Essential Online Resources for Musicians

JUNE 2005

# Electronic Musician®

PERSONAL STUDIO | RECORDING | PRODUCTION | SOUND DESIGN

## The Lost World Rediscovered

*8 virtual synths go head-to-head with analog classics*

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*CREATING GUITAR EFFECTS WITH SOFT INSTRUMENTS*

**Tony Shepperd**
*Captures the Stars in His Garage*

**REVIEWS**

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Alesis Micron
Open Labs NeKo 64-220
Apple GarageBand 2
Image-Line FL Studio 5
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Logic Pro 7

# Half studio. Half instrument. Total creative freedom.

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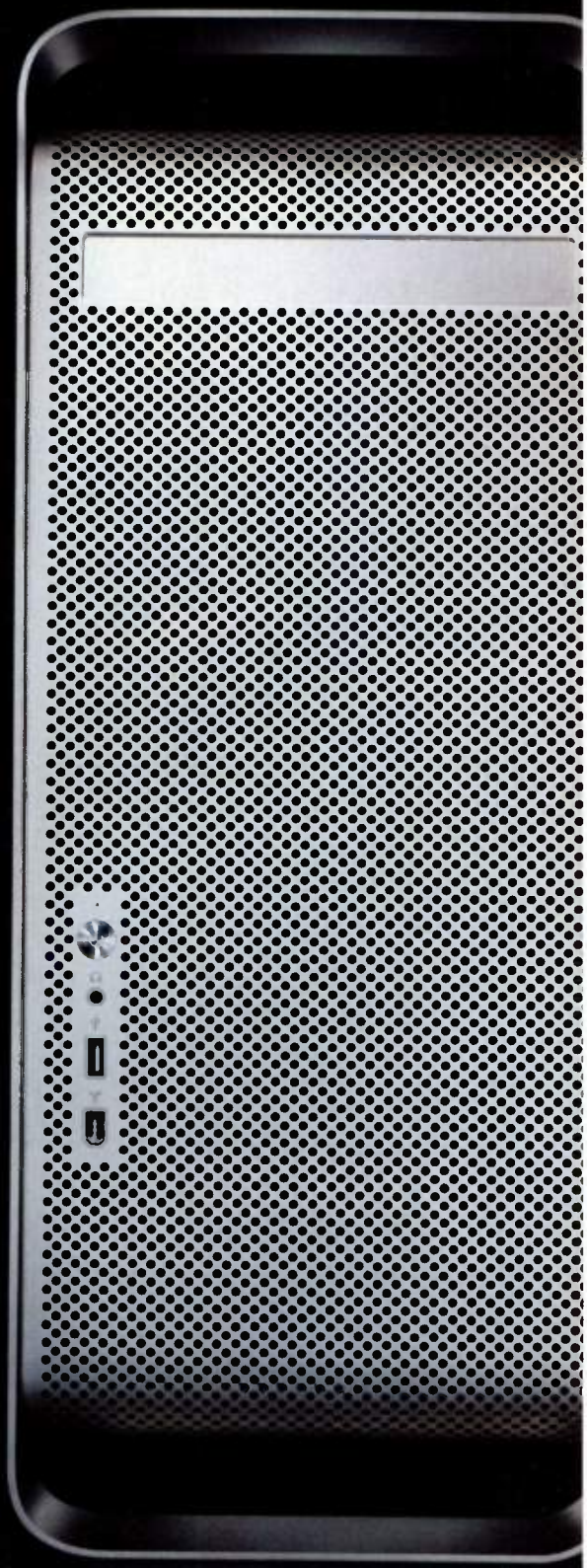
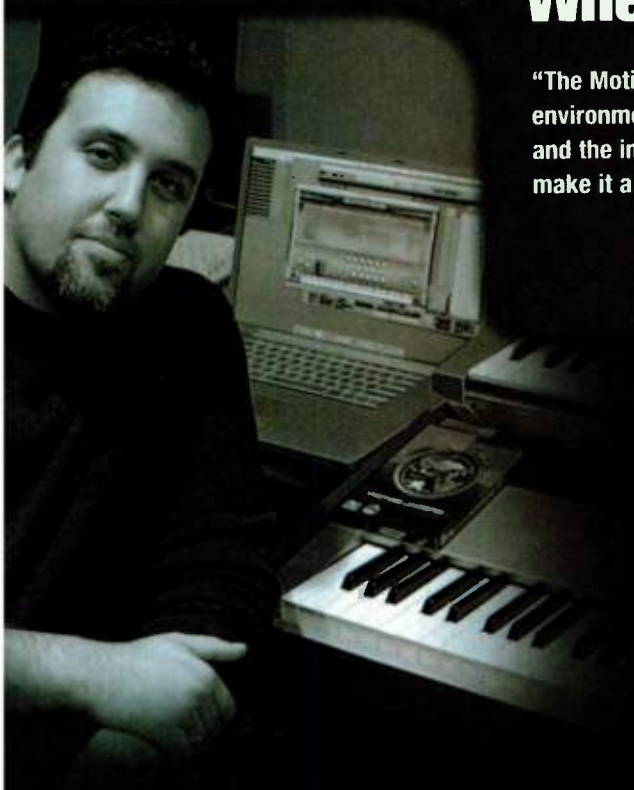
Images are of the band Kid Galahad making the film *Hello You*. For more information, visit kidg.net. 

Loops let you produce instant sound beds, Ultrabeat delivers endless drum-machine permutations, Guitar Amp Pro models any tone instruments and expandable DSP processing power, thanks to Distributed Audio Processing, will make the $999* price tag music to your ears.

*www.apple.com/logic*

# When Virtual Gets Real



**"The Motif ES series is the perfect companion in a virtual studio environment. For me, the smooth dynamic feel of Yamaha keyboards and the immediate availability of quality sounds and great features make it a staple in my studio."**

**Dave Kerzner**
CEO and main sound designer for Sonic Reality, Inc.

Whether Dave Kerzner is at work in the studio developing new sounds for VST plug-ins like Halion or Sonik Synth™, producing legendary drummer Danny Gottlieb or setting up custom Sonic Reality samples for the Motif ES synths on Beyonce's concert tour with Alicia Keys and Missy Elliott, this virtual synth sound developer has only one choice in hardware, the Motif ES. If your company is called Sonic Reality, you demand the best in sound quality, the most flexibility in features and the tightest integration with your PC and virtual instruments. That's why Dave always keeps it real with his Motif ES music production synthesizers.

