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Grammy-Winning Engineer
John Paterno

A PRISM BUSINESS MEDIA PUBLICATION

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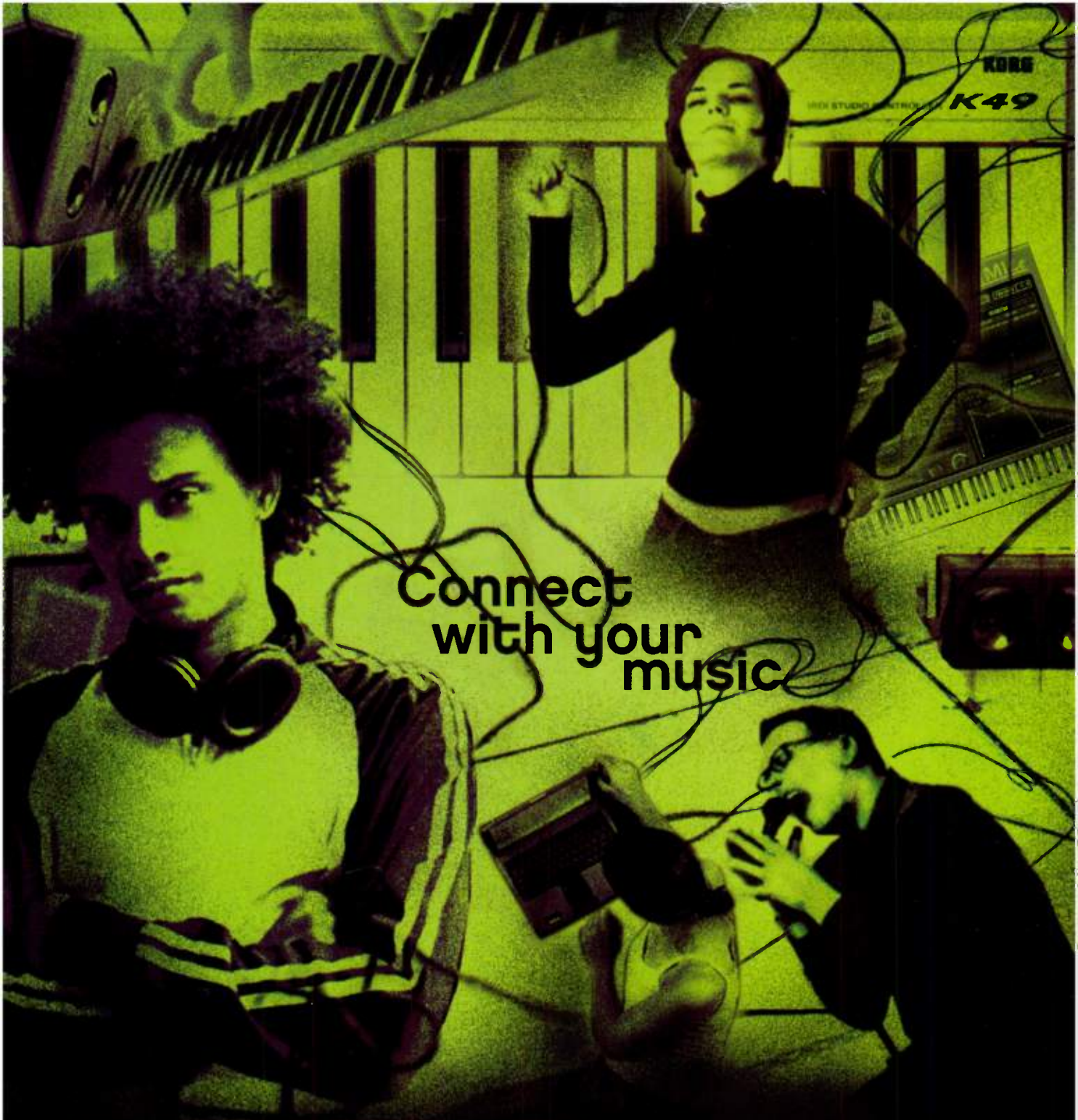

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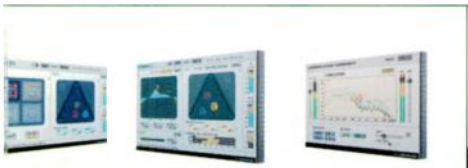

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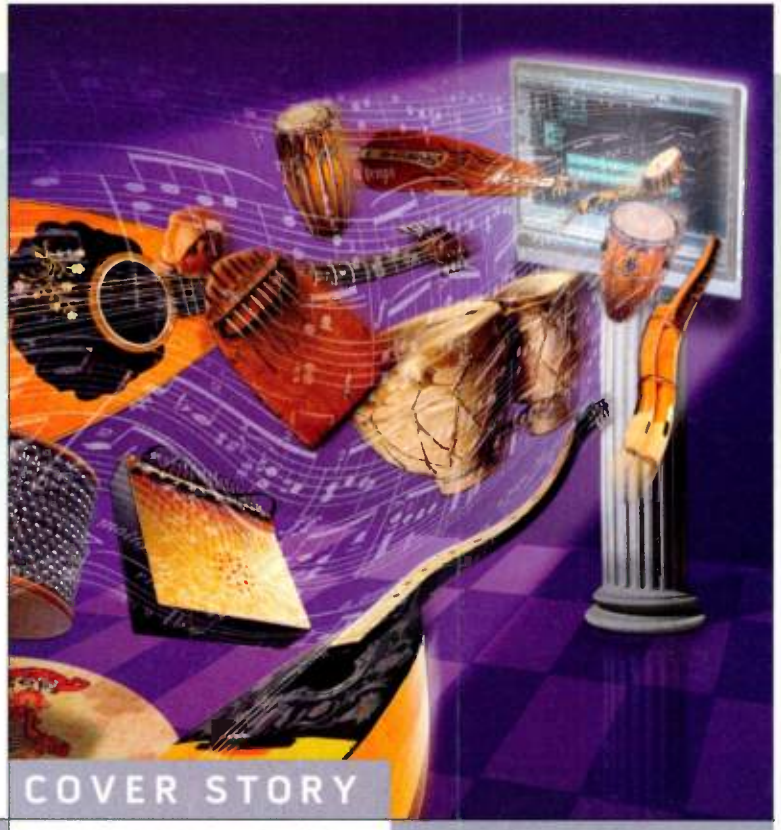

COVER STORY

STEVE MCAFEE

FEATURES

33 SHOULD YOU BUY AN INTEL MAC?

Apple's Intel Core Duo–based Macs promise major speed gains but raise questions about software compatibility. EM investigates the new CPU's impact on electronic musicians. By Bob "Dr. Mac" LeVitus

40 CULTURAL DIVERSITY

In a fusion of Old World and new school, electronic musicians are using ethnic software instruments to explore sounds from around the globe. EM examines 11 ethnic-instrument software packages that can expand your timbral horizons. By Geary Yelton

61 PRODUCTION VALUES: THE EXUBERANT ENGINEER

L.A.-based engineer and producer John Paterno, who has worked with such artists as Robbie Williams, Los Lobos, and Badly Drawn Boy, talks about his outlook on recording and the differences between working in a commercial studio and a personal studio. By Diane Gershuny

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Doing It Because You Can

In the August 2006 "Letters" column, readers Michael Zavoski and Scotty Webb responded to our interview with Geoff Emerick (see "Production Values: The Long and Winding Road" in the May 2006 issue) by debating whether recording and editing in the computer is a boon or an impediment. Zavoski thinks that computer editing detracts from the creative process, and suggests rehearsing until a performance is right so one doesn't have to edit later. Webb believes that the computer's capabilities are a plus, and that a performance doesn't suffer as a result of recording through one.

In this month's "Letters" (see p. 14), Tom Slocombe says in response to our July 2006 feature "Vocal Magic" that minor inaccuracies are part of what makes a performance human. He thinks the effect of technology is to encourage producers to overedit a performance in an attempt to make it "perfect." Like Zavoski, Slocombe advocates using musicians who can nail their parts to begin with.

Zavoski, Webb, and Slocombe are discussing music that is meant to sound as if it is being performed; we're not talking about electronic music that is intended to sound inorganic, and with which it's appropriate to heavily quantize and construct the piece bit by bit or loop by loop.

JULIE BIRUM

Webb's real point is that the computer is a tool, and what matters isn't the tool but how it is used. Most of us agree that it's better to hire musicians who play a piece correctly the first time, rather than having to fix an inferior performance later in the computer.

Sometimes, however, our options are limited. For instance, the featured artist could be the problem; there are times when you can't obtain or afford the veteran session player you want, so you have to settle for who you can find. In that case, since the point of the project is to produce music by that artist, your only option is to do the best you can with what you have. That might mean comping multiple takes and using products like Antares Auto-Tune to an unpleasant extent.

In addition, you must consider who the client and the intended audience are. You have different demands from a commercial pop project for a label than from a blues band that wants a classic sound. Pop listeners could be unenamored with the human variability that might charm blues fans. With local radio and TV commercial spots, you have to please the client, which might be an ad agency that demands an extremely polished sound. So identify who you are producing the project for and produce appropriately.

That said, it is all too easy to overedit a performance just because you can. The solution should be to focus on musical taste first and foremost and to exercise some self-restraint. A little bit of processing and editing can go a long way. Use quality musicians, and then enhance their performance with tasteful use of software rather than using software to cover up a poor performance or to strive for absolute perfection.

The real question is whether the music is meaningful to the listener and has achieved the creator's artistic goals. If you have those things, then the method used is a technical detail that is of professional interest to other musicians but irrelevant to listeners.

Steve Oppenheimer
Editor in Chief

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PANELS & WORKSHOPS SCHEDULE

Wednesday September 20
Registration - All day Demo Listening Room Sessions

Thursday September 21
-Video VJ & the art of Visual Music
-Protecting Your Music & Contract Negotiations

Friday September 22
-Technology
1. Studio in a Box, all in one music equipment and software.
2. Lap Top vs. Desk Top production.
3. Multiple platform, digital instruments and compatibility.
4. Home recording and how can my studio sound professional?

-Media
1. How to approach labels when you are an unknown producer/artist.
2. Is web publishing a viable way to get your music out there?
3. Licensing and revenue streams from you music.
4. Creative ways to promote yourself and your music.

Saturday September 23
Music Production
1. From demo to release & the steps taken.
2. Realistic avenues to approach labels & distributors.
3. Collaborations, remixes and its benefits.
4. Do's and Don'ts

Electronic & Dance Club Music In Feature Films panel
1. The future of Dance Music in films and its influences.
2. Advice to producers/artists about multi-channel mixing & surround sound.

Sunday September 24
Closing party

For Contact INFO: 619.578.4130

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SYNTHESIS

SCRATCH LIVE

LAURA WILLIAMS

Letters

Human Elements

Thank you for the fascinating article about recording and editing vocals (see "Vocal Magic" in the July 2006 issue of EM). However, I am concerned that the general effect of technology is the elimination of what is human in musical performances, as well as the production of music that is technically impressive but sterile and boring. A sequencer can be programmed to play a song on a synthesizer perfectly, with every note exactly on the beat and perfectly in tune, but I don't think very many people want to listen to that kind of music.

Recently I watched a DVD that included an informal performance by a woman singing and accompanying herself on the banjo, which was shot with a handheld camcorder using the built-in microphone. It was fantastic. However, on the same DVD were songs she had recorded in a studio that sounded lifeless and stale. I could hardly believe it was the same performer. It's bad enough that so much music is inherently boring, but it's worse when all the life has been sucked out of it—with the best of intentions—using powerful editing technology. I prefer to listen to recordings of real performances with minimal editing. If the musician is so poor that extensive comping and pitch correction are needed, get a better musician. And avoid labeling human elements as "mistakes" or "clams" or "imperfections." Just enjoy the music, the human elements in the performance, and the fidelity of the connection with the human performer.

Tom Slocombe
via email

Key Words

Scott Wilkinson claims that the amount of energy required to produce solar cells is "arguably more energy than they can ever generate" (see "Tech Page: Catching the Sun" in the May 2006 issue of EM). He also gave "high energy cost of manufacturing" as a reason for solar cells not being more widespread.

I could not find a source to confirm his claim. I did, however, find a number of credible sources that estimate the "energy payback" (the amount of time it takes for a solar panel to produce the amount of energy used in manufacturing) to be a period of one to four years. The U.S. Department of Energy's Energy Efficiency and Renewable Energy Web site (www.eere.energy.gov) puts the average life span of a

Coda: Arif Mardin

On Sunday, June 25, 2006, the world lost one of its greatest record producers and arrangers, Arif Mardin, who died of pancreatic cancer at the age of 74. Mardin was responsible for countless hit records spanning four decades.

Mardin came to the United States from Turkey in 1958 to attend the Berklee College of Music as the recipient of the first Quincy Jones Scholarship. In 1963 he began a relationship with Atlantic Records that lasted until his retirement in 2000. At first, he worked as an arranger with producers Tom Dowd and Jerry Wexler, then as a producer and senior vice president of Atlantic Records. Artists he produced include Chaka Khan, the Bee Gees, the Rascals, Bette Midler, Hall and Oates, Aretha Franklin, Jewel, Judy Collins, Roberta Flack, Phil Collins, and the Average White Band.

I was privileged to work with Arif Mardin for 16 years as an arranger-programmer and, on occasion, coproducer. He was gracious, professional, and always inspiring, and he was able to bring out the best in everyone, from assistant engineers to stars. He also had an uncanny ability to come up with that one special color or sound that made each record unique.

To Mardin, the artist's voice always came first. As a young man, he heard one of his Aretha Franklin records coming from a transistor radio down in a manhole, and he was delighted that Franklin's voice came through clearly on the noisy street. He wanted all of his records to have that effect.

Mardin was working on an album of his own material at the time of his death. The album is almost done and will be completed by his son Joe Mardin, who coproduced. He is survived by his wife Latife, son Joe, and daughters Julie Joffre and Nazan Joffre.

—Steve Skinner

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Next Month in EM

COVER

Software Eighty-Eights

We compare six of the leading sampled grand-piano virtual instruments to find the best choice for different types of music-production applications.

FEATURES

All Is Not Lost

Learn what perceptual coding is, which lossy encoders are the most important for personal-studio owners, and how to get the best results with them.

Production Values: Duncan Sheik

Singer-songwriter Duncan Sheik discusses his latest album, *White Limousine*, which includes a DVD with the multitrack files for all the songs in Ableton Live format. Sheik talks about why he created the Live files, how he recorded the album, and his personal studio in a Manhattan loft.

COLUMNS

Making Tracks: Cakewalk Sonar 5

A grab bag of tips for this powerful sequencer.

Sound Design Workshop: Pitch-Shift Plus Transposition

Use pitch-shifting together with opposing transposition to produce timbral changes with multisampled instruments.

Square One: New Tricks for an Old Dog

Find out how MIDI can be used in unusual and creative ways beyond sending note messages to and from a sequencer.

. . . and much more

Letters

photovoltaic (PV) cell at 30 years. Therefore, a PV cell produces 6 to 30 times the amount of energy used to produce it.

Perhaps one reason that PV technology is not more widespread is that the myths about it are too widespread. Scott's articles are always informative and useful, but this was a rare moment of carelessness that I consider to be especially unfortunate because of the importance of alternative energy at this time.

Jon Stubbs
via email

Author Scott Wilkinson replies: The key word here is arguably, *which I used deliberately. I was paraphrasing Craig Grimes, professor of electrical engineering and materials science and engineering at Penn State, who conducted the research that I profiled in the article. As Grimes states in a press release, "Solar cell technology has not changed very much over time and is still predominantly silicon solar cells. It takes a great deal of energy, five gigajoules per square meter, to make silicon solar cells. It can be argued that silicon solar cells never fully recover the energy it takes to make them in the first place."*

I agree that alternative energy is increasingly important these days, which is why I wanted to write about Grimes's work. I could have—and probably should have—attributed the statement to him, but I disagree that it was a careless statement. In fact, it got you thinking and researching, which is a very good thing.

We Welcome Your Feedback

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Not a Bit Sorry

Mike Levine's article "Better Safe Than Sorry," which appeared in the May 2006 issue, typifies the in-depth coverage that EM provides to its readers. This particular article not only provided what any computer user should know from the time that PCs came out with the original IBM Baby Blue in 1983 to the present day, but also presented an exhaustive subject in a conversational manner. Great job, Mr. Levine. Thank you for your journalism.

John Sussewell
via email

War and Peace

While Dave Pensado's comments (see "Production Values: Mixing Down and Speaking Up" in the July 2006 issue of EM) may ring true for the majority of our culture, will any of the popular music produced today be remembered later? Beethoven and the Beatles were new in their day, but they were also good. A new sound generally implies that it is a unique sound, one that typically uses brand-new technology. In time, some technologies can sound dated (Cher's "Believe" vocoder effect is an example), yet others, like the synthesizer, become classic. But for Pensado to proselytize new over good is sophomoric. Hearing a new sound is more obvious than hearing a good sound, provided one has a mental library of everything that has already been performed.

It's easy to make statements that incite an emotional response, which is the technique of an unsophisticated mind. Real, good music has melody and harmony; rap is rhythmic rhyme and thus would be less than music. So what if it sells—it sucks. Is that inflammatory enough?

Warren Peace
via email EM

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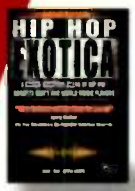

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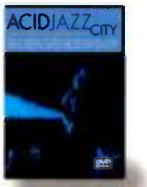

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Heat Seekers

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WAV/REX/Apple Loops

If you're looking for the most current and popular hip-hop sounds out, then you got to pick up this new joint. With blazin' beats, thick bass lines, nasty synth, tight horns, strings and more, these kits are pushin it to another level. You'll get more than 1900 loops in 50 construction kits ranging from 70 - 140 bpm. That's over 4 gigs of content in WAV, REX, and Apple Loops to blow up your tracks. Next time you head into the studio... bring the heat with you.

Off The Hook Hip Hop: Dirty South

$99.95
WAV/REX/Apple Loops

Bling Bling and country grammar... this is as dirty as it gets. From the legendary "Off the Hook" series, these construction kits flow with some serious southern Hip Hop flavor. 2116 loops and sounds including drums, synths, electric bass, organs, guitars, Rhodes, strings, percussion and more. Plus a ton of bonus material! With enough crunk juice to fill your pimp cup twice, you can ride with these tracks from St. Louis to New Orleans and back.

Electro Magnetic Fury

$99.95
WAV/REX/Apple Loops

Acclaimed producer Perry Geyer is back at it again with Electro Magnetic Fury. Whether you're making hard hitting house, nu school breaks, big beat or electro you'll find just what your searching for with this surge of furious beats over menacing atmospheres. Nearly 100 construction kits of punishing drums and beats, basses, pads, FX, atmospheres, distorted grooves, massive percussion and more will bring the Fury.

Funk Quartet

$99.95
WAV/REX/Apple Loops

Good times are back again as jazz and funk genius Rich Mendelson lays down the squeaky grooves in the set. 73 construction kits of the finest funk around. We have released a number of top selling Jazz and Funk libraries but nothing like this before. We're going back to basics with this 28 GB library of just pure clean funk. You'll find only drums, bass, piano and guitar on this user friendly construction kit library.

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If you're looking for a subconscious state of electronic, hypnotic rhythms and sounds, then what you want is progressive House and Trance, and what you need is a RUSH! All the material you need to get your tracks into the biggest clubs is right here. These kits offer you the full mix, breakouts and drum hits from each kit in REX2, WAV and Apple Loops format. Over 1.3 gigs of pure adrenaline, plus a bonus folder of 420 extra drum hits and loops.

Chill:

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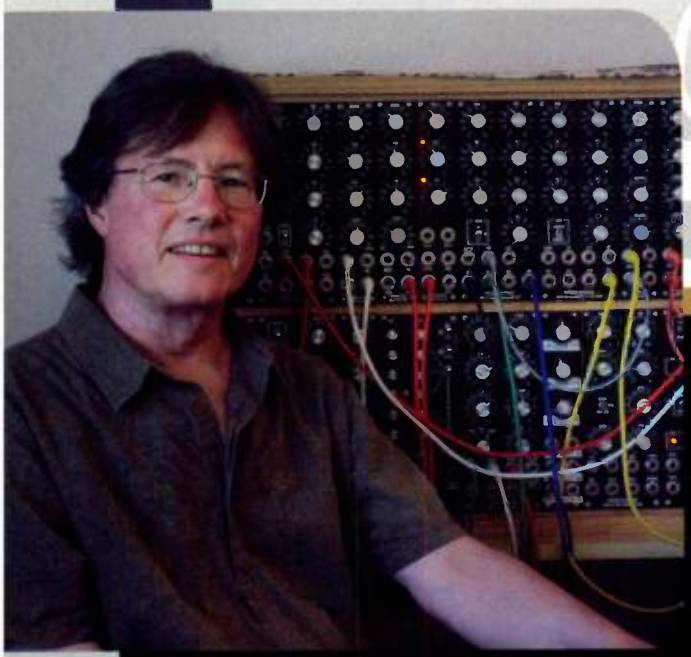

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EMspotlight

Roger Powell Returns!

Best known for his solo albums—*Cosmic Furnace* (Atlantic, 1973) and *Air Pocket* (Bearsville, 1980)—and his work with Todd Rundgren in Utopia, Meat Loaf, and David Bowie, Roger Powell has just released his long-awaited third solo project, *Fossil Poets* (Inner Knot, 2006). In this exclusive interview, Powell talks about his new CD and shares his thoughts on musical-instrument interfaces and analog synths. By Gino Robair. emusician.com/em_spotlight

On the Home Page

EM Web Clips

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

EM Guides Online

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

Show Report

The 2006 Summer NAMM show is one of the largest annual musical-instrument expos in the United States. Visit emusician.com for Associate Editor Geary Yelton's report on the exciting new recording gear, music software, and electronic musical instruments unveiled at this year's show.

EM seminars on demand

The EM Seminars on Demand offer an exciting way to see new products and learn new applications and techniques online and at your leisure. Korg USA's top sound designer, Jack Hotop, shows you how to customize a variety of synth sounds to suit your performing and compositional styles.
emusician.com/editorspicks

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

M-Audio MidAir 25

M-Audio (www.m-audio.com) has taken the wraps off the MidAir 25 ($249.95), the first in a line of wireless USB MIDI controllers. The MidAir 25 was designed for musicians who want freedom of movement onstage or who simply want to minimize cable clutter. It has 25 Velocity-sensitive, full-size keys and an effective wireless range of 30 feet. Front-panel controls include eight MIDI-assignable knobs, up and down buttons for switching presets and octaves, a sustain button, and an assignable data slider.

The MidAir 25 keyboard ships with the MidAir receiver, which is a 2.4 GHz wireless MIDI interface that connects to your computer's USB port. It can also function as a normal 16-channel USB MIDI interface with one MIDI In and one MIDI Out. With six AA batteries, M-Audio claims more than 20 hours of continuous keyboard use. The MidAir 25 also has a 9V power supply, pitch-bend and mod wheels, and ten nonvolatile memory locations, and comes with Ableton Live Lite 5 (Mac/Win).

Toontrack EZDrummer

Toontrack (distributed by EastWest, www.soundsonline.com), makers of dfh Superior, has introduced an easy-to-use drum-sample playback plug-in called EZDrummer (Mac/Win, $179). Onscreen graphics let you select from an assortment of drums, cymbals, and preset kits. EZDrummer includes 850 MB of compressed 16-bit, 44.1 kHz content, which Toontrack says is equivalent to 5 GB of uncompressed WAV files. In addition to a rock-oriented core library, EZDrummer comes with the Yamaha Cocktail kit, the first in a series of EZX expansion packs. The plug-in supports AU and VST formats, and RTAS is in the works.

EZDrummer lets you quickly create complete drum parts in just a few clicks. Choose from thousands of MIDI files in the included Groove Library, or create and save your own grooves. Introduce realistic beat variations with the Humanize function, and scale the dynamic range with Velocity Sweep. You can drag EZDrummer's grooves directly into your sequencer's MIDI tracks. The mixer screen has nine channels for controlling outputs, panning, bleed, and ambience. If you'd rather mix using your sequencer, you can route EZDrummer to seven stereo tracks or send individual channels to separate tracks. To get you started, EZDrummer's Help menu links to a Flash tutorial, PDF manuals, and online support.

Solid State Logic Duende

Who wouldn't want the sound of an SSL (www.solid-state-logic.com) console on their next recording project? The Duende ($1,899) is the first DAW-oriented product from the company, which is an undisputed leader in pro-level studio gear. The Duende is a Mac OS X–compatible DSP host that uses signal-processing technology developed for SSL's C series of digital production consoles.

The Duende's EQ and Dynamics Channel Strip plug-in is based on the XL9000K's EQ and dynamics sections. It features a 4-band parametric equalizer, variable highpass and lowpass filters, and independent sidechains for the compressor/limiter and expander/gate. The Stereo Bus Compressor plug-in is a simplified processor that gives you critical control over dynamic range. The Duende's plug-ins are compatible with AU, RTAS, and VST hosts.

The 1U rackmount unit incorporates four 333 MHz, 40-bit SHARC DSPs and a FireWire 400 connection. With 32 mono processing channels, it can run as many as 16 stereo plug-ins at 44.1 or 48 kHz, or 16 mono plug-ins at 88.2 or 96 kHz. A Universal Binary version and Windows XP compatibility are expected soon.

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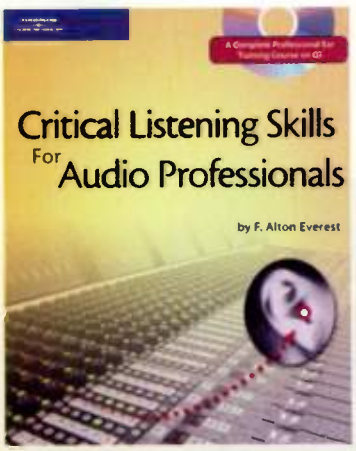

The ability to quickly recognize frequencies, distortion, and sonic imbalances is a requisite skill for anyone who hopes to find work as a recording engineer. Ear-training courses designed for musicians can be helpful, but they're poor substitutes for real-world studio experience with a talented engineer by your side. Unfortunately, few students have such an opportunity. Since 1997, one desirable tool for sharpening your skills has been a $350 book and 5-CD set developed by F. Alton Everest, who died last year after authoring more than 20 authoritative books on acoustics and audio engineering. Now **Thomson Course Technology** (www.courseptr.com) has repackaged Everest's audio-training course with a new title, *Critical Listening Skills for Audio Professionals* ($49.99). This profusely illustrated 216-page hardbound book is accompanied by a single CD-ROM that contains the entire contents of the original CDs in the form of 320 kbps MP3 files, totaling nearly five hours of instruction and audio examples. Topics range from estimating frequency and sound-level changes to location perception and binaural listening.

To help you gain mastery over Sony Acid Pro, **Sony Media Software** (www.sonymediasoftware.com) presents *The Seminar Series: Professional Training for Acid Pro 6 Software* ($99.99), a 3-disc tutorial that promises hands-on experience. Authored by Acid's developers and hosted by Sony training manager Gary Rebholz, two video DVDs deliver four interactive lessons. The first lesson focuses on loop-based music creation for the beginning user. The next covers the basics of MIDI, with an emphasis on Acid-style sequencing. The class on multitrack audio tells you how to make the most of Acid's DAW features, and the advanced MIDI section takes you deep into Sony's MIDI functionality. Rebholz suggests watching the lessons on your television while working with Acid Pro on your PC. The third disc is a CD containing Acid, WAV, and MIDI files that you'll need to complete the lessons. Also included is a DVD-ROM with demo versions of various Sony Media Software products.

Peachpit Press (www.peachpit.com) has published an update to Mary Plummer's book on Apple's entry-level digital audio sequencer, *Apple Training Series: GarageBand 3: Create and Record Music on a Mac* ($39.99). Now in its third edition (just like GarageBand), the 421-page book is part of the Apple training and certification program's official curriculum. The new edition covers topics such as scoring videos and creating Podcasts, and is packed with color illustrations, screen shots, and photos. A DVD-ROM of tutorial content includes GarageBand files, image files, QuickTime files, and PDF files.

Digidesign Pro Tools has become such a sophisticated production platform that it might take years to learn everything on your own. To help ease the learning curve, **Thomson Course Technology** has published the third edition of *Pro Tools 101 Official Courseware* ($49.99). This 395-page introduction, written by Digidesign and Frank D. Cook, takes you from understanding basic digital audio theory and Pro Tools' file structure to handling the details of real-life music and postproduction projects. By developing essential techniques for recording, editing, and mixing with Pro Tools 7 software, DV Toolkit 2, and various hardware configurations, you will begin to acquire the comprehension and hands-on experience necessary to progress to Pro Tools Operator or Expert certification. Included with the book is a DVD-ROM containing video files, plug-in installers, and tutorial sessions.

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Audio Engineering Associates Ribbon Pre

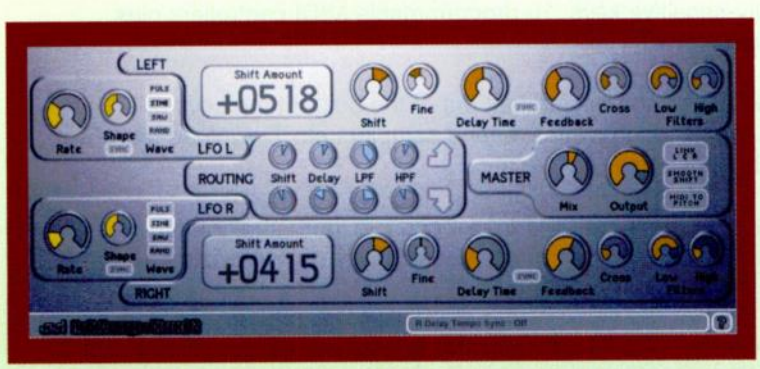
Audio Engineering Associates (www.ribbonmics.com) has introduced a dual-mono ribbon-microphone preamplifier with a name that's easy to remember: The Ribbon Pre ($835), or TRP for short. Designed by Fred Forssell, the ½-U TRP is a minimal-path FET preamp with as much as 83 dB of gain and an 18 kΩ input impedance. Its low-noise circuitry is optimized for ribbon, moving-coil, and tube mics that don't require phantom power. And if external power is applied, zener diodes protect TRP's input stage.

