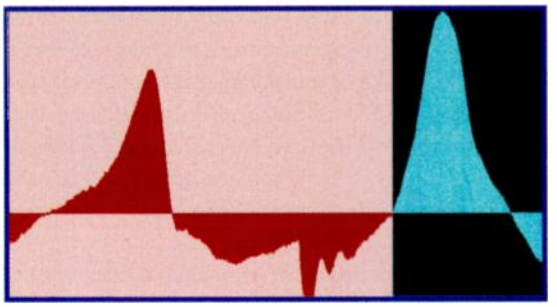

FIG. 4: A fundamental technique amid all the space-age tools: zero-crossing edits make for a seamless loop of cat purrs without requiring any crossfades.

To give the alien vessel as much subliminal angst as possible, I recorded several tortured cries. Over these sad syllables I played random 3-note combinations, eventually settling (fittingly, some would say) on a minor triad. I used a fade-out to smooth the sound of the ship flying away and a fade-in to obscure the initial consonant, lest the illusion be compromised. With a bit of practice, I was able to get the Doppler shift about right with my keyboard's pitch wheel, but I still did some hand tweaking. With the addition of a small amount of reverb, **Web Clip 2** was born.

Landing the Mothership

To create a sound for a biomechanical mothership, I turned to my cats. A cat's purr is a mysterious yet comforting sound, until you scale it up to the size of a tiger looking for lunch. It's also a complex timbre with which to work.

Cats don't purr on demand, however, so I had to be sneaky. For several days, I kept my M-Audio MicroTrack 24/96 handheld recorder close at hand, waiting for an opportunity. It came in the middle of the night, when two of our three feline companions took turns stealing my pillow. Pleased with themselves, they purred victoriously as I reached out to my nightstand for my recorder and slowly brought it in close to their smug whiskers.

A cat's purr continues seamlessly as the cat breathes, but its timbre changes between inhale and exhale. I started by editing out all the inhales from a particularly vigorous episode. With some careful old-fashioned zero-crossing edits, I created a seamless drone that sounded more like the thrum of a giant spaceship and less like a happy Himalayan (see **Fig. 4**).

To make the sound much bigger than life, I dropped the pitch several semitones with Digidesign's Time Shift

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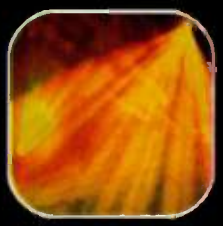



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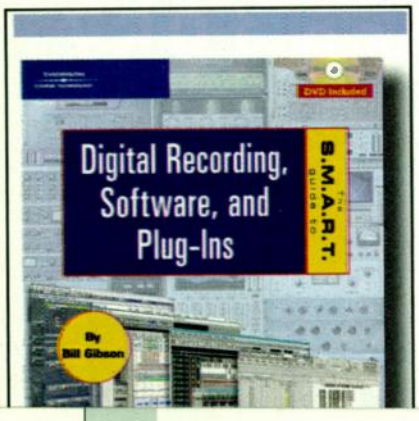

Outer Limits

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MAKING TRACKS

Sound in Motion

By Jim Aikin

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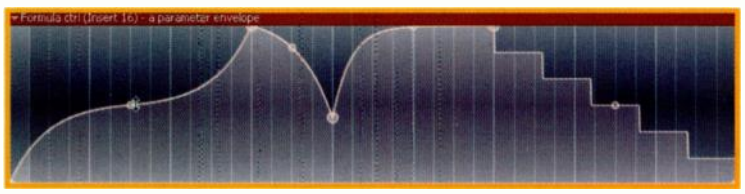

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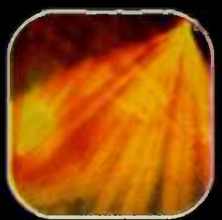



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plug-in. I followed that with some heavy compression with Sonnox's Oxford Dynamics and Inflator. The compression leveled out the volume fluctuations to create a steadier engine sound. Inflator has a way of adding more beef to a sound without actually making it louder.

Digidesign's Hybrid synthesizer provided the mechanical part of the engines. I adapted a drone preset by modulating the pitch of two oscillators with separate semirandom LFOs. The third oscillator provided mostly noise, with the whole thing being lowpass filtered pretty heavily. The resulting timbre held only a hint of pitch, especially when played in the lowest octave.

I created escort ships with another Hybrid patch using its various envelopes to drop the pitch and lower the filter cutoff as the ships pass by. Small amounts of pan automation for each note—each note being an escort—contribute to the illusion of motion. I had to draw each pan curve meticulously by hand to keep the tail of one ship from jumping to the position of the next ship (see **Fig. 5**). Had I printed each ship to its own track, or at least enough tracks to ensure that no two adjacent or overlapping ships shared a track, the panning would have been easier. My work flow is necessarily shaped by the tools at hand, however, so I tend to conserve tracks when working in Pro Tools M-Powered, which supports only 32 audio tracks.

There's one special fighter that flies by at about 25 seconds—it sounds a bit like a Formula One car. I chose another organic sound to call attention to it and to imbue it with a hint of emotion. It's the sound of another of our cats getting annoyed at the recorder, a delicious meow that I massaged into a flyby. First I molded the timing of the sound in V-Vocal, working it like a lump of Play-Doh

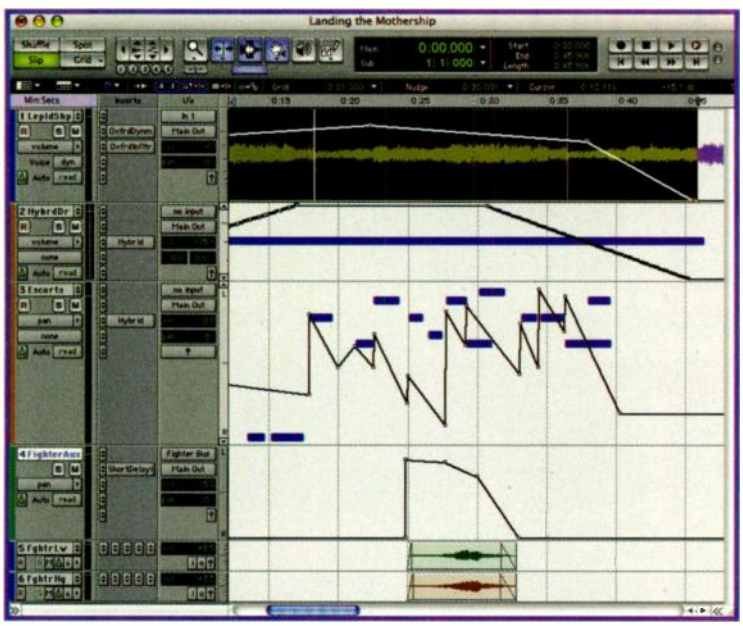

FIG. 5: Layers of sound, each with one or more automation envelopes, combine to create the sound of a spaceborne warship passing overhead.

FIG. 6: Sometimes a heavy hand is warranted, as with these three EQ plug-ins adding up to 10 dB of low bass to the primary rumble tracks.

until it had the right velocity. I used V-Vocal's pitch and volume envelopes to get the Doppler shift right. When working with pitch- and time-manipulation plug-ins, I am always listening carefully for the point at which the algorithm "breaks." The sound gets grainy and artificial, and I have to pull back the effect or try another plug-in. For this task, V-Vocal allowed me all the headroom I needed, and its graphic interface made the job a snap.

I bounced the clip and exported it into Pro Tools, where I doubled it and transposed the copy an octave down to give it bulk. I bused the two tracks to an aux, where I added a chorus with the Short Delay plug-in. The chorus gives the sensation of the beating of two engines, a sound that pilots know well and the rest of us recognize at least subconsciously. The fighter's trajectory was achieved with a bit more-dramatic panning than the escorts, another subtle sign that it is special. **Web Clip 3** is the final 40-second sequence.

Bring Down the House

Recording an avalanche is tricky business, what with the risk of death and all that. With a bit of imagination and the right tools, however, a world-class landslide can be created in the studio—or, in this case, the kitchen.

As I held the microphone as close as practical, my ever-patient wife poured 4 pounds of cat food from one container into another over and over. Predictably, this drove our cats into a feeding frenzy, so I retreated to my studio and left Barb to appease them. I imported the files into Pro Tools and auditioned them for the best bits, editing and naming them as I went.

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The slowed-down cat food did a pretty good job of imitating falling rocks, but creating a compelling avalanche requires enough bottom end to give the impression of the earth belching. For this, I turned to Way Out Ware's TimewARP 2600. I created a simple patch that blends all three oscillators, each set to a different low base pitch. I set the initial filter cutoff to about 100 Hz. The thing that really made the earth move was patching the noise generator to the filter cutoff. This made the timbre shift unpredictably, lending the sound the sort of natural chaos it needed. This flexible architecture is one reason modular or semi-modular synths like the ARP 2600 and its clones are so powerful for sound design. I played this sound in real time to create accents that help steer the intensity.

The core sound of the avalanche was complete: two copies of the lowest-pitch cat food region, offset by several seconds and panned stereo left and stereo right, complemented by a synthesized rumble. Each part was heavily EQ'd to emphasize its low end (see **Fig. 6**). The painstaking work, however, was yet to come.

I had succeeded in creating an avalanche ambience without any clear and present danger. The basic cat-food-turned-landslide regions were in stereo, and, panned to opposite sides, they established a good three-dimensional environment for the landslide. Next I needed to get up close and personal with some heavy rocks.

Pro Tools always deals with stereo regions as multimono files, so creating a mono region from a stereo region is as simple as dragging one channel from the region list to the tracklist. I harvested a handful of such regions that had been pitch-shifted less severely than the "rumble" regions. Each occupied its own mono audio track so it could be mixed individually. I hand trimmed each region to an appropriate length and hand drew volume and pan automation to make it come crashing into the picture.

Sonnox's Oxford Reverb includes a preset called Canyon, and it proved to be just the thing to keep things rumbling through the surrounding mountains. **Web Clip 4** is the result of all this faking and tweaking.

Postscript

Note the recurring application of basic synthesis techniques. Even when a synthesizer is not directly involved, you'll need to apply volume and pan envelopes and automate effects parameters—after all, life is never static, so why create static sounds?

Given a Hollywood budget, I would have done a few things differently, such as experimenting with different brands of cat food—perhaps even dog food. Seriously, though, the common thread through all these examples is the triumph of imagination over money. If you listen carefully to the sounds around you and take note of their distinctive characteristics, you will start to hear the possibilities in a chair squeaking or crickets chirping. Almost any sound can be pressed into service if you break it out of its original context. To a good sound designer, there are no ordinary sounds. EM

EM WEB CLIPS

Brian Smithers is the author of Mixing in Pro Tools: Skill Pack *(Thomson Learning, 2006). He would like to thank his family, friends, and pets for their contributions to this article.*

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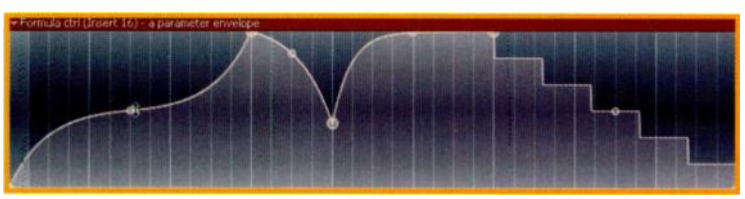

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STEP-BY-STEP INSTRUCTIONS

1

If you're planning to automate effects for various instruments, assign each instrument to its own mixer bus using the FX parameter (upper right).

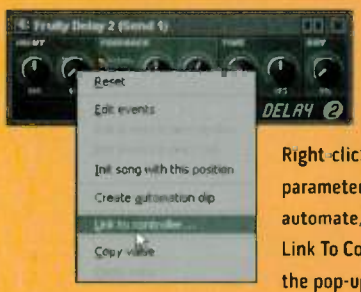
2

In the master bus, insert a Fruity Formula Controller as an effect. Right-click on the *a* knob and select Create Automation Clip.

3

For more control over the wet/dry mix and delay feedback, I've routed the snare channel to a send bus and raised the send-bus input level.

4



Right-click on each parameter you want to automate, and choose Link To Controller in the pop-up menu.

5

In the Remote Control Settings box, select your Formula Controller as the Internal Controller input and enter a suitable formula in the Mapping Formula field.

6

Right-click on the *b* knob in the Formula Controller and assign it to an external MIDI input. Type an equation in the Formula box. The Meter display at the bottom gives a timeline graph of the output.

envelope to crossfade the values of several parameters at once (see "Step-by-Step Instructions" above). **Web Clip 1** illustrates the result. In it, you'll hear a single clip envelope being used to control the panning of both kick and snare, the filter cutoffs and resonances of both, and the level of a delay line's output. (You can download the song file I used to create this clip from **Web Clip 2**.) By editing the envelope as shown in **Fig. 1**, I can control all of these parameters together over the course of a break or an entire song. EM

EM WEB CLIPS

When he's not writing about music technology in his PC-based home studio, Jim Aikin plays and teaches cello. You can visit him online at www.musicwords.net.

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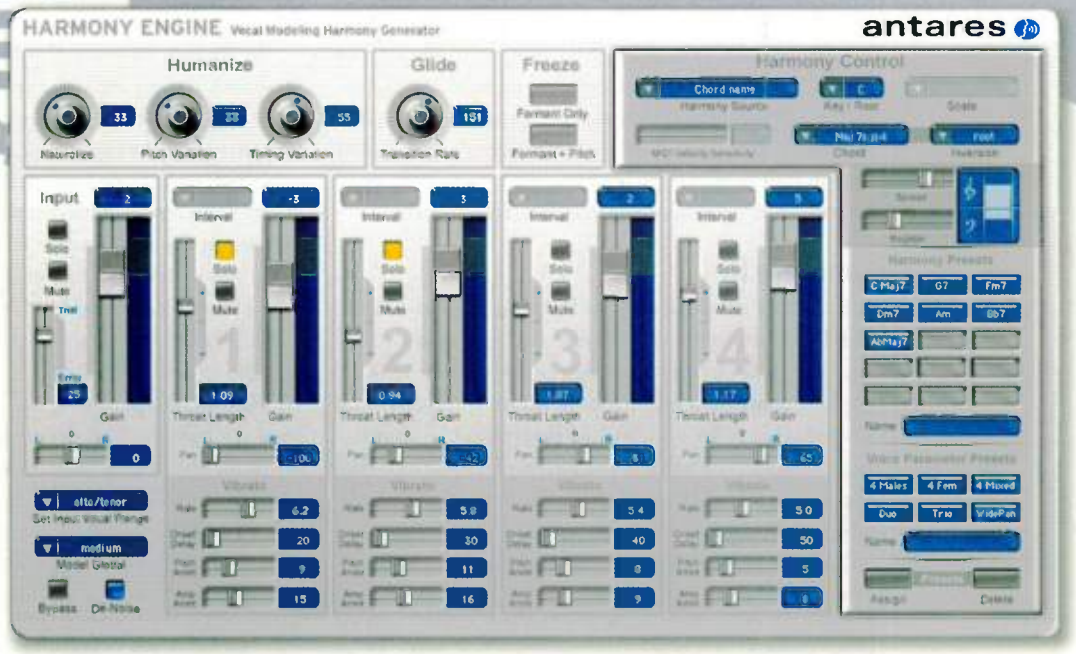

If you've ever wanted a quick, easy-to-use tool that gives you the power to create great sounding harmony parts, without requiring an advanced degree in vocal arranging, well, heads up! Harmony Engine is a real-time harmony generating plug-in that puts professional-quality vocal harmony arrangements within reach of any songwriter, producer, musician or engineer.

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Harmony Engine is available in Native formats for Mac OS X and Windows XP and Vista. Check it out at your local Antares dealer or come to our website for more details, audio demos, and a fully functional 10 day trial version.

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Monster Patch

By Jon Engel

Get bigger synth sounds by stacking waveforms.

Hypersaw and Supersaw patches gained notoriety in the late '90s with the Roland JP-8000 line of synthesizers. Most modern synths have stacked sawtooth waveforms in their sample sets, but those are just one sound designer's interpretation of that signature sound.

I'll show you how to build stacked sawtooth patches from a variety of basic single- or dual-oscillator waveforms. I'll then extend the concept by applying it to other sampled waveforms. I've used Digidesign's free Xpand plug-in for my examples, but I could have achieved similar results using almost any multioscillator synth.

Tune 'em In

Start with a simple lead waveform like Xpand's Mono Saw from the Basics category, and assign it to each of the four parts on the Mixer page (see **Web Clip 1**). Vary the Fine controls between plus or minus 5 and 20 cents. Keep the value for each pair of parts roughly symmetrical around zero so that the patch plays in tune (see **Fig. 1**). For added effect, increase the Detune parameter by different amounts for each part.

Adjust level and pan settings to spread the parts across the stereo field and to give the patch a sense of depth and space. Assign reverb and delay or chorus to the two FX slots and use more-moderate send-level settings for parts in the center of the stereo field (see **Web Clip 2**). Apply time delay and modulation effects conservatively so that the patch maintains its definition. Discretion is the better part of valor when setting effects parameters, but you might experiment with higher values for more-extreme effects.

FIG. 1: You access parameters such as fine-tuning for stacking waveforms from the Mixer page in Digidesign's free Xpand plug-in.

If your synth has random-pitch, analog-feel, start-offset, or random-panning features, apply these in varying amounts to each part. If necessary, you can simulate such effects by applying slow but varying modulation amounts and rates to each part's pitch, pan position, and attack time. Modulation rates of 7 to 10 seconds work well. Modulating filter attack and decay rates will also add to the effect. Try different parameter combinations, and always turn off key tracking and LFO delay.

In Xpand, click on the Mod tab to bring up the Modulation page and use the Mod Wheel Control section to apply varying small amounts of pitch modulation to each of the four parts. Set the Depth to less than a third of a semitone (about 300 cents), and remember it's the differences between the four parts that count. Increasing the relative rate and depth offsets between parts will widen and deepen the effect. You can affect that globally with the Mod Wheel (see **Web Clip 3**). Experiment to find your own signature sounds.

Stack 'em Up

Now try substituting preset stacked-sawtooth waveforms for the single-oscillator waveforms in the stacked patch. Assign Xpand's Saw Stack in the Hard Lead category to one or more of the parts, and you open the door to a whole new set of sound-design possibilities. Transpose one or more parts by an octave up or down to create a wall of sound (see **Web Clip 4**). Experiment with octave and sync waveforms for even bigger sounds.

Stacking brass and string waveforms is a fast and inexpensive way to expand and upgrade your sound palette. Try mixing and matching Xpand's Soft and Hard Tenor Sax parts with the Solo, Soft, and Hard Trumpet parts in the Brass + Woodwinds category to build your own killer sections. Use higher parameter offset values and effects levels than you typically would with synth waveforms to make your section sound wide and large.

With synthesizers that have deeper editing features, you can modulate LFO rates and delay times across different parts and then trigger the effect with Aftertouch to simulate ensemble vibrato. You can also make small variations in the pitch-bend range for each part for added realism. You'll achieve more realism by progressively panning pitched instruments across the stereo field. EM

EM WEB CLIPS

Jon Engel spends way too much time programming patches for his original compositions (www.soundclick.com/malaren) and his live gig (www.mushmouth.net).

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Loud and Clear

By Larry the O

A beginner's guide to vocal processing.

It's been said that the human voice is the most important source for recording or amplification. However, even when vocal tracks are beautifully recorded with excellent equipment, there are still lots of reasons to process them.

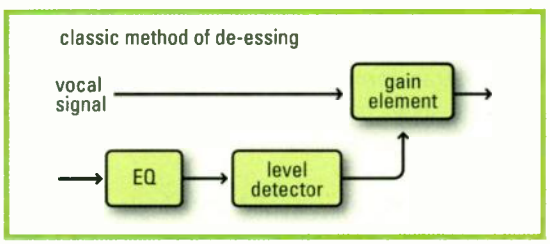
Vocal processing works on the basic properties of level, timing, timbre, and pitch, but also includes reverberation, spatial placement or movement, and just plain mangling. Most vocal-processing tools can be used either correctively (to fix a problem) or creatively (to achieve an effect).

Loud, Louder, Loudest

Level control comes in two forms: dynamics processing (compression, limiting, expansion, and gating) and automation. The most common vocal-processing task of all is probably compression. Distant-miked vocals, such as a choir or chorus, may not need compression, but close-miked vocals, whether in performance or recording, almost always need some.

Compression is often done in the analog domain, as part of a live or recorded signal path. Being able to get good results from a compressor in a vocal recording session is a key skill in vocal processing. Some applications call for a compressor that is reasonably transparent sounding, while others need the sound of a compressor colorfully squashing a vocal. A compressor working on a vocal can suggest power, as it sounds like the singer is really belting it out. A good rule of thumb when recording vocals is to shoot for 2 to 6 dB of gain reduction on a regular basis.

Stereo compression is a great tool for vocal groups, such as harmony vocals, as it helps to attain a smooth, even blend. Compression or limiting can also be useful following heavy effects processing, such as intense flanging, to keep peaks under control. In fact, it is common for vocal chains to use both compression and peak limiting.



CHUCK DAHMER

FIG. 1: Classic de-essing is accomplished through frequency-sensitive compression, which is achieved by inserting equalization into the compressor's sidechain.

Automation is an extremely powerful vocal-processing technique, whether it is created with a fader or by using breakpoint envelopes to do surgical dips and boosts. Automation is also good for balancing multiple vocal tracks, EQ or effects automation, and more.

De-essing, usually achieved through frequency-sensitive compression, is a crucial vocal-processing task. Close-miking most often creates the need for de-essing, as the full high-frequency pickup that occurs close to the mouth combines with the rising high end of the condenser mics used in most vocal recording to create sibilance. The compressor is sensitized to sibilance by using an equalizer set to emphasize sibilance frequencies in the sidechain (see Fig. 1). (Dynamics processors have two signal paths: the audio path and the sidechain, which derives the signal for controlling the gain from an audio input.) Multiband compression can be even more effective for de-essing when configured correctly, and EQ automation is another excellent de-essing method when the problem occurs only in isolated spots.

Time for a Change

In the time domain, doubling and chorusing are two very common vocal effects. Most doubling or chorusing processors (software or hardware) have presets for vocals in which the effect is fairly intense and pitch movement is accomplished with a sine or triangle LFO. For a subtler effect, don't be afraid to use a very low wet/dry mix, even as little as 6 or 7 percent wet signal. For a more natural and interesting effect, use a modular synthesis environment like Cycling '74 Max/MSP or Native Instruments Reaktor to construct your own chorus effect that uses slow random modulation instead of sine or triangle waveshapes.

Of course, DAW editing makes you the master of time with your vocal tracks. Fly choruses around, nudge one line, or fix a spot that has rough rhythm. Beware, however: it is easy to overprocess vocals until they no longer sound natural, and that applies in particular to moving things around in time. It can be a great effect but also a slippery slope.

Time compression and expansion have become

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popular vocal-processing tools, as their audio quality has gotten quite good and the interface for invoking them simple. Today's time-stretching can even be used with confidence on a lead vocal. A good example of an application for time-stretching is when harmony vocalists end a note at slightly different times.

Tone to the Bone

Timbre covers a lot of ground; it's essentially everything that's not level, timing, or pitch. The most fundamental timbral tool is the equalizer. From a corrective standpoint, EQ is often used to deal with problems resulting from vocal quality, equipment (mic, preamp, or compressor) characteristics, and the interaction among them. Reducing boominess, boxiness, sharpness, dullness, or sizzle are all common EQ uses. EQ can also be used for effects, such as the ever-popular telephone filter. EQ is often vital to giving a vocal its own place in a mix, including among other vocals.

Traditional graphic and parametric equalizers are still found in abundance, but there is also a new generation of equalization plug-ins with uncommon approaches to EQ. Among the traditional tools, parametric EQ is the more difficult and, by far, most useful choice, offering the capability both to fix many problems and to shape the sound. Really learning how to use parametric EQ on vocal tracks gives you awesome control over their sound.

Here's the Pitch

Last but not least is pitch correction. Programs such as Antares AutoTune have become very popular for a variety of pitch-related uses. But although AutoTune is an outstanding tool, it is often used as a substitute for singing ability. Pitch correction is best used sparingly, for individual problem notes. If you have to use it heavily, what you really have is a performance problem (though pitch correction might just save your bacon in that situation).

Tuning aside, a classic pitch-shifting application is to widen the image of a single voice by hard left and hard right panning two versions of a vocal with very small pitch-shifts above and below the original pitch, while the original stays centered (see **Fig. 2**).

In the last several years, formant-based pitch-shifting has become readily available, opening a number of new doors, from "gender reassignment surgery" (making a male voice sound female, or vice versa, by shifting pitch and formants) to making corrective pitch-shifts less audible by also shifting the formants.

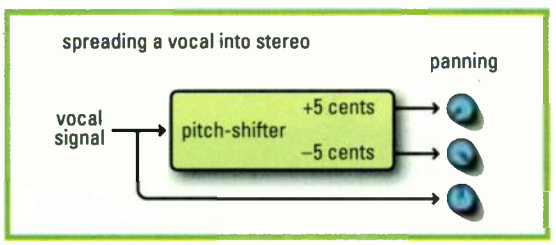

FIG. 2: Hard-panned micro-pitch-shifts are an effective way of widening the image of a vocal track. Using delays of a few milliseconds is another alternative. The two techniques can even be used in combination to widen the image further.

Wrap Your Dreams in Echo

When all other processing is done, you will usually want to put some sort of space around the vocal with echo and/or reverb. In thick mixes, you may find that using simple echo on vocals is sufficient and that reverb may actually smear the vocals into the mix to the point that they are no longer distinct. On the other hand, in a sparse setting, a lush reverb can be gorgeous.

Watch out for excessive boominess or sibilance in the vocal, which gets emphasized by reverb. An EQ in the reverb-send path can be most beneficial for protecting against these. Boominess can also be reduced by making the low-frequency decay time shorter than the high-frequency decay. Though this is contrary to almost every natural acoustic situation, it works well in pop music.

Mutants and Space

Spatial placement for vocals usually means panning the lead to center and backgrounds somewhat off center, but this is often combined with other techniques, like putting different processing on the backing vocals than on the lead. Because the vocal is typically the primary focus of a song, it is unusual to subject it to dynamic spatial movement, but on occasion, flying a vocal around can be a very dramatic effect.

There is a tradition, dating back at least to the Beatles, of using transformative processing on vocals. The Beatles introduced processing vocals through a Leslie cabinet, but the use of vocoding, talkboxes, or flanging (among many other devices and processes) on a vocal can immediately cast an entire mix in a different light. Taste aside, the challenge of using radical processing on a voice is retaining intelligibility. Mixing some amount of unprocessed vocal back in can help when a vocal gets so twisted by processing that it can't be understood. It's worth pointing out that vocal recording and live performance commonly call for real-time processing, frequently provided by dedicated outboard processors. Compression and equalization, especially, are often best performed by a good-quality analog compressor or EQ following the mic preamp.