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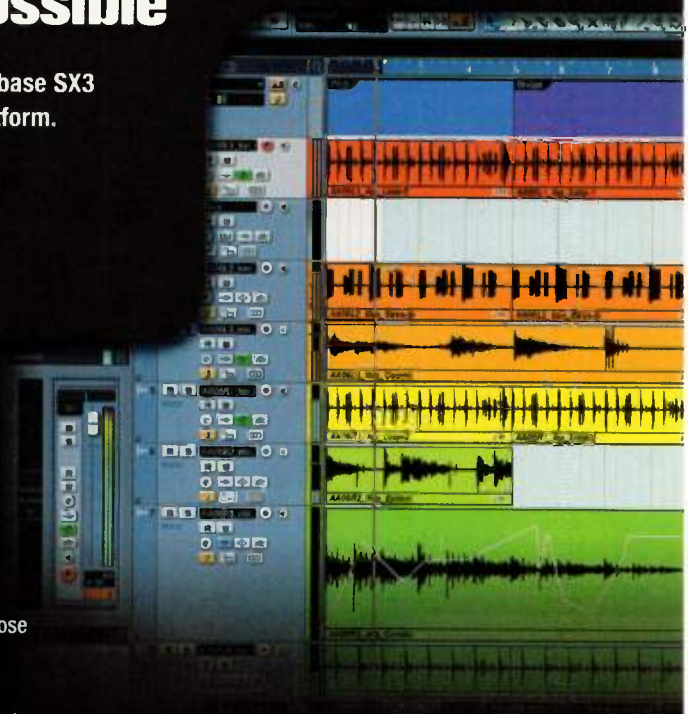
**Creating music these days is all about making choices. Cubase SX3 gives you more freedom of choice than any other DAW platform.**



Want to add loops of different tempos to your music? SX3's new Audio Warp feature lets you twist and stretch audio any way you want. Have friends who like working on a different OS than you do? No problem, SX3 is the only cross platform DAW on the market. So whether you choose XP, OS X or both, SX3 is right there with you. Want to add outboard gear into your virtual environment? SX3's new features for integrating external hardware—including FX return channels, advanced latency compensation and Studio Connections Recall—lets you decide what external studio gear you use and how.

Cubase SX3 features the same 32-bit VST 2.3 audio engine as Nuendo 3.0, so it's not only fully VST and 5.1 surround sound compatible, it sets a new standard for audio quality.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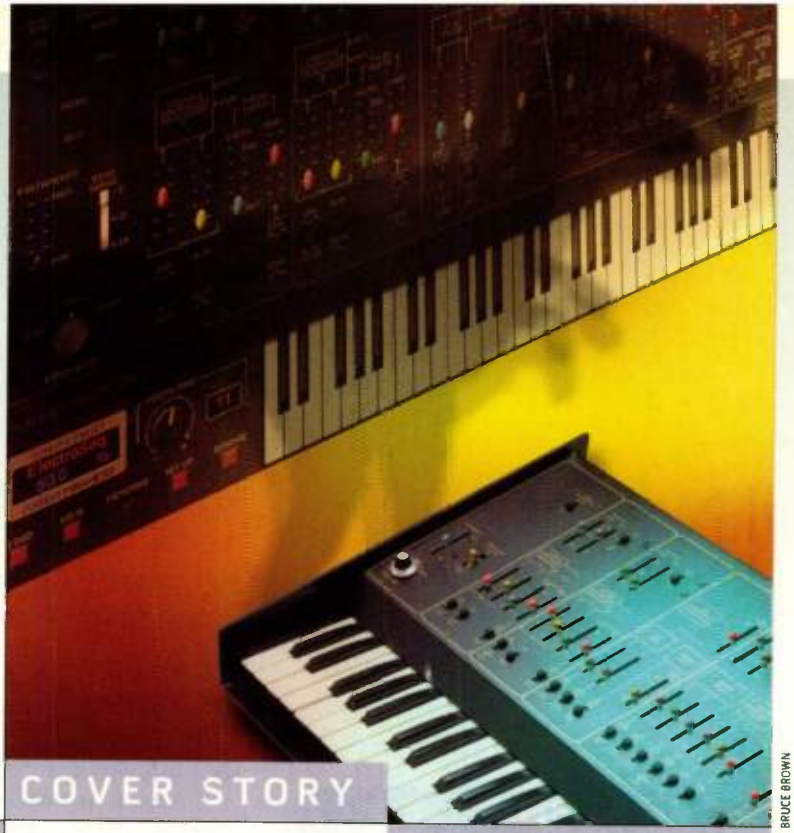
# FLEXIBILITY

Electronic Musician
June 2005

# INSIDE



BRUCE BROWN

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Can today's virtual synthesizers accurately re-create the sounds of the great analog synths of yesteryear? Our panel of synth experts pits seven vintage "dinosaur" synths against their software emulations in a blind test that's full of surprises.

By Brian Smithers

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From Web sites to newsgroups, the knowledge that you need to create and record music using the latest technology is just a few mouse-clicks away.

By Geary Yelton

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Engineer-producer Tony Shepperd, who has worked with artists such as Whitney Houston and the Backstreet Boys, designed and helped build Tonysound, one of the top personal studios in Los Angeles. Shepperd talks about the studio's design and his recording techniques.

By Maureen Droney

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**Propellerhead Software *Reason Drum Kits ReFill Collection*** sound library (Mac/Win)




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# Letters

## Point of Clarification

Kurt Heiden's detailed and informative article "Experimenting with SoundFonts" (April 2005) contained an important error for Cakewalk Sonar users. Heiden asserts that Sonar 4 includes the DS864 software sampler. However, contrary to Heiden's assertion, no software sampler ships with Sonar 4.

Sonar, versions 1 and 2, shipped with LiveSynth, which is designed expressly for playing SoundFonts. Sonar 3 shipped with VSampler 3, which loads and plays SoundFonts. Sonar 4 users who upgraded from previous versions will have either or both of those software samplers at their disposal.

But Sonar 4 users who lack these software instruments have an option. You can use rgcAudio's excellent free VST SoundFont player, sfz, with Sonar via the Cakewalk VST Adapter, which ships with Sonar 4. Sfz can be downloaded from rgcAudio's site or from kvraudio.com.

**Richard Hunter**
**via email**

*Richard—Thanks for your note. You are correct in that DS864 does not come with any version of Sonar. However, if you happen to be a Project5 user, as well, and have installed DS864, which comes with that bundle, then the sampler will be available while you are running Sonar.—Dennis Miller*

## Got QUALMS? Gotcha!

I'm writing with regard to the Tech Page column in the April 2005 issue. I read the article and, for five minutes of my life, I was more excited than I'd been about anything I can remember. I showed it to my roommate and he flipped out, too. I was just about to print copies and start posting them everywhere and handing them out to my friends.