On the front panel is a 12-position switch for adjusting first-stage gain. Its settings range from +6 to +63 dB, with an additional 21 dB of gain available from the output-level knob. Each channel has polarity-reversal and highpass-filter switches and LEDs that indicate level and overload. On TRP's rear panel are two balanced XLR mic inputs, two balanced +4 dBu XLR outputs, two unbalanced –10 dBV ¼-inch TS outputs, and a connection for the included external power supply.

Download of the Month

AUDIO DAMAGE DISCORD 2 (MAC/WIN)

Discord 2 ($49) is the latest piece of audio-demolition software from Audio Damage (www.audiodamage.com), a partnership between plug-in designer Christopher Randall and DSP wizard Adam Schabtach. With this third-generation upgrade, Discord has evolved from an emulation of the classic Eventide Harmonizer H910 to an advanced, MIDI-aware plug-in with a full range of pitch-shifting and delay capabilities. Discord 2 is available in VST and AU formats for the Mac and VST format for the PC. Despite its sophistication, it is easy to program and comes with a substantial library of presets to get you started (see **Web Clip 1**).



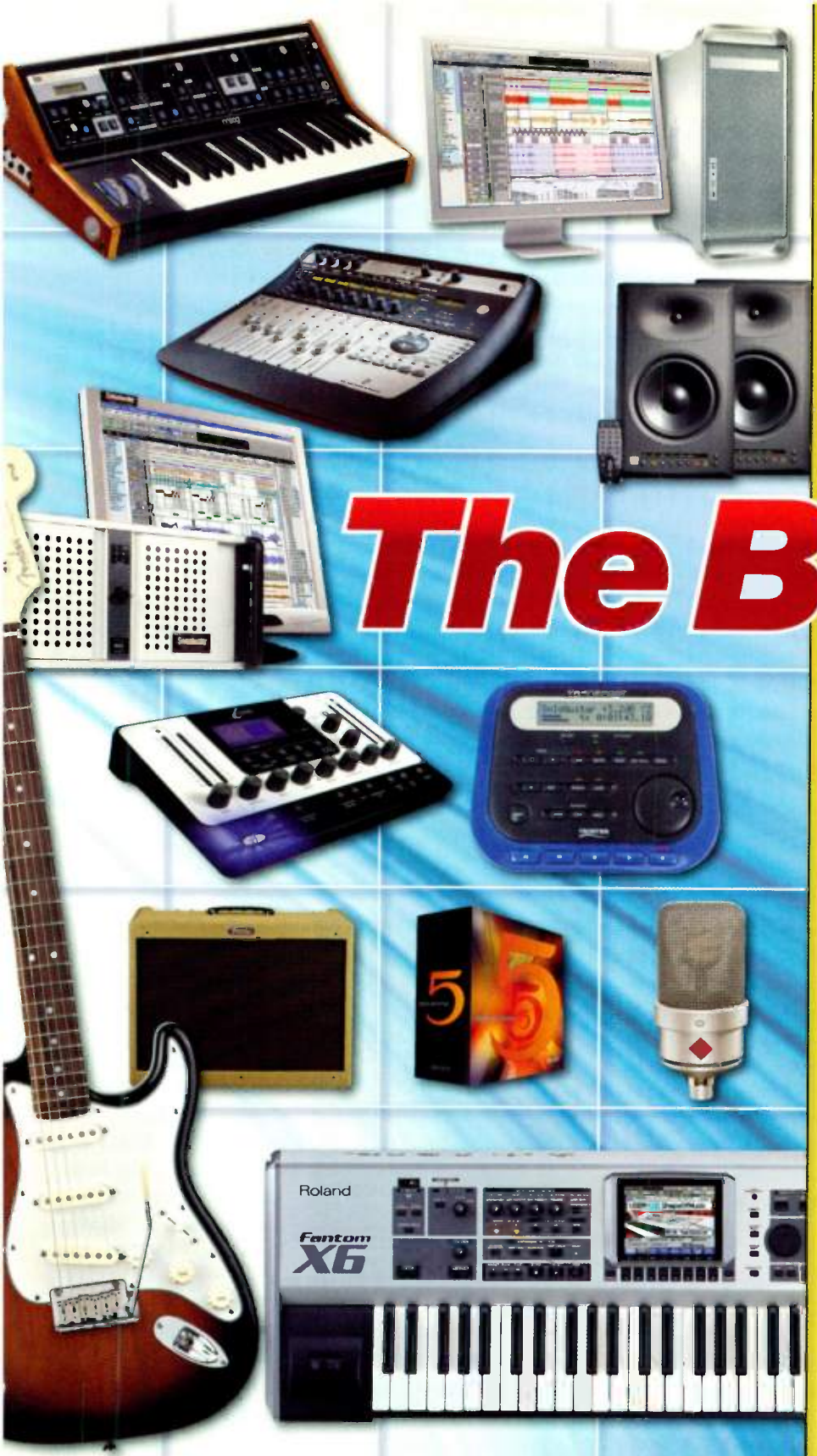
Discord 2's primary functions are pitch-shifting and delay. It has completely independent signal paths for the right and left channels, with individual controls for all parameters. Dual multiwave LFOs can modulate the amount of pitch-shift, the delay time, and the cutoff frequencies of lowpass and highpass filters at the end of the signal paths. The VST versions offer MIDI Learn capabilities for all parameters. The pitch-shift range is up and down one octave, and you can set the pitch-shift amount in semitones with MIDI Note Numbers between 48 and 72.

Audio Damage's product line includes a variety of other reasonably priced hardware emulations. Phase 2 (Mac/Win, $49) models the Mutron Bi-Phase with a pair of 6-stage phasers that can work in parallel or in series. The 914 Fixed Filter Bank (Mac/Win, $39) replicates the Moog Modular's 914 filter module. Ratshack Reverb (Mac/Win, $34.99) needs no introduction. As its developers put it, "Never before has a vintage effect of such low quality been as painstakingly modeled." Dubstation (Mac/Win, $39), a very basic feedback-delay line, and BigSeq (Mac/Win, $39), a 16-step gating and filtering sequencer, aren't exact emulations, but they follow the same simplicity-first philosophy of most Audio Damage products.

On the other hand, Ronin (Mac/Win, $69), my personal favorite, is anything but simple. It has dual delay lines with a maximum of 12 seconds of delay, dual multimode resonant filters with continuous morphing between modes, and dual saturators. Two multiwave LFOs and an envelope follower provide the modulation. But Ronin's signal-routing matrix is the mind bender. You can route the right and left input channel to any module, and you can route the output of any module to the input of any other. Failing to consider feedback can lead to a world of hurt, but a little attention to detail yields quite unusual results (see **Web Clip 2**).

EM WEB CLIPS

—Len Sasso



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Arturia Analog Factory

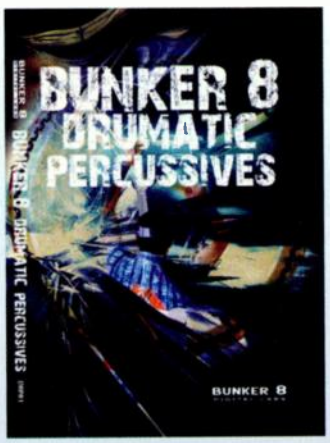
Arturia (www.arturia.com) has taken hundreds of the best presets from its vintage synth emulations—ARP2600 V, CS-80V, Minimoog V, Modular V, and Prophet V—and packed them into Analog Factory (Mac/Win, $249), a new software instrument with a straightforward user interface and realistic sound. Analog Factory ships with 2,000 presets that emulate five classic analog synths and the digital hybrid Prophet VS.

Analog Factory's Preset Manager classifies sounds by instrument, type, and characteristic. Just click on the descriptors to quickly find exactly the sound you need. Looking for a bizarre bass? Analog Factory has 23. How about soundtrack effects? Choose from 16. Need an ambient pad? Are 92 enough?

Organize presets by traits such as name or CPU usage, and create a list of your favorite sounds. You can classify and save your own presets, too. Control filter, LFO, effects, envelope, and four preset-specific parameters in real time. Take as many as eight snapshots for instant recall. Analog Factory runs standalone and as an AU, RTAS, or VST plug-in. To try out Analog Factory for yourself, download a demo version with 137 presets from Arturia's Web site.

Sound Advice

Instruments and voices from cultures throughout history are the focus of *Dirk Campbell's Origins* ($349), a sample library from Ilio (www.ilio.com). On a timbral journey through time, producer Campbell has captured musical sounds reaching back to their tribal origins. Inspired by civilizations from ancient Egypt and Persia to pre-Christian Europe, the collection features primitive vocals, percussion, wind and stringed instruments, and sound effects, presented in an educated best guess as to how they could have been used in times gone by. Winds include Roman war horn, conch, duduk, and suling—even blowing on grass blades. Strings range from the Finnish zither to the West African harp. Tribal drums, scrap metal, gongs, and other percussion were recorded with and without ambience. Male and female vocals feature overtone singing, slave chants, war shouts, cries of fear, and more. Simulated animal noises and the sound of swordplay are among the sound effects. *Origins* also layers instrumental sounds into pads and drones. The DVD-ROM contains more than 3.5 GB of data for GigaStudio 2.5 and more than 3.3 GB for EXS24 II.



New from **Big Fish Audio** (www.bigfishaudio.com) is *Bunker 8 Drumatic Percussives* ($99.95), an extensive collection of 24-bit drum and percussion samples. The DVD-ROM gives you thousands of single hits organized into 96 drum kits for Steinberg HALion 2 and for Native Instruments Kontakt 2 and Battery 2. It also provides 146 Redrum patches and 34 NN-XT patches for Propellerhead Reason. Kits include everything from orchestral percussion and hip-hop to effects such as Deranged, Robocom, and Whimsy Snake. Some kits contain only one type of sound, such as claps, congas and bongos, cymbals, hi-hats, kicks, shakers and tambourines, or snares and side sticks. EM

AUTHENTICITY

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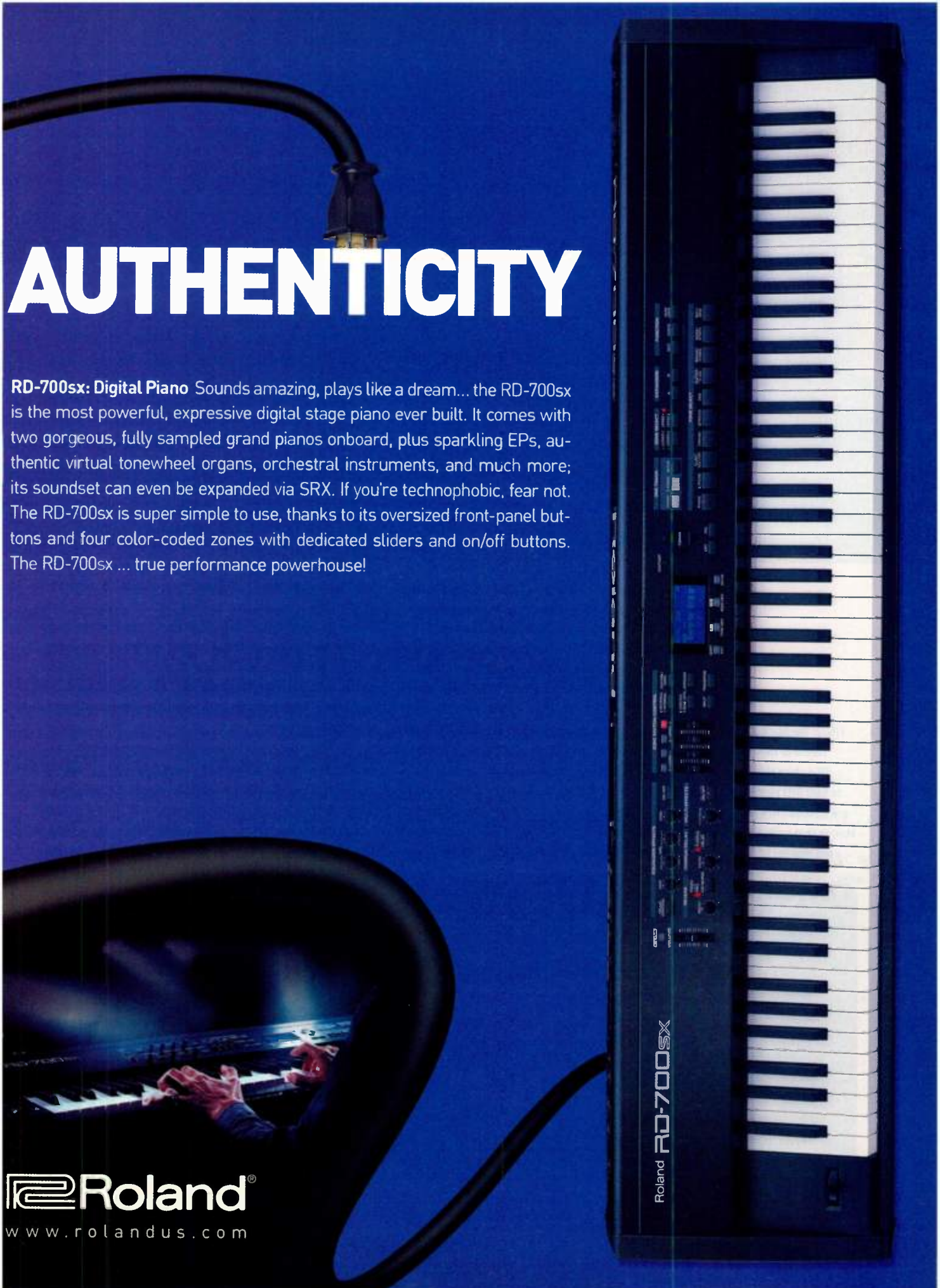

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LAURA WILLIAMS

Should You Buy an Intel Mac?

By Bob "Dr. Mac" LeVitus

What Apple's CPU switch means to electronic musicians.

Unless you've been living on the moon for the past year, you know that Apple (www.apple.com) has abandoned PowerPC processors and is replacing them with chips from Intel. In fact, most of Apple's current crop of computers—the iMac, the Mac mini, the MacBook, and the MacBook Pro—already have Intel inside (see **Fig. 1**).

New Terminology

Before discussing what Apple's switch to Intel processors means to you, I should explain a few new terms. Intel's *Core Duo* processor is the central processing unit (CPU)—the "brain" inside your computer. The Core Duo has two *execution cores*, or computational engines, on one chip. The result is a single chip that offers roughly twice as much computational power as a single-core chip.

In previous models and in current Power Macs, Apple used PowerPC G4 or G5 CPUs manufactured by IBM, Motorola, or Freescale. Today, most Macs use an entirely new and very different type of CPU manufactured by Intel. One result of this switch is that software you previously used with your Mac G4 or G5 will need to be updated by its maker to achieve maximum performance on Intel-based Macs. Programs that have been updated to run natively on Intel-based

FIG. 1: An Intel Core Duo processor powers every Mac that Apple has introduced since last year. Whether you're ready to make the switch depends on the software you use.

Macs and will also run on PowerPC-based Macs are called *Universal* applications or *Universal Binaries*.

For applications that have not been (or will not be) updated to Universal, Mac OS X 10.4.4 and later versions contain a new technology known as *Rosetta*. You don't see it, and you don't have to configure it or even think about it. Rosetta works behind the scenes, letting you run most non-Universal applications on Intel Macs. That's the good news; the bad news is that because Rosetta is translating older code on the fly, applications running under Rosetta pay a performance penalty that ranges from virtually unnoticeable to unbearably annoying.

There is also one newly obsolete term you can forget: *Classic*. Intel-based Macs can't run Classic applications developed for Mac OS 9 at all.

An Apple with Five Flavors

When you use a Mac that has an Intel processor, you'll encounter five types of software: Universal, Intel only, Rosetta compatible, Rosetta sluggish, and incompatible. On an Intel Mac, Universal and Intel-only applications and plug-ins are some of the fastest Mac software ever. Some Rosetta-compatible software runs acceptably under Rosetta, but other software runs sluggishly. And some Mac software is completely incompatible with the Intel processor and doesn't even run under Rosetta.

Almost every program from Apple, including Mac OS X and its bundled applications (such as Safari and Mail), is Universal—so are the company's Pro applications (such as Logic Pro and Final Cut Pro), Express applications (Logic Express and Final Cut Express), and iLife applications (GarageBand, iMovie, iTunes, iWeb, and iDVD). Almost every program Apple makes, including Mac OS X, runs faster than ever on an Intel-based Mac.

Performance of many non-Universal productivity applications, including Microsoft Office 2004, Quicken 2006, and Adobe Reader, is perfectly acceptable under Rosetta. Those programs (and many others) may run slightly slower on an Intel-based Mac than on a PowerBook G4, but not slow enough to annoy you. Alas, other programs—most notably Adobe Photoshop and the other components of Adobe Creative Suite 2—are sluggish enough to hamper your productivity.

A handful of programs and hardware drivers—including all but the latest versions of Apple Pro and Express applications, all Classic applications, Microsoft's Virtual PC, and some third-party keyboard, mouse, tablet, and audio interface drivers—don't work at all under Rosetta. Consequently, if you depend on any of those or are a heavy Adobe user, you should probably wait until the software you rely on is available in an Intel-only or Universal Binary version.

Just for the record, Apple reports that more than 2,000 Universal applications are already available and that the transition continues to gather momentum, with more applications being introduced for Intel Macs every day.

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The State of the Union

In May and June, I surveyed 15 vendors of popular audio software and hardware, asking them three questions: Which, if any, of your products are Universal Binaries already? What is your timetable for updating products that are not Universal? Do your non-Universal products run acceptably with Rosetta translation on Intel-based Macs? Not surprisingly, each developer gave me different answers.

Ableton. Ableton (www.ableton.com) reported that all versions of Live 5 are now shipping as Universal Binaries. Ableton CEO Gerhard Behles said, "We are always striving to make Live faster, and the new Intel-based Macs have really made significant performance increases possible."

Apple Computer. As I mentioned previously, most, if not all, Apple products are Universal already. More specifically, Aperture 1.1, Remote Desktop 3, Final Cut Studio 5.1, iLife '06, iTunes 6.0.2, iWork '06, Logic Express 7, Logic Pro 7, Soundtrack Pro, and Mac OS X 10.4.7 and later are Universal.

Applied Acoustics Systems. According to AAS (www.applied-acoustics.com), Universal Binary versions should start becoming available by the time you read this. The first update will probably be Lounge Lizard

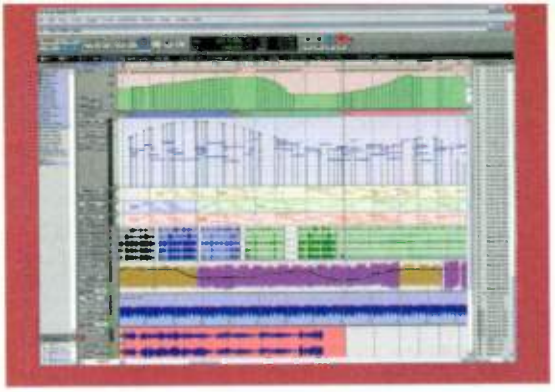

FIG. 2: Digidesign Pro Tools LE and Pro Tools M-Powered users can download an update that supports the Intel-based iMac, Mac mini, and MacBook Pro.

or Ultra Analog, followed by Tassman, String Studio, and Lounge Lizard Studio. The current versions of AAS programs will run under Rosetta, but because they are extremely CPU intensive, you won't get decent performance out of them.

Arturia. Virtual-instrument maker Arturia (www.arturia.com) said that its most recent products—Analog Factory, Brass, and Prophet V—are Universal Binaries. The rest of its software is expected to be Universal before October. Arturia added that although its PowerPC-native standalone instruments currently

work in Rosetta, Universal hosts are unable to load PPC-native plug-ins.

BIAS. Peak Pro 5.2 and Peak LE 5.2 are already available as Universal Binaries. In a recent test, BIAS (www.bias-inc.com) found that several computationally intensive DSP routines run as much as 130 percent faster. According to BIAS vice president Christine A. Berkley, "Our timetable [for updating the rest of the product line] is basically ASAP. While we don't have publicly announced dates available yet, BIAS is a leading Mac developer, and therefore we place a high priority on getting our products to run native on the new Intel-based Macs. We'll have more specific information for each product as we get closer to release." When asked about Rosetta compatibility, Berkley responded, "Our other products offer compatibility under Rosetta to varying degrees. Specific information can be found on our FAQ page."

Cycling '74. According to Cycling '74 (www.cycling74.com) president David Zicarelli, public betas of Max/MSP and Jitter were released in June, and he expects to be shipping in July. Universal Binary versions of the company's plug-ins should be released by mid-August. Cycling '74's products will run under Rosetta, but Max's Java feature does not work, and the usual issues with plug-ins—they won't work in native host applications—apply.

Digidesign. Digidesign (www.digidesign.com) stated, "To provide our Pro Tools LE customers an Intel Mac–compatible version as soon as possible, Digidesign has chosen to code our software natively for Intel Macs rather than creating a Universal Binary, and as a result will be offering both a native Intel Mac version of Pro Tools LE software as well as continuing support for PowerPC versions. We offer Pro Tools LE 7.1.1 software for Intel Macs, along with Intel Mac–compatible versions of all Digidesign-branded plug-ins [see **Fig. 2**]. Since Apple has not announced Intel versions of their Power Mac line of desktop computers, we cannot comment as to when an Intel Mac–compatible version of Pro Tools | HD software will be available."

Regarding Rosetta compatibility, Digidesign warned, "Customers should not attempt to run Digidesign software designed for PowerPC Macs on new Intel Macs. Please check the Digidesign Web site for the latest compatibility information."

MakeMusic. MakeMusic (www.finalemusic.com) reported that Finale 2007, its flagship music-notation program, will be released as a Universal application sometime this year. According to chief marketing officer Ron Raup, "We're committed to supporting this important and exciting development for Macintosh in Finale 2007 once it is released later this year."

Though the actual release date for Finale 2007 has not yet been announced, MakeMusic pointed out that it typically releases a new Finale upgrade annually; the last release, Finale 2006, shipped on July 25, 2005. Furthermore, all current Finale products—from Finale 2006 to the free downloadable Finale NotePad—run acceptably under Rosetta.

MOTU. At present, all of MOTU's (www.motu.com) FireWire and USB audio and MIDI interfaces and supporting software (such as CueMix Console and SMPTE Console) have been released as Universal Binaries. Its PCI core systems (2408mk3, HD192, and so on) are expected to ship for Intel Macs near the ship date of Apple's first PCI-equipped Intel desktop computers. By the time this article hits the streets, Digital Performer should be available as a Universal Binary. Universal versions of Symphonic Instrument, Ethno Instrument, and MX4 have already begun shipping.

Native Instruments. Native Instruments (www.native-instruments.com) has already released Kore, which it calls its Universal Sound Platform, as a Universal Binary (see **Fig. 3**). It expects to have the rest of its products ported to Universal by the end

of the year, and most of them even sooner. You'll find a detailed timetable on the NI Web site.

With regard to Rosetta, NI said (and I concur), "Rosetta translation in general doesn't provide the performance that is necessary to run modern audio software. We do not recommend running our software via Rosetta."

Propellerhead Software. The current version of Reason (3.0.5) is a Universal Binary and is a free download for registered users on Propellerhead's Web site (www.propellerheads.se). ReWire and REX are also available as Universal Binaries, and ReWire 2.5 offers significant performance enhancements on Intel-based Macs when loading samples into Reason in a ReWire session.

Propellerhead Software CEO Ernst Nathorst-Böös said, "We're committed to providing musicians with all the musical power they need, on the computer they already have. Reason was more powerful than any other music application on a Power Mac G5, but on the Intel-based Macs, it totally rocks! This new combination of Apple's hardware and Propellerhead's software will allow even more people to record and play music live, using computers instead of expensive dedicated audio hardware."

Sibelius. Sibelius (www.sibelius.com) reported that none of its products are Universal yet, but they will be "when we release upgrade versions." In the meantime, the company said that Sibelius, Sibelius Student Edition, G7, PhotoScore, and all of the products in the Sibelius Education Suite run acceptably under Rosetta.

Steinberg. Steinberg (www.steinberg.net) replied that none of its products are currently Universal Binaries but that development for the new platform is continuing apace. It will offer Intel Mac–compatible Universal Binary versions by the end of the year and plans to release the new version of Cubase in the fourth quarter.

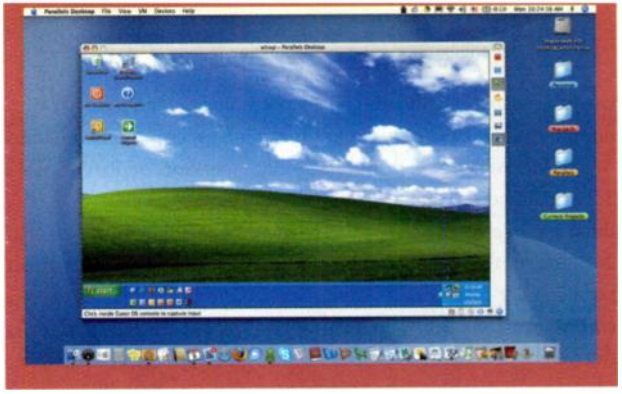

FIG. 4: Parallels Desktop allows Intel Mac users to run any version of Microsoft Windows (and at least six other operating systems) in a separate window under Mac OS X.

Regarding Rosetta, a Steinberg spokesperson said, "Tests of our non-Universal products under Rosetta are currently not planned since this is not the target for Steinberg hosts. Our engineering and testing teams are fully concentrating on the upcoming Universal Binary releases at this time."

Wave Arts. All of the Wave Arts (www.wavearts.com) plug-ins are already shipping as Universal Binaries: TrackPlug 5, MasterVerb 5, FinalPlug 5, MultiDynamics 5, and Panorama 5.

Waves. Waves (www.waves.com) reported that it doesn't have dates for Universal releases at this time, and added that all of its products would eventually be released as Universal Binaries. Its representative also said that none of Waves' current products run acceptably under Rosetta.

FIG. 3: Kore is the first Universal Binary from Native Instruments. Work is under way to make all of NI's products compatible with Intel Macs by the end of the year.

Do Macs Do Windows?

You may have heard that Intel-based Macs can run Windows, and it's true—sort of. Apple offers an elegant solution called Boot Camp, which is currently in public beta and will be included in the next major Mac OS X release, known as Leopard. Simply put, Boot Camp allows you to install and run Windows XP on any Intel-based Mac. Better still, you can install Windows XP without touching your Mac data or erasing your hard drive.

First, you'll need a licensed copy of Microsoft Windows XP, Service Pack 2, Home or Professional Edition. Then just download Boot Camp from Apple's Web site. Boot Camp's easy-to-use wizard will help you burn a CD with installers for all the required Windows drivers. Install Windows XP, and then install the drivers from the CD you created. Restart your Mac, and Windows XP will be running natively on your Intel-based Mac. To switch back and forth between Windows XP and Mac OS X, just hold down the Option key at startup and choose one or the other.

What does Boot Camp mean to you? For one thing, for the first time, you can run Windows-only audio applications such as Sony Media Software's Acid Pro or Cinescore on a Mac if you so desire. It also means you can play games that are Windows-only and not available for the Mac OS.

If you're interested in running Windows on a Mac, you should also know about Parallels Desktop ($79.99; www.parallels.com), a program that lets Mac users run Windows and Mac OS X simultaneously on Intel-based Macs. Unlike the Boot Camp solution, Parallels Desktop doesn't require you to partition your hard disk or restart your Mac to use it; instead, Windows runs in a window under Mac OS X (see Fig. 4). The bad news is that Parallels Desktop doesn't run Windows at its full native speed. It runs it at speeds that are eminently usable for many purposes, but probably not fast enough to handle demanding audio applications. On the other hand, I got Parallels Desktop to run several Web browsers, all of the Microsoft Office applications, and Windows Solitaire (to name just a few) at perfectly usable speeds.

Parallels Desktop has one other useful feature worth knowing about: it allows you to run any version of Windows (3.1, 3.11, 95, 98, 2000, 2003, ME, NT, or XP), any Linux distribution, FreeBSD, Solaris, OS/2, eComStation, or MS-DOS. Boot Camp, at least at present, supports only Windows XP, Service Pack 2, Home or Professional Edition.

The Bottom Line

If your productivity depends on applications or plug-ins that don't run well or at all under Rosetta, then you should probably wait for Universal releases before you even consider buying an Intel-based Mac. If you depend on Adobe Creative Suite, Microsoft Virtual PC, third-party hardware drivers, third-party System Preference panes, or Classic applications that don't run or don't run well under Rosetta, you don't have much choice but to wait.

If, on the other hand, most or all of the software you need is Universal already—and that includes Logic Pro, Logic Express, GarageBand, Ableton Live, Pro Tools LE, and others—you're going to love the improved performance you'll get from an Intel-based Mac running Universal software.

There is one last thing: don't take this article as gospel. Reporting on software upgrades is like trying to hit a moving target. Much of the information I collected could be totally out-of-date by the time you read this. Check with the vendors before making any decisions about buying an Intel-based Mac. EM

Bob "Dr. Mac" LeVitus has written about Macintosh computers for more than 20 years and is the author of GarageBand for Dummies *(Wiley, 2004). A few of his GarageBand productions can be found at http://homepage.mac.com/boblevitus/FileSharing17.html.*

Cultural Diversity

By Geary Yelton

Global commerce and the World Wide Web have connected musicians from different cultures as never before. Recordings made on six of seven continents and all points between are available to almost anyone who wants to listen. The result has been an ongoing cross-pollination that fuses diverse combinations of traditional folk and classical music with rock, jazz, electronic, and other modern musical genres. This fusion combines ancient instruments with modern rhythms and modern instruments with ancient rhythms.