Though creativity always offers additional options, mastering a relatively small set of vocal-processing skills, such as compression, de-essing, EQ'ing, and adding ambience, can be the third best way to get great-sounding vocals—the first two ways being having a good singer and having a great mic-and-preamp combination. EM

Larry the O is a contributing editor and has been writing for EM for more than 20 years.

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Q&A: Jeff Price

By Mike Levine

TuneCore helps remove the barriers to success.

The Web offers independent musicians the ability to self-distribute, allowing them to bypass record labels, distributors, and other gatekeepers of the old order. One of the best ways to distribute digital content is through online music services, most prominently Apple's iTunes Store, but also Rhapsody, eMusic, Napster, and others. Getting music onto such services used to be difficult, but it has been made extremely easy thanks to a Web-based service called TuneCore (www.tunecore.com), which also offers marketing opportunities for indie artists. I recently had a chance to speak with TuneCore's CEO and founder Jeff Price (see Fig. 1), who also runs the independent label spinART Records.

NICK LOSS-EATON

FIG. 1: Jeff Price of TuneCore (right) with Chuck D.

In brief, what is TuneCore's mission?

The mission is to enable artists to succeed. If you want the philosophy, that's the philosophy. Enable artists and musicians to succeed under a new model that never takes any of their rights—it doesn't exploit them, it serves them.

Describe how TuneCore works.

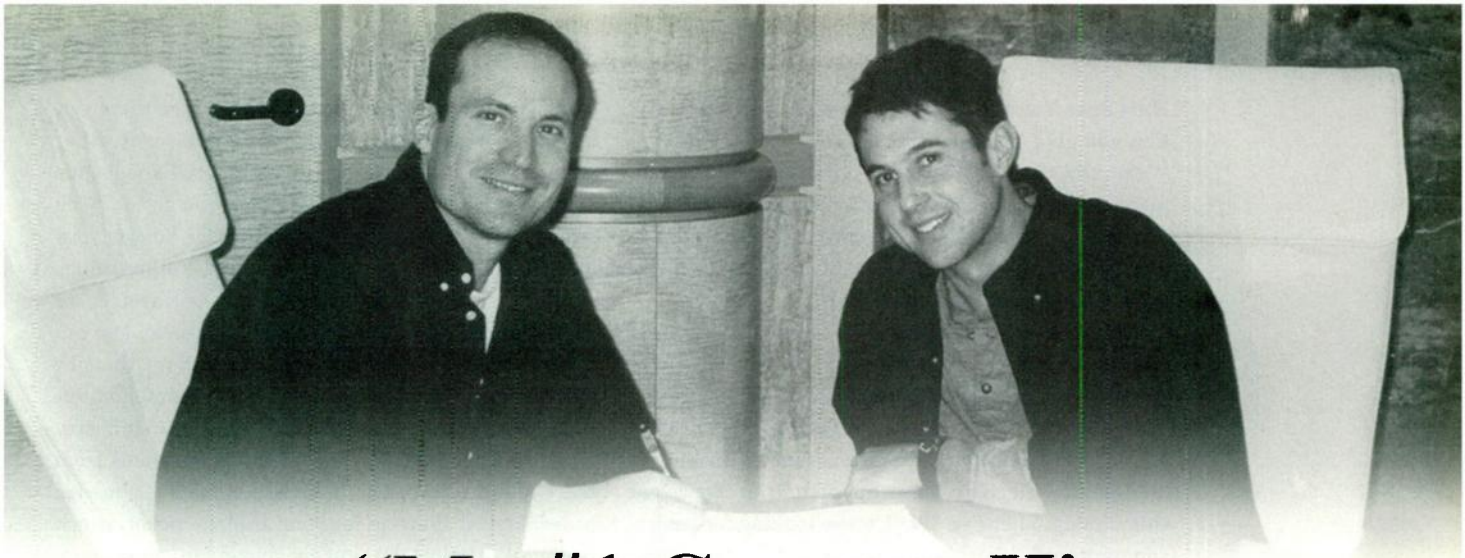
For the first time in the history of the music industry, you can get worldwide distribution of your music, and make it available for sale in the stores where people go to buy it, like iTunes, which is the third-largest seller of music in the United States and on the planet. For a simple, one-time, up-front flat fee, usually around 30 bucks, you get worldwide distribution of your music, placed into the [online] music stores where people go to buy it, and get 100 percent of the money from the sale of the music, and it's nonexclusive. You can cancel whenever you want.

Do your customers upload MP3 or AAC files to your site, or are there higher-fidelity options?

The format that we currently request is 320 kbps AAC. And the reason we request that is that we did a lot of testing. Each store has its own format or codec that it needs the music delivered in. What we need is a foundation, a piece of clay that can be molded. What we discovered after doing a lot of testing is that 320 kbps AACs really have the most flexibility without losing quality. We even compared it to AIFF and WAV files and so on, and we found that if you take the 320 kbps AAC, you can convert to, obviously AAC, MP3, Windows Media, Real, or any of the other formats, and there is really no sound degradation.

Can you get any artist's material into the stores, regardless of quality, or is there some sort of gate that the artist must get by first in order to get accepted?

The point of TuneCore is to remove filters. So previously, the barrier to entry was that you had to get to a label, the label would sign you based on subjective judgments and opinions, and then provide you the necessary tools, at a cost. The goal of TuneCore is to have no filter. To this point in time, there is not a single one of the hundreds of thousands, if not approaching millions, of songs that we've delivered that's been rejected by any store or service.



"My #1 Country Hit Started With a Phone Call to TAXI"

Elliott Park – TAXI Member

Photo: Elliott (left) with publisher, Michael Martin

I used to think that living in Clyde, Texas (Population 3,345) really limited my chances of ever having success in the music business. But all my friends and family members live here, so I've never wanted to move to Nashville.

Although I love to write songs, I felt isolated when it came to getting them heard by anybody in the music business. Then a friend told me that TAXI would bring real opportunities for my music right to my front door.

I Used a 4-Track

I signed up and sent in songs that I demoed with my digital piano in my little home studio. The A&R people at TAXI liked my songs and began sending them off to some pretty high-level people in Nashville.

All the sudden, doors started opening. With the connections I made through TAXI, I began to have meetings with some of Country Music's top executives, and signed a staff writer deal with a great publisher in Nashville.

Tim McGraw, Rascal Flatts and Faith Hill Put My Songs on Hold

Over the next three years, my songs were considered by a Who's Who of Country Music, but the "big cut" eluded me. I learned to be patient and worked even harder on my songwriting.

Then, my publisher hooked me up with veteran songwriter, Walt Aldridge. Together, we wrote a song called, 'I Loved Her First,' and finally, I hit pay dirt!

#1 Hit on Two Charts!

The group 'Heartland' cut our song and released it as a single. It started out slowly, then gained momentum, and eventually made it all the way to the Number One spot on the Billboard *and* R&R Country charts.

Could that have happened without TAXI? Probably not.

Although there were many people that helped me once I signed my publishing deal, it was TAXI that made that all important first connection for me. And I didn't have to leave my hometown to do it.

Can TAXI do the Same Thing for You?

If your music is competitive, the answer is yes! And if it's not quite ready yet, TAXI's A&R people will help you with that too. You'll also get two FREE tickets to TAXI's world-class convention with your membership. Just *one* ticket for some other conventions cost *twice* as much as your TAXI membership!

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How does TuneCore help people with promotion? Can you give me some specifics?

We provide opportunities for promotion by going to places and creating avenues. I'll get specific: Sony VAIO is manufacturing 6 million computers. These are coming out fourth quarter. On those computers will be music from TuneCore customers.

Chosen how?

They [Sony] chose. But it provides the opportunity. This is the benefit of being a TuneCore customer. We'll go in through our relationships and what we know, and we'll create these opportunities. We've got this catalog. They say, "Well, we're looking for singer-songwriters." Great, here's singer-songwriter music, here's a lot. Here are things based on your parameters, because most of them [the third parties] want to pick it.

Can you give me another promotion example?

We did a promotion with *BPM* magazine, where we had a playlist of 25 songs, giving away 4 free, through iTunes. *BPM* promoted it in their magazine and on their Web site, and iTunes promoted it and so did we. They made like a quarter million of these free codes, which were tied into their Web site, and handed out plastic credit-type cards. It was exclusive only to TuneCore customers, and there was a quarter million downloads of a playlist of 25 dance/electronica songs for *BPM*. We're probably in the neighborhood of 80 to 120 artists that have been featured or profiled either on eMusic or Rhapsody or iTunes or Napster. And how do we pick and choose what we're promoting? I wish I could give you a magic formula, but to be very honest about it, I can't. I think this is an important second differentiator between us and other companies. Other companies will say, "We're going to market and promote you and get you on iTunes." That's B.S. Running a label for 20 years, I understand how to market and promote, and the reality is that if everything is great, then nothing is great. And if you've got 3,000 releases coming out every month, because that's how many labels you work with, you can't say all 3,000 are great, which means most of it is not getting marketed and promoted.

The reality is that if everything is great, then nothing is great.

Do you differ a lot from your competitors in terms of how you work?

I view TuneCore differently than maybe the way other people do. The reason is because I know in my head what I want us to be; we just haven't gotten there yet, because it takes time to build it. So what is it, what are we? In the end, what is TuneCore? It's Expedia, it's Travelocity, it's Orbitz. As a traveler, you go to a Web site to take the pain out of being a traveler. You get your airplane out of it, and then there are the other things you'll need that are specific to being a traveler: car rental, vacation package, travel insurance, and so on. So it's one place to simplify. And that was my thought with TuneCore—you go to one place, to simplify. But the radical shift in the model is, it's a music-industry model that doesn't take any rights or revenues from the exploitation of the masters—it's all service-fee based. So you show up for your airplane ticket, which is digital distribution, but maybe when you're there you want to get CDs made, so we manufacture them. Or, you want to get posters or buttons or T-shirts or stickers, and we do that.

If your fees are so small, how do you make any money?

A very valid question. Look at Federal Express. It's probably worth about 40 or 50 billion dollars. That's a company that made its money 15 to 20 dollars at a time delivering packages. I deliver packages, except that I don't have to own airplanes and airplane hangars, jet fuel, insurance, and so forth. I take broadband and a hard drive, and the rest of it is connections and writing the one-time write of the software code, and that's my overhead. The reason why the delivery fee is so low is because it can be. It's the cost of the broadband, and it's the cost of my processing power to convert your music to the format, and then it's delivering it on the other side to the third-party company. So if you think about it, that shouldn't cost thousands of dollars and give me unlimited amounts of money; that should be a simple flat fee. It's just like saying, "Give me your package at FedEx, put it in this envelope that we've made for you, and I'm going to put it in an airplane and fly this airplane to China." They certainly can figure out the margins, and have a heck of a lot more overhead than we do. But the rest of it is, I hope that if you choose to do anything else on the service side—the buttons, the posters, the stickers, the T-shirts, the musical gear, the equipment, and so forth—that you'll choose to use us to buy it. Because why not, there's your money, you click a button and it's done, and the rate's lower than you can get on your own. And you know what? We'll make a small margin on it. Sure. EM

Mike Levine is an EM senior editor and the producer of the twice-monthly Podcast "EM Cast" (www.emusician.com/podcasts).

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Nathaniel Kunkel's Studio Without Walls is as much an approach to making records, as it is the actual physical studio. "I move around all the time and I take my studio with me. More often than not I find myself working in smaller, irregular rooms, such as a guest house, office, or hotel room. When I am working in a smaller room like that, the first thing that gets sacrificed is the monitoring environment – and there is almost always some kind of low frequency problem. The LSRs allow me to know exactly what is going on with the bottom end, and create mixes that translate impeccably outside of the studio. The RMC system makes a tremendous difference. I've been working on the JBLs exclusively and I'm really, really happy with them."

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Motif XS6 pictured – also available in 76-note and 88-note versions

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CUBASE

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- 48 stereo audio playback tracks
- Up to 64 MIDI tracks
- HALion One Virtual Instrument with 150 Motif sounds
- 25 VST effects
- 8 FX return channels
- Notation with display quantize

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Cubase Studio 4

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- 64 FX return channels
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Music Instruments & Pro Audio

KORG M3

See Product Specs @emusician.com

A budget OASYS or a Triton killer?

By Geary Yelton

The M3 is the latest in a long succession of pro-level synth workstations from Korg. It borrows much of its technology from the groundbreaking OASYS, for well under half the price. Both the M3 and OASYS have a color touch screen, second-generation KARMA, an onboard control surface, user sampling, tons of effects, and a primary synthesis engine based on 16-bit, 48 kHz sample playback. Both have two stereo oscillators for each voice. The M3's maximum polyphony is a very reasonable and generous 120 voices, though polyphony is halved for Programs that use both oscillators. And if you like the OASYS's collection of factory timbres, the M3's sounds are guaranteed to please your ear.

FIG. 1: It's been almost 20 years since Korg introduced its first professional music workstation, and the M3 is the very latest. It encompasses synthesis, sampling, sequencing, effects processing, and algorithmic control capabilities.

Although it lacks the OASYS's open architecture and multiple synthesis engines, the M3 breaks some new ground. To integrate easily with computer-based recording setups, it comes with M3 Editor software that runs standalone and as a plug-in. Each Program and Combi is paired with an independent, user-programmable Drum Track (see **Web Clip 1**). At 480 ppqn, the M3's 16-track MIDI sequencer actually improves on the OASYS's note resolution. It doesn't record audio tracks, but recording and playing back audio samples at specific locations is easy, so you can still incorporate vocals, guitars, and acoustic instruments in your sequences.

An instrument like the M3 is so deep, I could easily fill this magazine describing it and detailing its operation.

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

BRING ON THE HEAT.

TUBEFIRE8

Eight Channel Tube Preamplifier with Firewire

The ART TubeFire8™ delivers the best of all worlds in one tube driven digital audio interface package. Ideal for any recording application, the TubeFire8™ adds eight incredibly warm tube driven microphone or line inputs and eight balanced outputs to any FireWire equipped computer.

Complete FireWire Based Studio Solution

Designed as a complete studio package, the TubeFire8™ is shipped with Steinberg's Cubase LE 48-track for both Mac and Windows operating systems making it a truly plug and play recording solution, although it is compatible with many popular ASIO and Core Audio based applications.

Class-A Tube Design

ART's TubeFire8™ packs eight quality second-generation discrete Class–A vacuum tube microphone preamps in a single rack space audio interface with balanced I/O and FireWire connectivity.

Versatile I/O

ART's microphone preamps provide clean quiet gain while maintaining incredible transparency through the input stage. The eight balanced outputs of the TubeFire8™ can be driven from either the analog microphone preamp inputs making the TubeFire8™ an in-line eight channel tube preamp, or from the internal high quality D/A converters making it a high quality multi-channel audio output for your PC.

Full Input Control & Low Latency Monitoring

Every input channel offers both XLR input and 1/4-inch TRS balanced input with 70dB of gain. All inputs have –10dB Pad, High Pass filter, Phase Invert clip indicators and a wide range LED meter to monitor the preamp levels. The eight balanced outputs can be summed to an integrated headphone output providing either a mono or stereo mix function for low latency input monitoring and for monitoring audio playback from the computer.

Features

- **Shipped with Steinberg's Cubase LE 48-track** *(for both Mac and Windows operating systems)*
- **8 x quality second-generation discrete Class–A vacuum tube microphone preamps**
- **8 x XLR & 1/4-inch TRS Combi-jack Inputs**
- **2 x 1/4-inch instrument jack Inputs (CH1 & 2)**
- **8 x 1/4-inch TRS balanced Outputs**
- **1 x 1/4-inch TRS headphone jack**
- **8 x Input Gain / Channel Level / HPF / Phase Invert**
- **8 x Channel Metering** *(4 bar led graph w/ clip indicator)*
- **44.1KHz, 48KHz, 88.2KHz, 96KHz Sample Rates**
- **24-204KHz External sample rate**
- **44.1K, 48K, 88.2K, 96K, 176.4K, 192K Internal sample rates**

A R T
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FIG. 2: All the ins and outs are mounted on the detachable M3 module. In addition to 2-in/6-out analog audio on unbalanced jacks, it supplies rear-panel ports for S/PDIF, MIDI, USB 2.0, and an optional FireWire card.

ONLINE BONUS MATERIAL

Because page space is limited, see the **online bonus material** at www.emusician.com to read more about the M3's user interface, sequencer, editing software, KARMA, storage, and expansion options as well as other topics.

For Here or to Go

Four M3s are available: 61-, 73-, and 88-note keyboards, and the rackmount M3-M module. The keyboard versions, including the 73-note model that I received, incorporate the new Korg Komponent System (KKS), which allows you to detach the surprisingly lightweight M3 module from the keyboard section. The 61- and 73-note models have an all-new key bed designed by Korg, and the 88-note model has a progressive weighted-hammer action called RH3, similar to the OASYS 88's RH2. All three keyboards have a joystick, a ribbon controller, and two assignable buttons.

The M3 module, which is identical in all four editions, contains all the controls, displays, and I/O (see **Fig. 1**). Mounted in the keyboard housing, it can either lie flat or tilt at a comfortable angle. The front panel is quite similar to the OASYS's, but with fewer knobs, fewer indicator LEDs, and a much smaller display that doesn't tilt independently. The 5.7-inch-diagonal, 320 × 240–pixel touch screen is the same size as on Korg's earlier workstations, the Trinity and the Triton, but with color.

When you press the adjacent X-Y Mode button, the touch screen functions as a two-dimensional control pad. You can control parameters such as filter sweep or oscillator balance by sliding your finger across the display, which changes color to reflect real-time changes (see **Web Clip 2**). Pressing and holding the Motion button records your movements into the M3's motion sequencer, and simply pressing the button plays them back in a loop.

Beneath the display are eight 1-inch-square, Velocity-transmitting pads for triggering drum sounds and up to 8-note chords (see **Web Clip 3**). You can easily assign notes or chords to each pad and even merge assignments from two or more pads to a single pad. Each Program, Combi, and Song retains its own set of pad assignments.

The M3's control surface section has eight assignable sliders and eight assignable buttons, as well as illuminated buttons for changing modes, selecting scenes, starting and stopping Drum Tracks, and so on. Five Control Assign buttons allocate the eight sliders and buttons to alter real-time performance or patch parameters, control KARMA functions, change mixer levels and mute status, or manage parameters on external MIDI devices.

In addition, the front panel furnishes buttons for tasks such as operating the sequencer and sampler and selecting banks, modes, and pages. A slider for scrolling through parameter values flanks two buttons for stepping through them. There's also a numeric keypad for entering values directly, a data wheel for scrolling, and a tempo knob with a Tap Tempo button.

The rear panel supplies a complement of I/O connectors (see **Fig. 2**). Four assignable audio outputs supplement two main outputs and a stereo headphone jack. Two unbalanced ¼-inch audio inputs have a level knob and a mic/line level switch; they're fine for guitars and line-level sources, but an XLR input would preclude the need for an external mic preamp. A pair of Toslink ports handle S/PDIF I/O. MIDI In, Out, and Thru ports sit alongside two Type A and one Type B USB 2.0 ports. Three control jacks accommodate a damper switch, an assignable footswitch, and an assignable expression pedal.

PRODUCT SUMMARY

KORG M3

synthesizer workstation
M3-M, $2,375
M3-61, $3,000
M3-73, $3,475
M3-88, $4,000

FEATURES	4
EASE OF USE	3
QUALITY OF SOUNDS	5
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Spectacular sounds. Impressive versatility and interactivity. Stereo sampling. Excellent effects. Terrific keyboard.

CONS: No audio tracks. Maximum 320 MB of sample RAM. No internal drive. No XLR input.

MANUFACTURER
Korg
www.korg.com

Sound Engineering

The M3 is powered by Enhanced Definition Synthesis (EDS). It is very similar to the OASYS's sample-playback engine, HD-1, and a sizable leap ahead of the Triton's HI synthesis. In fact, Korg developed EDS in parallel with HD-1. Each voice has two oscillators that play stereo samples from the M3's 256 MB of waveform ROM. Each sample has up to four Velocity layers, and you can crossfade between them. Each voice also has two resonant multimode filters. Because you can configure each filter as two filters in parallel or in series, they can function like four filters, offering maximum flexibility for specifying custom curves and responses.

Each voice has four envelope generators: one for amplitude, one for pitch, and one for each of the two filters. Envelopes let you specify four levels and four

transition times between them, as well as the curvature of each segment. Each Program, Combi, and sequencer track has three bands of EQ, and the middle band lets you sweep its frequency from 100 Hz to 10 kHz. AMS mixers, like those in the OASYS, add versatility to the M3's modulation routing.

The M3 contains 522 factory Drum Tracks, each with a name suggesting a matching kit, in dozens of musical styles. If you'd rather create your own patterns, the M3 can store 1,000 of them. You can convert your own sequencer patterns to Drum Tracks or import Standard MIDI Files. Dozens of kits are available for use in Drum Tracks, or you can build your own using ROM samples or samples you've recorded or imported. Because you can set any Program's category to Drum, you can use any M3 sound in a Drum Track to explore some exciting timbral territory.

Sample It Yourself

The M3 employs the Open Sampling System first developed for the Triton and later refined for the OASYS. Along with standard do-it-yourself sampling tasks, it can resample itself to capture KARMA performances or record through effects. The M3 can also load samples in AIFF, WAV, SoundFont 2.0, or Akai S1000/S3000 format, even importing entire Akai and SoundFont programs complete with program parameters and key and Velocity maps. If you connect a CD or DVD drive, it can rip tracks from an audio disc.

The M3 comes with only 64 MB of sample RAM installed, but adding the optional EXB-M256 expansion board ($99) brings it up to the maximum of 320 MB—more than three times the maximum of the Triton Studio or Extreme, but far short of the RAM available for sampling in the OASYS.

Once you've recorded or imported your samples, you can graphically trim and truncate, define loop points, execute crossfade loops, invoke time slicing, change tempo without affecting pitch, and so on. The Convert MS To Program command saves your edited multisample to any vacant Program location.

Object of Desire

The M3 is a giant step up from the Triton and incorporates many of the OASYS's most musically useful features. In fact, if not for the over-the-top OASYS, the M3 would be Korg's flagship synth, and I'd put it up against top-shelf workstations from any of Korg's competitors. Thanks to an army of talented sound designers from around the world, the M3 supplies a wealth of factory timbres and effects that cover all the bases and inspire creativity. Your ability to interact with the onboard sounds is remarkable, but the bottom line is that the M3 sounds awesome. If you want even greater variety, the optional EXB-Radias expansion board ($350) adds virtual analog, VPM, and other forms of synthesis.

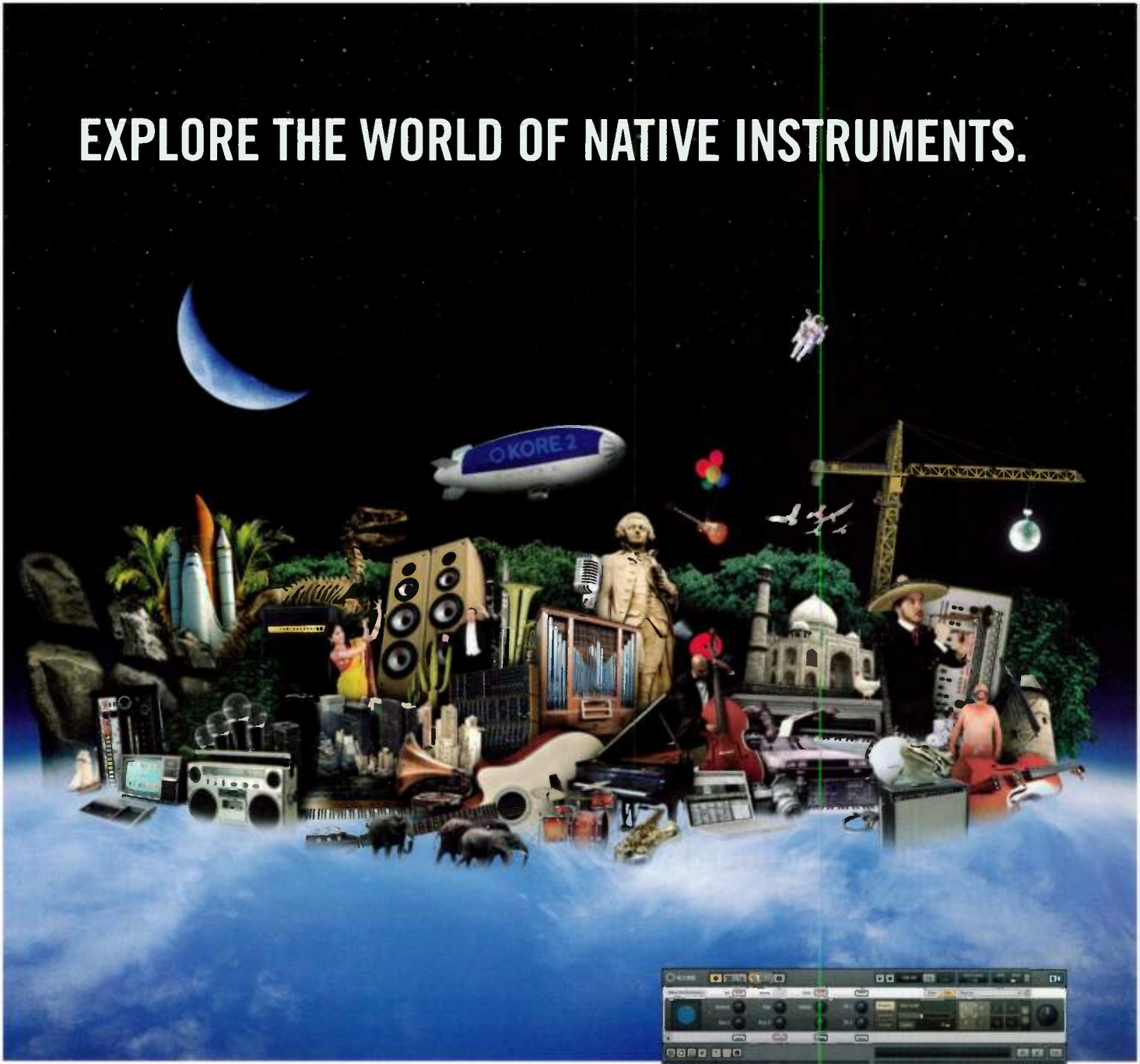
With its red-only illuminated buttons and stuck-on wood side panels, the M3's appearance may not appeal to you. Nonetheless, its tilt-up synth module is a very practical design, and the new Korg-constructed key bed has the best synth action I've ever played. It not only feels musically responsive, but it also lets you control Aftertouch to an extent I've never experienced; you can actually step through values one by one as you press down.

