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Electronic Musician

APRIL 2007

PERSONAL STUDIO | RECORDING | PRODUCTION | SOUND

THE DIRECT CONNECTION

6 USB MICS THAT MAKE RECORDING EASIER

QUANTIZING AUDIO DRUM TRACKS IN LOGIC PRO

FIGHTING THE MAJOR LABELS OVER TECHNOLOGY

REVIEWS

Neumann TLM 49
Korg D888
Steinberg HALion Symphonic Orchestra
and 9 more

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Jerry Harrison
From Talking Heads to Production Whiz

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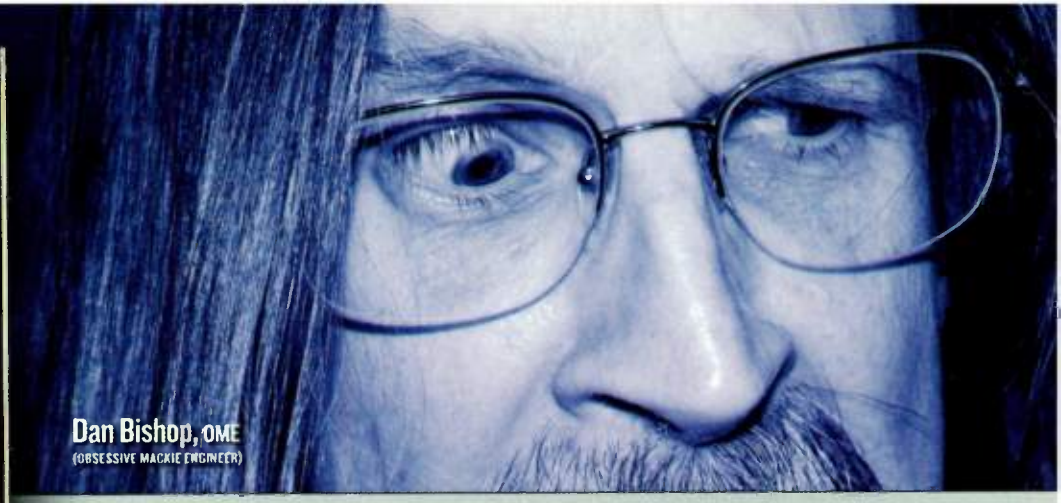

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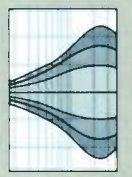

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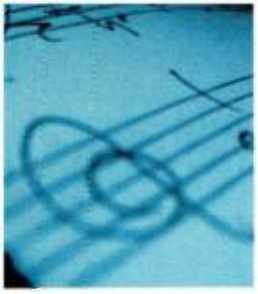

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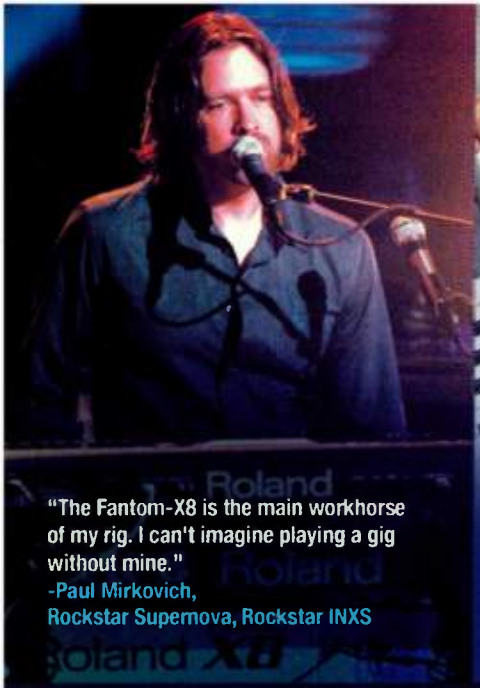

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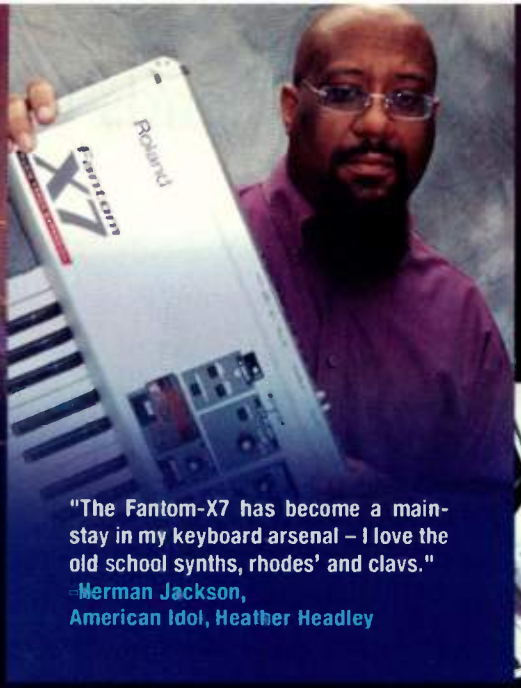

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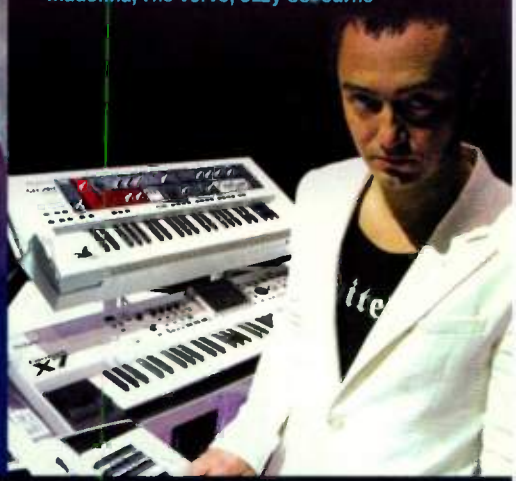

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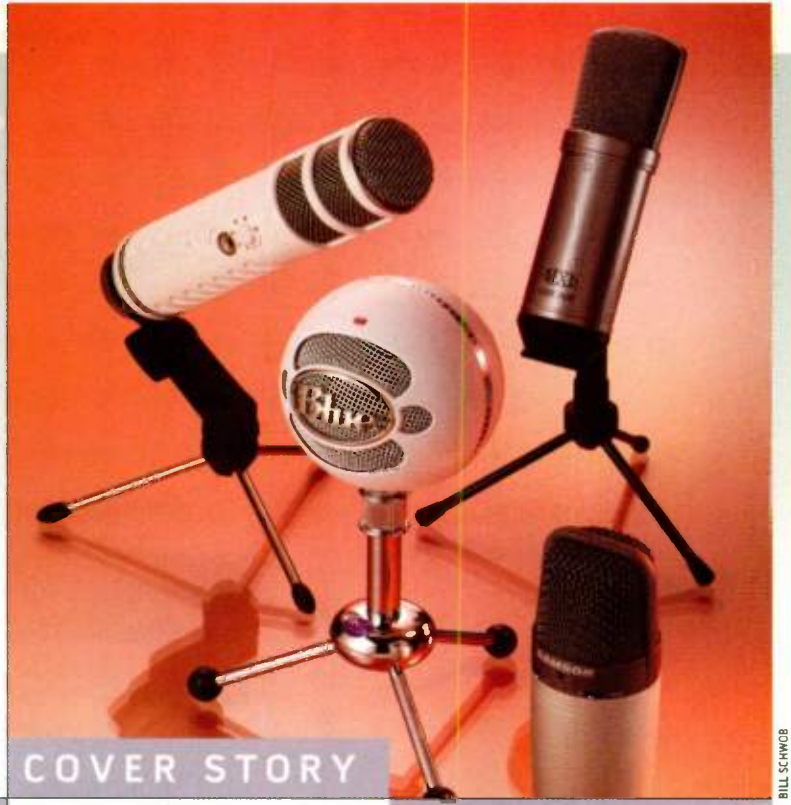

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When he was with the Talking Heads, keyboardist and guitarist Jerry Harrison was always involved in the production side of the band's recordings. These days, he's a successful producer who works mainly out of his own facility in Sausalito, California. Find out about his production philosophy, his gear choices, and his advice for personal-studio owners. By Paul Tingen

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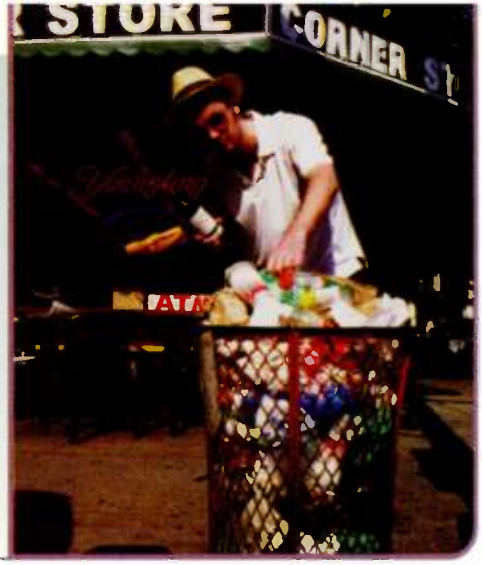

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Why Bad Things Happen to Good Plug-ins

If you purchased a plug-in only to find that it won't work with your host program of choice—even though the two support the same "standard" plug-in architecture—welcome to the very large club. One would think, for instance, that if a plug-in is in VST 2 format, it would work fine with all hosts that support VST 2, and that AU plug-ins would work with all Mac hosts that support AU.

Unfortunately, things aren't that simple. In practice, some plug-ins work with one host but not with another that supports the very same format. Incompatibility is obviously a drag for end users, and it can be an expensive problem if you have purchased a pricey plug-in bundle or a hardware processor that relies on a plug-in front end (for example, Lexicon MX series, SSL Duende, and Focusrite Liquid Mix).

One's expectations of compatibility are even higher with proprietary formats such as Digidesign TDM and RTAS, which have to work with only one host—in Digidesign's case, Pro Tools. The same is true of using plug-ins for MOTU's proprietary MAS architecture, which is exclusive to Digital Performer. Both Digi and MOTU prequalify their development partners, so the host developers (both of which also make plug-ins) need only provide support and test plug-ins (both have extensive testing programs) for a well-defined group of plug-in companies. That makes it easier for them to inform their third-party developers about updates and changes that could affect plug-in performance, but it's still a huge job. After all, there are about 900 plug-ins for Digidesign Pro Tools alone. Even so, neither company can guarantee compatibility in all cases. Digital Performer supports AU as well as MAS, so MOTU still has to deal with the uncontrolled world of AU development.

JULIE BIRUM

Indeed, the worlds of VST and AU more resemble the Wild West. Although VST is developed by Steinberg and AU by Apple, these formats are not exclusive to their developers' host programs, and there are no restrictions on plug-in developers. Commercial developers have a financial interest in ensuring compatibility to the extent that their resources permit, but those resources may be limited. Some amateur developers are vigilant about compatibility testing, but others aren't. A validation program for Audio Units provides a variety of standard tests, which is helpful in ensuring compatibility. But nothing says you must use it. As with other formats, most host developers try to help plug-in developers ensure compatibility, but there are countless VST and AU plug-ins, so much of the testing falls, as it should, on the plug-in developers. The biggest compatibility problems by far are with VST, which also is slightly different on Windows than on the Mac.

Yet despite the host and plug-in developers' major investment in support, testing, and cooperative development, we still have compatibility headaches. Why?

For starters, gray areas in specification and documentation gaps can lead to problematic implementation. For instance, some specs define how a plug-in should work but leave out details about hosting. And sometimes, as Strother Martin famously stated in the movie *Cool Hand Luke*, "What we've got here is a failure to communicate." Steinberg recently released Cubase 4, which uses the new and promising VST 3 architecture. But as of this writing, the VST 3 specification has not yet been released to third-party developers, so plug-in compatibility could be a problem for a while.

Creativity is a double-edged sword in the plug-in world. It leads to innovative products

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EDITOR IN CHIEF
Steve Oppenheimer, soppenheimer@prismb2b.com

MANAGING EDITOR
Patricia Hammond, phammond@prismb2b.com

SENIOR EDITORS
Mike Levine, mlevine@prismb2b.com
Gino Robair, grobair@prismb2b.com

ASSOCIATE EDITORS
Dennis Miller, emeditorial@prismb2b.com
Len Sasso, emeditorial@prismb2b.com
Geary Yelton, gyelton@prismb2b.com

COPY EDITOR
Marla Miyashiro, mmiyashiro@prismb2b.com

EDITORIAL ASSISTANT
Tracy Katz, tkatz@prismb2b.com

CONTRIBUTING EDITORS
Michael Cooper, Marty Cutler, Larry the O,
George Petersen, Scott Wilkinson

EDITORIAL DIRECTOR
Tom Kenny, tkenny@prismb2b.com

DIRECTOR OF AUDIENCE AND BUSINESS DEVELOPMENT
Dave Reik, dreik@prismb2b.com

DIRECTOR OF NEW MEDIA
Tami Needham, tneedham@prismb2b.com

GROUP ART DIRECTOR
Dmitry Panich, dpanich@prismb2b.com

ART DIRECTOR
Laura Williams, lwilliams@prismb2b.com

INFORMATIONAL GRAPHICS
Chuck Dahmer, chuckd@chuckdahmer.com

SENIOR VICE PRESIDENT
Peter May, pmay@prismb2b.com

EXECUTIVE ASSISTANT
Natalie Stephens, nstephens@prismb2b.com

ASSOCIATE PUBLISHER
Joe Perry, jperry@prismb2b.com

EASTERN ADVERTISING DIRECTOR
Michele Kanatous, mkanatous@mixonline.com

EAST COAST ADVERTISING MANAGER
Jeff Donnenwerth, jdonnenwerth@prismb2b.com

NORTHWEST/MIDWEST ADVERTISING MANAGER
Greg Sutton, gsutton@prismb2b.com

SOUTHWEST ADVERTISING MANAGER
Albert Margolis, amargolis@prismb2b.com

LIST RENTAL
Marie Briganti, (845) 732-7054, marie.briganti@
walterkarl.infousa.com

MARKETING DIRECTOR
Kirby Asplund, kasplund@prismb2b.com

MARKETING COORDINATOR
Clarina Raydmanov, craydmanov@prismb2b.com

SALES EVENTS COORDINATOR
Jennifer Smith, jsmith@prismb2b.com

CLASSIFIEDS/MARKETPLACE ADVERTISING DIRECTOR
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CLASSIFIEDS/SPECIALTY SALES MANAGER
Kevin Blackford, kblackford@prismb2b.com

CLASSIFIEDS PRODUCTION COORDINATOR
Jamie Coe, jcoe@prismb2b.com

GROUP PRODUCTION MANAGER
Melissa Langstaff, mlangstaff@prismb2b.com

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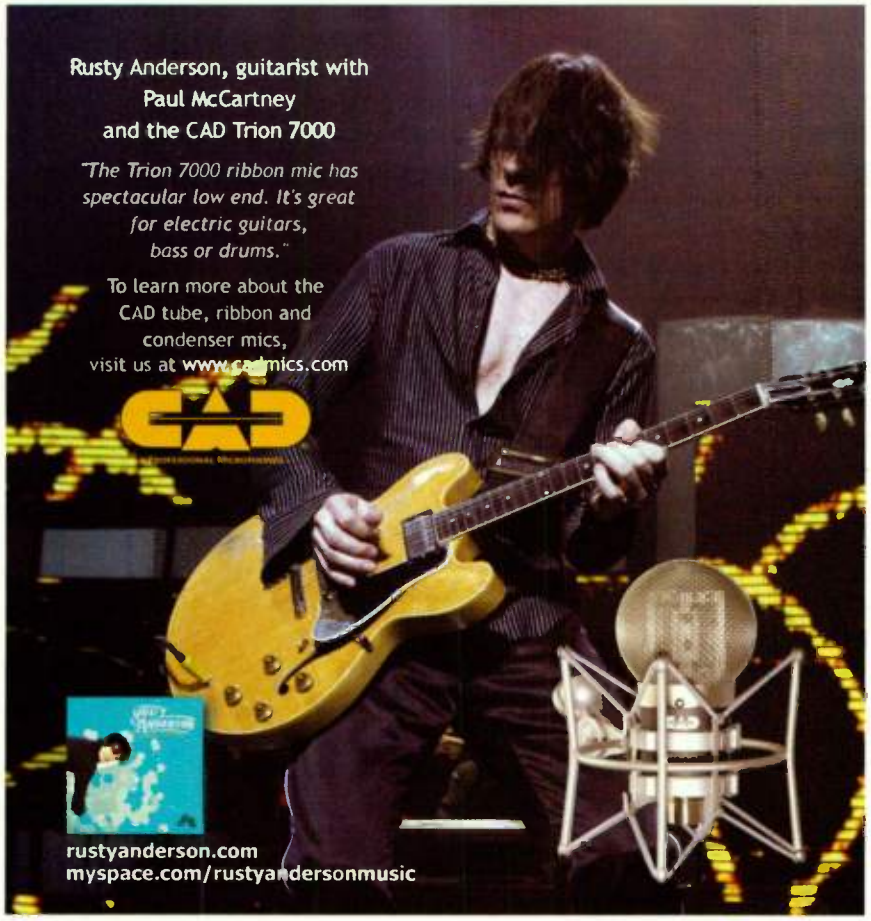

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EDITORIAL, ADVERTISING, AND BUSINESS OFFICES:
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LAURA WILLIAMS

Letters

DIY Mastering

When this February's issue of *Electronic Musician* arrived in the mail, I was quick to notice "Do-It-Yourself Mastering" in a large font on its front cover. Immediately, I felt my blood pressure rise and I thought, "Here we go again on how to master in your basement with a set of Tannoy speakers, a Mackie board, and the latest version of Steinberg WaveLab." It's not that I have anything against those products. It's just that I often read about cheap mastering services being made available or about users thinking that with the right software, a couple of VST plug-ins, and a decent pair of speakers, you're ready to master your finished project.

I read time after time with great frustration suggestions from end users that mastering is a simple process that takes little effort or money. For example, one user forum that I visit frequently recently suggested a plug-in for a well-known sequencing program that will "do it all." In fact, that same plug-in has a preset labeled Mastering, as if to say "Use it, and you're good to go"!

Michael Cooper's thorough article on mastering quickly puts all those myths to rest. As an independent musician who has released two CDs to date (both of which have enjoyed considerable radio play), my 20-plus years of sound engineering in the broadcast industry has opened my eyes to many things, including mastering. It's because of this knowledge that I chose to hire the best mastering facility that I could afford when preparing for manufacturing. It's for all the same reasons that Michael Cooper explains in his article: if you want to produce a CD properly, you replicate rather than reproduce.

Tony G
via email

I am a music composer and producer and have been an avid reader of EM for the past few years. Along with EM, I have been reading and researching numerous resources on recording, mixing, mastering, and anything in reference to digital audio. I recently started mastering my own tracks to cut down on the high cost of professional mastering.

On the cover of the February 2007 issue of EM, the highlighted feature is titled "Do-It-Yourself Mastering." At first glance I was thrilled, because I definitely need assistance with mastering. But after reading the article, I felt that it was poorly written and didn't cover important topics that one needs to know about to improve mastering techniques. The article basically informed readers on what to do *before* mastering a track. It's common knowledge that one would need good monitors, a tuned studio, reference speakers, and plug-ins. I was expecting techniques, tips, and tricks that would further my mastering skills. I'm positive that many readers felt the same way.

Although I was disappointed with the February issue, EM has been a big help over the years. With the extensive databases and product reviews in the print magazine and on the Web site (www.emusician.com), no one can match the knowledge that you provide.

Paul M. Sikora
Middletown, New Jersey

On VCOs

Regarding the write-up for the Cyndustries Zeroscillator in the "2007 Editors' Choice Awards" (see the January 2007 issue of EM): an article in a 1981 issue of *Electronotes* discusses building a through-zero VCO. So although it appears that Cynthia Webster of Cyndustries was the first person to manufacture and sell a through-zero VCO, the idea, in fact, dates back to the 1970s.

It's sad that FM synthesis wasn't very popular until the Yamaha DX7 came out. It seems to me that modular synths are ideal for FM experimentation. The Metasonix VCO is deliberately designed for high control-voltage sensitivity that allows a person to frequency modulate its input. But there is still nothing like the Cyndustries VCO. Now if only the users would try something unusual . . .

Eric Barbour
Metasonix
via email

Eric—FM synthesis wasn't popular before the DX7 for good reasons. FM, especially as implemented in modular synths, was unintuitive compared with subtractive analog, and few people could use it skillfully. Yamaha did a great job of developing FM into the commercial DX-series products, providing a practical user interface, a nice selection of factory-preset sounds, onboard patch storage, good industrial

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design, and MIDI support, which wasn't a given at that time. Even so, programming the DX7 was daunting, so most DX7 owners relied on factory sounds and commercial libraries. The bottom line is that FM became popular because Yamaha figured out how to properly package it. —Steve O

E-text

Thank you for putting your articles online. I'm blind, and accessing printed text can therefore be a big challenge, but my computer's speech software reads your Web pages perfectly.

Many thanks, and keep up the awesome work!

Monty Anderson
Honolulu, Hawaii

Monty—Thanks for your comments. I'm glad the archives are useful. Incidentally, the May 2007 issue of EM will have a feature on studio problem solving for sight-, hearing-, and mobility-impaired musicians. I hope you find it useful as well! —Steve O

Error Log

October 2006, "Software Eighty-Eights," p. 59. In the "Essential Statistics" sidebar under the Samples: Release column, the Art Vista Virtual Grand Piano should have been listed as "yes."

February 2007, "Do-It-Yourself Mastering," p. 59. The article incorrectly states that "PreMaster CD forces you to set the same gap between every song." PreMaster CD does indeed allow the gaps between songs to be set to different lengths; users can set spacing presets to 0, 1, 2, or 3 seconds, as well as edit or set track spacing.

February 2007, "Old-School Contemporary," p. 62. In the first paragraph of the section entitled "Firm Believer," the last sentence misidentified a few musical artists. The corrected version of that sentence is as follows: "Bushby has engineered for Norton many times, working with Dashboard Confessional, Feeder, Gomez, Natalie Imbruglia, Kylie Minogue, Morningwood, My Bloody Valentine, New Order, and Placebo." EM

We Welcome Your Feedback

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FIRST TAKE

Continued from page 10

but can cause compatibility problems, even when everyone honors the specification. For example, if a plug-in has its own transport controls or clocking system, it may need the host to handle timing and tempo information in a certain way, and some hosts might not accommodate that. Hence, the plug-in may load and pass audio yet fail to operate properly. Host developers also add innovative features, and if a plug-in is written to take advantage of such a feature in one host, it might not work in other hosts. Normally, these problems are worked out cooperatively by the developers, but some solutions involve code changes that can cause bigger problems, so a fix may be impossible or too expensive to justify. The result can be incompatibility.

The Mac, in particular, has undergone an assortment of platform and OS changes, some of which throw a monkey wrench into the works. The shift to Intel Macs broke a lot of things, not just because the software had to be compiled for a different processor, but because, for example, the way that AU plug-ins interact with hosts changed, which affected some plug-ins more than others. The move to Windows Vista will probably require adjustments as well. Furthermore, some copy-protection schemes interact with the plug-in and the host, as well as with the operating system; changes in one can cause compatibility problems in the others. Developers try hard to adjust quickly, but most are small companies with limited resources.

Making things more complicated, some users rely on a wrapper to run plug-ins in apps that don't normally support the format. If you use the FXpansion VST Wrapper with Pro Tools, for instance, it should work with many plug-ins; there are no guarantees, though. Less obvious is the fact that some plug-in developers rely on a wrapper to create AU plug-ins from VSTs. That usually works, but it's imperfect and can lead to compatibility problems.

And we will always have human error. Whether there are errors in the spec, errors in its implementation, or bugs in the code, compatibility problems can result—extensive beta testing notwithstanding.

Most of the developers I discussed these issues with agreed that we all would be a whole lot better served if we had one universal plug-in architecture that is cross-platform, robust and full featured, written in an industry-standard language (such as C++), and well documented with respect to both plug-ins and hosts. I suspect this could happen only if the standard were regulated by an independent organization, somewhat like the Audio Engineering Society and MIDI Manufacturers Association. That wouldn't eliminate all problems, but it would be a big step in the right direction.

Of course, it would not be easy to get companies like Steinberg, Digidesign, and Apple to buy into this, because they have vested interests in their own architectures. But I suspect that many plug-in developers would support such a move, as would almost all electronic musicians.

Steve Oppenheimer
Editor in Chief

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EMspotlight

Tony Visconti: Audio Visionary

Tony Visconti has worked with just about every legend, singer-songwriter, and scoundrel in rock. Although he is best known for his work with David Bowie and T. Rex, his productions have made a lasting imprint on every decade since the '60s. In this interview from the EM archives, Visconti talks about the approach he uses with artists and the benefits of working at home. By Michael Molenda.
emusician.com/em_spotlight

GET ON THE BUS!

The Bus is the exciting new blog by the EM editors that includes tips and tricks on a variety of recording topics, covers the latest technologies and industry trends, and offers a behind-the-scenes look at trade shows, product demos, and the creation of *Electronic Musician* magazine.
blog.emusician.com/the_bus

PODCASTS

"EM Cast," *Electronic Musician*'s new monthly Podcast, gives you the latest on new products, features original interviews with producers, engineers, and musicians, and much more.

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

SHOW REPORT

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

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Looking for a particular article from the past? EM back issues since September 1999 are available online.
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- Firewire Bus or adapter power

iO|14 FireWire

ALESIS

www.alesis.com/io26

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By Geary Yelton

Mojave Audio MA-100

A new microphone from Mojave Audio (www.mojaveaudio.com) made its debut at the recent NAMM show. The MA-100 ($995) is a tube condenser mic with a 0.8-inch-diameter diaphragm and interchangeable cardioid and omnidirectional capsules. Designed by David Royer, the MA-100's cathode-follower circuitry gives it lots of headroom for high-SPL applications such as miking drums and guitar amps. It's also suitable for applications that typically call for small-diaphragm tube condensers, such as recording cymbals, acoustic guitar, and piano. Mojave recommends using pairs of MA-100s for stereo recording.

Like the MA-200 introduced in 2005, the MA-100 contains a Jensen audio transformer and a military-grade JAN 5840 vacuum tube. It comes with a padded flight case, a shockmount, and an external power supply that's switchable between 110–120 and 220–240 VAC.

Edirol M-16DX

If you've been waiting for the cost of digital mixers to drop, check out the M-16DX ($799) from Edirol (www.edirol.com). The M-16DX is a 16-channel modular mixer that functions as a 24-bit, 96 kHz audio interface and connects to your computer via USB 2.0. It's the only mixer in its price class that can analyze and compensate for your studio's acoustics, thanks to a feature called Room Acoustic Control. The mixer's backlit 122 × 32–pixel LCD can graphically show each channel's EQ curve and a spectrum analysis of your entire mix. Onboard DSP furnishes COSM insert effects, reverb and echo, and finalizing effects such as multiband compression.

The M-16DX comprises two units: a Mix Controller and an I/O Module. The Mix Controller has four mono and four stereo channel strips, each with dedicated knobs for level, pan, and three bands of EQ; buttons for select, mute, and solo; and another knob for aux 1, aux 2, and effects. Two additional stereo channels have no EQ or pan controls. The I/O Module has four XLR inputs with phantom-powered mic preamps, two channels with switchable high-impedance inputs, optical and coaxial S/PDIF I/O, and more. Additional features include 16-band graphic EQ and scene memory for recalling mixer settings.

Yamaha MM6

Because the MM6 synthesizer ($699) derives its sounds from the Motif series, Yamaha (www.yamaha.com) calls it the Mini Mo. With a 61-note keyboard, quick-edit controls, and more than 200 arpeggiator types, the MM6 is well suited to live performance. The instrument's Performance Memory stores Voice combinations, backing patterns, and other settings needed for live work, and recalls them at the press of a button. An onboard collection of sequencer patterns encompasses contemporary styles from rock and electronica to rap and hip-hop.

The MM6 is 32-voice polyphonic and 16-part multitimbral. Alongside 128 General MIDI presets, it has 418 user presets and 22 drum kits. Effects types include 25 reverbs, 30 choruses, and 189 DSP effects such as echo, distortion, compression, and amp simulation.

The internal sequencer has eight tracks for real-time recording and another track for patterns, with 96 ppqn resolution. You can store sequences, patterns, and performances on USB flash drives for transferring to anything that can read Standard MIDI Files. The USB-to-Host port gives you a direct connection to your computer's sequencing software. The MM6 comes with a copy of Steinberg Cubase LE (Mac/Win).

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M-Audio is synonymous with the mobile recording and production revolution. Now M-Audio IE professional reference earphones with Ultimate Ears technology give you high-definition monitoring on the go without lugging bulky, delicate headphones. They're the perfect companions for any mobile studio–like a Pro Tools M-Powered laptop with the FireWire 410 or other M-Audio interface. They're also ideal for field recording with compact units like the popular M-Audio MicroTrack 24/96. On stage, you can say goodbye to cumbersome monitors and feedback. Available in three application-specific designs, the M-Audio IE series delivers the same stage-proven technology used by major touring acts at a price everyone can afford.

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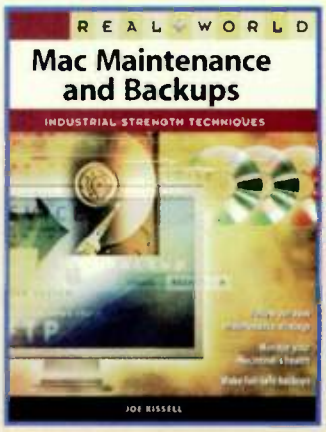
Get Smart

Spaces Speak, Are You Listening? ($39.95) presents a comprehensive perspective on the influence that environment has on any listening experience, whether you're attending a concert and sitting in the balcony, watching a film in your home theater, or visiting a Gothic cathedral. Subtitled *Experiencing Aural Architecture*, the 437-page hardbound book emphasizes the importance of physical space's audible attributes and offers advice on setting up rooms for listening. Authors Barry Blesser and Linda-Ruth Salter describe how space affects mood by integrating disciplines ranging from music and audio engineering to sociology, anthropology, and cognitive psychology. They explain how the concepts and language of aural architecture can help you develop a better understanding of how space enhances well-being. *Spaces Speak, Are You Listening?* is published by **MIT Press** (http://mitpress.mit.edu).

Two new books in the Skill Pack series from **Thomson Course Technology PTR** (www.courseptr.com) promise to ramp up your Digidesign Pro Tools proficiency. *Editing Audio in Pro Tools* ($29.99), by Michael White, aims to give you a thorough understanding of Pro Tools' editing capabilities by explicating all the resources at your disposal. The author guides you from the initial session setup to working with Spot, Slip, Grid, and Shuffle modes. He explains the edit tools and tells you how to navigate regions and edits. In later chapters, he covers region and track grouping, looping regions, and finding tempo and timing solutions using Beat Detective.

EM author Brian Smithers tackles the various situations you'll encounter while mixing in the studio in his new book, *Mixing in Pro Tools* ($29.95). After discussing signal processing in detail, he takes you from a rough mix to advanced signal flow and explains automation, doubling parts, and stems and submixes. He touches on sidechain processing and related topics, and then offers suggestions for working with external effects and managing resources. Both Skill Pack books take a practical, hands-on approach to getting the most from any version of Digidesign's multitrack recording software. Each includes a CD-ROM containing source files for working with the techniques presented in the text.



Just about everyone who works with computers knows the horror of catastrophic data loss that can result from a crashed hard disk. The key to preventing such a scenario is the subject of *Mac Maintenance and Backups* ($29.99), published by **Peachpit Press** (www.peachpit.com). Over the course of 228 pages, author Joe Kissell lays out a series of tasks to perform daily, weekly, monthly, and yearly. He tells Mac users how to recognize and solve problems before they become disastrous, and he gives instructions on how to recover from a crash. If you own a Mac, this book can save you a lot of time and trouble.

In *Windows Vista: The Missing Manual* ($34.99), from **O'Reilly Media** (www.missingmanuals.com), David Pogue eases your transition to any version of Microsoft's new operating system. He introduces you to updated features and provides clear instructions on performing necessary tasks such as keeping your computer secure and building a network. From the Welcome Center to the Registry, Pogue offers helpful tips on everything from configuring your audio hardware and managing Media Center to making the most of speech recognition and remote control, all in a casual style that's easy to comprehend. If you're considering making the move to Windows Vista, this book can help you recognize and resolve potential problems before they occur.

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Line 6 GearBox Plug-in

Line 6 (www.line6.com), maker of Variax guitars and basses and the POD family of outboard guitar processors, manufactures a suite of plug-ins that supplies virtually every modeling algorithm the company has ever developed for vocals, guitar, bass, and other instruments. Called GearBox Plug-in, the bundle comes in two varieties—Silver ($419.99) and Gold ($699.99)—and supports AU in Mac OS X, VST in Windows, and RTAS on either platform. Both versions include the TonePort D.I. USB direct box, which allows you to monitor your processed source with very low latency, regardless of your computer software's buffer size.