All of this multicultural exchange has been a motivating force behind a recent trend in sample-based software instruments. As the demand for sounds from Africa, Australia, the Near East, and the Far East has grown, so has the availability of sample libraries offering vocal and instrumental sounds from those regions.

Around the World 11 Ways

Diving into the world of multiethnic music software, I discovered dozens of sample libraries that might fit the scope of this article. Although many are excellent, there's simply too much sample content to give adequate coverage in a single article. I decided to concentrate on virtual instruments, both plug-in and standalone, that don't require separate sampler software.

I found 11 virtual instruments from 7 developers: Best Service Ethno World 3 Complete, Latin World, and Orient World; MOTU Ethno Instrument; Quantum Leap Ra; Swar Systems SwarPlug; Wizoo Darbuka and Latigo; Yellow Tools Culture; and Zero-G Afrolatin Slam and Beats Working in Cuba. All of the developers except MOTU and Quantum Leap are based in Europe.

Four titles—Afrolatin Slam, Beats Working in Cuba, Latin World, and Orient World—are built around Native Instruments Intakt Instrument, which is oriented for playing tempo-sliced loops. Ethno World 3 Complete and Ra are based on Kompakt Instrument, Native Instruments' more traditional sample player. The six Native Instruments–based titles run standalone or as plug-ins, as do Ethno Instrument and Culture. The remaining three—Darbuka, Latigo, and SwarPlug—run only as plug-ins. The two Wizoo plug-ins have a custom graphical user interface, and Culture, Ethno Instrument, and SwarPlug have distinctive GUIs as well.

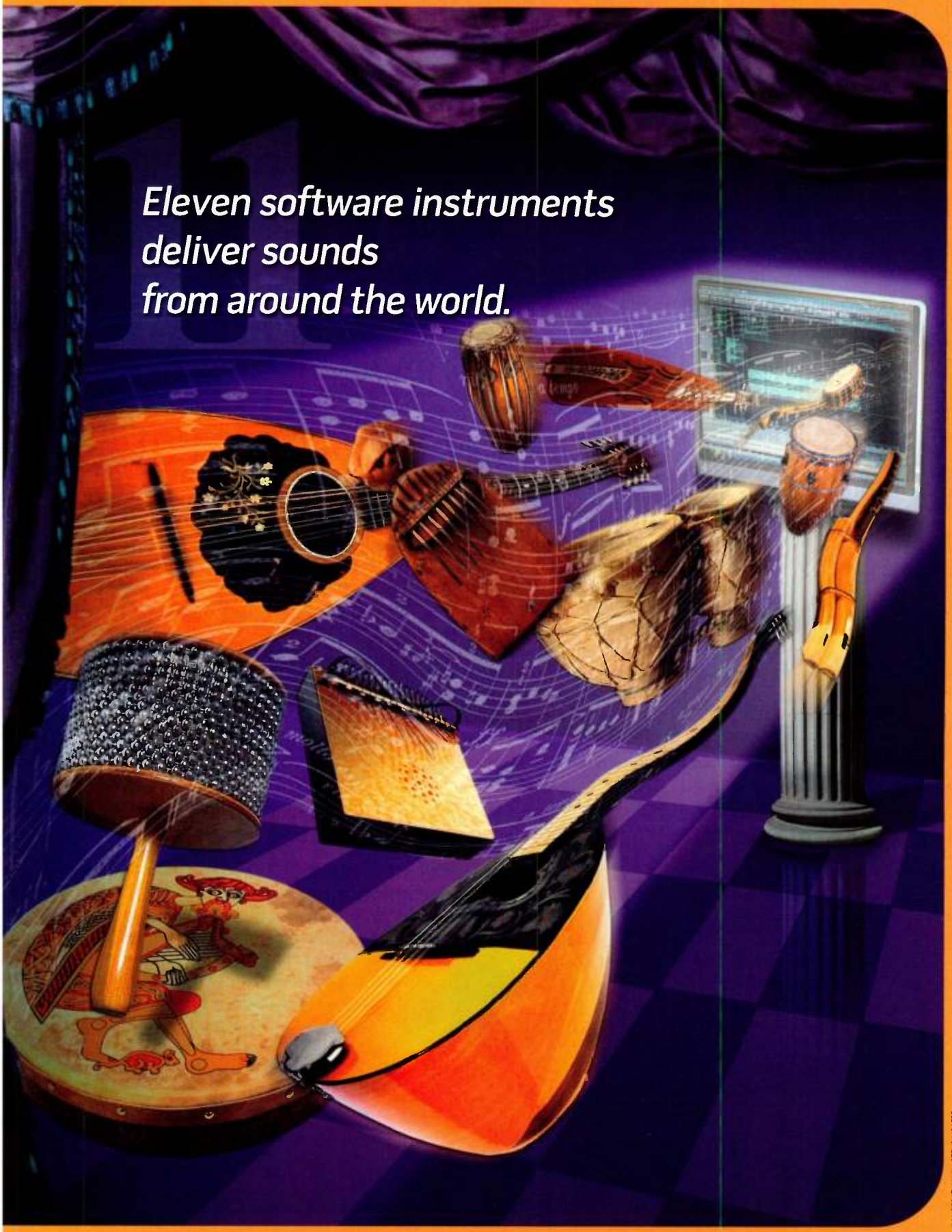

ILLUSTRATION BY STEVE MCAFEE

FIG. 2: Latin World's time-sliced loops embrace diverse musical styles native to Latin America. Sounds include drums, percussion, brass, guitars, bass, and ambient environments.

Because they all come with large quantities of content, each requires quite a bit of storage space to install. Fortunately, none require that you install their content on your startup disk, and you sometimes get better performance by installing the samples on a separate hard drive. SwarPlug is by far the smallest, with 171 MB of 16-bit content, and Ra is by far the largest, with more than 13 GB of content. Most supply 24-bit samples, and most can stream their samples from hard disk.

All are cross-platform and support AU and VST plug-in formats in Mac OS X and VST in Windows XP. Culture, Ethno World 3 Complete, and SwarPlug run in older versions of Windows, too. Darbuka and Latigo support RTAS on the Mac, and the Native Instruments plug-ins support RTAS on both platforms. Culture supports DXi in Windows and RTAS on both computer platforms. Ethno Instrument is the most all-inclusive, supporting AU, HTDM, MAS, RTAS, and VST in Mac OS X and DXi, HTDM, RTAS, and VST in Windows XP.

For this article, I tested standalone versions of each program. I also used VST versions in Steinberg Cubase SX3, RTAS versions in Digidesign Pro Tools M-Powered 7.1, and AU versions in MOTU Digital Performer 4.61. The only exception was that I used the MAS version rather than the AU version of Ethno Instrument in DP4, and I ran the AU version in Apple Logic Pro 7.1. My computer was a dual-processor 2.3 GHz Apple Power Mac G5, and my audio interface was a MOTU 2408mk3 with a PCI-424 card.

FIG. 1: Best Service's Ethno World 3 Complete combines Kompakt Instrument with more than 5 GB of samples from all over the world.

All titles are copy protected. SwarPlug requires only that you enter a serial number called a product key. The six Native Instruments–based packages rely on a simple challenge-and-response system using a Registration Tool application. When you register Darbuka or Latigo by entering data directly into its setup window, you receive an authorization file to place in its content folder. Culture comes with a Yellow Tools–specific USB key, and Ethno Instrument includes an iLok USB key.

Best Service Ethno World 3 Complete

As the title suggests, Ethno World 3 Complete ($449.95) is the third and most comprehensive product to use the Ethno World name. The original *Ethno World* is still available as a 3-CD or 5-CD sample library for GigaStudio and several hardware samplers. *Ethno World 2* builds on that collection, offering six CDs for EXS24 and HALion and four CDs for GigaStudio. Ethno World 3 Complete supplies all the previous editions' content and 40 new instruments. It is available either as a sound library for GigaStudio or as a software instrument. If you own a previous edition, you will qualify for a discounted upgrade.

Produced by German film composers Marcel Barsotti and Andreas Hofner, Ethno World 3 Complete furnishes samples of 170 instruments from every continent except Antarctica, totaling 5.14 GB of content. Most presets supply multisampled instruments, allowing you to play polyphonically, but many also supply loops and licks performed by more than a dozen talented musicians (see **Web Clip 1**). Because Kompakt Instrument is 8-part multitimbral, you can load as

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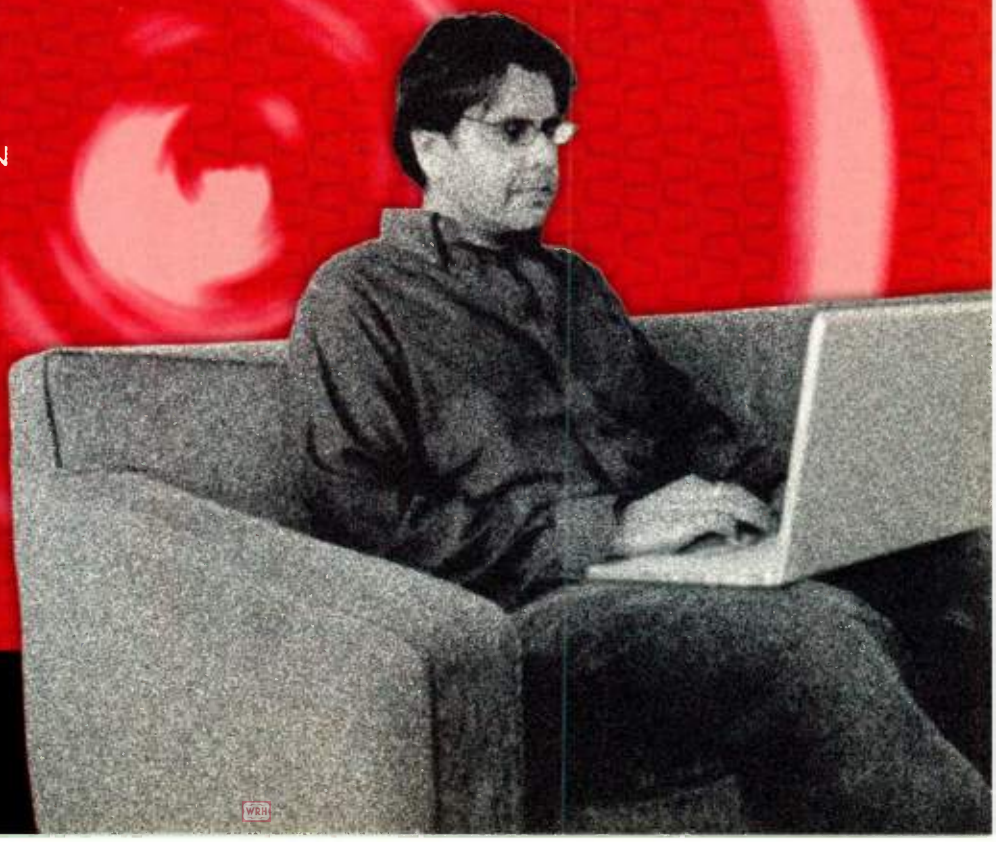

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many as eight instruments and assign each to its own MIDI sequencer track (see **Fig. 1**).

Rather than categorizing sounds by their geographic origins, as many multiethnic sample libraries do, Ethno World 3 Complete categorizes them by their instrument type. Unless a descriptive adjective such as *African* or *Tibetan* is part of the preset's name, you'll never know its origin unless you look in the excellent 28-page manual, which provides color photos and very brief descriptions of most instruments. The manual also lists each preset's pitch range, size in megabytes, and location on disc, but for presets that offer keyswitching, it doesn't tell you which notes are keyswitches. Additional documentation includes a 42-page Kompakt Instrument manual and HTML files that duplicate portions of the printed manual.

Besides Bell Type, Bowed, Key, Metal Type, and Stringed Instruments, categories include Construction Kits, Gongs and Bowls, Woodwind and Brass, World Drums, and World Percussion. World Drums and World Percussion contain by far the largest number of instruments. Stringed Instruments and Woodwind and Brass are also quite plentiful. Eighteen Bell Type instruments range from Bamboo Vibraphon and Dream Catcher to Tibetan Cymbals and Vietnam Bells. The Key Instruments category contains only Dallape Accordion, Melodica, and Scale Changer Harmonium. Ethno World 3 Complete has seven Construction Sets: a China Set in three tempos and a Mid East Set in four tempos.

Although filter and envelope parameters vary from one instrument to the next, all presets appear to have the same amount of reverb, chorus, and delay. Only a handful offer any Velocity switching. Though some cry out for user-controlled vibrato, none respond to MIDI Control Change (CC) messages. Overall, though, the variety and sound quality make Ethno World 3 Complete a well-rounded introduction to ethnic musical instruments.

FIG. 3: Also from Best Service, Orient World features instruments and genres from the Middle East, North Africa, and the Balkans.

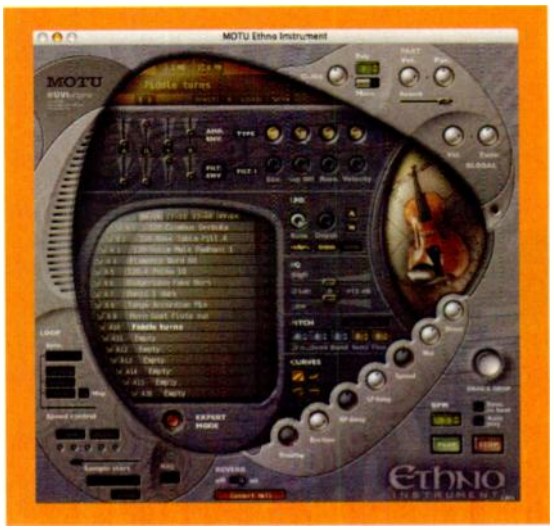

FIG. 4: Half of MOTU Ethno Instrument's nearly 8 GB of content comprises time-sliced loops and phrases, and the other half comprises multisampled instruments.

Best Service Latin World

Latin World ($199.95) teams Intakt Instrument with 4.66 GB of South American, Central American, and Caribbean-flavored loops and one-shot samples (see **Fig. 2**). Practically all of Latin World's content serves as a construction kit for creating your own tracks. Unlike many Intakt-based instruments, Latin World focuses on time-sliced loops without splitting them into separate slices you can trigger using MIDI. Each category supplies variations in as many as five tempos, and the loops accommodate tempo changes quite well. Many loops are as long as 16 measures. Their sheer number is impressive; not surprisingly, most concentrate on Latin drums and percussion.

Six of Latin World's 15 categories are called Instrument Loops. Five of them group their presets by instrument type: Drums, Percussion, Bass, Guitar, and Horn. In addition to the loops, you get a multisampled bass, three multisampled guitars, three percussion kits, and one complete drum kit you can play from your MIDI keyboard. The sixth Instrument Loops category, Athmo, has only one preset, but it maps 46 ambient sound effects to the keyboard. Sounds range from cheering crowds and traffic noise to recordings of a street parade (see **Web Clip 2**).

The other nine categories are called Music Style Loops, and indeed, seven are defined by their musical style. They include Baion (Brazil), Bomba (Puerto Rico), Candombe (Uruguay), Merengue (Dominican Republic),

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and Murga (Uruguay), each of which comes in two tempos. Salsa gives you three tempos, and Samba gives you four. All seven categories supply 4/4 loops in four key signatures and one rhythm-only preset.

Two more categories, Ternary and Polyrhythm, are grouped with the Music Style Loops. The Ternary category was apparently designed for assembling songs in the A-B-A (or ternary) song form common in Latin music. Ternary supplies loops in four keys at 120 and 136 bpm, as well as rhythm-only loops at the same two tempos. Polyrhythm gives you two presets, each with a selection of drum and percussion fills at 120 bpm.

Most Music Style Loops contain all five instrument types mapped to different notes. Drum and percussion loops are assigned to the two octaves below middle C. Middle C and above play bass guitar, acoustic or electric guitar, and horn section loops. A two-sided cheat sheet uses color coding to show you how Instrument Loops and Music Style Loops are mapped. Latin World's documentation also includes a 68-page Intakt Instrument manual, a 4-page PDF file that shows idiomatic chord progressions in eight styles, and HTML files that provide credits, the license agreement, and a brief description of the software.

Best Service Orient World

From the name, you'd probably expect Orient World ($199.95) to feature sounds from China, Japan, and other regions of the Far East. You might be surprised to find no koto, shamisen, or erhu, nor any other sounds usually associated with that part of the world. Instead,

FIG. 5: With more than 13 GB of sounds from almost every continent, Quantum Leap Ra takes you on a virtual trip around the world.

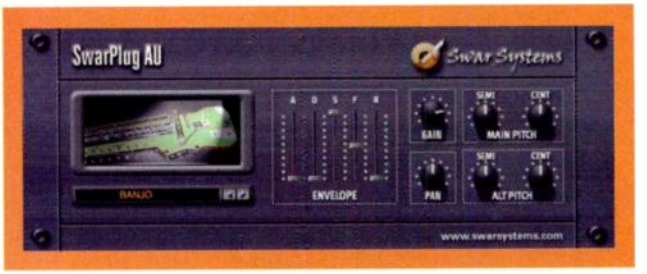


FIG. 6: SwarPlug's straightforward user interface gives you quick access to 40 authentic instruments from the Indian subcontinent.

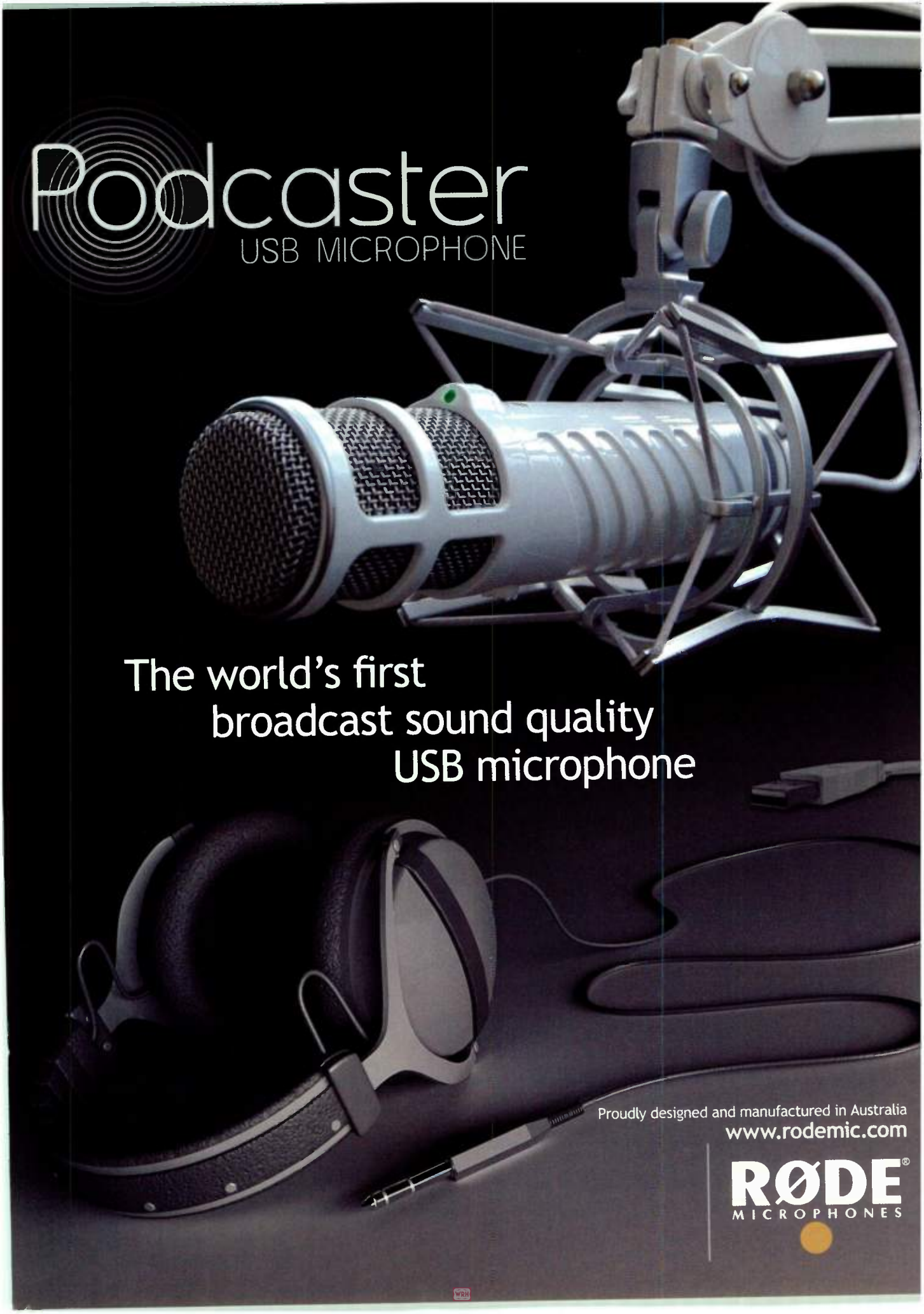
Orient World focuses on the Middle East, North Africa, and southeastern Europe—specifically, the Arabian Peninsula, Egypt, Morocco, Turkey, the Balkans, and regions only as far east as Pakistan.

Because Orient World is also an Intakt Instrument with an orange-pastel color scheme, it appears identical to Latin World (see **Fig. 3**); its layout of presets, however, is quite different. Among the 16 preset categories are 9 individual instruments, voice (wordless male and female vocals), percussion instruments and ensembles, and short musical phrases played by an orchestral string section. Two categories, Inspiration Alibaba and Inspiration Odyssey, each contain a single preset that maps loops and phrases from other categories across the keyboard (see **Web Clip 3**). Another category, X Oriental Dance, gives you heavily processed experimental timbres created from instrumental source material.

The selection of instruments in Orient World's 4.66 GB of content is quite varied. It includes winds such as the balaban and ney; strings such as the kanun, saz, and violin; and percussion such as the bendir, darbuka, tablas, and tar. It also includes instruments not necessarily Eastern in origin—accordion, saxophone, and electric guitar—playing in Eastern modalities.

Other than nine individual hand drums you can play from a MIDI keyboard or percussion controller, all of Orient World's content consists of loops and phrases. Before you can play the hand drums, though, you'll need to edit their envelopes; the release stages are set at the same default, which decays too quickly for percussion to sound natural. In fact, all of Orient World's sampler parameters have been left at their default values, which means, for example, that all instruments—even vocals—are processed by simulated tube distortion with a Drive value of 25%.

Although most categories offer a selection of tempos, the tempo range varies depending on the instrument. Ney, for example, provides a total of 22 presets containing phrases at tempos of 60, 70, 90, 100, 120, or 130 bpm. Percussion Combo provides seven loop presets, each at a different tempo: 74, 86, 93, 94, 108, 140, or 147 bpm. Guitar gives you nine phrase presets, all at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120 bpm. The number of phrases or loops in each preset also varies, from as few as 3 to as many as 65 samples; their lengths also vary.

Orient World's documentation consists of an Intakt manual and a 6-panel gatefold that provides brief descriptions of 22 instruments and lists of instruments used in 6 categories, as well as the license agreement and credits. A handful of HTML files duplicate that information.

MOTU Ethno Instrument

MOTU's Ethno Instrument ($295) delivers 7.87 GB of content and a custom interface that works a lot like MOTU Symphonic Instrument's GUI, but with time-slicing functionality (see **Fig. 4**). Sample content is evenly divided—3.92 GB provides more than 6,000 loops and phrases, and 3.95 GB provides more than 500 multisampled instrument presets. If your computer is up to snuff, Ethno Instrument is 64-part multitimbral and capable of 256 stereo notes per part, according to MOTU.

FIG. 7: Wizoo Darbuka offers real-time control over a virtual ensemble of Middle Eastern master percussionists.

Ethno Instrument encompasses musical cultures from all over the world (see **Web Clip 4**). When selecting instrument presets, you can browse them either by geographic origin or by instrument type. Clicking on the browser's Geographic button lists 12 regions or cultures such as Africa, Celtic, Indonesian-Gamelan, Occidental, and Spanish Gypsy, as well as categories for World Synths and Xtra Percussion. If you click on the Instruments button, seven types are listed: Fretted String, Key, Percussion, Strings, Woodwind, World Synth, and Bell, Metal & Gong. Clicking on the Loops button reveals a list that's almost identical to the Geographic list. Many loop and phrase presets supply numerous key signatures and tempos.

Ethno Instrument has lots of programmable parameters, and its presets take advantage of them. Comprehensive user controls let you adjust the multimode filter, ADSR envelopes, tuning, polyphony, glide, 2-band EQ, and other settings. Onboard convolution reverb has controls for predelay, highpass and lowpass damping, and more. Clicking on the Expert Mode button opens a window to specify a part's note and Velocity range, custom keyswitches, disk-streaming preferences, and audio outputs.

Controls in the Loop section affect only loops and phrases. You can start and stop playback, change tempo, sync playback to a host's tempo, and choose from three loop-playback modes. Increase or decrease playback by a factor of four and change the sample start position. You can drag-and-drop loops and phrases from Ethno Instrument to your host software's audio tracks and drag-and-drop time-slice data to MIDI tracks.

With so many instrument presets to choose from, Ethno Instrument's diversity is very impressive. If you're browsing by instrument, the Fretted String category offers tremendous variety. The Latin Percussion subcategory alone gives you 25 presets. If you browse by region, Middle East–Mediterranean instruments such

FLYINGHAND PERCUSSION

During the course of writing this article, I received an advance copy of Handheld Sound's FlyingHand Percussion (Mac/Win, $299), a massive 13.69 GB sample library that developer Eitan Teomi plans to pair with Kontakt Player 2 (see **Fig. A**). Devoted entirely to hand drums and handheld percussion, FHP incorporates as many as 20 Velocity layers, each with 4 alternate hits on numerous articulations, as well as release samples and multiple zones for each drum.

FHP's emphasis is on realistic performance. Left- and right-handed drum samples are mapped to either side of a split point. Articulations mirrored on both sides simulate playing with different parts of your hand or fingers and playing on different areas of the drumhead. The software introduces a performance technique called *legato drumming*, enabling intuitive, real-time access to articulations that acoustic percussionists take for granted. FHP responds to how fast, slow, hard, or soft you play by triggering different samples; if you release a note quickly, for example, the tone will be muted and you'll hear the drum's natural resonance.

Along with frame drums, djembes, clay drums, congas, bongos, bottles, bells, and much more, FHP gives you a folder full of Mutants—heavily processed acoustic percussion—and experimental Morphosis sounds mapped for use as a drum kit. FHP includes PSPaudioware's PSP Nitro LE with custom presets, a collection of impulse responses from Voxengo, and mappings for the ZenDrum controller.

FIG. A: When it becomes available, FlyingHand Percussion will make it possible to realistically emulate an acoustic percussionist using only your keyboard.

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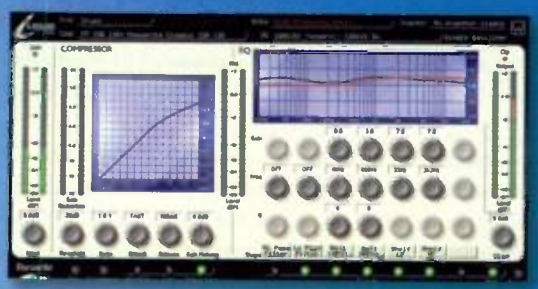

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as oud, baglama, and Egyptian flute are the most plentiful. World Synths, a category that furnishes 79 electronic timbres, goes beyond traditional ethnic sounds and offers complementary underpinnings for world-fusion musical styles.

Ethno Instrument has the most extensive documentation of any software in this roundup. The 120-page manual covers every aspect of its operation. It also groups instruments by their geographic origin and provides descriptions, preset names and sizes, and note ranges.

Quantum Leap Ra

At 13.19 GB, Ra ($995) has the most voluminous content of all the ethnic virtual instruments. Like Ethno World 3 Complete, Ra is based on Kompakt Instrument and features sounds from nearly every civilization on earth (see **Fig. 5**). Named after the Egyptian god of the sun, Ra descended from a sample library called Rare Instruments, but only a fraction of Ra's content came from that 3-disc collection. Respected sample-meister Nick Phoenix produced Ra for Quantum Leap, a division of EastWest.

Ra divides its content geographically into six main categories: Africa, Americas and Australia, Europe, Far East, India, and Mid East. Within each category are subcategories that divide instruments by type, such as Bowed, Perc, Pluck, and Wind. Each subcategory features individual instruments, and many instruments are further divided into articulations, effects, and elements, enabling you to impart nuance and detail to your performances.

Ra also divides some presets into four types, indicated by their names: Live, Keyswitches, Elements, and Melodies. Live presets are straightforward and easily playable without the need to master keyswitching techniques. Additional articulations in many Live sounds are triggered by higher Velocities; to bend a note, for example, just strike the key harder. Presets with keyswitches are indicated by *KS* in their names, followed by the range of notes that trigger keyswitching (Koto KS C0–F#0, for example). Because keyswitches are assigned to the lowest octave on an 88-note keyboard, you'll need to transpose your keyboard if it doesn't have 88 notes.

FIG. 8: Wizoo Latigo works just like Darbuka, but the focus is on Latin percussion instruments and grooves.

Elements allow you to sequence instruments by assigning each articulation to a different MIDI channel, thus avoiding the need for keyswitching. The Elements subcategory typically provides a submenu with choices such as Slur Up, FX (effects), RR (round-robin), and Leg Vib (legato vibrato). Melodies are melismas, trills, or other embellishments that are characteristic of an instrument; inserting them into a performance can enhance its realism.

FIG. 9: Yellow Tools Culture comes with nearly 9 GB of content that features ethnic, orchestral, and industrial percussion samples.