Then I tried to find out more. Nothing. Fu Ling Yu, huh? Cruel. What's up with this?

**Chris**
**via email**

*Chris—I have just two words for you: GOTCHA! (Okay, that's one word, but it's derived from two.) I often come up with ideas for my April Fools' Tech Page based on things I'd love to see, so I understand your sense of excitement. I got excited writing "Got QUALMS," even though I knew it was fake. I tried to give readers several clues as to the false nature of the piece, which you seemed to pick up on.—Scott Wilkinson*

## Sibling Rivalry

I was somewhat distracted when I first read your story on QUALMS (QuantumLinearModelingSynthesis; "Tech Page: Got QUALMS," April 2005). I was soon riveted, however, by the news of this stunning new technology emerging from China.

Not long afterward, I heard stories about Professor Fu's brother, who is on the faculty of Shanghai Technological-Neurological University (www.shtnu.edu). Both men were pursuing the same goal, but it was the Shanghai Professor Fu who published his findings first.

I was preparing to act on this information when it occurred to me that I was holding the April issue of EM in my hands. I sadly cancelled all my plans to email colleagues and post threads on the Steinberg forums. I imagine there are those at EM who will be disappointed that the news of this startling scientific breakthrough and the intense sibling rivalry that spawned it will not be discussed and debated throughout our professional community.

I, however, have no intention of telling how close Fu Ling Yu came to Fu Ling Mi.

**Michael Jones**
**Coolhouse Media**

## Alternate Routes

Thank you for a great review of the Mackie Onyx 1620 (March 2005). However, it missed a key issue: you can't send EQ settings or inserts for your effects to your DAW through its FireWire I/O card or DB-25 connectors. Customers are complaining in droves about this on the Mackie forums. I find this suspicious.

**Glenn**
**via email**

*Glenn—At first glance, it may appear that the FireWire card designed for Onyx-series mixers provides a postinsert and post-EQ pathway to a user's computer and digital audio application. It should be remembered, however, that the FireWire card is a convenience option for what is essentially an old-school analog mixer, albeit a modern one that sounds great*

cakewalk

# SONAR 4

"SONAR 4 Producer Edition is simply stunning. Surround is logically integrated in a way that keeps the creative flow and mixing moving fast. And SurroundBridge is brilliant!"

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## Next Month in EM

COVER STORY

### Build a Desktop Studio on Any Budget

Are you planning a new computer-based studio? EM's editors discuss which products we would choose to build well-integrated Mac- and PC-based studios on low, moderate, and generous budgets. We explain our choices in terms of studio goals, product features, integration, quality, and price.

FEATURES

**EM's Guide to eBay**
Advice and strategies for buying and selling gear online.

**Recording the Drums of Bahia**
Former EM associate editor Brian Knave discusses how he and other engineers recorded a 24-piece percussion ensemble for a CD by up-and-coming Brazilian percussion star Maceo.

COLUMNS

**Making Tracks: Power Tips for Apple GarageBand 2**
You'll be surprised at how much you can do with Apple's popular entry-level sequencer for the Mac.

**Sound Design Workshop: Extreme Editing**
Keep your listeners on edge (in a good way) by going for the extremes.

**Square One: Sealed and Delivered**
Creative use of synth envelopes can add life to your sounds.

**...and much more!**

# Letters

*and functions just about flawlessly. Many users will want to send unprocessed signals direct to their audio application for digital tweaking at a later time.*

*According to a Mackie spokesperson, the company considered adding a switch that would have allowed users to choose pre- or post-EQ for the FireWire and recording outputs. That was ultimately rejected because it would have resulted in increased cost, a longer signal pathway, and increased noise potential.*

*Fortunately, there are workarounds that would allow you to send signals that have utilized the built-in Perkins EQs or external processors to the computer via the FireWire card. Only the first eight channels have mic preamps and full EQs, so you could route those signals to stereo channels 9–10 through 15–16 via aux sends 1–4, and those channels would then be available in the computer's audio application.*

*Of course, a 16-channel analog mixer with mic preamps and Perkins EQ on every channel with digital conversion would be very attractive, and perhaps Mackie has one on the drawing board. It's unlikely, however, that we would be able to purchase one for the price of an Onyx 1620.—Rusty Cutchin*

## We Welcome Your Feedback

Address correspondence to:

Letters
Electronic Musician
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Emeryville, CA, 94608
or email us at emeditorial@primediabusiness.com.

Published letters may be edited for space and clarity.

## Current Musings

Thank you for the very positive review of the Muse Research Receptor hardware VST plug-in host in the February 2005 issue of *Electronic Musician*. I want to take this opportunity to point out some possible misconceptions that readers might conclude from the review, mostly due to the timing of its release. As you know, this review took place in October 2004, shortly after Receptor was released, and Receptor has gone through two software revisions and has changed greatly since your reviewer had a chance to look at the unit.

First of all, the review occurred with version 1.0 software. Receptor has been shipping with version 1.1 software for a couple of months now, and version 1.2, which adds significant new features, will be shipping by the time this letter is published. Next, the review was somewhat critical of the number of plug-ins that were available to run on Receptor. This changed drastically with the release of version 1.1 of Receptor software, which allows eight new premium plug-ins that ship preinstalled on Receptor. The review also pointed out that Receptor didn't run some popular VST plug-ins such as those from Spectrasonics; fortunately, owners of Stylus, Atmosphere, and Trilogy are now able to run those programs on Receptor.

We understand that the publishing business has a significant lead time involved in laying out and designing magazines, but we would encourage potential Receptor customers to visit the Muse Research Web site at www.museresearch.com and the Receptor support site at www.plugorama.com to ensure they have the latest information about the capabilities of this exciting new platform.

**Bryan Lanser**
**Muse Research**

## Error Log

April 2005, "Sharing the Load," p. 36. The abbreviation TDM, relative to Digidesign's Pro Tools systems, stands for Time Division Multiplexing. Also, on p. 38, there is a typographical error: "44.1 Hz" should be "44.1 kHz."