You should have no problem finding an excuse to seriously consider buying an M3. Your creative life might revolve around a music workstation from the 20th century, and you feel it's time to move up. Maybe you've been lusting after an OASYS but can't justify the expense. Or perhaps you've been waiting for a keyboard synth that will integrate seamlessly with your computer-based recording setup. Whatever your excuse, you should give the M3 a try and decide with your ears.

EM WEB CLIPS

EM associate editor Geary Yelton wrote his first book, The Rock Synthesizer Manual, *in 1983 and has been writing for EM since its first issue in 1985.*

EXPLORE THE WORLD OF NATIVE INSTRUMENTS.



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NATIVE INSTRUMENTS

THE FUTURE OF SOUND

FIG. 1: Like all of Arturia's classic-synth emulations, the Jupiter-8V interface looks just like the real deal.

ARTURIA Jupiter-8V 1.0.3 (Mac/Win)

Classic '80s keyboard with some new twists.

By Brian Smithers

Having successfully reproduced the Minimoog, Moog Modular, Yamaha CS-80, ARP 2600, and Sequential Circuits Prophet 5, the retro-synth-loving techies at Arturia have turned their attention to Roland's famous Jupiter-8. With its built-in arpeggiator, a keyboard that could be split or layered, and the ability to sync to its stablemate the TR-808 drum machine, the Jupiter-8 helped drive the wave of synth pop that dominated radio in the 1980s.

In typical Arturia style, Jupiter-8V does its best to emulate the original and then throws in some appropriate extra goodies. The Jupiter-8 offered 8-voice polyphony, whereas 8V allows up to 32 voices if your CPU can handle it. The rest of the basic sound engine is strictly emulative except for effects, a flexible step sequencer, and an imaginative *x-y* modulator called Galaxy. Jupiter-8V is available for the PC or the Mac, including Universal Binary, and works as a standalone instrument or as an AU, RTAS, or VST plug-in.

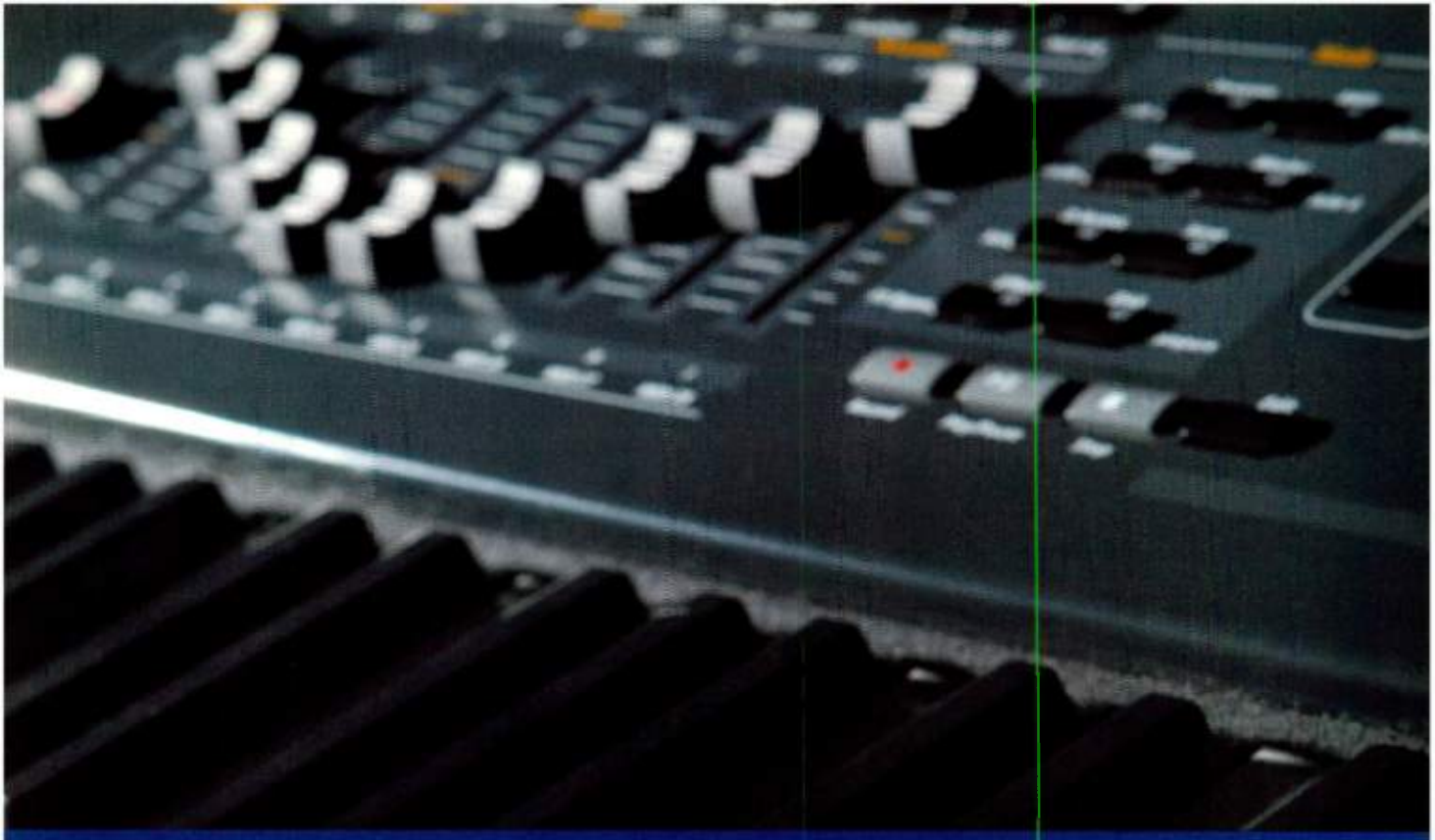
Original Recipe

Like the original, 8V features two oscillators, two filters, and two envelopes, all with controls patterned after the hardware version (see Fig. 1). Knobs are set by moving the mouse vertically, as though they were sliders. I ordinarily find this behavior preferable to circular motion, which the manual says is the default mode. As it turns out, circular motion is not even an option.

Another manual error suggests that either right-clicking or Shift-clicking on a knob or slider offers fine adjustment, when in fact only Shift-clicking works. That's unfortunate; right-clicking is a lot more convenient because it requires only one hand.

The architecture of the Jupiter-8 was not revolutionary, but its actual implementation—the character of the oscillators, filters, and envelopes—gave it a sound all its own. The sound of 8V is immediately reminiscent of the

Jupiter-8V does its best to emulate the original and throws in some extra goodies.



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original and distinct from the rest of the virtual field. Although it lends itself easily to light sounds with air and bounce, with a bit of digging you can find beefier tones (see **Web Clip 1**).

FIG. 3: The effects section includes both voice effects, which are inserted into the synthesis chain, and patch effects, which occur at the instrument's outputs.

Extratasty Goodies

Possibly the most interesting aspect of Jupiter-8V is the Galaxy modulation module (see **Fig. 2**). Were it merely a straightforward *x*-*y* modulation grid, it would be welcome. What sets it apart, however, is the ability to rotate the axes, creating wonderfully complex modulation patterns (see **Web Clip 2**). Each axis is controlled by an LFO, as is the grid's rotation. You can set each LFO to sine, square, saw, or triangle waves, and you can vary the initial angle of the grid's *x* axis. You can map each axis to three parameters, including the pitch or pulse width of either oscillator, the cutoff of either filter, the lowpass filter's resonance, or the VCA. You can set the modulation amount of each assignment independently.

Galaxy's LFOs optionally sync to tempo, and they can retrigger with each note or run freely. These two settings are not independent, though—your choice applies to all three LFOs. You can adjust all ten knobs (six modulation amounts, three LFO rates, and grid angle) in real time or automate them with MIDI Control Change messages. If, despite all this, your pads are static and boring, you have no one to blame but yourself.

The modulation section also features a single step sequencer with up to 32 steps that you can map to any 3 of the same 8 parameters as Galaxy. The sequencer syncs to project tempo or runs at its own rate, and it will optionally retrigger with each note. You can quantize its three outputs to semitones when mapped to oscillator pitch. The sequencer will run forward, backward, forward then backward, or randomly, and it offers nice subtleties such as smoothing, accents, glide, and swing. You might wish for a second sequencer to build complementary patterns, but at least each part of a keyboard split or layer (called Dual mode) has its own sequencer.

Subtle Effects

The effects section (see **Fig. 3**) is divided into voice effects, which are independent for each part of a layer or split, and patch effects, which are global. The voice effects include chorus-flanger, distortion, parametric EQ, phaser, and ring modulation. You can insert one between the oscillator section and the filter section and another between the filters and the VCA. Additionally, you can insert two stereo patch effects (chorus-flanger, phaser, reverb, and delay) at the instrument's output.

I don't ordinarily take much interest in the built-in effects of a software or hardware synthesizer. Often they are provided as conveniences for live performance, and the first thing I do in the studio is defeat them. The patch effects are perfectly serviceable, standard effects. But aside from their ability to sync to tempo, you may find them less useful than your DAW's standard plug-ins. The voice effects, however, are a worthy exception because of the way they are integrated into the synth's signal flow and can be shaped by any of the instrument's modulation sources.

In a perfect world, it would take a single mouse-click to disable all the effects, or at worst one click for the voice effects and another for the patch effects. Instead, it can take as many as eight clicks, and that's assuming the Effects page is already displayed. By itself this is a minor quibble, but if this and a few other mouse-intensive operations were streamlined, the user interface would provide a much smoother flow for designing sounds. For example, there should be an easy way to bypass Galaxy or the step sequencer should you want to tweak a sound in isolation from those modules.

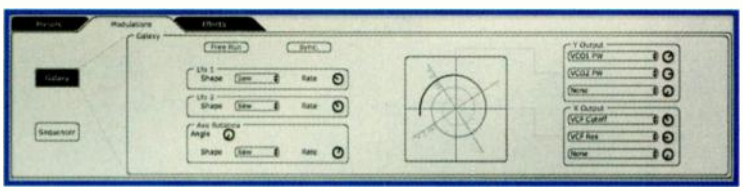

FIG. 2: The Galaxy module is good for some serious fun, with an *x*-*y* modulation grid that you can rotate. You can map each axis to three different destinations.

Extracrunchy Interface

My wish list for the next version contains a few other items. When the plug-in window is open in Digidesign Pro Tools, it steals all keystrokes from the application, including essential transport functions. You must either close the plug-in window to start, stop, rewind, and record, or resort to using the mouse to initiate playback. Because the patch effects are all stereo, the plug-in will appear only on a stereo track in Pro Tools. Although not a fatal flaw, it requires a couple of extra steps to make the instrument behave like the mono original.

While I'm picking on the manual, note that it doesn't document the procedure for assigning a Favorite patch to one of the 16 buttons that the original used to store its presets. (Simply call up the patch and then Shift-click on the desired button.) The original factory presets are not included as promised in the manual, but they are now

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available from Arturia's Web site. Patches are not organized in banks, sub-banks, and presets (as the manual says), but rather as projects.

Arturia does deserve kudos for including historical background on the Jupiter-8 along with a couple of good chapters on programming the instrument. But with the poor translation and rather large number of errors, the current manual is unworthy of such a good product. Because Arturia doesn't make its manuals available electronically, the chances of seeing a corrected version are pretty slim. I hope the company will at least post a persistent topic in its Jupiter-8V user forum listing known manual errors.

Extracrispy CPU

Arturia's system requirements for Jupiter-8V are a bit optimistic. It recommends a 1.5 GHz Mac or PC, but I couldn't get any sort of usable performance on my Athlon 2500+, which is significantly more powerful than that. Performance was better on my 2 GHz Centrino CPU (a notebook processor roughly equivalent to a 4 GHz desktop processor), and better still on my

PRODUCT SUMMARY

ARTURIA Jupiter-8V 1.0.3

software synthesizer
$249

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

RATING PRODUCTS FROM 1 TO 5

PROS: Great for both emulative and original sounds. Broad plug-in format compatibility and standalone mode. Useful nonemulative features, including presets, effects, and 32-voice polyphony. Innovative Galaxy module provides complex modulation curves.

CONS: Major CPU hog. Manual suffers from inaccuracies and poor translation. Interface should be more streamlined.

MANUFACTURER
Arturia
www.arturia.com

dual-core 2.33 GHz MacBook Pro. However, this synth can be an extraordinary resource hog.

Running within Cakewalk Sonar 6.2 with no other tracks, one active pad preset chewed up 35 percent of my notebook's CPU to play a 3-note chord. That's not too bad, but when I played a progression of 3-note chords, the overlapping releases overwhelmed my CPU completely by the time I played the third chord. I repeated this on my MacBook Pro in standalone mode, and although the CPU meter was somewhat lower, the third chord still choked the CPU. Disabling Galaxy and other effects did not help significantly. For all practical purposes, this particular preset is unusable. The moral of the story is that you should be prepared to make good use of printing or freezing Jupiter-8V tracks.

When running the plug-in within Sonar 6.2, I could escape constant distortion only by setting the buffer to an absurdly large size. I got the same results in Sonar 5, so I went digging for information. I found a link to a version 1.0.3 upgrade in Arturia's Jupiter-8V forum. It solved the problem, although I could still only get the latency down to a barely manageable 30 ms without distortion on my Centrino notebook. Arturia puts links to interim updates in its user forums and, less frequently, releases formal updates that have been fully tested. If you encounter problems, be sure to check the forums.

Like all recent Arturia virtual instruments, Jupiter-8V uses a Syncrosoft USB dongle. Authorization was straightforward, and the USB key allowed me to use the instrument easily on several different computers. However, Pro Tools refused to start without the USB key. Arturia says this should not happen, and it is looking into the matter.

Despite the handful of issues I encountered, I like Jupiter-8V a lot. Its ability to produce nostalgic sounds takes me back, but at the same time, its sonic potential has me looking forward. The more time I spend absorbing its sound-sculpting logic and making new sounds and templates for further experimentation, the less significant my quibbles about its interface seem. The Galaxy modulation module and the ability to patch effects into the synthesis chain promise nearly endless opportunities for timbre tweaking. Check out the demo when you're in the mood for some serious fun.

EM WEB CLIPS

Brian Smithers is course director of audio workstations at Full Sail Real World Education in Winter Park, Florida. His latest book is Mixing in Pro Tools: Skill Pack *(Thomson Learning, 2006).*

FIG. 1: Dynaudio Acoustics' BM 6A MKII features a 6.5-inch woofer and 1.1-inch soft dome tweeter in a distinctive compact cabinet.

DYNAUDIO ACOUSTICS BM 6A MKII

See Product Specs @emusician.com

Exceptional close-field monitors for any space.

By Rusty Cutchin

Dynaudio Acoustics' BM 6A has been a popular close-field monitor in pro studios for years. With the Mark II version, Dynaudio brings a new design and a lowered price to the table. Fortunately, the Danish speaker manufacturer hasn't lowered the quality on these excellent monitors.

Cool and Compact

The BM 6A MKII is a powered bass reflex monitor that sports a 6.5-inch woofer and a 1.1-inch soft dome tweeter (see Fig. 1). The relatively narrow front face features tapered and beveled edges on each side and a woofer mounting ring that overlaps the tweeter mount, giving the monitor a distinctive look. The woofer ring extends almost to the edge of the cabinet. The tweeter has a decorative cover, an inverted Y made of spindly metal tubing that provides some protection.

At the bottom of the front panel and just above the Dynaudio Acoustics nameplate are two LEDs. The first lights green when the monitor is powered on. The second lights orange when the output stage is close to clipping. It turns red when the signal begins clipping, at which point the monitor is automatically muted.

The woofer uses Dynaudio's well-known design: a polypropylene cone with a large fixed and vented dust cap, which provides more surface area and rigidity. The tweeter is Dynaudio's Esotec rear-chamber, magnetic-fluid soft dome, with an aluminum front and a pure aluminum wire voice coil.

The rear panel features a slotted port across the top of the solid black, all-wood cabinet (see Fig. 2). Half of the control panel is taken up by a vertical heat sink running the length of the metal panel. To the right of the heat sink are switches that control the amplifier's highpass filter, input level, and equalization.

In Control

The highpass filter switch has settings of 60 Hz or 80 Hz for matching the monitor to a subwoofer. You can also leave the unit set to flat. (The BM 6A MKII's listed frequency response extends to 40 Hz.) The Level Trim switch provides 0, +4, and –10 positions for matching to low- or high-output sources. Next to these switches is a second LED power indicator.

Below those are the EQ controls. The LF switch controls the bass gain level using a shelf-type EQ. The level

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can be set to +2 dB, 0 dB, or –2 dB. In small studios, this filter can help with bass buildup at walls or corners. The MF switch activates a bell-shaped notch filter, which can compensate for lower midrange response peaks, and provides –2 and –4 dB settings. The HF switch lets you boost or cut treble response by 1 dB.

FIG. 2: The monitor accepts XLR connections only and has slider switches to control its highpass filter, level setting, and EQ adjustments.

The BM 6A MKII has a single XLR connector positioned below the EQ switches and followed by the power toggle switch and power cable receptacle. Internally the amplifier supplies 100W to the woofer and 50W to the tweeter with a 1.5 kHz crossover frequency and 6 dB-per-octave slope.

Musically Speaking

Although over the years I've preferred larger drivers in stereo monitoring setups (as opposed to desktop-speaker-and-subwoofer configurations, for example), lately I've come across some compact monitors with pretty nifty bass handling. As more modern mixes rely on deep bass frequencies (traditional pop music as well as hip-hop tunes with extensive sub-bass tones), a few monitors with 6-inch drivers have risen to the challenge admirably.

Surely, though, the BM 6A MKII would fall short of this benchmark, despite the cabinet's impressive depth (13 inches) and 40 Hz reach. This monitor, I thought, is going to sound very crisp and transparent on top and cry out for a subwoofer on the bottom.

Wrong. I happened to be adding some Paul McCartney solo albums to my iTunes library when I first hooked up the Dynaudios, and I did a quick comparison between 1989's "My Brave Face" (coproduced by Elvis Costello) and 2007's "That Was Me" (coproduced by David Kahne). As I expected, the shimmering guitars, Beatle-esque layered vocals, and trademark bass fills of the '89 tune were rendered as though they'd been recorded yesterday, with Dynaudio's excellent stereo imaging apparent from the a cappella vocal intro.

The newer production, a swing-funk rocker, reaches way down for frequencies associated with modern R&B. I was amazed at the bass the BM 6A MKII was putting

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various parameters, I could use the Mod Wheel to scroll through the analysis data, playing through a portion of the file and then freezing on a single frame (this can be set to occur automatically as well; see **Web Clip 9**). I also found the Blur controls, especially when combined with a bit of reverb, to be very useful for creating colorful, ambient timbres that layered well (see **Web Clip 10**).

You can record Poseidon's output directly to disk in standalone mode (WAV only on the PC and AIFF only on the Mac) and of course when it is being used in a host. There aren't any options to customize the interface (resizing or rearranging windows and controls, for instance), but you can change the overall color scheme using any of 17 different options.

Resurfacing

Poseidon is more intuitive and somewhat scaled back from the complexity and multileveled architecture of Cube and Tera. And because it uses analysis/resynthesis as its main synthesis method, it has nearly unlimited potential for creating unique sounds, especially those that mix characteristics of two sources. I'd love to see even more ways to alter the analysis data, though. For example, it would be great if the program could adopt some of the spectral processing functions of Composers' Desktop Project (http://people.bath.ac.uk/masjpf/CDP/swgroups.htm), probably the most potent A/R toolkit around.

Poseidon's documentation is on the slim side; there is little detail on any of the program's features, and the getting-started-style explanations don't go into much depth. You're definitely in for a lot of trial and error with this one, though for many people that's not a bad thing.

Poseidon also retains many of the quirks of other VirSyn programs, the most annoying of which is the lack of any undo function. Equally frustrating is the program's failure to prompt you to save your presets after a work session, regardless of whether you have made changes or not. But these are things you'll get used to if you work with VirSyn's tools, and hopefully those features will be added to the company's software someday.

If you're looking to explore some new sonic territory, check out the trial version and listen to the Poseidon demos online. Just keep in mind that those only scratch the surface, and that the deeper you swim, the more you'll get from Poseidon.

EM WEB CLIPS

Associate Editor Dennis Miller is a composer and animator. Check out his work at www.dennismiller.neu.edu.

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REVIEW

out. The sampled kick drum was massive without a hint of distortion, and Paul's driving quarter-note bass added even more depth (what I would have called mud in the '80s) without overwhelming the arrangement. The monitors' amps spit out this low-end mash effortlessly, and their 150 watts filled up the room as though they were driving soffit-mounted reference monitors with 15-inch speakers.

Of course, a pop-rock AAC file is not a hip-hop CD. Here too, however, on tracks like Rihanna's "Umbrella" and Timbaland's "The Way I Are," the BM 6A MKII displayed uniformity across the frequency range and reliability for power handling and mixing that reminded me of the Yamaha NS-10M (if it were better-sounding and -looking).

Session Subtleties

On some traditional jazz mixes in my studio, the BM 6A MKII was a reliable reference—in fact, it rendered subtleties like reverb tails and acoustic guitar transients better than the very, very good (although less expensive) close-field monitors I've been using. The slight midrange honk of certain acoustic piano samples I like, which sound better in a mix than solo, came through without becoming undesirably prominent. The growl of an aggressively played acoustic bass was unmistakable in the mix—apparent without sticking out like a sore thumb pop.

Most of all, I was impressed with how the BM 6A MKII maintained its uniformity at high and low volumes and across several styles of music. My lead guitar lines on country demos lay in the mix the same way, whether the monitors were barely audible or shaking the rafters. The front-panel clip LEDs were fast and accurate. After listening to a lot of program material with the monitor's gain control set to 0, I set the switches to –10 and was able to crank the control room outputs of a Mackie Onyx 1220 mixer way up without any noticeable sonic alteration.

The monitor also sounded great in my room without any tweaking of the EQ switches. When I did engage them, they were properly subtle—the kind of setting that would clearly help balance a room without changing the entire character of the speaker. In my studio, there was no need for any bass boost. I still find this kind of bass response remarkable in a monitor this size.

Mark This

I can't say enough good things about Dynaudio Acoustics' BM 6A MKII. Straight out of the box, it had the power and sound of some of the best monitors I've heard in its class. If this monitor fits your budget and space, it should absolutely be on your list for auditioning. It won't astound clients with its clublike vibe—for that you'll need a subwoofer. But when the partygoers go home and you're mixing by yourself, you'll definitely dig the versatility and sound of the BM 6A MKII.

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

PRODUCT SUMMARY

DYNAUDIO ACOUSTICS BM 6A MKII

powered monitors
$1,745 per pair

FEATURES	4
EASE OF USE	5
AUDIO QUALITY	5
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Excellent frequency response, stereo imaging, and overall quality in a small package.

CONS: XLR inputs only. Pricey.

MANUFACTURER
Dynaudio Acoustics
www.dynaudioacoustics.com

FIG. 1: Poseidon's main screen provides access to all the major program controls and displays a list of attributes for finding presets.

VIRSYN Poseidon 1.4 (Mac/Win)

Ever more sound-design options from under the sea.

By Dennis Miller

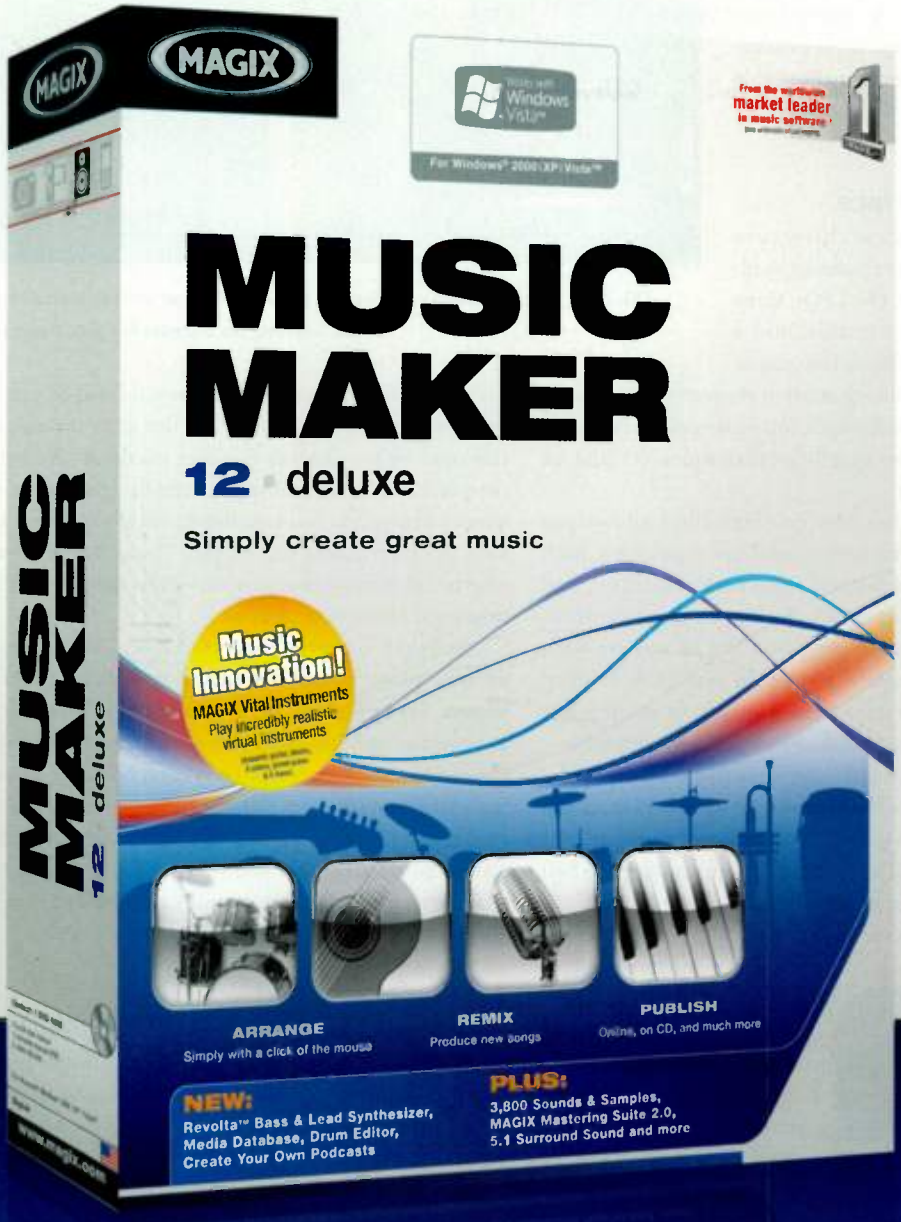
Poseidon 1.4 is a new software synthesizer from the always-innovative VirSyn. Unlike many recent soft synths, the program uses analysis/resynthesis (A/R) for its basic sound engine and provides up to 512 sine waves for the reconstruction of the included or your own analyzed sound files. Combining the powerful capabilities of A/R with components from VirSyn's other offerings, Poseidon adds to the company's already-impressive sound-design tools.