Ra makes good use of Kompakt Instrument's programming capabilities, and unlike many other ethnic virtual instruments, it features Velocity layers in every preset. Although filters are generally left open and effects are unassigned, envelopes and other sound-shaping parameters are customized for the individual presets. All of the instruments are tuned to an equal-tempered Western scale. For instruments normally played with alternate tunings, Ra offers custom temperaments in its Microtuning menu. The 14 available tunings, which include Chinese Lu and Shruthi India, are different from the 19 choices you usually find in Kompakt Instrument.

Ra is quite generous in providing plucked instruments ranging from banjo to Vietnamese jaw harp, wind instruments from didgeridoo to zourna, and bowed instruments from sarangi to gadulka (see **Web Clip 5**). Although plenty of drums and percussion instruments are also available, their proportion is not as great as in the other products in this roundup. Considering that most world-music libraries tend to have more percussion than anything else, this may be welcome news for anyone who owns other ethnic virtual instruments or sample libraries.

Ra comes with a comprehensive 118-page manual in PDF form. It explains the software's basic concepts and describes every instrument in some detail, one region at a time, complete with color photos of instruments and performers. The manual also lists all the presets and explains the keyswitches and elements.

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NATIVE INSTRUMENTS

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Swar Systems SwarPlug

SwarPlug ($230) is just one of several products made by Swiss developer Swar Systems that focus on the classical and folk music of India. SwarPlug is an instrument plug-in based on LinPlug's CronoX 2. It offers a cross-section of musical sounds representing the entire Indian subcontinent.

Compared with the other software in this roundup, SwarPlug has a very simple user interface (see **Fig. 6**). A menu lets you select and scroll through presets, and a display shows an image of the selected instrument. The control panel provides knobs for gain, pan, and pitch. You get four knobs to specify pitch; the two Main Pitch knobs handle coarse- and fine-tuning for the primary sound, and if an instrument has a secondary element (the left-hand drum in a pair, for example), the Alt Pitch knobs control the same parameters for that sound. Like the controls, the instruments in SwarPlug are programmed for basic performance, with no Velocity layering or keyswitching.

SwarPlug's 49 presets furnish 40 multisampled instruments that range from banjo and bansuri to udukke and veena, as well as 3 multisampled vocal sets: bols, konnakol, and sargam. Indian musicians learn to use their voices as percussion, a technique that's very important to their musical traditions. Bols are syllables that represent Hindustani (North Indian) rhythmic elements, and konnakol are syllables that represent Carnatic (South Indian) rhythmic elements. Sargam is a type of Hindustani solfège, comparable to Western music's do, re, mi, fa, and so on.

Over half of SwarPlug's presets are hand drums and other percussion instruments. Most of the remaining presets are stringed instruments such as sitar, tanpura, and even acoustic guitar. Also included are shehnai, nadaswaram, two harmoniums, and three bansuris (see **Web Clip 6**).

SwarPlug is bundled with Swar Librarian, a separate Java application that lets you preview over 1,000 melodic and rhythmic loops and phrases playing SwarPlug instruments in 12 idiomatic musical styles. When you find a loop that's suitable for the music you're composing, you can drag-and-drop it from Swar Librarian into a MIDI track in your sequencing program.

SwarPlug's only documentation is a folded, 4-sided page with basic instructions and a list of instruments. Swar Librarian's documentation is a searchable help file that briefly explains its layout and operation.

FIG. 10: Zero-G's Afrolatin Slam fuses musical influences from Africa, South America, and the Caribbean.

Wizoo Darbuka

The instrument plug-in Darbuka ($299.95) gets its name from a goblet-shaped Turkish hand drum that may have been invented earlier than the chair. Darbuka (the software, not the drum) is a virtual Middle Eastern percussion section. Wizoo's unique FlexGroove engine gives you real-time control over timing, arrangement, and other performance parameters. Nearly 2 GB of content comprises time-sliced recordings of live grooves played by master percussionists Suat Borazan and Mohamed Zaki. Darbuka encompasses the music of Turkey, Egypt, Algeria, Lebanon, the Arabian Gulf, and other East Mediterranean and North African cultures. The collection features indigenous instruments such as the bendir, douhola, riqq, and sagat.

On the Play page, Darbuka's unusual but intuitive GUI displays a list of 38 Styles (including 1 user Style) in the Style Selector on its left side (see **Fig. 7**). Each Style is a complete percussion arrangement with as many as 14 tracks and 61 Patterns, as well as fills, mixes, and various parameters. When you load a Style, graphical images are shown in the Instrument Symbols area, along with tabs that access the Mix page, on which you can adjust parameters such as level, pan, and 3-band EQ for each track. Eight instruments at a time appear, and if necessary, you can scroll to reveal additional tracks. Right-clicking in the Instrument Symbols area (Control + clicking on a Mac) will summon a color illustration and details about the selected instrument. If your computer has sufficient processing power, clicking on the XXL button turns on a playback mode with 32-bit fidelity.

You can display Styles by name, region, tempo, or time signature. Preview any Style either by holding down the Listen button after you select it, or automatically when you select it. Darbuka always locks to the host's tempo when you trigger a pattern, but the pattern plays at its original tempo when you preview it.

At the bottom of the plug-in pane is the Color Keyboard, which responds to mouse-clicks and to corresponding MIDI notes. When you click on a blue key or play a MIDI note below C3, a rhythm groove begins to play; you can assign color keys to any MIDI note. Playing other notes or clicking on other blue keys changes the pattern. Green keys trigger fills, and yellow keys mute individual tracks within the pattern. At the Color Keyboard's right side is an orange End key, which plays an ending when the current measure is complete, and a red Stop key, which ceases playing immediately. To the left, the Latch button enables and disables looping, which is turned on by default. All

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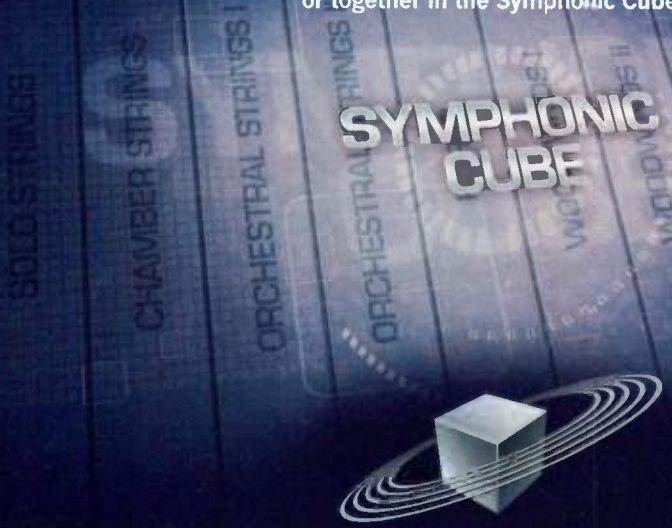

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of Darbuka's controls respond to MIDI CC messages, enhancing its real-time controllability and capacity for sequencer automation.

In addition to keys that trigger patterns, Darbuka provides ample controls for changing percussion arrangements in real time. You can half or double the speed, adjust the timing and quantization, and add swing. High, Mid, and Bass buttons let you selectively mute instruments in those ranges. You can replace certain hits with other hits using the Variance slider. A Complexity slider lets you change a groove's rhythmic density in real time (see **Web Clip 7**).

To replace or add to existing tracks, Darbuka allows you to copy or click-and-drag tracks from one Style to another. You can even define additional user Styles. The Edit page gives you access to all parts, tracks, and patterns. The PDF manual explains how to use Darbuka to the fullest extent and describes the Styles and instruments it provides.

Wizoo Latigo

Latigo ($299) is Darbuka's Latin American cousin. Its GUI is identical except for its coloration, and its operation is exactly the same (see **Fig. 8**). That's because Latigo is also built on Wizoo's FlexGroove engine. Latigo specializes in Caribbean, Central American, and South American percussion grooves. It supplies 839 MB of content comprising multitrack patterns played by two very busy session percussionists, Edwin Bonilla and Olbin Burgos.

The primary differences between Latigo and Darbuka are the instruments and the musical genres. Instruments include bongos, congas, timbales, maracas, and a complete drum kit. Latigo's 23 Styles (which include 2 user Styles) run the gamut from Bolero, Bossa Nova, and Calypso to Merengue, Samba, and Songo (see **Web Clip 8**).

One other difference is that you can display Styles only by name, tempo, or type; the latter is a list of seven geographic origins such as Afro-Cuban and Venezuelan. In addition, all of Latigo's grooves are in 4/4 time. And whereas Darbuka has buttons to mute the high, mid, and bass tracks, Latigo has buttons labeled Drum, Skin, Metal, High, and Misc. They mute, respectively, the drum kit, hand drums such as congas and bongos, metal instruments such as timbales and agogo, high-pitched sounds such as cymbals and shakers, and miscellaneous percussion instruments such as whistles.

Latigo's PDF manual is virtually identical to Darbuka's, too. Other than the sections specifically regarding Latin instruments and styles, it contains the same wording and diagrams.

Yellow Tools Culture

As the first Modular Virtual Instrument from Yellow Tools, Culture ($339) has been around longer than any other product surveyed here. It combines a sophisticated and highly customizable sample player with 8.79 GB of content. Each instrument can comprise hundreds of samples and up to 16 Velocity layers per note. Culture offers detailed sounds that allow realistic performances using a variety of playing techniques.

Although Culture's focus is on world drums and ethnic percussion, it also features a number of industrial sounds, such as barrels and trash cans, and orchestral sounds, such as timpani and snares. The majority of sounds are Latin instruments such as bongos, cajons, congas, and timbales. You'll also find a nice selection of Middle Eastern instruments such as dumbek, darbuka, and tablas, and African instruments such as udu, djembe, and dunun. Far Eastern instruments include taiko drums, gamelan chimes, and kokiriko.

An individual instrument in Culture is called a Layer, and you can combine as many as eight Layers in a Multi. Culture ships with an assortment of ready-made Multis, including an African Multi, a flamenco Multi, 17 Brazilian Multis, and over two dozen more for Latin musical styles.

Culture gives you lots of controls for creating and customizing Layers and Multis (see Fig. 9). Its front panel is divided into the Basic section in the upper half and the Pro Editor in the lower half. In the Basic section, you can specify or change any part's volume and panning, MIDI channel, key range and Velocity range, polyphony, and other parameters. Clicking on the Alternate button ensures that you'll never play the same sample twice in succession, contributing to a response that sounds natural. For each Layer, you can set up dynamic mapping, Velocity curves, and even the response of the mod wheel for real-time volume control.

The Pro Editor affects key groups and provides access to envelope parameters, tuning, playback modes, and audio functions such as enabling reverse play and specifying sample start point. Fixed MIDI CC mapping lets you control all parameters with external controllers or sequencer automation. An onscreen keyboard displays note mapping for the selected Layer. Buttons allow you to perform functions such as editing and copying parameters from one key group to another. All of the controls are explained in Culture's 41-page manual.

After you've registered with Yellow Tools as a Culture user, you can download Culture Groove Pack, an excellent 5.3 MB collection of more than 1,100 MIDI files.

They supply grooves programmed especially for Culture in assorted musical styles (see **Web Clip 9**). Grooves are sorted into folders by region and by instrument. In addition to basic grooves as long as two minutes, Groove Pack gives you fills, breaks, and other variations.

Zero-G Afrolatin Slam

Afro-Latinos are people from Latin America of African descent. Like almost any ethnic group, they have a distinct musical heritage. Afro-Latin music is a cultural fusion that embraces the music of Africa, South America, and the Caribbean. Afrolatin Slam ($99.95), a Virtual Sound Module in Zero-G's ProSample Platinum (PSP) series, captures its flavor by pairing 465 MB of time-sliced loops with Intakt Instrument (see **Fig. 10**). Production credits go to Francis Fuster, a percussionist from Sierra Leone who has worked extensively with Hugh Masekela as well as Paul Simon and Joan Baez, and Kenyan producer and multi-instrumentalist Sultan Makendé, better known as Dave Yowell.

Afrolatin Slam's rhythmic and melodic content embraces all of its musical influences. Besides places like Cuba, Jamaica, Venezuela, and Brazil, its timbral palette comes from the Congo, the Ivory Coast, Nigeria, and Ghana. Loops are divided into six main categories: African, Afrolatin Fusion, Caribbean, Latin American, Instruments & Hits, and Miscellaneous Loops. Miscellaneous Loops contains a mishmash of recordings that defy categorization, such as 082 Scratchy, 095 Funky Dread Drums, and 134 Dark Drum'n Bass.

Regional subcategories break loops down into musical instruments or styles, with their names preceded by tempos. Afrolatin Fusion's subcategories, for example, are 074 Slow Clave, 108 Congas, 112 Congas, 120 Afrosamba, 130 Afrosamba, 153 Speedbash, and 170 Afrobossa. Although Latin American subcategories include 072 Candomblé, 103 Maracatu, 128 Samba, 152 Pandeiro, and 24 others, the Caribbean subcategory includes only 140 Soca. Subcategories may have as few as 1 preset or as many as 15; 130 High Life, for instance, has Bell Shakers, Lead Conga, Mix, Mix No Conga, and Rhythm Conga. I found loops as short as 2 measures and as long as 40.

Most of Afrolatin Slam's presets map a complete loop to the lowest note on a 5-octave keyboard and individual slices to the remaining notes. You can trigger a complete conga loop, for instance, or manually play the congas one hit at a time.

Some presets, including everything in the Instruments & Hits category, furnish multisamples mapped across the keyboard. As with Orient World, though, the release portion of the envelopes is too short for most percussion sounds to fade naturally. Unless you want to create the illusion of muting hits, then, you'll want to extend the release times for every sound if you intend to play from the keyboard or use drum pads.

The loops in Afrolatin Slam definitely have a live feel and will impart your music with rhythms you're unlikely to find anywhere else (see **Web Clip 10**). Documentation consists of an Intakt Instrument manual, a few HTML files, and a PDF listing of categories, subcategories, and presets.

Zero-G Beats Working in Cuba

If Latin percussion is your passion, Beats Working in Cuba ($299.95) is right up your alley (see **Fig. 11**). With 8.32 GB of content recorded entirely in a major Havana studio, the Intakt-based instrument is a compendium of 13 Afro-Latin rhythms characteristic of Cuban music, played by some of Cuba's finest studio percussionists. Musical styles such as the cha-cha, danzon, bolero, and mambo embody Cuban music and its African and South American roots. Produced by prominent British recording engineer Barry Sage and Spanish record producer Gonzalo Lasheras Garcia, Beats Working in Cuba captures dozens of multitrack grooves with hundreds of variations, as well as single hits derived from half a dozen styles.

The primary categories comprise the 13 styles. Each style is divided into subcategories that supply as many as 41 modern and traditional variations. Each style was recorded at a single tempo, ranging from 84 bpm for bolero and Guajira son to 130 bpm for conga moderna. Variations present different recordings of song segments such as the intro, verse, chorus, instrumental, and ending (see **Web Clip 11**). A single 16-measure variation may provide presets for a complete multimiked mix, a mix without drums, a mix with drums only, and most individual instruments recorded dry and direct, with

FIG. 11: Cuba's most respected percussionists gathered at one of Havana's finest studios to record the hits and grooves in Beats Working in Cuba.

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ambience, and for surround applications. Different mic perspectives are often mapped to different MIDI notes.

Although the individual samples don't make much use of Intakt's parameter programming, they do take full advantage of its three sound engines: Beatmachine, Timemachine, and Sampler. Beatmachine loops are time-sliced and assigned to MIDI notes, allowing you to sequence the playback order of the beats at any tempo. Timemachine loops offer smooth transitions that sound more natural over a limited range of tempos. Sampler loops give you instant access to time- and pitch-shift artifact effects at any tempo.

Although Beats Working in Cuba's categories, variations, and samples are meticulously organized, the enormous magnitude of the material can be overwhelming. Fortunately, HTML files supply some of the most extensive documentation I've ever seen for a sample collection. It presents a wealth of information about the samples, the musicians, the instruments, and the recording process (including mic placement). It even includes transcriptions of the various rhythms and a brief history of each style. Every category is documented in painstaking detail with a color-coded chart and copious notes. Beats Working in Cuba also comes with a video DVD that takes a 12-minute look at how the samples were recorded and introduces the people involved. All told, Beats Working in Cuba is an ambitious project that offers as much authenticity as you could ever wish for.

World Class

You don't need to be an ethnomusicologist or know a lot of musicians from other cultures to produce music that explores a world of musical genres. To make convincing world music, though, you'll probably need more than instruments; you'll need to familiarize yourself with the idiosyncrasies of the indigenous music you want to emulate. The World Wide Web is an indispensable tool for finding your way. Plenty of online resources are available, many maintained by the natives of countries where the music is local. As always, you should listen to a lot of music in whatever styles interest you.

Additionally, several software applications can teach you about regional musical traditions; an excellent example is Swar Systems' SwarShala 3 Pro (Mac/Win, $250), which takes a multimedia approach to teaching you about Indian music. It also serves as a sort of composer's assistant that allows you to create rhythms and melodies and then drag-and-drop them to your sequencer's MIDI tracks.

You'll find a world of inspiration in any of the software instruments in this roundup. Ra is versatile and deeply expressive, and it should fulfill almost any need for world instruments for a very long time. Although it is the most expensive, Ra's enormous sample collection and well-designed presets make it worth the cost. Ethno World 3 Complete also supplies a broad palette and a large selection.

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Ethno Instrument has the best cost-to-performance ratio, encompassing an approachable user interface, tremendous flexibility and user control, and an impressive collection of high-quality instrument and vocal samples from all over the world. No other software gives you such a broad selection of time-sliced loops and playable instruments.

Darbuka and Latigo are unique in their approach. Their combination of sampled performances and user interactivity makes them terrific plug-ins for creating world-class music that lives and breathes. For Latin-music aficionados who need a comprehensive rhythmic vocabulary, though, you can't go wrong with Beats Working in Cuba.

Whenever you're in the market for ethnic instrument samples, it will pay to look beyond the software instruments I've discussed here. If you own a software sampler or work with audio loops, you'll find a huge selection of sample libraries available from dozens of developers. I can highly recommend Apple World Music Jam Pack (Mac, $99), Ilio Origins (Giga/EXS24, $349), and almost any ethnic collection from Discovery Sound, for example.

Any of the software in this article will put you on the road to composing and recording your own world music, and others are forthcoming (see the sidebar "FlyingHand Percussion"). Which product you choose will depend largely on the regional style or combination of styles you want to pursue. Bon voyage, and have a safe journey! EM

EM WEB CLIPS

EM associate editor Geary Yelton's first world-music gig was in 1990. Using the alias Guy Lambada, he programmed synthesizers and sequences for Son Bolive's The Best of La Lambada.

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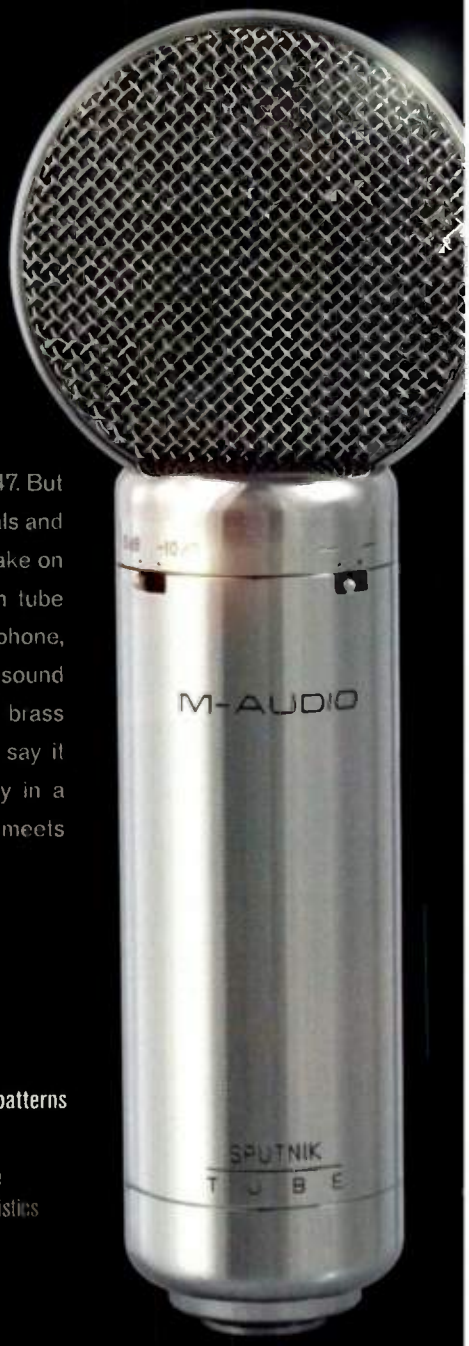

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COURTESY JOHN PATERNO

The Exuberant Engineer

By Diane Gershuny

Multitalented John Paterno discusses how to bring passion to your work.

If you spend any time chatting with producer-engineer John Paterno, you can't help but notice his over-the-top passion for music and making records. Everything about the creative process gets him pumped—from helping artists find their inner voice to capturing spontaneous performances live in the studio. His fascination with gear, technology, and exploring sonic palettes is boundless. And he considers his other creative pursuits, including photography, to be outlets that enable him to focus more intently on his craft.

A Long Island native, he studied recording at the University of Miami, where his roommate was Joe Barresi. Armed with a degree in music, Paterno headed for the West Coast music mecca of Los Angeles in the early '90s. From assisting on sessions to engineering and mixing to producing, he's risen up the ranks and built a multipage list of credits in a career spanning 15 years.

He developed his studio chops during years of sessions with the famed production duo of Tchad Blake and Mitchell Froom, working on projects for artists ranging from Los Lobos and the Latin Playboys to Suzanne Vega and Richard Thompson. Those productive years and the bountiful connections made during that time prepared Paterno for his multiple projects with

TV-music maven Vonda Shepard and work with U.K. phenom Robbie Williams. He also worked on many sessions with artists such as Badly Drawn Boy, Robben Ford, Jeffrey Gaines, Ted Hawkins, Faith Hill, Jackshit, Particle, Bonnie Raitt, Soul Coughing, and the Thrills.

Paterno won a Latin Grammy Award in 2004 for his engineering and mixing work with Colombian singer-songwriter Soraya. He's also engineered or mixed a number of movie soundtracks, including *How the Grinch Stole Christmas* (Universal, 2000), *Steal This Movie* (Lions Gate, 2000), and *Feeling Minnesota* (Fine Line Features, 1996).

How did you become interested in making records?

I've been interested in making records since I was a kid. What fascinates me is that trapped in those bits or rust particles is an energy, and it's always there. One of my favorite examples is the count-off in "I Saw Her Standing There" by the Beatles. I've always been attracted by the fact that records capture energy, and that that energy is available to you anytime you want it.

I've also played guitar in bands and have always been into gear and how it interfaces with guitars. I'm interested in how systems are put together. I was accepted into the University of Miami's recording program, where I earned a degree in music with a minor in electrical engineering.

Why Los Angeles, and what was your first gig?

At the time, I had three choices: I could go to New York, Nashville, or Los Angeles. My friend Joe Barresi, who had established himself in L.A., influenced my decision. On a visit there, while out bowling, I was introduced to the studio manager from Cornerstone Recorders. Six weeks later I was offered a freelance gig assisting at Cornerstone. I continued freelance assisting, which allowed me to work in various studios and experience the different ways that producers and engineers work. A year later Sunset Sound hired me as a staff engineer, and I stayed there for five or six years. That's how I got hooked up with Tchad Blake and Mitchell Froom.

What was it like working with them?

My first time working with Tchad and Mitchell was a two-week stint on a Peter Case record. They barely spoke to me the whole time. All they gave me was their food order! The next project with them was a Los Lobos record. The studio manager suggested I bring a book to read because Tchad did all his own patching. Tchad had come up through Sound Factory [also owned by Sunset Sound], so he knew the rooms extremely well and would work solo. He's a wonderful guy but can be intimidating because he's very intense when he works.

Because I was determined not to sit around for six weeks, I planted myself between Tchad and the patch bay. Sound Factory's pretty small, and I figured that Tchad would either ask me to do things or get up and walk around me. After watching Tchad, I was able to anticipate his needs and set him up so that he could continue working. From this, a friendship and working relationship was born. These were the sessions for *Kiko* [Warner Brothers, 1992]. The band would show up late, and it gave Tchad and me time to hang out. Our backgrounds were so different, but we shared this common thing—the Beatles. We'd listen to Beatles records for hours and really got on. I worked on all of his sessions for the next four to five years.

COURTESY JOHN PATERNO

FIG. 1: With minimal acoustic treatment and by keeping the volume low, Paterno is able to get accurate results when mixing in his control room.

At what point did your focus shift from assisting to engineering?

My goal was always to be an engineer-producer, and I was afforded opportunities when Tchad and other producers recommended me for gigs. One of my first records was Ted Hawkins's *The Next Hundred Years*. I continued to assist while looking for recording opportunities. That eventually led to engineering a record with That Dog (an L.A. band), which signaled the end of my assisting days.

You worked with Vonda Shepard during the late 1990s and early 2000s, when she was involved with the hit TV show *Ally McBeal*.

Yes. That was right at the time that the show was taking off, so I got to

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record the TV-show stuff as well. Mitchell recommended me to her. I started out doing some overdubs and ended up recording a lot of stuff for her. She was great to work with. Even though only 30 seconds of a song might end up on TV, we would do whole, or nearly whole, takes of songs. The sessions could be intense; sometimes we had to record five songs in a day, mix them, and have them ready for the next day on set.

I've always been fast, and my approach was to make sure the focus was on the transparency of the recording process. The last thing you want is a musician sitting around getting bored. Boredom is the antithesis of creativity. No matter what my function on the session, I never want to be the slowest guy in the room; I never want anyone waiting for me. The focus has to be on the pace of the artist and the creative process. The TV thing was great for sharpening my skills.

COURTESY JOHN PATERNO

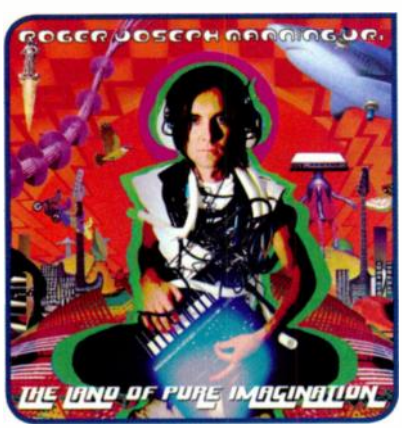
FIG. 3: Paterno in the studio during a recent project with a band called the Big Provider. He convinced them that they'd get better results if they recorded their parts together rather than layering them separately, as they'd done in the past.

Tell me about transitioning into a personal-studio environment.

For the past several years, I've been mixing more records at home in the computer. There are things I miss about traditional studios—mainly the support staff and the recording spaces. But in a home studio, you don't have the time or financial constraints that you have in a conventional studio. I can take the time to rerecord things at my home studio [see **Fig. 1**]: I can take a sound, run it through my gear, and record it back to get a sound I'm happy with.

The recall thing is great, too—being able to work on something and open it up later and have it exactly the way you left it. That's huge, because it's something you can't do in a conventional studio. Even when you do recalls on a console, they don't always come back 100 percent.

FIG. 2: When Paterno mixed Roger Joseph Manning Jr.'s recent CD *The Land of Pure Imagination*, most of his interaction with Manning was online. They corresponded by email, and Paterno posted mixes on his iDisk for Manning to download and audition.



In a home studio, I tend to work independently. I'll do the mix, pop it up on my iDisk, and the client downloads it on their end. Clients can make better judgments in their own listening environments. Usually I'll get emails with comments and changes, which I prefer to doing verbally because there is a written chain of revisions. I address the changes and upload revisions until the mix is approved.

I understand that both the recording and the mixing of Roger Joseph Manning Jr.'s recent record, *The Land of Pure Imagination* [see Fig. 2], was done from both of your home studios.

Roger had been recording this record from his home studio for two or three years. Upon a recommendation, we got together at his place to listen to what he was doing and to see if I could bring something to it. He put an incredible amount of time and effort into it. The tracks were dense at times, and the arrangements were really cool. It ran a wide gamut stylistically. Because of the distance between our places, it wasn't practical for him to come by every day, so I suggested using my iDisk to get mixes to him. We went through all the songs, made revisions, and took care of most of the comments via email. Just before the final mixes were printed, we spent two days together making final changes. I mastered the record as well using my iDisk to transmit the final version.

Describe the gear in your studio.

[Digidesign] Pro Tools is the centerpiece of my setup. I've got an HD3 rig with one Accel card and have yet to do a mix where I've run out of processing. I have two 192s [digital I/O units], and another one that stays with my cartage company. I had been using a trackball but recently picked up a [Digidesign] Command 8 control surface for some of its features. There are buttons you can get to that are easier to access than pull-down menus. I can grab a fader if I need to set up a quick mix. I'm using an Apple Power Mac G5 with a dual 2 GHz processor.

When did you first work with Pro Tools?

When I was engineering, a Pro Tools operator would be brought in to do whatever fixes were necessary. The

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FIG. 4: Jackshit in Paterno's studio (left to right): Val McCallum, Davey Faragher, and Pete Thomas. Faragher and Thomas are also in Elvis Costello's band, the Imposters.

producer would leave and I'd have to sit there and say, "Yes. No. Move it forward. Move it back." I finally got my own setup so I could do it myself. At first, it was used to augment analog sessions, but as time went on, it became more of the recording medium. My first record where the whole thing stayed in Pro Tools was Badly Drawn Boy's *Have You Fed the Fish?* I worked with Tom Rothrock, who's also worked with Elliott Smith, James Blunt, and others. I called him to have lunch and was invited to record drums on the record.