The Silver bundle features models of 18 guitar amps and 24 speaker cabinets from the POD XT, 5 bass amps from the Bass POD XT, 6 mic preamps, and 30 studio and stompbox effects. The Gold bundle ups the ante with models of 78 guitar amps and 24 cabinets from the POD XT and Vetta II, 28 bass amps and 22 bass cabinets from the Bass POD XT, 6 mic preamps, and no less than 80 effects. A large collection of professionally programmed presets is included, and you can transfer your own presets to the POD XT Live and other Line 6 products. If you already own a POD XT, TonePort, or GuitarPort, you can download GearBox Plug-in only for $199.95 and run all the models in your device in a native plug-in format.

Download of the Month

SONALKSIS FREEG (MAC/WIN)

FreeG (free) is a channel strip plug-in with extensive metering and customization options. It is intended for use as a track insert effect and is available in AU, VST, and RTAS formats for the Mac and VST and RTAS formats for Windows. FreeG won't make your next song a hit, but it can save you lots of time when you're mixing it. You can download FreeG from the Sonalksis Web site (www.sonalksis.com).

FreeG is a straightforward channel strip with a large level meter and gain fader on the left and a variety of handy controls and readouts on the right. You can place the meter pre- or post-fader, and you can adjust meter ballistics on FreeG's back panel. The gain fader has normal and fine modes, and you can also set the range of the fine mode on the back panel. Pan and pre-fader trim knobs, along with bypass, phase-inversion, and mute buttons, round out the active controls. Digital readouts display the highest peak and instantaneous RMS values, which are also indicated by red and yellow arrows on the meter. Clicking on the digital readouts resets them. FreeG is useful on any track, but its metering and large-scale slider make it especially handy on the master.

While you're visiting the Sonalksis Web site, have a look at the first two offerings in the new TBK series of creative plug-ins ($99 each or $149 bundled). Both effects are centered around a big, shiny knob (hence the *BK* in *TBK*) that does most of the work. A small input-level meter/slider combination and three even smaller mode switches round out the interface. Dubbed Creative Filter, TBK1 is billed as the world's first adaptive-resonance filter. It uses psychoacoustic modeling to constantly adapt resonance to frequency and saturation level. TBK1 provides highpass, bandpass, and lowpass filters with 12, 24, and 48 dB slopes and four resonance modes: Low, Medium, High, and Rude. The knob controls frequency, and a handy button toggles the calibration between frequency and pitch.

Digital Grimebox (TBK2) is a degradation plug-in capable of bit crushing, downsampling, and clipping distortion. A lowpass filter is available to tone down the grunge. When downsampling, the knob sets the downsampling ratio, whereas in bit crusher mode it controls the bit depth. In either mode, you can restrict the knob to integer steps. Both TBK effects sound great and live up to their 1-knob-job design for ease of use (see **Web Clip 1**). Slap one or both of them on any track, twiddle or automate the knobs, and keep one hand on the FreeG gain fader just in case.

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—Len Sasso

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FRANK FILIPETTI

Five-time GRAMMY® Award-winning engineer/producer whose credits include projects with:

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Luther Vandross
Mariah Carey
Ray Charles
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"When working in a recording environment, I've found it critical to 1. create an atmosphere that people find comfortable and 2. make sure the listening environment, especially your speakers, are as good as you can get - so you don't second-guess what you're hearing. When I first used the LSR6300s, I just loved what I was hearing and I've been using them ever since. They're smooth across the entire spectrum. I don't hear the speaker - just the music. Working in a range of rooms in LA, London, and here in Manhattan, the ability to tune the LSRs to the room is extremely useful. I'm really stoked about the new LSR4300 series especially the 6-inch model. The 4300s, with automated Room Mode Correction, go one step further. I put the supplied calibration mic in the center of the room, push a button and the speaker does all the work. It not only does it, it does it well and it does it right! The technology's amazing - I'm blown away by it. I take my LSRs wherever I go."

Hear why award-winning engineer, producer, Frank Filipetti is blown away by the LSR series studio monitors. Visit JBLPRO.com/LSR

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The use of the artists' names above is a factual statement and does not constitute an endorsement or representation of JBL Professional or any of its products.

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M-Audio NRV10

M-Audio (www.m-audio.com) has introduced the NRV10 ($899.95), an 8 × 2 analog mixer that works with your computer as a 10 × 10 FireWire audio interface. Built-in DSP effects provide 16 programs that include reverb, echo, chorus, flange, and delay. The included NRV10 interFX software (Mac/Win) adds a compressor, expander/gate, and two VST effects slots to each channel, so you can use computer-based third-party effects onstage. You can route and record mixer channels directly to individual sequencer tracks, monitoring through plug-in effects, and return audio channels from your computer for direct mixing and monitoring with no latency.

The NRV10 supports 24-bit sampling rates as high as 96 kHz using Pro Tools M-Powered and other audio software. Five XLR mic inputs feature phantom-powered Octane preamps. Each of the mixer's four mono channels and two stereo channels has independent volume faders, buttons to switch between FireWire and audio input, and knobs for pan, DSP effects, aux and monitor send, and three bands of EQ. The headphones section facilitates DJ-style cueing, as well as sending the main or monitor mix to a performer. You also get independent level faders for the mix, control room, and headphone outputs. The NRV10 lets you move seamlessly between composing, recording, practicing, editing, and performing without ever having to reroute connections.

Korg mini-KP Kaoss Pad

Eight years after launching the first Kaoss Pad, Korg (www.korg.com) has introduced the mini-KP ($250), a model that makes the Kaoss concept even more portable and affordable. At its heart is an *x-y* touch pad that lets you control several parameters simultaneously by tapping and rubbing its surface with your fingertips. The mini-KP is smaller than previous models—small enough to fit in your shirt pocket—and it can be powered by four AA batteries, enhancing its usability for mobile audio production and performance applications.

The mini-KP comes with 100 presets drawn from the KP3's effects collection. Some are traditional, such as reverbs, filters, and EQ, and others are Korg innovations with names like Digi Talk, Radio Isolator, and Mid Grain Shifter. The mini-KP's built-in sound engine can even generate timbres inspired by the Radias synthesizer. Effects can sync to tempo, and a Tap/BPM button lets you detect an input source's tempo or manually tap the beat. You can lock in the effects settings at any point, and let the effects decay gradually when you lift your finger from the pad. The mini-KP has RCA line inputs, RCA line outputs, and a minijack for headphones.

Audio Ease Altiverb 6

Audio Ease (www.audioease.com) is shipping a significant upgrade to its pioneering convolution reverb plug-in. Now called Altiverb 6 Regular (Mac/Win, $595), the native version has an enhanced user interface, a browser for impulse responses (replacing the pop-up menu), a wider set of adjustable parameters, and 40 automation presets for total recall of all parameters. Altiverb 6 Regular supports stereo sampling rates up to 96 kHz in AU, Audio Suite, MAS, RTAS, and VST hosts on the Mac and in RTAS and VST hosts in Windows. Upgrading from any version of Altiverb 5 to Altiverb 6 Regular is free.

Altiverb 6 XL (Mac, $995) introduces additional features and makes Altiverb available for Mac users with Pro Tools|HD Accel hardware. Along with the Regular version's improvements, the XL version adds TDM support for Accel chips, channel configurations up to 5.1 surround, zero TDM latency at rates as high as 48 kHz, and a maximum 384 kHz sampling rate for native plug-in formats. Upgrades for current HTDM owners range from $100 to $129 (depending on the purchase date), and an upgrade from native Altiverb 5 to Altiverb 6 XL costs $400. Support for non-Accel HD chips is in development. EM

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Air-Guitar Hero

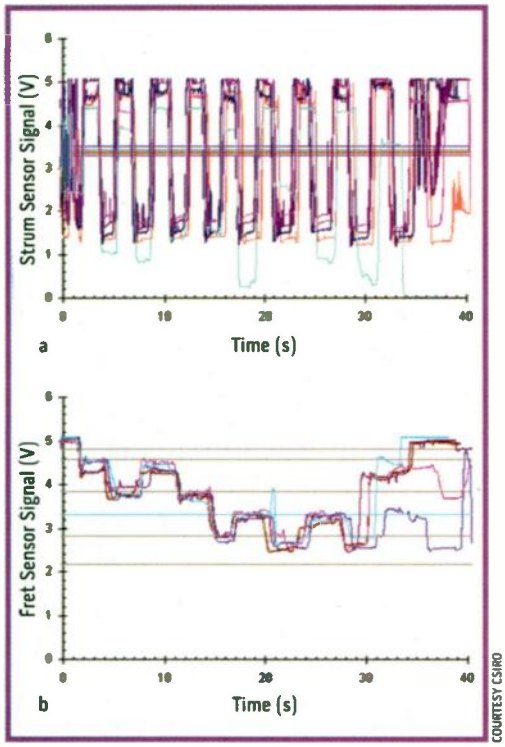
By Scott Wilkinson

Textile-based sensors bring the air guitar to life.

Who among us hasn't played air guitar? Even accomplished guitarists have flailed their arms at some point in their lives, perhaps before they learned to play the real thing, striving to feel cool as they listened to Hendrix, Clapton, or Slash.

Now, thanks to research being conducted at Australia's Commonwealth Scientific and Industrial Research Organisation (www.csiro.au), air guitarists could soon do more than just feel cool—they could actually make music without strapping on an instrument. Dr. Richard Helmer, a research engineer at CSIRO, is developing what he calls a Wearable Instrument Shirt (WIS) with motion sensors embedded in the elbows of a long-sleeved T-shirt.

The textile-based sensors, which were designed at CSIRO to change their electrical resistance in response to being stretched or otherwise deformed, are connected to a small wireless unit with conductive threads sewn into the shirt. The unit monitors the sensors' resistance and converts that information into a digital signal that is transmitted wirelessly, via radio-frequency signals, to a receiver that is connected to a computer's USB port.



COURTESY CSIRO

FIG. 1: These plots of the strum (a) and fret (b) sensor signals over five repeat performances (represented by different colors) indicate that the sensors can be used to play a song reliably while allowing some wiggle room in the precise placement of the arms.

The computer runs custom software to analyze the data and reconstruct the elbow positions that generated them. This information is then used to trigger samples stored in the computer. The position of the left elbow selects the sample to play, while the right elbow activates the sound. The system can even distinguish between up and down strumming in the right elbow.

You might think that two bend sensors at the elbows offer little in the way of fine control, and you'd be right. But the software can compensate for that limitation by mapping the sensor data to larger song structures based on the idea that pop songs are usually constructed from relatively few sections and chords. For example, most pop songs consist of a verse, chorus, and bridge and four or five chords. These elements can be triggered in Simple mode (in which a few positions correspond to loop-based sections of a song) or in Fine mode (with more positions assigned to separate chords). In future incarnations, I can imagine smaller bend sensors in each finger of a pair of gloves that would allow individual notes to be played.

Helmer designed the system so that different arm positions can reliably trigger the associated song elements without requiring absolute precision. In other words, each gesture can fall within a range of positions and still trigger the same element. For instance, in one trial, he repeated a performance five times and plotted the sensor data (see Fig. 1), which clearly demonstrated that the gestures can be used to reliably play a song, even though they were in slightly different positions each time.

Guitar isn't the only instrument that can be played with the WIS; Helmer has also demonstrated a tambourine, drums, and more. Another possibility is sending MIDI messages in response to different gestures. In those cases, the left and right elbow gestures are interpreted differently by the software than they are for the guitar. In addition, the instrument and song definitions are independent, allowing them to be mixed in different combinations. You can even create new compositions using samples from an existing song.

One of the beauties of the WIS is that it can provide a satisfying musical experience for players and nonplayers alike. It takes virtually no musical training to play a song in the system's Simple mode, while trained musicians can take advantage of Fine mode to realize more-sophisticated musical structures. As a result, the WIS could open a whole new avenue of expression for electronic musicians as well as for their friends and families. EM

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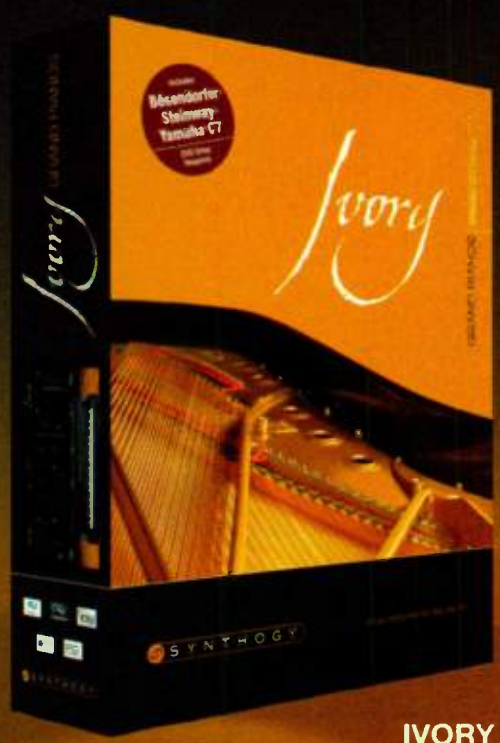

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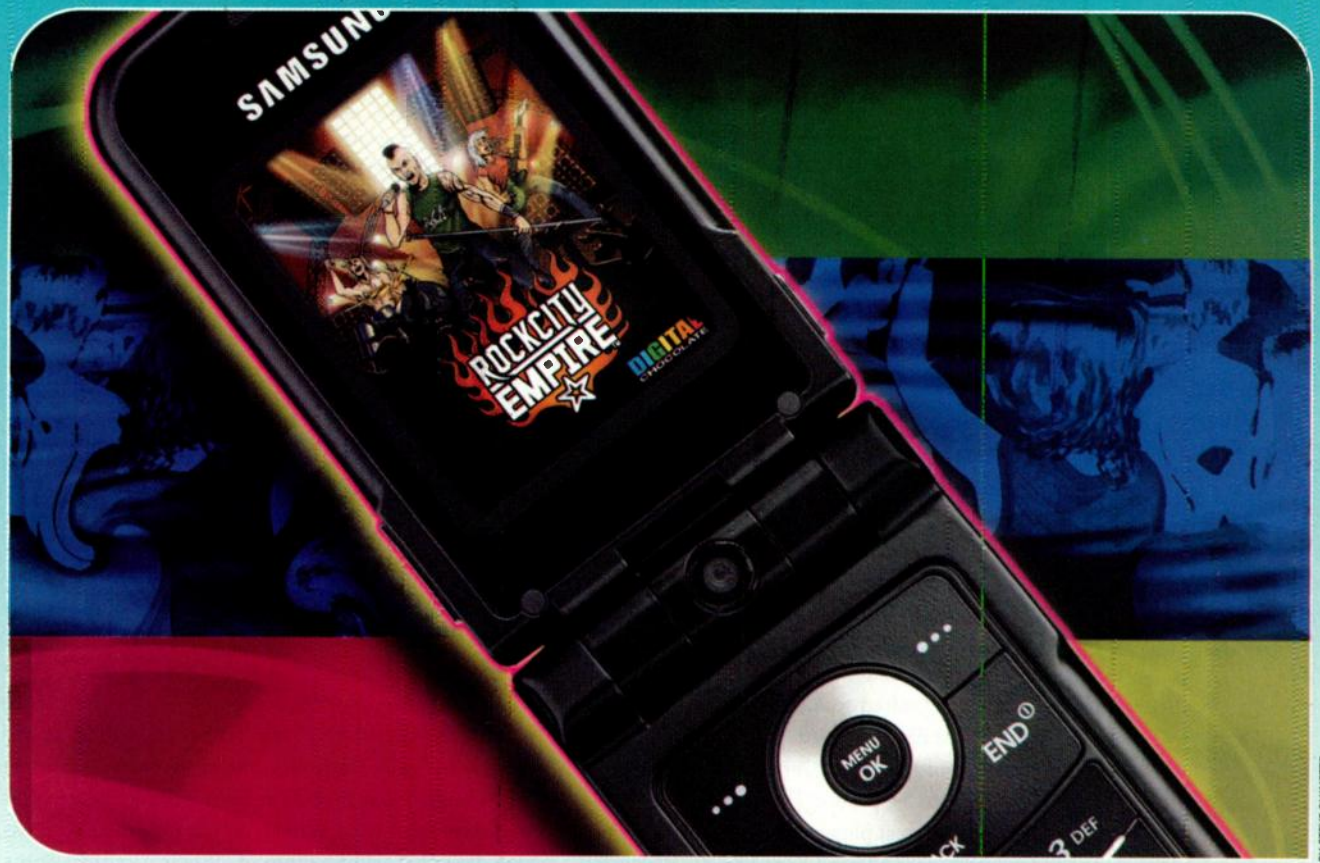

BY STEVE OUIMETTE

Phone Tag

By Steve Ouimette

Creating soundtracks for mobile games.

Writing music for cell-phone games is a specialized skill. Though it may seem simple on the surface, the process is more complex than just dropping an MP3 or MIDI file in an email to a client and getting paid. In its most basic form, it requires the composer to navigate through a dizzying array of formats, work with reduced file sizes and polyphony counts, and make the best possible sound come through an unforgiving mobile-phone speaker.

In this article, I'll provide strategies to create bulletproof mobile soundtracks. To illustrate the process, I'll walk through a recent project and describe some of the techniques and tools I used. Though more-advanced mobile audio technologies are available, my focus will be the common protocol for U.S.-based games: playback of a single file using a limited General MIDI sound set. Mastering the basics will ensure a smooth transition to working with more-advanced engines.

Before starting the composition process, it is crucial to fully understand the scope of the project and its requirements. What style will the music be? What formats does the client require? What are the maximum file sizes? What is the polyphony count for each format? My particular project called for a 30-second looping theme no larger than 4K, delivered in four different formats: 4- and 16-voice GM, 16-voice Yamaha SMAF, and monophonic Nokia OTT. I'll describe these format types and the conversion process later; for now I'll focus on the composition.

The Project

Award-winning mobile game developer and publisher Digital Chocolate needed a soundtrack for an upcoming game. The music and the theme of the game were dark and moody. In the

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game, the user would play the role of a club manager, hiring dancers and staff while keeping the local law enforcement in check. There were six main dancers that needed their own theme song while they danced onstage.

The user had the challenge of figuring out which dancer would match up with the patrons that were in the club at the time. The better the match, the more money they would earn. With this earning of cash came more respect from the manager's bosses, and with the earning of respect, new items and staff were available for the club. In addition to these six tracks, the developer also required a title theme. The process of composing the theme is the basis of this article.

FIG. 2: In this screen shot from Unwiredtec's Ringtone Creator, all the checked formats are note based and the unchecked are PCM.

Preparation

Because the largest and most complex version was the 16-voice GM theme, I chose to start with that and work down to the mono version later. The platform was a mobile phone with limited sound-playback capabilities, not an Xbox 360 or PS3, so I used only a basic sequencer and limited the sound palette to General MIDI. (Although it's tempting to load up your DAW or digital audio sequencer with the latest plug-ins and effects, that's not a good idea in this case.) I used Yamaha's XG Works 3.0 and set the playback source to my sound card's software GM sound set (see the sidebar "Manufacturer Contacts" for the URLs of the companies mentioned here). This allowed me to hear a representation similar to the final playback medium while I worked.

To streamline work, I used a template that included the necessary header information and track setup for the mobile formats. Track 1 was used as the master track and included two SysEx messages: GM System On and GM Master Volume, set to 127. Because some phones can be finicky, I always reserve the first five ticks to store patch, volume, and pan information on sequential steps (see **Fig. 1**). On more than one occasion, I have corrected sequences that did not play properly because all the setup data was stacked up on tick 0.

After going over the creative brief, I began work on the main theme. Keeping a careful eye on the polyphony count, I started by composing a monophonic melody to a click track and finished by filling out the arrangement with the remaining voices. I allocated the backing-track voices to synth bass, two distortion guitars, and a small drum set. In the end, I used all the available voices and had a fairly full-sounding arrangement of the theme.

A Clean File

To ensure proper playback on most mobile audio sequencers, MIDI controller messages must be kept to a minimum. Most mobile sequencers recognize only Pitch Bend and Mod Wheel, so it's pointless to have extra data that will be ignored. This is a critical point because in some cases, the extra data can result in playback errors on certain phones. I used an input filter so the sequencer ignored that data to begin with, which saved an extra step down the line. However, having recently bought a new controller keyboard, I realized that I had inadvertently recorded Aftertouch messages on all the tracks, so that data was removed after the fact in the event editor.

Before moving to the next stage, I double-checked the total polyphony count to make sure there were never more than 16 simultaneous voices. Because XG Works does not include a polyphony-count meter, I counted the notes manually, track by track. Right away I spotted overlapping notes in the melody track (which would count for two voices) and a few doubled notes on the drum track. It was much easier to see the doubled notes when I viewed the drum track in the event-list view.

Because the GM spec doesn't include start and end points, I used a simple technique to create a seamless loop of the music. Most phones handle looping by using the first Note On as the start point and the last Note Off as the end point of the sequence. To ensure a smooth loop, I extended the length of the last snare hit to reach the end of the last bar. That created a perfectly timed Note Off and end point for the sequence. Another trick to create an end point is to insert a note at the desired

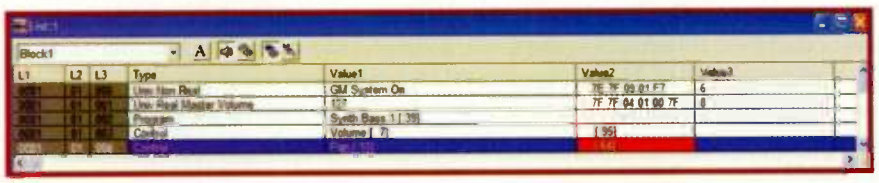

FIG. 1: This figure shows a common setup for configuring GM playback on a mobile phone. The sequencer being used is Yamaha's XG Works 3.0.

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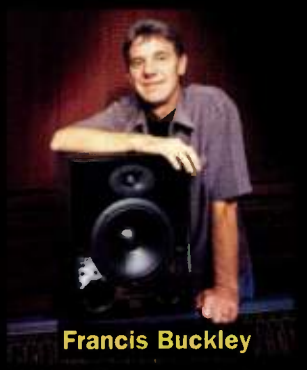
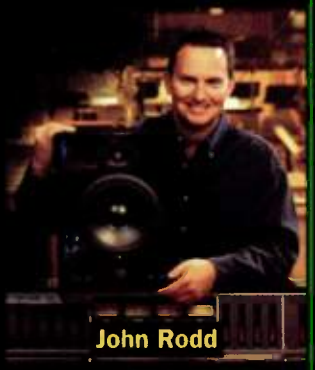
"We Switched"

Grandmaster Flash
Producer / DJ / Recording Artist

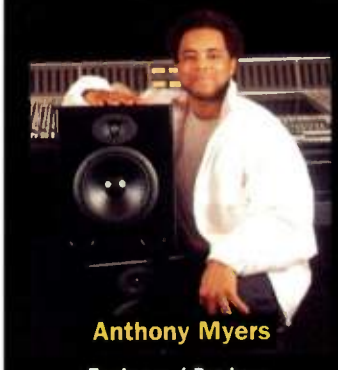


Francis Buckley
Multi-Platinum Grammy-Winning
Engineer / Producer



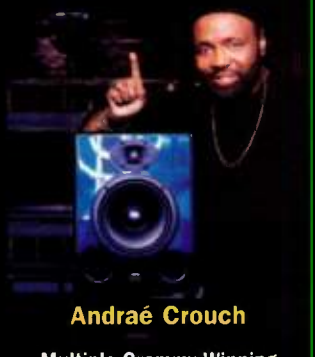
John Rodd
Orchestral Scoring Recordist
Music Scoring Mixer

"Prince Charles" Alexander
Multi-Platinum Grammy-Winning
Engineer / Producer



Anthony Myers
Engineer / Producer
Sound Designer

Gerhard Joost
Multi-Platinum Engineer
Mixer / Producer



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Gospel Singer / Producer / Pastor

Lionel Jarvis
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DJ Ron G
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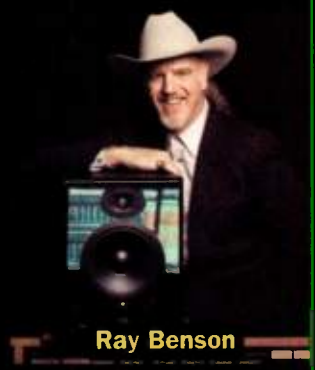
Steve Pageot
Grammy-Winning Producer
Musician / Composer / Engineer



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Michael Jay
Emmy-Winning Composer / Engineer
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Cons: None *—Electronic Musician*

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ending place in the sequence and set the Velocity to 1, which acts as a silent marker.

Lower Your Voices

After finishing the file cleanup and loop, the next step was to create the 4-voice GM version. Using the 16-voice version as the template, I began the task of reducing the theme to four voices. Because the melody was using only one voice, there were three voices available to finish the arrangement. The bass track also used one voice, so it stayed in as well. With only two voices left, I employed a technique that allowed me to squeeze an apparent three voices out of the drums. Inspired by Charlie Watts's technique of never hitting the high hat and snare simultaneously, I simply removed the high-hat notes whenever the snare was hit. Because both the hat and snare were high-frequency sounds, it was a great way to keep the groove going, and the hat's absence was barely noticeable.

Making the mono version required a bit of extra thought and work. I used the 4-voice GM version as the working template and employed a few techniques to make a convincing 1-voice track. Because the original theme began with drums and bass, there would have been a lot of empty space had the file been reduced to just the melody track. The best way to represent the rhythm was to use the bass track up until the melody came in. I erased all the bass notes when the melody was playing, and when the melody took a break, I used the bass again to fill in the gap. This created a pseudo rhythm track while still using only one voice.

Yamaha Considerations

The Yamaha SMAF format works a bit differently than standard 16-voice General MIDI in that each different drum sound is counted as one voice of polyphony. This means a kick, snare, and high hat will count as *three* voices, even if they are not played simultaneously. Because I had used seven different drum sounds in the 16-voice GM version, I had to be careful not to go over the 16-voice limit. As a result, I ended up combining the two toms into a single tom hit, which reduced the track polyphony to six. With those changes, the SMAF file preparation was complete, and all the files were ready to go for the conversion stage.

The next step was to convert the SMAF and Nokia tracks into their respective formats (the 4- and 16-voice GM files were already in their final format). Many specialized tools are available for file format conversion and creation, but the one I chose to use on this project was Unwiredtec's Ringtone Creator. Ringtone Creator allows for conversion to many note-based and PCM formats from a variety of sources (see **Fig. 2**). The conversion process involved simply loading the prepared file, selecting the appropriate output format, and clicking on a few buttons. I did this for both the SMAF- and Nokia-prepared files and ended up with files that could be played on their respective handsets.

Playback Testing

Playback testing for mobile is very much like mixing and mastering at the same time. Listening to the files on real handsets allowed me to tweak the voicing and balance of the instruments to sound best for each format. Because there was no single handset that could play all four of the formats for this project, I ended up using several to test on. The files were loaded onto the handsets through a data cable using various software and hardware combinations. Although there are other ways to transfer the data (Bluetooth or WAP, for example), all of the phones were set up for data-cable transfers. For the 4- and 16-voice GM versions, I used Motorola Phone Tools and loaded the files onto a Motorola Razr. For the Yamaha SMAF format, I opted to use the Yamaha MA2 hardware developer box with a dummy phone connected to it (see **Fig. 3**). Finally, the Nokia format was loaded onto a Nokia 6630 phone using Nokia's PC Suite.

Listening to the GM versions, I noticed right away that the bass was inaudible. It was also clear that the high hat was far louder than it had sounded when

FIG. 3: Shown here are some tools of the trade: a Yamaha MA2 developer box with a dummy phone connected to audition the sounds.

MANUFACTURER CONTACTS

Motorola http://direct.motorola.com/Hellomoto/nss/productresource.asp?PhoneModel=mpt
Nokia http://europe.nokia.com/A4144903
Unwiredtec www.ringtonecreator.info
Yamaha http://smaf-yamaha.com

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playing back on my PC monitors. The solution was to raise the bass part an octave and reduce the Velocity of the high hats. After going back and forth a few times, I found the balance to work great for both GM versions on the Razr. Knowing that each handset would sound different, I opted to load the GM versions onto a variety of handsets in my collection. After a few more minor tweaks, the files sounded good across the different phones (see **Web Clip 1**).

The same process was applied to the SMAF and Nokia formats until they sounded right to my ears. Yamaha's hardware developers tools allow for extensive editing of the FM voices, so I spent a good deal of time crafting the actual sounds. An added bonus of the SMAF format is that it provides uniform playback across MA2-enabled phones (see **Web Clip 2**). The only difference is in the speaker and molding of various handsets.

The most difficult format to get a good-quality sound from was the mono Nokia OTT. OTT was created more than a decade ago and was not designed to play ringtones the way we know them now. The familiar Nokia ringtone that we've all heard showcases the sound of the format, which can be very piercing but functional. Most of my time was spent making sure the notes were in a pleasing octave range and not overly loud (see **Web Clip 3**). With that last bit of tweaking, I was finished and ready to deliver the files to the client.

Who's Calling?

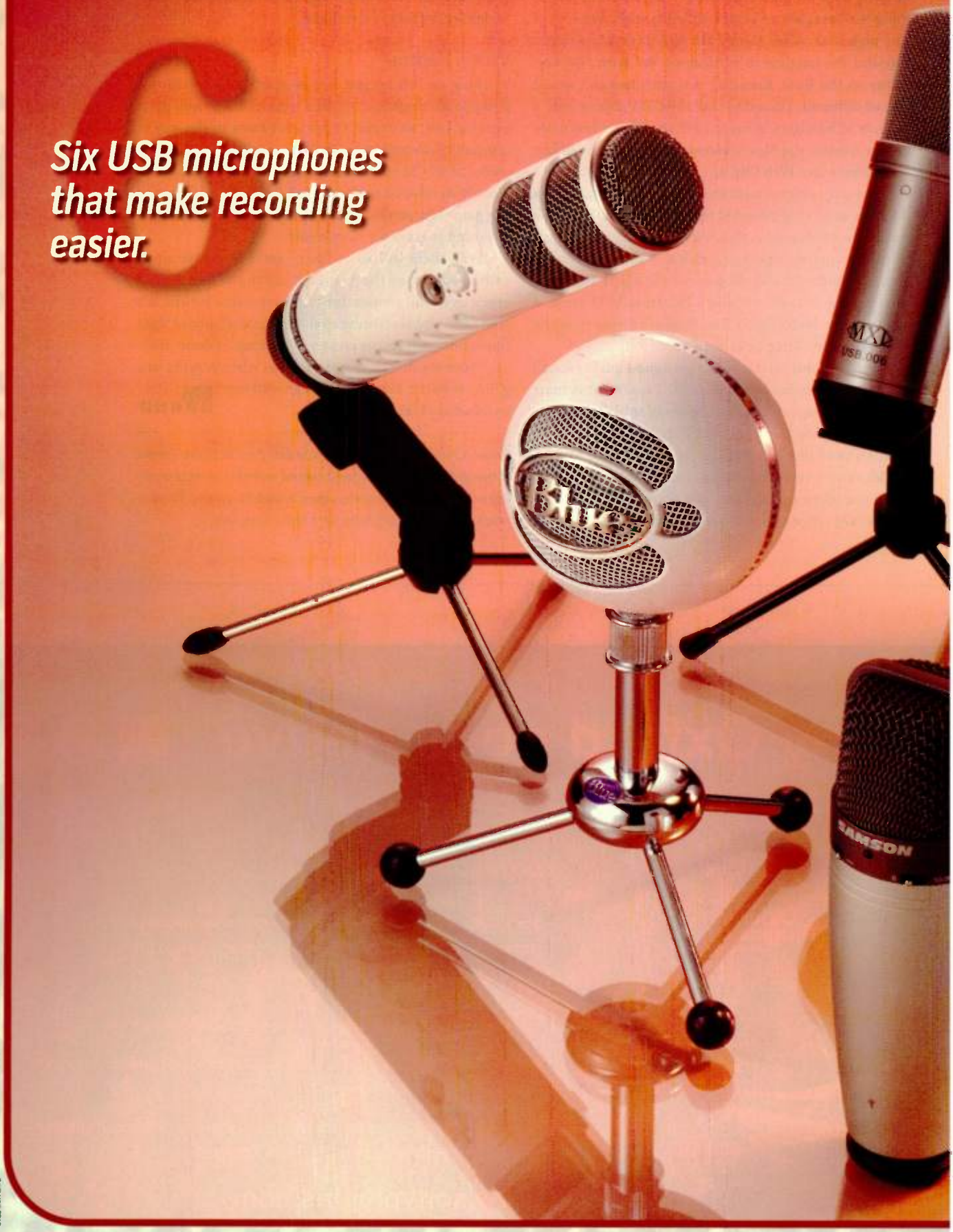
Working on this project was very much like writing a polyphonic ringtone. At this time the technology is growing fast, so expect to see a lot more in the way of interactive soundtracks, multiple tracks of streaming audio, and PCM sound in the future. These trends have already developed in Japan and Europe, and some of the game companies I work with are now using highly advanced engines for mobile games.