Riding the Waves

Anyone familiar with VirSyn products will recognize many of Poseidon's interface elements. At the bottom of the main screen is a 7-octave keyboard for triggering sounds and a panel containing the knobs, wheels, and text fields you use to control program parameters (see Fig. 1). Above that is the Sound Browser display, which shows preset names on the left and several categories of attributes on the right. You use the Sound Browser like a database by specifying the attributes of the sound you are looking for, whereupon Poseidon will locate the presets that match your criteria. The Sound Browser display toggles with the Spectrum window, which offers different modes for viewing the frequency and amplitude components of your sounds and provides access to several other functions (see Fig. 2).

VirSyn's trademark Slot Machine (Randomize) icon appears at the upper right of the main screen, as do an icon that triggers an All Notes Off message, a button to link to the company's Web site, and a MIDI icon that toggles the display of the controller mappings for all the main program controls. The mappings can't be edited from this display, but a very simple MIDI Learn option is available. You

I used Blur Levl to increase the amount of vibrato in a vocal sample.



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can use the Slot Machine to jump-start ideas: let it create new patches by mixing parameters from existing ones. I found the results to be usable a high percentage of the time (your odds may vary).

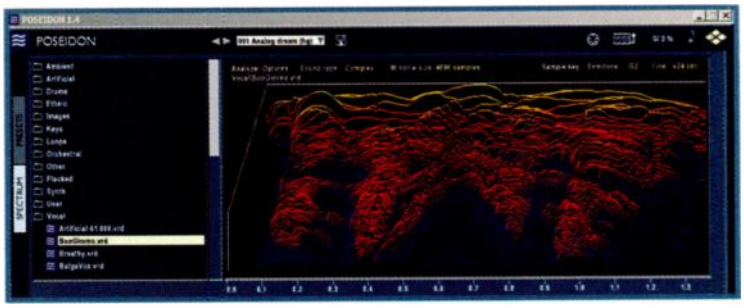

FIG. 2: The Spectrum window toggles with the Sound Browser and has several display modes, including the 3-D waterfall view shown here.

Under the Surface

Poseidon's basic architecture includes a spectrum-modeling oscillator, several filters, two LFOs, three ADSR envelope generators, and a small set of effects (up to four can be enabled at once). Though most of these components are standard issue for a modern soft instrument, Poseidon offers some unique capabilities that you won't find on your average synth.

For example, the new PoleZero filter allows you to custom design two separate filter topologies, each containing eight poles and eight zeros (notches), and then manually or automatically morph between them. Designing the filters is very intuitive, as you can both see and hear changes you make in real time. You can copy the filter structures from one patch to another, but you can't save them to disk as independent elements.

Another unique filter option is the new Inverse filter. This filter extracts the resonant characteristics of a sound and lets you map them onto another sound. For instance, you could apply the resonant model of a bell sample onto an acoustic instrument sample to give it a bell-like quality (see **Web Clip 1**).

Even more powerful is the ability to freely substitute spectral-analysis files (which Poseidon calls "models") between patches. Choose a preset such as Electric Piano, with its short attack and moderate release times, then substitute the analysis of a vocal sample for the model that the EP preset uses by default, and you'll get a sound that mixes characteristics of the piano with a vocal timbre (see **Web Clip 2**). Poseidon ships with more than 100 analysis files that you can freely interchange among the presets, and you can also make your own by analyzing any samples you have on hand.

The analysis process is very flexible: you can tweak settings to best fit pitched or nonpitched material, and you can alter the window size used by the analysis (smaller windows give better temporal resolution and larger windows give better frequency accuracy). You can also specify how many partials the resynthesis will employ (from 1 to 512) and whether only harmonic partials will be used or if inharmonic partials will be allowed.

Another powerful feature, found in advanced analysis/resynthesis software such as SMS (see the home page of Xavier Serra, a key researcher in this technique, at www.iua.upf.es/~xserra/ for more information), is the ability to isolate the pitched component of a sound from its noise component (called the residual). You can change the mix amount of the pitched and nonpitched elements, which allows you to, for example, hear only the airy portion of a flute sample or the noisy fricatives of a vocal sample (see **Web Clip 3**).

Totally Submerged

Poseidon provides other high-end analysis/resynthesis features that give you even more sound-design potential. For instance, because you have access to the individual components that make up a sound's spectrum, you can alter the frequency ratios and the relative amplitudes of the partials; there are several controls for this purpose. The Spread parameter, for example, will detune the upper harmonics in your model so that they become increasingly inharmonic, and the two Blur functions smooth out changes in either the individual amplitudes (Blur Levl) or frequencies (Blur Frq) of the sound's spectrum. Though there is very little information in the manual about these two options, I found that I could use Blur Levl to increase or decrease the amount of vibrato in a vocal sample.

Like some other current additive synthesizers (U&I MetaSynth comes to mind), Poseidon can extract data from a bitmap image file (BMP only on both the PC and the Mac) and use it to generate a new spectral model. The brightness of the image determines the amplitude of a frequency band, and the number of bands (calculated from 20 Hz to 20 kHz) depends on the number of partials you use in the resynthesis.

PRODUCT SUMMARY

VIRSYN Poseidon 1.4

software synthesizer
$279 boxed (with dongle)
$269 download (without dongle)

FEATURES	4
EASE OF USE	3
QUALITY OF SOUNDS	5
VALUE	5

RATING PRODUCTS FROM 1 TO 5

PROS: Freely interchangeable spectral models. Unique filter options. Excellent cross-synthesis functions.

CONS: No undo function. No reminder to save work. Could use more spectral processing features.

MANUFACTURER
VirSyn
www.virsyn.com

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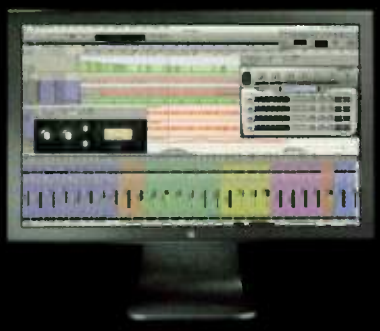

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There aren't any controls to modify the image, but with a little luck, you'll find an image that produces worthwhile results.

Even if the analysis produces garbage, however, you can tweak so many of the resynthesis playback parameters that you can turn most anything into a useful model. Changing the start position and playback speed, for instance, can have a huge impact on how the spectrum is scanned, and varying the loop mode (one shot, bidirectional, and so on) creates even more permutations of the resulting sound (see Web Clip 4).

Fans of microtuning will be pleased to know that Poseidon supports tuning setups in Scala format, and you can even give each voice (up to eight in normal playback mode or six in Unison mode) its own custom scale. Currently over 3,000 scales are available at the Scala Web site (www.xs4all.nl/~huygensf/scala/), and with a bit of tweaking you can create your own.

In the Locker

Poseidon includes several banks of presets, and user contributions are already appearing on the company's Web site. Moreover, each incremental upgrade that appeared during this review process also included new banks. Many of the sounds are clearly reminiscent of the VirSyn family and could probably have been created with Cube or Tera, but another very large portion is unique to Poseidon. Note that you can also map each bank to MIDI Program Changes, though there is no support for Bank Select messages.

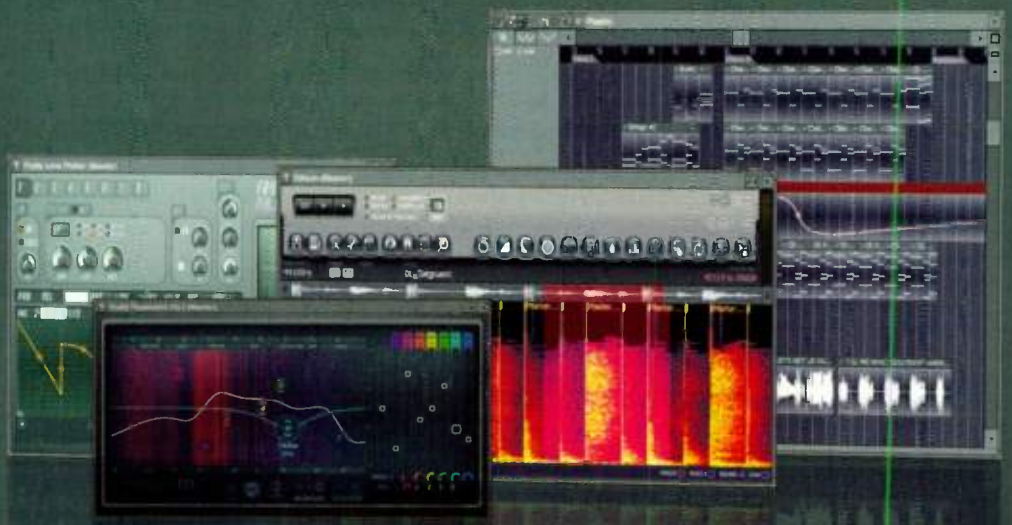
Among my favorites is Flying Water, a shimmering, slithering sound that uses a bird model as its source. Raising the Blur Levl on the preset changes the sound into a colorful blast of steam (see Web Clip 5). Frost, from the Expressive category, loops bidirectionally over a very small slice of the spectrum to creates its haunting, evolving quality (see Web Clip 6), and Kreissaege uses a Tibetan cymbal as its source. I found that raising the Spread level to maximum on Kreissaege gave the sound an added edge (see Web Clip 7).

There are many sounds that would work as leads and pads, and searching for Film Music, World Music, Pop, or Jazz will point you toward dozens of presets, too. You'll also find sounds reminiscent of granular synthesizers as well as more-traditional subtractive/analog emulations.

Some of the sounds—for example, Bass Drum and Analog Space—are less than inspired, but simply adjusting the Residual and Spread amounts can turn a dull preset into something more useful. Changing the filter that the preset uses can also have a positive (and dramatic) impact on a sound (see Web Clip 8).

Flowing Along

I spent most of my time with Poseidon in the Spectrum Editor, changing loop start points and adjusting the time the synth takes to play through different analysis files. By assigning MIDI controls to the



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Associate Editor Dennis Miller is a composer and animator. Check out his work at www.dennismiller.neu.edu.

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Jonathan Little of Little Labs continually pushes the boundaries of analog technology with his unique products. His small company boasts some of the most innovative and highly regarded gear available, and the new Lmnopre microphone preamplifier is no exception.

Face Value

For a single-channel microphone preamp without EQ or compression, the Lmnopre has more features than you can shake a dozen sticks at. And somehow Little managed to fit them all into a 1U faceplate. The controls are as elegant and pleasing to the eye as they are functional and easy to manipulate (see **Fig. 1**). Starting at the faceplate's left are an XLR mic input and a switch that disables the rear XLR input and conveniently doubles as a mute switch. To their right are two separate ¼-inch DI inputs, one active and one passive; using internal jumpers, you can configure whichever jack you're not using as a thru for feeding an amplifier. In addition to a DI-enable switch, another switch isolates the ground of the DI inputs to eliminate potential ground-loop hum.

The next three switches are standard preamp fare—a 20 dB pad, 48V phantom power, and a 6 dB-per-octave highpass filter starting at 120 Hz. But because the Lmnopre is a Little Labs device, of course, the highpass has a twist: engaging the filter allows you to use a separate low-frequency resonance feature that employs a different coupling capacitor to give you a low-frequency boost (more about that later). The preamp has two knobs for controlling gain, one for lower levels (20 to 48 dB) and one for higher levels (40 to 74 dB). A switch for choosing the gain range lies below the indicator LED, which glows green for low and red for high.

The low-frequency resonance controls come next—an enable switch and a knob controlling the amount of boost. To their right are the 180-degree polarity-flip

The Lmnopre opens up a whole new world of sonic possibilities.

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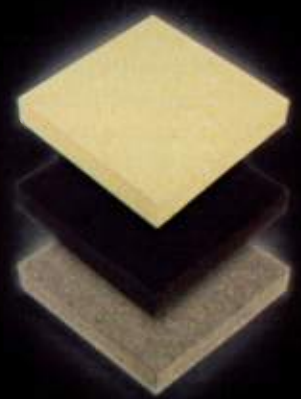

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FIG. 2: The Lmnopre's back panel contains most of the vital I/O, including a 5-pin XLR to connect your own input transformer.

switch and the phase-align switch and knob; the latter determines the amount of phase shift.

The output section has a trim knob; when engaged, it allows you to drive the preamp harder without overloading the next device downstream from the Lmnopre. A switch for bypassing the output transformer further expands the Lmnopre's sonic palette. At the end of the line are two clip-indicator LEDs, one for the preamp section and one for the phase circuit.

The backplate has the lion's share of the Lmnopre's I/O, including another mic input, a 5-pin jack for your own external transformer (in the manual, Little recommends a few to try), and a pair of insert jacks that essentially allow you to split the device in half by separating the preamp and the phase-alignment tool (see Fig. 2). Also on the rear are a master output jack and a 4-pin jack for the Lmnopre's hefty lump-in-the-line power supply. All rear-panel jacks are XLRs, including the power supply input. Switches on the backplate let you select the external transformer and activate the insert jacks.

In the Thick of It

Over the course of the review, I paired the Lmnopre's fully differential preamp section with a variety of microphones and sound sources. From snare drum and vocals to electric bass and guitar, the Lmnopre gave me the sound I wanted every time.

When I directly compared the Lmnopre with similarly priced solid-state preamps, such as the Millennia Media TD-1's HV-3 mic preamp, I heard very slight differences that I couldn't label as better or worse. In A/B comparisons, I heard a general tightness, as opposed to the HV-3's airiness; although the Lmnopre didn't sound dull or lacking in any particular frequency range, the HV-3 sounded a little more open. The Lmnopre sounded a bit more compressed and slightly thicker in the midrange, but that's what I expected, because the HV-3 is transformerless. All the nice, custom-wound iron in the Lmnopre's transformers thickens up its sound somewhat.

If you want a cleaner signal path, you can patch out of the insert-send jack on the back, bypassing the phase circuit and the output transformer. You can even run the Lmnopre transformerless using the 5-pin jack on the back (you need to know what you're doing if you want to try that out, though, as it could void your warranty).

Both DI inputs, which run through a separate custom-wound transformer, yielded equally satisfying results when compared to the TD-1, which is renowned for its DI. I slightly favored the active version, perhaps because my basses and guitars all have passive electronics.

More Than Just a Phase

The phase-align circuit is one of the preamp's most unusual features. In essence, it allows you to line up the waveform of the signal running through it relative to a similar signal to minimize phase cancellation. (That capability is useful only when two or more signals are representing the same source, as a waveform can only be out of phase relative to another waveform.)

The Lmnopre's phase-align circuit uses allpass filters and other analog voodoo to actually change the audio's phase characteristics. Although it is based on the circuitry in Little Labs' exalted IBP (In-Between-Phase) tool, it's a bit simpler than the IBP's. A switch for engaging the circuit and a knob for determining the amount of phase shift are the only two controls that got ported over.

The results of using this circuit are usually not subtle. When I used it on a bass DI next to a signal from a miked cabinet, or on one of two mics on a guitar amp, or on one mic in a 2-mic bass drum setup, I could find the sweet spot where the phase lines up to yield the best sound, second only to timely microadjustments in mic placement. The effect is magic—it's almost like equalizing the signal across the whole frequency spectrum at once.

You can also use the phase-align control as a special effect. Outside of the sweet spot are many areas where a guitar, for instance, thins out in a certain cool way. The Lmnopre opens up a whole new world of sonic possibilities, and all before your sound even gets to the recording medium. However, if you're feeling dodgy about committing your phase-aligned signal to tape, you can always use the phase circuit at line level during mixdown, thanks to the insert

PRODUCT SUMMARY

LITTLE LABS Lmnopre

microphone preamp
$1,680

FEATURES	5
EASE OF USE	4
AUDIO QUALITY	5
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Many innovative features. Aesthetically and functionally well designed. Top-notch audio quality. Informative and educational manual. Excellent product support.

CONS: Rear-mounted switch to separate phase-align circuit from preamp. Phase circuit decreases headroom considerably.

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points provided on the Lmnopre's backplate. I do have one small gripe, though: the insert switch is on the back, which is a minor inconvenience if you have the box in a rack.

The only real problem with the phase-align circuit is that because it uses filters to achieve the effect, it substantially decreases the entire device's headroom. The manual claims that this decrease is no more than 12 dB, but I ran an oscillator through it and found that it's more like 13 dB, and 16 dB with the output transformer bypassed. If you switch the phase-align circuit in after you've set your levels, you'll probably need to readjust your gain to avoid nasty distortion (as opposed to the quite pleasant distortion the unit achieves when pushing the transformers above and beyond). The loss of headroom is by no means a showstopper; it merely requires some diligence in gain staging, which is worth the trouble to have access to the Lmnopre's brilliant phase tool.

A Certain Resonance

The low-frequency resonance circuit is yet another unique feature. Without adding active circuitry to the signal path, it lets you add girth to your audio, from a subtle rise in the sound's body to a woofy, woolly low-end boost.

Even when I pushed this circuit to its extreme, it sounded better than a standard low-end EQ boost. It's similar to the proximity effect achieved by moving cardioid mics close to the sound source, in that an enhanced presence accompanies the boost in low end.

Spells a Winner

The Lmnopre's $1,500 street price is an awfully fair one to pay for so much audio mojo. The unique design, attention to detail, excellent customer service, and pristine audio quality that have all become part and parcel of the Little Labs product line make this preamp extremely enticing for studios of all sizes. If it's in your budget, you'd do well to get the Lmnopre in your rack ASAP.

Eli Crews is often found reciting the alphabet at New, Improved Recording (www.newimprovedrecording.com), his studio in Oakland, California.

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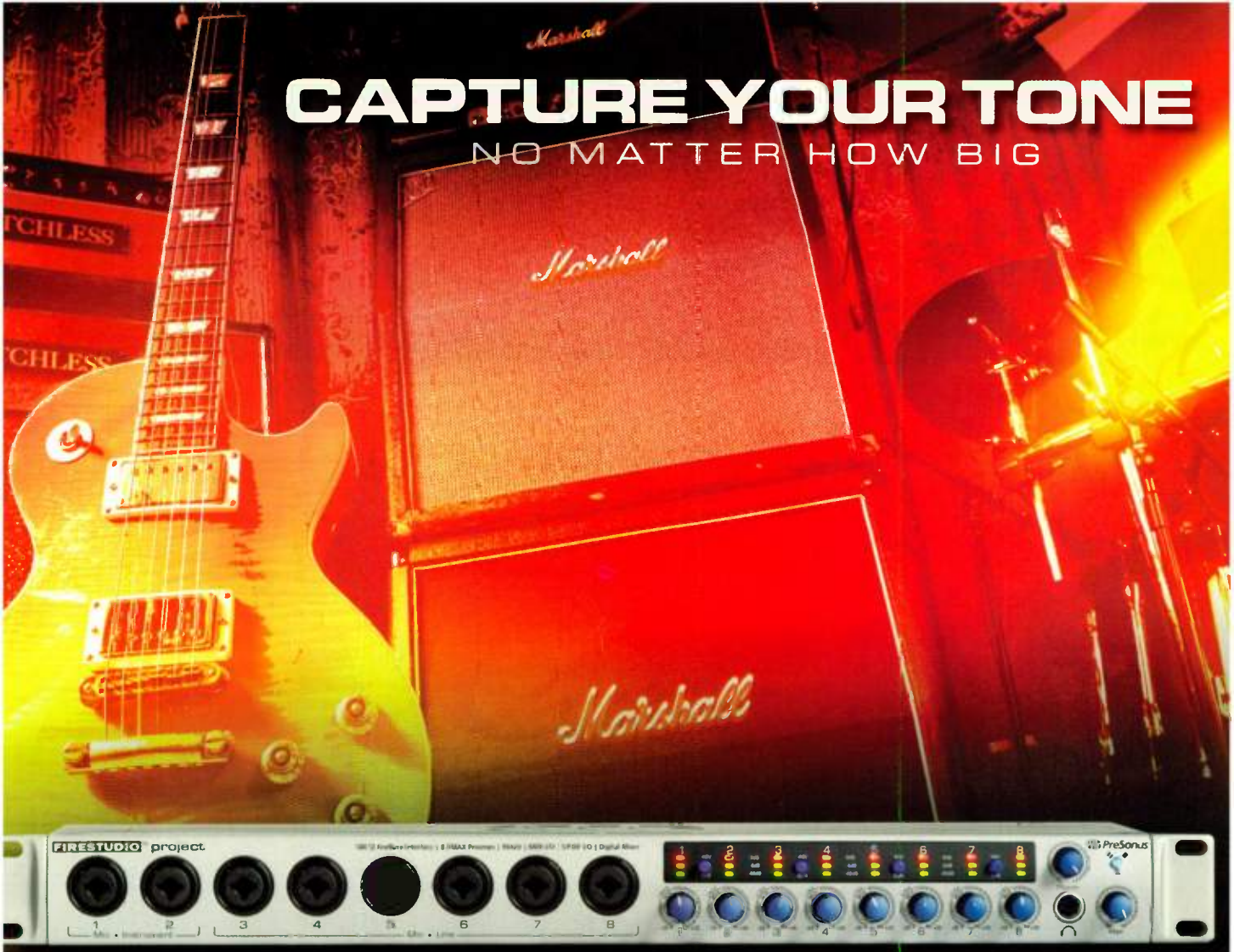

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- ProPak Software Suite featuring Cubase LE 4, BDF Lite, Discrete Drums, 25 real-time plug-ins and more than 2 GB of samples and drum loops included!
- Mac and Windows compatible

FIG. 1: EchoBoy is the most extensive and powerful of the SoundToys Native Effects bundle.

SOUNDTOYS Native Effects 3.0 (Mac/Win)

Powerful plug-ins to take your sounds to new heights.

By Eli Crews

As computer processing power escalates, it's becoming more feasible to have every aspect of a professional recording studio inside the box. SoundToys gives desktop engineers another means toward that end by providing them with a number of top-notch effects processors, the likes of which historically were only in the hands of people working at high-end facilities.

The SoundToys Native Effects bundle comes with six plug-ins: EchoBoy, Crystallizer, PhaseMistress, FilterFreak, Tremolator, and Speed. All but Speed come in both RTAS and AU versions. Speed, like most other pitch- and time-manipulation plug-ins, can function only in a non-real-time fashion, so it is available as an AudioSuite plug-in for Digidesign Pro Tools only.

> EchoBoy has all the controls you'd expect from a delay generator, and then some. And then some more.

Out of One Box and into Another

Installation was remarkably easy on my dual 2 GHz Macintosh G5 with 4 GB of RAM. The boxed version comes with a CD installer as well as a "license card," which is a little chip that you insert into your iLok dongle to upload your authorization. This is mighty convenient for users who don't have Internet access on their DAW machines. Both the AU and RTAS versions loaded without incident, and I was able to start using the SoundToys plug-ins right away in both Pro Tools LE 7.3.1 and MOTU Digital Performer 5.0.

The only thing worth remarking about the installation is that when Pro Tools is starting up, it pauses for a second while loading each SoundToys plug-in, indicating the amount of code each effect contains. As for CPU usage, I could easily load 32

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NATIVE INSTRUMENTS

THE FUTURE OF SOUND

REVIEW

instances of all the effects except EchoBoy, which maxed out my CPU at around 24 instances (your mileage may vary). If you're working on a slower computer, you can always bounce the SoundToys plug-ins as AudioSuite effects to save processing power.

FIG. 2: Tremolator takes tremolo to a whole new level.

All in the Family

Aside from Speed, which has a completely unique design and control set, the Native Effects bundle has a number of consistencies between the various individual plug-ins. First, the graphical user interface for each plug-in has the same white-on-black minimalist elegance, emulating the real knobs and buttons of a hardware unit—even the numerical and menu boxes look like hardware LED displays. Second, all of the effects have separate Input and Output controls, which are designed to work like analog units in that you can drive the input and back off the output to change the harmonic characteristics of your sound. This is most useful in the Analog mode found in Tremolator, PhaseMistress, and FilterFreak. (EchoBoy has certain settings that simulate analog distortion as well.) Analog mode takes more processing power but saturates in a fuzzy, analog way, as opposed to the nasty distortion caused by digital clipping.

All of the real-time effects have time-based or rhythmic components that can either be synced to the current bpm of the session via MIDI or set by using the Tap Tempo function. Tap Tempo allows you to click your mouse on a button in time with the music. Tap is very responsive and quite helpful if you are dealing with music that wasn't played to a click.

All of the RTAS/AU SoundToys plug-ins also have the Tweak button in common. This button calls up a page with a few extra parameters pertaining to whatever set of controls it is nested near. These parameters differ greatly from plug-in to plug-in (and from mode to mode on each plug-in). The controls in a given Tweak page are usually what I'd call "above-and-beyond" controls, akin to "modding" in the hardware domain. For example, a Tweak page in Crystallizer allows you to vary the offset between the left and right channels of three different parameters, and a page in Tremolator lets you trigger rate and depth modulations of the tremolo effect from the envelope of the incoming signal.

Speaking of modulation, all of the plug-ins except EchoBoy and Speed have some sort of modulation that is capable of being triggered by the envelope of the signal itself. The Threshold knob in each of these cases determines the point at which the modulation occurs, and a ring of LEDs around the knob shows you where the signal level is at any given moment, so setting this control is remarkably easy. (It kind of makes me wonder why all software threshold controls don't have such a display; maybe someday they will.)

Before I start describing each of the plug-ins, let me make it clear that I'm only scratching the surface of the power and control of these effects. To fully describe the whole bundle, this entire magazine issue would have to be devoted to this review. I'll try to give a general idea of the capabilities and strengths of each plug-in.