We tracked at Cello Studios and did overdubs at Tom's. That's when the migration to Pro Tools began for me—around 2001, right before the HD stuff came out. I cut my next record on tape and transferred it to my new HD system. There have been a few tape things since, but the majority of projects have been done entirely in Pro Tools.

Any insights about getting the most out of Pro Tools?

Pro Tools is a tool, so it helps to understand what you can and cannot do with it. The same goes for plug-ins and outboard gear. It also helps to understand how Pro Tools interacts and interfaces with your other gear. Experimenting is the only way for me to figure out these kinds of things—to make it an extension of what I'm going after as opposed to a hurdle to get over. I mean that from a sonic perspective as well as from an editing or technical perspective. I know it sounds simplistic, but it is amazing how many people don't take the time—on their own time and not a client's—to sort these things out.

Do you use a lot of plug-ins?

Not a ton. I love the McDSP FilterBank plug-ins—the EQ and the filters. I'm getting into the Analog Channel as well. I like the Cranesong Phoenix for some things. I'm using Celemony Melodyne and quite a few of the Native Instruments synths and sample-based programs. I like [Audio Ease] Altiverb, too. I have standard stuff like Antares Auto-Tune. I tend to use plug-ins that help me deliver what I hear in my head.

What outboard gear do you have?

A lot of mic pres, EQs, compressors, and guitar pedals. I love the Chandler stuff, especially the TG Channel. I've got a Little Labs PCP, which converts line-level to instrument-level signals so I can reamp stuff. I can run things through guitar pedals, and then record them back in. The Little Labs IBP [analog phase-alignment tool] can be a lifesaver. Both have amazing-sounding DIs. I use an Empirical Labs Distressor; it's brilliant. I also use an Alan Smart CL2 stereo compressor on the stereo bus as part of my mix chain.

Are you a fan of vintage gear?

I've got a few things, like LA3As, Spectrasonic 610s [compressors], and an Altec 438A, but in general, I can't justify the expense. If I'm going to spend money on old gear, it's going to be on instruments, guitar amps, and things like that. I've yet to hear a preamp

JOHN PATERNO: A SELECTED DISCOGRAPHY

Roger Joseph Manning Jr., *The Land of Pure Imagination* (Cordless Records, 2006): M, Ma
Marco Benevento, *Best Reason to Buy the Sun* (Rope-a-Dope, 2005); E, M
Mitchell Froom, *A Thousand Days* (Inner Knot, 2005); P, E, M, Ma
The Stands, *Horse Fabulous* (Liberation Music, 2005); E, M
The Warlocks, *Surgery* (Mute, 2005); E
Robbie Williams, *Intensive Care* (EMI, 2005); E, G, M (B-sides only)
The Black Mollys, *Overnight Disgrace* (Vital, 2004); P, E, M
Particle, *Launchpad* (OR, 2004); P, E, M
Soraya, *Soraya* (EMI Int'l., 2003); E, M
The Thrills, *So Much for the City* (Virgin, 2003); E
Badly Drawn Boy, *Have You Fed the Fish?* (Artist Direct BMG, 2002); E
Jackshit, *Jackshit* (Evangeline, 2002); E, M
Mia Doi Todd, *Golden State* (Sony, 2002); E, M
Tim McGraw, *Set This Circus Down* (Curb, 2001); E
Joan Osborne, *Righteous Love* (Interscope, 2000); E
Los Lobos, *Colossal Head* (Warner Bros., 1996); E
Ted Hawkins, *The Next Hundred Years* (Geffen, 1994); E, M

P = producer, E = engineer, M = mixer, Ma = mastering engineer, G = guitar

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Besides the obvious ones, what are some of the challenges of working in a small room?

Getting the monitors to make sense. I put up treatment to control some of the high-frequency flutter, but I got lucky with this tiny room! I use NHT M-00s with the S-00 sub for monitoring. They sound fantastic. I can hear a lot of detail without having to crank them up. Fortunately, room anomalies don't come into play for me as much as for someone who's turning it up all the time. The room just doesn't get "involved" when listening at lower volumes. I've got it dialed in to where it sounds good to me.

Interfacing is a problem, too. I have to climb around the racks to plug things in. I could get a patch bay made, but I like the signal path to be as short as possible. Also, there's a lot of gear I want to have access to, so things are pretty tight—for example, the 192s are underneath the table. I use a Mackie Big Knob for monitoring, which has all the functionality I need. It has four stereo inputs, three speaker outs, a mono button, a dim button, and two separate headphone sends. Some say it colors the sound, but I'm happy with the monitoring. And let's not forget the room, too—more than two people is remarkably cramped.

Any must-have gear?

NHT makes M-20s, which I take when I track and mix in other rooms. They have midrange detail but are full range as well. I use Sennheiser HD650 headphones that are audiophile-style and great for listening for breath noises, reverb decays, and things you might not notice sitting in front of speakers all day.

Have you brought any insights or techniques from the big studios into your personal studio?

There are a few, but the main one is to make decisions. There is something to be said for knowing when a performance is acceptable and when it is crap. Just because Pro Tools lets you save every scrap of audio you record doesn't mean you should. Additionally, session files should be easily understood. That means you have to label tracks; mute, disable, and hide unused items; and include any necessary information for the next person working on the session. Lastly, crossfade your audio regions. There is nothing more distracting than hearing a bunch of weird clicks as a track plays down because the regions were not crossfaded. And it's even more of a hassle when the regions in question have been consolidated into a continuous file. In short, turn over a session as you would want it handed to you.

What's your recording philosophy as a producer?

The initial process is the raw-material process. I try to get great performances and enough takes so I have it covered. Then I can fine-tune it as necessary. And that

doesn't mean using Beat Detective or slicing it up and making it "perfect." It means selecting the best performances. I'm currently producing the Big Provider, a band from San Diego [see **Fig. 3**]. I love what they do. In four days, we cut 11 songs, did a bunch of guitar overdubs, and sang half the lead vocals and background vocals. The band was thrilled with the rough tracks, despite their initial apprehension to record while playing together (their previous experience involved each member recording their parts separately). As the producer, I felt their energy and interaction would translate better when they played together.

I did the same last year with a band called Lustra, and they've repeatedly told me it was the best recording experience they've ever had. Currently, I'm finishing up mixing a second record for Jackshit [see **Fig. 4**], which has drummer Pete Thomas and bassist Davey Faragher from Elvis Costello's Imposters, along with guitarist Val McCallum. Same basic approach, although usually it's just one take with those guys.

You seem to be chameleon-like in your approach to making records.

I'm truly attracted to all kinds of music. It doesn't matter what the genre is. I love the philosophical aspect of making records. I like finding ways to enable artists to get to their "truth." Sometimes it's being more hands-off, or sometimes it's helping them figure out chords, arrangements, and things like that. I guess that's what I mean by the philosophy of it: I want to make records that are unique to the artist.

What are some of the highlights?

There have been quite a few, but here's one with a cool thread to it. Through Vonda I met Michael Landau, who was one of my guitar heroes when I was in college. He played on a ton of records. But I'd lived in Los Angeles for ten years and never came across him on a session. It was great when we met, because he was a big fan of stuff that I'd worked on, like the Los Lobos records, and I was a fan of his. I got to record a little song called "The Blue Horn" that he did at his house, and it's still one of my favorites. Mike, in turn, recommended me to a producer in Nashville named Byron Gallimore, who has produced Faith Hill and Tim McGraw, among others. When Byron came here to record Tim, Mike recommended me, and that turned into a bunch of extra things.

It's funny how one little thing runs you off into another. Mitchell Froom put out a solo-piano record last year and asked me to coproduce it. He's shown a

lot of trust in me and has been an amazing supporter. I love working for him and always learn something. His focus, his sense of music, his sense of harmony is great. And Tchad is the same way. We're still good friends. I learned a lot about making records from them. When you spend five years with people, their philosophies and ways of working definitely rub off on you.

How did you start working with Robbie Williams?

One of my best friends, Jeremy Stacey, who I met in '95 when he was looking for an engineer, is a drummer and producer from England. Jeremy was playing on Robbie's *Escapology* [Virgin, 2003] at Conway in 2002, so I went down to hang out. Due to looming deadlines, I was asked to record one song. Two years later I got a call from the A&R guy, Chris Briggs, asking about my availability to help finish the new Robbie record with new producer and cowriter Stephen Duffy. It was an interesting project; we were sorting through two and a half years of Pro Tools sessions recorded all over the world. We overdubbed, edited, and molded the songs into shape. Stephen gave me a lot of room creatively to try things, and I really appreciated that. It was one of the most challenging things I've done.

Do you make your own music?

When I moved to L.A., I had the foolish idea that I'd actually be able to play guitar and work in a studio at the same time. After my first 100-hour workweek, there was no way. I've always wanted to produce, and I decided that working in a studio was what I needed to do. I have occasionally played guitar or piano on a record, and it's been a blast.

It's funny—I learned more about music by watching guys like David Hidalgo [from Los Lobos], Mike Landau, Jeremy Stacey, Mitchell, Davey, Pete, Val, and a lot of other great players than I did from my years at school. I always learn something from everyone I come across. EM

Diane Gershuny is a freelance writer and publicist who has written about music and musicians, instruments, and pro audio for more than 20 years. She's worked for companies such as Fender, Mackie, and Tascam.

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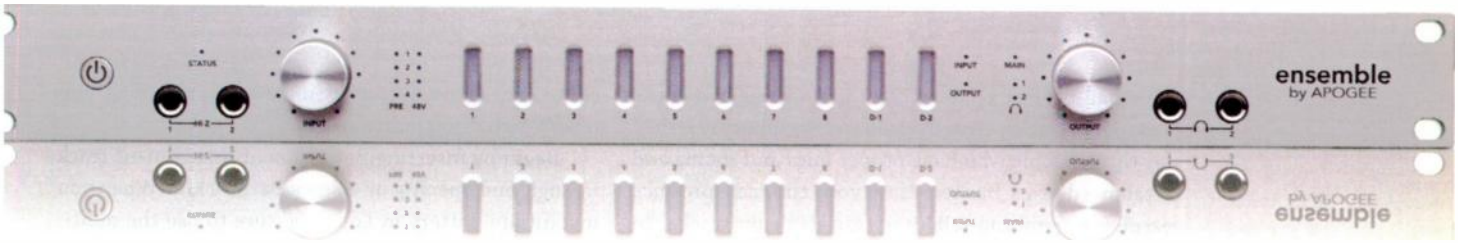

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Reality Check

By Mitchell Sigman

How to make sampled drums sound realistic.

In small-project studios, recording drums live is the exception rather than the rule and is a luxury reserved for those people who have proper mics and rooms and a talented stick basher. Now you, too, can produce excellent-sounding (albeit artificial) drum tracks. In this article, I'll explain how to create the illusion of a live, grooving drummer using sampled drums and a digital audio sequencer.

Anyone who has heard the raw tracks of a multi-miked live drum kit knows that unprocessed drums sound very different from the polished, vibrant-sounding kits on commercial CDs. Extensive compression, EQ, and spatialization effects make all the difference, and that's what you want to replicate in the artificial-drum world. Here, I've used Apple Logic Pro 7 along with the Native Instruments Battery 2 drum sampler, but these ideas can easily be applied to any sequencer and sampler.

Be Discrete

Though drum loops are currently in fashion for creating drum tracks, a sampler with individual instrument hits gives you much more flexibility because you control every note. Furthermore, by assigning each instrument to its own audio output, you can compress, EQ, and reverb each drum individually.

FIG. 1: The red box indicates where to select the appropriate Battery output pairs for each aux object in the Logic Environment window.

Begin by inserting Battery in an Instrument track in Logic and opening up a stock Battery kit. (When you instantiate Battery in Logic, be sure to use the multi-channel option.) In the Logic Environment window, create a stereo aux object for each Battery stereo output you intend to use, then select the Battery outputs in the aux objects' I/O boxes (see **Fig. 1**). You can now go back to Battery and select the desired output pair for each cell (see **Fig. 2**). You can assign outputs for multiple cells simultaneously by Shift-clicking on multiple cells, and then selecting an output pair.

A Warm Compress

The next step is to apply separate processing to the individual outputs by inserting effects in the aux channels. Start by compressing the kick drum. Settings vary depending on the particular kick drum sample and song, but generally kicks should have a thick, solid low end and a present beater. For that, set the compression ratio to 3:1 with a gain setting of about –8 dB. Use an attack of at least 20 ms so the smack of the beater doesn't get squashed. Decay should be fairly quick for hard kicks and longer for softer kicks.

Follow the compressor with a parametric EQ. For kick drums, use a low-shelf EQ at around 100 Hz to boost or cut the lows; a spectrum analyzer can be really helpful for choosing the frequency. Think fat, but don't overwhelm the track. If it's a little honky, a gentle dip in the 400 to 600 Hz range will smooth it out. Finally, a gentle boost at 1 kHz will bring out the attack of the beater.

Ensnared

For the snare drum, again insert a compressor followed by a parametric EQ. Because snare tones vary greatly, you'll need to experiment. For a realistic snare sound, subtle compression and EQ work best—perhaps a 2:1 or 3:1 compression ratio with a –6 dB gain setting and an attack of about 30 ms. Use EQ to mildly exaggerate what's already there. You can adjust the ping of the snares with an EQ band in the 500 to 600 Hz range, and you can use a high-shelf EQ near 5 kHz to brighten things up. To achieve a more

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artificial snare sound like the Cars or Queen, use a higher compression ratio, more gain reduction, and a superquick attack (try 0 ms). That will crush the attack and take out all the ping.

Regardless of the tone you choose, send the channel to a bus to add reverb. You can use a reverb on the drum's own channel, but using a bus makes adjustment easier, and you can send multiple drums to the same reverb. That puts them in the same sonic space and saves processor power. Be sure to listen to the drums in the context of the mix for a reality check.

Tom Is of the Essence

You can often skip compression altogether on the toms, or to punch them up, compress them with settings similar to those used for the snare. Be sure to keep the attack time high to let the stick hits through.

Equalizing toms is usually a matter of finding the fundamental frequency of the tom and boosting or cutting it to taste, using your ears or a spectrum analyzer as your guide. Some high-shelf EQ boost above 5 kHz can help toms cut through the mix. Finally, make sure your toms are realistically panned. Visualize the drum kit and place the toms accordingly. Don't overdo it. Remember, the drummer doesn't have his kit spread across the entire room. You may want to send a bit of the toms to the reverb bus, but don't go too heavy, or they'll sound like a drum circle of doom.

Cymbals of Success

Hi-hats don't usually need compression, but they often need some of the low end knocked out. Use a highpass or low-shelf EQ in the 200 to 500 Hz range. Hi-hats might need a little high-end boost as well. And pan the hi-hat a little to the right.

FIG. 2: The red box indicates where to set individual output channels for each cell in Battery.

Crashes and rides usually need EQ similar to the hi-hats. You can take some lows out with a low-shelf or highpass filter, and boost a little above 5 kHz for sheen. Pan those around the stereo field a bit, and send a little to the reverb bus.

Web Clips 1 and 2 are dry and processed versions of the Battery factory Rock kit. **Web Clip 3** is a Logic Pro 7 file with the settings described here.

Bang the Drum

Now that you have a realistic kit, here are some sequencing tips. Go easy on the quantization. Most sequencers have a percentage-quantize feature that reels in the notes only to a percent of the quantize value. I find 70 to 80 percent works well. That way your playing sounds better, but it's not robot perfect.

It's also important to avoid playing superhumanly. If you play a tom fill before a change, mute the hi-hats and ongoing snare hits. Physically air drumming the fill can help you figure out what should hit where; you'll know exactly where to stop your hats and when to simplify the kick part.

When playing repeated-note fills, lower the Velocity on every odd hit to avoid the dreaded machine-gun syndrome. Most important, mix things up. Real drummers often throw in little cymbal hits, tom flourishes, or an extra snare hit. Subtle inconsistency is the name of the game.

Straighten Up and Groove Right

I've saved the most important point for last: program the drums first, and then track all the other instruments to the drums. I frequently receive songs in which all the instruments were tracked by playing to a click. Then the drums were programmed or played live to the already recorded instrumental tracks. This is groove suicide! At best the vibe will suffer, and at worst you'll have a musical train wreck on your hands. Musicians always play differently to a real drum track than to a click. The best approach is to throw down some quick-and-dirty instrumental and vocal reference tracks for drum tracking, and then replace them later with the keeper tracks.

All the tricks I've covered here work just as well for synthesized drum kits, such as the Roland TR-808 and TR-909, and for older digital drum machines, such as the vintage Linndrum and the Oberheim DMX. Use the same strategy as for the Battery kit: break out and process the individual sounds, and the kit will sound really great. Now start bangin' and mow down those wimpy drum-loop users. EM

EM WEB CLIPS

Mitchell Sigman is keyboardist and music director for the seminal '80s synth band Berlin. He also makes his own synth rock with the L.A. band Celebutante.

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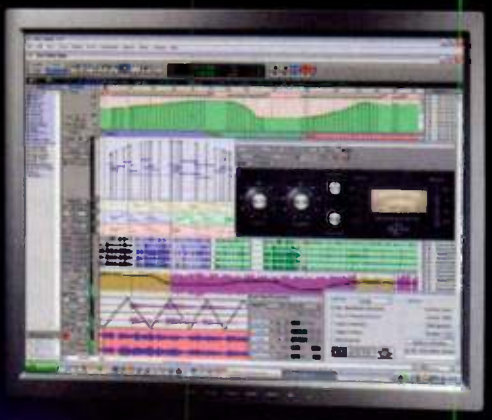

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After a Brief Delay

By Jim Aikin

Enhance your tracks with pre- and postdelay effects.

A delay line simply echoes its input at its output, and unless you take some extra steps, your listeners will soon tire of the effect. Rhythm-based delay lines, however, can add a vital element to electronic tracks. Sync the delay to the master clock, set it to a rhythmic value such as an eighth note, add a little feedback, and you've transformed a dry beat into a percolating phantasmagoria.

The Web Clips made for this column were created in Propellerhead Reason 3.0. Reason can patch devices together in user-defined signal paths, which makes developing complex multi-effect routings easier than it is with a conventional mixer (see **Fig. 1**). If you own Reason, you can download and experiment with a Reason song file for each of the examples presented here.

The Tone Zone

Begin by splitting the signal that you want to delay. Send one output of the splitter to the mixer dry, and send the other outputs to a couple of delay lines. The delays should be set to 100 percent wet, because you've handled the dry signal path manually. Set each delay to differing numbers of 16th notes to create a polyrhythm.

Next, patch a parametric equalizer between the output of each delay and the mixer. Set the two EQs so that each of them boosts a different narrow notch. In the mixer, pan the delay output channels left and right. The EQs will give each side of the stereo delay image its own tone color (see **Web Clips 1 and 2**).

FIG. 1: This screen shot shows the rack in Propellerhead Reason. The main signal paths for delay processing in Web Clip 5 are Aux Send 1 (not shown) to Delay 1 to Unison 1 to Scream 1 to Fast Delay and Delay 2 to Reverb 1 to Scream 2.

Now patch a phaser after each EQ. Again, set the parameters of the two phasers differently, so as to give each side its own character.

Bad Bends

The order in which effects are patched is significant. If you use pitch bends on lead synth sounds, route the lead into a delay line set to a fairly short time with a bit of feedback. Send the output of the delay through a distortion effect.

Each time you bend a note, the distortion effect will receive several echoes of the bend, which will be at different pitches because they've been delayed by different amounts of time. When several notes at different pitches are distorted together, the distortion will add a rough edge to the tone. The result: a more expressive pitch bend. This patch can add subtle coloration or grinding distortion (see **Web Clips 3 and 4**).

Pick and Kick

Sending an entire drum loop through a delay line would likely produce an extremely busy texture. Instead, isolate a single sound within the loop and apply a delay to that sound. Digital audio sequencers allow you to isolate sounds in various ways. For example, you may be able to use a scissors tool to snip apart an audio waveform and drag a particular sound vertically to a different track without affecting its start time.

I loaded a REX file into Reason's NN-XT sampler and routed a few of the sample slices to a separate audio output. I chose a prominent backbeat slap sound in a hand-percussion loop for treatment and patched its output into the mixer, where two aux sends routed it to separate delay lines whose outputs were set to 100 percent wet.

The first of the delays, set to two 16th notes with some feedback, fed Reason's Unison (chorus) effect and a Scream distortion unit, giving each of the echoes a slightly different tone. Scream fed a third delay line that was set to a 4 ms delay and high feedback, which caused the delay line to ring. The slightly different tone at each input caused subtle variations in the waveform. This part of the patch works much like Karplus-Strong plucked-string synthesis.

I routed the second aux send to a delay of two 16th notes with no feedback followed by a Scream distortion unit, which turned the slap sound into a short noise burst. You can add a reverb with a short decay time between the delay line and the distortion to lengthen the noise burst (see **Web Clips 5 and 6**). Adding distortion to the output of a reverb destroys the natural character of the reverb, but it's good for horror-movie special effects like this one. EM

EM WEB CLIPS

Jim Aikin is a cellist and a frequent EM contributor. He learned a few Reason programming tricks by editing Power Tools for Reason 3.0 *(Backbeat Books, 2005), written by Kurt Kurasaki.*

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Pitch vs. Frequency

By Mark Ballora

Knowing the difference can help you with many tasks.

One thing that desktop musicians often struggle with is the distinction between creative and technical terms. An example is the musical term *pitch* as opposed to the scientific term *frequency*. Though they both describe the same thing, they aren't quite synonymous. Here's a look at the differences between the two.

All Relative

One key distinction between these terms is that pitch is relative (a matter of common agreement among musicians), while frequency is absolute (a precise, unambiguous measurement). Both describe how often air-pressure levels, or changes in the air's molecular density, repeat. Nature's simplest form of repeating change is called *simple harmonic motion*. For our purposes, this refers to changes in air pressure that can be represented by a sine wave (see **Fig. 1**).

An example of a scientific description of pressure levels changing at a certain rate could be "The frequency of the oscillation is 440 cycles per second" (or 440 Hz). But a musical description would refer to pitch; for example, "That's an A above middle C."

Both of these statements are correct, but the scientific description is precise and unwavering; the frequency is exactly 440 Hz—not 440.1, not 441, not 439. The musical description, on the other hand, refers to a flexible convention. The pitch of A could be assigned to any frequency we choose. Some orchestras tune a little sharp, for example, to an A of 442 or 444, to give their sound a little extra bite. Any frequency will do, as long as musicians playing together agree on a common reference. In the Middle Ages, when people lived in isolated communities, tuning could vary widely from place to place: a famous table made in 1862 comparing European church bells reported frequencies of A ranging from 370 Hz to 567.3 Hz.

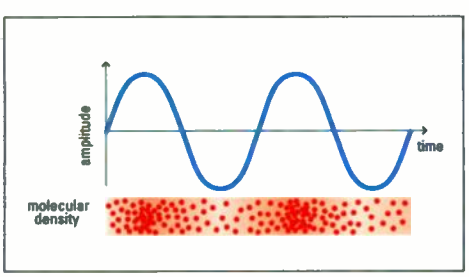

FIG. 1: With simple harmonic motion, air-pressure changes take the shape of a sine wave. Increased air pressure (high molecular density) is shown as high points of the wave, and reduced air pressure (low molecular density) corresponds with low points of the wave.

Though pitch and frequency are not equivalent, they are correlated. This means that as one goes up, the other does as well. A higher frequency produces a higher pitch, and a lower frequency produces a lower pitch.

All in Your Head

Another distinction between the two is that frequency describes a physical phenomenon, while pitch describes a perceptual phenomenon. Physically speaking, objects have a natural tendency to vibrate at certain frequencies, which are called their *characteristic frequencies*. Say you have a tuning fork that vibrates at 100 Hz when struck. This fork is "inclined" to vibrate at that frequency, which is called the *fundamental frequency*, as well as at any *harmonic* of the fundamental. (A harmonic is a vibration whose frequency is an integer multiple of the fundamental's, which in this case would be 200 Hz, 300 Hz, 400 Hz, and so on.) Just how strong is this inclination? Expose the fork to one of its characteristic frequencies being sung or being played by an instrument or a synthesizer. As the air-pressure levels around the fork change at one of these frequencies, the fork begins to move in tandem. This physical phenomenon is called *sympathetic vibration* or *resonance* (for more on this subject, see "Square One: Standing Tall" in the January 2005 issue of EM).

Perceptually speaking, how does the human auditory system interpret these vibrations? Our musical understanding is based on the perceptual phenomenon of *pitch class*. A pitch class is the entire superset of all instances of a certain note, regardless of what octave they are in. And all members of any given class retain a certain identity regardless of register. To prove this, try playing a well-known tune like "Happy Birthday" on a piano. Randomly transpose different notes by an octave (or two or three or four) in either direction. The melody remains familiar and intact, even though the register jumps around (see **Web Clip 1**).

We hear a change of an octave when a given frequency is doubled or halved. This means that the frequency range spanned by an octave depends on the specific frequencies in question. The span from 100 Hz to 200 Hz is smaller than the span from 800 Hz to 1,600 Hz, but to our ears, the pitch distance sounds equivalent: an octave has been traversed.

Thus, we perceive pitch relationships based on fixed ratios, rather than fixed spans of cycles per second. For two frequencies to sound an octave apart, they must have a ratio of 2:1. Other intervals have different ratios.

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A ratio of 3:2 produces a perfect fifth (for example, 300 Hz and 200 Hz, or 900 Hz and 600 Hz). A ratio of 4:3 produces a perfect fourth. To create a pitch that is a perfect fourth from any frequency, multiply that frequency by ⁴⁄₃; to go down a perfect fourth, multiply by the inverse, or ¾.

Like other objects, musical instruments tend to vibrate at multiple harmonic frequencies simultaneously, rather than at just one harmonic frequency. What does that mean perceptually? As stated earlier, harmonics are whole-number multiples of an object's fundamental vibration, but pitch class is determined by equal frequency ratios. This means that not all harmonics are of the same pitch class. **Fig. 2** shows the pitches that are produced by the first 16 harmonics of a low C.

People who learn a technique called *analytic listening* can hear individual harmonics as separate pitches, but the vast majority of us hear a single pitch, typically determined by the fundamental frequency. The presence or absence of frequencies above (and in some cases, below) the fundamental gives the sound its tone color, or *timbre*.

Headed Through the Pass

An example of a real-world application in which the relationship of frequency and pitch is a factor can be seen with bandpass filters. They allow a certain band or range of frequencies to pass, limiting all others (see **Fig. 3a**). A typical bandpass filter has three adjustable parameters. The first is called a *center frequency*, which is the frequency that passes through the filter at the highest power levels the filter will allow. The spectrum output by the filter is usually symmetrical in shape, with the power levels decreasing above and below the center frequency (for more on spectra and power levels, see "Square One: You've Got the Power" in the September 2004 EM).

The second parameter is *bandwidth*, and the third is *Q*, or *quality*. The difference between the two is similar to the difference between frequency and pitch. Bandwidth is absolute and is the difference in hertz between the frequencies above and those below the center frequency that are attenuated by 3 dB. Q is relative, because it deals with two frequency values: center frequency divided by bandwidth. For example, if the center frequency is 1,000 Hz, and the power levels at 900 Hz and 1,100 Hz have dropped by 3 dB, the bandwidth is 200 Hz and the Q is 1,000/200, or 5.

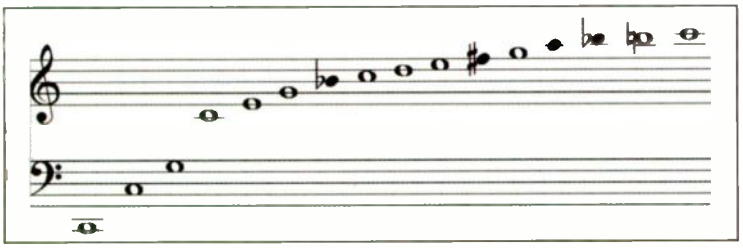
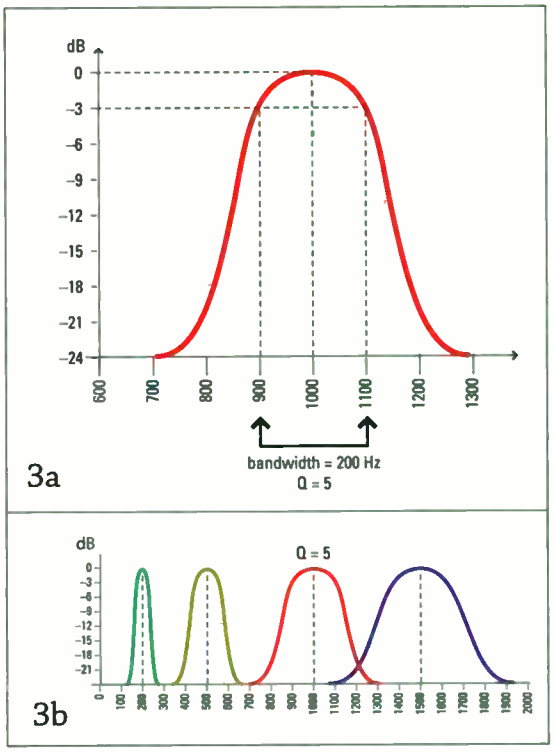


FIG. 2: This figure shows the first 16 harmonics of a low C. The darkened notes are pitch approximations, as the frequencies of the natural harmonics do not quite match those used in our 12-tone equal-temperament tuning system.



FIGS. 3a and 3b: This figure shows the spectrum output from a bandpass filter (3a). A constant Q filter adjusts the bandwidth as the center frequency changes, maintaining a constant ratio between the two (3b).

As described previously, we perceive pitch according to ratios. So when working with bandpass filters, it is often more useful to work with Q, a ratio, than with bandwidth, an absolute. For example, 100 Hz above and below 700 Hz (a Q value of 700/200) represents a much wider pitch interval than 100 Hz above and below 7,000 Hz (a Q value of 7,000/200), because of the differences in the ratios.