Still, there will always be projects that have small audio budgets, so the need to squeeze the most out of every byte will remain for the foreseeable future. It's also a fun and rewarding challenge to work under tight limitations—it forces creative thinking. If done properly, your music can be a joy to hear when playing in a game, even if it's coming through a 10 mm handset speaker. EM

EM WEB CLIPS

Steve Ouimette runs 8th Wonder Productions (www.8thwonderproductions.com), whose main business is creating soundtracks for mobile, console, and PC games. You can reach him at steve@8thwonderproductions.com.

Six USB microphones that make recording easier.



BILL SCHMID

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THE DIRECT CONNECTION

By Gino Robair

Thanks in part to the popularity of Podcasting and of consumer-friendly recording applications, a number of manufacturers have added USB microphones to their product lines. This class of products brings the allegedly esoteric concept of the "digital mic" (which is really just an analog mic with a built-in A/D converter) into the realm of the personal studio.

The plug-and-play convenience of a USB mic makes it desirable for someone who wants a good-sounding, cost-effective transducer for Web-bound programs or demo use but doesn't know anything about studio technology. Such simplicity is also good for recordists and multimedia creators who want to forgo preamps, mixers, and outboard digital interfaces in mobile applications yet want a higher level of fidelity and features than an inexpensive, consumer mic offers.

Although the USB mic's list price may be comparable to that of an XLR version, the street price is often more aggressive. That's because manufacturers are aiming for the *prosumer* market. Prosumers are hobbyists and non-specialists who buy inexpensive and easy-to-use products that include some pro-level features. A company can tap into this growth area by simply repurposing the technology from its regular line into a product with mass appeal. However, the question for those of us who think seriously about audio quality remains, do USB mics sacrifice sound and useful features for convenience?

In this article, I will cover six USB mics that are intended for personal-studio use, are available on their own (rather than being available only as part of a Podcasting package), and are priced between $90 and $350. At the 2007 Winter NAMM show, I saw several additional models, some of which will be available by the time you read this (see the sidebar "USB Mics on the Horizon").

Getting on the Bus

The USB (Universal Serial Bus) protocol is used worldwide for data transfer between peripheral devices and

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computers. The original 1.0 specification, which offered a transfer speed of 1.5 Mb per second, was later superseded by 1.1 (12 Mbps) and finally by 2.0 (480 Mbps). You can hot-swap USB devices, and the appropriate drivers will load and unload dynamically.

Like other USB devices, these mics have a square-shaped USB B port. This means you can use a standard cable with a USB B connector on one end and the flat USB A connector, which always goes to the host, on the other (see **Fig. 1**). As a result, replacing a lost or malfunctioning USB mic cable is relatively easy—an important point if you're traveling.

Internally, the USB connector uses four pins: two for data, one for ground, and one providing +5 VDC of power. It's good to keep this last spec in mind because the amount of power a microphone receives is critical to how it sounds. And because many of the products in this roundup are based on mics that require phantom power, how a manufacturer steps up the voltage and implements power conditioning, buffering, and noise filtering—USB power is notoriously dirty—will have a major impact on a mic's overall sound. Unfortunately for the consumer, manufacturers keep this information proprietary, as well as any details about the built-in A/D converter, which plays an equally important role sonically.

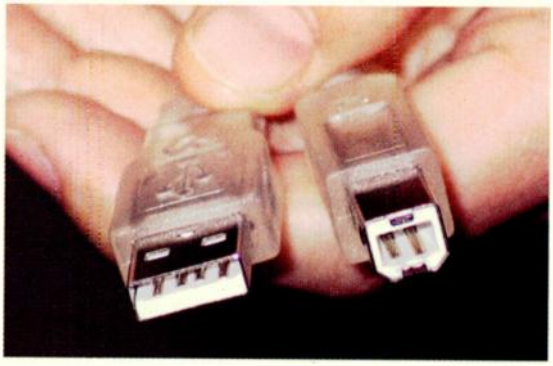

FIG. 1: The USB A connector (on the left) goes to the computer host, while the USB B connector attaches to the mic.

USB MICS ON THE HORIZON

Apex Electronics (www.apexelectronics.com) will be shipping the Apex181 ($99) by the time you read this. The side-address mic includes a 0.79-inch internally shockmounted diaphragm with a cardioid pattern.

Avant Electronics (www.avantelectronics.com) will offer the Avantone CU-2 ($199), a true condenser with a cardioid pattern and a 1.37-inch diaphragm, a switchable –10 dB pad, and an 80 Hz rolloff switch. The mic comes with a shockmount and a wooden case.

The Blue Microphones Snowflake is a single-capsule design that uses the same cardioid electret element and converter chip as the Snowball. Although the Snowflake doesn't include a pad switch, it is smaller than the Snowball and has a built-in stand that lets the mic rest on a desktop or attach conveniently over your laptop monitor.

FIG. A: The Samson G-Track can also be used as a 2-channel interface.

Marshall Electronics is expanding its USB mic offerings with the MXL USB.007 stereo microphone ($219.95) and the USB.008 large-diaphragm condenser ($199.95). The USB.007 uses a stacked pair of the same 0.79-inch capsules used in the 990 and USB.006, but permanently positioned in an *x-y* pattern. The USB.008 has a 1-inch capsule found in many of the MXL mics. Both mics include a selectable attenuation switch. The company has also announced the USB Mic Mate ($99), an XLR-to-USB converter that lets you plug any microphone directly into your USB port.

The Samson G-Track ($199) has the same capsule as the C01U but adds a 2-channel interface into the mic body (see **Fig. A**). Features include a stereo instrument/line input on minijacks with a gain control, a stereo headphone output with a level control, and an onboard gain control for the mic. You can send two channels of external audio through it, or send one external channel with the mic signal. The package includes audio and USB cables, a small tripod mic stand, a mic clip, and a copy of Cakewalk Sonar LE.

sE Electronics recently unveiled the USB1000 ($249), a small-diaphragm condenser. Like the USB2200a, the USB1000 includes voltage conditioning circuitry that is linked to the Mac/PC output switch.

The Main Players

The mics in this roundup are marketed as being convenient to use and having a level of sound quality that is enough above that of consumer-grade mics to warrant the extra cost. Besides sound quality and ease of use, however, I was also interested in the differences between the sizes and shapes of the mics. Portability is a big asset if you're planning to work while on the road (as some of the EM editors do).

Blue Microphones Snowball. With an attractive Mac-centric look, the Snowball contains a pair of electret condenser capsules and offers two polar patterns, each with a slightly different sonic signature (see **Fig. 2**). Although the Snowball's cardioid capsule is similar to that of Blue's 8-Ball, it uses a different amplification circuit in order to add presence, according to the manufacturer. Blue also says that the omni capsule is unique to this mic.

Besides the USB connector, the back of the mic includes a 3-position switch to select a cardioid pattern, a cardioid pattern with a –10 dB pad, or an omnidirectional pattern. A red LED on

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MM6

CODE NAME: "Mini Mo"

The MM6 synthesizer not only features sounds from the Motif, but the quick edit knobs and arpeggios to control them. You can jam over the top of the street smart grooves with layered or split sounds in Performance mode. When you're ready to record your music, you can record the grooves and keyboard parts directly to the on board song sequencer. For even greater flexibility, connect to your computer via USB and use the bundled Cubase software. Whether you're just jamming with friends or working on complete music productions, the MM6 lets you hit the streets in style.

PLAY – The MM6 not only features key sounds from the Motif, but also the arpeggios to go with them and the category search function to make them easy to find.

TWEAK – Your sounds, your way in real time using four dedicated control knobs.

JAM – Over tons of street smart beats in 64 User editable performances that include keyboard splits and layers.

CREATE – Your own songs by recording directly to the on board 16 track sequencer.

PRODUCE – Your music, just connect the MM6 to your computer via USB and use the included Cubase music production software.

YAMAHA

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the front glows when the mic is fully powered.

On the bottom of the Snowball is a swivelmount that, when attached to the stand, allows you to position the mic roughly 45 degrees forward or backward. That's handy if you want to avoid recording plosives by facing the mic up or down, and out of the direction of the mouth. The Snowball comes with a telescoping tripod table stand (6.75 inches at full height) and a USB cable.

The published frequency response graph shows the omni pattern with a flat response up to about 5 kHz, with a 6 dB rise at around 10 to 11 kHz, then a drop to 0 dB again around 18 kHz. The cardioid pattern bumps up 5 dB around 1 kHz, drops down, then goes up 4 dB at 10 kHz before dropping off at 18 kHz.

MANUFACTURER CONTACTS

Blue Microphones www.bluemic.com
Marshall Electronics www.mxl-usb.com
Røde Microphones www.rodemic.com
Samson Technologies www.samsontech.com
sE Electronics www.seelectronics.com

> Portability is a big asset if you're planning to work while on the road.

Blue intended the Snowball to be simple and easy to use, and it is. Like most of the other USB mics, the Snowball's A/D converter has a 16-bit, 44.1 kHz resolution. However, the Snowball doesn't give you the option of selecting a lower bit depth or sampling rate. A company spokesman noted that although there are newer USB chips offering a greater bit depth, it wouldn't be of interest to the typical Snowball user: anyone wanting a higher resolution would use a regular mic with a dedicated converter.

However, Blue offers a pair of downloadable firmware applets—high gain and low gain—that give you control over the Snowball's output level. With the Snowball plugged in, simply launch one of the applets and it will download the data to the mic's converter chip in about five seconds. Once downloaded, unplug the mic from your computer and then reattach it to hear the

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new gain level. Prior to March 1, 2007, the Snowball shipped with the lower gain setting, but by the time you read this, the mic will be shipping with the higher gain setting.

FIG. 2: The Blue Microphones Snowball offers omni and cardioid polar patterns, as well as a cardioid setting with a –10 dB pad.

Marshall Electronics MXL USB.006. The MXL USB.006 is a side-address cardioid condenser with the same 0.79-inch diaphragm used in the MXL 990 condenser (see Fig. 3). The mic includes a 3-position switch to control the amount of gain before the A/D converter: Hi (no pad), Medium (–5 dB pad), and Lo (–10 dB pad). You'll notice a gentle thump as you switch between levels.

The microphone's frequency response is 20 Hz to 20 kHz. Although the manual includes no other specs, it does offer instructions on using the mic in a Windows and Mac environment, including GarageBand in particular. A red LED illuminates from behind the grille when the mic receives power.

The MXL USB.006 comes with a nontelescoping tripod stand, a USB cable, a lightweight plastic mic clip, a thin foam windscreen, and a vinyl case that includes a separate compartment for the mic. The clip is attached by unscrewing the ring at the base of the mic, setting the mic into the clip, and then reattaching the base ring. Overall, the MXL USB.006 doesn't feel as solid as the other mics in the roundup, although its lighter weight can be a plus if portability is an issue. In a desktop situation, the clip and tripod held the mic securely.

Røde Podcaster. The Australian-made Røde Podcaster feels solid and is much heavier than the other mics in the roundup (see Fig. 4). Designed specifically for voice-over work rather than music recording, this neodymium-based dynamic mic has a 1.1-inch diaphragm with a cardioid pattern. It was designed for maximum off-axis rejection so that room tone and noise from shuffling papers wouldn't be prominent in the signal.

The Podcaster comes with a USB cable, a rugged mic clip that screws onto the locking collar at the base of the mic, and, when you register the mic online, a conditional ten-year warranty from the date of purchase. The mic clip gives you 180 degrees of positioning, which I found especially useful with an end-address mic.

On the side of the Podcaster are a stereo headphone minijack and a headphone volume control that lets you

SE ELECTRONICS USB2200A

Sharing features of the 2200a, the USB2200a ($499) has a 1-inch diaphragm, a cardioid polar pattern, and discrete FET electronics (see Fig. B). However, the USB2200a is unique in the context of this roundup because it includes an XLR output, which can be used simultaneously with the USB output. The mic can be powered from the USB bus or with +48V phantom power. Consequently, the USB2200a is a mic you can use in professional situations as well as for Podcasts and other informal uses.

FIG. B: The sE Electronics USB2200a includes an XLR output as well as headphone monitoring with a mix control.

It's worth noting that you can simultaneously record from both outputs at once. The mic includes a mini stereo headphone jack and a balance control to set the level between the mic signal and audio from your recording software.

The USB2200a also includes a 100 Hz rolloff switch, a –10 dB pad switch, and a Mac/PC switch. According to the manufacturer, the switch changes the mic's impedance to accommodate the differences in "sensitivity" of the USB bus between the two computer platforms, noting that the Mac's USB bus needs to see 15 dB more gain. However, I was unable to verify this because a production version of the mic was unavailable during my research, nor was I able to get a comment from Apple about this difference.

The USB2200a includes a separate circuit board that provides power conditioning, buffering, and noise filtering to deal with the problems inherent in power coming from the USB bus. Unlike the other mics in this roundup, the USB2200a accepts a mini-B connector on its side.

The published frequency response of the USB2200a is mostly flat, although down 1 dB from 40 to 300 Hz. From 500 Hz, it's flat at 0 to 2.5 kHz, where it begins its 3 dB rise to about 11 kHz. At 20 kHz, the response is roughly –1 dB. sE Electronics also says that although the converter chip has a 16-bit resolution, it can lock to sampling rates of 88.2 and 96 kHz.

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set the level of the combined signals of the mic and digital recording software. (You'll have to set the balance of the input and playback tracks within your audio application.) The onboard headphone output is designed to give you latency-free monitoring as you record. Considering that the mic is designed for use by nonspecialists, many of whom may not know about technical issues such as latency and buffer sizes, the onboard headphone jack is a very useful feature. On the opposite side of the mic is a status LED that indicates when the mic is receiving power.

The Podcaster is nearly 8.5 inches long and reminds me of that old broadcasting standard, the Electro-Voice RE20, in appearance. The published frequency response is 40 Hz to 14 kHz, with an 8 dB presence boost around 9 to 10 kHz. The response chart in the manual shows a 16 dB drop at the lowest extreme and about a 10 dB drop after about 12 kHz.

The capsule is not internally shockmounted and the mic is susceptible to handling noise. You'll want to use Røde's PSM-1 spider-style shockmount ($49) if floor- or tableborne rumble is an issue.

The manual is very useful and provides tips on using the mic with a Mac and PC, getting the best results when recording, and installing and using the Podcaster software for Windows users (available from www.rodepodcaster.com). The application, which boosts the level before the A/D converter to improve the signal-to-noise ratio, offers a volume control, a level meter, and a mute button.

FIG. 3: The MXL USB.006 has a built-in attenuation switch with –5 and –10 dB settings.

Samson CO1U. Samson offers USB versions of two of its mics. Many of the specs of the USB and non-USB versions are similar, although the SPL is several dB lower and the self-noise is slightly higher in the USB mics.

Like the original CO1, the CO1U is a side-address mic with an electret condenser element, a 0.75-inch internally shockmounted diaphragm, and a supercardioid polar pattern (see **Fig. 5**). This type of pattern is useful for spoken-word applications, where you want a high degree of rejection of off-axis sound.

The frequency response is 50 Hz to 18 kHz. The included chart shows the low end dropping at 150 Hz to about –7 dB at 50 Hz. The upper end has a 2 dB presence boost at about 3 kHz and a 4 dB rise at 11 kHz, before dropping to –6 dB at 18 kHz.

When purchased as single units, the Samson USB mics come with a lightweight plastic mic clip, a USB cable, a tabletop tripod stand, Cakewalk Sonar LE, and a vinyl bag that is big enough for the mic only. However, the CO1U I received was part of the CO1U Recording Pak ($249.99). Along with the microphone, clip, USB cable, and Cakewalk Sonar LE, the package includes a weighted tabletop stand, a spider-style shockmount, and a locking aluminum flight case.

The CO1U feels solid and substantial in your hand, and the included base and clip hold the mic securely. As with the MXL USB.006, you attach the CO1U to the mic clip by unscrewing the base, setting the mic into the clip, and then reattaching the base.

Although its USB mics work fine on their own, Samson offers a freeware applet called SoftPre (Mac/Win) that gives you greater control over the gain within the mic's internal A/D chip. With a range of –62 to +48 dB in 1 dB increments for the CO1U and Q1U (and a range of –13 to +24 dB for the CO3U), the applet offers input metering with a clip indicator, a switch for inverting phase, and a low-cut filter (–12 dB per octave), which is continuously variable from 21 to 200 Hz.

FIG. 4: Røde's Podcaster is a dynamic mic with a built-in headphone output and overall level control for latency-free monitoring.

Samson CO3U. Based on the CO3 design, the CO3U (see **Fig. 6**) has two 0.75-inch diaphragms. According to the published frequency response chart, it yields an overall flatter response than the CO1U, but with an 8 dB presence boost at 7 kHz. The CO3U lets you choose one of three polar patterns from a switch on the back: omni, supercardioid, and figure-8. On the front of the mic is a switchable –10 dB pad and a low-cut filter (–6 dB at 180 Hz).

The CO3U feels solid like the CO1U and comes with the same set of accessories. The CO3U is also available in a Recording Pak configuration ($344.99).

Samson Q1U. The Q1U is a dynamic end-address microphone that resembles a handheld vocal mic (see **Fig. 7**) but is not resistant to handling noise. It features a 1-inch element with a Mylar diaphragm. Like the other Samson mics, it comes with a mic clip, a USB cable, a tabletop tripod stand, Cakewalk Sonar LE, and a vinyl bag for the mic. It has a wide, supercardioid pattern, though the response chart shows that there is less off-axis rejection in higher frequencies.

The published frequency response is 50 Hz to 16 kHz. The chart shows a gentle rolloff beginning at 200 Hz and dropping –10 dB to 50 Hz. The presence

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boost starts at 1.5 kHz and reaches +5 dB at 5 kHz, rolling off to 0 at 10 kHz and dropping to –8 dB at 16 kHz from there. Like the previous two mics, the Q1U feels hefty and solid.

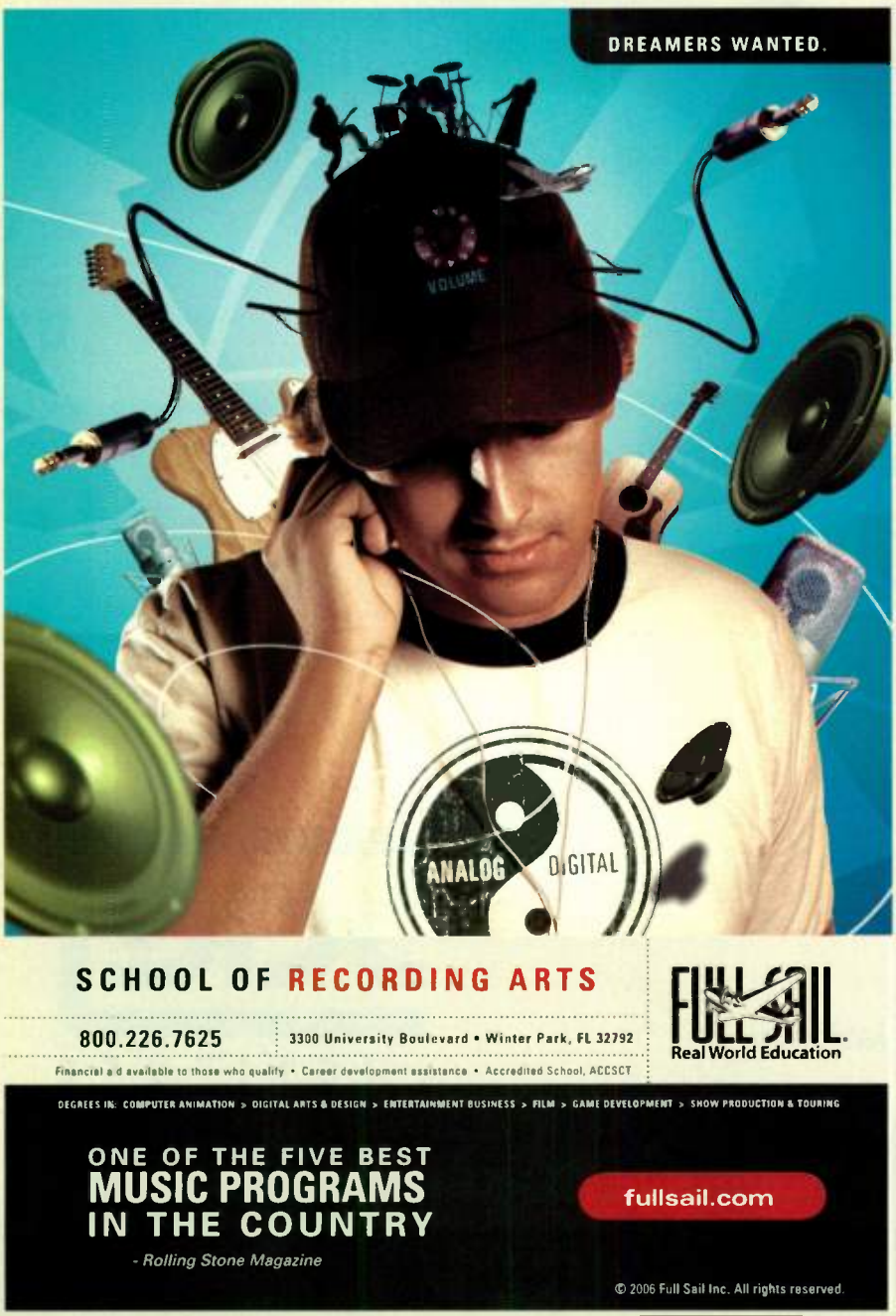
Idiotproof

I began the roundup by setting up each mic on my desktop and, one at a time, plugging them into the USB port on the back of my Mac G4 tower (running Mac OS X 10.3.9), my Mac G4 laptop (running OS X 10.4.8), and a Dell laptop running Windows XP. I wanted to know if the mics were truly hassle-free to set up, and to see if there were any obvious differences between them. All of the mics were immediately recognized by the computers and passed audio to my recording applications. From then on, I used my Mac laptop for the recording tests.

Initially I didn't use any additional software to bump up the signal. With the Mac, I increased the gain to maximum in the System Preferences→Sound panel whenever possible to test each mic's output limits. In the Input section of the System Preferences→Sound panel, I received an input volume control for the Snowball, Podcaster, and each of the Samson mics. With the MXL USB.006, however, a message reading "the selected device has no input controls" replaced the horizontal volume control. Perhaps that is because the MXL USB.006 has a level control on the mic that attenuates the gain to the internal A/D chip.

FIG. 5: The Samson C01U has a fixed supercardioid polar pattern.

Surprisingly, the three Samson mics were significantly louder than the other mics when simply plugged into the computers. To get distortion-free recordings on the Mac, I brought the level down slightly using the System Preferences→Sound panel. In addition, I downloaded and



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installed Samson's SoftPre to get more control over the volume level and to use the highpass filter. Samson offers only a Universal Binary version for OS X, but I was assured it would work with a G4.

However, whenever I launched SoftPre, the overall level of the mics was reduced, forcing me to boost the signal when recording by about 20 to 30 dB on the CO1U and Q1U, and 10 dB on the CO3U. In addition, the mics didn't always behave properly, even when SoftPre wasn't launched.

FIG. 6: The Samson CO3U is a condenser mic with three patterns (omni, supercardioid, and figure-8), a –10 dB pad, and a low-cut switch.

According to a Samson spokesman, SoftPre installs a kernel extension, which in my case was conflicting with other software extensions on my laptop. He added that "a very small number of users that install SoftPre have encountered system conflicts. When this occurs, we recommend uninstalling SoftPre and using the mic without the application." With Samson's help, I did the uninstall, though it required a few more steps than I had anticipated. (The steps to do an uninstall for Windows XP users are already online, and the OS X instructions should be online by the time you read this.)

Despite my troubles with SoftPre, Senior Editor Mike Levine had no issues when using it with his Samson CO1U and Mac G5. If you purchase a Samson mic, I suggest that you use it without SoftPre for a period of time and download SoftPre only if you really need features such as low cut or a phase switch.

Stop Your Whining

There is quite a bit of online discussion and marketing hype about the self-noise in a USB mic, which is often described as a high-pitched whine. In fact, a representative from Marshall Electronics told me that the company has worked hard to eliminate this annoying artifact from its USB mics using proprietary electronics.

However, the MXL USB.006 was the only mic in the roundup to have a noticeable high-pitched noise artifact (a B-natural, in fact). The noise was very quiet and was perceptible mostly at the beginning and end of the recordings.

The Samson mics, on the other hand, had a bit of hiss that was evident on exposed or low-level sources, with the Q1U generating the highest level. The self-noise of the Snowball and Podcaster were negligible.

Word

Because USB mics are primarily designed for Podcasting and songwriting uses, the majority of my testing was with voice and acoustic guitar at 16 bits, 44.1 kHz. However, I also subjected the mics to the shaker test to see how they would respond to a high-frequency source. And although the performance of the dynamic microphones would differ greatly from that of the condensers, all of the mics received the same treatment in this roundup.

In my spoken-word tests, I stayed about four inches from the mics. Overall, intelligibility and clarity were not a problem with any of the mics. The Snowball's cardioid pattern emphasized the upper frequencies of the voice, with minimal chest tone, even up close. The omni pattern was slightly brighter, and as I got closer, it emphasized sibilance too much.

USB MICROPHONE FEATURES COMPARED

Company	Model	Polar Pattern	Mic Type	Diaphragm	Frequency Response
Blue Microphones	Snowball	cardioid, omni	electret condenser	0.55"	40 Hz–18 kHz
Marshall Electronics	MXL USB.006	cardioid	condenser	0.79"	20 Hz–20 kHz
Røde	Podcaster	cardioid	dynamic	1.1"	40 Hz–14 kHz
Samson	CO1U	supercardioid	electret condenser	0.75"	50 Hz–18 kHz
Samson	CO3U	omni, supercardioid, figure-8	electret condenser	0.75"	50 Hz–18 kHz
Samson	Q1U	supercardioid	dynamic	1"	50 Hz–16 kHz

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The MXL USB.006 added more of the lower tones I expected when speaking close to a cardioid condenser. Although it picked up less sibilance than the Snowball, the MXL USB.006 emphasized lip smacks slightly.

The CO1U didn't have the sibilance problems and retained a nice balance of vocal tone. There was more self-noise evident in the track, but it wasn't high enough to render the track useless. The CO3U had a rounder, tighter sound, with the directional patterns yielding more satisfying lows as I moved closer to the mic.

The Q1U also sounded good with spoken material, although the noise floor was more noticeable. Sibilances were downplayed, but when they got through, they sounded a bit crunchy.

On voice, the Podcaster delivered as promised, excluding environmental noise and room reflection nicely, while giving a robust vocal sound (even with a thin voice like mine) that is free of annoying sibilance. To get the most out of it, I had to get right up on it when speaking.

Strummin'

To record a Taylor 110 acoustic guitar, I placed each mic a distance of 12 inches from the instrument, pointing where the neck attaches to the body. This guitar sounds particularly bright, and it is always interesting to see how much of that brightness a mic picks up.

The two Snowball patterns yielded bright, jangly, and somewhat bass-lean tracks, with a perceptible hole in the lower mids. Of the two patterns, the omni version was a little peakier and not as satisfying on its own as the cardioid version.

By contrast, the MXL USB.006 track emphasized the guitar's upper mids, making the instrument sound a bit throatier but very pleasant. Compared with the other condensers, it seemed to compress the guitar a little.

The CO1U sounded somewhat similar to the MXL USB.006 but wasn't as dark. It offered a bit more of the welcome jangly high end.

Of the condensers, the CO3U captured the nicest overall tone in cardioid and figure-8 modes, and I took advantage of the proximity effect to get a beefier sound along with a +10 dB gain boost using SoftPre. In contrast, the mic's omni pattern was a little thinner sounding, although that could help the guitar fit nicely into a crowded mix.

The two dynamic mics yielded a nice punchy sound, with the Q1U being a little meatier than the Podcaster. The greater directionality of the Q1U sensed the subtle movement of the guitar as I played it and resulted in a bit of phasing.

Shakin' All Over

For the shaker, I recorded at distances of 2 and 4 feet from each microphone but moved closer when required. I even played behind the mics to see how much rear rejection or pickup each one had.

At 4 feet, the shaker was more than the Snowball's omni pattern could handle in high-gain mode. So I installed the low-gain applet, which reduced the level dramatically, allowing me to get a nice signal level and tone from the front. Playing to the side and behind the mic, the timbre shifted and the output level was

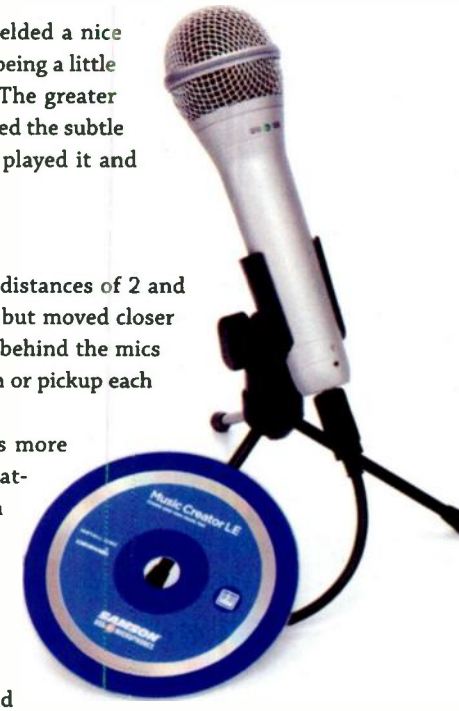

FIG. 7: The Samson Q1U is a dynamic USB mic with a 1-inch element.

Bit Depth	Sampling Rate	Onboard Filter	Onboard Pad	Weight	Price
16-bit	44.1 kHz	none	–10 dB	1 lb.	$139.99
16-bit	44.1 and 48 kHz	none	–5 and –10 dB	0.7 lb.	$169.95
18-bit	8–48 kHz	none	none	1.3 lbs.	$349
16-bit	8–48 kHz	none	none	1.06 lbs.	$134.99
16-bit	8–48 kHz	highpass	–10 dB	1.1 lbs.	$209.99
16-bit	8–48 kHz	none	none	0.75 lb.	$89.99

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reduced, however. When I used the CO3U in omni mode, the rear and side results weren't as dramatically different than the sound from directly in front of the mic.

The Snowball and CO3U in cardioid mode, the MXL USB.006, and the CO1U captured quite a bit of room tone at 4 feet but yielded good results right away. At 2 feet, the shaker timbres were more defined yet still pleasant. Also at a distance of 2 feet, the Podcaster and Q1U gave me the clear and direct sound I was looking for.

Give Me Convenience or . . .

Overall, I was surprised at the sound quality of the six USB mics, and at how much my preconceptions changed after spending time with them. They are, indeed, easy to use, and I grew to enjoy the luxury of needing only a mic and a USB cable whenever I felt the urge to record an idea while it was still fresh.

I would characterize the Blue Snowball as having the brightest reproduction of the bunch. It has excellent clarity, and its dual capsules, two polar patterns, and pad setting are a plus. The rear coloration in omni mode was a minor annoyance. The Snowball is spherical and intentionally the size of a softball, which is something you should take into consideration if you plan to travel with it.

The Marshall Electronics MXL USB.006, on the other hand, had a darker quality that was very pleasing on voice and guitar. The two pad settings are a good selling point, although I didn't use them. The self-noise was the biggest issue for me with this mic.

The heavy-duty Røde Podcaster excels at what it was designed for: voice-overs. But it performed admirably with instruments and singing, and I found the direct headphone output and level control to be very useful. It's also the most expensive mic in the roundup, and because of its size and weight, it wouldn't be my first choice for traveling. But for studio use, it feels like it will last a long time.

Each of the Samson microphones has its own sonic personality, and I happen to like the sound of the CO3U the best. Having three patterns, as well as low-cut and pad switches, also works in the mic's favor. The CO1U and Q1U, however, have a lower price point working for them. My only gripe is that these three have a higher noise floor than the other mics.

One thing worth noting is that despite the popularity of the USB format today, it won't be around forever. Unlike a tube mic from the '50s or '60s, a transducer with a built-in A/D converter (whether it is 16- or 24-bit, or 44.1 or 48 kHz resolution) is not futureproof and is going to have a relatively short life span. When it comes time to upgrade your studio and/or computer, you're stuck with the resolution of the A/D chip, not to mention the USB interface. (If you have a SCSI peripheral collecting dust in your studio, you know how quickly computer products drop support for data protocols.)

On the other hand, you can always mate a better preamp and converter to a standard mic. Consequently, if you're looking at a USB mic as a long-term investment, a product such as the USB2200a (see the sidebar "sE Electronics USB2200a") will leave you with a traditional microphone long after USB ports are no longer supported by computers and their operating systems.

In the meantime, if you simply want an inexpensive microphone for a few years of Podcasting or songwriting that lets you leave your preamps, interfaces, and XLR cables behind, then any of these USB mics will be a worthwhile investment. **EM**

Gino Robair is a senior editor at EM.