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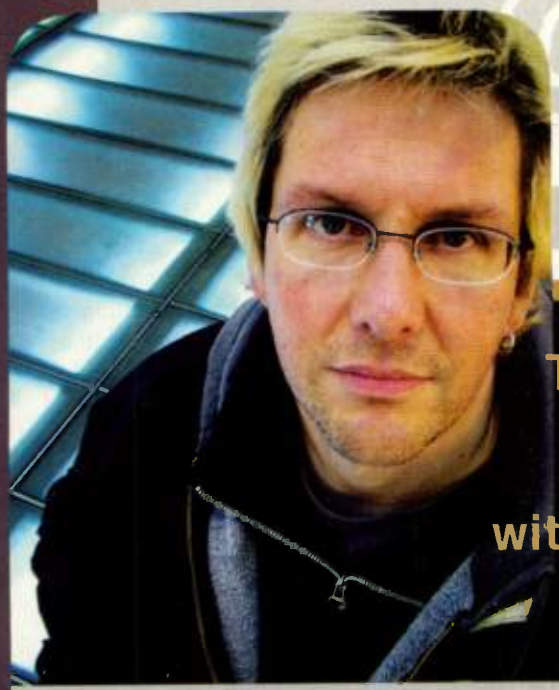

EMspotlight

## Thinking inside the Box with Banco de Gaia.

Toby Marks (aka Banco de Gaia) has long relied on hardware synths and samplers to produce his music live and in the studio. With the arrival of powerful computers and software instruments in recent years, Marks has been inspired to rethink his production methods. By Assistant Editor Matt Gallagher.

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

Frankfurt Musikmesse is the biggest annual musical-instrument expo in Europe. Visit emusician.com for Senior Editor Gino Robair's report on the exciting new recording gear, music software, and electronic musical instruments unveiled at this year's show.

## editor's picks


Associate Editor Dennis Miller has chosen three EM articles that focus on desktop composition. The topics include a roundup of algorithmic composition programs for the PC, a how-to on using Macromedia Flash, and a group of editing techniques for beginners and pros.

emusician.com/editorspicks

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*-Craig Anderton, Keyboard Magazine*

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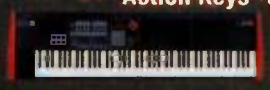

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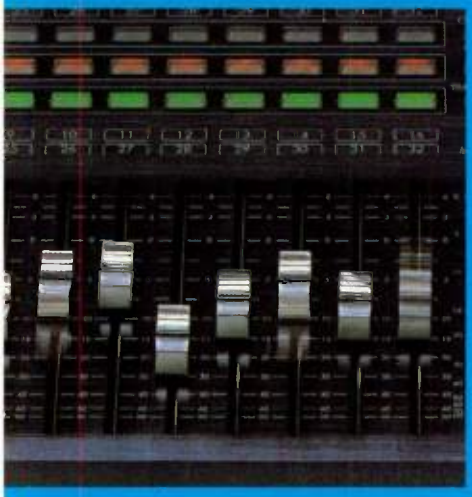

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D16XD


PXR4

By Geary Yelton

## Digidesign Pro Tools M-Powered

Considering that Avid Technology already owns Digidesign (www.digidesign.com), its purchase of M-Audio was bound to bear some pretty interesting fruit. One recent outcome is Pro Tools M-Powered (Mac/Win, $349), a new version of Digidesign's multitrack audio software that works with selected M-Audio hardware. The ability to use Pro Tools with M-Audio's Audiophile 2496 means that recordists can now own a Pro Tools system for less than $500. The software is also compatible with the Audiophile 192 sound card, the FireWire 410 and FireWire 1814 audio/MIDI interfaces, and the Ozonic, which combines the functionality of a FireWire audio/MIDI interface and 37-note keyboard. Although some of the hardware supports audio rates as high as 192 kHz, the software supports a maximum 96 kHz.

Pro Tools M-Powered will record and play back as many as 32 16- or 24-bit audio tracks and 256 MIDI tracks simultaneously. It will also open sessions recorded in any other version of Pro Tools. RTAS and AudioSuite plug-in formats are supported, and the bundle provides 7 Bomb Factory and more than 30 DigiRack effects. Additional features include groove analysis and correction and support for ReWire and the Command|8 control surface.

## M-Audio Black Box

The Black Box ($329.95) from M-Audio (www.m-audio.com) is EM's June favorite in the how-many-functions-can-you-stuff-into-one-product competition. Codeveloped with guitar-effects wizard Roger Linn, this 4-pound tabletop device combines amp modeling, effects processing, and a drum machine with a USB 1.1 audio interface. The Black Box has 24-bit S/PDIF I/O, balanced ¼-inch TRS outputs, ¼-inch headphone outputs, and separate preamps for the XLR mic and ¼-inch guitar inputs. WDM, ASIO, and Core Audio drivers are provided for Windows XP and Mac OS X.


Offering 100 factory presets and 100 user presets, the Black Box supplies 99 drum patterns and 43 effects that sync to a sequencer, to tap tempo, to external MIDI Clock, or to its own internal clock. In addition to such standbys as chorus and flanger, the Black Box furnishes beat-synced delay, random filters, tremolo sequences, and other effects. Two momentary footswitch inputs let you control functions such as preset selection and tap tempo, and you can program the expression pedal input to control amp gain, wah-wah, delay feedback, and other effects parameters. The Black Box features models of 12 classic guitar amps such as the Fender Deluxe, Vox AC30, Hiwatt DR-103, and Mesa Boogie Maverick.