A *constant Q* filter keeps things relative by adjusting the bandwidth depending on center frequency. This ensures that the pitch range spanned by the bandwidth remains constant as the center frequency changes. For example, setting a fixed Q of 5 means that at a center frequency of 100 Hz, the bandwidth becomes 20 Hz; at a center frequency of 500 Hz, the bandwidth will be 100 Hz, and so on (see **Fig. 3b**).

Making sense of music often involves understanding the interplay between science and our perception of physical phenomena. And the difference between frequency and pitch is just one such example. EM

Mark Ballora teaches music technology at Penn State University.

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Show Me Your License

By Fran Vincent

Proper licensing can keep your music out of court.

Have you ever considered recording a cover song for a CD project? Did you ever want to use audio that you sampled from somebody else's album or from some other musical work on one of your recordings? Would you know what to do if someone asked to use your original music in a film or commercial, or to stream on a Web site?

Welcome to the world of music licensing. Although there are dozens of types of music licenses and possible scenarios, understanding a few of the major concepts and how to secure or grant a license helps protect you and your compositions.

Music usually involves two forms. The first is the *song*, which is the original creation of notes, melodies, and, if applicable, lyrics. The owner of the song is usually the songwriter-lyricist or publisher.

The second form is the *sound recording*, which is the particular recorded version of a song. The recording artist or record label usually owns the masters for the sound recording. The song and sound recording are independent of each other and require separate licenses.

All Covered Up

If you plan to record a cover song on your album, you must obtain a *mechanical license* from the songwriter or publisher. A mechanical license gives permission to use a song or composition in an audio-only reproduction (CD, cassette, and so on) or for digital delivery (downloading and streaming).

You can go straight to the publisher for a license, or you can go through the Harry Fox Agency (www.harryfox.com), which acts as an agent for the publishers. The royalty rate you'll have to pay (per unit sold) depends on whether the song has been recorded previously and distributed commercially, and how many records you plan to sell. (If you want to change the lyrics, the melody, or the character of a song, you must also obtain special permission from the copyright owner.)

Congress sets the statutory mechanical rate, which is currently 9.1 cents per unit for songs less than 5 minutes in length (longer songs have higher rates). For a song that has had previous commercial distribution, you will pay no more than 9.1 cents per unit sold. You may even be able to negotiate a lower rate.

Once a song has been distributed commercially, anyone else can license it. If a song's copyright owner declines your request to cover

MUSIC LICENSES AT A GLANCE

This table shows some of the most common music-licensing scenarios.

Usage	License or Permission Needed	Granted By
Cover a song or a composition on a CD	Mechanical license	Music publisher or songwriter
Reprint lyrics of a cover song in liner notes	Reprint license	Music publisher or print publisher
Use a sample taken from an existing recording on a CD	Sample clearance license, or sample license	Record label. Covers the use of the sound recording—this is a form of master use license. May also need a sample license from the music publisher to use parts of a song.
Create and sell print arrangements of others' music	Special permission	Music publisher and/or print publisher
Use a song or composition in a movie	Synchronization license (covers composition), master use license (covers actual recording)	Composer (record label or other entity grants master use license if it owns the recording)
Use a song or composition in a TV show, a made-for-TV movie, or a commercial	Synchronization license, master use license	Composer (record label or other entity grants master use license if it owns the recording)
Use a song or composition in a DVD/VHS production	Videogram license, synchronization license, master use license	Composer (record label or other entity grants master use license if it owns the recording)

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We submitted a song we wrote with Jenn Shepard called "You Make Me Feel" to one of TAXI's Industry Listings. We didn't hear anything back for a while and eventually our TAXI membership ran out. Thankfully, we began to get so busy with production and writing gigs that we decided to wait and renew our membership at a later date.

Little did we know that TAXI had sent our song to a production/management company that was looking for material for a young, male Pop artist they were developing.

Later that year, Jesse McCartney's managers called us saying they had just heard "You Make Me Feel" on a CD they got from TAXI and wanted to have him cut the song. Although Jesse decided not to record "You Make Me Feel", his managers asked us to write more songs for him. We wrote a handful and they ended up putting his vocal on two of the tracks we produced, "Take Your Sweet Time" and "Beautiful Soul".

"Beautiful Soul" got played on Radio Disney, and Jesse's management got the song to a label executive at Disney. Soon after, Jesse was signed to Hollywood Records. "Beautiful Soul" became his first single, and we both signed publishing deals with Disney Music Publishing.

Jesse McCartney's album (entitled "Beautiful Soul") has gone Platinum in the U.S. and Australia.

"Beautiful Soul" went to #3 on Radio and Records CHR Pop Chart, #5 on Billboard's Top 40 Chart, #19 on Billboard's Adult Top 40 chart, it's a Platinum Digital Single Download, it's on the Gold-selling 'Cinderella Story' Motion Picture Soundtrack, the Gold-selling 'That's So Raven' TV Soundtrack, and the video was nominated for Best Pop Video at a 2005 MTV Video Music Awards."

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the song on a recording, you can go to the U.S. Copyright Office to get a compulsory mechanical license, which compels the owner to grant you permission. Do that only as a last resort, though, because it could trigger many hassle-filled accounting requirements.

For songs that have never been distributed commercially before, you'll have to pay 9.1 cents or more per unit sold—all negotiable with the copyright owner, who has sole discretion over whether to grant a license. If you are the songwriter, parties will need a mechanical license from you to offer your musical compositions for digital download and streaming or to put your music in a film, a commercial, or a compilation CD.

Put It on Paper

Print licensing encompasses a wide range of printed music (for example, sheet music, orchestra arrangements) and lyrics. Some musicians create customized arrangements of standard songs for various types of bands, symphonies, and ensembles. To sell those arrangements either in hard copy or digitally through a Web site, however, the arranger must first obtain permission from the music publisher.

The first step is contacting the music publisher of the song. You may be told that the print rights have been exclusively assigned to another company known as a print publisher, which specializes in transposing, arranging, and distributing sheet music for all types of instruments and ensembles. If that is the case, you can then ask the print publisher about a license for your arrangements. The print publisher will likely want 50 percent of the retail price of whatever you sell, as well as an advance. Depending on the song, the number of units projected to sell, and the agreements the publisher might have with the composer's heirs, that could cost you thousands of dollars.

A *master use license* is needed any time someone wants to use a particular sound recording in a compilation CD, a film, a TV or commercial production, or for sampling, digital download, streaming, or in hi-fi ringtones. Whoever owns the master (the record label or the artist) will probably handle the licensing.

There's no fixed rate for a master use license. It depends greatly on what the recording will be used for, how it will be featured (for example, is it a title song in a film?), the recording itself (was it a hit?), the budget of the licensor's project, the projected number of units to sell, and the duration of the use. A master use license could cost anywhere from $500 to $50,000 or more, per track and per project.

Although sampling is common in hip-hop, rap, and dance music, a recent Sixth Circuit Court ruling (*Bridgeport Music; Westbound Records vs. Dimension Films*) reaffirmed that only the sound-recording copyright owner has the right to sample his or her own work and give permission to others to do the same. You can sample for your own enjoyment, but if you intend to put your resulting work on a record and distribute it, ask yourself if using the sample is necessary. Can you create something in your studio that sounds similar but doesn't violate copyright laws?

If you must have that particular snippet in your recording, then contact both the record label and the publisher about sample licenses; you may need one from each. The license you'd get from the record label is sometimes referred to as a *sample clearance license* and is a form of master use license. The amount you have to pay will depend on, among other things, how prominently the sample is featured, if it makes up the character of the song, how many times it is used, and what the duration of the sample is.

Screen Gems

Getting your existing music into film, TV, or commercials can be lucrative. Any time music is cued into timed relation with a visual, a *synchronization* (or *synch*) *license* must be secured from you (the songwriter) or your publisher.

The film producer may opt to record a new version of your song for the production. If, however, the producer wants to use a particular recording of your song, then he or she must also obtain a master use license from the owner of that sound recording. You may also have to grant a *videogram license* to the producer (see the table "Music Licenses at a Glance" for a breakdown of the types of licenses needed).

Licensing music for film, TV, and commercials is completely negotiable, and your fees will depend on the program's production budget, how your music is to be used, and how badly the other party wants it. Unknown songwriters and recording artists might get a flat fee as low as $500 or $1,000 per song and recording. Make sure your song and recording copyrights are registered with the U.S. Copyright Office, and that you have signed on with a performing-rights organization such as ASCAP, BMI, or SESAC. These are important steps in ensuring that you receive any performance royalties, which you're entitled to as the composer when your music is used for broadcast.

Getting a Grasp

The information provided here should give you a basic overview of the types of licenses you need to secure for your music and for music created by others. Remember, if you're in a situation where a music license may be required, it's always best to consult with a good entertainment attorney versed in the nuances of licensing and copyright law. You should also consider using the services of a music-clearance house or licensing consultant. Such entities can do all the research and negotiating for you, often at a lesser fee than many attorneys might charge.

In the end, obtaining proper music licensing not only shows respect for the musical work of all involved, but also keeps the income flowing to those who have worked so hard at creating, marketing, and distributing their art. EM

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

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M-AUDIO MicroTrack 24/96

A capable pocket recorder.

By Rudy Trubitt with Bruce Koball

What's your vision of the perfect pocket-size audio recorder? Here's mine: It would be tiny and use solid-state media (a memory card) rather than rotating storage (a hard drive). It should accept ⅛-inch minijack mics as well as professional phantom-powered mics. It should record mono or stereo at a wide range of resolutions, from on-the-fly MP3 encoding up to high-sampling-rate, 24-bit linear PCM files. After recording, I should be able to mount the recorder or its media on my computer desktop so that I can simply drag the files into my audio editor. Oh, and I'd want it to cost less than $500.

FIG. 1: The MicroTrack 24/96 is designed to fit into your pocket or the palm of your hand. The multifunctional Nav button on the right can be controlled with your thumb when the recorder is in your right hand.

Back in the previous century, this would have been a pipe dream. But thanks in part to increasing integrated-circuit functionality fueled by portable consumer audio devices like the Apple iPod, M-Audio has delivered the MicroTrack 24/96, a tiny high-resolution audio recorder that has all the features on my wish list—including the low price.

We tested a pair of MicroTrack 24/96s for this review: one provided by M-Audio, the other purchased through regular retail channels. We ran multiple firmware revisions (including 1.1.5, 1.2.3, 1.3.3, and 1.4.0) and made hundreds of recordings over a seven-month period. Although we got off to a rocky start with the MicroTrack due to buggy firmware, with the latest firmware rev, it has turned out to be a capable performer.

Ins and Outs

A bit larger than a deck of cards (see Fig. 1), the MicroTrack boots up in roughly 30 seconds. Its front panel includes the power button, an LCD screen, a record button, left and right record-level controls, and a headphone volume control. The all-important record button is easy to find regardless of whether you are operating the device while looking at it or just by feel alone.

When the recorder is held in your right hand, your thumb comes to rest on the Nav button, a lever that can be pushed up or down as well as clicked inward. The Nav button serves as a menu scroller, an Enter key, and a play, pause, fast-forward, rewind, and skip-to-next/last file control.

GUIDE TO EM METERS

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

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REVIEW

On the left edge of the unit, your index finger aligns with a menu button that toggles between system options and the main record screen. Other left-edge controls include a 3-position input-level switch (L, M, and H for low, medium, and high levels of gain, respectively), a phantom-power switch, and a Hold switch, which disables the other controls to prevent the effects of accidental button presses when the unit is in your pocket.

The top panel sports two stereo minijacks (mic input and headphone output) and two balanced ¼-inch TRS jacks for mic-level or –10 dB line-level signals (see **Fig. 2a**). The MicroTrack gives you 30V of phantom power for the ¼-inch inputs rather than the typical 48V. Some professional condenser mics won't run properly at 30V, so check the specs for your mic's power requirements before using it with this recorder. The bottom panel has a pair of RCA line outputs (which are affected by the headphone volume control), a coaxial S/PDIF digital input, and a mini USB connector (see **Fig. 2b**).

A T-shaped stereo electret condenser mic is included with the MicroTrack, and I was surprised at how much I ended up using it. The mic doesn't provide much in the way of stereo imaging, but it is small and convenient: I've recorded lots of usable audio with the MicroTrack peeking out of my shirt pocket. The unit also comes with an AC charger, a mini USB cable, a soft case, and stereo earbuds.

An internal lithium ion battery provides power. Although we were able to get four hours of record time using the included mic, you can expect less when using phantom power. The battery recharges when the MicroTrack is connected to a computer via USB or when you use the AC charger. M-Audio estimates that the battery will last 500 discharge/recharge cycles, after which the factory will replace it for $75. M-Audio offers no external battery, but my colleague Bruce Koball designed and built a portable adapter that supplies regulated 5V through a USB connector from an external battery.

MICROTRACK 24/96 SPECIFICATIONS

Analog Inputs	(1) ⅛" stereo; (2) ¼" TRS
Analog Outputs	(2) RCA line; (1) ⅛" stereo headphone
Digital I/O	(1) coaxial S/PDIF input; (1) USB 2.0 port
Resolution	16/24-bit
Sampling Rates	MP3: 96, 128, 160, 192, 224, or 320 kbps; WAV: 44.1, 48, 88.2, or 96 kHz
Media	CompactFlash cards (64 MB–6 GB)
Battery	internal rechargeable: lithium ion
Dimensions	2.4" (W) × 4.3" (H) × 1.1" (D)
Weight	4.9 oz. (without CompactFlash card)

2a

2b

FIGS. 2a and 2b: The top of the MicroTrack 24/96 (2a) includes two ¼-inch line inputs, an ⅛-inch stereo mic input, and a stereo headphone output. The bottom (2b) offers RCA line outputs, a S/PDIF digital input, and a mini USB port.

Check Your Levels

My first test was to make rehearsal tapes of the band I'm in, the Sippy Cups. I set the recorder, with T mic attached, on top of my bass amp, near the drum kit. The results were quite usable, but I found that even with the record level and input trim controls set to minimum, I was still seeing the occasional digital overload. To alleviate this problem, M-Audio offers an optional stereo mini in-line attenuator ($19.95) that will add 10 dB of headroom to the MicroTrack's minijack input.

I also found it a bit awkward to control the MicroTrack's input levels. The record-level controls provide only a 12 dB range; I wish it were at least twice that. M-Audio notes that this control is actually a gain trim for the mic preamps, not a fader. Nevertheless, when I see a record-level button, my expectation is that turning it down all the way will silence the input. That is not the case with the MicroTrack.

When using the ⅛-inch input, only two of the three sensitivity settings are active; they provide

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an additional 12 dB of sensitivity adjustment. So, the 12 dB from the level control and 12 dB from the switch gives you a total range of 24 dB on the minijack—not a lot of room to maneuver.

The ¼-inch TRS inputs have a wider range. First, you get 12 dB from the front-panel fader. In addition, all three positions of the L-M-H switch are active, and together they provide approximately 18 dB of level adjustment. Add to that a menu-selected 27 dB of boost, and you end up with a total adjustment range of nearly 57 dB when using the ¼-inch inputs.

When miking quiet sounds, be sure to engage the 27 dB boost. The MicroTrack's manual incorrectly describes it as "digital gain," but it's part of the analog signal path. We measured a 15 dB improvement in the MicroTrack's signal-to-noise ratio when using it.

Speaking of which, noise performance of the mic preamp is respectable. We did fairly extensive measurements and found the MicroTrack to be 5 dB quieter than an older Sharp MD702 MiniDisc recorder, 3 dB noisier than a Sony D3 DATMan, and about 8 dB noisier than a Fostex FR-2 (albeit, this recorder costs substantially more than the MicroTrack). We also found the MicroTrack's ¼-inch inputs to be a bit (2 dB) quieter than the ⅛-inch inputs.

The balanced ¼-inch inputs clip when confronted with +4 dBu line levels. Even a –10 dBV signal from a CD recorder or cassette deck can push the MicroTrack into the red. However, if you can keep signal levels within the unit's operating range, you will get fine-sounding tracks. We made some clean live rock-band recordings using a Shure VP88 microphone plugged into the ¼-inch inputs, and we got excellent results recording a loud jazz combo and a choral group in a lively hall using a Røde NT4 (which can run on an internal 9V battery) patched into the minijack mic input.

The MicroTrack's level meters do not indicate a decibel scale, but our tests determined that each of the ten major tick marks represents about 4 dB, with the last tick measuring –39 dBfs. The unit's green signal-present LEDs pop on at –40 dBfs; the red clipping LEDs illuminate at about –1 dB before digital clipping. Unfortunately, the metering feels a little slow when recording and erratic on playback; a sine wave with identical levels in both channels showed the left channel bouncing from 2 to 4 dB higher than the right. In general, my MicroTrack recordings ended up with somewhat low overall levels, due to my uncertainty as to exactly what the metering was trying to tell me.

Happily, the MicroTrack appears to be digitally transparent. Recording from the S/PDIF input, we tested for dropped samples and found none. Next, a sample-for-sample comparison of a 16-bit, 44.1 kHz audio recording revealed no change in sample values. The unfortunate limitation is that you cannot monitor audio while recording from the digital

PRODUCT SUMMARY

M-AUDIO MicroTrack 24/96

portable 2-track recorder
$499.95

FEATURES	4
EASE OF USE	3
AUDIO QUALITY	3
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Very portable. Records high-resolution audio. Analog and digital inputs. Attractive price.

CONS: Easy to overload analog inputs. User interface is occasionally awkward.

MANUFACTURER
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input. This significantly compromises the utility of the recorder as a storage device for an external A/D converter.

In the Field

Cool sounds often happen with little advance notice, and fortunately the MicroTrack is pretty quick on the draw. Once powered up, it takes only a second to start a recording and about five seconds to close the recorded file before you can record new audio.

Each new recording creates a new file. File names are numbered sequentially, starting with file0001.wav (or file0001.mp3). The WAV format limits the maximum size of an audio file to 2 GB. When you reach this limit, the latest MicroTrack firmware is able to switch to a new file automatically, with only a brief interruption in the recording.

My favorite thing about the MicroTrack is that now I can have a decent audio recorder on my person at all times. For example, while running an errand, in the distance I heard a very loud, rapid metallic pounding sound. I had been right in the middle of a sound-design project in which we were simulating the sound of a diesel locomotive engine throwing a rod. Although we were almost done, we were still looking for something more. Three blocks away, I found the source of the sound: a jackhammer so big it was mounted on a mobile crane. The behemoth was busy busting open a huge concrete slab. I whipped out the MicroTrack and captured what turned out to be a key sound element in the final project.

The MicroTrack is equally useful as a musician's notepad. The last three songs I wrote all started out as MicroTrack recordings. Over the course of this review, the recorder served me well as a second deck on assignments for the public radio program *Weekend America*, and it was used to record numerous production rehearsals and concerts. With the right mic in the right position, the MicroTrack delivered fine recordings.

Get Rev'd

Up until M-Audio released firmware revision 1.4.0, the MicroTrack had a couple of deadly bugs. One occasionally caused the loss of the current recording; the other prevented new recordings from being made until you reformatted your CompactFlash card. However, these serious bugs appear to have been fixed. If you're using a MicroTrack with an earlier firmware version, we urge you to upgrade. The process is simple, and the upgrade is free.

Other details we hope will be improved in firmware upgrades include a new screen layout so that the record-level graphic indicators do not obscure the peak-level graphics, and a graphics display that is easier to read—a big uppercase RECORD message that can be seen without squinting would be great. Adding the ability to drop markers while recording would make it easy to find specific events in a long recording as well as ease navigation, since the fast-forward and rewind controls are difficult to manage.

In the Pocket

Overall, the MicroTrack 24/96 is a capable semipro recorder. It has become a regular part of my toolkit, accompanying me as a second deck on all of my field-recording gigs this year. Although I wouldn't recommend it as a primary deck for a professional sound recordist, it is an appropriate choice for musicians who want to record rehearsals and song ideas, as well as artists who want to have a digital recorder that they can carry around in their pocket. With the latest firmware installed, the MicroTrack is certainly worth its modest price.

Rudy Trubitt and Bruce Koball record music and rail locomotives in the San Francisco Bay Area. Contact them at www.trubitt.com.

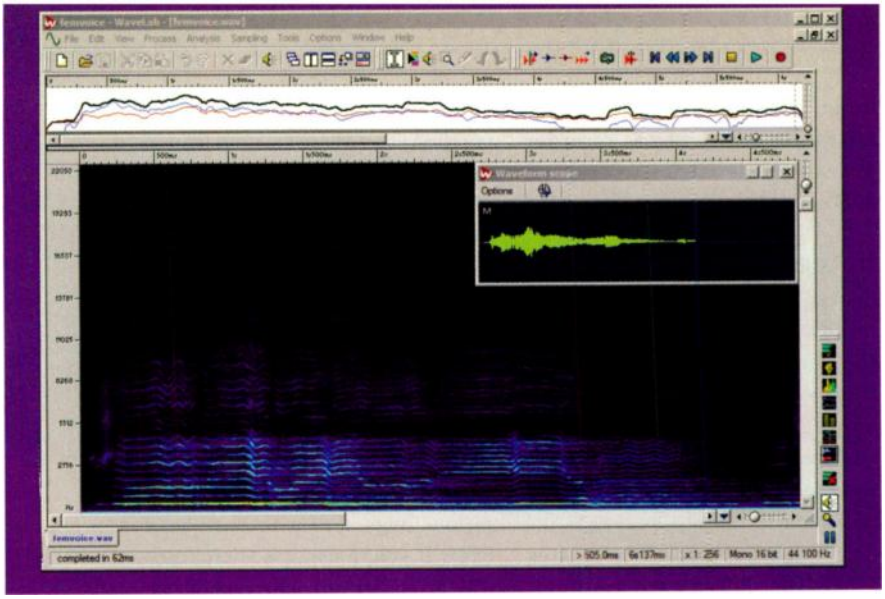


FIG. 1: WaveLab 6's Wave window has several new display modes. Here you can see the new Loudness Envelope at the top of the screen and the new Spectrum Editor at the bottom. The new Waveform Scope, also available in the Audio Montage area, appears in the upper right corner.

STEINBERG WaveLab 6.0b (Win)

An extensive upgrade gives more power to your desktop.

By Dennis Miller

WaveLab 6.0b is the latest version of Steinberg's high-end multitrack audio-editing software. As in the past, the developer has added a huge number of new features to an already mature program. Among the main enhancements are MIDI-based triggering and scrubbing of audio files, a powerful new spectral editor, new filter types and filter-processing options, and updated analysis and metering features. Other enhancements, though more pedestrian, are aimed at work-flow management and can help in nearly any project.

EM has covered WaveLab in the past (see the December 2004 issue), so after first giving a quick overview of the program, I'll focus on the features of this new version.

From the Top

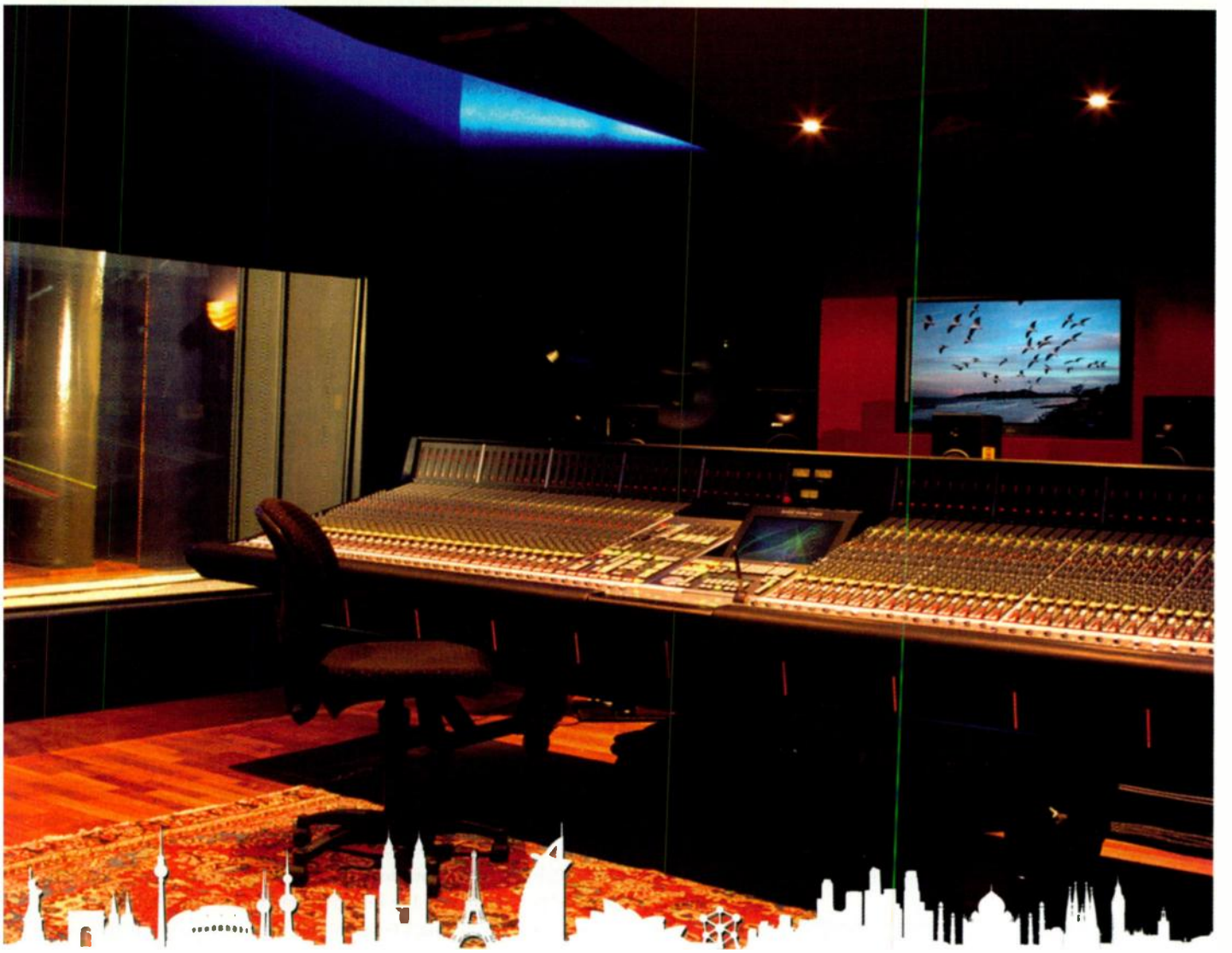
WaveLab combines a nondestructive multitrack audio editor called the Audio Montage with a dedicated stereo audio work area. The program supports a vast number of file formats for import and export and can display individual frames of a video file on its dedicated video track. WaveLab provides robust tools for DVD-Audio and CD creation as well as sophisticated surround editing and mixing and has many navigation and display options. (Its customizable 3-D "waterfall" spectral view is still my favorite.) It also offers extensive database features, such as the ability to identify all media files on your system and organize them according to categories you determine.

I tested WaveLab 6 on a 3.02 GHz Pentium 4 computer with Windows XP SP1 and 2 GB of RAM, and on a 2.8 GHz Pentium 4 laptop with the same operating system and 1 GB of RAM. As before, installation is off a single CD-ROM, but for the first time, WaveLab requires a hardware dongle. No online authorization is required, though registration is recommended. A quick trip to the Steinberg Web site revealed an update from the version that came on the CD-ROM.

First Look

When you first load WaveLab 6, you won't see much that's different from previous versions. The Wave window (WaveLab's stereo editor) opens to a large data area, with a file overview just above it and whatever icons and toolbars you choose to display just above that. Look closer, though, and you'll notice a new icon that lets you toggle between a standard waveform display, the new Spectrum Editor view, and the new Loudness Envelope window (see Fig. 1). There are a variety of display options for each of these windows, and like elsewhere, you can save presets that customize the display to your liking.

The options in the Loudness Envelope display, for



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example, allow you to show loudness levels in only the high- or the low-frequency ranges or in an isolated band of frequencies. You can also set the time resolution and the tracking rate for the envelopes. The file overview and the Wave window can display different views at the same time.

WaveLab's Audio Montage remains much the same, though there are some new features designed to make repetitive tasks less time-consuming. For starters, it's easier to adjust fades and lengths for multiple clips simultaneously. Hold down the Alt key when making a change to any clip, and all the other selected clips will receive the same edit. You can also render multiple individual regions to new files at the same time. If you didn't name the regions when you first created them, WaveLab can batch-rename them using a new feature dedicated to that purpose.

The Wave window has added several Processes, including a Pan Normalizer, a Level envelope, a Pitch quantizer, and a 3-band EQ with Q control. The Pan Normalizer analyzes the levels of each channel in a stereo file and will boost the softer of the two to match the gain of the louder, thus removing any panning. The other processes work as advertised, though the Loudness Normalizer is notable for its large number of parameters, including one called "Compensate for ear's frequency sensitivity" that I haven't seen before.

Unlike some other multitrack editors, WaveLab still can't mix files of different sampling rates in the same project. But the Batch Process tool is a great time-saver, especially if you need to change the rates of multiple files at once. Be sure to use the new Crystal Resampler plug-in to get the best possible results.

WaveLab's extensive recording options have not been enhanced, and the only significant new playback feature is the ability to slave to ASIO positioning protocol, which provides sample-accurate sync, for example, with an ADAT device.

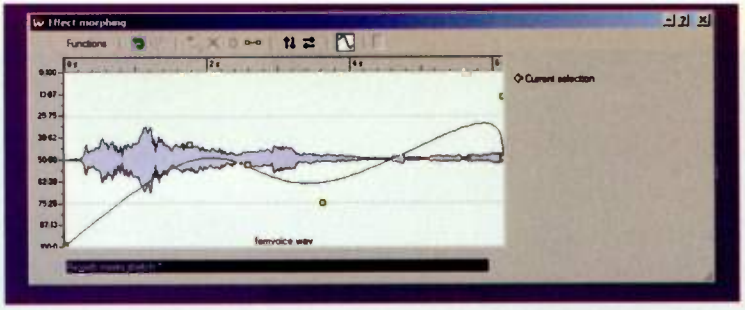

FIG. 2: The Effect Morphing feature lets you crossfade between two processed versions or one processed and one unprocessed version of a file.