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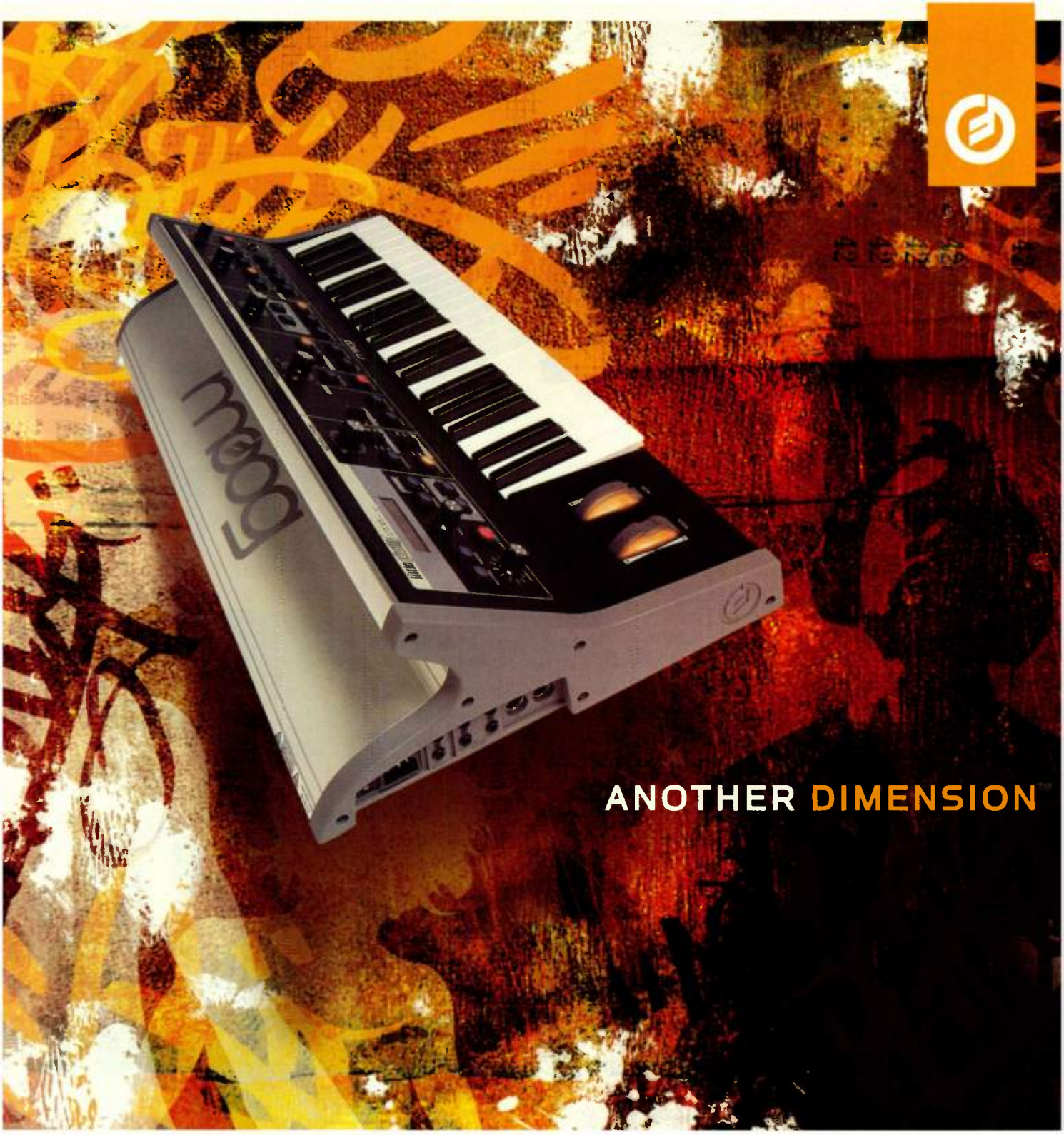

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SASHA GULISH

From Talking Heads to Production Whiz

By Paul Tingen

Jerry Harrison's smooth transition to the producer's chair.

Just a couple of miles north of the Golden Gate Bridge, Sausalito rises picturesquely above San Francisco Bay. The idyllic Marin County town is popular not only with tourists but also with studio owners, and it sports two commercial studios—the Plant and Studio D—as well as numerous private facilities. One such facility is Sausalito Sound, owned by former Talking Heads keyboardist and guitarist Jerry Harrison.

Harrison made his first musical splash in 1976 with Jonathan Richman's proto-art-punk band the Modern Lovers. But he is best known for his tenure with the Talking Heads, in which he played keyboards and guitar. He also cowrote and coproduced much of the band's output, ranging from their seminal debut, *Talking Heads: 77* (Warner Brothers, 1977), to their magnum opus, *Remain in Light* (Warner Brothers, 1980), to their last album, *Naked* (Warner Brothers, 1988). The band split up toward the end of the '80s, and Harrison segued into a production career, working with the likes of Elliot Murphy, Violent Femmes, Fine Young Cannibals, and Live.

When Harrison is asked how he made the transition from musician to producer, he explains that his role has always been much the same. "I was always the person who helped people realize their visions, whether that was Jonathan [Richman] or David [Byrne], rather than someone who was creating things from the start," he says. "That's one reason I was asked to produce

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Violent Femmes' *The Blind Leading the Naked*. People thought that I was able to handle creative people who might piss people off. They thought that Gordon [Gano, the band's leader] was an unusual guy, and indeed, I got on fine with him."

Harrison also conducted a solo career, releasing three albums under his own name: *The Red and the Black* (Sire, 1981), *Casual Gods* (Sire, 1987), and *Walk on Water* (Sire, 1990). But, says the producer, "Once I had children, it became hard to maintain a solo career. And my wife and I decided that Manhattan was not a good place to raise three kids, so we moved to Marin County in the early '90s. One reason I came here was to be close to some kind of recording industry. So I rented a room at the Plant, where I had a board and all my equipment."

SASHA GUILSH

FIG. 2: Harrison playing his Clavia Nord Electro 2 in the control room with second engineer Matt Cohen adjusting the Digidesign Pro Control in the background.

Delightful Color

After his move to the West Coast, Harrison continued to score production successes with Crash Test Dummies, Black 47, the Verve Pipe, Elliot Murphy, Violent Femmes, and Live. Then in late 1999, Harrison decided that he wanted to have his own facility. "I had accumulated enough equipment to have my own studio," he explains. "And when I'm working with young bands, it's often hard to predict how long the recordings will take. So in having my own place, I can more easily go overtime when needed. I thought it would be more convenient to have my own studio and that it would help me make better records. Also, the Plant wanted to turn my room into a mastering facility."

For a brief while, Harrison didn't have a studio, until he heard that Sean Hopper, a former keyboard player of Huey Lewis & the News (also from the Bay Area), had a studio in Sausalito that he was eager to sell. "The studio had been there for a while under different names and it wasn't making enough money, so they were leaving no matter what," says Harrison. "That made it a better deal for me. They took all their equipment with them, but the soundproofing had been done—it's a floating studio—and there was balanced electric power and troughs to run all the wiring in. We rewired everything and installed my equipment.

"We changed things around a lot. Mainly we reversed the functions of the control room and the recording area, because we wanted a really big control room [see **Fig. 1**]. So the original recording area became the control room, and vice versa. We figured that with all these great studios around here, if we needed a large live room to cut a band or have a live drum sound, we could just go there. The live room now is fine for recording guitars, vocals, or keyboards, and you can do drums in there. It just will sound tight—you won't get the massive sound that people are often after today. We recently did a horn section here, so we can make the recording room work for many different things."

The equipment at Sausalito Sound centers on two up-to-date Digidesign Pro Tools HD systems usually running at 96 kHz. One system runs on a dual-processor Apple Power Mac G5 with 4 GB of RAM and five Digidesign 192 interfaces (for a total of 72 analog outputs and 64 inputs). The other runs on a 933 MHz Apple Power Mac G4. Both systems have the same sets of plug-ins by Digidesign, MOTU, McDSP, Spectrasonics, Waves, and others. There's also a 16-fader Digidesign Pro Control controller and a wagonload of outboard gear, preamps, and microphones (see the sidebar "Gearing Up in Sausalito").

"I have been friends with the people who run Digidesign almost from the moment they started," says Harrison. "The company is perhaps 30 miles from here.

SASHA GUILSH

FIG. 1: Sausalito Sound's spacious control room was the live room in the studio's previous incarnation.

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"Machines can be used to retain human feel or to suppress it."

So I worked my way up from the Emulator editor to SoundTools to Pro Tools. The convenience and editing power of digital recording was immediately convincing to me. Digital tools for fixing performances are so much better than what we used to have."

Old Meets New

Since establishing Sausalito Sound at the beginning of 2000, almost all the projects that Harrison has produced have been done there. He's produced for Gary Lucas, No Doubt, O.A.R., Pink Spiders, and the Von Bondies. He recently recorded, produced, and mixed the music for *10 Days Out: Blues from the Backroads*, a DVD and CD by Kenny Wayne Shepherd that features the blues guitarist traveling around the South visiting, interviewing, and playing with a variety of blues musicians. It was recorded completely on location (see **Web Clip 1**).

The 5.1 mixes for the recent feature movie *Stranger Than Fiction* (Sony, 2006) and the award-winning Talking Heads boxed set *Brick* were also done at Sausalito Sound. *Brick* encompasses the group's eight studio albums in remastered stereo, high-definition stereo, and remixed into 5.1. The collection, which also features album outtakes, consists of a whopping eight dual discs. (The dual discs were also released individually in 2006.)

Sausalito Sound features an extensive collection of microphones and microphone preamps. Harrison states that the studio is in a kind of hybrid situation between the old-fashioned working methods and doing everything in-the-box. This is evidenced by the studio's three Dangerous Music Dangerous 2-Bus analog summing amplifiers, which are placed between the main Pro Tools system (run on the G5) and the second Pro Tools system

GEARING UP IN SAUSALITO

Computers and Peripherals

Apple Power Mac G5 with 4 GB of RAM through five Digidesign 192 interfaces for a total of 72 analog outputs and 64 inputs. Digidesign Sync and MIDI interfaces. Digidesign Expansion chassis with four HD process cards and two HD Accel cards. Video streaming through Canopus FW box to separate mounted monitor.

933 MHz Apple Power Mac G4 used for mixdown at 96 kHz.

Apple Mac 9600 running as a mix aux send/return to run older plug-ins (such as Lexiverb) with analog sends and digital returns to the mixing computer via sampling-rate conversion through AES/EBU.

Custom-built PC with an Aardvark Q10 interface.

Mac Software

Digidesign Pro Tools HD 7.2; McDSP plug-ins; MOTU Mach Five; Spectrasonics Stylus RMX, Atmosphere, and Trilogy; Waves Diamond, Platinum, and Surround bundles; and 5.1 plug-ins, including Digidesign Impact and Digidesign ReVibe.

PC Software

Native Instruments B4, Propellerhead Reason, Sony Acid, and Tascam GigaStudio 96. Sound library of Acid and Giga files.

Outboard Gear

Alan Smart stereo compressor (2), Cyclosonic Panner, dbx 120A Subharmonic Synthesizer, dbx 160x, Electro-Harmonix NY-2A compressor (2), Empirical Labs Distressor (4), Eventide H3000, Focusrite 3 stereo compressor, Neve 2254 stereo compressor, Roland Dimension D (2), SPL Transient Designer 9842, Thermionic Culture Phoenix, Thermionic Culture Vulture, UA Teletronix LA-2A (2), Urei 1176LN Peak Limiter (2), and Urei LA-4 (2).

Synthesizers and Modules

Clavia Nord Electro 2, Clavia Nord Lead, E-mu ESI-32, E-mu Proteus 1, E-mu XP, Korg Wavestation, Roland D-550, Sequential Circuits Prophet T8, Voce V3, Waldorf Microwave, Yamaha DX7, and Yamaha TX-816.

Microphones

AKG 414 (2), C451E (2), and D12 (2); EV RE18 (2) and RE20; Neumann KM86i (2), KM88i (2), TLM 103 (2), U67 (2), U87 (2), and U89i (2); Sennheiser 421 (4); and Shure SM57 (4), SM7B, and SM58.

Microphone Preamps

Daking (2), Focusrite (6), Grace (8), Neve 1073 (8), Neve 1084 (8), Telefunken V76 (4), and Upstate Audio (4).

Monitoring

System 1: Five Yamaha NS10 monitors powered by Hafler 200 power amps and a Meyer Sound subwoofer.

System 2: Blue Sky Audio surround system with five matched satellite speakers and Blue Sky subwoofer, controlled by Blue Sky's bass-management remote controller.

Mixing

Digidesign Pro Control Console with Edit Pack and 16 faders.

Three Dangerous Music Dangerous 2-Bus summing units (one full and two LT) for a surround analog spread of 48 channels.

Stereo mixes are sent back to the 96 kHz session from the 933 MHz Power Mac G4 and to an Alesis Masterlink ML-9600 at 16-bit, 44.1 kHz, passing through a Benchmark 8-channel A/D converter clocked from an Aardsync Master Sync Generator.

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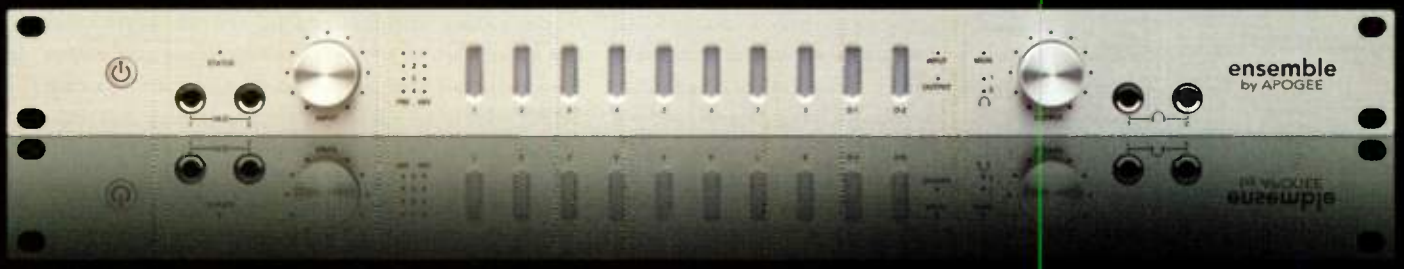

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(run on the 933 MHz G4) that Harrison mixes to. The Dangerous boxes introduce an analog link in the chain that is intended to dramatically improve the sound.

"I find that if you take things out of the box, they have more air," explains Harrison's regular engineer, Eric "E. T." Thorngren. "If you mix everything within one computer, the sound seems to collapse a bit. I'm used to mixing Pro Tools sessions via an SSL, and I always loved the way analog summing in the SSL sounded better than in Pro Tools. We searched around for something that could do the summing in Sausalito Sound and that wouldn't necessitate installing a large console, and we ended up with the Dangerous 2-Bus. We bought two more when we did the 5.1 remixes for the Talking Heads. So we now have 48 inputs and 6 outputs that can feed our two 5.1 monitoring systems: one a Blue Sky system, and the other consisting of five [Yamaha] NS10s and a Meyer [Sound] subwoofer."

In Harrison's view, plug-ins that imitate the effect of analog are the way of the future but not yet of today. "The need for running things through tape or going into the analog domain is less than it once was. But E. T. says that though many of the plug-ins are very good, when he goes back to using the original analog effects, they are still another step better. The only exception is plug-in EQ, which can be as good. But we're a bit old-fashioned here, and many of the Pro Tools outputs and inputs are prewired. So if you do an insert on a track, it can automatically go to an 1176, an Alan Smart, a Focusrite, or an LA1 or LA2. That being said, we often EQ or compress while recording using the preamps. It's better to make things sound good to begin with."

For that reason Harrison recommends that personal-studio owners with limited financial means prioritize the acquisition of the best possible front end, rather than spend all their money on the latest-and-greatest DAW. "A lot of excellent and affordable all-in-one units by the likes of Avalon, Focusrite, and Universal Audio have come out in the past few years," Harrison says. "I'm a fan of the Universal Audio remakes of 1176 and LA2A, LA3A, and LA4. The UA 2-610 is an excellent box, for instance. I'm also a fan of Grace [Design] equipment. I'm not very familiar with midrange microphones, but everybody should certainly own a Shure SM57. There are still times when it's the best vocal mic around."

A Little Knowledge

Like everyone, Harrison has been strongly affected by the home-recording phenomenon. "Bands, particularly new bands, now think that they know everything," he

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observes, "and they can be very stubborn about their stuff. People have their own digital setups at home, and when they come down to the studio here, they have the lingo down. But a little bit of knowledge can be a dangerous thing. If they are wrong, it can be very hard for me to explain why they are wrong, and things can turn into an argument.

"Every person who uses digital audio for the first time can get too perfectionistic. Just like with MIDI many years ago, you gradually realize that the most interesting aspect of music is that things are not perfect. I had to leave one project because the musician I was producing wanted to fix things way more than I wanted to fix them. So you learn to have a softer touch. Machines can be used to retain human feel or to suppress it.

"The primary focus should always be on the song. A lot of people think that they're ready if they have two parts to a song—a verse and a chorus. But that's just the beginning. You may also need an intro, a bridge, or a prechorus. Capturing a great performance is the next important thing; it can happen in a minute.

"One of the great things about digital recording is that you won't be running out of tape, so you can record as much as you like. Later you can go back and fix the most obvious mistakes that may have happened when you played with complete abandon. But it's important not to tweak too much. Sometimes a performance or a sound overrides any flaws in the recording. I demoed *The Red and the Black* on a 4-track cassette deck, and it also had some weird delays because it was recorded in a brick loft. When I transferred the demos to a 24-track tape recorder, I could not re-create them; so I used them, even though they were noisy.

"When working with bands, I always encourage them to go for the final sounds that they want. Sometimes when working in DAWs, people leave everything half-finished, thinking they can always change it later. But it's really nice when you put a song up and all the sounds are exactly as you want them to be. And if you're working on a less powerful system, the fewer channels and tracks that are playing, the better. If you have a lot of stuff playing, it may slow down the computer and you may start to get delays, which you can start to hear on some effects. Like suddenly the attack on the compressor doesn't quite work the way it should.

"Another problem with home studios is that people often lack good monitoring systems or quiet rooms, and they can miss hearing distortion on the recording. People often don't hear it until they come here or visit a mastering room, and the distortion suddenly becomes audible. That is why I strongly recommend that home-studio engineers invest in a good playback system. A good set of headphones may already make a difference, but something I particularly recommend is the Benchmark DAC-1 2-channel DA converter. It costs around $900, is a wonderful piece of gear that sounds great, has a volume control, and comes out at +4 dB, so

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JERRY HARRISON: A DISCOGRAPHY

Kenny Wayne Shepherd, *10 Days Out: Blues from the Backroads* (Reprise, 2007)
O.A.R., *Stories of a Stranger* (Lava, 2005)
Talking Heads, *Brick* (Rhino, 2005); remixed for 5.1 surround
Von Bondies, *Pawn Shoppe Heart* (Warner Brothers, 2004)
No Doubt, "New" from *Return of Saturn* (Interscope, 2000)
Stroke 9, *Nasty Little Thoughts* (Cherry/Universal, 1999)
Foo Fighters, "Walking After You" from *The X-Files: The Album* (Elektra, 1998)
Big Head Todd and the Monsters, *Beautiful World* (Warner Brothers, 1997)
The Kenny Wayne Shepherd Band, *The Trouble Is* (Warner Brothers, 1997)
Rusted Root, *Remember* (Fontana/Island, 1996)
The Verve Pipe, *Villains* (RCA, 1996)
Live, *Throwing Copper* (MCA, 1994)
Crash Test Dummies, *And God Shuffled His Feet* (Arista, 1993)
Poi Dog Pondering, *Volo Volo* (Sony, 1992); produced selected cuts
Live, *Mental Jewelry* (MCA, 1991)
Fine Young Cannibals, "Ever Fallen in Love" from *The Raw and the Cooked* (MCA, 1989)
BoDeans, *Outside Looking In* (Reprise, 1987)
It's Immaterial, *Driving Away from Home* (Virgin, 1986; import)
Violent Femmes, *The Blind Leading the Naked* (Warner Brothers, 1986)

(Produced by Jerry Harrison except where noted.)

you can run it through a power amp. The Benchmark is also a really good headphone amp."

As a keyboardist, Harrison still prefers playing old hardware keys to soft synths. He's a fan of the Clavia Nord Electro 2 (see Fig. 2) and plays an E-mu Emulator III, a Hohner Clavinet, a Nord Lead, a Sequential Prophet 5, a Sequential Prophet T8, a Waldorf Microwave, and a Wurlitzer. He says the reason for that has more to do with growing up turning knobs than with any inherent sonic flaws in the realm of soft synths. He's very impressed by the results that can be obtained with Arturia, Native Instruments Reaktor, and Propellerhead Reason synths.

Reflecting on the changes brought about by digital technology, Harrison bemoans the emergence of music that's "like a commodity," with individual tracks downloaded in lossy formats—a bit like the aural equivalent of fast food. "In a way, we are going back to the '50s, when you had to buy singles and when albums were single compilations." He thinks that MP3 and AAC are great for "finding out what songs sound like" and that they're convenient in noisy surroundings such as airplanes and public transport.

"As I said," concludes Harrison, "the most important thing is a great song; a great performance is second. The equipment you use is in many ways a distant third. So I do everything I can to give musicians the space and time to redo things if they want to. Recording budgets have become smaller over the years, so having my own studio is helpful here. I never thought of it as a way to make money; it really is a place to aid the creative process." EM

EM WEB CLIPS

Paul Tingen is a writer and musician living in France. He is the author of Miles Beyond: The Electric Explorations of Miles Davis, 1967–1991 *(Billboard Books, 2001), a book on early weird funk experimentation. For more information, visit www.tingen.*

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Slice, Move, and Glue

By Mitchell Sigman

How to align audio to MIDI in Apple Logic Pro.

The advent of digital audio sequencers has made quantized drums a fact of life. For a recent electronic project of mine, live drums were overdubbed onto quantized synth tracks, making quantized drums a necessity (see **Fig. 1**). Here's how to chop up multitrack audio drum parts and quantize them perfectly in Apple Logic Pro.

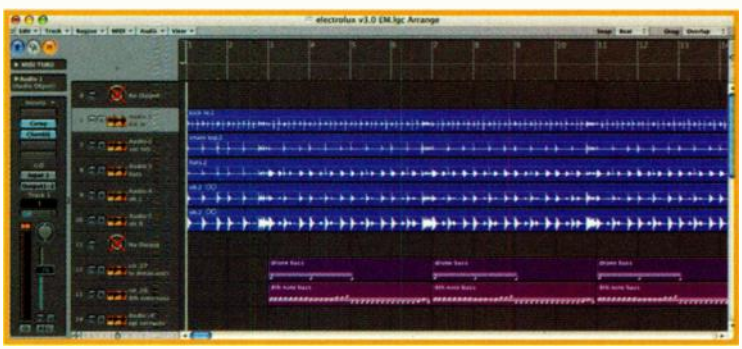
For this example I used kick, snare, hats, and stereo overhead tracks, but the technique will work with any number of tracks (see "Step-by-Step Instructions" on p. 64). Look closely at step 1, and you'll see that the kick and snare waveforms don't align exactly with the grid lines (see also **Web Clip 1**).

Group Therapy

Cuts and moves must be exactly the same for all tracks; otherwise, nasty phasing artifacts will result. You can use Logic's Group function to ensure that all edits happen simultaneously. Enable grouping by selecting the same group number for each drum audio channel using the drop-down menu directly beneath the channel's track number in the channel strip. Make sure to check the Arrange Select (Edit) box in the Group Settings dialog box. Grouping greatly reduces the number of edits you'll need to make.

It is best to work with one or two bars at a time and to start with eighth-note slices. Select the Scissors tool and cut the kick track at the 2-bar mark. Ensure that Snap is set to Ticks in the upper-right corner of the Arrange window, and then hold the Option key and cut at the first eighth-note grid line. (The Option key activates Logic's Divide Multiple command, automatically making cuts at every eighth note.)

FIG. 1: The five drum tracks at the top need to be aligned to the MIDI bass tracks below.



Line 'Em Up

If you zoom in, you'll see that the regions are in perfect alignment with the grid but the audio hasn't been moved; everything will sound the same. Next, move the start time of the audio regions as necessary to have the transients of the waveform line up correctly. Do this from the Arrange window—don't double-click on the waveform.

Zoom in on the region containing the first kick hit and select it. (You can temporarily select the Zoom tool by holding the Control and Option keys.) Choose the Arrow tool, click near the left edge of the region, and move its start point to the beginning of the waveform. Note that because the tracks are grouped, the regions that are vertically aligned with the edited one will have their start points adjusted simultaneously. Repeat this process for every kick and snare hit (or hi-hat hit if there isn't a kick or snare on the beat) that is not already aligned. You may have to move the region start to the left or right depending on whether the drummer was rushing or dragging.

Once all the region starts are correct, you need to move all the regions back to the grid. You can move them one by one, but here's a shortcut. Highlight all of the regions of the section you've been working with. In the Windows pull-down menu, select Event List. In the Event List, click on the Q button and select "1/8-note." Now all the beats will be quantized (see **Web Clip 2**). You might also want to do some 16th-note cutting and aligning if the pattern calls for that.

Timely Alterations

The beats are now in perfect time, but there may be gaps between some of them. Here's how you can use Logic's Time Machine to time-stretch those regions and eliminate audio gaps.

At the top of the Arrange window, draw a cycle loop a few ticks longer than an eighth note. Select all the regions within the 2-bar range in which you've been working. In the Arrange window's Audio pull-down menu, select Adjust Region Length To Locators to time-stretch them. Now all the regions will be stretched to at least an eighth note in length. (I recommend making the cycle length a little long because sometimes Logic's time-stretch algorithm calculates on the short side, and it won't hurt if a region is a bit long.)

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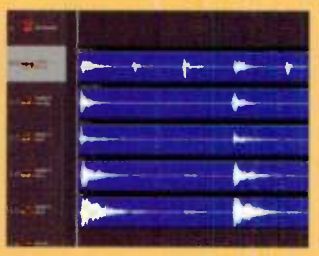
STEP-BY-STEP INSTRUCTIONS

1

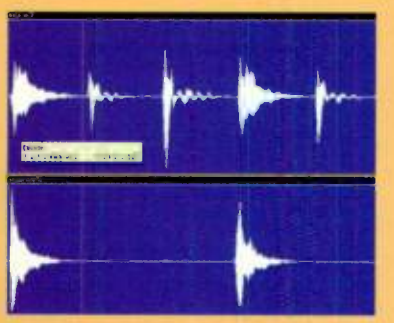


Notice how the kick and snare drum waveforms are shifted a little to the right of the eighth-note grid lines.

2

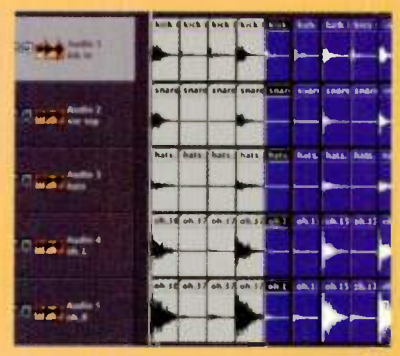
Assign each of the drum tracks to the same group using the channel strip drop-down menu under the track numbers.

3



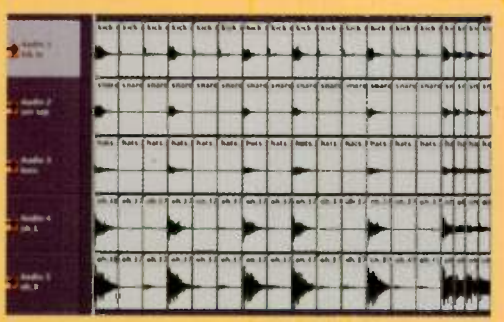
With the Scissors tool selected, hold the Option key and click at the first eighth-note grid line.

4



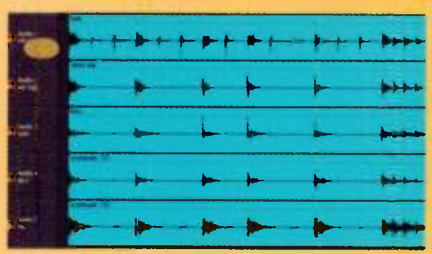
Align the region starts to the beginnings of the kick or snare waveforms. Then quantize the regions to eighth notes in the Event List.

5



Use Logic's Time Machine to time-stretch each region to an eighth note in length.

6



Use the Glue tool to merge the regions on each track back into one 2-bar region.

The beat should sound perfect now (see **Web Clip 3**). But Logic works harder to play many little chunks, so I glue each track into a contiguous region with the Glue tool. Alternatively, you can select all the regions on a single track and select Merge Regions Per Tracks from the Arrange window's Region pull-down menu. With either method, you need to disable the Group function; otherwise, Logic will mix the grouped tracks down to a single audio file. EM

EM WEB CLIPS

Mitchell Sigman is a Los Angeles–based musician. He plays keyboards in the classic '80s synth-pop band Berlin as well as fronting his own project, Celebutante.

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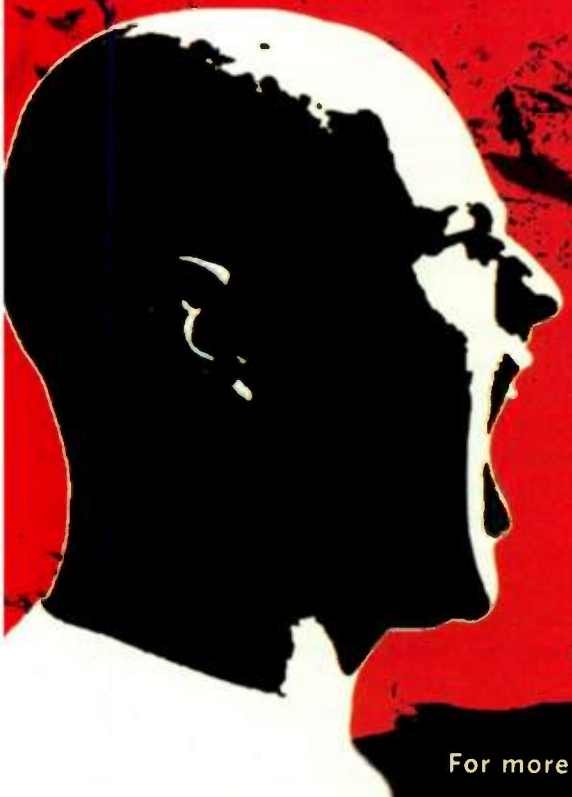

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Machine Tools

By Len Sasso

How to customize SFX Machine Pro presets.

SFX Machine Pro, winner of an EM 2007 Editors' Choice Award, takes a novel and somewhat quirky approach to effects design. One of the best ways to learn how to use it is to analyze and modify its factory presets.

I like to insert SFX Machine Pro as a prefader send effect, and then feed it an audio track holding a variety of short loops (drums, bass, keyboard, guitar, voice, and so on) and a virtual instrument with a simple sound (such as a sine wave). That gives me a broad range of material for auditioning changes, and I can use the track and return faders for before-and-after comparisons.

Soul of the Machine

SFX Machine uses eight identical signal-processing modules, each with a source, a single DSP process, two postprocess modulation routings, and an output. The source can be incoming audio or an internal generator, and you can mix in other modules' outputs. You can map all seven front-panel sliders to multiple module parameters, and you can apply MIDI remote control and host automation to them.

Load the Pitch ±100 Cents preset from the Pitch Shift bank; the sliders are assigned to pitch-shift, LFO rate, delay time, and output volume. Audition the effect while moving the sliders; the first three sliders affect pitch, and the output level pulsates. Next click on the Preset Editor button to expose the module layout (see **Fig. 1**).

All eight modules are in use, but the top and bottom rows are almost identical: the differences lie in the modulation destinations and oscillator phase settings. Notice that toggling module 7 out of the circuit increases the amount of pulsating. With module 7 on, the top and bottom rows crossfade, which is the purpose of the different phase settings. Leave module 7 off and concentrate on the top row.

FIG. 1: In the glitchless pitch-shifter, the top and bottom rows of modules render the same time-stretching process with a 180-degree phase shift.

What's Going On

When unraveling a preset, I start at the output—module 3, in this case. Module 3 appears to do nothing; it has no source, process, or modulator. That's a baffling but common SFX Machine trick. Module 3 actually gets input from module 2's top modulator, which is set to Mix with destination 3—meaning that it provides module 3's input. Module 3's amplitude is modulated by module 4 acting as a sine-wave LFO. Because amplitude modulation always applies at a module's input, you need to use module 3 to adjust module 2's output. Modules 4 and 8 are identical but 180 degrees out of phase, and that's how the crossfading is done. Here's why.

You pitch-shift by modulating module 2's delay time with the sawtooth LFO in module 1. The negative LFO frequency produces a ramp-down sawtooth causing the delay time to decrease. That results in linear time compression until the sawtooth resets, causing a glitch. Module 5's sawtooth is 180 degrees out of phase with module 1's, and the crossfading provides the deglitching. To calculate the pitch-shift ratio, multiply the settings of the first three sliders, divide by –50,000, and add 1 (see **Web Clip 1** for details).

Something Different

You can now make a variety of modifications. I like to assign the bottom-row ModAmp, Delay Time, and LFO Frequency numericals to their own sliders. That way you can crossfade between different pitches. If you use different LFO frequencies, the crossfade will also move in and out of phase.