# Satisfaction in Every Box

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— *Everett Davis*

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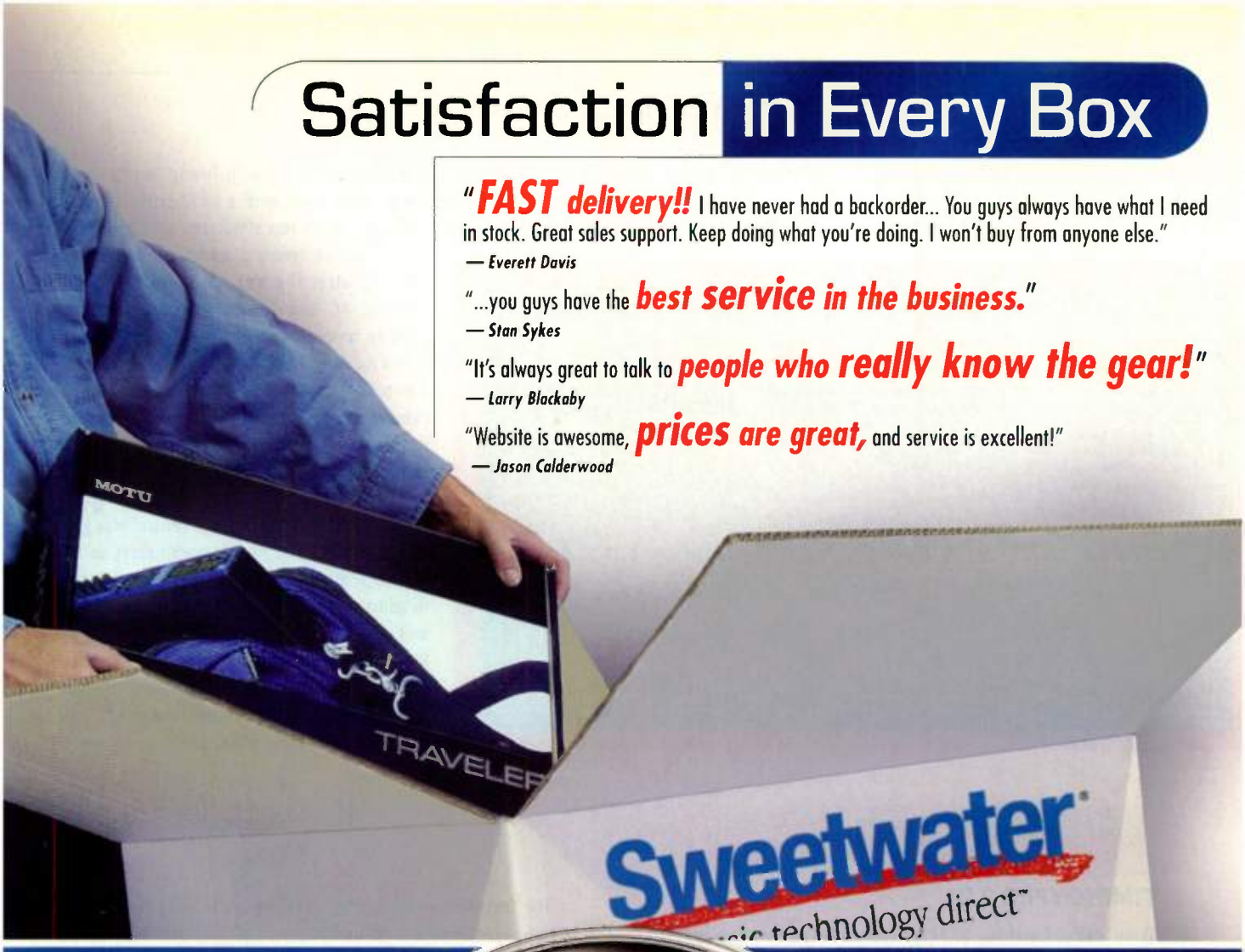
— *Stan Sykes*

"It's always great to talk to **people who really know the gear!**"
— *Larry Blackaby*

"Website is awesome, **prices are great,** and service is excellent!"
— *Jason Calderwood*





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# Native Instruments Guitar Combos

Drawing on the modeling technology developed for Guitar Rig, Native Instruments (www.nativeinstruments.de) has introduced three new virtual amps called Guitar Combos (Mac/Win; $79 each, $199 bundled). Twang Combo emulates the Fender Twin Reverb with a 2×12 cabinet and a Neumann CMV 563 mic. It has simulated spring reverb, stereo chorus, tremolo, and tube overdrive. Modeled after the Vox AC-30 with a 2×12 cabinet, AC Box Combo features a treble booster, tremolo, and spring reverb combined with a modeled Neumann U87. Plexi Combo is a virtual Marshall JMP50 paired with a 4×12 cabinet and a Shure SM57. Stereo chorus, distortion, fuzz, spring reverb, and reverse delay comprise its complement of software effects.

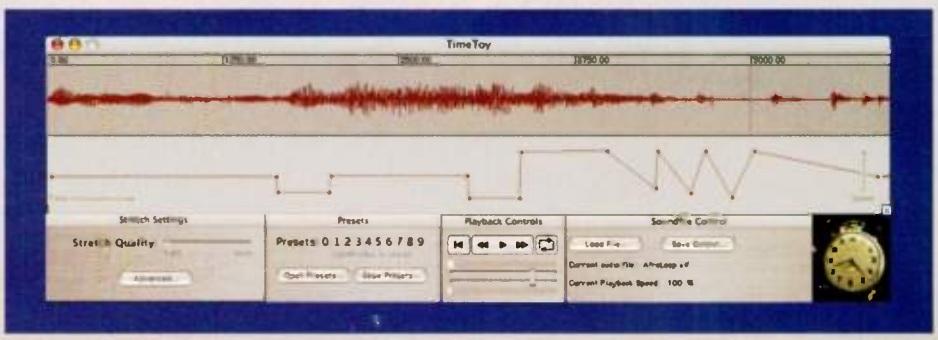

Each Guitar Combo has locations for 64 user-rewritable presets. MIDI control lets you switch presets and modify parameters using a MIDI footpedal or sequencer automation. In addition to a precision tuner, a noise gate, and a limiter, each Guitar Combo has a Demo Player with a collection of unprocessed guitar loops to make it easy to audition amp sounds. Guitar Combos operate standalone or as plug-ins in a variety of formats.

# Download of the Month

## TIMETOYPRO 2.0

TimeToyPro 2.0 (Mac, $17) is a standalone time-stretching application created with Max/MSP and based on granular DSP technology. Author Marcel Wierckx is well known for his Real Time Granular Synthesizer (RTGS), which has been completely revised for Mac OS X and is also worth checking out. Demos of both are available from his Web site (www.lownorth.nl).

The most unique aspects of TimeToyPro are its extreme range and its breakpoint-envelope control of time stretching. The range, given in terms of playback speed, is 1 to 200 percent. At the low end, that stretches an audio file to 100 times its original length (see Web Clip 1).




Setup is as simple as loading an audio file, clicking to create breakpoints on a graph that appears in the waveform display, and dragging the breakpoints to control playback speed at corresponding points in the audio file. When you're happy with the result, you can save the breakpoint envelope as a preset as well as save the time-warped audio file. TimeToyPro's memory holds ten presets at a time, but preset banks can also be saved to disk.

The free demo version of TimeToyPro is fully functional, but the registered version offers several advanced features. Advanced stretch settings allow you to control grain density, size, shape, and direction. Reversing the playback direction of the individual grains while moving forward through the file is an interesting effect even without any time stretching. Advanced playback controls allow you to set a region of the audio file for looped playback, apply real-time stretching to live audio input, or scrub through the time-stretched file, which is crucial for fine-tuning the breakpoint envelope. Grab this one—it's fast, easy, and fun.