Where the Action Is

The real action in WaveLab 6 is in the editing and processing areas. Among the many new editing features is the Spectrum Editor, which is intended primarily for audio restoration but also has great potential for creative sound design. You can use the editor to cut, copy, or paste any range of frequencies over any amount of time. Using the highest vertical and horizontal zoom levels, you can perform surgically precise edits on individual components of your sound. You can also highlight a range from within the sonogram display and send only that range to the Master Section for processing. That means you can add reverb to only the lower partials in a vocal track or process just the high frequencies of a cymbal sample with a bit of delay (see **Web Clips 1 and 2**).

I was disappointed to see the Pencil editing tool grayed out when I accessed the Spectrum Editor window. It would have been great to be able to draw directly on the display and have WaveLab resynthesize the file according to my modifications. I would also like to have seen more selection options—for instance, the ability to select just odd or even partials.

The new Dirac time-stretching and pitch-shifting algorithms, developed by Stefan Bernsee of Prosoniq fame, are big improvements over their predecessors. Stretching a 6-second file with the new algorithm took 30 seconds on my laptop but resulted in virtually no artifacts. The old stretch method finished nearly instantaneously, but the resulting file had considerable artifacts (see **Web Clip 3**).

WaveLab 6 has a new Effect Morphing feature that lets you crossfade between a processed and unprocessed or two different processed versions of a file (see **Fig. 2**). The feature takes a little getting used to (you must first copy one of the processed versions to the Clipboard, for example) but ultimately produces the expected results.

Speaking of effects, if you use hardware effects devices in your studio, you'll appreciate the External Gear plug-in. This plug-in, which you can use anywhere in the processing chain, is designed to route audio out of the program to external hardware for processing, then directly back in for rendering. It's more flexible than an audio interface that might have a similar option but that works only at the final output stage. And if you happen to have a lot of plug-ins, you'll like the Plug-ins tab that appears in the Audio Montage. This tab provides access to the plug-ins (VST only) on your system and allows you to create complex effects

PRODUCT SUMMARY

STEINBERG WaveLab 6.0b

multitrack audio editor
$699
competitive upgrade, $399

FEATURES	4
EASE OF USE	4
DOCUMENTATION	5
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Huge feature set. High-end spectral-editing options. Numerous file formats supported. Excellent documentation.

CONS: No support for playback of MIDI data. No multitrack mixer. Can't mix files of different sampling rates in the same project.

MANUFACTURER
Steinberg
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chains that can be saved for use on other projects (see Fig. 3).

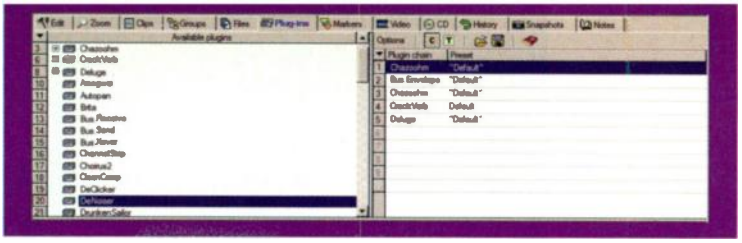

FIG. 3: WaveLab's Plug-ins tab is where you can create extensive VST effects-plug-in chains.

New Views

WaveLab has always had numerous metering options, but version 6 adds yet another. This time we get the Waveform Scope, which shows you a real-time update of a sound wave as it is being rendered, complete with all effects and processes. This allows you to spot exactly where a problem (clipping, for example) might lie within a file before you commit it to disk.

WaveLab 6 lets you customize more elements of the program than previous versions do, from the look of its menus and windows to added features in its Preferences menu. For example, there's a new dedicated VST window in the Preferences menu that offers additional options, such as whether WaveLab should scan for new plug-ins each time it loads. Other preferences have been consolidated, resulting in a smaller number of Preference windows overall. WaveLab has also assumed some functions that you'd normally perform from Windows itself, such as setting file associations and copying data to the Clipboard for use in other programs.

I've used WaveLab for many projects, including producing audio for video, composing computer music, cueing sound effects live in a theatrical setting, and mixing dozens of audio tracks. I've always found it to be the fastest environment for composing and mixing. Though some of the new features aren't as well integrated as they might be, which is inevitable with such a feature-rich and mature program, others are tightly integrated and feel as though they were there from the start.

WaveLab 6 has so many features, you might occasionally feel overwhelmed, and a good set of video tutorials would be a welcome addition. But the printed manual that comes with the program provides an excellent overview and makes for good reading. If you need a high-end multitrack editor that can manage nearly all your media needs, give WaveLab a try.

EM WEB CLIPS

Associate Editor Dennis Miller composes music and images. His works can be found at www.dennismiller.neu.edu.

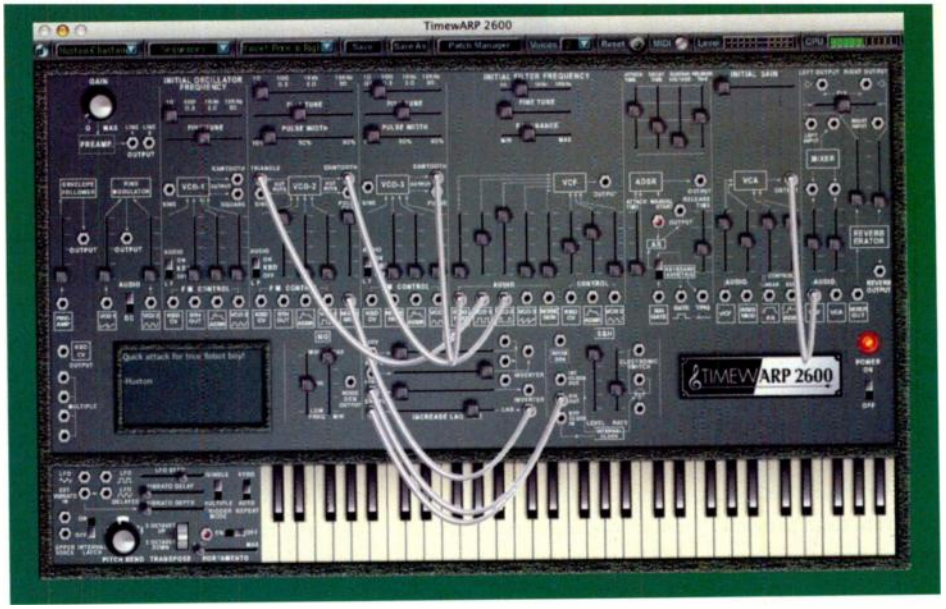

FIG. 1: TimewARP 2600's main screen looks just like an ARP 2600, with the addition of the comments field in the lower left and the control bar along the top. The left side of the control bar accesses presets, and the right side has configuration and status functions.

WAY OUT WARE TimewARP 2600 1.15 (Mac/Win)

The joys of an analog classic in digital form.

By Larry the O

The ARP 2600 has been one of the most revered synthesizers in electronic music since its introduction in 1971, a scant few months after the Minimoog's debut. With all the physicality of moving sliders and the ability to use patch cords, the 2600 was a delight. Nonetheless, it went the way of all analog synths, replaced by newer keyboard synths or, more recently, soft synths running on a computer. Still, over the years, the 2600's legend has lived on.

A Soft Alternative

Way Out Ware (WOW) TimewARP 2600 1.15 takes on the legacy of the ARP 2600, attempting to capture its sound and flexibility and fuse it with programmability, MIDI, and polyphony to make something that could be seen as better than the original. And, by gum, it is.

TimewARP replicates the original 2600 in absolutely every sense (see Fig. 1). It's a good-enough knockoff to earn the endorsement of Alan R. Pearlman (ARP), who created the 2600. (The features of the original are well documented, so I won't spend time on them in this review.)

TimewARP can run under Mac OS X or Windows XP and is available in RTAS, AU, and VST plug-in formats. It can also run as a standalone instrument. After installation, two versions of the software show up; the one intended to be used as a plug-in on an audio track has *efx* appended to its name.

WOW's Jim Heintz emphasizes that TimewARP is fully optimized for Digidesign Pro Tools 7, though it runs just as well under any supported host. In all cases it runs native, so it is capable of putting a hit on your CPU, especially if you play more than one voice.

WOW did its best to capture all the features and nuances of the original, but it also took advantage of the additional capabilities emulation offers. That translates into polyphony: up to eight voices from a single instance of TimewARP. My now-doddering 800 MHz Power Mac G4 running OS X 10.3.9 could barely handle more than one voice at a time, but I would expect a G5 to be perfectly happy cranking out multiple voices, and a quad-core machine probably rocks with TimewARP.

Patch It Up

Patching between "jacks" is accomplished by clicking-and-dragging from one jack to the next; a little virtual patch cord appears to make the connection. One advantage of the virtual world is that running out of patch cables is not a problem with TimewARP.

But though it may seem cute to have little swinging

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virtual cables, this cuteness comes at the expense of functionality—they obscure panel features and legends just as annoyingly as physical cables do. If there are more than a few cables, as is the case on most presets, you can't differentiate between them when they cross or even when they're just very close. That makes it hard to see what connections are being made. After all, one of the wonderful things about the 2600 was that the normaled signal path eliminated the need for many cables.

FIG. 3: Unlike the original 2600, TimewARP 2600 can save presets. Presets are grouped into folders and are accessed from the Patch Manager, shown here.

A lot of front-panel emulations are equally dumb, as rotary pots make elegant physical controllers but awkward virtual ones. However, in the case of TimewARP, the front-panel emulation might be justified for two reasons (even if the cables are not). First, the physical layout of the 2600's front panel and its graphics were key to the usability of the machine. Second, all of the controls except the preamp gain were sliders, which translate better to the virtual world than rotary pots.

MIDI Machine

Flexible patching is just the start, however, as you can map all controls to MIDI continuous controllers as well as to Velocity, Aftertouch, and Mod Wheel (see **Fig. 2**). Each mapping has its own range setting, polarity switch, and a choice of three sensitivity (scaling) curves. Of course, TimewARP can also be played from a MIDI keyboard or other instrument controller.

It's good that assigning MIDI controls is so easy, because it's the only way for TimewARP to catch up to the original in terms of tactile control. Without physical controls to move, it's not really possible to extract the same level of gesture that can be done with something you actually touch. To get out of TimewARP what you could get out of the 2600, you should have a control surface with a bunch of sliders and take the time to do the mappings. Once you do, the map is stored independently of individual patches, so it remains in effect globally. Though not quite as good as being able to reach into the graphic on the front panel, grab a slider, and move it, mapping sliders is an adequate method of gaining expressive control over TimewARP.

When TimewARP is inserted in an audio track, its internal clock and/or keyboard LFO can be synced to MIDI Beat Clock from the host. The Beat Clock sync rate can be defined in terms of 2600-LFO transitions per beat-clock division; fooling around with this setting to obtain different subdivision relationships leads to all sorts of rhythmic fun.

FIG. 2: TimewARP 2600 responds to a wide range of MIDI continuous controllers. Most parameters have a dialog box such as the one shown here to set up MIDI control.

Presets and Preamp

The 2600 predated programmable presets. WOW, on the other hand, revels in them. TimewARP comes with collections of presets from several composers and sound designers, such as legendary electronic musician (and EM author) Robert Rich, in addition to the factory collection (see **Web Clips 1 through 3**). I found the presets to be a great mix of keyboard synth sounds suitable for bass, lead, or rhythm parts (using multiple voices); classic synthesizer-effect sounds; and examples of just plain twisted sonic imagination. The presets are organized into more or less consistently named folders, which makes for their efficient use.

You access presets through the Patch Manager, whose controls are located in a control bar above the main panel (see **Fig. 3**). The control bar also contains a drop-down menu for choosing the number of voices, a reset button, a MIDI data indicator, a level meter, and a CPU usage meter. In general, I found the level meter pretty accurate and the CPU meter less so. The latter

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told me I was in dandy shape running two or even three voices (depending on the patch), though the audio I heard told a decidedly different story.

The 2600 had a preamp that let you process external signals, and TimewARP does likewise (in stereo) using the first two inputs from your audio interface. The *efx* version of TimewARP also can be inserted on an audio track in a DAW as a processor. This lets you take voice, guitars, drums, tire screeches, or any other recorded source and process it with TimewARP's filter, ring modulator, envelope follower, or other modules (see **Web Clips 4 and 5**).

In Use

I tried TimewARP as a standalone instrument and as a plug-in under BIAS Peak 5 and MOTU Digital Performer 4.61. Once I resolved a small installation hiccup, it behaved nicely in all environments and never crashed. I played it from the onscreen keyboard and from an Alternate Mode malletKAT MIDI mallet controller (that was fun!).

It did reveal one interesting oddity, however. Though the 2600 had no sustain pedal, the malletKAT does, as do many electronic keyboards. I feel sure that there's a way to patch a pedal into TimewARP to produce sustain, but I was not able to find it.

There's very little I've heard in the way of modeling, aside from my Pod Pro and Universal Audio plug-ins, that I really, really like the sound of enough to use if I have other choices. But TimewARP has just joined that exclusive club, not simply because it behaves exactly like a 2600, but because it lacks graininess in the sound, it responds well to dynamic changes and slider movements, and it captures that familiar "analog" sound. Even the onboard reverb sounds good. (Interestingly, I had forgotten how nice the spring reverb in the original 2600 sounded.)

I put TimewARP up against my real ARP 2600, and guess what? TimewARP sounds better. Of course, that's part of the point here: my ARP has 25 or 30 years of

PRODUCT SUMMARY

WAY OUT WARE — TimewARP 2600 1.15

software synthesizer

$249

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

RATING PRODUCTS FROM 1 TO 5

PROS: Sounds like the original. Excellent use of polyphony, MIDI control, and presets. Usable as a synth or a processor.

CONS: Substantial CPU hit. No overload indicator for preamp. Presets have very hot levels.

MANUFACTURER
Way Out Ware
www.wayoutware.com

wear on it, and I couldn't tell you the last time it was calibrated. TimewARP, on the other hand, sounds now and for always like a brand-new 2600. And from that standpoint, yes, it really does sound like the real thing. (See **Web Clip 6** for a comparison between a TimewARP preset and the same sound on the original 2600.)

WOW rightfully emphasizes the importance of the filter sound needed in any emulation of analog synthesis, and the company is justified in claiming that it nailed the 2600 filter. It sounds like a million bucks, even though it costs only a few hundred.

Keeping It Real

Functionally, I really couldn't find anything that TimewARP did differently than the original, even when trying fancy things like audio frequency modulation and patching the same control signal to multiple control inputs on the same module to get more effect. The 2600 struck a balance between getting quick sounds using normaled connections and getting wild sounds with patching, and I found that TimewARP duplicates that balance nicely.

I do have a few quibbles. Most of the patches were extremely hot in level, forcing me to lower the output pots drastically on pretty much every preset to avoid clipping. (WOW says it is working on the problem.) I also experienced some latency playing TimewARP from the malletKAT as compared to playing an E-mu Proteus 2000 (set to an ARP patch, just for fun).

One thing I realized while using TimewARP in Digital Performer was that when working at high sampling rates (TimewARP works at up to 192 kHz), I had to tweak the buffer sizes very carefully: there's a trade-off between using larger buffers for optimal recording and smaller buffers for minimal latency when playing. It would also be nice to have a few default MIDI mappings, at least Pitch Bend, in the presets, and I'd love to have an overload LED for the preamp, even if there wasn't one on the 2600.

In the end, there are a few simple questions that sum up TimewARP's story: does it work like the original? Answer: yes. Does it sound like the original? Answer: yes again. Does it sound good? Answer: very yes. Is it fun to use? Answer: still yes. Is TimewARP 2600 something a synthesizer fan would be delighted to have for his or her software-synthesis environment? Answer: enthusiastically yes! EM WEB CLIPS

Larry the O has been an electronic musician since the ARP 2600 was current, and a contributor to Electronic Musician *since it became current.*

FIG. 1: The PM5 features a biamplified design and a magnetically shielded, ported cabinet with a small footprint.

E-MU PM5 Precision Monitor

Another entrant in the affordable active-monitor market.

By Michael Cooper

The market for active close-field monitors in the under-$700 price range has become increasingly competitive over the last year and a half, with well over a dozen new models introduced. Virtually all of them have a footprint small enough for placement on a console's meter bridge or on the shelves of workstation furniture.

Most also feature a tuned bass port designed to extend bass-frequency response to a depth that allows the monitors to deliver nearly full-bandwidth output. In my experience, however, this gain in bass extension often results in a flabby bottom end and murky upper-bass and low-midrange frequency response. Such problems become exacerbated when the monitors are placed on shelves instead of on dedicated monitor stands. Because the E-mu PM5 Precision Monitor follows this current design trend, I was interested in seeing if it could avoid these pitfalls and deliver the sonic accuracy necessary in a studio monitor.

> When I moved the PM5s off the shelves, the spectral balance improved dramatically.

Inside and Out

Weighing 14.3 pounds and measuring just under 12 inches tall and 10 inches deep, the magnetically shielded PM5 is small and lightweight enough to be placed just about anywhere (see **Fig. 1**). It has an attractive-looking black MDF (medium-density fiberboard) cabinet.

The PM5's 1-inch-thick front baffle is home to a 1-inch-diameter neodymium soft-dome tweeter and a 5-inch glass-fiber-cone woofer. Each driver is powered by its own 40W amplifier. Both are custom discrete amps with Class A input stages and MOSFET output stages. A front-firing, slot-shaped bass port and LED status indicator join the PM5's drivers on the front of the monitor. The dual-mode LED lights up blue when power is applied to the PM5; it turns red when the internal overload-protection circuitry kicks in.

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Below the monitor's sizable heat sink on the rear of the cabinet (see Fig. 2), you'll find two separate inputs: a balanced XLR/TRS combo jack (latching for XLRs, thank you) and an unbalanced RCA jack (both analog). A 2-way switch lets you select between them. Only one of these jacks can be active at a time on a single PM5. A continuously variable, rotary input-sensitivity control—with a 12 o'clock detent—offers a 21 dB range to accommodate a wide variety of input levels and to allow fine-tuning of the relative volume of each speaker in a stereo or surround setup.

A 3-way switch on the PM5's rear panel adjusts the monitor's low-frequency response using bass-rolloff filters with progressively higher corner frequencies on alternate switch settings. The first of these settings uses a steep highpass filter (HPF) with a 67 Hz corner frequency to achieve the monitor's stated bass-frequency response.

The second setting uses a combination HPF and low-shelving filter with a corner frequency of 150 Hz, resulting in 3 dB of attenuation at 67 Hz and a sharp drop-off in response for lower frequencies. The third setting uses a combination HPF and low-shelving filter with a corner frequency of 200 Hz to cause a 5 dB cut at 67 Hz and a steep drop-off below that point.

A second 3-way switch, labeled Treble Tilt, tailors the monitor's high-frequency response. The first Treble Tilt setting selects an unfiltered response out to 20 kHz. The second position kicks in a high-shelving filter with a 3 kHz corner frequency to culminate in a 2 dB cut at 20 kHz. The third switch setting uses a high-shelving filter with a corner frequency of 10 kHz, resulting in a 4 dB attenuation at 20 kHz.

FIG. 2: Below the PM5's rear-panel heat sink are XLR/TRS combo and RCA analog-input jacks, an input-sensitivity control, and separate switches for tailoring low- and high-frequency response.

The product literature suggests that both shelving filters begin rolling off highs at around 1 kHz, which is unusually low for monitor equalization. I would

PM5 PRECISION MONITOR SPECIFICATIONS

Inputs	(1) balanced ¼" XLR/TRS combo; (1) unbalanced RCA
Drivers	1" neodymium soft-dome tweeter; 5" glass-fiber-cone woofer
Amplifiers (×2, one for each driver)	power: 40W RMS into 4Ω; signal-to-noise ratio (at full output): >98 dB; THD: <0.2%
Crossover Frequency	2.5 kHz (active, second-order Butterworth)
Enclosure Type	magnetically shielded, ported cabinet
Input-Sensitivity Control	continuously variable knob, –21 dB–0 dB
Maximum SPL, Short-Term	single PM5: at least 100 dB SPL @ 1m; pair: at least 103 dB SPL @ 1m
Frequency Response	67 Hz–20 kHz ±2.5 dB
Treble Tilt Filter	setting 0: unfiltered response; setting 1: 3 kHz corner frequency, –2 dB at 20 kHz; setting 2: 10 kHz corner frequency, –4 dB at 20 kHz
Bass-Rolloff Filter	setting 0 (HPF only): 67 Hz corner frequency, ±2.5 dB at 67 Hz; setting 1: 150 Hz corner frequency, –3 dB at 67 Hz; setting 2: 200 Hz corner frequency, –5 dB at 67 Hz
Dimensions	6.9" (W) × 11.5" (H) × 9.7" (D)
Weight	14.3 lbs.

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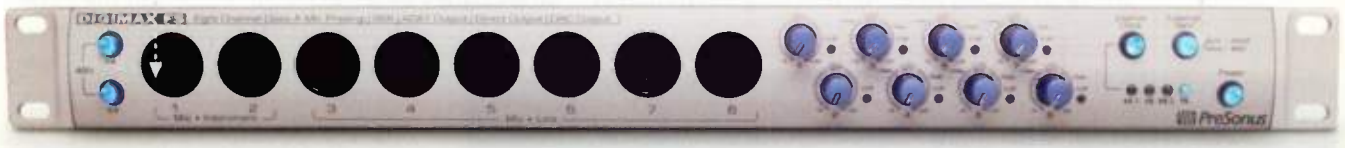

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like to have seen a high-frequency boost control for the PM5 for use in heavily damped (for example, carpeted) control rooms. A power switch and IEC power connector—the latter for an included, detachable AC cord measuring roughly eight feet in length—round out the PM5's rear panel.

In Place

For my first test of the PM5, I set up a pair on the monitor shelves of my Omnirax Mixstation 02R (console furniture) with acoustic-foam Auralex MoPads placed as decouplers. My listening environment includes an ASC Attack Wall, a contiguous arrangement of modular tube traps that wrap around the rear of my Mixstation 02R to tighten up the impulse response and imaging.

I immediately appreciated the excellent grip of the PM5's combo jack when I plugged in a TRS cable. Adjusting the PM5s' trim controls, I noticed they didn't attenuate to –∞ (silence) when adjusted fully counterclockwise, but the range was nevertheless suitably wide to accommodate any imaginable input levels.

I listened to a variety of country and pop tracks—including my own completed mixes—on the PM5s with all filters set to provide the flattest and most extended frequency response. My initial impression was that the monitors provided a warm, easy-on-the-ears sound with decent bass extension.

I also quickly noticed that the low-midrange and upper-bass bands sounded a bit muddy, and that the imaging, transient response, and depth (the sense of sound extending behind the speakers) were unimpressive. That is, the placement of individual instruments and vocals in the stereo field sounded a little imprecise. Percussive elements seemed a bit rounded off, and the overall sound tended toward two-dimensionality.

These types of flaws are often caused or exacerbated by resonances in furniture

PRODUCT SUMMARY

E-MU PM5 Precision Monitor

active close-field monitor
$349.99 each

AUDIO QUALITY	2
VALUE	2

RATING PRODUCTS FROM 1 TO 5

PROS: Biamplified drivers. Magnetically shielded cabinet. Accepts three types of input connectors. Wide-ranging sensitivity control. Onboard filters. Small footprint.

CONS: Requires stringent decoupling to sound good. Somewhat pricey given its performance. Treble Tilt filter doesn't offer boost setting.

MANUFACTURER
E-mu
www.emu.com

shelving that monitors are placed on, but in this case the problems were worse than what I've generally heard when auditioning other close-field monitors placed the same way. I also heard a slight dip in response around the 2.5 kHz active-crossover frequency. This made picked acoustic guitars, for example, sound a bit thin and brittle, and it moved fiddle tracks into the background. Although the overall sound was warm, the top-octave response lacked air and sounded closed in. For that reason, I couldn't imagine ever using the PM5's Treble Tilt switch to attenuate high frequencies further.

When I engaged the PM5s' highest bass-rolloff settings, the monitors' clarity, imaging, and transient response all improved significantly. Even so, the upper-bass and low-midrange bands still sounded a little muddy, and imaging and transient response were still disappointing. With the PM5s placed on the shelves of my console furniture, they sounded best with their highest bass-rolloff settings and their unfiltered Treble Tilt settings. I especially liked how they sounded when used in tandem with my Tannoy PS-88 subwoofer (a discontinued model).

When I moved the PM5s off the Omnirax shelves and onto ASC Monitor Traps (16-inch-diameter cylindrical monitor stands) and set all the filters to provide their flattest response, the PM5s' spectral balance improved dramatically. The decoupling that the stands provided allowed me to set the bass-rolloff switch to its flat setting without the exaggerated upper-bass response that I heard when the monitors were placed on the shelves. However, the bass still sounded a little flabby. Imaging and transient response were good but not great.

The Verdict

I found that the PM5s sounded best when placed on monitor stands and didn't work well when they sat on console furniture. Like most other close-field monitors on the market (and all that I've heard in this price range), they also require an added subwoofer if you want to hear the bottom two octaves of your mix in proper perspective. (E-mu recently announced the PS12, a subwoofer designed to work with the PM5s. It should be available by the time you read this.)

Overall, the PM5 is a fairly good performer when placed optimally. However, it's sure to face stiff competition in the increasingly competitive and crowded powered-monitor market.

Michael Cooper offers out-of-area clients flat-fee mixing and mastering services via Fed Ex delivery. He can be reached at coopermb@bendbroadband.com.

FIG. 1: Control panel B houses the settings for the elements of the physical model.

APPLIED ACOUSTICS SYSTEMS String Studio VS-1 1.0.1 (Mac/Win)

A physically modeled virtual instrument for strings.

By Len Sasso

Physical modeling of acoustic instruments has finally reached the desktop and even the laptop, now that personal computers can handle the required calculations in real time. Applied Acoustics Systems, a leader in physical modeling with its Tassman modular system and Lounge Lizard EP-3 electric piano, has added String Studio VS-1 1.0.1, the winner of EM's 2006 Editors' Choice Award for software synthesizers, to the mix.

String Studio is a virtual instrument that turns your description of a stringed instrument into the equations governing the creation of sound. You decide what sets the string vibrating (pick, hammer, bow), which string characteristics you want to hear (inharmonicity, high-frequency damping, decay), and what instrument body type to use (piano, guitar, or violin, for example). String Studio does the rest.

String Studio comes as a standalone and a plug-in instrument for Mac OS X and Windows. It comes in VST format for both platforms, DXi for Windows, and AU and RTAS for OS X. Challenge-and-response authorization can be carried out online on any computer or by phone.

What's All the Excitement?

Two panels make up the String Studio GUI. Panel A houses performance and global controls such as keyboard settings, the arpeggiator, and the multi-effects chain. Panel B is where you define a stringed instrument's characteristics.

Panel B hosts six modules: Excitator, String, Damper, Termination, Filter, and Body. The Filter, which has a dedicated LFO and an ADSR envelope generator, falls outside of strict physical modeling but adds great variety to the sounds String Studio can produce. Panel B houses a 3-band EQ, a distortion effect, and controls for setting the location of the damper and the excitator relative to the string. The modules are encircled in gray with the ancillary controls close by (see Fig. 1).

The Excitator module determines how the string is set in motion; you choose the type and position of the excitator. The types are plectrum (of which a pick is an example), bow, and hammer (striking the string from above or below). Hammers striking from above can bounce on the string.

Three black knobs below the selection menu control the excitator's characteristics. Gray knobs below the black knobs set modulation amounts for key (MIDI

Note Number) and Velocity. The Damp knob at the bottom, which is active only for the plectrum and hammer excitators, varies the damping of the string caused by the impact of the excitator. For example, hard hammers cause less damping than soft ones.

The Geometry settings, above the Excitator module, determine the position of the excitator and the damper. You can specify the position in absolute distance or as a fraction of the string length, and you can modulate position by key and Velocity.

The Pickup knob, below the Excitator module, sets the position of a magnetic pickup relative to the string. Unlike with real electric stringed instruments, the pickup's output can pass through the Filter and Body modules to create a kind of hybrid electric-acoustic instrument. With the Filter and Body modules turned off, the pickup acts as it normally would; with those modules turned on and the Pickup module turned off, the instrument is purely acoustic.

The String's the Thing

The String, Damper, and Termination modules make up the physical model of the string. The String module covers high-frequency damping, overall decay, and inharmonicity of the string. You can modulate high-frequency damping and decay by key. You can also set the ratio between decay and release time, which is a quick way to achieve damping without using the Damper module.

The Damper module controls the damping of the string's vibrations. That's achieved with dampers on a keyboard instrument and with the performer's fingers on other stringed instruments. You have control of the mass and stiffness of the damper, the velocity with which it leaves and returns to the string, and its absorbency. The Gated button controls whether the damper is raised from the string when a key is pressed. Stiff, ungated dampers can bounce on the strings, as can falling hammers.

Termination is the last module in the string triumvirate. It controls the mass of the finger and the stiffness of the finger or fret for instruments that control pitch by terminating the string on a fingerboard.

PRODUCT SUMMARY

APPLIED ACOUSTICS SYSTEMS String Studio VS-1 1.0.1

software synthesizer
$249

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

RATING PRODUCTS FROM 1 TO 5

PROS: Convincing string emulations. Broad palette of sounds extends far beyond strings. Control panel clearly laid out. Excellent manual.

CONS: Buttons are hard to hit. Can't save arpeggiator rhythm patterns.

MANUFACTURER
Applied Acoustics Systems
www.applied-acoustics.com

FIG. 2: Control panel A contains the effects controls (top) and controller settings (bottom).