You can add a process to modules 3 and 7. Resonant filters with cutoff modulated by the sine waves from modules 4 and 8 add an interesting auto-wah component. You might also change the waveforms of the module 1 and 5 oscillators, though that moves away from the pitch-shifting paradigm.

Use automation and real-time MIDI control of the sliders to add motion. And don't limit yourself to monophonic source material; pads and exotic ambiences make great sources. Percussion works well with long delays and slow, offset LFO speeds (see **Web Clip 2**). EM

EM WEB CLIPS

Len Sasso gives special thanks to SFX Machine creator Earl Vickers for patiently explaining many SFX Machine intricacies.

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How Your DAW Does Math

By Brian Smithers

Floating versus fixed—what's the point?

Desktop musicians have lived with computers and digital audio long enough to know how binary and decimal numbers relate to one another. Had humans developed with two fingers instead of ten, we might well consider binary numbers normal. Yet much of the number crunching that occurs within your audio software remains a mystery. For example, does your DAW treat audio as floating-point numbers or as fixed-point numbers? Do you know what the difference is, and should you really care?

The Fix Is In

Decimal numbers are known as *base 10* numbers because the meaning of each column is based on increasing powers of 10. The base, 10, is also known as the *radix*, and the dot that divides an expression into integers on the left and fractional values on the right is called the *radix point* (it's called the *decimal point* in the decimal system). The first digit to the left of the radix point represents the number of ones (the ones column); the second, multiples of 10 (10^1); the third, multiples of 100 (10^2); and so on. Each place represents another power of the radix, with the *exponent* (the number indicating the power) corresponding to the number of places to the left of the ones column.

Binary 1101 = decimal 13

8s place (2^3)	4s place (2^2)	2s place (2^1)	1s place (2^0)	
1	1	0	1	
1 × 8				8
	1 × 4			4
		0 × 2		0
			1 × 1	+ 1
			total	= 13

CHUCK DAHMER

FIG. 1: The binary number 1101 represents 8 (1 × 2^3) + 4 (1 × 2^2) + 0 (0 × 2^1) + 1 (1 × 2^0), or 13, in the decimal system.

The same pattern applies to the right of the radix point, but the exponents are negative. The first decimal place (tenths) consists of multiples of 10^{-1}; the second (hundredths), multiples of 10^{-2}; the third (thousandths), multiples of 10^{-3}; and so on. The negative exponent means the same as dividing 1 by that power of 10. For example, 10^{-3} is the same as 1 ÷ 10^3 or 1 ÷ 1,000—each means a thousandth. Yes, the ones place is multiples of 10^0—any number raised to the power of 0 is 1.

All of this is known as *fixed-point* arithmetic because the radix point never moves. The same principles apply in a binary system, but because the radix is 2, each place is an appropriate power of 2. The binary number 1101 represents 8 + 4 + 0 + 1, or 13, in the decimal system (see Fig. 1). Try not to think too hard about binary fractions or your head might explode—the same pattern of negative exponents applies.

Fixed-point arithmetic is pretty straightforward, but there are times when it is inefficient or limiting. In particular, describing very large or very small numbers in fixed-point notation is awkward. For example, as I write this, the U.S. national debt is reported to be $8,551,759,486,884.88. (No, wait—it just went up $3 million!) That's a long string of numbers and is usually therefore expressed as "$8½ trillion." Although the word *trillion* is not terribly meaningful to a calculator or a computer, it's a useful description for us because it makes a very large number more manageable visually and mentally.

Float Me a Trillion?

Floating-point numbers are good for expressing very large or very small numbers. For example, in floating-point parlance one would say that the Andromeda galaxy is about 2.1 × 10^{19} kilometers away. In fixed-point terminology, however, the distance must be expressed using a number that is 20 digits long: 21,000,000,000,000,000,000! To create a floating-point number from a fixed-point number, lop off the significant digits from the left of the expression (the *significand*, or 2.1 in this case) and specify how many places you needed to shift the radix point (19 in this example). The significand is sometimes called the *mantissa*, although some prefer to reserve that term for use with logarithms. The rest of the expression then indicates the magnitude of the number—how big (or small) this number really is. It consists of a radix and an exponent (which is effectively a zoom level). You may recognize this as the way your calculator represents very large numbers—through *scientific notation*, or decimal floating-point notation.

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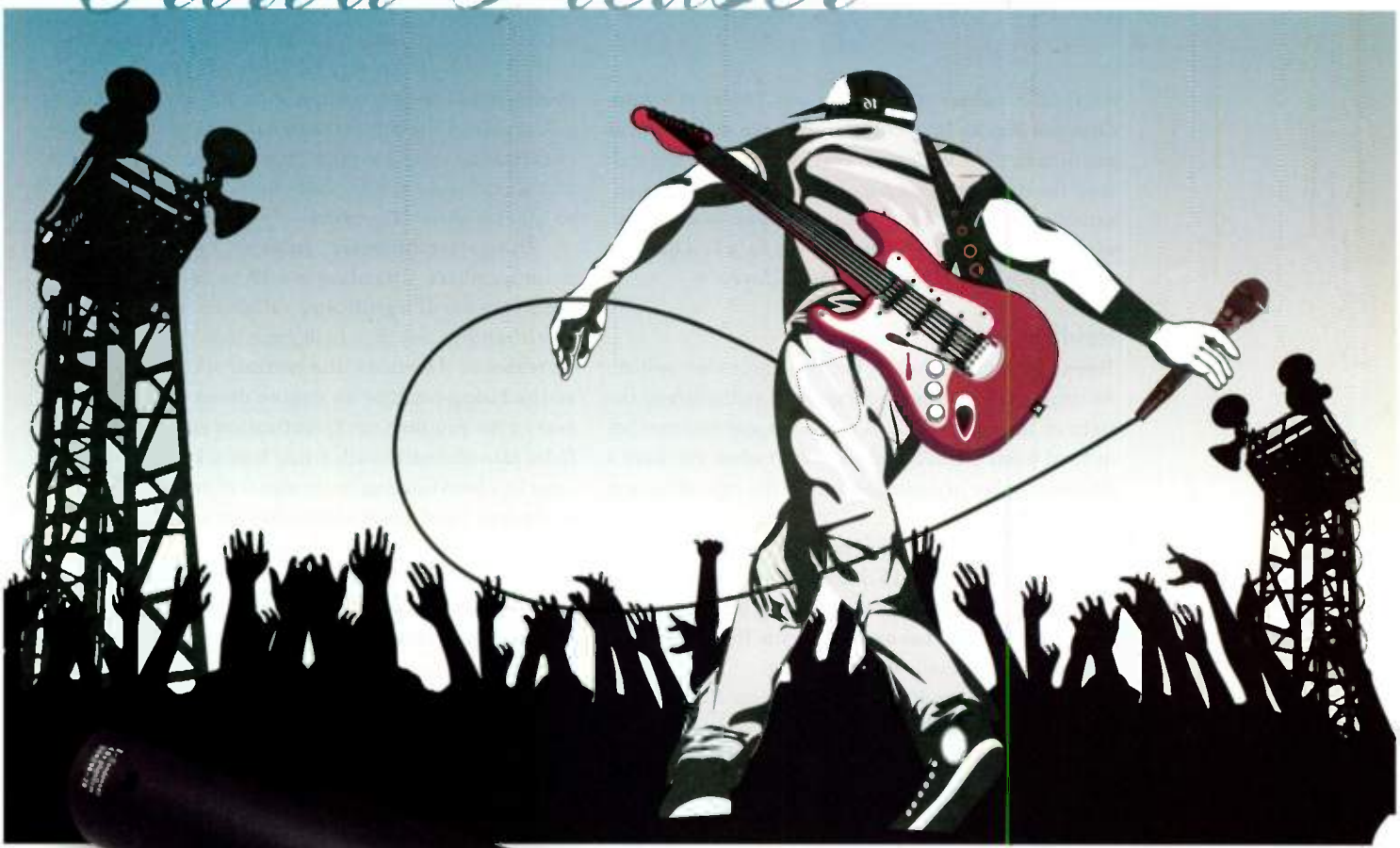

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The 32-bit floating-point numbers that most host-based DAWs use allocate 1 bit (called the *sign bit*) to indicate whether the number is positive or negative; 8 bits (256 values) of exponent; and 23 bits of significand (see **Fig. 2**). Interestingly, there are still 24 bits of *precision* in the significand. That is because a "normalized" floating-point number always has exactly one nonzero digit to the right of the radix point, and because with a binary number that can only be a 1, a bit isn't wasted on it. This is known as the *hidden bit*.

> Had humans developed with two fingers instead of ten, we might well consider binary numbers normal.

Reality Sets In

There's nothing inherently better about either system. As long as you can keep adding digits to the left or the right of the radix, you can represent any real number in fixed-point format. Problems start when you have a limited number of digits (or bits, in the case of binary) with which to work.

Consider the problem of adding the fixed-point decimal numbers 5,200 and 6,582 if restricted to using only four digits. The answer that one would like to come up with is 11,782, but that uses five digits. This is known as an *overflow* or, in audio terms, *clipping*.

The floating-point system presents similar challenges: $(5.2 \times 10^3) + (6.582 \times 10^3)$ should equal 1.1782×10^4, but if restricted to using only four digits of significand, the final digit (2) is lost. And if restricted to using exponents of no more than 3, there is an overflow. Clipping and loss of resolution are the omnipresent bugaboos of the math that makes our DAWs tick.

Both numbering systems present unique challenges and require unique solutions for handling overflow, resolution, and other quirks. The sound that a particular DAW has is due in part to the skills of the programmers who wrote the algorithms that decide how signals are summed, scaled, and otherwise manipulated internally. Given sufficient resolution, however, the differences between the two fade into relative obscurity. Modern DAWs often use *double-precision* arithmetic, meaning that fixed-point systems allow 48 bits to process 24-bit signals and that some floating-point systems allow 64 bits to handle 32-bit signals.

The other big distinction between the two systems is how they handle quantization error. Quantization error is the unavoidable result of the finite resolution of digital samples. When the measured voltage at an A/D converter or the result of a processing algorithm is between two numbers, you must round the result up or down to the system's resolution. Rounding very small fixed-point numbers (representing very quiet signals) results in very large errors relative to the overall signal level: rounding from 4.5 up to 5 is a 10 percent error! The louder the signal, the less significant quantization error becomes: rounding from 99.5 up to 100 is a 0.5 percent error and rounding from 999.5 up to 1,000 is only 0.05 percent.

Things are different, however, with floating-point numbers. Rounding is still more problematic with very small significand values than with large significand values. But each time that the exponent increases or decreases, the pattern starts over, just as the rising pitch of an engine drops and restarts every time you shift up. Quantization error no longer fades into obscurity with rising levels. It can be quite large in a loud floating-point signal compared with an equivalent fixed-point signal, but because the signal is loud, how apparent will the quantization distortion be? Some observers suggest that the absolute level of the quantization distortion is less significant than the fact that its level "pumps" with each change in exponent.

Resolution

The advantages of either system diminish with increased resolution, when more bits are available to buffer overflow and retain resolution. To put everything in perspective, you will get much more mileage from wise mic selection and placement than obsessing over the differences between fixed- and floating-point systems, and neither type of arithmetic will save a bad song. EM

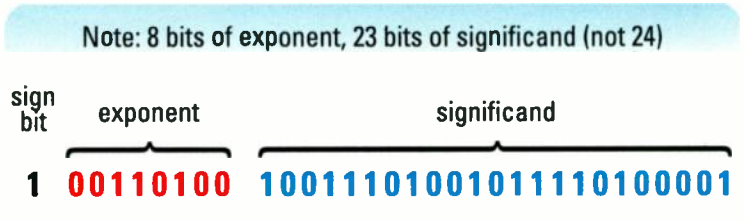

FIG. 2: Here is the anatomy of a 32-bit floating-point number: 1 sign bit (positive or negative), 8 exponent bits, and 23 significand bits.

Brian Smithers is a musician and educator in central Florida.

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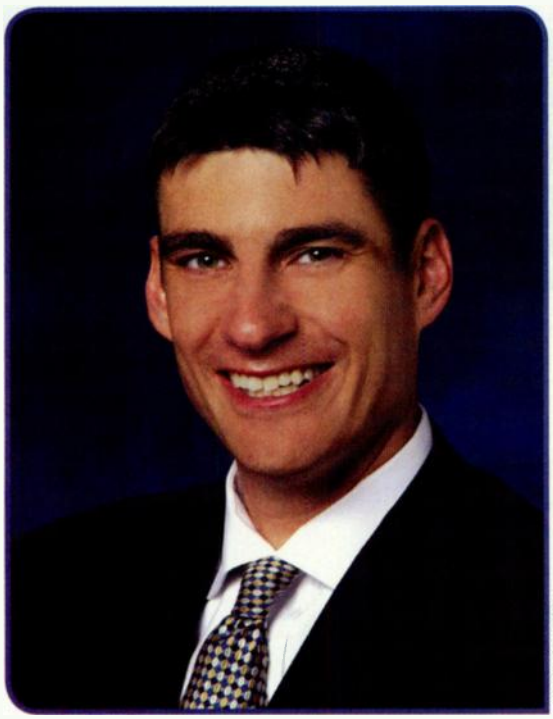
Q&A: Michael Petricone

By Mike Levine

Fighting the major labels over technology.

The first time I heard Michael Petricone (see Fig. 1) speak was at the CMJ Music Marathon in New York City last fall when we were both on a panel there. Petricone is a vice president at the Consumer Electronics Association, an industry group that represents manufacturers of consumer technology products. He talked about how the major record labels, through their industry group the RIAA (Recording Industry Association of America), were attempting to suppress certain types of digital technology, and how that could have a negative impact on musicians, especially recording musicians. Petricone's speech piqued my interest and led me to request an interview with him for this column.

Digital technology is at the center of many disputes between the major record labels and the manufacturers of consumer products. Can you give some background on that?



COURTESY CONSUMER ELECTRONICS ASSOCIATION

FIG. 1: Consumer Electronics Association vice president Michael Petricone says that the major record labels are stifling technologies that could benefit recording musicians.

What you see today is a situation where creativity is becoming democratized. All of a sudden, everybody can be a creator. You can make media, make movies, take pictures—you can make these creative works and then distribute them. And for a recording artist, the situation is even more advantageous.

Absolutely. The technology has opened up more avenues of creativity for musicians than ever before.

Huge. Unprecedented. If you think back over the past ten years, it's astonishing. And when you do what the major labels are trying to do—that is, put limitations on the ways that lawful people can create and distribute music and on what those devices can do—it hurts consumers, and it hurts the vast majority of musicians, who aren't affiliated with major labels.

When you talk about things that restrict a musician's ability to distribute, do you mean from a hardware standpoint?

Yes. For example, there's a lawsuit and a lot of legislation right now that's aimed at limiting and severely restricting the satellite-radio services XM and Sirius. XM is being sued by all the major record labels, and there's pending legislation that would try to prevent XM and Sirius from marketing receivers that allow you to record programming for later listening.

Why are the major labels doing that?

Because they want to squeeze every last penny out of the relationship. And XM and Sirius are startup businesses—they have huge overhead costs. Any time you have a national service that's based on launching satellites, it's very costly. [At press time the two firms announced a proposed merger.]

If the suit is successful, how will it harm independent musicians?

Surveys say that satellite-radio subscribers are spending more money on purchasing music and going to concerts; they're finding out about new bands from XM and Sirius, and then telling their friends. Services like XM and Sirius actually enable smaller artists and independents to finally get on the air. So any major-label initiative that

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would significantly limit or harm those services is not in the interests of artists.

Are the labels doing this to protect their monopoly and stifle indie competition?

They're in a business that's changing very fast, and that makes them nervous, understandably. That's what technology does; it is inherently disruptive. You see that happen every time a new innovation comes out that empowers consumers, starting with the player piano at the beginning of the 20th century. John Phillip Sousa literally went to Congress and said it was going to be the end of the music industry. He demanded that music publishers have a monopoly on building player pianos. All the testimony is out there. And the arguments that he used sound eerily similar to the arguments that are being used by RIAA today.

The major labels claim that digital technology is adversely affecting their business. What do you say to that?

Are CD sales going down? Sure. But look at ringtones. Ringtones now make up an $8 billion global business that didn't exist four years ago. And who would have thought that you could charge people $1 to download a song and $3 to download a 15-second snippet of a song? The point is that what happens in so many of these cases is that even as the business changes, digital technology opens up new opportunities.

But piracy is unquestionably occurring with regard to downloading and peer-to-peer networks.

There are certain things that we all agree on. One of them is that commercial piracy is wrong, illegal, and needs to be stopped. The other is that mass indiscriminate redistribution over the Internet—sending somebody's copyrighted work without their permission to a million of their "closest friends" with a push of a button—is wrong. Where my organization parts company with the major labels is on things like the satellite-radio issue, where we're talking about the consumer's right to use and enjoy their lawfully acquired music privately and for noncommercial purposes. That is legal and that's okay.

Can you give me some examples, in addition to satellite radio, in which they're trying to stifle technologies?

First of all, the satellite-radio issue is also important as a precedent. Once you establish a precedent that recording something for noncommercial purposes within the privacy of your home is something that can be regulated or stopped, that has all kinds of implications for products like TiVo. Right now, there are a large number of lawsuits against a variety of technology companies that are engaged in activities that are clearly not piracy. A lot of them are small companies. One of them is Kaleidescape, which builds a DVD jukebox that will allow you to load up your DVDs and then network them around your home. Another one is a company called Sima Products, which makes video-editing software. Everyone from small companies to large companies is facing litigation. Google is facing a lawsuit by publishers because of its project to index books. You see a lot of this litigation on IP [intellectual property] grounds. If you're a big company, you've got a hefty litigation budget and you can have the philosophy of "Whatever happens, happens." If you're a small company—even if you will probably prevail in the end—and the lawsuit goes to a decision, the legal costs are ruinous. That can be a very intimidating factor. We've heard firsthand from venture capitalists who are reluctant to fund new technologies; the last thing that any venture capitalist wants to invest in is a potential lawsuit.

Are Podcasts and services like YouTube under attack from the labels as well?

For Podcasters, there's a potential intellectual-property issue, and you need to be quite careful to clear the rights. And some major labels are more accommodating than others. For a lot of these technologies, the major labels are in a situation where their business model is shifting quite rapidly. They're transitioning from a time when selling music meant selling little plastic discs to a very different business, and they're trying to figure out how to deal with it. For example, if you're a major label and one of your artists posts a music video on YouTube and more people are seeing that video, is that a good thing or a bad thing? If somebody is using your song in a Podcast or posts it on a music blog, is that a good thing or a bad thing? I think they are honestly still trying to work through that.

Can you recommend anything for musicians to do to make their voices heard about that?

There's a new coalition called digitalfreedom.org that recently started up. The coalition says that artists need to be compensated and that piracy is wrong. But it also says that we need to avoid imposing limitations on new technologies; that they are immensely beneficial to artists, independent musicians, and the public at large; and that we should safeguard and promote them. So I would encourage musicians to get on digitalfreedom.org and take a look. And, certainly, if they agree, get active. EM

Mike Levine is an EM senior editor.

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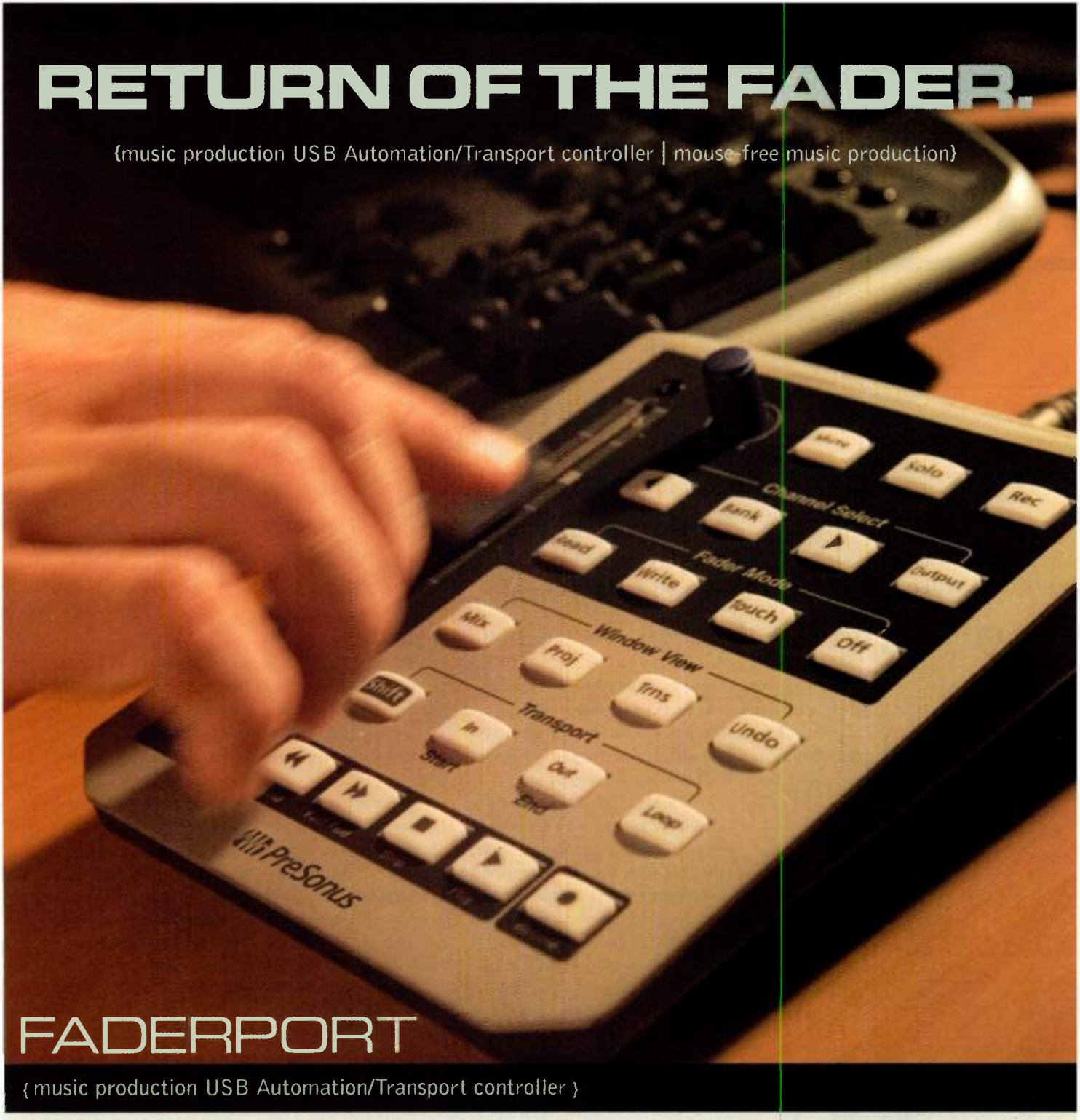

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NEUMANN USA TLM 49

A large-diaphragm condenser mic offering plenty of detail.

By Myles Boisen

While its competitors try to duplicate its most famous creations, Neumann is maintaining a steady balancing act of affordability, quality, and innovation as it mines new designs from its substantial historical legacy. With a nod to the past, the TLM 49 is Neumann's latest entry.

FIG. 1: The Neumann TLM 49 (shown here in its shockmount) combines a K 47 capsule with solid-state electronics to approximate the vintage character of a tube mic.

Although its chunky vintage look is quite similar to that of the original multipattern tube M 49, the TLM 49 is a solid-state cardioid microphone. There are no highpass or attenuation switches, and as with all TLM-series mics, the TLM 49 is transformerless. Its large triple-mesh grille encloses a K 47 capsule, as used in Neumann's original M 49 and U 47 as well as its newer M 147 and M 149 mics.

A sturdy metal-and-elastic suspension shockmount comes with the mic, increasing the value of this package (see Fig. 1). The TLM 49 is secured to the swiveling mount by a threaded metal ring and can be rotated from side to side within the shockmount basket. The shockmount can also be inverted, making it easy to position the mic at almost any angle. The microphone's diaphragm is internally shockmounted as well.

Highly Directional

The 8-page manual that comes with the TLM 49 is basic and doesn't highlight any special qualities or suggested applications. But in a conversation with Neumann product manager Dan Radin, I learned a few things about the mic that haven't yet been mentioned on the company Web site or in ads.

Radin explained that Neumann's goal was to "come as close to a tube sound as possible, but with semiconductors and phantom power instead of a tube" in order to avoid the cost of the tube power supply. According to Radin, the TLM 49's electronics provide an increase in even-order harmonics and will also break up like a tube mic would when faced with high sound-pressure level.

It is also worth noting that the TLM 49's polar response is very directional with respect to high frequencies. This gives the mic a more focused and tight sound, which tends toward supercardioid pickup, making it a good candidate for close-miking in ensemble situations.

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

Specifications tables for EM reviews can be found at www.emusician.com/specs.

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

Jenna Drey – TAXI Member – www.jennadrey.com

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

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

Who Hears Your Music?

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

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

A Record Deal With Lots of Zeros!

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

Madonna, Bowie, Jagger, and me!

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REVIEW

In one respect, Neumann has broken with tradition by not including a wooden case. The TLM 49 arrives in a heavy-duty cardboard box. The mic slips inside this box easily with the shockmount attached, and a protective inner box with a thick foam lining fits securely over the head grille.

With Voices and Winds

A pair of TLM 49 mics (serial numbers 208 and 222) were provided for this review, and over a period of a month, I used them in sessions at my Guerrilla Recording studio in Oakland, California. My first test was with vocalist Aurora Josephson, a classically trained singer. I set up the TLM 49 alongside a Blue Bottle mic with a B6 capsule—one of my first-call tube vocal mics—and recorded into a Digidesign Pro Tools workstation.

Comparing the results of this session, I was surprised to find that the two mics conveyed a similar overall timbre and flattering balance of warmth and presence. The Blue mic was a bit crisper and bigger sounding, sometimes adding lush airiness but also exaggerating sibilance in this case. The TLM 49 rendered sibilant consonants much more smoothly and realistically, which became a distinct advantage once digital reverb was added to the program.

The TLM 49 pair also scored points as a stereo room configuration up against a pair of vintage Schoeps 221b small-diaphragm tube mics. On a session with the Rova Saxophone Quartet, I picked the Neumann pair for its superior low-midrange tone, natural highs, and minimal coloration when the room pair was blended in with close mics.

The TLM 49's smooth tone was evident on an assortment of female singers, including one vocalist whose strong midrange doesn't usually fare well on presence-boosting tube microphones. On a variety of vocal sessions, the Neumann impressed me by consistently delivering a winning combination of warm tone and unhyped clarity. Fellow engineer Bart Thurber achieved good results on male rock singers as well, and characterized the mic as "neutral and on the warm side."

The TLM 49 does need to be used with a windscreen, however. Despite its multiple-layer grille, the mic was prone to popping when used in close proximity with one singer-songwriter.

Around the Drums

Another role in which the TLM 49 excelled was as a room mic for drums. On a few different sessions in my wood-floored drum room, this mic delivered a huge ambient sound that mixed perfectly with the close-miked kit. When placed close to and outside the kick drum, the TLM 49 added low-end heft without muddiness or a lack of focus. Thurber gleefully described this bass drum effect on one of his rock sessions as a "wallop."

In the wake of these successes, I also tried the TLM 49 on a live drum tracking session with the Afro-beat band Aphrodesia. On djembe and conga drums, the Neumann delivered woody, natural tone and also displayed above-average rejection of a full drum kit just 10 feet away. When mixing, I did have to add minimal high-frequency shelving EQ to bring out the attack on these hand drums.

On a later Aphrodesia date, the TLM 49 provided one of the best baritone sax sounds I've ever gotten in the studio. It also did a nice job as a room mic for a 4-piece horn section. Once again the distant TLM 49's timbre mixed beautifully with close mics and needed little or no equalization. On other sessions, the TLM 49 got high marks when used to record tambourine and a Leslie cabinet.

Speaker in the House

To gain further insight into the sound of the TLM 49, I conducted some controlled loudspeaker tests. For these trials, test tones and mixes were played through mastering monitors (Dynaudio BM 15s), which were miked at a distance of 15 inches. A Millennia Media HV-3 preamp was paired with the test mics, and the audio was recorded through one mic at a time into a Pro Tools workstation at 24 bits, 48 kHz.

The two TLM 49 mics were very closely matched during sweep tone and full frequency mix tests. In my judgment, this mic pair could be used without reservation for critical stereo recording. Neumann's M 147 and TLM 103 microphones were also included in the loudspeaker tests. Output levels and self-noise were very similar for all these Neumann models.

The TLM 103 is a good all-purpose mic that I use frequently around the studio. Compared with the TLM 103, the TLM 49 had a flatter response with a more detailed midrange and less presence boosting. Depending on the application, it could be heard as having either a fuller or duller sound relative to a brighter mic like the TLM 103. On a hip-hop mix, the TLM 49 also possessed a punchier midbass response, bringing out a desirable range of electric bass and kick drum without adding muddiness.

Relative to the tube M 147, which also uses the K 47 capsule, the TLM 49 was a closer timbral match throughout the frequency spectrum. Each of these two mics treated the midrange a little differently, emphasizing distinctive aspects of vocals, snare, and chordal instruments on a variety of mixes. Overall I found the TLM 49 to be more open, airy, and dimensional—more hi-fi, if you will—while its tube-based cousin yielded more of a colored and compressed sound.

The TLM 49's major strength is a realism that makes it as versatile as it is sweet sounding.

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The published frequency chart in the booklet shows the TLM 49 to have a flat response from 100 Hz to 15 kHz within ±2 dB, with the exception of about a 3 dB boost at 5 kHz. The response is down roughly –6 dB at 30 Hz and 20 kHz. An individual frequency trace was not provided with each mic. My experience with the TLM 49 is that it is, indeed, very flat and particularly smooth in the high end compared with most condenser mics designed for vocal use.

I noticed no distortion or tube mic–like breakup under any conditions, including close-miked vocals and the aforementioned drum recordings. Impressive specs like a 98 dB dynamic range (at 0.5 percent distortion) for the mic amplifier make audible distortion a fairly remote possibility.

The TLM 49 is heavy and bulky, weighing in at almost 2 pounds. The addition of the suspension mount makes the unit a little awkward to handle. As with heavier ribbon and tube mics, extra care is recommended when mounting this mic, especially on a boom arm.

Easy Listening

During the review period, I used the TLM 49 on a wide variety of sources and never once felt compelled to change it. Overall, Neumann's new model sounded remarkably natural, conveying exceptionally smooth high-end clarity and plenty of tone.

Normally I wouldn't compare tube and solid-state transducers in a review, except to illustrate a point. And in the case of the TLM 49, the point is that regardless of whatever electronic magic Neumann has concocted, this mic can indeed hold its own alongside top-dollar tube mics on revealing sources such as vocals and saxes.

That's not to suggest that the TLM 49 is capable of replicating the quirks or coloration of an old tube mic. Rather, the TLM 49's major strength—though it is undeniably warm and easy on the ears—is a realism that makes it as versatile as it is sweet sounding. Contributing factors in this mic's stellar performance include ultraclean electronics, excellent specs, good off-axis rejection, and neutral off-axis pickup.

My only gripe with the TLM 49 package is that a wooden case is not included. For those like me who are hooked on the old-fashioned Neumann touches, an M 149 case is a perfect fit and still available as an optional accessory for $195. Of course, the included shockmount is an attractive bonus and arguably more useful than a fancy box for those who have to keep an eye on the bottom line.

Despite (or perhaps because of) all the quality-oriented small microphone companies nipping at its heels, Neumann is still finding new and exciting ways to improve microphone technology. Its TLM 49 is a winner, and I expect to be raving about it for a long time.

Myles Boisen transduces frequently at Guerrilla Recording and the Headless Buddha Mastering Lab in Oakland, California.

PRODUCT SUMMARY

NEUMANN USA TLM 49

large-diaphragm microphone
$1,699

AUDIO QUALITY	5
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Warm sound without exaggerated presence. Excellent specs. Suspension shockmount included. Vintage styling. Consistency of the unmatched pair was sufficient to allow for critical stereo recording.

CONS: Comes in a cardboard box instead of a wooden case.

MANUFACTURER
Neumann USA/Sennheiser Electronic Corp. (distributor)
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FIG. 1: Like other software built on the HALion Player platform, HALion Symphonic Orchestra is 16-part multitimbral and allows you to route each part to individual stereo outputs.

STEINBERG HALion Symphonic Orchestra (Mac/Win)

Balancing economy with expressivity.

By Geary Yelton

For at least as long as synths and samplers have existed, musicians have aspired to putting an orchestra on their desktops. Achieving that goal has been a gradual process; sampling techniques have improved, realism has increased, and large sample libraries have become more affordable. Software instruments focusing on complete orchestras and priced under $300 are available from developers such as Garritan and MOTU. At the other end of the spectrum, premium virtual orchestras that cost $2,995 and up are available from Vienna Symphonic Library, SoniVox, and EastWest.