EM WEB CLIPS

*—Len Sasso*


# Who says all PCI cards are the same?

PowerCore PCI mkII is the latest member of the PowerCore family, TC's hardware powered plug-in platform. It is a potent processing solution for DAW's including 14 high-quality plug-ins from the onset, and the doors are opened for a wealth of top-quality plug-ins from 3rd party developers and TC Electronic. PowerCore PCI mkII features processing power similar to the renowned PowerCore FireWire, and it is the prime choice when internal processing is preferred. PowerCore PCI mkII integrates with virtually any VST, AU and RTAS* based digital audio workstation for Mac or PC.


* Via the VST to RTAS adapter from FXpansion (optional)

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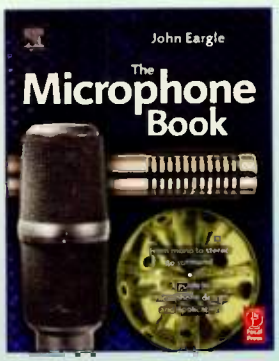
## Scarbee Keyboard Gold Bundle


Soundware company Sonic Implants (www.sonicimplants.com) has begun shipping Scarbee's Vintage Keyboard Collection (VKC) (Mac/Win, $449) and Vintage Keyboard FX (Mac/Win, $229), sold together as the Scarbee Keyboard Gold Bundle (Mac/Win, $599). Scarbee Keyboard FX is an Audio Units and VST plug-in that delivers a virtual rack of eight vintage effects, including a compressor, a phase shifter, chorus, overdrive, an envelope filter, a tape delay, a tube amp, and an electric-piano preamp with stereo tremolo. Keyboard Gold Bundle also has D-6C Filter, a plug-in that simulates the Clavinet's EQ circuit.

Harnessing the sample-playback capabilities of Steinberg's HALion Player, the VKC furnishes detailed multisamples of four classic electromechanical instruments. RSP73 is a sampled 73-key Rhodes Stage Piano Mark I, and WEP is a Wurlitzer 200A electric piano; Scarbee has previously released both as individual sample libraries. N-HP is an entirely new sound set featuring a Hohner Pianet N. Another new sound set, D6-C, is a Hohner Clavinet D6 sampled at four pickup positions, with and without the mute bar switched on. VKC runs standalone, as a ReWire device, as a VST or Audio Units plug-in for Mac OS X, and as a VST or DirectX plug-in for Windows.

## Get Smart

For recordists at any level of expertise, a thorough understanding of microphones is key to perfecting their craft. To aid in their quest for knowledge, the second edition of *The Microphone Book* ($44.95) is a comprehensive guide to mic technology written by Grammy Award–winning recording engineer John Eargle and published by Focal Press (www.focalpress.com). The 389-page text is brimming with technical diagrams and photos, and serves as a guide to mic technology and as a practical reference. Eargle focuses not so much on specific mics as on mic selection, providing detailed explanations of different types of mics and the applications for which they're best suited, with an emphasis on problem-solving tips and techniques.




If you are a collector of effects pedals, For Musicians Only Publishing (www.formusiciansonly.com) has a book that raises stompboxes to cult status. *Analog Man's Guide to Vintage Effects* ($39.95) is, according to author Tom Hughes, "the most complete and comprehensive resource for vintage effects to date." Indeed, every type of effects processor is discussed in detail, including such rarities as the EMS Synthi Hi-Fli, the Ampeg Scrambler, and the legendary Psychedelic Machine. Eighty pages are devoted to the history of stompboxes, followed by an in-depth explanation of effects technology. Brief descriptions of more than 150 manufacturers are followed by a look at today's makers of boutique effects. The book is profusely illustrated, with hundreds of photos and reproductions of some original print ads. It also features a very entertaining foreword by King Crimson guitarist Adrian Belew.



Hugo Pinksterboer's *Tipbook: Amplifiers & Effects* ($11.95) takes a different approach. Although it describes itself as a "basic book and reference guide, with nothing you don't want to know," the author tackles practical issues on a greater variety of gear than the title suggests. Chapters deal with product types and features, technical specifications, care and maintenance, and how to select and buy an amplifier and effects for guitar, bass, and keyboard. It also covers cables, mixers, mics, and pickups. Slim enough to fit in your back pocket or your instrument case, the 234-page book is available from the Hal Leonard Corporation (www.musicdispatch.com).

# Put your outboard EQ inside your DAW

## Presenting Q-Clone

### Software that turns your hardware equalizer into a plug-in — in real time

You know there's no substitute for the sound of a classic hardware equalizer. You also know hardware can't match the flexibility of a plug-in. But what if you could have both?

### Not an emulation—It's your EQ only better

Let's be clear: Q-Clone isn't an emulation. You tweak the knobs on your equalizer just like always. Q-Clone captures the exact sound of your equalizer as you adjust it.

### Presets recall your hardware sound

Save your sounds as presets, and you can instantly A/B between them. Or get your signature hardware sound—without the hardware.

### Add EQ on top of EQ

Once you've equalized a track, you can equalize that equalization—like chaining two of your EQs together! Or make your four-band EQ into an eight-band! There is no end to the possibilities. Finally, a way to get hardware "inside the box."

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## Neumann BCM 705

Neumann (www.neumann.com) has a well-deserved reputation for making some of the most desirable microphones in the world, but the cost of the company's products often puts them beyond the reach of many personal recording studios. The BCM 705 ($799.99), in addition to being the most reasonably priced, is Neumann's first dynamic mic. Neumann has redesigned the capsule used in the Sennheiser MD 431 and housed it in a body identical to the BCM 104. By mechanically suspending the capsule to reduce its sensitivity to motion, surrounding it with a larger chamber than the one used with the MD 431, and acoustically coupling it to a rear entrance port, the result is a supercardioid directional pickup pattern and a wide frequency response that's tailored to reduce bass boost caused by proximity effect.

Although the BCM 705 is marketed primarily for voice-over work, it is also suitable for recording vocals, electric guitar and bass, kick drum, and other instruments. It has an elastically suspended mount and a removable pop screen with color-coded, quick-release head grilles for each user.

## Focusrite Saffire

Veteran pro-gear maker Focusrite (www.focusrite.com) has introduced the Saffire ($499), a low-latency FireWire audio interface with multiport I/O and onboard DSP. The Saffire boasts 24-bit, 192 kHz A/D/A and two Focusrite preamps with XLR inputs. It also has two TRS inputs (switchable to high impedance), stereo S/PDIF I/O, MIDI I/O, and two independent ¼-inch stereo headphone outputs. And with eight balanced TRS outputs, the Saffire lets you mix 7.1 surround.