EchoBoy. The flagship effect of the SoundToys bundle is EchoBoy, the "Ultimate Echo Machine." This plug-in has all the controls you'd expect from a delay generator, and then some (see **Fig. 1**). And then some more. And then even some more. There are four Echo modes: Single, Dual, Ping-Pong, and Rhythm, and each has a completely unique set of Tweak parameters. You can get quite complex with the multitap patterns for your delays, using Feel and Groove controls to make the pattern fit the song. You can choose from one of 31 Echo Styles, such as Space Echo, TelRay, and Memory Man, which emulate the effect of classic delay boxes, or create your own Echo Style with a 3-band EQ and parameters such as Wobble, Saturation, and Diffusion. Getting the picture? This is no one-trick pony, but if EchoBoy's guts are too much for you to handle, there are bountiful presets that make getting good sounds easy for the timid. (Speaking of presets, the SoundToys plug-ins contain a unique and very handy feature worth mentioning: when scrolling through presets, you can disable any parameter from changing by Control-Option-clicking on it. See **Web Clips 1 through 3.**)

Crystallizer. It's no surprise that some of the engineers who developed the SoundToys line of products

PRODUCT SUMMARY

SOUNDTOYS Native Effects 3.0

DSP plug-ins
$495

FEATURES	5
EASE OF USE	4
AUDIO QUALITY	5
VALUE	5

RATING PRODUCTS FROM 1 TO 5

PROS: Incredibly versatile and powerful plug-in set. Presets are extensive and highly useful, and new preset packs are available for free download on a regular basis. Interface is sleek and stark. Excellent documentation. Shockingly low price point.

CONS: CPU requirements may be too heavy for pre-G5 machines.

MANUFACTURER
SoundToys, Inc.
www.soundtoys.com

were part of the team that created the Eventide H3000 Harmonizer. Crystallizer is a direct descendant of that legendary hardware box, based in part on the popular Crystal Echoes preset. The subtitle of the plug-in is "Granular Echo Synthesizer," which belies the fact that

in interesting and very musical ways (see **Web Clips 4 through 7**).

PhaseMistress. Vintage analog phase-shifting pedals are highly sought-after for the unique textures they create. PhaseMistress re-creates a number

DCS REMOTE PREAMP

Like the DI inputs, the preamp inputs and main line outputs serve different functions depending on how you use them. The control surface lets you specify whether you'll use the preamps separately (A-B), summed to a single output (A+B), or combined to derive a mid-side stereo signal using the onboard encoder (M-S). Consequently, the XLR inputs act as either channel A and B or as the mid and side inputs of an M-S stereo signal. You use both outputs for A-B and M-S modes, but only the channel A output for the summed A+B.

FIG. 2: The DCS Remote's rear panel is jam-packed with enough connectivity to suit almost any studio application.

Controlling Behavior

The control surface's very efficient design allows for another abundance of setup and routing possibilities. The wedge-shaped box is small and light enough to place on all kinds of surfaces without fear of damage. The VU meters, which sport the real-deal ballistics you'd expect to find on pro gear, are attached to a separate metal housing. This housing—I'm probably going to sound like a dork, but this really is the coolest—swivels to a locked position at either 15 degrees (flat in relation to the angled control surface) or 45 degrees, allowing users to optimize its viewability.

Within each of the A and B channel control sections are functions such as the DI switch, phase reverse, and 48V phantom power (which ramps the voltage up and down over a couple of seconds when turning on and off—another neat feature). You can configure the highpass filter to roll off frequencies below 30, 70, or 100 Hz.

Perhaps the most interesting control in the preamp section is each channel's Gain knob, which takes advantage of digital control over analog circuitry. I call it a knob because it's not a potentiometer; it is a remote control that lets you raise and lower the preamp gain as the digital display shows you precisely the amount of gain being applied in decibels. This design is quite different from a variable-resistance pot, which would be limited in its ability to exactly reproduce results (typically resulting in a user's reliance on visual matching using silk-screened lines, pieces of tape, and so on). In terms of repeatability, the DCS Remote's Gain knob is closer to stepped attenuators, which allow for the best possible audio path but can add significantly to a product's cost and size.

You can adjust the gain staging of the preamps using the Gain Trim and arrow buttons in the section between the preamp controls. The peak LED glows red when the signal reaches the gain you've set as your maximum level, and it glows yellow when the signal approaches the maximum. You can vary the level at which the yellow LED kicks on, up to 12 dB below the maximum. This middle section also has a Cue > VU button, which switches the metering between preamp level and cue mix level for playback and overdubs. In addition, this section provides buttons to switch between dual-mono, stereo, and M-S modes.

Being able to accurately display gain and control gain staging represents only a few of the many ways UA has exploited digital control to maximize the DCS Remote's functionality. You can further adjust a remarkable number of other control-surface features by simultaneously pushing and holding particular buttons; I will mention a few more, but the level of control is so extensive that it goes beyond the scope of this review. The ability to configure everything so thoroughly, and in such a fluid manner (once you can remember everything), leads me to believe that the designers thought of everything.

More of Me in the Mix?

The control surface's lower section comprises a fairly elaborate mixer with several functions specifically allotted for vocal overdubbing. Three knobs let you mix the levels of the A and B preamp channels and the C stereo line in to optimize the overdub's mix. An effects section features a digital reverb with nine presets, high and low bandpass filters at 14 kHz and 85 Hz, respectively, and a knob to adjust the effects level for the A and B channels. The reverb and filters allow vocalists to adjust their own mix to taste, and although sounds processed with effects aren't passed to the preamp outputs, you

PRODUCT SUMMARY

UNIVERSAL AUDIO DCS Remote Preamp

preamp/recording interface
$1,199

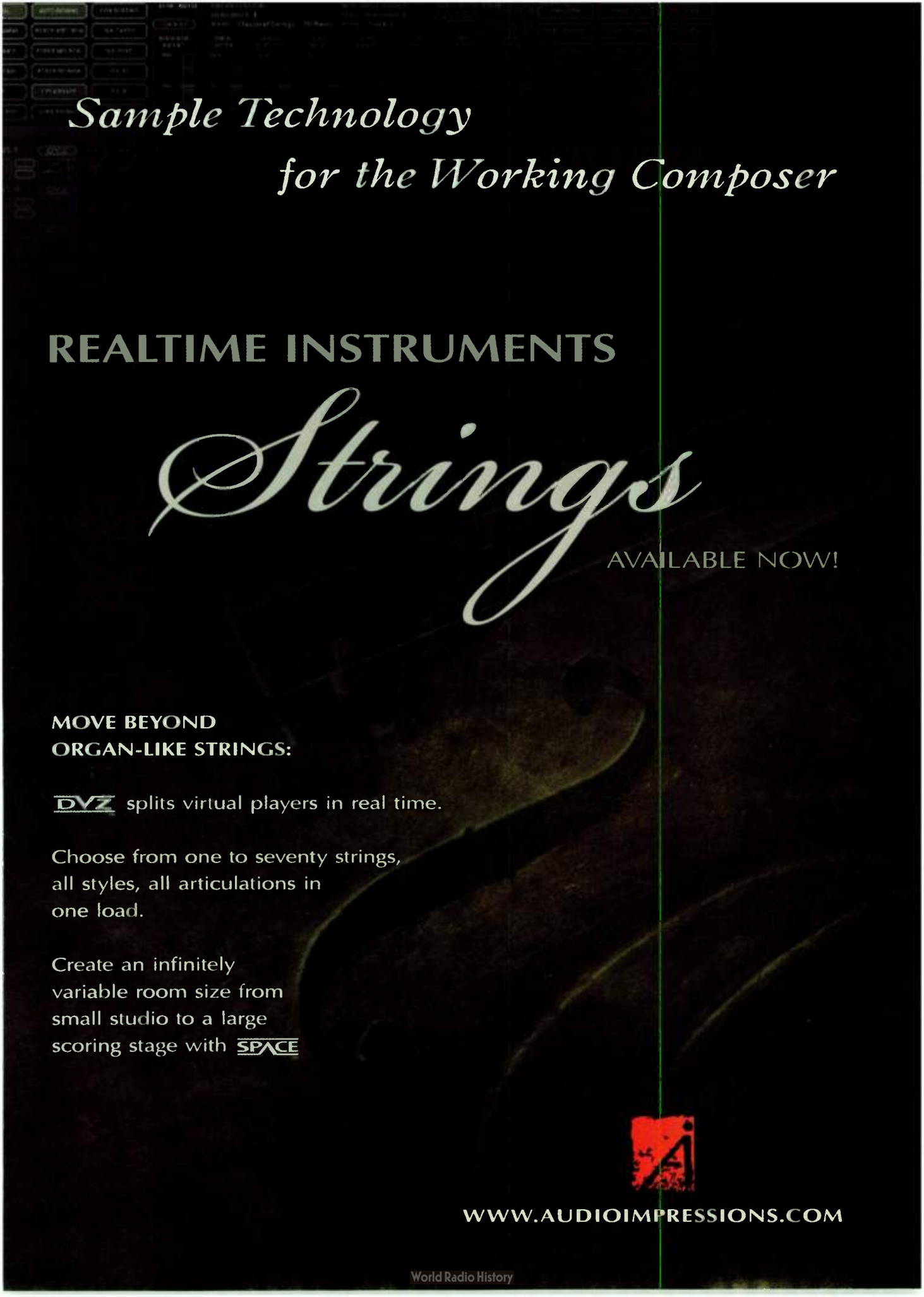
FEATURES	5
EASE OF USE	4
AUDIO QUALITY	4
VALUE	5

RATING PRODUCTS FROM 1 TO 5

PROS: Great-sounding preamps. Comprehensive functionality and user controls. Competitive value.

CONS: Speaker outs somewhat noisy.

MANUFACTURER
Universal Audio
www.uaudio.com



were part of the team that created the Eventide H3000 Harmonizer. Crystallizer is a direct descendant of that legendary hardware box, based in part on the popular Crystal Echoes preset. The subtitle of the plug-in is "Granular Echo Synthesizer," which belies the fact that it's an instrument almost as much as an effects processor. At its most extreme, Crystallizer can obscure the sound of its input source to the point of annihilation, and used more subtly, it can add harmonics and texture to any signal. In essence, it slices up the incoming signal into little bits and uses a combination of pitch-shifting and delay to spit those little slices back out in interesting and very musical ways (see **Web Clips 4 through 7**).

PhaseMistress. Vintage analog phase-shifting pedals are highly sought-after for the unique textures they create. PhaseMistress re-creates a number of these vintage sounds, but of course, because it's a SoundToys plug-in, there are lots of added features that make it more widely useful than your average pedal. My favorite of the bonus features is the Envelope Modulation mode, which ends up sounding halfway between a phaser and an envelope filter (see **Web Clips 8 and 9**).

FilterFreak. FilterFreak finds its roots in the sound and behavior of the analog filters found on classic synthesizers. There are four filter shapes: Lowpass, Bandpass, Highpass, and Band Reject (Notch). In addition to common filtering controls like Resonance and Frequency, FilterFreak allows you to dynamically change the corner frequency (as well as the resonance and level) of the filter based on either the envelope of the input signal, an LFO, or a number of other triggers. FilterFreak 2 (also included in the bundle) lets you gang up two filters in an interactive fashion, and you can even have the modulation source trigger opposite movements in each of the two filters. From subtle to sci-fi, this is a really fun plug-in. The Bandpass filter in conjunction with overdriving one of the many Analog mode choices gave me an extremely cool lo-fi telephone sound on a vocal (see **Web Clips 10 and 11**).

Tremolator. Another highly versatile take on a commonplace effect, Tremolator takes simple tremolo and turns it on its ear (see **Fig. 2**). Not only can you create your own waveform shape for the tremolo, but you can also use any waveform to build a custom tremolo rhythm up to four bars in length, with resolution down to a 64th-note triplet. Other controls, like Groove and Accent, allow you to customize the feel of the tremolo even further. Suffice it to say, this is the most powerful and unique tremolo plug-in I've used, by far (see **Web Clips 12 and 13**).

Speed. Available only as an AudioSuite (Pro Tools) plug-in, Speed changes the pitch of your audio, the speed, or both. There are multiple interfaces available, giving a truly impressive amount of control over these tasks (see **Fig. 3**). The Simple and Calculator control panels let you change

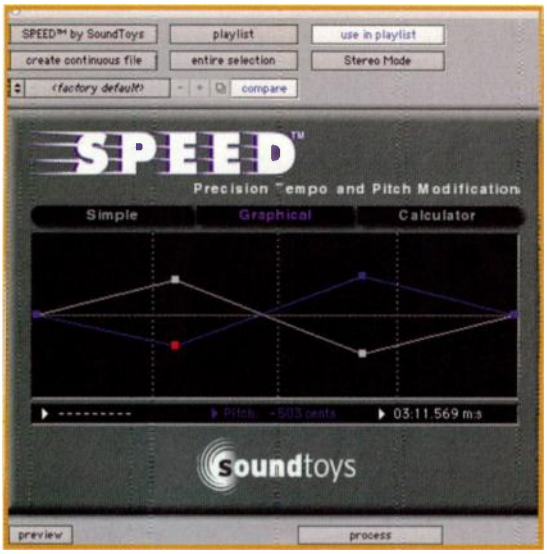


FIG. 3: Speed allows you to change the pitch and tempo of a sound independently.

the speed based on either Tempo (expressed in bpm values or percentages) or Length (expressed in seconds, samples, or percentages), and also allow you to independently change the pitch, based on Key (expressed in semitones, cents, or percentages) or Tuning (expressed in hertz). The Graphical control panel takes it a few steps further, enabling you to actually draw in breakpoint curves (similar to penciling in automation moves) to variably change the speed and pitch, again totally independently. For example, you can have a sound slow down over time while also steadily increasing in pitch, the opposite of what you'd get from tape manipulation. Sound tweakers, take heed: this is a very cool plug-in (see **Web Clip 14**).

Play Along

All in all, with SoundToys Native Effects you have a ridiculous amount of control over six excellent-sounding plug-ins. I especially love the fact that you can get cool sounds with minimal hassle, but if you're willing to put in the time, you can get ultradeep into the nitty-gritty. The street price of around $400 would arguably be a fair price for EchoBoy alone, but add in five other killer effects, and this is truly one screaming deal.

EM WEB CLIPS

Eli Crews plays well with others at New, Improved Recording (www.newimprovedrecording.com), his recording studio in Oakland, California.

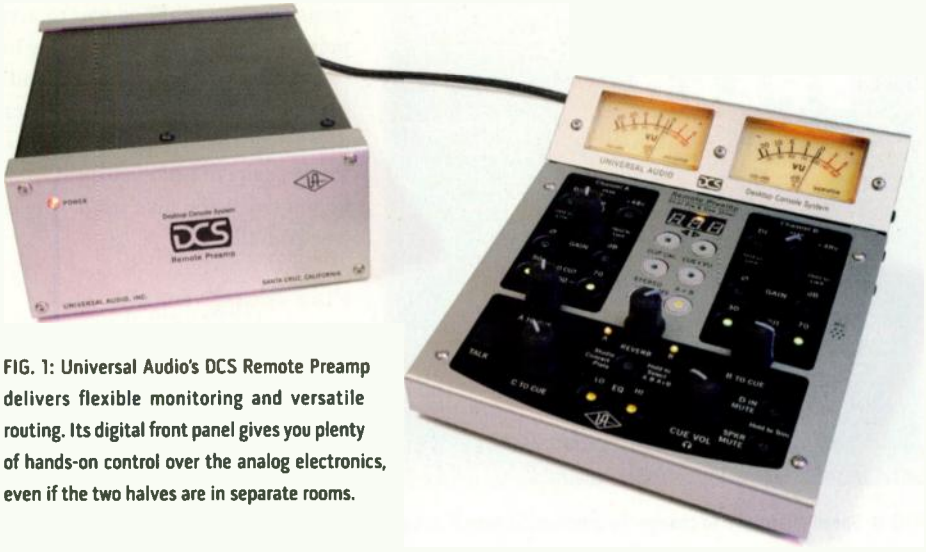


FIG. 1: Universal Audio's DCS Remote Preamp delivers flexible monitoring and versatile routing. Its digital front panel gives you plenty of hands-on control over the analog electronics, even if the two halves are in separate rooms.

UNIVERSAL AUDIO DCS Remote Preamp

See Product Specs @emusician.com

Is this what solo recordists have been waiting for?

By Rich Wells

Since the relaunch of the Universal Audio (UA) brand in 1999, the company has put out some very cool reissues as well as new hardware products and software plug-ins, many of them simulating classic audio devices. The first in UA's all-new Desktop Console System product line is the DCS Remote Preamp.

The DCS Remote goes far beyond the functionality of a simple dual-channel preamp, providing extensive connectivity, versatile routing, and many clever extras that add up to a really impressive product. Connectors, buttons, switches, and metering are organized and labeled well enough that you could get started without even touching the manual. I was able to perform simple recording tasks within minutes of opening the package.

If you do require help, plenty is available. Besides the manual, you get a heavy-cardstock quick-start guide and a comprehensive tutorial DVD, in which a well-mannered, plain-spoken UA employee takes you step-by-step through the many minutiae of the DCS Remote's features. You'll also find more background information on the company's Web site about the design of the preamps and the decisions leading to the unit's final configuration.

Two-Part Process

The DCS Remote is a neat feat of industrial design (see Fig. 1). The analog unit provides connectivity and contains the power supply, and the digital unit provides a control panel with metering. The included 20-foot Cat-5 cable connects the two units. A longer Cat-5 or Cat-6 cable will allow them to operate up to 300 feet apart, with the digital half controlling the analog half. The cable carries digital data and power for the LEDs and the backlit VU meters.

In addition to two balanced XLR inputs and two balanced TRS line outputs, the I/O comprises a second pair of line outs to connect to monitors, a pair of line inputs (switchable between +4 dBu and –10 dBV) to connect to your recording system, and a ¼-inch stereo headphone jack (see Fig. 2). Two ¼-inch DI inputs become line-level inputs when you insert a TRS plug, and another TRS connector provides unbalanced 2-channel line outs at –10 dBV on the tip and ring. There's also a talkback output and yet another TRS line input for an unbalanced stereo signal.

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Like the DI inputs, the preamp inputs and main line outputs serve different functions depending on how you use them. The control surface lets you specify whether you'll use the preamps separately (A-B), summed to a single output (A+B), or combined to derive a mid-side stereo signal using the onboard encoder (M-S). Consequently, the XLR inputs act as either channel A and B or as the mid and side inputs of an M-S stereo signal. You use both outputs for A-B and M-S modes, but only the channel A output for the summed A+B.

FIG. 2: The DCS Remote's rear panel is jam-packed with enough connectivity to suit almost any studio application.

Controlling Behavior

The control surface's very efficient design allows for another abundance of setup and routing possibilities. The wedge-shaped box is small and light enough to place on all kinds of surfaces without fear of damage. The VU meters, which sport the real-deal ballistics you'd expect to find on pro gear, are attached to a separate metal housing. This housing—I'm probably going to sound like a dork, but this really is the coolest—swivels to a locked position at either 15 degrees (flat in relation to the angled control surface) or 45 degrees, allowing users to optimize its viewability.

Within each of the A and B channel control sections are functions such as the DI switch, phase reverse, and 48V phantom power (which ramps the voltage up and down over a couple of seconds when turning on and off—another neat feature). You can configure the highpass filter to roll off frequencies below 30, 70, or 100 Hz.

Perhaps the most interesting control in the preamp section is each channel's Gain knob, which takes advantage of digital control over analog circuitry. I call it a knob because it's not a potentiometer; it is a remote control that lets you raise and lower the preamp gain as the digital display shows you precisely the amount of gain being applied in decibels. This design is quite different from a variable-resistance pot, which would be limited in its ability to exactly reproduce results (typically resulting in a user's reliance on visual matching using silk-screened lines, pieces of tape, and so on). In terms of repeatability, the DCS Remote's Gain knob is closer to stepped attenuators, which allow for the best possible audio path but can add significantly to a product's cost and size.

You can adjust the gain staging of the preamps using the Gain Trim and arrow buttons in the section between the preamp controls. The peak LED glows red when the signal reaches the gain you've set as your maximum level, and it glows yellow when the signal approaches the maximum. You can vary the level at which the yellow LED kicks on, up to 12 dB below the maximum. This middle section also has a Cue > VU button, which switches the metering between preamp level and cue mix level for playback and overdubs. In addition, this section provides buttons to switch between dual-mono, stereo, and M-S modes.

Being able to accurately display gain and control gain staging represents only a few of the many ways UA has exploited digital control to maximize the DCS Remote's functionality. You can further adjust a remarkable number of other control-surface features by simultaneously pushing and holding particular buttons; I will mention a few more, but the level of control is so extensive that it goes beyond the scope of this review. The ability to configure everything so thoroughly, and in such a fluid manner (once you can remember everything), leads me to believe that the designers thought of everything.

More of Me in the Mix?

The control surface's lower section comprises a fairly elaborate mixer with several functions specifically allotted for vocal overdubbing. Three knobs let you mix the levels of the A and B preamp channels and the C stereo line in to optimize the overdub's mix. An effects section features a digital reverb with nine presets, high and low bandpass filters at 14 kHz and 85 Hz, respectively, and a knob to adjust the effects level for the A and B channels. The reverb and filters allow vocalists to adjust their own mix to taste, and although sounds processed with effects aren't passed to the preamp outputs, you

PRODUCT SUMMARY

UNIVERSAL AUDIO DCS Remote Preamp

preamp/recording interface
$1,199

FEATURES	5
EASE OF USE	4
AUDIO QUALITY	4
VALUE	5

RATING PRODUCTS FROM 1 TO 5

PROS: Great-sounding preamps. Comprehensive functionality and user controls. Competitive value.

CONS: Speaker outs somewhat noisy.

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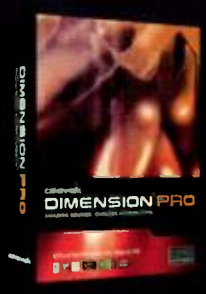

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INSTRUMENTS

can record them from the speaker outputs if you want. Cue In Mute and Speaker Mute buttons let you silence those pathways, and by holding the buttons down, you can adjust line-out and cue-in levels. A handy talkback mic with an accompanying button completes this section. You can send the mic's output to the Talk Mic Out connector, the Cue Out, or both.

I really loved the ability to quickly get good effects settings for my own vocals. Having devoted long periods of time to getting usable headphone mixes for other vocalists, I find the mix section's reverb and filters to be great assets. They may not cover every vocalist's needs, but the DCS Remote's effects sound surprisingly good. And of course, you can also add external effects if you'd like.

Trial by Fire

Many times over the years, while recording myself in small two-room studio setups, I've had to run from room to room to fine-tune preamp levels. I've also done my share of peering through a control-room window to squint at a meter or a computer monitor ten or more feet away. As soon as I ran Cat-5 cables through the wall to connect the DCS Remote's two halves between rooms, I was literally hooked. The reliable metering made setup nearly instantaneous, resulting in nice, fat amplitude just shy of clipping. With a couple of Cat-5 cables and a method for quickly switching out XLRs, you can alternate from one room to another, from one mic to another, or from one dynamic level to another, within a minute or two.

On the less-than-stellar side, one thing I noticed is that the speaker line outs are somewhat noisy. Although they're completely usable and worthwhile for tracking, overdubbing, and so on, I would avoid using them for critical monitoring if possible. One feature I'd wish for is a phase-alignment mode for recording a single source with two mics spaced apart; it would be terrific if I could adjust the phase from 0 to 180 degrees while viewing a digital readout. Nonetheless, I was very impressed by the overall sound of the preamps (for details, see the **online bonus material** at www.emusician.com).

ONLINE BONUS MATERIAL

Sum of Its Parts

The DCS Remote Preamp is an amazingly comprehensive, great-sounding, and well-thought-out device. I need to own one, and if you're someone who records yourself and others, so do you.

Rich Wells runs the Supreme Reality, a recording studio in Portland, Oregon (http://thesupremereality.org).

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FIG. 1: The signal-flow grid in the center of Zebra's Synthesis tab is flanked by a sound-module rack (left) and a modulator-module rack (right). The Global/FX tab in the bottom panel reveals Zebra's modular effects processor.

U-HE Zebra 2.1 (Mac/Win)

A horse of a different stripe.

By Len Sasso

Zebra, the brainchild of independent software developer Urs Heckmann, started out as a great-sounding plug-in synth for the Mac; it was especially noted for the quality and flexibility of its oscillators. Version 1.5, which was reviewed in the July 2004 issue of EM (available online at www.emusician.com), added new effects and modulators along with the signal-patching grid. But Zebra 2.1 is a whole different animal, much more modular and loaded with new sounds.

The big changes in version 2.1 are complete modularity, morphing multiwaveform oscillators, a pattern-based arpeggiator, and the new Cross Modulation Filter (XMF). Zebra comes with two bonus plug-ins: Zebralette is a simpler, nonmodular version of Zebra intended to be a hands-on tutorial for the oscillators, and ZRev is an enigmatic digital reverb—no instructions but lots of fun. Zebra has also gone cross-platform and multiformat, with VSTi and AU versions for the Mac and a VSTi version for the PC.

Gridlock

Zebra's user interface is divided horizontally into two tabbed panels. The top panel's tabs—Perform, Synthesis, and Presets—respectively house four *x-y* controllers, the synthesis engine, and the preset browser. The bottom panel's tabs reveal the fine structure of Zebra's global effects, oscillators, multistage envelopes, controller assignments, and arpeggiator. The grid at the center of the Synthesis tab is at the heart of Zebra programming, so I'll start there (see Fig. 1).

The grid contains 48 cells arranged in 4 columns. Audio modules are inserted in the cells by right-clicking and selecting from a pull-down menu, and the signals flow down each column to be mixed at the bottom. The modules are either sound generators (oscillators and noise generators) or sound processors (filters, waveshapers, mixers, and ring modulators). All modules have one or two inputs. Sound generators usually mix whatever sound they are generating with their input (there are some exceptions), whereas effects modify their input before sending it on. Input mixing makes the grid much more flexible. For example, you can build a Minimoog-style synth (oscillators and noise through a filter) in a single column as well as in the more obvious 4-column configuration (see Fig. 2).

Zebra's signal path ends in an effects chain with a 3-column grid of its own. Here the columns are fed by three separate buses: Master, Send1, and Send2. Each of the main grid columns can feed any of those buses,

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and modules in the effects grid can also take input from other columns in the effects grid. You can, therefore, use the effects section as one complex effects block or as three separate, linear effects chains. Effects include a chorus-phaser multi-effect, delay, reverb, EQ, filtering, compression, shaping, and ring modulation.

Although you can move modules around freely in either grid, you get a fixed number of modules of each type. For sound generators, you get four waveset oscillators (a waveset is a table of 16 waveforms), four FM oscillators, and two noise generators. The noise generators offer four flavors of noise, lowpass and highpass filters in series, and their own pan and stereo-spread controls.

The FM Oscillator (FMO) gives you five ways to modulate its built-in sine-wave oscillator. You can also use the sine-wave oscillator as the modulation source, or you can use the module's input for that. Using the oscillator (called self-modulation) produces a kind of feedback modulation effect that becomes increasingly chaotic as the modulation amount increases. A second self-modulation mode, called Self2 (+), results in a signal with only odd harmonics (think square wave). The self-modulation modes mix the input with the output as usual. When the input is used as the modulation source, you can choose between ring modulation, attenuated FM, and filtered FM. For filtered FM, the modulation-amount control sets the cutoff of a lowpass filter applied to the input. You can accomplish standard FM synthesis by using one FMO to modulate another.