Taking the middle ground, Steinberg's entry is HALion Symphonic Orchestra (HSO), a sample library paired with a custom version of HALion Player. Composer Claudius Brüse is largely responsible for HSO's content. He's the developer behind Steinberg's HALion String Edition and The Grand, and HSO borrows much of its content from the former. Because HSO is built around HALion Player, it offers advantages such as real-time disk streaming and the ability to delete unused samples from RAM.

HALion Player is 16-part multitimbral, allowing you to load as many as 16 instruments or ensembles in a single plug-in. If you need more and your computer can handle it, you can open additional plug-ins. HSO supports AU and VST on the Mac and DirectX and VST in Windows, and it runs as a standalone application that supports ReWire.

Opening Night

I installed HSO on my dual-processor 2.3 GHz Apple Power Mac G5 with Mac OS X 10.4.8, 4 GB of RAM, and a 16× SuperDrive. I ran HSO standalone and as a VST plug-in in Steinberg Cubase SX 3.1.1 and an AU plug-in in Apple Logic Pro 7.1.1 and MOTU Digital Performer 4.61.

Four DVDs contain installers for the standalone version, plugs-ins, and sample content. After running the installer for the application and plug-ins, I ran separate installers for HSO's 16- and 24-bit content; you can install either or both. It took about an hour to install all the content, which added up to about 27 GB. If your computer is connected to the Internet, you run Syncrosoft's License Control Center application to authorize a Steinberg-compatible USB key (which is not included) using a code that comes with the software.

Across the Board

Like other HALion Player–based instruments, HSO's graphical user interface presents you with 16 Program Slots, each with a pull-down menu for loading programs

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and fields to specify MIDI channel, volume, panning, and output (see **Fig. 1**). Clicking on a button in each slot selects that program for editing, and a Category field lets you narrow down the listed programs to a particular instrument type, such as brass or woodwind.

A sound-editing section below the Program Slots contains eight soft knobs called Q Controls, and the selected program determines which parameters they control. In addition to standard parameters such as Attack, Velocity, and Pan, Q Controls provide hands-on access to parameters such as Body, Air, and Ambience. The manual doesn't explain every parameter, but you can quickly gain a feel for their effects by experimenting with them. Two additional knobs control volume and tuning for all parts simultaneously. A small display tells you how many voices of polyphony are being used. On the far left are a virtual LED indicating when effects are applied and a button to disable them.

The large Options button opens the Player Options dialog box, in which you can specify parameters concerning RAM allotment, sampling quality, and MIDI controller assignments (see **Fig. 2**). A pop-up menu lets you assign crescendo control to one of four MIDI sources. You can also assign MIDI Control Changes (CC) to the eight Q Controls, but I discovered a minor bug when I tried to scroll through a list of MIDI CCs: the scrollbar didn't work. Fortunately, I could use MIDI Learn to assign controllers.

Clicking on a slot's Program menu reveals an alphabetical list of choices. If you prefer to view instruments grouped into folders by family and type, you can select Show Content By Category in the Player Options dialog box (see **Fig. 3**). When that option is selected and you click on a slot containing a program, the folder containing the current program is open by default, which is quite convenient when you're choosing from similar articulations of the same instrument.

Clicking on HSO's onscreen keyboard lets you audition sounds at any Velocity, depending on where you click. The keyboard displays sample mapping for the currently selected program in alternating blue and green groups. Keys designated as keyswitches are labeled *ks* if they toggle and *kr* if they're momentary. To the keyboard's left, a Disk LED glows green when samples are streaming and red when they're unable to load quickly enough (I never saw that happen). Beneath that is the RAM Save button, which deletes any unused samples from RAM—a handy way to conserve computer resources.

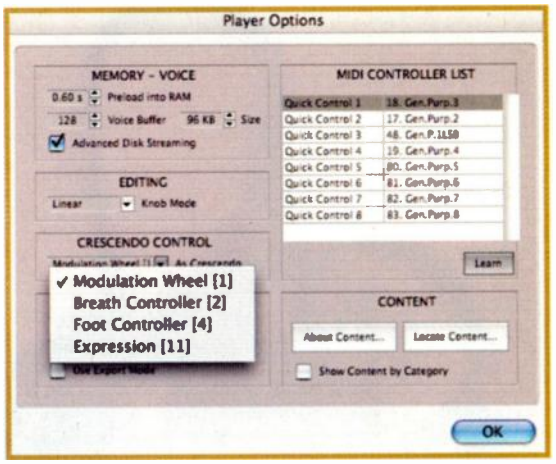

FIG. 2: Clicking on the Options button opens a dialog box in which you can assign MIDI controllers and make adjustments that affect HSO's demands on your computer.

Expressive Types

HSO offers several techniques for changing articulations on the fly, thereby allowing you to control musical expression in real time. It provides four main program types, each with its own method for playing different layers and controlling volume. Any program type may incorporate keyswitching.

XFade programs let you crossfade between layers using whatever controller you assign to control crescendos. Because the controller affects loudness, you won't hear anything until you engage it. The same can be said of XSwitch programs, which instantly switch from one layer to another whenever the controller's value crosses a threshold.

Note On Velocity controls expression in Velocity programs (labeled Vel). Like most multisampled instruments, Velocity programs select which layer to play in response to how hard you strike the keys. This technique sacrifices the ability to change layers continuously as a note sustains. Another option is Velocity with Pitch Bend (labeled VelPB), which lets you select the initial layer using Velocity and then control volume using Pitch Bend. Obviously, you lose the ability to bend pitch, but that's of limited use in most orchestral music anyway.

Performance Enhancement

You can improve your computer's performance by using 16-bit samples while assembling tracks, because they make fewer demands on your CPU, RAM, and hard disk. Then, when it's time to render tracks to audio, you can

PRODUCT SUMMARY

STEINBERG HALion Symphonic Orchestra

virtual orchestra

$749.99

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

RATING PRODUCTS FROM 1 TO 5

PROS: Impressive flexibility at a reasonable price. Fully multitimbral. Abundant string articulations. Resource-saving features.

CONS: No harp, muted horns, or contrabassoon. No woodwind groups. Scroll-bar bug.

MANUFACTURER
Steinberg
www.steinberg.net

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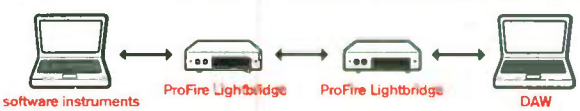

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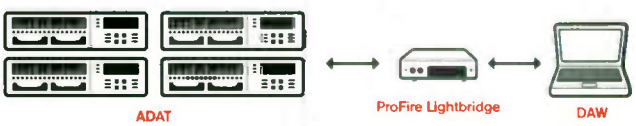

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switch to 24-bit versions of the same programs for better quality. In addition, many programs are available in Eco versions, which require fewer resources.

HSO also lets you specify certain system values that affect computer performance, such as the maximum polyphony, the size of the voice buffer, and the length of samples preloaded from disk into RAM. Distributing the sample content on more than one disk can also improve performance, assuming your hard disks are equally fast.

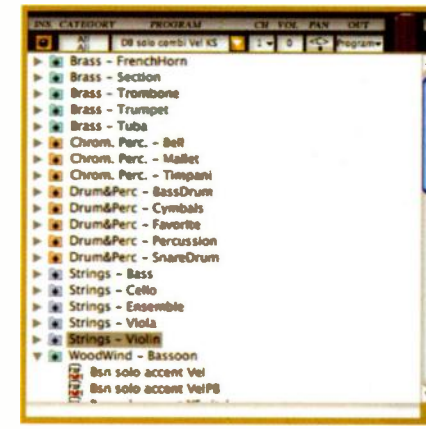

FIG. 3: You can choose to either list all programs alphabetically or, as shown here, list them grouped into folders by instrument category.

Traditional Families

HSO's content focuses on the four primary orchestral families—strings, brass, woodwinds, and percussion—and provides solo instruments and ensembles in each family. The only orchestral instrument conspicuous in its absence is harp.

All four instruments in the string section are well represented in both solo and tutti forms. Legato and spiccato violins, violas, and cellos each supply two alternate versions, labeled A and B, which you can use to play divisi parts or to double a section's size without layering the same samples. Several programs use keyswitches to alternate bowing between up- and downstrokes.

Violin offers the greatest number of articulations, including short, fast, tremolo, trill, pizzicato, and staccato variations, among others. Two programs let you use the mod wheel to transition from 16 to 32 violins. Viola, cello, and double bass have almost as many articulations, with enough timbral variety to keep things interesting (see **Web Clip 1**). In ensemble programs, different string sections are mapped across the keyboard, and pads furnish layered groups of strings with very slow attacks.

HSO's brass instruments cover French horn, trumpet, trombone, and tuba, along with sections combining them. Although articulations include legato, staccato, accented, crescendo, diminuendo, loud, and soft, there are considerably fewer choices than with strings, and no muted horns whatsoever. Trumpets and trombones are available solo and in groups of three; French horns are solo and in groups of four. Some programs contain brass ensembles, most comprising a trumpet and a trombone or three of each.

Woodwinds supply bassoon, clarinet, English horn, flute, oboe, and piccolo, but no contrabassoon. All wind instruments are solo, and most provide a broad selection of articulations, with an especially good collection of trills. Only the English horn gets short shrift, with no more than legato and staccato variations. And although real orchestras often group bassoons, clarinets, flutes, and oboes in threes, HSO's only woodwind ensembles are splits, with bassoon in the lower octaves, clarinet and oboe in the middle, and flute on top.

HSO divides percussion instruments into two categories, Chromatic Percussion and Drums & Percussion. Chromatic Percussion comprises small bells, tubular bells, glockenspiel, vibraphone, xylophone, and timpani. Drums & Percussion includes large and small cymbals, bass drum, a small collection of snares, and assorted percussion such as sleigh bells, tam-tam,

World Radio History

triangle, and woodblocks. The Velocity layering is especially effective on the cymbals (see **Web Clip 2**). I appreciated the inclusion of snare rolls, bass drum rolls, and cymbal rolls, which many sample libraries overlook. A Percussion Ensemble program maps different instruments across the keyboard, with several notes assigned to each.

Where appropriate, programs for all instrumental families include release samples that contribute to their realism. In addition to natural decays, they capture a slight amount of room sound. If you need more, you usually have the option of using Q Controls to specify the depth, time, and volume of ambience.

Although it doesn't explain every parameter, the manual is quite helpful, and it features a brief introduction to arranging for orchestra. It also furnishes a tutorial on reconstructing the beginning of Schubert's Unfinished Symphony. The installation disc contains project files and PDFs of the score to accompany the tutorial, and the result sounds quite convincing (see **Web Clip 3**).

Disproportionately Cool

HALion Symphonic Orchestra is an essential program that fills the niche between budget-minded and high-priced premium virtual orchestras. It works very well as a tool for orchestral composition and production in a variety of applications, from film scoring to fleshing out rock arrangements. Virtually all the instruments sound realistic enough to fulfill most musical duties for which you're likely to need them, but the strings are the real star of the show. They have the broadest selection of articulations, and the means to impart expression is well implemented.

Considering the consistently high quality and sheer volume of the included content, you get a lot for your money. To sweeten the deal, a cross-grade offer gives you a $450 discount off the retail price if you already own certain software, including almost any virtual orchestra that comes to mind. HALion Symphonic Orchestra doesn't deliver the depth of virtual orchestras costing several times more, but it is probably the best you'll find for under $1,000.

EM WEB CLIPS

EM associate editor Geary Yelton lives in Charlotte, North Carolina.

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FIG. 1: Korg's D888 is a capable digital mixer and recorder intended for live use. It combines eight XLR and eight balanced/unbalanced TRS inputs with 3-band EQ per channel strip and a 40 GB internal hard drive.

KORG D888

This mixer-recorder offers more than meets the eye.

By Mark Nelson

Korg's D888 Digital Recording Studio is an unassuming digital recorder designed to record eight tracks of audio from mics or line sources while feeding a front-of-house mixer. This eliminates the need for a splitter box—in fact, the D888 can even serve as your main mixer. I recently took one for a spin, and I was impressed.

The D888 doesn't look like your average DAW; it appears to be a basic 8-channel mixer (see Fig. 1). Although it has some of the features of a desktop studio—virtual tracks, minimal editing and mixing functions—it is really intended for live use. Eight XLR and eight balanced/unbalanced TRS inputs run along the top of the unit. You can switch phantom power; a fat red LED glows comfortingly to remind you of the status. Each channel strip consists of a trim (input-gain) knob, three fixed band EQs (10 kHz, 2.5 kHz, and 100 Hz), and a single effects send and pan pot—no confusing soft knobs here. The 60 mm nonmotorized faders are short but feel solid.

The D888 features a single effects engine with a rotary selector knob similar to those on inexpensive mixers. Reverb choices include hall, arena, cathedral, club, and the ever-popular garage, and you get a handful of echoes and delays. Although you can use the effects to sweeten your mixes, their main function is to add ambience in live applications.

The Parameter knob affords a modicum of control over reverb and delay times, and there's a button to turn the effects on or off globally. Effects sends are postfader—the effects feed the master bus. In other words, you cannot record a track with effects, even accidentally. You can always patch an effects unit in front of the input if needed. But most pros save effects for the mix, which is where they show up here.

The output matrix is where things get interesting. You can either send each individual channel to a direct out, which is handy for feeding your main front-of-house mixer (oddly, these are prefader but post-EQ), or send stereo main and monitor signals (see Fig. 2). Note that the monitor outs get exactly the same signal as the mains; a small rotary knob controls monitor volume. All outputs are unbalanced ¼-inch TS operating at –10 dBu.

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You also get two ¼-inch stereo headphone outs, each with its own volume pot. Nice.

A S/PDIF optical output taps the main bus; use this to feed a stereo recorder, for example. The D888 must be the master clock—44.1 kHz is the only option. (The digital output sends 24-bit audio even though the files contain only 16 bits of information.) When the mixer is configured to send direct outs, the digital output draws from channels 3 and 4, while the phones monitor channels 1 and 2. I can't think of a situation where this would be useful; too bad you can't assign them as needed.

Record This

The D888 is a basic, easy-to-use little mixer suitable for small bands in small rooms. The only clue to its secret identity are transport buttons for standard recorder functions. A 40 GB hard drive is poised to handle eight tracks of simultaneous recording, each with up to eight virtual tracks. Files are written as mono WAV files for easy compatibility with DAWs. The only resolution supported is 16-bit, 44.1 kHz.

Recording time is approximately 124 hours, which translates to 15.5 hours using all eight tracks. The maximum is six hours per song, surely enough for even the most self-indulgent singer-songwriter.

Recording couldn't be easier: arm a track and press Record. It takes a long time to write data after you hit Stop; plan ahead when recording live, or you may miss an intro while the recorder is tied up.

None of the EQ, effects sends, or fader moves affect the recorded signal. This is what makes the D888 so great: use it to capture tracks before they go to the main house mix. My only quibble is that eight tracks are not enough to record drums without a submixer or seriously minimalist mic techniques.

The MIDI Out port sends MTC (30 fps, nondrop only) to an external sequencer or recorder. Too bad there isn't a MIDI In as well; I'd love to be able to slave a second D888 to increase the track count (see the sidebar "Freewheeling Frank's Low-Budget Sync Trick").

Although the D888 is clearly designed for live use, a metronome keeps you on the beat when overdubbing. Basic repeat, rehearse, and autopunch functions are easy to use. Sadly, punch-ins are not crossfaded, so you'll hear an annoying glitch if you aren't dead on the mark.

Finding Your Way

If you've ever been confused by overly complex digital recorders, you'll love the D888. You handle most chores without ever entering a menu. And when you need to, it's simplicity itself: to set the metronome, press a button labeled Metronome; to return to the meters screen, press Level Meter. Easy. Ah, but where's the Track Edit button? Turns out editing functions are grouped under the Menu button, along with more generalized housekeeping tasks, such as setting the LCD contrast.

The level screen displays absolute or SMPTE time

FREEWHEELING FRANK'S LOW-BUDGET SYNC TRICK

Here's a way to record with two D888s using a variation on an old analog-recorder trick. In the days before reliable synchronization, enterprising engineers would occasionally let two recorders *freewheel*, or run independently, then combine the results by ear. The recorders ran at slightly different speeds, and the small variations often created a cool sound effect. Here's a step-by-step guide to the technique using a digital audio editor.

1. Plan the recording to duplicate one or more tracks on each recorder. Instruments with strong attacks are best; kick and snare drums are ideal. Vocals with count-offs are another good bet.
2. Start recording well before the downbeat or count-off.
3. After the session, load all of the tracks into your DAW. Be sure to keep those from each recorder together.
4. Choose one set of tracks as the reference; these will stay put. Select all of the other tracks so you can move them simultaneously.
5. Zoom down to the waveform level and slide the tracks around until the downbeats on the identical tracks line up. Be sure you have selected all the tracks that need to move; if one gets away from you, undo and start over.

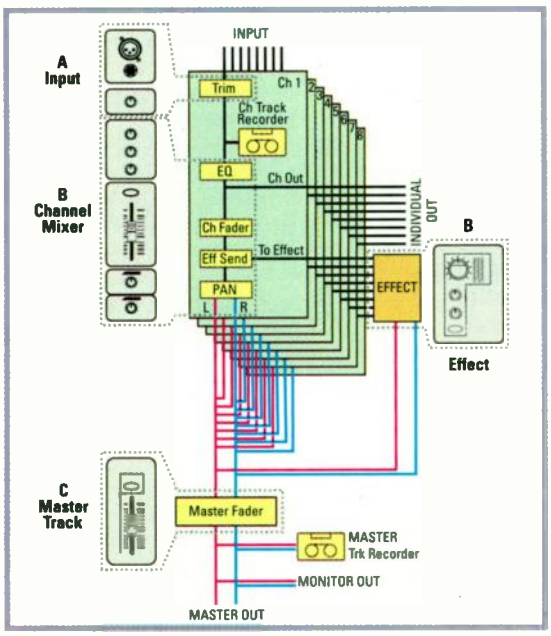

FIG. 2: This figure illustrates the flexible audio signal flow of the D888.

ADAPTED FROM D888 MANUAL COURTESY KORG

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(though you cannot slave to another device) as well as time remaining on the drive. In addition, you can select duration for the meter's peak-hold function. The display is quite small but adequate. Dedicated meters would be welcome, particularly because the meters disappear when you select different screens.

You add fader moves, EQ, and effects in real time when bouncing to consolidate tracks or mixing down to a stereo master track. Incidentally, although effects, EQ, and fader levels are stored with your song, there is no way to reset the physical controls to match the virtual ones.

DAW Lite

The D888 includes a handful of basic track operations, such as rename, copy, track swap, erase, and delete. You can't move regions around, so erasing a chunk of audio simply leaves a hole. Nor can you slice and dice multiple tracks, which makes whole-song edits tedious. Undo and redo are limited to the last action.

You can mix on the recorder, but here you are limited by the single effects engine and lack of essential tools such as compression and parametric EQ. You're better off using the USB 2.0 port to send tracks to your computer for serious editing and mixing. You can also send your edited tracks back to the D888, for example, for use as backing tracks, as long as you don't violate Korg's naming conventions.

Got Live . . .

If you can get by with only eight tracks, the D888 is great for capturing live recordings. It's a capable but basic live mixer that eliminates the need for costly mic splitter boxes and cables. The lack of higher sampling rates or bit depths really isn't an issue. After all, 16-bit, 44.1 kHz remains the CD standard.

Although Korg included some basic editing and mixing functions, the D888 really isn't intended as a desktop studio. So if that is what you need, look elsewhere. However, the D888 is so easy to use that it might just be the ticket if you are turned off by more complicated recorders. I applaud Korg for coming up with such a simple interface. Sure, you miss out on features like automated mixing, moving faders, and oodles of effects. But anyone who has used a club mixer or a cassette studio will have no trouble figuring out the D888.

My wish list is fairly short. I'd like some way to slave multiple units together to record bigger bands and drums. Balanced outputs and more flexible routing for the phones and digital out would be useful. It would be great to be able to solo individual recording tracks too. But these things would add to the cost and make it more complicated to use. Bottom line? If you have been looking for an inexpensive way to record your band live, check out the D888.

Acoustic musician Mark Nelson is the author of Getting Started in Computer Music *(Thomson Course Technology, 2005). You can see what else he's up to at www.mark-o.com.*

PRODUCT SUMMARY

KORG D888

portable digital studio
$800

FEATURES	3
EASE OF USE	4
AUDIO QUALITY	3
VALUE	3

RATING PRODUCTS FROM 1 TO 5

PROS: Easy to use. Fills a unique niche. Eliminates much of the hassle of remote recording.

CONS: Eight tracks are not enough for drums. No balanced TRS outs. No monitor send for individual channels. Insufficient editing functions.

MANUFACTURER
Korg USA
www.korg.com

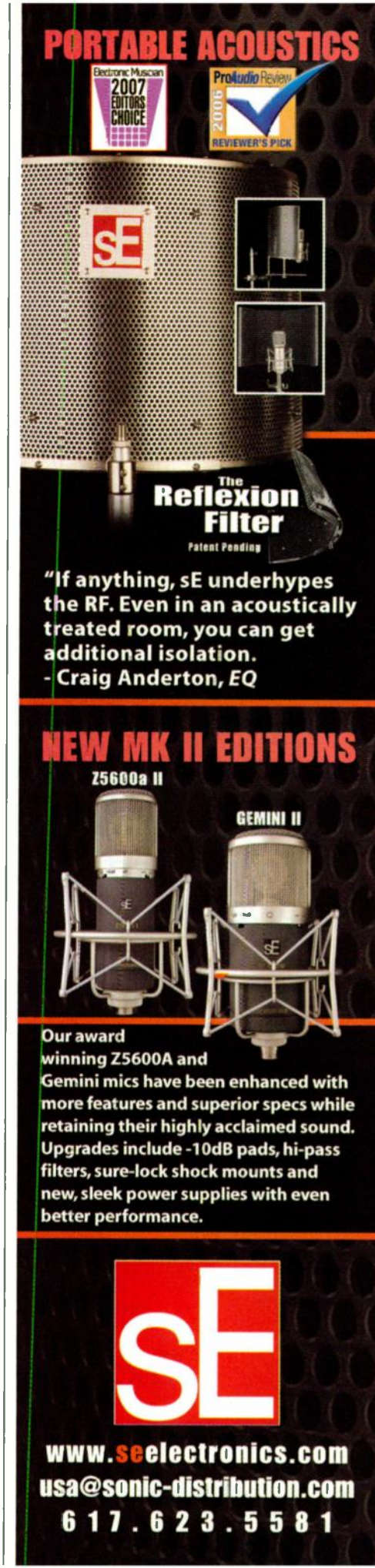

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FIG. 1: Uniquel-izer gives you control over how many bands and what types of filters you want to use.

ROGER NICHOLS DIGITAL Pro Bundle (Mac/Win)

Four powerful and deep plug-ins.

By Mike Levine

A lot of companies attach the word *pro* to the names of their products in an attempt to hype them. In the case of Roger Nichols Digital's Pro Bundle, no hype is necessary—these are professional plug-ins in every way. The bundle is not cheap, and some of the plug-ins take a while to learn. But they all offer a deep level of functionality and excellent sound, are fully automatable, and come with presets from Roger Nichols himself.

The Pro Bundle plug-ins were all formerly released by Elemental Audio. Roger Nichols Digital reached an agreement with Elemental Audio last year to distribute these plug-ins and develop new ones together (the recently released Detailer is one example).

The four plug-ins in the bundle are Uniquel-izer (formerly Equim), an all-around EQ; Frequal-izer (formerly Firium), a linear-phase mastering EQ; Dynam-izer (formerly NeoDynium), a very flexible dynamics plug-in; and Finis (formerly Finalis), a brickwall limiter. The bundle is available in a number of native formats, including AU, VST, and RTAS for the Mac and VST for Windows. The plug-ins are also available separately.

Unique Indeed

One of the real go-to plug-ins in the bundle is Uniquel-izer (see **Fig. 1**), an extremely customizable EQ. You can configure it with as many or as few bands as you want, and choose from a large range of filter types, including parametric, low and high shelving (two types each), lowpass, highpass, bandpass, harmonic, and notch. If you set up Uniquel-izer to use only the bands that you need, you can keep CPU usage low, enabling instantiation on numerous channels.

There's a vertical display on the right called the Cloud Meter.

As with all the plug-ins in the bundle, user controls abound. On a stereo instantiation of Uniquel-izer, you can split a band into left and right components and treat each

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side separately. The plug also lets you solo any filter that you're using to hear its effect, and separately control the left and right outputs. You can customize the main frequency display and even zoom in on it.

Uniquel-izer's wide array of filters gives it a Swiss Army knife functionality. From parametric and shelving EQ for typical channel adjustments to more-specialized applications like notch filtering, Uniquel-izer can do it, and it always sounds really good.

I was particularly enamored of its harmonic filters, which accentuate or cut fundamentals and odd and even harmonics. According to Roger Nichols Digital, the harmonic filters can be used for enhancing bottom end. I found them useful for tuning drum sounds to match the key of a song, and as a sound-design tool.

The presets range from channel EQ setups to hum removal and telephone EQs. If you're looking for a flexible and excellent-sounding EQ that you can use in a range of situations, Uniquel-izer is a great choice.

Freak Out

Frequal-izer is a linear-phase mastering EQ and, as such, uses Finite Impulse Response (FIR) filters for its processing. These filters make it less susceptible to phase shift than a conventional equalizer and therefore more transparent. The trade-off is that Frequal-izer (like any linear-phase EQ) is also more CPU intensive and may cause latency in your system. RND recommends it mainly as a mastering EQ.

Frequal-izer's greatest strength is its extremely flexible user interface. It offers 50 frequency control points (see Fig. 2) that can be graphically adjusted with the flick of your mouse. It also has a real-time frequency readout that appears in the same window, letting you quickly see the spectrum of your source material.

To make adjustments, you can grab and drag individual points or simply draw in the graph with your mouse pointer and the control points will follow in the shape that you drew. It's really easy to use and gives you pinpoint control. You can't choose from different filter types, but you can draw in whatever types of curves you want.

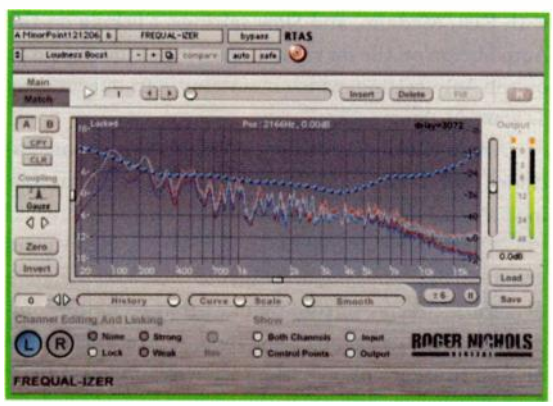

FIG. 2: You can set Frequal-izer's 50 EQ bands by dragging them or just by drawing in a curve with your mouse.

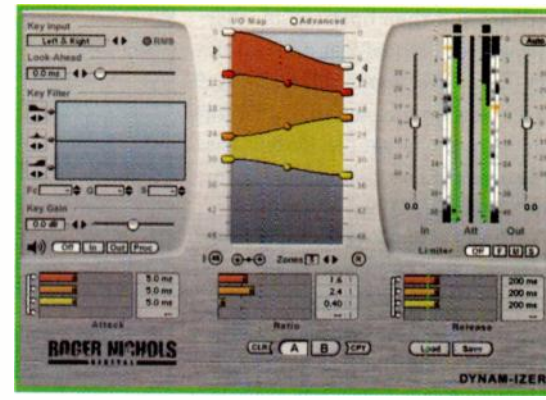

FIG. 3: By glancing at Dynam-izer's center section, you can see the ranges of the compression zones on the left and their range after processing on the right. The vertical strips on the right with the white, gray, and orange in them make up the Cloud Meter.

Frequal-izer allows you to save 50 "States" in each instance of the plug-in. Each State is like a separate preset with its own curve. You can even use your sequencer's automation to switch between States (like scene automation), which gives you additional control.

Even if you don't save any States, you can step back and look at the various edits you made in Frequal-izer since you instantiated the plug-in. These are retained even after you've closed your audio file for the song. And Frequal-izer, along with the other plug-ins in this bundle, offers an A/B work space so you can easily compare two different settings.

Like the other plug-ins in the bundle, Frequal-izer can be opened as either a mono or stereo version, although for the most part you'd be using the latter. With a stereo instantiation, you have the option to address each side individually, which can be very useful for homing in on a particular element. I used this feature on a stereo mix file to lower the level of a shaker that was panned to one side. Being able to process either side also allows you to accentuate elements that are panned to one side or another, which can effectively heighten the stereo image of the source track.

Frequal-izer's match EQ function is turned on with a switch on the front of the plug-in. Once it's activated, you first have to let Frequal-izer learn the frequency response of the source (the file whose frequency response you want to copy). When analyzing the source, Frequal-izer provides what's termed a Confidence Rating for the success of its analysis. The wider the band you see around the frequency display, the lower the Confidence Rating. You can improve the Confidence Rating by playing back only a small portion of the audio file for analysis, rather than letting it run too long. The more drastically a source file changes, the less likely you'll get a successful result.

Once you've analyzed your source, you save the

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setting, and then open up another instance of Frequal-izer on the target track. After you recall the source curve, you set the plug-in to analyze and learn the target file. Once it has it learned, it automatically kicks in the matching EQ curve.

I tried Frequal-izer's match EQ on a number of sources, including full mixes, vocals, bass, and drums. I was never totally satisfied with the results. I tried the match EQ that comes with Apple Logic Pro on the same sources and generally got better results. But in its primary role as a mastering EQ, Frequal-izer offers awesome control and transparent sound.

FIG. 4: Finis is a brickwall limiter that features the Crest Factor Meter, which lets you easily gauge the effect of the limiter on your material's dynamic range.

The Dynamic One

Probably the most unusual and initially baffling plug-in in the bundle is Dynam-izer. RND calls it a "graphic, multi-regional, dynamics processor." It's similar to a multiband compressor except that instead of setting up separate compression zones based on frequency, you do it based on amplitude. This allows you to compress or expand dynamically different elements in a source track to differing degrees.

As with all the plug-ins in the bundle, the documentation for Dynam-izer is excellent. Nevertheless, it still took me a couple of readings through the manual, a long talk with Reinhold Probst at Roger Nichols Digital, and a lot of experimenting to really get my head around the concept of this plug-in. The reason it's called a "graphic" dynamics processor is that the user interface is designed so you can see and control, in graphic form, both the range (in terms of amplitude) of the audio and its range after compression.

Using its Advanced mode (which, ironically, I found easier to use than Simple mode), you can control, for each band, the dynamic range within which it will compress or expand (shown on the left side of the graphic display) and the dynamic range that will result (shown on the right; see **Fig. 3**).

Like Uniquel-izer, Dynam-izer is extremely user configurable. You can have complex multizone setups (with up to four zones) or just have one zone and use Dynam-izer like a conventional compressor plug-in. Each zone has its own threshold, ratio, attack, and release controls, which correspond to movements you make in the graphic sliders.

Using more than two zones can get complicated; I didn't have a lot of success coming up with usable settings that employed more than two. However, I'm sure that the more I use Dynam-izer, the more likely I'll be to try using additional zones.

Near the center of the plug-in, the Input Audio Meter helps you scope out where the various amplitude levels are of the different elements in your audio so that you can set the boundaries of a compression zone. Sometimes, though, you need more information than that simple meter can give you. For those occasions, a vertical display on the right called the Cloud Meter shows the audio energy at various levels with puffs of white, gray, and orange. Once you've sussed out the amplitude range of a particular element (or elements), you can then set Dynam-izer to either compress or expand only that range.

Dynam-izer also has a sidechain input with lots of options, a look-ahead function, and a built-in limiter with Fast, Medium, and Slow settings. Clicking on the Auto button on the far right of the output meters turns on the Auto setting, which maintains your output level as you add compression.

A number of useful Roger Nichols presets are included with Dynam-izer. I particularly liked the mastering presets, which really made my mixes come to life.

What's intriguing about Dynam-izer is that it gives you a unique canvas upon which to create imaginative dynamics effects—including ones that combine compression and expansion on the same source. This is definitely a tweaker's plug-in; the better you understand its functionality, and the better you can recognize where the various elements fall dynamically in your source track, the more you'll be able to get out of it.

PRODUCT SUMMARY

ROGER NICHOLS DIGITAL **Pro Bundle**

plug-in bundle
$745
individual plug-ins $249 each

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

RATING PRODUCTS FROM 1 TO 5

PROS: All plug-ins are extremely flexible, well thought out, and excellent sounding. Crest Factor Meter on Finis helps prevent overcompression. Frequal-izer very easy to adjust. Excellent documentation. Dynam-izer provides unique dynamics control. Harmonic filters on Uniquel-izer very musical.

CONS: Dynam-izer has complex user interface. Match EQ on Frequal-izer a bit disappointing. Relatively pricey.

MANUFACTURER
Roger Nichols Digital
www.rogernicholsdigital.com

World Radio History

Finishing Up

The final plug-in in the bundle is Finis (see **Fig. 4**), a brickwall limiter. While its main use is for mastering, it's also quite handy for pumping up individual tracks. Like the rest of the plug-ins in the bundle, it comes in both mono and stereo versions.