The Saffire's software front-end is SaffireControl, a Mac OS X and Windows XP application developed by the team responsible for LiquidControl and the Forte Suite. It controls all the ins and outs, allowing you to create as many as five separate stereo monitor mixes at the same time. The Saffire has a suite of hardware-powered plug-ins, with amp modeling, EQ, and compression to use on the input channels, as well as reverb for the headphone outputs. It also comes with Steinberg Cubase LE (Mac/Win) and all the same plug-ins for VST and Audio Units hosts.

## Sound Advice

One of the latest titles from **Big Fish Audio** (www.bigfishaudio.com) is *London Solo Strings* ($399), a DVD-ROM with 3.75 GB of 24-bit violin, viola, cello, and bass multisamples. Available in either GigaStudio or Kontakt format, the collection features carefully sampled instruments with MIDI-controllable playback parameters. One highlight is a violin built in 1740. The Kontakt disc includes a custom version of Native Instruments Kontakt Player (Mac/Win), which runs standalone or as a VST, RTAS, DirectX, or Audio Units plug-in.

Each instrument offers articulations ranging from tremolo and trills to Bartok pizzicato. Keyswitch patches let you quickly select from arco, marcato, spiccato, or pizzicato. Marcato and martellato let you select up, down, or alternating (round-robin) strokes. Crescendos come in short, medium, and long varieties. Also offered are quartets with a choice of articulations, as well as string effects and ambient noises.

*Chicago Fire: A Dance Music Anthology* ($249.95), from Sony Pictures Digital (www.sony.com/mediasoftware), is a five-disc library of Acid loops and samples produced by Vince Lawrence, who had cofounded Trax Records by the time he was 18 years old. Every disc presents a different musical genre taken from Chicago's dance-club culture: Old School, Deep House, Progressive, Electro, and Drum 'n' Bass. Each disc contains royalty-free WAV-file construction kits for crafting complete songs in a particular style and has percussion and drum loops, basses, sound effects, synth stabs and arpeggios, and even vocal phrases and harmonies. Separate folders contain loops, licks and phrases, one-shots, and other rhythmic and thematic elements that allow you to build a complete multitrack groove that captures the Chicago sound.

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## APPLE LOGIC PRO 7.1

The latest version of Apple's top-shelf audio sequencer, Logic Pro 7.1 (Mac, $999; upgrade from Logic 7, $19.95), features five new plug-ins, full native plug-in delay compensation, and more than 70 new key commands. The update also boasts significant improvements in the speed, efficiency, and stability of Logic Pro and Waveburner.

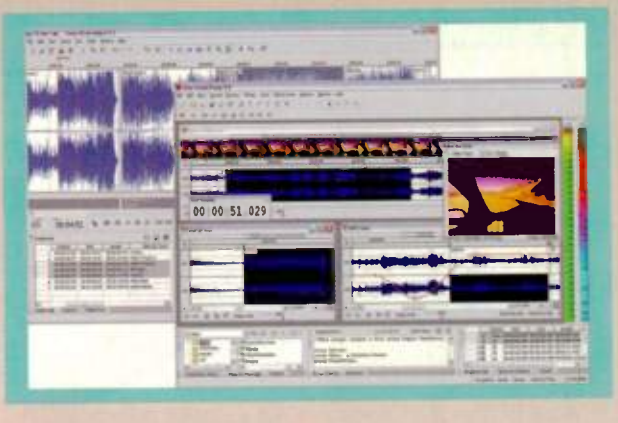
Once you've created an Apple Loop that uses software instruments, placing the loop in an Audio Instrument track will restore its original MIDI performance and channel-strip configuration. Now you can easily copy and rearrange channel-strip inserts and easily convert REX files to Apple Loops. By applying the new Follow Tempo parameter, audio regions will automatically adjust their length and pitch when you change the sequence's tempo or key.


Numerous plug-ins have been revamped in Logic Pro 7.1. Along with a more versatile rotary-speaker effect, EVB3 has better integration with drawbar controllers from Hammond Suzuki and Native Instruments. Drag-and-drop operations make Ultrabeat more flexible and easier to use. New instrument and effects plug-ins include two Hybrid Synths, Bass Amp, and Enhanced Timing. Further improvements have been made to EXS24, Sculpture, and other plug-ins. Logic Pro 7 also supports nine additional control surfaces from various manufacturers.

## SONY SOUND FORGE 8

Hot on the heels of Acid Pro 5, Sony Pictures Digital (www.sony.com/mediasoftware) has released Sound Forge 8 (Win, $399.95; upgrade $149.95). The update offers support for VST plug-ins, XP themes, Flash import, and custom keyboard commands. Now you can use batch conversion to apply effects and processes to several files simultaneously. Application scripting lets you automate tasks and customize features; numerous scripts are provided. Quickly find audio events using the new scrub tool and JKL keyboard commands. For faster sorting and in-place editing, new features in the Regions List and Playlist windows let you edit regions by simply typing in new values. Low-latency ASIO driver support lets you use a greater variety of sound cards, too.

Sound Forge 8 comes with a full version of CD Architect 5.2 with updated driver support and a new level of integration between the two programs. CD Architect will automatically import Sound Forge regions as CD tracks, and it now reads and writes CD Text.




## STEINBERG GROOVE AGENT 2

Steinberg (www.steinberg.net) has updated its virtual drum machine to Groove Agent 2 (Mac/Win, $249.99; upgrade $79.99). Groove Agent 2 contains nine new drum kits and more than 80 musical styles, each with 25 levels of complexity. Old Skool HipHop, Retro Rock, Punk, and Grunge are among the 27 new styles, which include patterns, fills, and half-tempo variations. The new studio kit is well suited to modern pop and rock genres, and the battery of percussion sounds has been enhanced.

If you prefer, now you can bypass Groove Agent's sample-playback engine and record its output to a MIDI track for triggering other drum machines and samples. You can also export its output as a Standard MIDI File. Eight stereo outputs are now available, and ReWire 2 is fully supported. Groove Agent 2 runs standalone and as a VST, DirectX, or Audio Units plug-in. Groove Agent 2 requires a Syncrosoft USB dongle called the Steinberg Key. If you don't already have one, you can purchase it separately for $29.95. EM

# DRUM SAMPLING GETS REAL.

**Finally, you can create sequenced drums that are indistinguishable from live performances.** Because the new 24-bit *Larry Seyer Acoustic Drums* library contains more live drumming variations and nuances than anything that's come before. And because it harnesses the creative power of GigaStudio 3's new features like unlimited stacked instruments on the same MIDI channel and convolving GigaPulse™ reverberation.