The Wave's the Rave

Zebra's morphing waveset oscillators are so powerful that you could build a whole synth around one of them, and that's exactly what Heckmann has done with Zebralette. Playing with Zebralette is a great way to get a handle on these oscillators, and you can load Zebralette presets into Zebra for further expansion.

The Zebralette oscillator is based on a waveset. Currently, you get neither waveset presets nor any way to copy individual waveforms between wavesets, although you can copy entire wavesets.

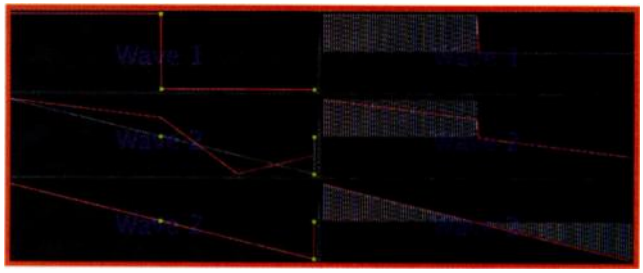

FIG. 3: Waveform morphing (left) and blending (right) are different ways of moving through oscillator wavesets.

Waveforms can be created geometrically (Geo) or additively (Spectro), and in either case you can move through the table by crossfading (Blend) or morphing (Morph). That results in four oscillator modes: GeoMorph, GeoBlend, SpectroMorph, and SpectroBlend. In the Morph modes, you create breakpoints, and moving through the table converts one shape to another by moving the breakpoints (see Fig. 3). In the Geo modes, the graph represents the waveshape, whereas in the Spectro modes, it represents the levels of the sine-wave components of an additive waveform. It can take a while to bend your brain around the terminology, but the tools for creating waveforms are both simple and powerful.

Once you have a waveset, the oscillator gives you several ways to mess with it. You can modulate the oscillator's Wave knob to automate morphing or blending through the waveset. Envelopes and LFOs are good sources for that. You can layer two or four copies of the oscillator and spread them across the stereo field. You can add a phase-shifted copy of the waveform to itself either inverted or not, and you can hard-sync a pitch-shifted copy with itself. The oscillator also has an effects section consisting of two waveshaping processors.

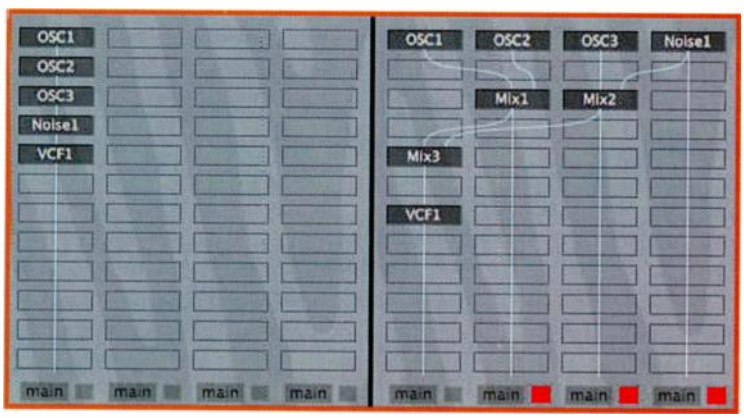

FIG. 2: A simple Minimoog-style synth can be wired in several ways. Input mixing allows the linear configuration on the left. The more obvious approach on the right uses more modules to produce the same result.

Filters, Filters, Filters

Zebra gives you three types of filter module: four VCF, two Comb, and two XMF. VCF is a versatile multimode filter. In addition to quite a few variations on the usual suspects (lowpass, bandpass, highpass, and notch), you get shelving, peaking, and phasing-allpass filters. One of the most interesting lowpass variations, LP formants, follows a 2-pole lowpass filter with a formant stage with morphing between the five vowel formants A, E, I, O, and U (see **Web Clip 1**).

The Comb filter is actually a feedback-delay line with very short delay. An impulse fed to a delay of a few milliseconds with a lot of feedback produces a self-sustaining tone much like an oscillator, and the Comb modules have a built-in noise source for that purpose. Thus, they can act as oscillators as well as process an incoming signal. As oscillators, they're ideal for plucked, bowed, and

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metallic sounds reminiscent of physical modeling. As signal processors, they produce resonator, phasing, and flanging effects.

Like the Comb filter, the Cross Modulation Filter (XMF) will self-oscillate, and it doesn't even require an impulse—high resonance is sufficient—although a click impulse is provided for pingy sounds. The XMF is a stereo filter, and you can offset the tuning (cutoff) of the two sides. You can also modulate the cutoff by the filter's sidechain input for filter-FM effects. A bank of presets called XMF Files contains good examples of the XMF's capabilities.

Around and About

You can apply modulation to most Zebra parameters, and you get several ways to do so. Many knobs have adjacent, smaller knobs for applying modulation. In those cases, clicking on the smaller knob reveals a pull-down menu for selecting a modulator from among several MIDI sources or one of Zebra's modulation generators. The latter includes LFOs, ADSR and multisegment envelope generators (MSEGs), modulation mixers (allowing several sources to modulate a single target), and two controller lanes in Zebra's pattern-based arpeggiator. The arpeggiator and MSEGs are programmed from tabs in the lower panel. All other modulators are created on demand and housed in a rack to the right of the grid. (Audio modules are housed in a similar rack to the left of the grid.)

You can apply modulation from the ModMatrix, which is an alternate tab of the mixer at the bottom of the grid. The ModMatrix houses four modulation routings, and it gives you pull-down-menu access to every parameter of every module in the grid. Each routing has Amount and Via controls, the latter of which routes MIDI or another modulator to control the amount.

Finally, you use the XY Assign tab in the bottom panel to route either dimension of any of Zebra's four *x-y* controllers to the same parameters accessible from the ModMatrix. The *x-y* controllers are, of course, MIDI controllable.

PRODUCT SUMMARY

U-HE Zebra 2.1

software synthesizer
$199

FEATURES	5
EASE OF USE	3
QUALITY OF SOUNDS	4
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Huge sound palette. Flexible modular architecture. Bonus plug-ins Zebralette and ZRev. Great sound. Hundreds of factory presets.

CONS: Manual is a work in progress. CPU intensive.

MANUFACTURER
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Step-by-Step

Zebra excels at pattern-based modulation. First there's the arpeggiator, which uses its pattern sequencer to select the note played (from those currently held), the step length, the gate, and the transposition. The pattern can have up to 16 steps and play forward, backward, or alternating. You can use the arpeggiator's two modulation sequencers to control module parameters such as the waveform selector of a waveset oscillator.

Next up are the four MSEGs—32-step breakpoint envelopes with independent control of each segment's slope—linear, concave, convex, or S-shaped (see **Fig. 4**). You can activate looping between any two breakpoints, and you can scale the rate of the preloop (attack), loop, and postloop (release) stages independently.

Zebra's LFOs also have a pattern sequencer as one of their waveform options. You get up to 32 steps, transitions can be linear or stepped, and you can force the two global LFOs to restart after a specified number of measures.

Sounds Abound

The manual is an online work in progress, with PDF versions released periodically. Given all that's going on in the program, the manual may leave you feeling a little adrift. Because Zebra is the work of a one-man development team, less manual means more Zebra. On the other hand, you get a huge, well-categorized collection of presets. With a bit of exploring and tinkering, you can gain a basic knowledge fairly quickly. Probably only Heckmann knows all the intricacies lurking beneath the stripes, and that might be a good thing.

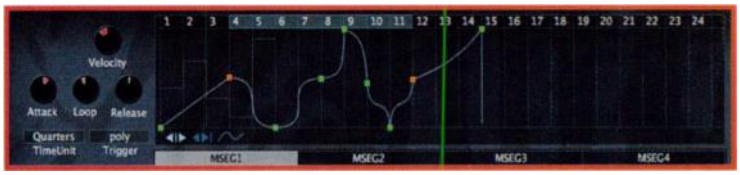

FIG. 4: The MSEG1 pattern shown in the foreground is modulating waveset selection. MSEG2 holds the pitch-modulating step sequence shown in the background.

The vastness of its sound palette, the programming flexibility, and the bonus plug-ins Zebralette and ZRev make Zebra 2.1 a real bargain. This synth covers a lot of bases and gives you plenty of room to grow—you won't get tired of it anytime soon. EM WEB CLIPS

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

FIG. 1: The Midjay combines the functionality of a performance-oriented sequencer with a multitimbral sound module. Its faders control the volume level of MIDI and audio files, and the Master fader handles output on a global basis.

KETRON Midjay

See Product Specs @emusician.com

Not quite a workstation but more than a sound module.

By Marty Cutler

The Midjay, from Italian synth manufacturer Ketron, is a MIDI-and-audio playback device that features an onboard sound module, auto-accompaniment styles, WAV-file rendering and playback, and even an RGB video output for projecting karaoke lyrics. Add to those a USB jack for computer connectivity, mic and instrument inputs, a 40 GB hard drive for audio and MIDI storage, and a 3.5-inch floppy drive, and you have a piece of gear that aims to be a one-stop solution for musicians who need to pack their accompaniment into a box. The Midjay comes with a lump-in-the-line power supply, two manuals, and no cables. (For more background, see the **online bonus material** at www.emusician.com.)

ONLINE BONUS MATERIAL

Topside Tour

The Midjay's small footprint belies its robust construction (see **Fig. 1**). A heavy-duty, high-impact-plastic top surface area overlaps and effectively recesses and protects the lower housing of the unit, which harbors all the physical connections and the floppy drive mounted on its side (see **Fig. 2**).

The controls peppering the top panel are divided into three main areas. On the top right, an alpha dial scrolls through lists or changes values, depending on the context. Four cursor buttons surround an Enter button; again, based on context, you can navigate up, down, left, or right, toggle an entry on or off, delete characters from a file name, or change a value. A vertically arrayed group of buttons on the left has context-sensitive functions for editing text, playlist orders, crossfades between songs, and so on. You use the same buttons to edit Registrations—templates for different styles of music that include instrument transpositions, volume, and patch selections.

The top center row of buttons, labeled Play List, serves two functions, allowing you to select song sections on the fly and to select files from a playlist. You can also use them to jump to any file with a single button push. If you place part markers in your song, you can access them quickly but not instantaneously; playback changes at the end of the measure to avoid discontinuities.

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— Reviewed by Beau Sorenson
Studio Engineer, Smart Studios
(Death Cab for Cutie, Garbage, Sparklehorse...)

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— Reviewed by Bill Tullis
Studio Engineer, SoundsAtlanta Studios

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Just below the Play List buttons are Tap Tempo and global Transpose buttons. Notably, the drums do not transpose with the rest of the song—a useful touch in a gig-oriented box. On the other hand, I couldn't get the hang of the Tap Tempo button, which only toggles the tempo value on or off; of course, you can change the tempo with the alpha dial at this point, but that does not constitute a tap tempo function. The owner's manual was incomprehensible in this regard (more on the manual later).

To the right of Tap Tempo and Transpose, context-sensitive buttons serve as transport, recording, and playback controls as well as real-time split- and level-editing buttons for a Voice—Ketron's terminology for a composite instrument patch or multitimbral combination consisting of four instruments. Voices comprise up to four single instruments that you can layer, Velocity switch, or split. Because the Midjay is 16-part multitimbral, doubling up and splitting instruments can help to conserve channels when you need to maximize available parts. In support of hefty doubling and layering, the Midjay gives you a maximum 100 voices of polyphony. The front panel's lower center portion supplies seven faders for adjusting levels of WAV files, loops, styles, MIDI tracks, MP3s, a mic input, and line-in devices; an eighth fader is the unit's Master.

FIG. 2: All of the Midjay's inputs and outputs are on the instrument's sides and rear and recessed underneath its control surface.

Safe and Sound

Most of the Midjay's preprogrammed song material betrays its demographic target. Although it has enough built-in club-date and wedding-gig chestnuts to get you through a few nights of work, don't let that steer you away from it. You have plenty of room to play your own songs or just groove to the built-in styles. Many styles sound quite good, especially the lively Latin and Caribbean selections.

The Midjay also holds up well in many critical sound categories. The brass and woodwinds have clarity, presence, and bite; they benefit from expressive programming, though the somewhat exaggerated

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VSTi DXi AU RTAS Notation

REVIEW

sampled vibrato on the trumpet, violin, and flute can sound strained if you play too many sustained notes. You also get some special articulations, including brass-ensemble falls and trills. The electric pianos are sparkly, and the drums are nice and punchy, with fat kicks and crisp snares. I noticed one minor gaffe: the overdriven guitar is listed as the distorted guitar, and the distorted guitar is labeled overdriven. Still, they are nice-sounding instruments, and the selection of variations goes well beyond typical GM and XG choices (see **Web Clip 1**).

A few sounds don't withstand closer scrutiny. Most acoustic and electric bass patches settle into their loops too quickly, though that shouldn't be a problem in an ensemble situation. It also appears that violins, violas, cellos, and contrabass derive from the same sample map. Loops on the string ensembles stick out a bit too much, almost creating a tremolo effect (for the record, the GM Tremolo Strings patch is different, relying on a gating effect). Again, it sounds to my ear like the entire string ensemble sound set relies on a common set of samples, and many of the synth pads follow suit. It's important to note that the sounds are nicely balanced, and that's an important feature to anyone needing to create large-ensemble performances with a minimum of EQ and volume tweaking.

PRODUCT SUMMARY

KETRON Midjay

synth/sequencer module
$2,167

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

RATING PRODUCTS FROM 1 TO 5

PROS: Many good, well-balanced sounds. Plays back sequences and WAV files in sync. On-the-fly song arranging. Easy data exchange with computer. Construction is solid.

CONS: Occasional lockups. Some sounds prematurely looped and truncated. Must disconnect USB to change data-transfer modes. Awful owner's manual.

MANUFACTURER
Ketron
www.ketronus.com

Because the Midjay's synthesizer architecture confers a reasonable amount of programmability, you aren't restricted to simple preset tweaks. Unlike many dedicated General MIDI devices, it gives you access to ADSR values as well as filter cutoff, resonance, and LFO rates and depth.

Another terrific feature is its ability to play WAV files as loops in sync with MIDI tracks in a song arrangement. Of course, you can also drop in one-shot samples. You can even perform on-the-fly time compression and expansion, which sounds quite good over a wide range of tempos and pitches. You can render the whole shebang—MIDI data, audio loops, live instruments, and input from a microphone—to a stereo WAV file. The manual provides clues to a sound-on-sound method of creating songs by reimporting rendered tracks into new song files, but erroneously refers to it as multitrack recording. Nonetheless, it's a useful feature for building dense arrangements, especially with its ability to shunt files to the computer (for optional additional processing) and back.

Building a Better Idiot

When I first connected the Midjay to my 3.06 GHz Windows XP notebook (with 1.5 GB of RAM) using a USB cable, it immediately appeared on the desktop as the F: drive when I powered up. Once the Midjay's drive shows up on the computer, you are in familiar drag-and-drop file-management territory. Unfortunately, however, I needed to disconnect the USB cable to reset the unit to receive or transmit MIDI data. The Midjay cries out for the ability to toggle between file-transfer and MIDI tasks without yanking cables or rebooting. Occasionally it just locked up, particularly when I was randomly pressing buttons. That could prove to be a problem on a darkened stage with last-minute changes and fumbling fingers.

Many problems could be solved with a better-organized and indexed owner's manual, but the slim guide relies on a referential style rather than providing a graduated, tutorial approach. The page explaining the file-transfer state appears in the middle of the manual rather than at the very beginning, where it would be most effective—so much for instant gratification. On an adjacent page, a section on saving the startup state presents a confounding list of 39 unrelated parameters you can save, without giving any reference to the pages on which they are covered.

Electronic Sideman

The Midjay offers plenty of power and flexibility to anyone seeking a compact source of interactive musical accompaniment. Its robust construction provides a strong argument against schlepping a comparatively fragile laptop. Why bother, when you can prepare your MIDI tracks and loops on a computer and send them to the Midjay for playback? My only major concern is the possibility of the device locking up onstage during a moment of overzealous button pushing.

Clearly, the Midjay is not a device to bring to a gig fresh out of the box. You'll need to invest a good deal of time getting comfortable with its menus and conventions. Because it is a relatively deep instrument, the provided owner's manual is its worst enemy. With another OS update (I used version 4.0) and a rewritten manual, Ketron's Midjay could take a major leap to the head of the class.

EM WEB CLIPS

Marty Cutler wrings a living from his 5-string banjo and his MIDI and writing smarts. Check out his Web site at http://web.mac.com/martycutler.

SD2
ORCHESTRAL WIZARD

The KETRON **SD2** Orchestral Wizard is a pocket size sound module designed for all PC and Midi applications. Equipped with a new powerful sound engine, including a professional Stereo Grand Piano sound over 88 notes, huge Orchestral voices such as Saxophones, Brass, Woodwinds, Guitars, Accordions, Organ Digital Drawbars and many others, the **SD2** has all the latest features for recording, programming and live performances. The quality of the Solo instrumental Voices (following the traditional KETRON Best Natural sound heritage) is a remarkable advantage of the **SD2**. In addition, the **SD2** includes very distinctive Audio Drum and Percussion Loops selected from Slow, Jazz, Latin, Acoustic, Traditional and Dance styles. Used in conjunction with a Computer, Master keyboard, Midi accordion or Midi guitar, the **SD2** offers an "all-in-one" great sound resource that can be used to greatly enhance standard Midi files, as well as for Home and Studio compositions and recordings. Its Midi capability allows for control of up to 32 Midi channels and DSP effects such as Reverb, Chorus, Delay and Distortion. A very useful (optional) USB to Midi cable also allows the **SD2** to communicate fluently with any laptop, which might normally not be equipped with a Midi Interface. Special configurations with the sound Map (Templates) are provided so the instrument can easily 'work' with the most commonly used sequencer programs such as Cubase®, Logic®, Cakewalk® as well as the complete **SD2** Drum Loop Library. Templates and Loop Libraries can be downloaded free of charge from the KETRON Internet site **www.ketron.it**.

USB to Midi cable (optional)

pc and midi sound module

300+ incredibly realistic voices and sounds, including Grand Piano, Sax, Brass, Guitars, etc.

Over 150 live drum and percussion loops.

Templates included for popular programs such as Logic™ Cubase™ and Cakewalk™

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www.KetronUSA.com

They laughed when I said they could have Perfect Pitch

... until I showed them the simple secret —and they heard it for themselves!

David-Lucas Burge

● Name any note or chord – by EAR! ● Sing any desired pitch at will ● You'll hear it for yourself – immediately. ● Copy music straight off a CD ● Play by ear – instead of searching by hand ● Identify keys of songs just by listening ● Perform with confidence ● Compose music in your head ● Enjoy richer, finer music appreciation ● You'll open a new door to new talents...

The true story behind the worldwide #1 best-selling ear training method

by **David-Lucas Burge**

It all started in ninth grade as a sort of teenage rivalry . . .

I'd practice and slave at the piano for five hours daily. Linda practiced far less. Yet somehow she always shined as the star performer at our school. It was frustrating.

What does she have that I don't? I'd wonder.

Linda's best friend, Sheryl, bragged on and on to me, adding more fuel to my fire.

"*You* could never be as good as *Linda*," she would taunt. "*Linda's* got *Perfect Pitch*."

"What's Perfect Pitch?" I asked.

Sheryl gloated about Linda's uncanny abilities: how she could name *exact tones and chords*—all BY EAR; how she could sing any tone—*from memory alone*; how she could play songs—after just *hearing* them; the list went on and on . . .

My heart sank when the realization came to me. *Her EAR is the key to her success.* How could I ever hope to compete with her?

But it bothered me. Did she *really* have Perfect Pitch? How could she know tones and chords just by *hearing* them? It seemed impossible.

Finally I couldn't stand it anymore. So one day, I marched right up to Linda and asked her point-blank if she had Perfect Pitch.

"Yes," she nodded aloofly.

But Perfect Pitch was too good to believe. I rudely pressed, "*Can I test you sometime?*"

"OK," she replied.

Now she would eat her words . . .

My plot was ingeniously simple . . .

When Linda least suspected, I walked right up and challenged her to name tones for me—*by ear*.

I made her stand so she could not see the piano keyboard. I made sure other classmates could not help her. I set up everything perfectly so I could expose her Perfect Pitch claims as a ridiculous joke.

With silent apprehension, I selected a tone to play. (She'll *never* guess F♯, I thought.)

I had barely touched the key.

"F♯," she said. I was astonished.

I played another tone.

"C," she announced, not stopping to think.

Frantically, I played more tones, skipping here and there all over the keyboard. But somehow she knew the pitch each time. She was AMAZING.

"Sing an E♭," I demanded, determined to mess her up. She sang a tone. I checked her on the keyboard—and she was right on!

Now I started to boil. I called out more tones, trying hard to make them increasingly difficult. But she sang each note perfectly on pitch.

I was totally boggled. "*How in the world do you do it?*" I blurted.

"I don't know," she sighed. And that was all I could get out of her!

The dazzle of Perfect Pitch hit me like a ton of bricks. My head was dizzy with disbelief. Yet from then on, I knew that Perfect Pitch was real.

"How in the world do you do it?" I blurted. I was totally boggled. (age 14, 9th grade)

I couldn't figure it out . . .

"How does she DO it?" I kept asking myself. On the other hand, why can't *everyone* recognize and sing tones by ear?

Then it dawned on me. People call themselves *musicians* and yet they can't tell a C from a C♯?? Or A major from F major?! That's as strange as a portrait painter who can't name the colors of paint on his palette! It all seemed odd and contradictory.

Humiliated and puzzled, I went home to work on this problem. At age 14, this was a hard nut to crack.

You can be sure I tried it out for myself. With a little sweet-talking, I'd get my three brothers and two sisters to play piano tones for me—so I could try to name them by ear. But it always turned into a messy guessing game I just couldn't win.

Day after day I tried to learn those freaking tones. I would hammer a note *over* and *over* to make it stick in my head. But hours later I would remember it a half step flat. No matter how hard I tried, I couldn't recognize or remember any of the tones by ear. They all started to sound the same after awhile; how were you supposed to know which was which—just by *listening*?

I would have done anything to have an ear like Linda. But now I realized it was way beyond my reach. So after weeks of work, I finally gave up.

Then it happened . . .

It was like a miracle . . . a twist of fate . . . like finding the lost Holy Grail . . .

Once I stopped *straining* my ear, I started to listen NATURALLY. Then the simple secret to Perfect Pitch jumped right into my lap.

Curiously, I began to notice faint "colors" within the tones. Not *visual* colors, but colors of *pitch*, colors of

sound. They had always been there. But this was the first time I had ever really "let go"—and *listened*—to discover these subtle differences.

Soon—to my own disbelief—*I too could name the tones by ear!* It was simple. I could hear how F♯ sounds one way, while B♭ has a *totally different sound*—sort of like "hearing" red and blue!

The realization struck me: THIS IS PERFECT PITCH! This is how Bach, Beethoven, and Mozart could mentally envision their masterpieces—and know tones, chords, and keys—all by ear!

It was almost childish—I felt sure that *anyone* could unlock their own Perfect Pitch with this simple secret of "Color Hearing."

Bursting with excitement, I told my best friend, Ann (a flutist).

She *laughed* at me. "You have to be *born* with Perfect Pitch," she asserted. "You can't *develop* it."

"You don't understand Perfect Pitch," I countered. I showed her how to listen. Timidly, she confessed that she too could hear the pitch colors. With this jump start, Ann soon realized she had also gained Perfect Pitch.

We became instant celebrities. Classmates loved to call out tones which we would then magically sing from thin air. They played chords for us to name by ear. They quizzed us on what key a song was in. Everyone was fascinated with our "supernatural" powers, yet to Ann and me, it was just normal.

Way back then, I never dreamt I would later cause such a stir in the academic world. But as I entered college and started to explain my discoveries, many professors *laughed* at me.

"You must be *born* with Perfect Pitch," they'd say. "You can't *develop* it!"

I would listen politely. Then I'd reveal the simple secret—*so they could hear it for themselves*. You'd be surprised how fast they changed their tune!

In college, my so-called "perfect ear" allowed me to skip over two required music courses. Perfect Pitch made everything easier for me—my ability to perform, compose, arrange, transpose, improvise, and even sight-read (because, without looking, you're sure you're playing the correct tones). And because my ears were open, music just seemed richer.

I learned that music is definitely a HEARING art.

Oh, you must be wondering: whatever happened with Linda? Excuse me, I'll have to backtrack . . .

It was now my senior year of high school. I was nearly 18. In these three-and-a-half years with Perfect Pitch, my piano teacher insisted I had made ten years of progress. And I had. But my youthful ambition wasn't satisfied. I needed one more thing: *to beat Linda*. Now was my *final chance*.

The University of Delaware hosts a performing music festival each spring, complete with judges and awards. To my horror, they scheduled me that year as the *grand finale* of the event.

The fated day arrived. Linda gave her usual sterling performance. She would be tough to match, let alone surpass. But my turn finally came, and I went for it.

Slinking to the stage, I sat down and played my heart out with selections from Beethoven, Chopin, and Ravel. The applause was overwhelming.

Later on, I scoured the bulletin board, searching for our grades in the most advanced performance category. Linda received an A, which came as no surprise.

I scored an A+.

Sweet victory was music to my ears—mine at last!

Now it's YOUR turn!

For 26 years now, musicians around the globe have proven the simple methods that David-Lucas Burge stumbled upon as a teenager *(plus research at two leading universities—see www.PerfectPitch.com/Research)*.

Now you can hear it for yourself! It's easy and fun—and *guaranteed* to work for YOU—regardless of your instrument, your playing style, or your current ability.

Order your own **Perfect Pitch® Ear Training SuperCourse** and listen to the first CD. We promise you will *immediately* hear the Perfect Pitch colors that David-Lucas starts you on—or return the course for a full prompt refund (you've got our 26-year word on it).

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Imagine the talents that Perfect Pitch can open up in YOU to advance *your* playing, *your* singing, *your own* creativity and confidence. *Then again, how will you ever know until you listen for yourself?* There's no risk. Order your course now and *HEAR IT for YOURSELF!*

We are a proud member of the Music Industry Conference, an affiliate of MENC: The National Association for Music Education.

QUICK PICKS

MOOG MUSIC

MF-107 FreqBox

By Vijith Assar

Over the past few months, pictures showing Red Hot Chili Peppers guitarist John Frusciante's pedalboard have made the rounds online and in print. The photos confirm that he's a fan of Moog Music's boutique stompbox effects, with no fewer than six Moogerfooger pedals in his rig. Moog has capitalized on the resulting swell of interest in Moogerfoogers with the release of the MF-107 FreqBox ($359).