The controls on Finis are relatively straightforward, and I was able to quickly dial up useful settings. You set the Ceiling (maximum value), Release time, and the Reaction parameter. Reaction is a pretty subtle variable, which the manual describes as governing the "aggressiveness" with which the limiter reacts to audio that is at or near the Ceiling level. As with all limiters, the parameter on Finis that most dramatically affects the final result is the input level. The harder you hit it, the more squashed the result. Finis offers a choice of three different limiting algorithms: one optimized for heavy limiting, one for moderate limiting, and one for light limiting.

Using Finis, I was able to quickly boost levels without making my source sound overly compressed (see **Web Clip 1**). I found it to be quite transparent at non-extreme settings.

One of the pitfalls of limiters is that they can easily be overused, which results in the song's dynamic range being reduced to unmusically low levels. To help guard against this, Finis offers the Crest Factor Meter, which essentially measures the difference between the peak and RMS values in your audio, giving you a good indication of its dynamic range.

Once you get used to reading the meter (it's not hard), you can see at a glance how much you're increasing the average loudness of your program material (compared with the input level), and how the limiting you're applying is affecting the dynamic range.

Between its transparent sound and the utility of the Crest Factor Meter, I'm sold on Finis. It's become the limiter that I turn to first.

Bundle of Joy

Overall, I was very impressed with all the plug-ins in Pro Bundle. They're creatively designed, offer a ton of features, and have excellent sound and thorough documentation. The price is a bit on the high side (buying the bundle does offer significant savings when compared with purchasing all the plug-ins individually), but you do get a lot for your money. If you're serious about audio, you'll love this bundle.

EM WEB CLIPS

Mike Levine is an EM senior editor.

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FIG. 1: The H7600's front panel houses a large LCD, soft key and cursor buttons for navigation, and a data wheel and 10-key pad for data entry.

EVENTIDE H7600 Ultra-Harmonizer

This legendary processor is still state-of-the-art.

By Babz

The H7600 is the latest edition of the Ultra-Harmonizer multi-effects processor from Eventide, a leading name in high-end professional effects technology since the 1970s. Building on its predecessors (the H3000, DSP4000, and DSP7000 series), the H7600 boasts greater processing power, expanded effects building blocks, increased user-memory storage with CompactFlash cards, and a new operating system that includes a search engine to help navigate its vast library of more than a thousand presets.

The H7600 faceplate colors have been given a makeover with the same burnished silver look as Eventide's flagship model, the H8000FW (see Fig. 1). The H8000FW is an 8-channel, dual-processor unit, whereas the H7600 is a single-processor stereo unit. With approximately 25 percent more processing power than the DSP7000 series it replaces, the H7600 is Eventide's most advanced stereo Ultra-Harmonizer to date.

The H7600 does lack the H8000FW's FireWire connectivity. That option, although a convenient computer interface standard, is less essential because the H7600 is not routing eight channels of I/O as the H8000FW does. The H7600's rear panel offers a versatile selection of 2-channel connections: analog (XLR combo jack input and XLR output) and digital (AES/EBU and S/PDIF) that you can mix and match as needed. The rear panel also has word-clock I/O; MIDI In, Out, and Thru; pedal jacks; a port for Eventide's Eve/Net remote controller; and a 9-pin RS-232 serial port for accessing software upgrades over the Internet (see Fig. 2).

Up Front

The front panel sports the same user interface as earlier Ultra-Harmonizers, with meters and a bypass button, a large LCD with four corresponding soft key buttons underneath, function and cursor buttons, a large data wheel, and a 10-key numeric pad. When the Program button is

The H7600 is a powerful and imaginative audio toolbox.

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selected, the LCD shows a list of presets, with four presets visible at a time. You use a navigation wheel or cursor-up and -down buttons to scroll through presets. If you know a preset's number, you can recall it directly with the 10-key pad.

The H7600's Search feature provides a new time-saving method of navigating presets. It sorts them according to various criteria and categories (effect type, intended use, banks, user groups, recent use, location, and so forth). With more than 1,000 factory presets arranged in 85 banks along with additional user-preset banks, the search engine is a powerful means to quickly locate the right effect.

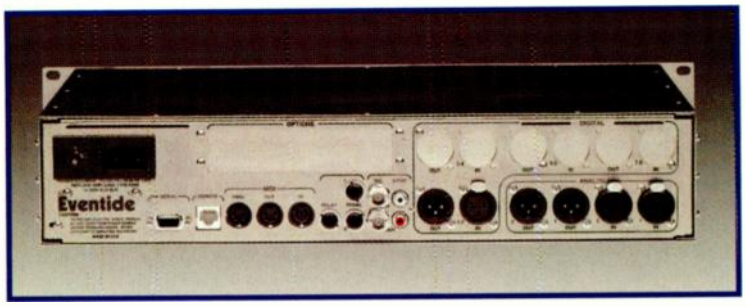

FIG. 2: The H7600's rear panel provides XLR jacks for analog I/O, several forms of digital I/O, MIDI In, Out, and Thru jacks, and an RS-232 port.

Presets can also be selected using MIDI. You can organize your favorites in User Groups and use the MIDI Map function to create banks of 128 custom programs that you can recall with MIDI Program Changes. The H7600's 85 banks respond to MIDI Bank Select commands, and I was able to create a Mac OS X ".midnam" patch list file and select any of the factory presets by name using pop-up bank menus within my sequencing application. The patch list works with MOTU Digital Performer, Digidesign Pro Tools, and Steinberg Cubase, and you can adapt it for Apple Logic. I've made the patch list available to Eventide to post online.

PRODUCT SUMMARY

EVENTIDE H7600 Ultra-Harmonizer

multi-effects processor
$4,495

FEATURES	4
EASE OF USE	3
AUDIO QUALITY	5
VALUE	3

RATING PRODUCTS FROM 1 TO 5

PROS: Powerful multi-effects of supreme quality and exceptional character. Search function greatly aids preset navigation. Hundreds of evocative and truly useful presets.

CONS: Editor software is powerful but not user friendly. Expensive.

MANUFACTURER
Eventide
www.eventide.com

Parameter Editing

Once a program is loaded, the LCD changes to Parameter mode, in which essential functions are immediately available for editing. Four soft keys call up additional screens for editing lesser-used parameters. Many presets have a handy Info soft key that brings up a text description of the preset and how to operate it.

Although I do most of my tweaking in software these days, I found the H7600's front-panel interface quite user friendly. Screens are well organized, and there are enough dedicated controls and options to keep most functions easily accessible. Very little paging through screens is necessary. Naming patches, always the Achilles' heel of front-panel interfaces, is the only tedious part.

You can dig more deeply into the H7600 DSP architecture with Vsig (Windows) and VsigX (Mac) editing software. Microsoft Vsig lets you create completely new algorithms through custom construction of some 230 effects-module building blocks. Vsig is much more than the simple editor-librarian you might expect. It offers a flexible flowchart-and-wire graphical interface, and you can even program in code if you're so inclined.

Software integration is more important than ever these days, and this is one area where the H7600 could stand some improvement. VsigX, the Mac version of Vsig, is not officially supported by Eventide; it was adapted from Vsig by a generous Mac user in his spare time. Although Vsig does provide far deeper programming power than most software editors, its interface will prove daunting to users who simply want to perform common tasks such as tweaking, renaming, and organizing patches.

Those Spectacular Presets

The H7600's generous complement of presets covers any conceivable signal-processing need. You'll find more than just the top-notch pitch-shifting effects that gave the Ultra-Harmonizer its name. You get rich reverbs; a full range of chorus, phaser, flanger, and filter-modulation effects; EQ and dynamics processing; ring modulators; vocoders; panners; samplers; distortion effects—the list goes on and on.

There are banks dedicated to specialized production techniques such as mastering, remixing, post-production, and broadcast collections. You will find audio environments to make your signal sound like it is coming from a walkie-talkie, a bullhorn, or a TV in the next room; sound effects to simulate everything from scratchy records to UFOs and mortar shells; and advanced pitch manglers to make you sound like an evil alien or a cartoon character. The H7600's range of resources is so extensive and compelling that no matter how long I worked with it, I felt I'd barely scratched the surface. Here are just a few highlights.

Eventide's famous pitch-shifting engine is used in many of the most exciting presets. Effects range from micro-pitch-shifting to add thickening (an effect heard

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on countless records) to precision shifting for correcting tuning errors to completely wild special effects that can morph a voice into a different age, gender, or species. You can even turn a single voice into a whispering crowd. The UltraShifter is Eventide's most advanced formant-correcting pitch-shifter. As you would expect, the H7600 Ultra-Harmonizer is capable of a full range of chromatic, diatonic, and custom scales (see **Web Clip 1**).

I was also immediately drawn to some of the extreme vowel-like wah filter presets, such as Kill The Guy and Mouth-a-lator Two. These patches allow you to specify filter-sweep parameters as vowel sounds using onscreen phoneme choices. This is filter modulation taken to a whole new level (see **Web Clip 2**).

I loved the liquid textures found in multi-effects patches such as Easternizer and the haunting motion of patches like Flange Echoes. Others that caught my ear were Hiccup Chorus, which fuses eight chorusing delays into a stuttering tremolo effect, Stratospherics, which provides strange modulated delay oscillations, and ReverseTetra, which bathes your signal in four reversed shifters. Even old-standby effects like flanging are far from ordinary in the H7600. Drew's Throatflange took my everyday synth pad and gave it a business-class seat on the next flight to Mars (see **Web Clip 3**).

Himalayan Heights is an excellent example of the many sound effects available. It uses noise generators sprinkled with bell-like tones to sculpt a windy Tibetan landscape. Ghosties will summon spirits from a haunted chamber. Other patches seem to have minds of their own. Feed Genesis II a few guitar notes, and watch it warp them into an entire atmosphere of crystal orbs and Frippertronic-style pad washes (see **Web Clip 4**).

The H7600 is one serious signal-processing machine, with a price tag one decimal place to the right of all but the most serious professional budgets. A lot has changed since the days of the first Harmonizers, and you do have to consider how time-honored hardware boxes fit into today's software-dominated world. But a software-leveled playing field makes it all the more important for the pro studio to reach for that extra edge. Eventide continues to fill that niche. The H7600 is a powerful and imaginative audio toolbox that can add subtle sparkle and sheen to any project as well as produce mind-blowing multi-effects that send your signal to another galaxy.

EM WEB CLIPS

Babz is a composer, multi-instrumentalist, and music-technology writer based in New York City.

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FIG. 1: Each side of the Crowley and Tripp Naked Eye ribbon microphone offers a different frequency response. The front of the mic has the darker response.

CROWLEY AND TRIPP Naked Eye

Two ribbon-mic flavors in one high-quality, affordable package.

By Nick Peck

Crowley and Tripp Microphones, a division of Soundwave Research Laboratories, has released the Naked Eye, a dual-voiced figure-8 ribbon mic in a relatively small form factor. The Naked Eye's front side is voiced to emulate the darker response of the company's Proscenium mic, while the rear side is voiced to emulate the rising frequency response of its Studio Vocalist mic. The Naked Eye is less than half the cost of either of these products and is aimed at the project studio. However, it's important to note that the Naked Eye is not appropriate for Blumlein stereo recording techniques because the two lobes are not voiced symmetrically.

The Naked Eye is 5.5 inches long and 1.5 inches in diameter, making it small enough to squeeze into tight spaces (see Fig. 1). The mic has considerable heft for its size and has been built with solid and precise machining: there is not a screw or seam to be found anywhere. The body is powder-coated steel, and the logo badge is affixed to the side of the mic that exhibits the darker response. Each mic comes in a beautiful tongue-and-groove box and has a three-year warranty.

The Naked Eye's mounting hardware is innovative. Designed to minimize any sonic interference with the mic, the mount consists of a twisted steel bar that attaches at right angles to a felt-lined circular cup. The mic body has a bottom ring that unscrews and holds the mic solidly in place within the cup. As the cup and steel bar rotate on perpendicular axes, the Naked Eye can be angled into any position you want.

The mic is designed around a custom-wound, high-bandwidth transformer. The published frequency response is from 30 Hz to 15 kHz, and each mic includes a reference plot. The manufacturer states that the response curve is used as a reference and that all Naked Eye mics are matched to it, within a tolerance of ±2 dB.

The response curves that accompanied the review units are fairly flat through most of the range, with the low frequencies beginning to roll off at about 80 Hz (see Fig. 2). There are +2 dB boosts at 100, 300, and 600 Hz, and a +3 to +4 dB boost in the 4 kHz range. From there, the darker side's response begins to drop sharply at around 6 kHz. The brighter side maintains a +1 dB response to about 10 kHz before beginning to roll off.

All of my microphone tests were done at my studio, Perceptive Sound Design, in San Mateo, California. Though I experimented with a variety of tube preamps, I

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discovered that the Naked Eye sounded best with the Millennia Media HV-3D, a clean, high-gain solid-state preamp. All material was recorded directly to an iZ Radar V hard-disk recorder. My primary comparison mic was the AEA R84 ribbon mic, a superb product that costs about 50 percent more than the Naked Eye.

Electric Guitar

I've never met a ribbon mic that didn't love to be placed in front of a guitar amp, and the Naked Eye is no exception. I recorded guitarist Seth Chapla playing a custom-built, single-coil Stratocaster-like guitar through a 1965 Fender Bassman amp. I faced the darker side of the Naked Eye about three inches from the grille, halfway between the cone and rim of one of the speakers. For comparison, I then positioned the AEA R84 in a similar position on the other speaker. To maximize the direct signal, the mics and guitar amp were enclosed by acoustic gobos.

For his rhythm parts, Chapla dialed in a straight-up, vintage-rock guitar sound, with the preamp set to generate just a bit of overdrive. Both mics delivered a satisfyingly large, round sound. To our surprise, the Naked Eye's sound was significantly brighter than the R84's. We ended up blending both signals together, using the R84's thick body to support the sheen of the Naked Eye. The resulting sound was tight, clean, and big (see **Web Clips 1 and 2**).

For a lead guitar sound, Chapla kicked up the gain on the preamp and added a shade more treble to help the notes cut through. In that situation, we used the Naked Eye alone and were delighted with the results: the sound was bright and a bit twangy and had all the retro vibe we were looking for (see **Web Clip 3**).

PRODUCT SUMMARY

CROWLEY AND TRIPP Naked Eye

ribbon microphone

$745

AUDIO QUALITY	4
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Affordable. Excellent construction. Tight, smooth, detailed sound. Made in the United States.

CONS: Asymmetric lobes make this mic unsuitable for Blumlein stereo recording.

MANUFACTURER
Soundwave Research Laboratories/Crowley and Tripp
www.soundwaveresearch.com

Hammond Organ

Though I usually record the Hammond organ in stereo, for a recent session I went with a single Naked Eye. After a bit of experimentation, I ended up placing the mic about two feet in front of the center of the cabinet at the height of the upper rotors. I initially tried to record without any baffling, but quickly discovered that the Naked Eye's figure-8 polar pattern brought in too much of the room. Placing gobos directly behind the mic solved this problem.

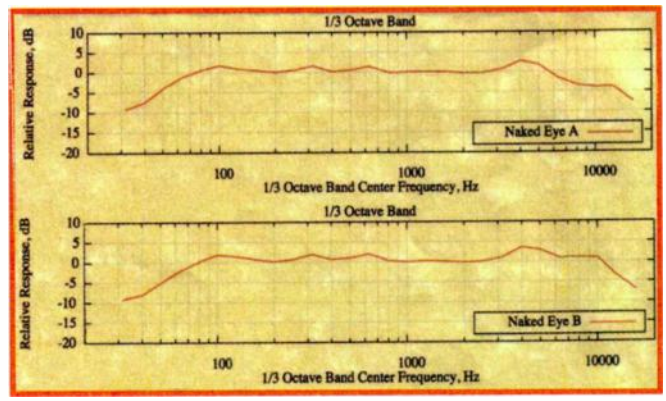

FIG. 2: This shows the frequency response of the Naked Eye. The upper graph is of the front of the mic, and the lower graph is of the rear.

As the Hammond tends to be a darker instrument, with a good amount of low and low-mid frequency content, I used the brighter side of the Naked Eye. This helped bring out the upper harmonics a bit. The result was a sweet, smooth, full-bodied organ tone that sat nicely in the mix, requiring just a touch of tube compression and a slight EQ lift in the upper mids (see **Web Clip 4**).

Female Voice-over Session

Though I typically use large-diaphragm condensers for voice-over work, I gave the Naked Eye a shot in this application and was happy with the results. The talent was a female alto in her midtwenties, recorded in a moderately treated acoustic environment.

I recorded directly into a Sound Devices 722 field recorder, which has a clean, neutral, and transparent mic preamp that is able to easily supply sufficient gain. I had expected the Naked Eye's brighter voicing to be the one we would use, but I found it a bit harsh and sibilant in this circumstance: the darker side gave us everything we needed. The resulting audio was clean, tight, and neutral. I didn't need to apply any EQ or compression to the sound files—all they required was editing and a bit of gain (see **Web Clip 5**).

Grand Piano

No mic is useful for everything, and I was disappointed with the Naked Eye's performance on grand piano. I tried it on my 1927 Mason and Hamlin model AA artist grand. I started with a vintage approach, using a Telefunken V76 tube mic preamp, and tried three miking positions: directly above the soundboard, 4 feet back from the piano, and about 12 feet back. The result each time was thin and unflattering, with a bit of a scooped midrange and a strange overemphasis of the upper harmonics.

At that point, I swapped out the V76 for the Millennia Media HV-3D solid-state preamp and ran all the tests again. There was an improvement, particularly at 4 feet from the piano, but the results were still not what I was looking for. For comparison, I ran the R84

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through the same paces, and I liked it a bit better. But it was still not my mic of choice for this application (see **Web Clip 6**).

Acoustic Bass and Drums

I tried out the Naked Eye on a jazz date, recording acoustic bassist Greg Dunn and drummer Mike McKenzie. For Dunn's bass, I positioned the darker side of the mic about six inches out, and two inches down from one of the f holes, pointing upward toward it.

McKenzie was playing a vintage '60s Gretsch jazz kit. I placed a Naked Eye mic about five feet up and centered over the kit, looking down toward the snare drum. I used the brighter side of the mic to enhance the cymbals a bit.

The recorded results were stellar. The mics delivered clean, natural, solid, unhyped audio, with a smooth, detailed, extended low end for the bass. The drum mic picked up a good balance between drums and cymbals on the kit.

When we listened to the results, both musicians were blown away. "Finally!" remarked Dunn. "That's the sound I've been trying to get out of this bass!" McKenzie was equally impressed, feeling that the Naked Eye captured an honest, unadorned, but very musical version of his drum kit (see **Web Clips 7 and 8**).

Lead Vocals

For the lead vocal test, I worked with a male tenor singing over a rock tune. We got a tight direct-vocal sound by placing the mic between two gobos on stands in a V configuration. The singer was placed 8 inches in front of the microphone, and a pop filter was used. Another absorbent panel was placed 2 feet behind the singer.

For this application, we used the brighter side of the mic. The Naked Eye again delivered the goods, creating a good balance between the rich fundamentals of the male voice and an airy top end. The singer had good mic technique and was able to use the Naked Eye's proximity effect to his advantage by leaning in to get a richer tone on more intimate passages. Once again, I found that the tracked material required little processing, and applied just a bit of compression to help it sit well in the mix.

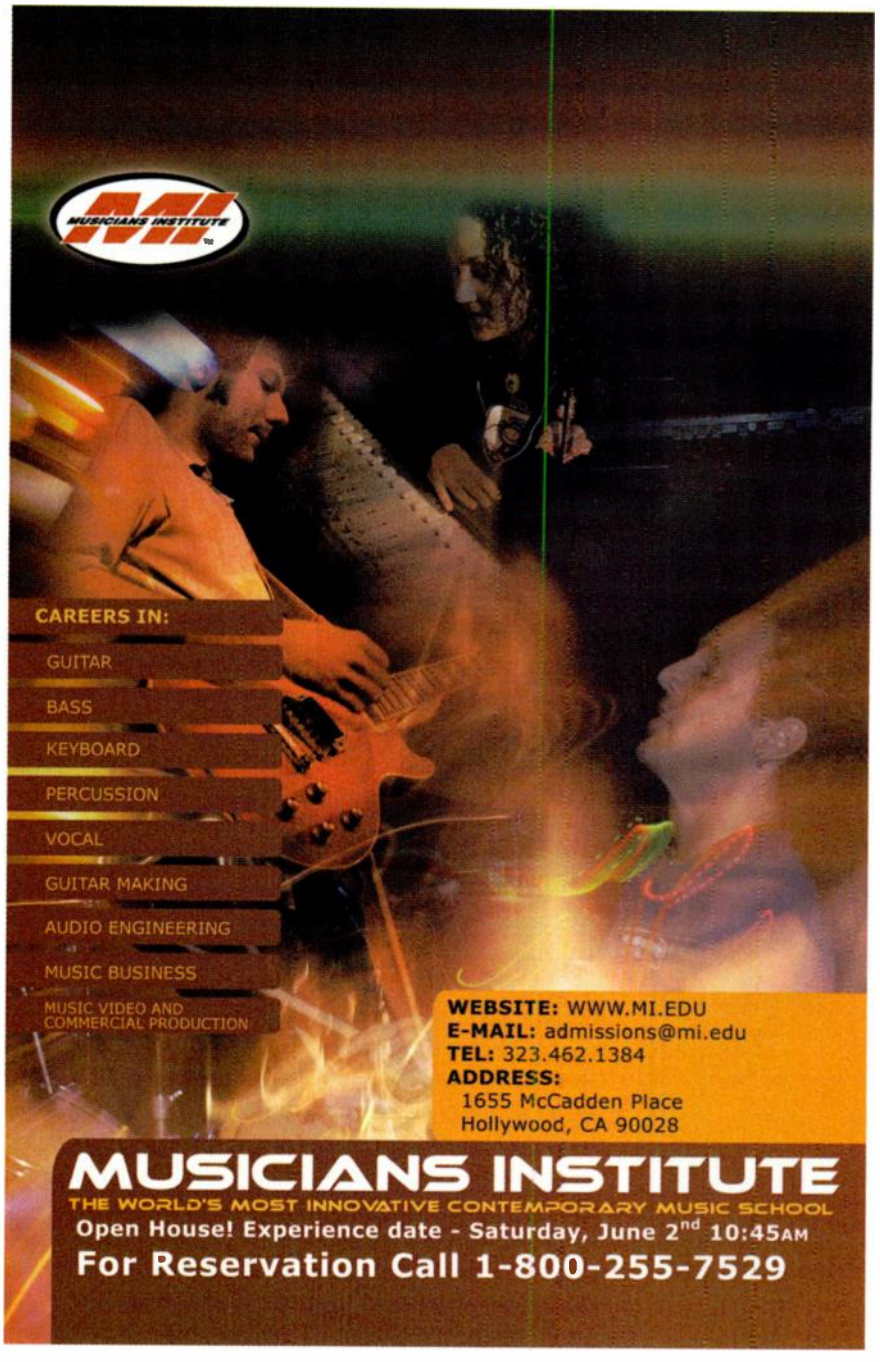
Get Naked

The Naked Eye delivers two distinctive sounds in one microphone. Overall, the sound is tight, clean, smooth, and direct, comparing favorably with that of ribbon mics costing as much as a grand.

The build quality is excellent, the mounting system is innovative and effective, and the mic's relatively diminutive size allows it to fit into tight spots. All of this at a moderate price for a product completely built in the United States. What's not to like about the Naked Eye?

EM WEB CLIPS

Nick Peck, a keyboardist-composer-sound designer based in the San Francisco Bay Area, is the audio director of a video



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QUICK PICKS

MOJAVE AUDIO

MA-200

By Eli Crews

Recently I've had the pleasure of using a pair of David Royer–designed Mojave Audio MA-200 large-diaphragm tube condenser microphones ($995 each). Royer is well known for his trusty ribbon-mic designs, and although the MA-200 is his first commercially available condenser mic, he's been making them on a limited, custom basis for more than a decade.

EM ★★★★★ hot pick

The Mojave Audio MA-200 is the most refreshingly exquisite new microphone I have had the pleasure of using in a long time.

Function over Form

The MA-200's cylindrical black-barrel body and silver-colored mesh grille are simple and elegant. However, it's easy to see that this mic is not your average large-diaphragm condenser (LDC). Its heft instills a sense that you are holding a solid piece of gear, reminiscent of a vintage European microphone. The sonic bonus of its weight is that the mic body's resonance is practically nonexistent, which means the capsule picks up vibrations only from the air, not from the body.

The MA-200, which houses a military-grade JAN 5840 vacuum tube and a top-shelf Jensen transformer, comes securely packaged in a small flight case within a bigger flight case. It is accompanied by a compact power supply with a 7-pin XLR jack, a 3-pin XLR jack, an IEC power socket, an illuminated power switch, and a selector for 110 or 220V. Also in the bigger case are a cable to run between the mic and power supply and a cage-and-rubber-band shock-mount that screws securely onto the microphone's base. Given the quality of the mic, the accessories (aside from the cases) feel a touch cheap but are completely functional. The pins on the 7-pin cable are very tiny, and you should take extra care that the notches line up before pushing the connector into place.

The Ringer

I received two identical mics and could hear absolutely no difference between them in comparison tests. This is especially notable because the MA-200's 3-micron capsules are of Chinese origin, which is the reason the mic is as affordable as it is. Royer and company have gone to extra lengths to ensure that the quality of the Chinese capsules meets their criteria. In fact, I learned that David Royer personally listens to each mic before it leaves the factory to make sure it's up to snuff.

As luck would have it, I received the MA-200s right before beginning a monster series of sessions that would push my studio's capabilities to the limit. Scott Pinkmountain of the band P.A.F. wanted to record music he'd written for a band with two drummers, an 11-piece big band with horns, a different 11-piece acoustic band, a 5-piece percussion ensemble, and a 28-piece orchestra. Tracking the ensembles was followed by a few days of overdubs with a variety of instruments, from celesta to bass flute to contrabass clarinet. I used the MA-200 on most of the sessions, and in A/B comparisons, it often won out over microphones costing two to five times as much.

By the end of those and a few other sessions, I had used one or both MA-200s on vocals, drums, piano, violin, cello, oboe, English horn, clarinets, alto and tenor saxophones, and electric and acoustic guitar and bass, as well as on a Buchla synthesizer, a 30-inch gong, and probably a few more instruments I can't remember. Not once did the MA-200 disappoint. Standout applications were as drum overheads through a Focusrite ISA 428 and Manley VariMu and as a vocal mic through a Vintech X73i and Empirical Labs Distressor.

The word that came to mind most often while using the MA-200 was *silky*, as the mic's high mids are present enough to give the source definition and a place in the mix, without any of the harshness or sibilance sometimes abundant in other LDCs. It sounded brighter than a Neumann M 7 and darker than an AKG C 12, but had every ounce of nuance you'd expect from those classic capsules.

Mojave Desert Island Mic

A lot of readers might not consider a $995 microphone to be a "budget" mic, and in terms of sonic quality, there is absolutely nothing budget about the MA-200. In fact, the only thing budget about it is that you should make room in your budget to buy at least one. In this humble reviewer's opinion, you would have to pay at least double, and maybe even multifold more, to acquire a modern or vintage microphone of similar quality from any other manufacturer. Any time you don't have to settle for an inferior product just to save money, you've found a good value, and the MA-200 is a very good value.

Value (1 through 5): 5
Mojave Audio
www.mojaveaudio.com

AROBAS MUSIC

Guitar Pro 5.1 (Mac/Win)

By Marty Cutler

Accurate transcription of guitar and related stringed instruments is a highly specialized task that often defies capture with standard music notation. The use of tablature is a tradition dating back to 16th-century German music for the lute. Unlike standard notation, tablature illustrates note placement on the fingerboard as well as fingering—a necessity, as most stringed instruments offer several ways to play the same note. Orchestral-scoring programs may lack necessary features for accurately representing guitar-oriented music.

Arobas Music Guitar Pro ($59.95) is more than a tablature-editing program but less than a full music-notation

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program. Arobas touts its Realistic Sound Engine (RSE), a collection of sampled instruments that provide aural feedback.

I installed Guitar Pro on my dual 1.42 GHz Power Mac G4 with Mac OS X 10.4.8, 2 GB of RAM, and a MOTU 896, and on my 3.06 GHz Pentium 4 notebook with Windows XP, 1.5 GB of RAM, and an M-Audio Ozonic. Installation was not complicated. Both versions have the same features, though the Mac one has a floating Tools palette, whereas the Windows one has a toolbar positioned above the score.

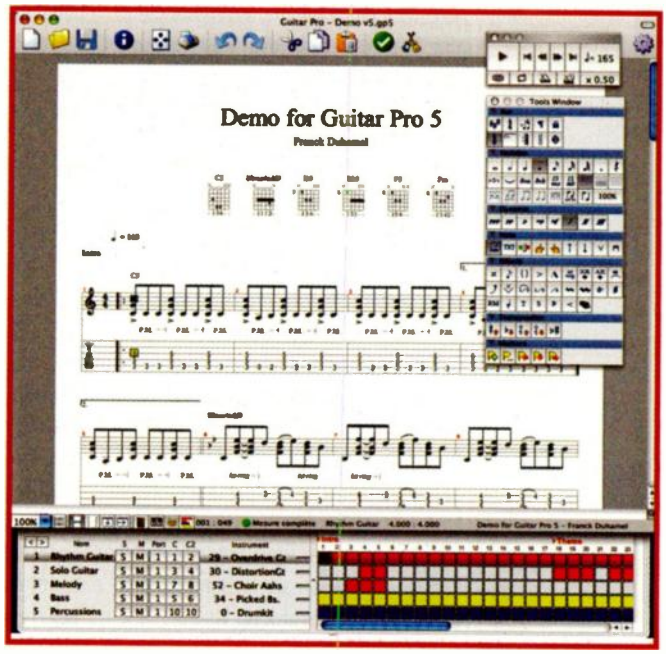
Our Plucky Hero

Methods of entering notation include using your computer's keyboard, clicking on an onscreen keyboard or fingerboard, and using real-time or step input from a MIDI controller. Arrow keys let you navigate the tablature or notation staff. For MIDI guitar and other stringed-instrument controllers, Guitar Pro recognizes multiple-channel modes and correctly assumes one channel per string. If your string controller uses an alternate tuning, you can set up the track so that notes are displayed at the proper frets. You can set up capos or even banjos with the fifth string starting at the fifth fret.

The Mac's floating Tools palette offers a handy feature: adjustable transparency. You can place the palette anywhere onscreen and still view the chart. The palette furnishes bar markings, durations, ties, upward or downward beam directions, octaves, chord diagrams, dynamic markings, and guitar-specific effects such as hammers, bends, and natural and artificial harmonics. You can even insert markers for referencing specific parts of the song. Anything available in the palette is also available from the Mac menu.

Guitar Pro doesn't let you change fonts, but Arobas plans to offer that feature in a future update. Meanwhile, the program supports Recordare's MusicXML, so you can export the file to another program that allows a higher degree of customization.

Compared with Mac and Microsoft General MIDI synthesizers, RSE does a superior job of following guitar articulation symbols; hammer-on and pull-off notes play back without retriggering. Bent notes, although never quite as articulate as when they're played on a real guitar, play back quite smoothly. Unlike other tablature programs, Guitar Pro lets you create multitrack arrangements with a full band. The RSE sound set includes a variety of drums, bass, and even amp tones and reverbs (albeit with no programmability); that's a potentially great tool for teaching and practice, as you can provide a full context for guitar tracks. Still, I would have liked to see more fretted instruments, including banjo and mandolin.



Guitar Pro 5.1 is the latest version of the popular guitar-transcription software. It lets you create and edit fretted-instrument scores in tablature or traditional music notation and play them back using its Realistic Sound Engine (RSE).

Picky, Picky

I was never able to get RSE to work reliably on either my Mac or Windows computer; selecting either of my FireWire audio interfaces consistently muted playback and produced an error message. Surprisingly, when I switched from Core Audio to Sound Manager on the Mac (despite the stated system requirements of OS X 10.4 for RSE playback), RSE output played back through my audio interface, but denser arrangements of four tracks or more produced grossly distorted audio. And although Guitar Pro can render RSE tracks to a WAV file, I consistently received error messages followed by a progress bar, but no resulting audio. I never got RSE to work with my Ozonic under Windows at all, despite downloading the latest ASIO drivers. According to Arobas, RSE does not yet work well with FireWire interfaces. You can always use your operating system's resident GM synth for an audible, albeit somewhat graceless, confirmation of your score.

Arobas Music Guitar Pro could potentially occupy the very top rung of guitar-oriented tablature and notation programs. Its facility in creating accurate guitar notation quickly is impressive, which is why the faulty implementation of its sound engine is especially frustrating and disappointing. Documentation suffers from a few translation problems, and help and troubleshooting advice for setting up audio is minimal. I fully expect that Arobas will address these issues; in every other respect, Guitar Pro is worthy of your consideration.