Out-of-Body Experience

The body of an acoustic stringed instrument acts as an amplifier as well as a resonant formant filter. String Studio not only models various body types, but it goes one better by offering a resonant multimode filter with envelope and LFO, a 3-band EQ, and distortion.

The filter has 2- or 4-pole lowpass, bandpass, notch, highpass, and formant modes. In formant mode, the Cutoff knob moves all the formants, thereby affecting gender, whereas the Q knob selects between vowel formants. I tried the formant filter on a variety of presets but found it very peaky and almost unusable.

The Distortion module emulates electric-guitar distortion pedals, but it's quite useful on all kinds of sounds. It can add a little roughing up or completely desecrate the sound (see **Web Clip 1**).

The 3-band EQ, which comes after the distortion effect, is very useful for tweaking the overall sound. The low and high bands are shelving filters, and the middle band is a resonant bandpass filter. Each of the EQ bands has variable frequency and can boost or cut.

Globals and Effects

String Studio's Effects section contains chorus, delay, and reverb effects in series (see **Fig. 2**). A Topology button switches the order of the chorus and delay effects; the reverb always comes last. The chorus and delay have three controls: Mix, Depth, and Rate. The reverb has Mix, Decay, and Color controls.

All three effects have a presets drop-down menu. The chorus presets cover a variety of mono and stereo chorus and flange effects as well as simulated vibrato. The delays include four types of ping-pong, along with tape, digital, slapback, and studio delay emulations. The reverb has typical room presets.

Although rudimentary, the effects are exactly those needed for the types of sounds that String Studio is designed to make. Effects settings are saved with String Studio presets, but you can lock the Effects section so that changing presets doesn't alter the effects settings.

A Clock module, which can be locked, allows String Studio's effects, LFO, and arpeggiator to sync either to an internal tempo setting or to the host's tempo when

running as a plug-in. The standalone version has an audio recorder for capturing those magical string moments.

Expressive Control

Playing string sounds with a keyboard is always a challenge, and String Studio gives you four modules to help: Vibrato, Portamento, Keyboard, and Arpeggiator. Unlike the simulated vibrato in the Chorus module, Vibrato is an LFO modulating the pitch of the string. You can set delay and fade-in times, the amount of random variation in the vibrato rate, and how much the MIDI Mod Wheel affects vibrato amount (see **Web Clip 2**).

In addition to octave and semitone transposition and tuning reference, the Keyboard module has a Stretch knob for stretching or shrinking the semitone and an Error knob to introduce random variations in pitch. Unison mode stacks two or four voices per note with adjustable detuning and delay. When the keyboard is in polyphonic mode, you can choose between low, high, and last voice-stealing priority.

String Studio's arpeggiator incorporates a rhythm-pattern generator, which can run free or be synced to tempo. Patterns have as many as 16 steps, and you can toggle individual steps off to create timing gaps in the arpeggio. The currently held chord is arpeggiated in forward, backward, or bidirectional mode (with or without repeated end points). The arpeggio can span as many as five octaves. Arpeggiator patterns are loaded and saved with presets. You can choose from eight rhythm-pattern presets, but you can't save your own.

Sound Advice

My one complaint about String Studio is that the buttons on the control panels are hard to hit and the knobs are hard to fine-tune. It's a small thing, but it can be annoying if you're doing a lot of tweaking. On the other hand, the robust MIDI Learn implementation, complete with editable and savable MIDI maps, makes up for it.

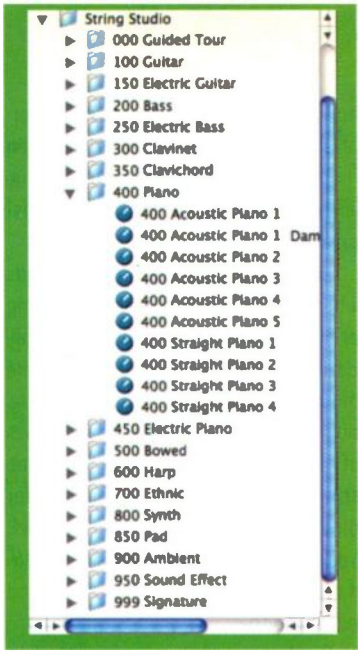


FIG. 3: The hierarchical factory preset library covers all stringed-instrument categories and then some.

The String Studio manual is extremely well written, with lots of graphs and illustrations to clarify the sometimes obscure theory behind the controls. You can download it from the Applied Acoustics Systems Web site before you buy, and it's an enlightening read. Registered String Studio users can also download banks of presets from other users and a master class on using the Damper module.

String Studio delivers a variety of convincing stringed-instrument emulations, but that's not its real charm. It offers a huge sound palette, as its generous preset library attests (see **Fig. 3**). The library is spread across 17 categories, most named after stringed instruments, but the presets in those categories range from emulations to strange instrument hybrids to unstable sounds that you won't find in nature. And it's easy to make those sounds your own, because the settings you're tweaking call up real-world images that at least hint at what the results might be. EM WEB CLIPS

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

QUICK PICKS

NUSOFTING

Modelonia 1.2 (Win)

By Len Sasso

Modelonia ($79) is the latest synth from physical-modeling expert Luigi Felici of NUSofting. It combines two physical models—plucked string and blown bore—and you can mix or cross-modulate them. Although capable of realistic acoustic-instrument emulations, this synth is intended for, and excels at, producing original timbres.

Modelonia is a VSTi plug-in for Windows. A Mac OS X version is planned for the future. You can download a save-disabled demo that occasionally emits a soft noise burst from the Modelonia Web site (www.modelonia.com). Purchase via PayPal gets you a link for downloading the full version.

Get Physical

Modelonia uses pure physical modeling to achieve its sound; there are no effects or sweepable synth-style filters in its signal path. If you're new to physical modeling, it can take a while to break old habits like reaching for the filter-envelope, distortion, or chorus controls, but Modelonia is actually quite easy to program. It comes with 128 presets, a Sound Wizard menu for bringing up 10 starting-point patches, and a quick-reference help-screen overlay for the graphical user interface. Even if you have no idea what you're doing, you can quickly generate some original presets.

The Modelonia control panel has modulator controls at the top, exciter controls in the middle, and resonator controls at the bottom.

Acoustic instruments make sounds when a resonating body such as a string or hollow pipe is stimulated by striking, bowing, blowing, and so on. Modelonia models three forms of stimulus—picking, noise, and vibrating lips—and two types of resonator—string and horn. The three stimulators reside in Modelonia's Exciter block in the middle of the control panel. You can apply the pick to the string resonator, the lips to the horn resonator, and noise to either.

The two resonators are located in the Resonator block below the Exciter block, and each has controls specific to its type. For example, there are controls for the stiffness of the string and the brightness of the horn. In keeping with real wind instruments, the horn resonator produces a sustained sound by means of feedback to the lips exciter. Unlike with real instruments, you can produce all sorts of hybrid sounds by feeding the output of the horn resonator into the string resonator and vice versa. You can even produce unstable, but often interesting, sounds by simultaneously feeding the resonators back to each other.

Next in Line

The resonators feed a basic output section consisting of EQ, reverb, tuning, and gain. The effects are intended to enhance the physical model rather than function as sophisticated multi-effects. Modelonia does not emphasize modulation, but it does have two LFOs and an ADSR envelope generator, and you can route each of those to six targets using a modulation matrix. You can also automate most Modelonia parameters using its MIDI Learn feature.

One characteristic of physically modeled sounds is that they can go out of tune at specific frequencies related to the characteristics of the resonator. The array of 72 sliders at the bottom of the Modelonia panel allows you to tune each of the 36 notes between A3 (MIDI Note Number 69) and G#6 for each resonator. The process can be tedious and is not always necessary, but an examination of the factory presets in the TUN category reveals the value of this feature.

Out of the Box

Modelonia comes with 128 factory presets ranging from natural-sounding to painful. It is especially good at ensemble sounds, which are labeled ENS in the factory bank. All of the sounds are eminently tweakable, and the manual suggests starting with the filters in the resonator sections, the EQ controls, and the handy Pluck-to-Sustain slider, which adjusts the mix of the two resonators and feeds a touch of strings into the horns.

Ten Sound Wizard templates give you a head start in creating common types of plucked, blown, and percussive sounds. The templates are contained in an XML file. You can edit that file to add your own templates if you know what you're doing, but the provided templates give you plenty to work with.

If you're tired of standard-fare synths but not quite ready to build your own physical model in a DIY application such as Reaktor or Tassman, Modelonia offers a simpler path. The factory sounds are great, they're easy to tweak, and it won't take long before you're building your own trombone-ukulele hybrid (see **Web Clip 1**).

EM WEB CLIPS

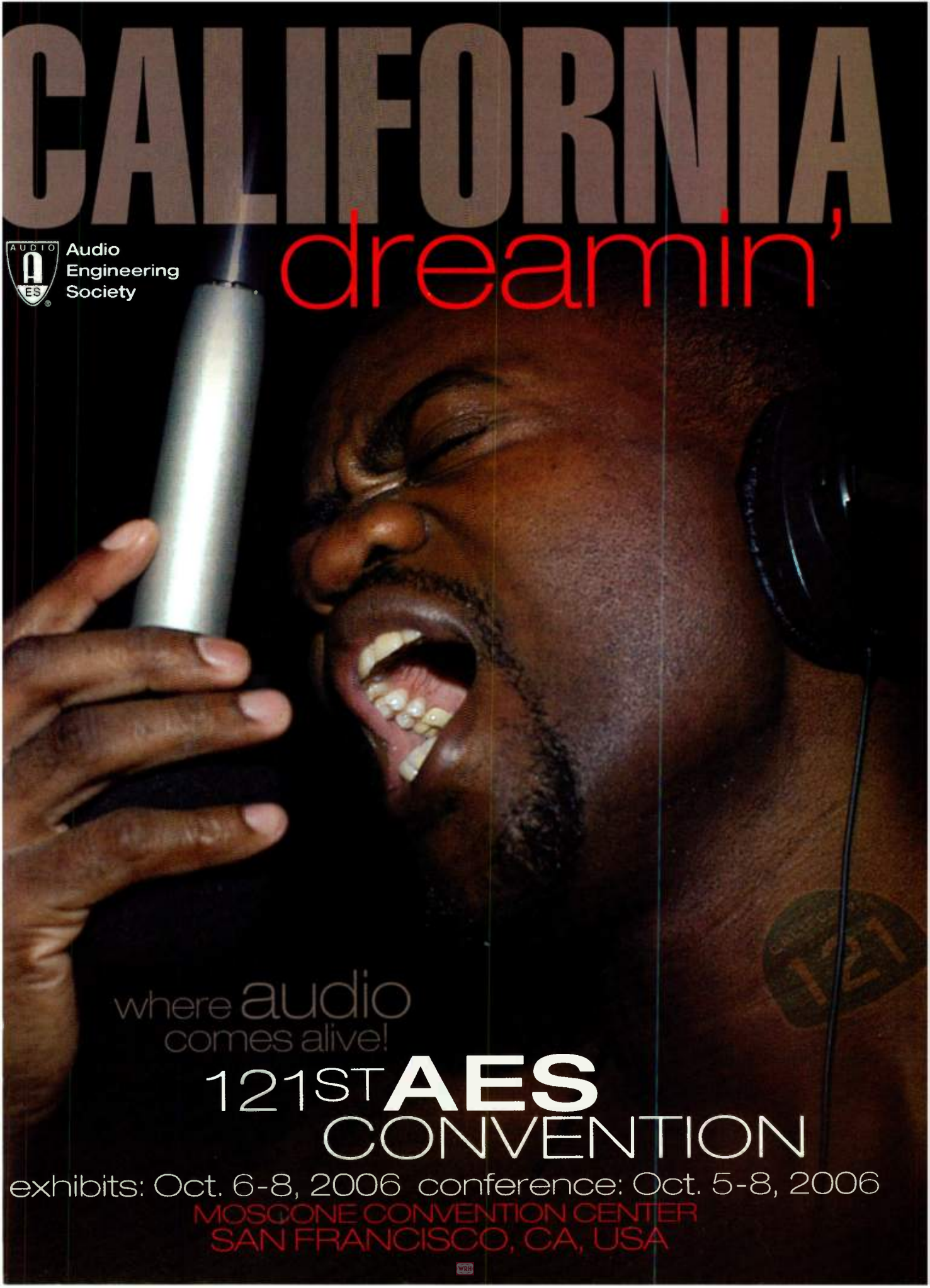
Value (1 through 5): 4
NUSofting
www.modelonia.com

THE MUSICROW GROUP

Crow Gold Pack 1.1 (Mac/Win)

By Len Sasso

Crow Gold Pack 1.1 ($119) is a suite of 26 instrument and effects Ensembles for Native Instruments Reaktor 5. Most of the Ensembles can be purchased separately, and the instruments and effects are available as separate bundles for $79 and $59, respectively. New Ensembles, when released, are free to Crow Gold Pack users. You will, of course, need Reaktor 5 to use this package, and to make the best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Crow Gold Pack's Oberline Ensembles emulate the vintage Oberheim line of synths, built from Synthesizer Expander Modules and a little pattern sequencer.

use of the effects Ensembles, you'll want audio-editing or digital audio sequencing software that will host Reaktor 5 as an effects plug-in.

The instruments in Crow Gold Pack include emulations of classic analog synths, early electronic and electroacoustic instruments, and digital synths that could be constructed only with modern software synthesis and sampling technology. The effects range from classics such as tape echo and tape flanging to the otherworldly Space-Boy, which combines a mono reverb with a panner for space and motion effects.

The Synth Zone

Musicrow's strong affinity for vintage instruments is reflected in its three electroacoustic offerings: Accordion Virus, Theremin, and Future-Bass, a Fender-style bass and guitar synth. Accordion Virus is a pulse wave–oscillator subtractive synth (no samples are used) that produces quite authentic accordion sounds. In a clever twist, it routes MIDI Pitch Bend Change messages to control the effect of the bellows. Theremin starts with samples from several theremins and adds simple controls for managing vibrato, tuning, and sample looping. Musicrow even throws in a 440 Hz reference tone so you can be authentically out of tune.

My favorite of the two classic synths

is Oberline, modeled after synths using the Oberheim Synthesizer Expander Module (SEM). There are Oberline Ensembles with one, two, and three SEMs, and all include the 8-step pattern sequencer found in the Oberheim 2-voice and 4-voice synths. As many of the 179 Oberline presets illustrate, this little sequencer is loads of fun.

Among the modern synths, Orpheus and Blue Crow, which use similar synthesis engines, are standouts for producing fat leads and evolving ambiences. These are 3-oscillator subtractive synths, but what makes them interesting is that two of the oscillators are actually sample players playing very short loops that act as complex waveforms. The third oscillator can morph through a variety of standard waveforms. Both Ensembles come with a small collection of useful samples, but adding your own samples greatly expands these synths' sound palette.

My favorite of the modern synths is Trancoid, which is aimed squarely at the trance and dance crowd. Trancoid has hard-sync and FM oscillator banks that feed a multimode filter. That produces a huge sound, but it's the three built-in pattern sequencers that make this synth. One gates the output, while the other two control filter cutoff and resonance. It's the motion that counts (see **Web Clip 1**).

For Effect

Crow Gold Pack effects fall into three broad categories: delay-reverb, filtering, and phase-flange-chorus. The four reverbs—Plate, Electro Verb, Ultraverb, and Space-Boy (described earlier)—are as good-sounding as they are different. Plate has no early reflections and a fast buildup. Electro Verb emulates the room placement of four mics and emphasizes an in-the-can sound. The high-end Ultraverb gives you extensive control of early reflections and the reverb tail.

Among the phase-flange-chorus effects, Tape Flanger, Tape-Loop Echo, and Ultra Chorus stand out for realism—you can feel the tape residue on your fingers. GrainD Lay and Golden Crow Delay are both capable of a wide range of effects. GrainD Lay samples the incoming audio, chops it into grains, and munges it to your specifications. The impact is more resynthesis than delay. Golden Crow Delay splits the input into ten frequency bands, with separate delay settings for each band. It's great for broad-spectrum material.

The newest effect is the multiband, granular Vocal Modeler. Although it has a decidedly vocal sound, Vocal Modeler is useful on almost any material, from drums to leads to pads. Each frequency band has its own granular delay line with color, chorus, pitch-shift, and grain-playback controls.

With a couple thousand free Ensembles in the Reaktor User Library, commercial Ensembles have to offer a lot to be viable. The Ensembles in Crow Gold Pack definitely do; they're cleverly designed, well built, and great-sounding, and include hundreds of presets. My one objection is that the Ensemble structures have been purposely scrambled, which makes modifying them tedious, though not

impossible. That seems both unnecessary and contrary to the spirit of Reaktor. But Crow Gold Pack is a lot of bang for the buck and a worthwhile addition to your Reaktor library. EM WEB CLIPS

Value (1 through 5): 3
The Musicrow Group
www.mcrow.net

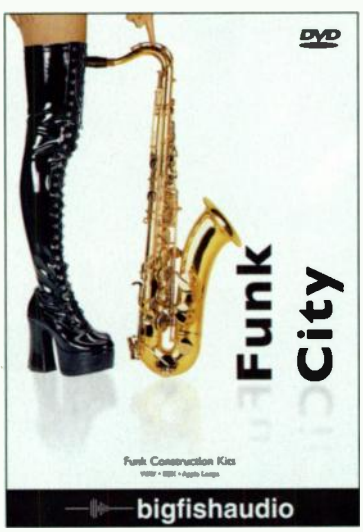
BIG FISH AUDIO

Funk City

By Marty Cutler

Musicians may argue over what constitutes funk, but you can't argue that the most sampled funk tracks ever originated with George Clinton's Parliament/Funkadelic crew. It's no surprise, then, that the same group of musicians have seeded slews of sample collections that cover the same territory.

One such collection is Big Fish Audio's *Funk City* ($69.95), a sprawling, single-DVD construction-kit set dripping with attitude and groove. The disc breaks down into folders for three popular formats: Apple Loops, WAV, and REX2. I used the files in Ableton Live 5.0.1, Propellerhead Reason 2.5, MOTU Digital Performer 4.61, and Apple Logic Pro 7.1.1. I also examined the REX2 files in Propellerhead Reason 2.5 and ReCycle 2.2.9 to check for looping accuracy and slicing precision.



Big Fish Audio's *Funk City* is a multiformat sample DVD that delivers intense, burning funk loops.

What the Funk?

The disc supplies 29 individual construction kits. Each folder contains a riff-oriented pattern that sits on a single chord, divided into separate instrument files such as guitar, horns, congas, and so on. The pliable nature of the file formats provided—particularly REX2 and Apple Loops—lets you adapt tempos and key signatures as needed. With REX2 files, you can even adjust dynamics, timing, and the order of the individual slices. If you have a software sampler or a sampling drum machine, you can create custom grooves using a separate folder of drum hits and assorted scratches.

Each file format has its own folder. Numbered subfolders list the original tempo and key in their titles. The numbering system is consistent between formats, which is useful if you need to switch between WAV files and Apple Loops, for example, without losing your place. Each folder has a stereo mix of the complete groove, composed of that folder's loops assembled in order. That's handy for auditioning the contents, but it's not difficult to make your own composite grooves from different sources in the collection.

The contents of each construction kit's folder are different. Some kits have horn section parts with separate saxophone lines. Some offer pulsating synthesizer patterns, and others hold piercing, resonant solo-synth fills. Clavinets dominate in some grooves, whereas a phased, mildly overdriven Fender Rhodes or organ pads the harmonic background of others. Basses range from busy slapping to low-end fingerstyle parts with just enough activity to push the groove.

Different instruments—guitars that sound like Strats and Telecasters, for example—take turns in different kits. There is no shortage of rhythm guitar; playing styles range from single-note, riff-oriented playing to percussive, barely tonal dead-note strumming to wah-wah-inflected rhythm guitar. In addition to wah-wah pedals, guitars get a bit of extra beef from distortion, chorusing, compression, and reverb and delay (which also bolsters the guitar's rhythmic component).

Funk in A

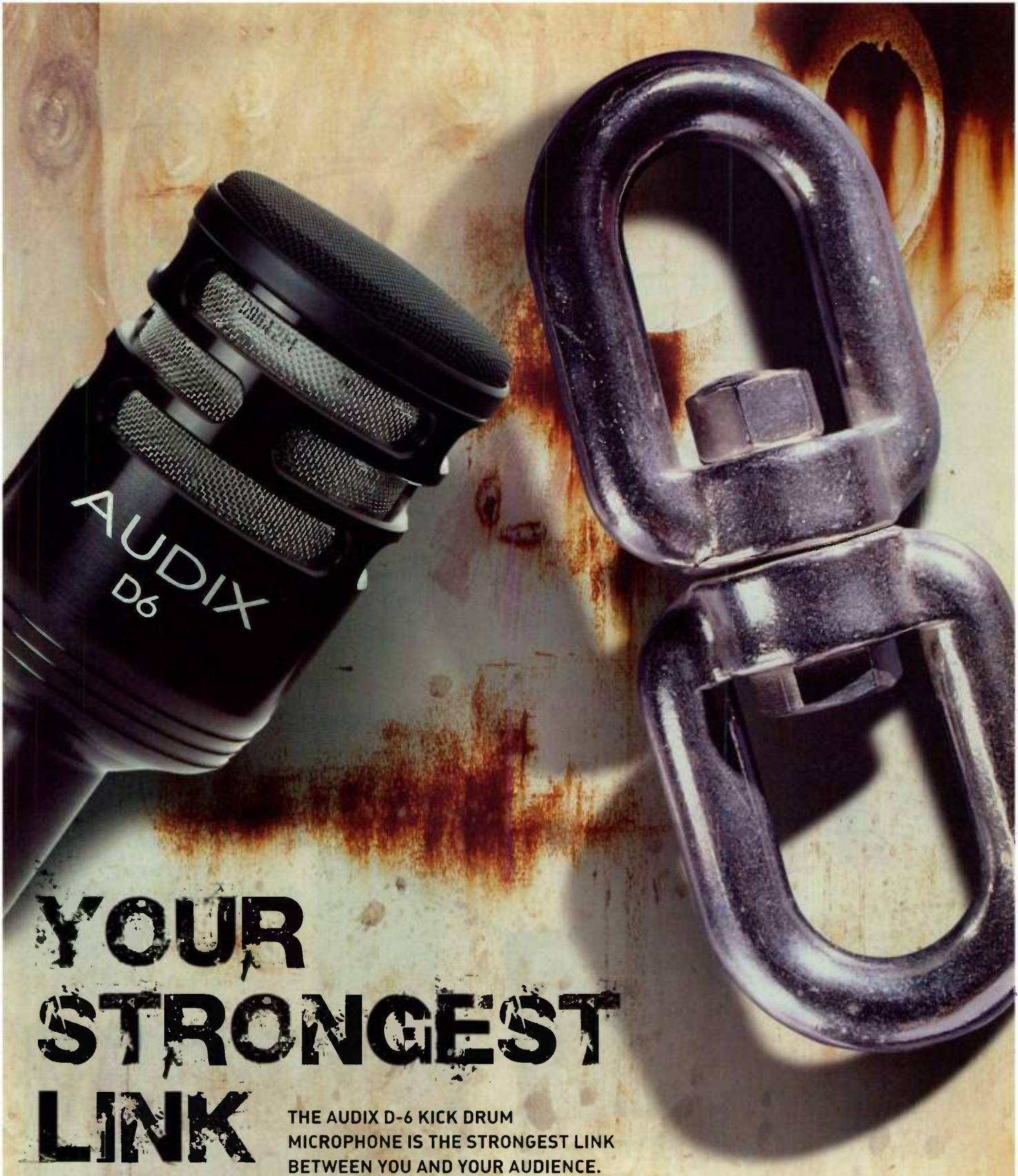
Likewise, drums and percussion instruments are diverse, with a variety of hardware and tunings. Snares range from ringy and clangorous to fat and tight, with lots of sonic variety in between. To provide a bit of extra ambience, some folders include a room-mic track for the drums. Harmonically, loops tend to sit on a single key; although that is often the nature of funk, the accompaniment (particularly on guitars) is rarely static, changing voicings and adding lively passing tones and lots of unique fills and variations. Otherwise, there's plenty of variety, with tempos starting from the low 90s through 130 bpm.

I successfully managed to transpose horn and bass lines as much as five half steps up or down, which means that you could certainly adapt parts to any necessary key changes. Grooves vary greatly, from straight 16th-note propulsive feels to loping, lazy feels with plenty of swing. REX2 files adapted beautifully to quantizing or groove quantizing, so you're not even locked into a preset feel.

It's difficult to single out any favorite groove. Because I'm partial to the syncopated style of Tower of Power, though, my pick of the litter (despite its decidedly funk-challenged file name) is 10 110 E (see **Web Clip 1**).

Funk City's only drawback is that its diversity makes it a little difficult to choose consistent timbres using loops from different folders, particularly with drum kits. A bit more documentation indicating which kits used similar hardware would alleviate that problem. Otherwise, Big Fish Audio and the musicians involved have created a terrific collection of funk grooves at a great price. I've heard it said that Aretha Franklin could sing the federal tax code and make it funky; there's little doubt that Big Fish Audio's *Funk City* could have a similar effect on your music. I recommend it highly. EM EM WEB CLIPS

Value (1 through 5): 4
Big Fish Audio
www.bigfishaudio.com



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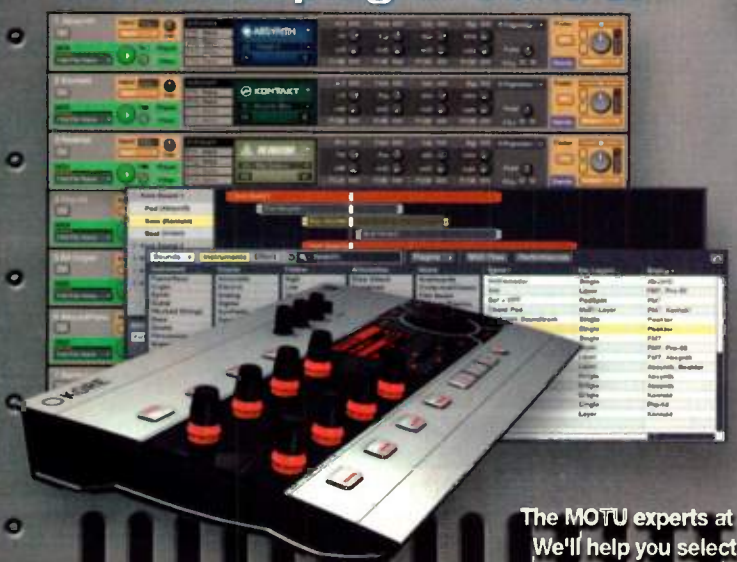

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The Arc of a Project

By Larry the O

Projects have their own flow and arc, and one must complete several of them before the process comes together in one's head. I'm mostly thinking about large projects with a bit of sprawl, such as films, albums, games, and sound design in product development, rather than projects with short turnarounds or cycles, such as TV shows and magazines. While each project has unique aspects, more often than not they all follow a familiar pattern.

The first part of a typical project is assessment and preparation. This is when I tend to spend time just mulling over a project and making notes. I start getting my head around the project's scope, purpose, and priorities; formulate my initial viewpoint of the task; and consider my methods for accomplishing it. While exciting, this part of the process can also involve acquiring tools and learning how to use them, as well as devising some form of asset management. The latter might be as basic as making a folder to hold all files related to the project or as involved as creating an entire folder structure, scripts, automation, templates, and tracking databases. I also consider how to best handle tasks that will be repeated constantly, such as batch-file format conversion.

It takes more time than I'd like for all of this orientation and preparation, and I often start feeling panicky near the end of this phase because I haven't produced anything yet. In fact, this nervousness is a primary factor in ending the preparatory phase. But ideally, the prep phase is Zen in nature: I spend a long time laying out and arranging tools and materials just so, so that the actual execution of the job can be very rapid. It doesn't always pan out that way, but that's the notion.

The next phase is transitional. I begin production, but things go excruciatingly slowly because I'm just starting to put my preparation into practice for the first time, and I have to work out the kinks. I establish working methods and find a rhythm for doing the job. This phase can go on longer than I'd like, too, but because I'm turning out content, I rarely get as nervous as I do near the end of the prep phase. Still, it can be nerve-racking from the standpoint that I am, at this point, perhaps a third of the way into the project's schedule and don't yet have enough completed work to demonstrate that things are moving along.

When all goes well, I reach the heavy-production phase before the client gets the jitters. Just when their faith is wearing thin, I come through and deliver something that reassures them—both in terms of showing that things are on schedule and proving that the quality of the work is suitable.

Then I get to the "shoveling" portion of the program, where I've found the rhythm. I've put tools and systems in place, and I can create the majority of the project. I get such a head of steam going that I resent taking any substantial amount of time to document what I'm doing and to concoct communications to the client. But I've learned that I must do those things nonetheless.

When all goes well, I reach the heavy-production phase before the client gets the jitters.

Somewhere along the way come the inevitable changes in direction from the client, a few setbacks of varying severity, and some massively productive days. Hopefully, I can get some invoicing done and, finally, make a complete draft of most if not all of the material.

The last phase is tweaking and reworking, accommodating late requests, and getting sign-offs on final versions. Then it's all done! The project's completion hardly seems real. I think I'm suddenly going to get a chunk of my life back, although, as we all know, nature abhors spare bandwidth. With luck, there's at least a short recovery period before the next project kicks off in earnest.

Grasping this rhythm is most useful. Having an awareness of project arcs and a good feel for riding them is a skill that marks a professional. Of course, it is also the mark of a professional to be able to ride the arc when it is nothing at all like this. EM

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The CueMix Console software gives you direct access to the UltraLite's 10-input, 8-bus digital mixer. Route any combination of inputs to four separate output pairs. Create and save up to 16 mix setups. You can even set up talk-back and listen-back for studio recording sessions.

UltraLite

Compact bus-powered 10 x 14 FireWire audio I/O

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