The FreqBox is an analog synth module in a box, with an input that accepts audio signals from instruments and line-level sources. The device looks like a large effects pedal, but it works in a fashion unfamiliar to most guitarists. Instead of simply processing the input signal, it routes the signal to modulate an internal voltage-controlled oscillator (VCO), essentially replacing sounds from your guitar or other source with FreqBox tones.

Inside Job

Depending on the mode of operation you choose, the FreqBox uses the input signal as the master waveform for hard sync, the modulator for FM synthesis, or the source for an envelope follower that alters the VCO's pitch in response to your playing dynamics (see **Web Clip 1**). The Env Amount and FM Amount knobs on the unit's right-hand side determine the degree to which the FreqBox uses each mode. Knobs on the left determine VCO characteristics such as waveform shape and frequency. You can toggle hard sync with a switch, and there are additional controls for level and drive as well as a bypass footswitch.

The Moog MF-107 FreqBox brings unique analog synthesis capabilities to your guitar pedalboard or effects arsenal.

The FreqBox's all-analog design has two major implications. First, it's easy to add control voltage inputs, because no A/D conversion is necessary to plug an external device into the circuit. Indeed, the back of the unit is festooned with ¼-inch TRS jacks that let you control almost all the front-panel functions with expression pedals or other gizmos. The only glaring omission is a footswitch input for toggling sync mode.

Second, and more problematically, being all analog rules out presets, which would require A/D conversion of the control signals and the dreaded quantization of parameters. That makes the FreqBox a bit of a one-trick pony for live applications if it's sitting on the floor—that is, unless you connect expression pedals for real-time control, and you can connect as many as five. And it does balance quite nicely on the edge of a keyboard, as long as you have enough extra space next to your modulation wheel.

TweakBox

If you're in a situation that allows for twiddling, the FreqBox is a pretty potent device. Aside from the lack of stereo input, it is quite well suited to the studio; Moog even sells a three-Fooger rackmount kit ($59). A quick survey of the user forums turns up intrepid adventurers stringing them up alongside the CP-251 control voltage generator ($369) to create quasimodular beasts (see the CP-251 review at www.emusician.com).

The hard-sync modes are by far the most useful, because they're the only way to match the output pitch to the input; with sync turned off, the frequency knob or CV input determines pitch. The FreqBox can be interesting even with sync turned off, though. Carefully tuning the VCO frequency for a harmonically simple song can continually emphasize an important note (see **Web Clip 2**), and driving the pitch with an expression pedal inevitably leads to dramatic Tom-Morello-like whammy freak-outs (see **Web Clip 3**).

When you aren't using the Frequency knob to modulate pitch, you use it to change the filter cutoff, switching between the Moog equivalents of whammy and wah as the sync mode changes. It's possible to mangle your sounds pretty aggressively (see **Web Clip 4**), but with a sufficiently subtle setting on the Mix knob, you can blend in even the most outlandish configuration as an agreeable sonic backdrop.

Freq Out

For anyone on a musician's budget, the FreqBox isn't inexpensive enough to be an impulse buy, and it definitely exists outside the normal realm of most guitar effects users. Given that diminutive sub-$200 DSP boxes with nowhere near the FreqBox's level of ingenuity dominate the market, though, it's hard to quibble about any of its quirks.

With a bevy of expression pedals and a quick right foot, you can use the FreqBox to deliver an infinite variety of sounds—literally, because the values aren't quantized—that you just can't find elsewhere. It isn't for everybody, but if you do use one, you certainly won't sound like anybody else.

EM WEB CLIPS

Value (1 through 5): 4
Moog Music
www.moogmusic.com

PROPELLERHEAD SOFTWARE

Abbey Road Keyboards 1.1 (Mac/Win)

By Len Sasso

The *Abbey Road Keyboards* ReFill ($229) for Propellerhead Reason is an exquisite collection of sampled vintage keyboards. All of these keyboards have been


Feel the keys
The best feeling keyboard foundation any controller
Hit the pads, trigger the music
to trigger MIDI files or audio clips at your command
Built-in USB Audio I/O
Makes the VX your complete music production studio
CME
VX
The Most Powerful Ever
Built-in 32bit CPU and Multi-function expansion slot
Get Motorized
The world's first controller with motorized faders for DAW mixing control
U CTRL
U-CTRL
The smile button for easy setup with most DAW software
VX5678 INTELLIGENT KEYBOARD
VX - A Breakthrough Hardware Fusion
3-in-1 synthesizer, MIDI keyboard, and U-CTRL.
• 49 notes, 61 notes, 76 notes and 88 notes. Graded hammer action weighted keyboard (VX8) and semi-weighted keyboard (VX5/6/7), initial and after touch, velocity sensitive
• 9*60mm motorized faders for DAW mixing control
• Built-in 2-channel USB dio interface with 2 mic/line inputs, 2 line outs, and 2 headphone outs
• 12 programmable velocity sensitive trigger pads, 8 knobs with center demarcation, 9 endless encoder knobs, DAW transport controls, pitch bend and mod wheel, ribbon and breath controllers, and 2 programmable pedal inputs
• USB MIDI, USB hub functionality, 4 MIDI outs and 1 MIDI in
• U-CTRL for easy setup with most DAW software
• Class-compliant with windows Vista/XP and Mac OS X
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World Radio History

featured in countless popular recordings and film scores over the last half century. For this library, they were recorded in Abbey Road's Studio Two using classic and modern mics along with the console and signal processing that made these instruments famous.

The ReFill comes in 16- and 24-bit versions, and you can keep them both installed as long as Reason can't see them simultaneously. That's nice when you need 16-bit economy for tracking but want 24-bit quality in the final mix. For documentation you get a PDF Quickstart guide, which is all you need to use the library. As a bonus, you get a 40-page color booklet by Mark Vail detailing how the library was made. Installation is drag-and-drop with online registration needed to access updates.

Start Here

The ReFill is built around Reason NN-XT sampler patches. Each NN-XT patch captures one instrument with one mic placement. Samples are taken at every third note on average and at four or five Velocity levels. Additional samples of characteristics such as hammer noise and release resonance are included where appropriate. Propellerhead calls this multimiked multisampling method Hypersampling. In contrast to gigantic sampled-piano libraries, which capture every note at ten or more Velocities with separate sustain-resonance samples, this library is fairly compact (1.7 GB or 4.2 GB depending on the bit rate), but for the included instruments and intended purpose, it does the job nicely.

You can use the NN-XT patches right out of the box, but you'll more often want to combine several mic placements and throw in a bit of processing. For that you get Combinators containing preconfigured setups in four categories: Preset, Producer, Style, and Template. Preset Combinators typically include two or three mic placements along with basic processing such as EQ and compression. Producer Combinators are similar but offer more mic placements and are designed to blend into a mix. Style Combinators aim to emulate sounds used in classic songs. Their names hint at the source, and they often use several instruments and more-extreme processing. They make good starting points for creative sound design. Template Combinators contain empty NN-XT samplers ready for you to load with patches of your choice.

Abbey Road Keyboards' Combinator patches combine multisampled NN-XT patches for individual mic placements with mixing, effects processing, and global controls.

Abbey Vintage 1960

The library samples seven instruments—two upright pianos, two organs, a celesta, tubular bells, and a Mellotron. The Steinway upright, called Mrs. Mills Piano, is out of tune and has a hard sound owing to its lacquered hammers. On the other hand, the Challen Studio Piano is warm and woody sounding with lots of sustain. The organ, a Hammond RT3, is larger than a B-3 and has more features, but it has the same distinctive Hammond sound. It is sampled through a Leslie Model 122. The Mannborg Harmonium is a pedal-driven reed organ with a split keyboard for playing different reed combinations and knee levers (replicated by the MIDI Mod Wheel) to alter the timbre.

The Schiedmayer celesta and Premier tubular bells are bell-like instruments. The celesta has a soft, intimate sound, whereas the tubular bells are in your face and ring forever.

Before there were samplers, there was the Mellotron—heard on countless records, usually noisy, and often out of tune. In short, its 35 keys control 35 tape transports to play sounds recorded on 6-foot strips of tape. These are not tape loops; hold a key too long, and the tape runs out. Here you get Mellotron M400 flute, cello, and strings.

In addition to the wonderful collection of vintage keyboards, two things set *Abbey Road Keyboards* apart from the pack. The first is the Hypersampling technique of creating a separate multisampled instrument for each mic placement. That gives you unprecedented real-time control over ambience (see **Web Clip 1**). Being able to combine several multisampled instruments along with a selection of effects in a Combinator, a process akin to creating modular presets, is the second important advance (see **Web Clip 2**). The included Combinator patches offer a tantalizing preview of where a little imagination can take you with this ReFill.

EM WEB CLIPS

Value (1 through 5): 4
Propellerhead Software
www.propellerheads.se

SOURCE AUDIO

Hot Hand Wah and Wireless Adapter

By Michael Ross

Source Audio's Hot Hand Wah ($349) is an effects stompbox you control with a motion-sensor ring worn on your picking hand. The ring is tethered to the box by a rather cumbersome wire tucked beneath an armband. Fortunately, you can set the ring free by also purchasing the Hot Hand Wireless Adapter ($150). The wireless system's ring transmits its signal to a small receiver plugged into the Hot Hand Wah. The Wah and Wireless Adapter are bundled together for $474.

Hot Box

The rugged floor unit has three rotary knobs and two large, flat footswitches. The Effect knob lets you select from 11 effects types: a classic wah-wah, an auto-wah, a volume swell, four multipeak filters, and high- and low-resonance lowpass and bandpass filters. The Frequency knob lets you adjust filter frequency, and the Motion knob adjusts the unit's sensitivity to the ring. You can use the knobs to customize the effects and then store your configurations in one of four presets. One footswitch steps sequentially through the presets, and the other switches the effects on and off.

Source Audio's Hot Hand Wah lets you do everything you can with a traditional wah pedal, and more, just by wiggling your finger. And with the Wireless Adapter, you can control the wah just by gesturing in thin air.

In addition to ¼-inch in and out jacks for your guitar and for expression pedals, the Hot Hand Wah has an in and out for the sensor and a connection for the optional 9 VDC adapter (the unit usually runs on four AA batteries). One motion-sensor ring can control several chained Source Audio units (a phaser/flanger is available, and more are in development).

The Wah lets you control devices from other manufacturers as well as its own effects. The Expression Out jack generates an adjustable voltage from 0 to 5V, proportional to the Hot Hand's control signal. The output can drive any device with a voltage-based expression pedal input, such as the Line 6 POD XT Live, the Voodoo Lab Ground Control Pro, or the Moogerfooger Ring Modulator I used.

The Wireless Adapter includes the lightweight wireless ring, the receiver, and a DC adapter that charges the ring's lithium-ion battery. The system is based on frequency-hopping 2.4 GHz radio technology and is licensed for worldwide wireless standards. Source Audio says the system allows you to roam as far as 100 feet from the floor unit while modulating its effects. Though my 15-foot audio cable prevented me from verifying that claim, the system worked perfectly between rooms, so I'm inclined to believe it. You can use as many as four wireless adapters without them interfering with each other, and use separate rings on each hand to control different parameters.

With This Ring

The Motion knob has three adjustable areas—Pick, Strum, and Flail—and a button to invert the controller's effect. The Pick area gives the most filtering with the least movement, so I could pick funky lines while affecting their EQ coloration using the Classic Wah setting (see **Web Clip 1**). Strum worked best for rhythmic multipeak filtering applied to chord accompaniment (see **Web Clip 2**).

Flail was perfect for grand gestures and came into play when I switched off the Wah's effects and connected its Expression Out to the Moogerfooger Ring Modulator's Frequency input, allowing for long pitch sweeps punctuated by dramatic arm waving (see **Web Clip 3**). Switching to the Moogerfooger's Rate input, I could speed up and slow down the effect's modulation rate (see **Web Clip 4**).

I patched the Wah's audio I/O to a send and return on an M-Audio 1814 FireWire interface. Though the Hot Hand's input and output are labeled Guitar, they had no trouble with line-level signals. I set up an Ableton Live session featuring a rhythmically chopped string-sample loop. When I used varying hand motions to filter the loop with the bandpass and lowpass effects, the Hot Hand inspired sounds that might not have occurred to me, or that would have been unwieldy if not impossible using other forms of filter control (see **Web Clip 5**).

Wah's Happening

Because Source Audio has been marketing its products to guitarists, my first thought was, "Don't I already have enough to do with my hands?" So I was surprised by how natural it felt to use the motion-sensor ring while playing. With very little practice, I discovered expressive possibilities in the slightest movements of my ring finger.

The Hot Hand Wah offers new avenues of control to guitarists, no matter what style of music they play. It frees them from the tyranny of filtering with a footpedal. The Wah system should be ideal for DJs, laptop jockeys, and keyboard players too, as well as electronic experimenters of all ilks. Performers other than guitarists may find that the Source Audio system adds greatly to their visual presentation as well as their audio palette. EMWEB CLIPS

Value (1 through 5): 3
Source Audio
www.sourceaudio.net

ULTIMATE SOUND BANK

PlugSound Pro 1.0.0

(Mac/Win)

By Tony DiLorenzo

Ultimate Sound Bank (USB) refers to PlugSound Pro ($399) as a "complete workstation" plug-in, and what a workstation it is! PlugSound Pro ships with 8 GB of sounds, including USB's complete PlugSound Box. The sound set has synths, pianos, guitars, basses, orchestral instruments, drums, and

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I was kind of surprised that the recordings I make in my little home studio were good enough. I guess size really doesn't matter;-)

Want to know what does matter? Versatility. Being able to supply tracks in different genres makes you even more desirable for Film and TV projects. I didn't know that until I became a TAXI member and started going to their members-only convention, the Road Rally.

If you joined TAXI and never sent in a single song, you'd still get more than your money's worth just by going to their convention. It's three days of incredible panels loaded with some of the most powerful people in the music business, and the cool part is that it's FREE!

Unlike some of the other conventions I've attended, the panelists at the Rally are friendly and accessible. I've never been anywhere that gives you so much great information, and so many chances to meet people who can help your career.

If you've needed proof that a regular guy with ordinary equipment can be successful at placing music in TV shows and movies, then my story should do the trick.

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ethnic instruments all controlled with an uncluttered, intuitive user interface. A loop library consisting of beats, vocal parts, and musical phrases is also included to kick your inspiration into high gear. You can even add to the arsenal by importing files in REX, AIFF, and WAV formats as well as Apple Loops. If you still need more, USB has a selection of expansion libraries called UVI Sound Cards.

Give Me the Details

At the heart of PlugSound Pro is the UVI Engine, the same core engine found in MachFive, Ethno, and Symphonic Instruments by MOTU and Atmosphere, Trilogy, and Stylus by Spectrasonics. PlugSound Pro's feature set provides 64-part multitimbral capability, 64 MIDI channels, and an extensive effects section complete with convolution reverb. The plug-in also includes an Expert mode for creating complex stacks and combinations, with each part having its own effects and output setting. Don't worry about some of the large sound files—PlugSound Pro can stream samples from your hard drive. The Sound Design section has enough sound-shaping parameters to satisfy your need to tweak, and a MIDI Learn feature so you can map controls to various PlugSound Pro parameters.

Navigation is a snap because most of the parameters are available in the main screen of the plug-in. Each part has controls for volume, pan, pitch, and polyphony along with two aux buses (Aux 1 and 2). There's even a Mastering section that includes 3-band EQ, a compressor, a limiter, and tube harmonics. Want to make a sound stand out? Turn on the Mastering section and watch PlugSound Pro come alive.

Captain's Log

When I got the assignment to review this plug-in, I ran right to USB's Web site to start my research. The demo presets on the site only scratch the surface. I installed PlugSound Pro on a 17-inch MacBook Pro, which is a 2.16 GHz Intel Core Duo machine with 2 GB of RAM. (Note that according to the documentation, USB suggests placing the PlugsoundPro.ufs file on its own separate hard drive.) The entire installation, including authorization of my iLok Smart Key, went without a hitch.

I fired up PlugSound Pro in standalone mode and loaded a preset called Acoustic Grand Piano, an 11 MB masterpiece that is responsive and realistic in all registers. The collection of must-have Electric Pianos transported me back to the '70s. PlugSound Pro's Suitcase and Wurli sounds have that retro flavor, while the Electric CP patches (a nice recreation of an electric grand) have the same bright, cutting tone as the original. Acoustic guitar sounds like the Guild, Mahura, and Martin are absolutely beautiful—the stereo spread versions will have you writing "unplugged" music with your computer.

Synth pads like Beend and Modeler sound like they came straight from a Korg Wavestation or Sequential Circuits Prophet VS. Dance producers will appreciate the extensive Synth Bass collection, and the Electric Bass collection will appeal to those with more organic tastes. Bass patches such as MusicM, Fend.Jazz, and RickenBass really sit nicely in a mix.

PlugSound Pro 1.0.0 from Ultimate Sound Bank is a versatile sample player that ships with an 8 GB sound set. You can add to the collection by importing files in REX, AIFF, WAV, and other formats.

Let's Lay One Down

After auditioning PlugSound Pro's generous supply of sounds, I decided to do a short demo piece to see how the plug-in got along with Apple Logic. The Wurli samples put me in a funky mood, so that was the style I went with. I started by making use of PlugSound Pro's Drag & Drop feature to fly a loop right into Logic. This feature couldn't be easier to use. When the Drag & Drop icon shows an audio wave, you'll be dropping an audio file into an audio track of your host software. Click on the Map button, then the Drag & Drop icon will change from an audio wave to an eighth note, and you'll be able to drag MIDI data to your host. I created tracks using MusicM 3 Long for bass, Complete Orange Clav for rhythmic comping, Wurli Loud for piano, and Paul Hard Synth for a laid-back synth line. I also made use of the E Funky guitar phrase from the loop collection (see **Web Clip 1**).

With a street price of around $299, PlugSound Pro proves to be a powerful virtual instrument with plenty of bang for the buck. This versatile plug-in comes with a well-organized library of high-quality samples ranging from basic to exotic. Built-in mastering and effects processing combined with a user-friendly interface make it easy to like this one. Well done, Ultimate Sound Bank.

EM WEB CLIPS

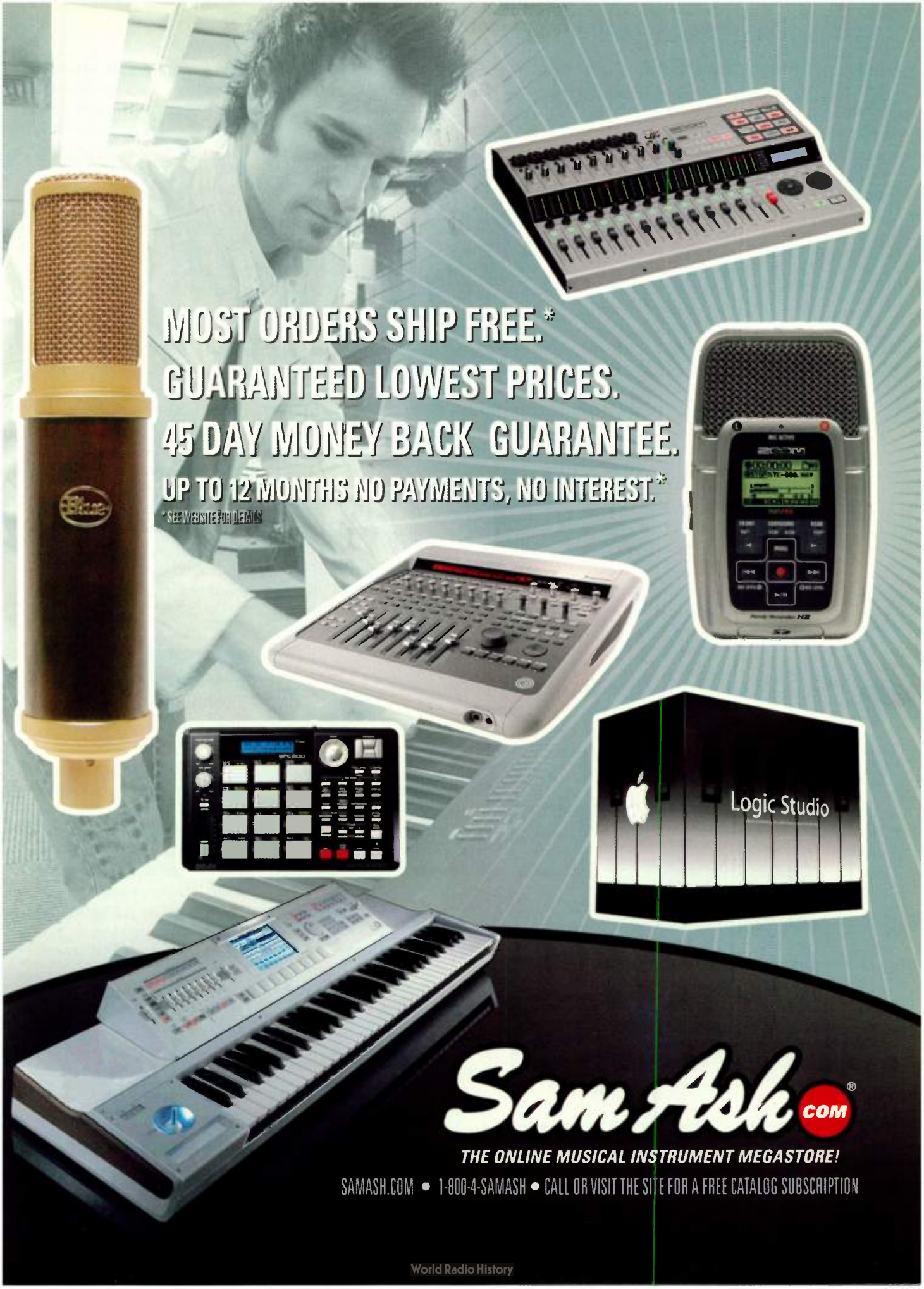
Value (1 through 5): 4
Ultimate Sound Bank
www.ultimatesoundbank.com

SE ELECTRONICS

Reflexion Filter

By Mike Levine

SE Electronics' Reflexion Filter ($399) is a sound-absorption device designed to minimize room reflections. SE touts it as a solution for recording in untreated spaces with subpar acoustics. The unit is composed of a curved metal frame, measuring roughly 12 by 15 inches, with several layers of absorptive material attached to its concave side. The entire



apparatus, which includes a sliding post to mount a microphone on, attaches to your mic stand.

Heavy Stuff

After assembly (which is easy), the Reflexion Filter weighs 8 pounds and can easily tip over a conventional mic stand. You can purchase heavy-duty stands from sE that are designed to take the weight, or just put something heavy at the bottom of your stand to keep it balanced. A 10-pound barbell across one of the legs of a tripod stand worked for me.

The curved filter section has a metal post that attaches into a hole in the clamping assembly. The post can be loosened, allowing you to raise or lower the filter to position it. Another post (about 7 inches in height), to which you attach your mic's shockmount or clip, sits on a track inside the curved filter and slides to move the mic closer to or farther from the filter.

That post is threaded in the 3/8-inch European standard, and sE includes a 3/8-inch-to-5/8-inch (U.S. standard) adapter that screws onto the post. I recommend that you tighten it with a tool such as a wide screwdriver. Why? I initially hand tightened it and found that once I finished with a mic and unscrewed its shockmount, the adapter came off the post with it and was stuck in the mount's threads. It happened several times, and it always took much effort to unscrew the adapter. I wish that for the U.S. market, sE would change to the 5/8-inch thread.

The Reflexion Filter is designed to reduce the sound of room reflections when recording.

The clamping assembly has three metal handles, which can be loosened to adjust various parts of the filter. Depending on how they're set, the handles sometimes get in each other's way, requiring readjustment. Despite this somewhat clunky design, you get a lot of flexibility for tweaking the height and angle of the filter (see **Web Clip 1**). If you choose not to mount your mic on the sliding post, you can always use a second stand for it. One other issue: the filter is so big that it can block your view of lyrics, a script, or, if you're self-engineering, your recording gear.

Test Case

I tested the Reflexion Filter extensively and found that it definitely reduced room reflections. I tried it with vocals, both sung and spoken, and it gave me a tighter, more focused sound. The effect was subtle when tested in my studio with the mic placed parallel to the filter's edges (as sE recommends). The closer I moved the mic to the filter, the more deadened the sound became. If I got too close, it started to sound harsh and honky. The control of reflections was more noticeable when I used the unit while recording vocals in a reflective hallway (see **Web Clip 2**).

I also used it with success recording acoustic instrument tracks, including guitar and mandolin. Again, unless you're in a really reflective room, the results are subtle. Regardless of the space, I liked the way that tracks recorded with it sounded—they seemed a tad more controlled and consistent.

According to sE, the Reflexion Filter was not designed as a sound isolator. Still, it can help lower the amount of ambient noise (such as the whir of your hard drives) that your microphone picks up.

Reflexions

If your studio's acoustics are not what you'd like, the Reflexion Filter may be a good solution. It's not completely user friendly, nor is it inexpensive (although its cost is low compared with acoustic treatment), but it delivers what it promises and would be valuable in almost any studio. Based on performance, I would have given it a Value rating of 4. However, the mic-stand-adapter problem and the other design issues I mentioned caused me to lower my rating by one point.

SE also makes the Instrument Reflexion Filter ($199), which is smaller, lighter, and designed specifically for instrument recording. It's mounted on a gooseneck that clips onto a mic stand. It has a hole in the middle to place a cylindrical-shaped mic, such as a pencil condenser (a large-diaphragm mic won't fit). Like its larger sibling, it was effective when recording acoustic-stringed instruments. SE also touts it for miking woodwinds, acoustic piano, guitar amps, and more.

EM WEB CLIPS

Value (1 through 5): 3
sE Electronics
www.seelectronics.com

PRO AUDIO VAULT

Blüthner Digital Model One (Mac/Win)

By Len Sasso

Sampling guru Dan Dean of Dan Dean Productions and sound designer Ernest Cholakis of Numerical Sound have teamed up to form Pro Audio Vault (PAV), a company specializing in virtual instrument design and implementation. Their first release is Blüthner Digital Model One ($299), a meticulously sampled 9-foot Blüthner Model 1 grand piano recorded at Skywalker Sound.

The piano was close-miked to capture the driest possible image, and damper-pedal-up and -down stereo samples were captured at 12 loudness levels (more than 2,000 samples in all). The result is a 4.5 GB library that runs standalone and as a VSTi, AU, or RTAS plug-in using Native Instruments Kontakt Player 2 (included). Authorization is carried

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out online using the NI Service Center application.