Value (1 through 5): 3
Arobas Music/eMedia (distributor)
www.emediamusic.com

EOWAVE

Persephone

By Gino Robair

Although ribbon controllers have been incorporated into a variety of instruments over the years, Eowave's Persephone is one of the few instruments to make the ribbon its primary interface. The Persephone has a single synth voice featuring an analog oscillator with a 10-octave range, a 1-pole (6 dB per octave) lowpass filter, and an LFO (with a range of approximately 1 to 20 Hz) for modulation.

The instrument is available in desktop ($1,099) and suitcase versions ($1,299). The suitcase model, reviewed

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here, includes a handle, a removable lid, and Tolex covering (available in three colors). Four rubber feet keep the instrument from slipping as you play.

Horizontal Boogie

The ribbon's rubberized playing surface is very responsive and has a nice feel. It's roughly 19.25 inches long and 0.7 inch wide, and the entire instrument is the size of a small mono synth.

To the left of the ribbon is a wooden expression key that is automatically mapped to control amplitude, modulation amount, or filter cutoff frequency, depending on the performance mode. The expression key, modeled after a similar control on the Ondes Martenot, uses an optical sensor, making it musically useful (see **Web Clip 1**).

Despite being an analog instrument, the Persephone has eight digital controls on the front panel. The Mode knob sets the behavior of the ribbon, the expression key, and the CV expression pedal. The 4-position Scale knob sets the oscillator's range on the ribbon at one, two, five, and ten octaves, minus the last note at the highest position on the ribbon. (By tweaking an internal trim pot, you can adjust the ribbon scaling to complete the top octave and get scale ranges other than the factory presets.)

The Tune and Finetune knobs set the instrument's base pitch. Set it too high, and the upper portion of the 10-octave scaling goes out of the audio range. For pitch accuracy while playing, I taped scale steps for each of the octave scalings above the ribbon. (A removable template marked with pitches would be a nice add-on feature.) The oscillator is very stable and the instrument will stay in tune for hours.

The output waveform is continuously variable between triangle and sawtooth using the Wave knob. The Filter Frequency control determines the filter cutoff point, and the Modulation control sets how much further the filter opens as the expression key or ribbon is pressed. When fully open, the filter control lowers the pitch slightly.

The instrument has an unbalanced ¼-inch output, MIDI I/O, an expression pedal input, a CV output, and an internal power supply. The CV output accepts a standard Y-cable with a TRS plug at one end, so you can send control voltages corresponding to ribbon pressure (ring) and horizontal position (tip) from one jack. An expression pedal is a must: without it, the LFO speed remains constant.

À la Mode

The four performance modes (A to D) determine how the ribbon, expression key, and expression pedal are mapped to the audio parameters as well as the pressure CV output. Mode doesn't affect the MIDI mappings. Horizontal finger position on the ribbon always controls pitch.

In mode A, ribbon pressure controls the filter's cutoff frequency, the expression key is used to swell the note in and out, and the expression pedal acts as the master volume. Once you touch the ribbon in this mode, the Persephone remembers the pitch, even if you remove your finger. In mode B, ribbon pressure and the expression pedal control amplitude, and the expression key controls the filter cutoff frequency. Unfortunately, you can hear stepping in the volume level when the expression pedal moves through its lowest range in these two modes.

In mode C—tremolo mode—ribbon pressure controls volume, the expression key sets the modulation depth, and the pedal controls the tremolo (LFO) speed. Mode D works similarly except that the type of modulation controlled is vibrato.

Note that as the scaling is increased from one to ten octaves, the base pitch rises slightly (see **Web Clip 2**), so you will have to adjust the tuning when you change ranges. Also, as you increase the number of octaves on the ribbon, intermodulation distortion adds buzziness to the tone.

Outward Control

The MIDI I/O and a CV output on the Persephone are a welcome addition, though somewhat problematic. Although the pitch CV response is smooth, the pressure response is a little trickier to use, and the harder you press on the ribbon, the more noise you get in the pitch CV. Also, the pitch CV is scaled only to the 5-octave range. It would be more useful if it changed with the position of the range knob.

The MIDI implementation is basic. The ribbon senses horizontal position before sending a Note On, giving you a stable pitch right away. It sends Note On (Velocity 127) and Note Off (Velocity 0) when your finger touches and leaves the ribbon, respectively, and it sends Pitch Bend messages from C3 (MIDI Note Number 60) depending on finger position. The expression key sends Volume data using CC 7, while the expression pedal sends data using CC 2 (Breath Controller).

The Persephone puts a monophonic analog synth under the control of a ribbon strip.

Unfortunately, you will need a computer and MIDI interface to send the instrument Program Change messages to switch MIDI Local on and off, as well as to use the half- and whole-step quantization modes. On an instrument with digital controls designed for live use, these should be accessible with an onboard switch or key combination.

Back to the Future

I applaud Eowave for offering a pro-level ribbon-controlled analog synth built by hand in a world of cheaply mass-produced me-too instruments. Although its MIDI and CV implementation needs

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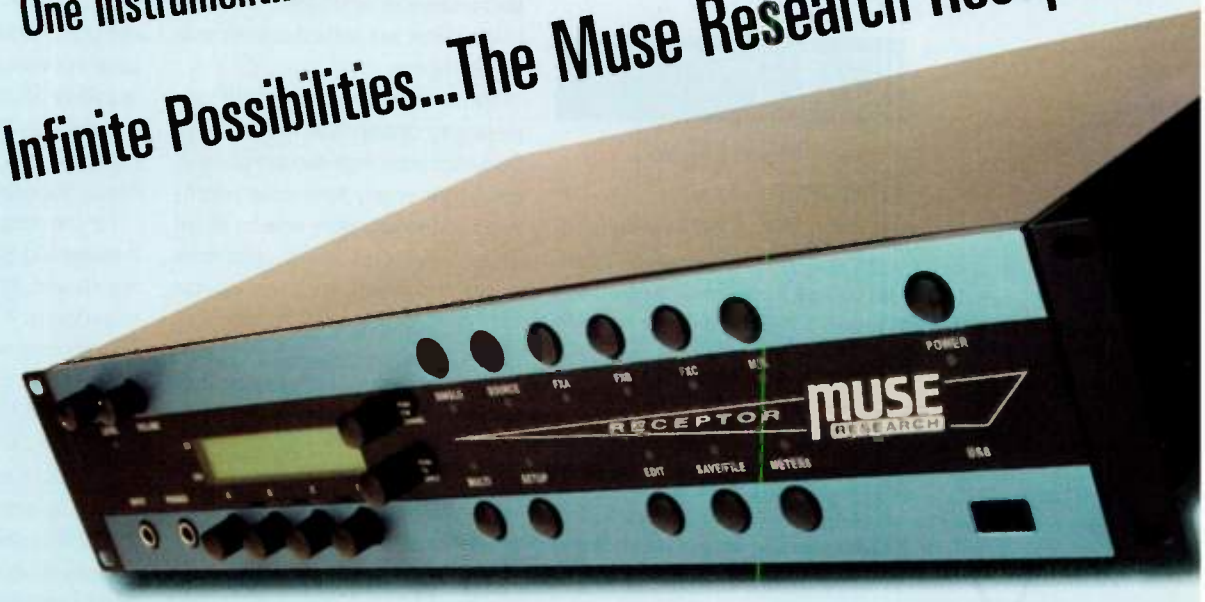

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Receptor: A New Way to Play.

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some tweaking, as an instrument on its own, the Persephone allows for sophisticated music making and is a joy to use.

EM WEB CLIPS

Value (1 through 5): 3
Eowave/Analogue Haven (distributor)
www.analoguehaven.com

PROPELLERHEAD SOFTWARE

Reason Pianos (Mac/Win)

By Len Sasso

Reason Pianos ($129) is a sampled-piano refill for Propellerhead Reason. Two concert grands—a Steinway D and a Yamaha C7—and a Steinway K upright have been meticulously sampled for this library. Compared with other high-end sampled-piano libraries, Reason Pianos is relatively compact, with the 16-bit version weighing in at under 600 MB. (A 24-bit version is also included.) Size notwithstanding, Reason Pianos is very versatile due largely to its easy integration with other Reason devices using Reason 3's Combinator.

The philosophy behind Reason Pianos is production, and a number of decisions have been made with the modern producer in mind. Although the pianos are very playable, they don't have all the bells and whistles of multigigabyte piano libraries aimed at the solo performer. For example, the una corda (soft) and sostenuto (middle) pedals of the piano have not been implemented, and looping, rather than full-decay and sustain (damper-pedal-down) samples, is used to sustain notes. The advantages are lighter CPU load, less disk space used, and no need for direct-from-disk streaming. However, loading all samples into RAM does increase preset load time.

The Terrain

Propellerhead's approach to creating these sampled pianos, which it calls hypersampling, entails recording each piano with six different microphone configurations: Close, Jazz, Bottom, Ribbon, Floor, and Ambience. Bottom and Ribbon are mono recordings, whereas the rest are stereo. Each sample set contains 4 Velocity zones for each of 25 key zones. Separate samples routed to separate NN-XT sampler outputs capture release resonance and hammer noise. Except for the lowest and highest octaves, each key zone spans three semitones, which ensures that no note is transposed more than a semitone up or down. The zones in the lowest and highest octaves span four semitones.

The zoning strategy, along with sample looping, distinguishes Reason Pianos from most other high-end sampled pianos, which usually have more Velocity zones and sample every note for its full decay. If you listen to individual notes played at different Velocities, you can indeed hear both the Velocity-zone transitions and the looping, but when actually playing, even in a solo context, both are barely noticeable. You'd be hard-pressed to pick them out at all in a mix.

Each of the sampled pianos in each miking configuration is included as an NN-XT patch by itself and embedded in a Combinator. The purpose of the Combinator is to provide individual EQ of the release and hammer-noise samples; EQ and compression of the sustained-note samples; and mixing of the sustained-note, release, and hammer-noise samples. The four Combinator buttons toggle release, hammer noise, low cut, and compression with the corresponding knobs controlling the amounts.

More Is More

Beyond those basic configurations, eight more Combinator patches for each piano mix various miking configurations by adding NN-XT samplers and effects. For example, there are patches that combine the jazz, ambient, and ribbon mics or the close and floor mics.

For the more adventurous, there are Producer and Style collections containing 10 and 29 Combinator patches, respectively. A refill from Exode with 40 additional stylized patches is a free download for registered users. The ten Producer patches each incorporate several mikings with some additional processing such as reverb and individual EQ. My favorites among them are the David Darlington NY Jazz Steinway, the Flatback Producer upright, and Niklas Flyckt Fat'N'Ambience.

The Style patches chart more-daring territory. They typically start with one

Reason Pianos comes in Combinator racks that combine several mikings with EQ, compression, and other effects.

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or two NN-XT piano patches, layer in a synth, and add some extreme effects processing. Eclipse, one of the more interesting, passes the piano mix through a digital delay line and uses the LFO from a Subtractor synth to control the delay time. That requires some clever patching using the Combinator's modulation inputs. Beyond Eclipse and a few others, the Style patches stay pretty much within the layered piano paradigm, but the exceptions show how far you can stretch these pianos with a little imagination. For instance, the collection begs for a few vocoded pianos, some piano-percussion hybrids, and some pianos with individually processed notes (see **Web Clip 1**).

Reason Pianos is an excellent-sounding, well-organized sampled-piano library. The 16-bit version is easy on your system, and you can always switch to the 24-bit version for final rendering (although you do have to swap sample sets manually). Even lighter NN-XT versions of each piano are included for quick sketching, and templates with labeled instruments, EQs, and mixers, but without samples, make creating your own Combinator patches a breeze. If you're a Reason user looking for a full-featured yet inexpensive piano library, look no further.

EM WEB CLIPS

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

EDIROL

UA-4FX

By Vijith Assar

In a world of me-too stereo USB audio interfaces, the Edirol UA-4FX ($229) stands out from the crowd. It has an XLR input with phantom power, an unbalanced ¼-inch input switchable between mic and guitar level, and an ⅛-inch plug-in powered input for lavalier and electret microphones. There are RCA jacks for line-level analog I/O and optical jacks for digital I/O.

The UA-4FX is class compliant in 16-bit, 44.1 kHz mode, but you need a custom driver for 24-bit, 48 and 96 kHz operation as well as to use the MIDI ports. There is a headphone output on the front of the unit. Phantom power and input monitoring mode are toggled with microswitches on the bottom. The unit is fully compatible with Windows and Mac OS X and supports WDM, ASIO 2.0, and Core Audio.

Add Effects

The UA-4FX comes with 16 built-in effects. They are split among four banks, but you can use only one bank at a time. The Mastering bank offers noise suppression, high and low EQ, and a high-frequency presence effect called Enhancer. The Listening bank includes reverb, center cancellation, and high and low EQ. The Perform bank has pitch variation, distortion, chorus, and delay.

The COSM bank houses a tube-mic-preamp simulator with compression and makeup gain but oddly no compression-ratio control. A knob labeled Bright and another labeled Fat And Warm alter the modeling algorithm, the most noticeable effect of which is high and low EQ. Inexplicably, although each bank uses the same four knobs, different knobs are assigned to high- and low-EQ settings in different banks. The effects are of average quality, but they're reasonable for the price.

Ins and Outs

The unit's input quirks are more troubling. Even with no effects in use, switching effects banks causes a complete dropout in both recording and playback. Plugging a cable into the ¼-inch input defeats the other inputs, and using the ⅛-inch input defeats the XLR jack. The active mic jack is routed to both output channels, so unless you have external preamps feeding the line inputs, this is effectively a 1-input interface, and using the advanced driver does not mitigate these problems. The LED input monitoring is very good as USB devices go.

A switch selects between analog and digital inputs, so there's no way to trick this unit into multiple inputs with external converters. However, that same switch has a Loopback setting for routing output back to the inputs. That makes for a much cleaner implementation than the usual patch-cable method. You can apply the effects during recording or playback, and applying them during playback and then engaging Loopback mode is a slick way of permanently printing your effects. You'll have to repeat the process several times if you want to use effects from different banks or apply them to individual tracks. Beginners may find that acceptable.

The UA-4FX's top panel sports the effects selector; four effects parameter knobs; and large input, output, and guitar/mic input-level knobs. I/O jacks and mod switches line the front, rear, and side panels.

The bigger question is, why include the effects at all? Support for DirectX and VST effects in the bundled Cakewalk Sonar LE software and most other free or inexpensive sequencers makes most of the UA-4FX built-in effects redundant. Edirol's answer is that the UA-4FX is intended for users, especially beginners, who still want their effects in hardware. I can't help thinking that those folks would be better off buying a standalone recording device. Once you've graduated to a digital audio sequencer, you'll probably use built-in or third-party effects.

Used strictly as an audio interface, the UA-4FX's sound quality compares favorably to that of devices in its class. Its input limitations—only the XLR input is balanced and only one input functions at a time—are issues to be aware of, but the unit is certainly fairly priced.

Value (1 through 5): 3
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WARPIV TECHNOLOGIES

Screaming Trumpet

By Marty Cutler

Quite often the elements lacking in one-size-fits-all sample collections are focus and attitude. Focus is relatively easy: you simply concentrate the sample set on an instrument or a musician whose expertise is in a specific musical genre. Attitude is a bit more difficult to quantify, but it comprises elements that endow a bunch of samples with something more than a series of chromatically played notes stretched across a keyboard map. It's with attitude and focus that Screaming Trumpet ($199) captures an impressive variety of jazz and pop trumpet techniques, exploiting the formidable capabilities of trumpeter Wayne Bergeron, whose chops grace the works of an impressive roster of artists.

The single DVD supplies programs and stereo samples (16-bit, 44.1 kHz) for several popular software instruments—Tascam GigaStudio 2 and 3, Native Instruments Kontakt 2, Propellerhead Reason NN-XT, and Apple Logic EXS24 mk II. A folder of WAV files accompanies each sampler's set of programs, allowing you to create programs from scratch or use the library with hardware samplers. Depending on which software sampler you use, Screaming Trumpet allocates roughly 600 to 700 MB sound sets.

I tested the sets on my dual-processor 1.42 GHz Power Mac G4 with Mac OS X 10.4.8 and 2 GB of RAM. I auditioned

The Screaming Trumpet library features Wayne Bergeron, who played lead trumpet with Maynard Ferguson's band in the late 1980s.

the samples and programming in Native Instruments Kontakt 2.2, in EXS24 mk II in Apple Logic 7.1, and in Reason 3.05.

Brass Section

According to WarpIV, the instruments are specifically designed to be leads and solos, but they would fare equally well as section instruments in which trumpets dominate. The quality of the samples is excellent, and they capture the trumpet's upper register in the tradition of Maynard Ferguson, a bandleader noted for playing extremely high notes on the instrument.

The various techniques are sampled in the appropriate ranges of the instrument (and sometimes considerably beyond), and the chromatic sampling effectively avoids any pitch-shifting

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anomalies. According to WarpIV, four Velocity layers are provided in the sustained patches, with looped and unlooped versions available. Attention to detail in the sampling is evident, especially in techniques such as flutters, where the rates and intervals are consistent across the keyboard.

Listening to individual samples, I noticed a couple of subtle inconsistencies in execution. In one instance, there was a very slight swoop up to pitch on one key. However, these slight variations are of little consequence other than enhancing the human factor in the instruments.

Patches include key- and Velocity-switching instruments, modulation wheel crossfades, instruments recorded with and without natural vibrato, flutters, rises, falls, growls, "doits," and more. I particularly liked ST_All_KS.nki, which effectively combined legato and staccato instruments and a truckload of different techniques with the easy access of a keyswitching program. The Kontakt 2 set makes use of round-robin programming, in which successive iterations of the same note automatically switch to adjacent samples, thus avoiding the telltale machine-gun effect.

Trumped

The programming in most cases is quite good, utilizing Kontakt 2 scripting capabilities and release triggers, though in a few instances you may want to tailor patches to your own working preferences. For example, the Combinator patch in Reason loads all of the individual patches so that every articulation is available. WarpIV recommends that users who require fewer articulations load smaller subsets of the library to save memory.

In ST_NV_Growl Crossfade for Kontakt 2, a couple of the growl samples are flat, causing some unintended beating artifacts when the modulation wheel moves midway between the samples. And on the EXS24 mk II, a patch that is supposed to modulate between growl and flutter-tongue articulations plays both samples simultaneously with no perceptible modulation.

Although there are legato samples and some excellent legato-mode scripts in the Kontakt 2 sets, conspicuously absent from a set of solo trumpets are any true legato monophonic instruments. According to WarpIV, that feature is in the works.

The Scoop

Overall, Screaming Trumpet has a lot to offer. The samples are full of life, and this fine set of representative trumpet articulations conveys much of the depth and breadth of modern jazz and pop trumpet technique. **EM**

Value (1 through 5): 3
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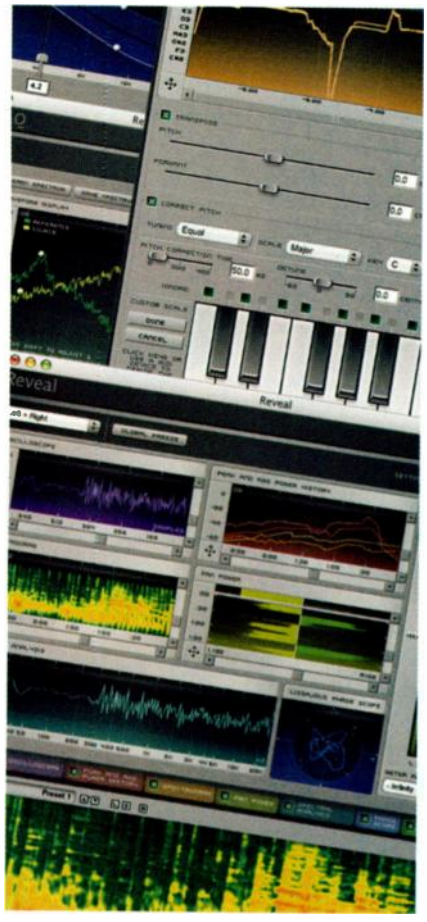

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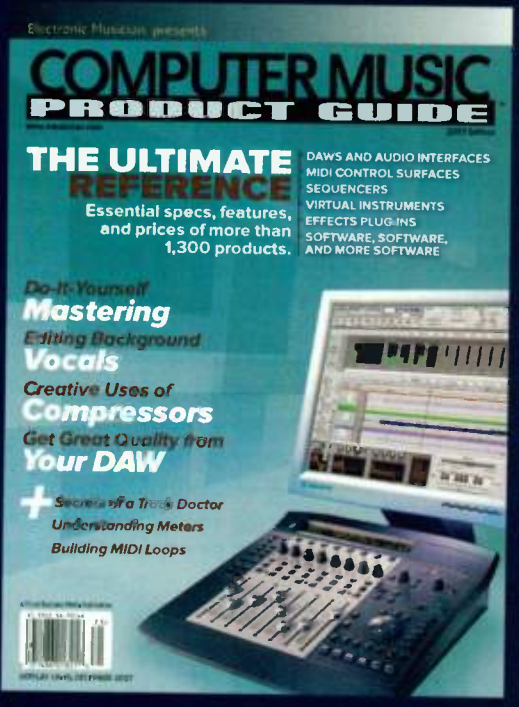

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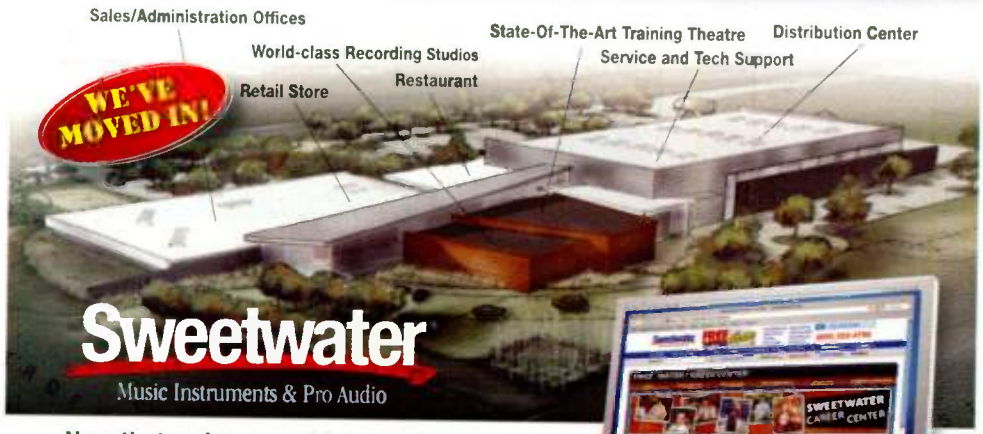

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The MOTU PCI-424 core system lets you connect up to four interfaces to a single card for up to 48 channels of 192kHz recording and playback (shown) or 96 channels 96kHz recording and playback. Mix and match any combination of three interface models to suite your I/O needs. The two-rack HD192 interface provides 12 XLR in/out with AES/EBU digital I/O (with sample rate conversion), 19-segment front panel metering and an incredible measured signal to noise ratio of 120dB. The 24io offers an astonishing 24 TRS analog inputs and outputs in a single rack space, all at 96kHz. And the 2408mk3 provides 24 channels of ADAT optical (3 banks), 24 channels of TDIF (3 banks), 8 channels of TRS analog, S/PDIF and seamless mixing across all connected interfaces.

On-demand processing

Want to run even more instruments and plug-ins? The Muse Receptor is a dedicated hardware-based plug-in player for your favorite VST software. With 16 channels to run virtual instruments or effects, a built-in MIDI interface and a versatile complement of digital and analog I/O, Receptor is the ideal way to run plug-ins while keeping your host computer running smoothly. Control everything from the front panel, or simply connect a monitor to the back. Receptor provides the ultimate in performance, stability, and sonic performance.

The MOTU experts at Sweetwater can build the perfect DP5 desktop rig 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?

World Radio History

FilterFreak and SoundToys

Rejoice! The SoundToys Native Effects bundle is now Audio Unit compatible, so DP5 users can experience the incredible sound of EchoBoy, FilterFreak, PhaseMistress Crystalizer, and Tremolator. With the focus on fat analog sounding effects, versatile control and easy of use, SoundToys plugs get you great sounds fast. These are the tools the pros use to make a mix into a hit. Trent Reznor of Nine Inch Nails says, "Calling EchoBoy a delay plug-in is doing it a disservice. It has become the first thing I turn to for treating a wide variety of sources."

Total Workstation Bundle $599
- SampleTank 2 XL
- Sonik Synth 2
- Miroslav Philharmonik

Total Effects Bundle $599
- Ampeg SVX
- Amplitube 2
- Classik Studio Reverb
- T-RackS

Total Studio Bundle $999
- SampleTank 2 XL
- Sonik Synth 2
- Miroslav Philharmonik
- Ampeg SVX
- Amplitube 2
- Classik Studio Reverb
- T-RackS

IK Total Bundle Series

The IK Multimedia Total Bundle Series offers professional quality production tools at prices every musician can afford. IK's Total Studio Bundle with 7 award-winning plug-ins, 90 DSP Effects, 8000 sounds and over 21.5 GB of samples offers a diverse collection of instruments and effects for every mix. The Total Workstation Bundle delivers 3 award-winning virtual instrument workstations covering every style of music and genre, powered by SampleTank's advanced sample technology, built-in DSP, and easy to use interfaces. The Total Effects Bundle includes 4 award-winning effect plug-in suites for guitar, bass, mixing and mastering, all modeled after the most sought-after hardware gear, with 90 ultra accurate, analog modeled DSP emulations. Musicians First.

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.

Komplete control

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

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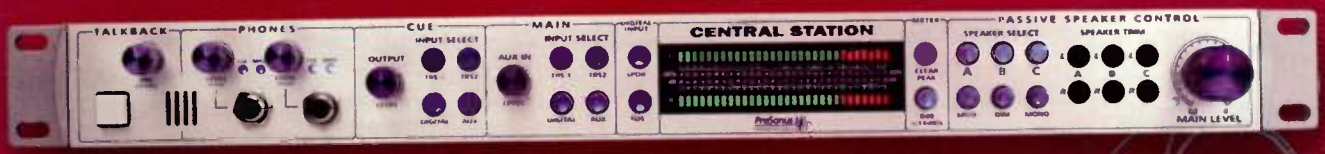
The MOTU Studio: 1,000 plug-ins and counting

Keystation Pro 88 features

- 88-key hammer-action, velocity-sensitive keyboard
- Powered via USB bus (cable included) or optional 9V power supply
- 24 MIDI-assignable rotary controllers
- 22 MIDI-assignable buttons
- 9 MIDI-assignable Alps faders
- MIDI-assignable pitch bend and modulation wheels

88 Weighted Hammer-Action Keys

Digital Performer 5 gives you unprecedented control over your MIDI and audio tracks. And what better way to take advantage of this hands-on control than the M-Audio Keystation Pro 88. Regardless of whether you're a seasoned pro or just ready to take your music to the next level, these hammer action keys are so expressive that you just won't want to stop playing! The Pro 88 could easily become your sole keyboard in the studio or onstage. Yet the Keystation Pro 88 weighs only 47 lbs. — half of most weighted-action keyboards! And the Pro 88's extensive features make it the most comprehensive and competitive product of its kind!



Control room monitoring

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

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 the perfect DP5 desktop rig 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?

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Accurate monitoring

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

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!

Power conditioning

A large-scale MOTU-based multitrack studio is not only a finely-tuned instrument, it's an investment. Protect that investment — and get the best possible performance from it — with the Monster Pro 2500 and Pro 3500 PowerCenters. Many so-called "power conditioners" only protect against random power surges and/or voltage spikes. But AC power line noise and noise from other components is an equally harmful and constant threat to your gear's performance. To prevent this, Monster's patented Clean Power™ filter circuitry (U.S. Pat. No. 6,473,510 B1) provides separate noise isolation filtered outlets for digital, analog and high-current audio components. The result is high quality sound that's free from hums, buzzes and other power line artifacts, revealing all of the rich harmonics and tone in your recordings. Get All the Performance You Paid For™. Get Monster Pro Power.

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Music Instruments & Pro Audio

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Sonic Sculptor

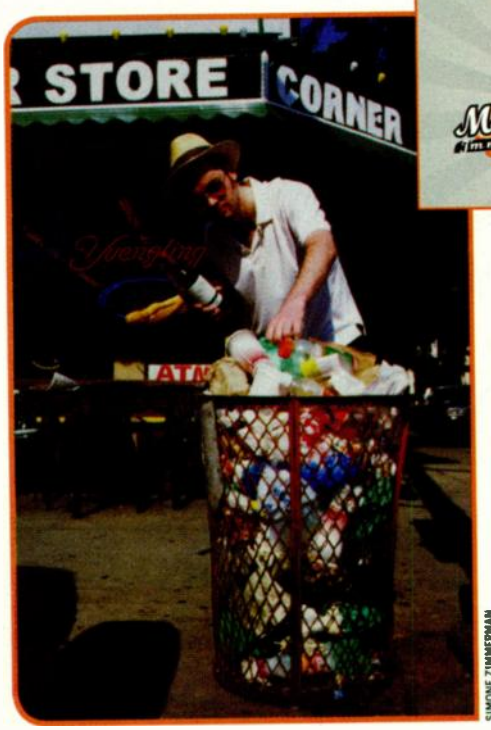
By Diane Gershuny

Monsieur Leroc cuts and pastes his latest CD.

Monsieur Leroc (aka Arne Dresch) blends funk, hip-hop, soul, and electronica into unique ambient grooves. The Stuttgart, Germany–born recording artist's third CD, *I'm Not Young but I Need the Money* (Cornerstone R.A.S., 2006), sounds, says his label, like Curtis Mayfield "if he had Pro Tools and a penchant for underground hip-hop."

Now living in the Sugar Hill section of Harlem, Leroc records from a home studio that has an older but functional setup. "I'm using Emagic Logic 4.8 [put out before Apple bought Emagic] on an Apple Mac G4, and a Korg 01/W proX keyboard," he says. "I use an ES1 synth in Logic and the one in the keyboard. I have an Audio-Technica AT4050 mic, a tiny Behringer MX 602A mixer, a Boss VT-1 voice transformer, and a pair of Yamaha MSP5 monitors. I recorded most of the vocals at my place. I play Rhodes, bass, and lots of other stuff on the keyboard. The rest is samples." The final compositions were mixed in Logic and mastered by Transducer, aka Mic McMullen.

The initial creative process on Leroc's latest CD was experimental compared with his previous releases, especially his second one, *Oh La La* (Cornerstone R.A.S., 2003). On that album, he brought in a number of musicians to record tracks. "That was a great experience," he says. "The musicians' tracks and the beat samples combined made it sound like a live-band recording."



SIMONE ZIMMERMANN

I'm Not Young but I Need the Money/Monsieur Leroc

On *I'm Not Young but I Need the Money* Leroc took a different approach, starting tracks out with random beats that he experimented with until he had a basic structure. He then looked for samples or instruments that would go well with the structure. "It was often the unexpected—when I'd try out something silly—that gave the song a new direction," he muses. "Other times, I'd start with a couple of chords on the keyboard and go from there. Usually, the skeleton of the track would come together pretty fast, and creating the rest took up most of the time. I wouldn't mind if I were more able to lay down a track the way I originally had it in mind. On the other hand, it's really fun to 'sculpt' a song step-by-step and appreciate the surprises."

The songs are sonically interesting and multilayered, and the scope of sampled references is broad and eclectic—ranging from Cat Stevens to Jerry Lee Lewis, and from Ella Fitzgerald to Frank Sinatra. "A lot of samples came from old records that I found on the street in Harlem," he says. "Most of the samples came from some kind of African American music from the early '70s: from folk, psychedelic, and soundtracks."

Leroc added his keyboard and bass playing to the tracks and brought in some guest vocal talent. "I recorded the vocals of Josh Fischel, Courtney Mace, 2Mex, and AWOL One at my place; Radioinactive and Plappermaul recorded at theirs," he says.

One of the more unconventional moments during the CD's making occurred when Fischel recorded a "telephone" vocal track—through an actual cell phone. "He couldn't leave the room where we were recording because he'd get bad reception, so to avoid feedback I put a thick blanket over myself, the [receiving] phone, and the mic. I don't think we were exactly sober then!"

How does Leroc's latest CD differ from his previous two? "This one is the most diverse," he says. "I wanted to explore new techniques in beats, song structures, and effects." EM

RIFFS

Monsieur Leroc

Home base: New York City

Sequencer used: Emagic Logic 4.8

Primary vocal mic: Audio-Technica AT4050

Web site: www.cornerstoneras.com/monsieurleroc

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Digital Performer scores **the impossible**

"Digital Performer is a huge part of my scoring process. I do all of my writing in DP. At the Mission Impossible 3 sessions, we had a laptop running DP and a MOTU Traveler to handle prelays and record live stereo stems of Dan Wallin's mix from the main board. DP also drove video to the main monitors and synced the entire 100+ piece orchestra, so that everything was perfectly in line with my composition sequence. I count on DP every day. It performs flawlessly."

— ***Michael Giacchino***
Composer
Original Music for M:i:3

Mission Impossible 3 "Bridge Battle" Digital Performer project courtesy of Michael Giacchino and Chad Seiter. Mission Impossible 3 image courtesy of Paramount Pictures. All rights reserved.

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