The basic piano comes in six dynamic-scaling configurations ranging from the full dynamics of the piano, labeled 100, to the most compressed dynamic range, labeled 45. The chosen scaling makes a huge difference in the sound and feel of the instrument. A little time spent experimenting with different dynamic-scaling choices combined with the Velocity-curve choices on my MIDI keyboards allowed me to dial in the feel I wanted with greater precision than on other sampled pianos I've tried.

Follow Your Impulse

The thing that most sets this piano apart from the competition is its heavy reliance on Kontakt 2's convolution engine. In addition to room ambience and reverb, convolution is used to enhance sustain resonance and, most important, to change the timbre of the piano completely. That last is accomplished by convolving the piano samples with impulse-response curves taken from other pianos, from piano recordings, and, in one of the most interesting twists, from speech.

The purpose of sustain convolution is to better reproduce the complexity of the resonances that occur in a real piano when the dampers are raised. You get two sustain groups (A and B) with five variations each (Crisp, Clear, Dark, Even, and Full). The difference between using pedal-down samples alone and with sustain-impulse convolution is subtle but clearly audible (see **Web Clip 1**).

Seven Timbral Impulse groups—Classical, Custom, Jazz, Pianos, Pop, R&B, and Vocal—contain a total of 260 impulses. The Classical group is taken from other manufacturers' pianos. The Custom group comes from other Blüthner pianos. The Jazz group represents mostly recent recordings, though several come from older recordings. The Pianos group comes from other sampled and digital pianos. Like the Jazz group, the Pop and R&B groups come primarily from recordings representative of those genres.

The Vocal group is a tantalizing example of how you can use convolution to go way beyond a natural piano sound. The impulses were taken from spoken vocal phonemes, and the results of convolution range from muted to piano-in-a-box to harpsichord-like sounds. Unfortunately, you are limited to the few impulses provided in this category because even when loaded into the full Kontakt 2 sampler, the instruments are locked and cannot be modified. Otherwise, you could use your own impulse samples for convolution. My biggest complaint about this instrument is that you can't get under the hood—probably necessary for security reasons but a shame nonetheless.

All the timbral impulses have a profound effect on the sound of the piano, and as I played this piano more, I came to prefer the unprocessed version. The same was true for the reverb impulses; although they sounded fine, I actually preferred an outboard reverb or none at all. On the other hand, I definitely preferred the sustain with convolution active. The nice thing is, you have lots to choose from in each category, or you can turn them all off and still have a great-sounding piano.

Revolution or Evolution

Blüthner Digital Model One has two other forward-looking features. A clever, variable just-intonation tuning system was devised by Ernest Cholakis. With it you set the root key either by using a second keyboard or, less conveniently, by using MIDI CC 16 together with an octave of the main keyboard.

A complete second set of instruments is included for use with a variable sustain pedal. A variable sustain pedal sends different values with increased pressure rather than simply acting as an on/off switch. It's a much more realistic piano-damper-pedal implementation, and variable sustain pedals are affordable and increasingly available.

There's no question that Blüthner Digital Model One is an excellent sampled piano. It stacks up well with the collection of top-of-the-line sampled pianos EM profiled in the October 2006 feature "Software Eighty-Eights" (see **Web Clip 2**). It's reasonably priced, and if not revolutionary, it's at least high on the food chain.

EM WEB CLIPS

Value (1 through 5): 4
Pro Audio Vault
www.proaudiovault.com

Blüthner Digital Model One's control panel is primarily devoted to choosing timbral, reverb, and sustain impulse-response presets.

NADY SYSTEMS

TRM-6 Tube Ribbon Microphone

By Karen Stackpole

Nady Systems' latest offering in accessibly priced studio microphones is the TRM-6 Tube Ribbon Microphone ($499.95), a hybrid that combines a classic ribbon design with an internal tube preamp. The 12AX7A triode provides higher output levels than you would get from a standard ribbon mic, allowing the TRM-6 to be used with any external preamp.

I received a pair of TRM-6s for testing. Each mic came in a vinyl zippered pouch, neatly packaged in its own lockable, foam-padded aluminum flight case. Also included was a TMPS-6 remote power supply, an AC power cord,

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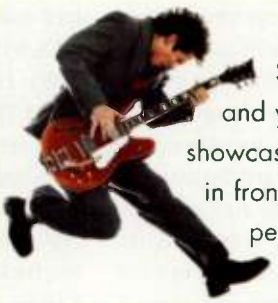

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an elastic suspension shockmount, a foam windscreen, and a 33-foot cable with 7-pin XLR plug to connect the mic to its power supply.

The TRM-6 has a low-tension, 2-micron-thick aluminum ribbon in a machined cylindrical housing that is internally shockmounted and topped with a sturdy mesh-lined grille. The mic is substantial, weighing in at just over 1.75 pounds. The TRM-6 has a bidirectional, figure-8 pickup pattern, a frequency response of 30 Hz to 18 kHz (±3 dB), and the ability to handle SPLs up to 135 dB.

On the Job

I used the TRM-6 to record saxophone, clarinet, electric and acoustic guitars, and male and female vocals. I even used it as a room mic with a drum set during a live recording. I ran the mics through a Langevin Dual Vocal Combo, a Focusrite Green Series preamp, and a Mackie 1202-VLZ mixer to see how the levels fared under each circumstance. The mic's output was hot enough that I didn't have to crank the preamp gain to its limit in any of the situations in order to get a good level. I recorded the results to Digidesign Pro Tools in the studio and to DAT during live situations. The pair of mics were sonically consistent and I found them to be pretty well matched.

In general, the TRM-6 sounded smooth, with a midrange fullness that was complimentary to a female vocalist with a smoky voice and a male vocalist with a midrangy timbre. While there wasn't as much clarity in the high end as with a condenser mic, the TRM-6's sound was still detailed and present with a nice, intimate quality. The mic's sonic characteristic worked especially well with saxophone and clarinet, sounding silky and rich.

The TRM-6's attributes really shone on electric guitar during a jazz session, enhancing the beautiful, round tone of the instrument while still providing good presence. On acoustic guitar, the TRM-6 was clear sounding, though not as transparent as a condenser microphone, which is my preferred transducer for this application. I found the ribbon mic's lows to be a bit on the boomy side for my taste in this case.

While recording a drum set in a resonant room with a cement floor, the TRM-6 sounded big thanks to its bidirectional pattern. The smoothness in the mic's high end quelled the edgy harshness from the cymbals' being played in such a reflective space.

The Nady TRM-6 is an active ribbon microphone that uses a tube in the output circuit.

Good Deal

Overall, the TRM-6 offers a rich sound with a full midrange presence, big lows, and a smooth high end. The tube-and-ribbon combination offers a pleasing sonic alternative to condensers and moving coil microphones, and it is especially well suited to capturing electric guitars, reeds, and vocals. Listing for under $500 and backed by a three-year warranty, the TRM-6 is an attractively priced choice for recordists looking to expand their mic closet.

Value (1 through 5): 4
Nady Systems
www.nady.com

ICED AUDIO

AudioFinder 4.5.7 (Mac)

By Len Sasso

EM ★★★★★ hot pick

A lot has changed since Iced Audio AudioFinder ($69.95) won an EM 2005 Editors' Choice Award. That was version 2.4.4; version 4.5.7 sports a different look and a host of new features. These include a basic sample editor ideally suited for beat slicing, a detachable player window that tracks your selections in the Mac OS X Finder, and much-improved browsing, scanning, and searching tools. Many other features have been improved in one way or another.

First and foremost, AudioFinder is about finding and auditioning audio files on your hard drives. When launched, it presents you with its own browser, which is similar to the List view of Mac OS X Finder windows. You can toggle an optional Columns view above the List view that automatically interacts with the List view to give you the best of both worlds. Whenever you select an audio file in a recognized format (just about any format you can think of, including MIDI files and Apple Loops), the file is displayed and played in the AudioViewer window, which by default is docked below the browser. You can defeat automatic playback and limit the size of displayed files.

By Any Means

To the left of the browser views, you'll find a Library panel with a variety of navigation options. One of the most useful is Finder Selection. That makes the AudioViewer follow your selections in the Mac OS X Finder rather than in AudioFinder's browser. To make things even more convenient, you can detach the AudioViewer, making it a floating window, and then close the browser.

However you go about finding and auditioning files, AudioFinder maintains two handy temporary bins: Playback History and Session Favorites. You populate Session Favorites by dragging-and-dropping audio files onto it, whereas Playback History contains every audio file you've selected during the session (whether played or not). You can add either bin to the permanent Library.

Browsing files can be tedious, and AudioFinder has a variety of search tools to streamline the process. First, it supports Spotlight searching, restricting the results to audio files. Then it offers keyword searching within the current list of found items, and you can search in folder names, file names, and Finder comments. Once you've entered a search word, you can use it to refine the current search to items including or excluding the word.

AudioFinder's best search trick is its ability to scan for audio files nested at any level below the selected folder. For example, you can scan your entire

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hard drive or a single loop library. Furthermore, you can limit your search by file extension—excluding certain types of audio files as well as including nonaudio files. You can create Scan Sets including combinations of folders not within the same nested hierarchy. Scanning huge nests of folders takes a while, but you can save the results for instant access later.

And Then?

Finding and auditioning audio files is usually a means to an end. AudioFinder supports full drag-and-drop from its various browser displays, and that's often more convenient than using your DAW's or sample editor's browser. You can freely add your favorite audio-processing applications to the Tools menu, which lets you instantly open selected files in those applications. You can also copy, move, or alias files to bookmarked locations with a single mouse-click or key command.

For DSP you get the typical set of sample-editor options such as normalizing, swapping and mixing channels, trimming, cropping, phase inversion, pitch-shifting, and so on. You can apply your favorite AU plug-ins (one at a time) and bounce the results, and you can batch process all selected files. You even get a plug-in manager for creating and managing AU, VST, RTAS, and Digidesign plug-in sets.

A basic sample editor, called the Sample Tool, offers quick trimming, fading, cropping, and beat slicing. You can export slices as individual audio files or save the file, converted to AIFF, with embedded slice markers. AudioFinder can randomly shuffle the slices for you. That's especially useful with percussion loops.

AudioFinder is a great utility for file conversion and renaming. With Power Rename, you can find and replace text, add or strip text at the beginning or end of file names, and serialize the names of any selected batch of files. You can convert files to any format supported by iTunes; you can directly convert between PCM formats AIFF, WAV, and SD2; and you can encode files in MP3 or the lossless FLAC format. If you have a Mac and lots of audio files, AudioFinder is a must-have utility.

Value (1 through 5): 5
Iced Audio
www.icedaudio.com

AudioFinder's one-window GUI includes a Library panel, a dual-format browser, and an audio-file viewer and player.

SCHIRMER TRADE BOOKS

Music, Money, and Success, 5th Ed.

By Michael Cooper

EM ★★★★★ hot pick

The subtitle for *Music, Money, and Success* (Schirmer Trade Books, 2006) reads "The Insider's Guide to Making Money in the Music Business," and that's no empty promise. Written by Jeffrey Brabec and Todd Brabec, entertainment-business lawyers with credentials a mile long, *Music, Money, and Success* is filled to the gills with closely held legal advice geared at optimizing the financial rewards of songwriters, recording artists, music publishers, and producers. It is the most comprehensive and clearly written reference book I've read on the subject.

Name That Tune

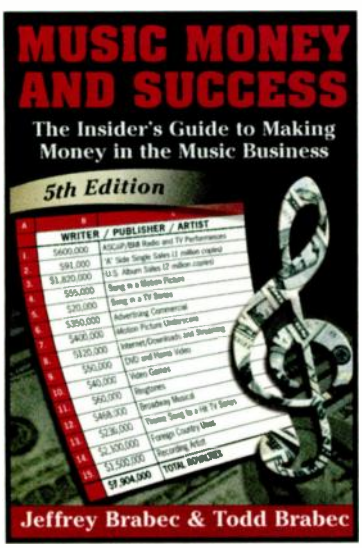
The book begins with three chapters that delve deeply into songwriting and music publishing. Topics include publishing-contract terms for individual songs and staff-writer deals; the ins and outs of copublishing, administration, and subpublishing (foreign publishing) deals; and sources of income for both songwriters and publishers (including TV, film, home video, commercials, video games, ringtones, Internet streaming and downloads, and much more). The fourth chapter explains various aspects of copyright law, including copyright registration, compulsory licenses, and works made for hire. (Compositions written for film and TV often fall into the last category.) Toward the end of the book, an entire chapter is devoted to an in-depth examination of subpublishing.

Chapter 5 is a must-read for aspiring recording artists. Beginning with the 22 most important points to be negotiated in every recording contract, this chapter tells you in plain language how to avoid getting screwed. What deductions from your royalties and what payment delays will the record company try to include in your contract? Will the label obligate you to pay for your own music videos, tour support, music equipment, and

record producer's services? Who owns the artist's masters and Web site? If you don't know this stuff, it's actually possible to lose money in a record deal.

After a very brief but authoritative chapter on the legal aspects of sampling, the next three chapters devote more than 100 pages to various contractual aspects of writing underscore, licensing songs for television shows and film, writing jingles, and licensing songs for TV commercials. If you ever get a call from a producer wanting to use one or more of your songs in a TV series, TV special, or made-for-TV movie, you'll likely need to negotiate contract terms and synchronization-license fees on the spot or lose the deal. (Synchronization fees are options for home-video and foreign theatrical uses, contract extensions, and more.) The Brabecs give you specific advice on the fees you can charge, what inducements to offer to seal the deal, and how to ensure you'll get paid the often-more-substantial performance royalties after the licensed use of your tunes takes place.

Chapter 10 guides you through choosing which Performing-Rights Organization (PRO) to join and how and when each pays performance royalties to their members and affiliates. ASCAP and BMI are given in-depth treatment. However, SESAC is barely even mentioned, arguably because of its relatively scarce presence in the United States. Chapter 11 deals with writing music for Broadway.



***Music, Money, and Success* uses plain language instead of legalese to prepare the reader for entering into contract negotiations and determining their music's monetary value for specific uses.**

Paradigm Shift

A significant portion of the fifth edition's roughly 40 additional pages covers new technologies, which are discussed in depth in Chapter 12. Those comprise contract terms and the going rates for licensing songs and their recordings for Internet use (such as on-demand streaming and downloading), cell phones (as ringtones), video games, digital jukeboxes, and Dual Disc (audio and audiovisual) recordings.

Leaving no stone unturned, the next chapter discusses the selling of music-publishing catalogs. Brief chapters follow on the roles of lawyers, managers, and agents; tips for breaking into the music business; and contact information for numerous industry organizations. But the book's focus is primarily on contract terms and the royalties and fees you can negotiate, quoted in both dollars and cents and percentages. This grounded approach is exemplified by the five sample contracts provided at the end of the book and by the numerous tables presented throughout that detail typical royalty and license payments for different uses.

Music, Money, and Success has more than 500 pages of indispensable information that songwriters, recording artists, music publishers, record producers, and all other music-business professionals can put to practical use. You absolutely need to know this information before considering or negotiating a contract or license. The softcover book's $24.95 list price is a pittance compared with the staggering wealth of expert legal advice contained therein. The 16-page table of contents and 18-page index increase the book's value as a handy reference. I cannot recommend *Music, Money, and Success* highly enough. If music is your business, make it your business to read this book. EM

Value (1 through 5): 5
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The Sleek and Powerful MOTU Studio

Run Digital Performer, MachFive 2 and your entire MOTU desktop studio on a new power-packed affordable Intel iMac, side by side with the very best names in audio recording software and hardware.

The all-new, all-in-wonderful iMac

The all-new, all-in-one Apple iMac packs a complete, high-performance computer into a beautifully thin design. Available in 20- and 24-inch widescreen models, iMac is striking to behold, with its anodized aluminum frame and glass cover. The glossy widescreen display makes Digital Performer, MachFive 2 and your other music production software tools come alive with rich color. Now iMac offers greater performance than ever thanks to faster dual-core Intel processors and a speedier frontside bus. iMac features the Intel Core 2 Duo processor at speeds up to 2.4GHz. And for maximum power, you can upgrade the 24-inch iMac to an Intel Core 2 Extreme processor at 2.8GHz. With their 64-bit processor architecture, the Intel Core 2 processors can manipulate data and execute instructions in large chunks to deliver advanced computational power to iMac. That adds up to exceptional speed and agility, improved performance you'll notice when working with large multi-track Digital Performer sessions running all of your favorite plug-ins and virtual instruments. Augmenting the advanced Core 2 processors is an equally advanced system architecture, which includes an 800MHz system bus and 4MB of shared L2 cache. With such substantial L2 cache, data instructions can be kept close to the two processor cores, greatly increasing performance and allowing the entire system to work more efficiently. Your MOTU desktop studio is now more stylish, powerful and affordable than ever.

32GB of instruments and loops

MOTU MachFive 2 is a universal sampler that includes a whopping 32GB of instrument sounds and loops to get you laying down tracks in no time. Got libraries of your own? MachFive 2 reads all major sampler library and audio file formats directly, with no time-consuming importing or conversions — even advanced Giga libraries with multi-layer "dimension" presets. MachFive 2 delivers tons of advanced features, including unlimited parts, pop-out full-screen editors, Loop Lab beat-slice editing, integrated synthesis and much more.

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.

The MOTU experts at Sweetwater can build the perfect MOTU studio for you. We'll help you select the right components, and we can even install, configure and test the entire system for you. Why shop anywhere else?

Acclaimed instruments from EastWest/Quantum Leap

An essential addition to your MOTU studio are the six new PLAY-powered Virtual Instruments just released by critically acclaimed sound developer EASTWEST/QUANTUM LEAP.

All of these Virtual Instruments include the EASTWEST PLAY advanced sample engine, with 64/32-bit support, easy to use browser, user controllable articulation window that allows users to build custom key-switches, built-in scripts, legato sensing, high quality convolution reverb (including 29 impulses), unique effects such as ADT (Automatic Double Tracking), and a high quality resampling engine.

There are too many other features unique to each product to cover here, so we urge you to go online and check out the video tutorials and audio demos.

- **SD2**
  The sequel to Stormdrum that is twice the size of the original with all new content
- **FAB FOUR**
  Virtual Instrument containing 47 instruments inspired by the sounds of the Beatles
- **VOICES OF PASSION**
  Female voice based instrument - Ethereal, Passionate, Mysterious vocals
- **MINISTRY OF ROCK**
  The ultimate production toolbox for rock producers recorded in famous EASTWEST Studio 2
- **GYPSY**
  Extremely detailed Gypsy style instruments essential for film, tv and game composers
- **QUANTUM LEAP PIANOS**
  The most detailed collection of the world's finest grand pianos

Komplete control

For DP5 users who want it all: Native Instruments KOMPLETE 5 is a first-class collection of 11 groundbreaking instruments, including the all-new KONTAKT 3 and GUITAR RIG 3 Software Edition. You also get the award-winning MASSIVE, ABSYNTH 4, BATTERY 3, FM8, REAKTOR 5, B4II, AKOUSTIK PIANO, ELEKTRIK PIANO, and PRO-53. Add KORE 2 — the Super Instrument — and you have perfect synergy with KOMPLETE 5: Use the Sound Browser in KORE 2 to access any of the 7,500 presets from KOMPLETE 5 within seconds. Open the sound and instantly tweak it analog-style using the KORE 2 hardware controller. Access and tweak your software instruments like never before. KORE 2 and KOMPLETE 5 — an infinite universe of sound at your fingertips.

Vintage EQ/Compression

The Focusrite Liquid Mix is another Focusrite first and a true one-of-a-kind. Based on the award-winning Liquid Technology, the Liquid Mix provides 32 channels of simultaneous DSP powered vintage and modern EQ and Compression plug-ins into your DP5 mix without affecting your host computer's CPU. 40 classic compressors and 20 timeless EQs are included. Each EQ and Compressor emulation is painstakingly created though a process called Dynamic Convolution which is a huge step beyond modeling. Through Dynamic Convolution, every frequency at every possible combination of settings is perfectly sampled. That means that you get the true sound and feel of a vintage or modern classic. Tens of thousands of dollars of gear is now right at your fingertips! Think how great your Digital Performer tracks will sound with the Liquid Mix.

The Sleek and Powerful MOTU Studio

Legendary grooves & drumkits

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.

Complete control

The M-Audio Axiom 25 represents an entire line of advanced Axiom MIDI controllers that are perfect for Digital Performer and your MOTU virtual instruments. Built around a rugged chassis, the Axiom 25 includes 25 semi-weighted velocity-sensitive keys with assignable aftertouch, eight MIDI trigger pads, six reassignable transport buttons and 20 non-volatile memory locations. Eight endless rotary encoder knobs let you get your hands on MachFive 2 parameters, Digital Performer's Mixing Board and more. Virtually everything is freely MIDI-assignable, and the backlit LCD screen makes programming easy and intuitive. If you need more keys and controller options, the 49-key Axiom 49 and the 61-key Axiom 61 complete the line.

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.

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.

The MOTU experts at Sweetwater can build your customized MOTU studio for you. We'll help you select the right components, and we can even install, configure and test the entire system for you. Why shop anywhere else?

New Mackie monitoring

The high-resolution Mackie HR824mk2 active studio reference monitor sounds as smooth as it looks. The new Zero Edge Baffle™ minimizes diffraction for a crystal clear image of your Digital Performer mix, and controls sound waves for wide, even dispersion. The rear-firing, mass-loaded passive radiator ensures tight, detailed bass extension, down to 35Hz. And thanks to remarkably linear frequency response, you always get accurate mix translation. Acoustic Space, LF roll-off and HF controls let you tailor the sound to suit your MOTU studio space—and your taste. With all this and more, the HR824mk2 turns your Digital Performer desktop studio's sweet spot into a full-on sweet zone.

New hands-on control for DP5

The new Mackie Control Universal Pro control surface gives you ultimate hands-on control of your Digital Performer desktop studio. Nine motorized, touch-sensitive Penny + Giles faders, eight V-Pots and more than 50 master buttons let you tweak parameters to your heart's content. Unlike generic MIDI controllers, the MCU Pro employs a sophisticated communication protocol that delivers ultra-precise control, makes setup easy - no mapping required - and enables you to see your mix in action with real-time visual feedback via the huge backlit LCD and eight LED rings. Apply the custom overlay for Digital Performer for dedicated labeling of DP-specific functions. The MCU Pro is the ultimate way to mix in DP5!

Purified power

To get the most out of your MOTU studio gear, you need the cleanest power possible. The negative effects of poorly supplied wall outlet AC power on your gear can be dramatic, without your ever knowing how good your gear can really sound with properly supplied power. Furman Sound introduces the all-new Power Factor Pro with its ground-breaking Clear Tone Technology™, which actually lowers the AC line impedance supplied by your wall outlet while storing energy for peak current demands — over 45 amps of instantaneous current reserve. Additionally, Linear Filtering Technology™ (LiFT) dramatically lowers AC line noise to unprecedented levels in the critical audio frequency band. Also included are Furman's unique Series Multi-Stage Protection Plus (SMP+) surge protection and automatic Extreme Voltage Shutdown (EVS), which protect you from damaging voltage spikes or sustained voltage overload. Equipped with the same LiFT and SMP+ features, plus EVS Extreme, the Furman Sound IT-20 II ultra-low noise balanced isolation power conditioner is designed for the most critical, ultra-low noise installations. Delivering an astonishing 80dB of common noise reduction from 20Hz-20kHz, you're assured the lowest possible noise floor for all the gear in your MOTU studio. The IT-20 II's toroid transformer design assures a contained magnetic field for complete isolation from sensitive studio components nearby. The ultimate in purified power.

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By Bill Murphy

Parallel Worlds navigates the analog oceans.

In this era of digitally manipulated sound, pure electronic music—that is, music based totally on analog synthesis—could be considered a lost art. But take one look around the module-packed studio of Greek composer Bakis Sirros, and you might feel thrown back to a time when spaghetti-like coils of multicolored patch cords were still in vogue, and tireless innovators in overheated sound labs were pushing huge banks of analog circuitry to their limits.

"I'd always wanted the real hardware," says Sirros, who acquired his first Doepfer A-100 modular synth (and founded the first online Doepfer users group—with Dieter Doepfer himself as a member) about eight years ago, "because I liked the open architecture. Whenever I was working with monosynths, I was always thinking, 'What if I had one more LFO and could modulate this?' No hardwired synthesizer could give me that capability, so it was very important for me to get the real thing, with all the knobs to touch and cables to plug in."

Sirros has been making music under the Parallel Worlds alias since 1998, and his fourth album, *Obsessive Surrealism* (DiN, 2007), owes a nod to his influences (among them Tangerine Dream, Klaus Schulze, Robert Rich, and Autechre) while standing apart for its dark, densely layered textures and subtle rhythmic complexity. The CD features titles like "Into the Caves of the Mind," "Beneath Fear," and "Mindmists," atmospheric pieces that spiral inward, featuring moods both aggressive and serene. An example of the former is in the saw-toothed stutter beats of "Distracted," while the latter is exemplified by the drawn-out strings and softly churning bass arpeggios of "Reflective." For all his reliance on modular synthesis, Sirros's setup isn't entirely analog, although even his digital quirks are decidedly old-school. He uses an early version of Ableton Live for most of his recording (having gradually moved away from a vintage Steinberg Cubase system for Atari) and still delves occasionally into Native Instruments Generator (the forerunner of Reaktor) for its ease of virtual synthesis. "I also have various MIDI-to-CV converters to control the modulars," Sirros says. "That's how I keep Live's software sequencer in sync with the analog step sequencers. Now I can record various loops in Live and then combine them."

Some of the beats on *Obsessive Surrealism* were created with a Korg Electribe R or a modified Roland TR-606, often with the individual drum voices being processed again through the Doepfer. Sirros also uses several drum modules designed by Analogue Solutions and Metalbox, which grant him the added flexibility to discover new drum patterns that can then be reprocessed even further. Whenever possible, Sirros avoids stock or preset sounds in favor of finding something truly original, particularly when it involves rhythm.

"Now that I'm working on my next album," he says, "I'm using even more modular percussion. I think modulars are better for creating analog drum patterns than melodies. But I'm not so obsessed with a pure analog sound—I'll still do my melodies with software synths sometimes. But to have all the modules in front of me, and to be able to see the signal path that I've created—that gives me a visual representation of the sound that I'm making, without an oscilloscope or anything like that. I just see the cables, and that's what's most important for me." EM

RIFFS

Bakis Sirros/Parallel Worlds

Home base: Athens, Greece

Key software: Ableton Live 4

Main synths: Doepfer A-100 modular, Analogue Systems RS Integrator series (50 modules), and two modified EMS VCS3s

Web site: www.parallel-worlds-music.com

Bakis Sirros in his studio.

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