Playing left to right on your keyboard triggers samples taken from left to right on the drum heads. GigaStudio 3 makes it possible.

**Add those nuances that make live drumming live.** Map *individual strike zones* from the surface of each instrument to individual keys. Choose from two styles of attack: ***Low Latency*** has drum attack edited very tight to the sample start for sequencer composing or live performance. ***Full Attack*** retains all the pre-attack (you can hear the "wind of the stick") for sequencer playback a hair behind the beat.

## 5 YEARS IN THE MAKING.

Larry Seyer

Grammy-winning engineer Larry Seyer and drummer Pat Mastelotto (*King Crimson, BOMO, XTC, Mr. Mister*) collected hundreds of vintage and current drums for this library.

Using up to 6 mics per drum, they recorded 8,330 stereo 24-bit samples and then configured them as 115 drum kits using 13 new GigaPulse™ rooms created specifically for this library. Each of the 115 kits comes in 12 versions for a total of 1,380 drum kits!

**But it's not just the sheer numbers that makes *Larry Seyer Acoustic Drums* a ground-breaking advance in drum sampling.** It's also what TASCAM GigaStudio™ 3 lets you do with them. Now, for the first time, you have total control over:

- **what drums make up a kit**
- **which of 13 acoustically modeled rooms the drum kit is placed in**
- ***where* in each room the drum kit is placed**
- **what kind of mics are used**
- **how hard and *where* each drum is struck**


## GS3 MAKES IT WORK FOR YOU.

**It takes the advanced features found only in GigaStudio 3 to unlock the stunning reality of this drum library.**

*Unlimited instrument stacking* lets you build a custom drum kit by assigning individual drums to a different GigaStudio MIDI sub-channel. Submix their levels; add effects...and yet control overall kit muting, tuning and level through a single master MIDI channel.


Demo the world's most powerful software sampler at your TASCAM dealer today.

Then use the *GigaPulse convolution interface*, included with all GS3 versions, to gain incredibly realistic control over mic and kit placement in each of the drum library's room environments including the soon-to-be-infamous "Trash Room" and "Dry Cleaner."

***Larry Seyer Acoustic Drums*, exclusively for GigaStudio 3:**

- 7 GB with 115 complete drum kits, 8,330 samples and 1,638 unique impulses
- 12 separate versions of each drum kit including General MIDI and EX; Low & Full attack latency; 2, 5 & 7-channels
- 13 new GigaPulse™ rooms
- Stick, rod and mallet striker variations
- Loop library with 1,444 MIDI files for a total of 1,992,270 loops that don't degrade with tempo changes
- 24-bit samples using premium multiple microphones and preamps
- Exhaustive illustrated manual
- Expandable with future drum kits and rooms

**GIGASTUDIO3.0**

Hear samples from *Larry Seyer Acoustic Drums* at: **http://www.globalfulfillment.net/gfsnet/giga/10Expand.aspx?ProductCode=LSACDRUMS** There you can also sample Larry's video tutorial. For more general GigaStudio information, visit **www.tascamgiga.com** 

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# Beating Superparamagnetism

By Scott Wilkinson

## Hundred-year-old technology enlivens hard disks.

Musicians have an insatiable appetite for digital storage capacity; anything that allows more data to be stored in a given amount of physical space is welcome. Unfortunately, the laws of physics limit the density with which bits can be stuffed into that space.

Consider hard disks: individual bits of data are encoded in the orientation of tiny particles, or grains, that are laid out in concentric tracks on the surface of a circular platter. If a grain's magnetic field is oriented one way, it represents a zero; oriented the other way, it represents a one. A write head records data by orienting the grains with a variable magnetic field as the disk spins under the head. To recover the data, a read head senses the magnetic orientations of the grains.

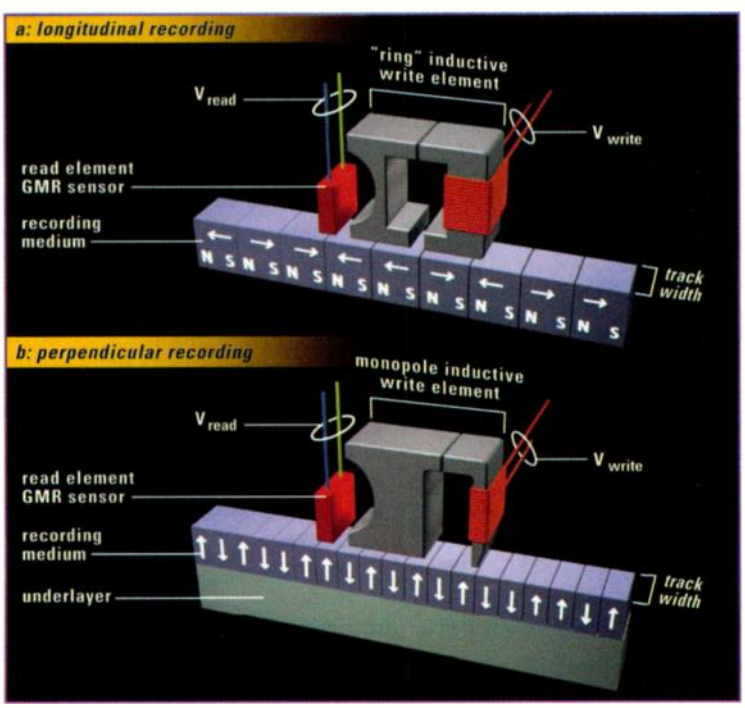
With today's hard disks, the grains' magnetic fields are parallel to the disk's surface; this is called longitudinal recording (see **Fig. 1a**). The density of longitudinally recorded data has reached more than 100 gigabits per square inch (Gb/in$^2$), but this technology is fast approaching its limits. Within two product generations, many researchers believe that longitudinal recording will hit a wall called superparamagnetism. As the grains shrink below a certain size, they weaken and cannot resist the various factors that demagnetize them, such as stray magnetic fields and heat. As a result, over time the data they encode become corrupted, making the hard disk useless.

One solution to this problem is perpendicular recording, in which the grains are perpendicular to the disk surface (see **Fig. 1b**). In this case, the magnetic field of each grain is oriented up or down rather than right or left. Because the grains are vertical, many more can be squeezed into a given area before superparamagnetism begins to take its toll. Interestingly, perpendicular recording is more than 100 years old, with roots in the work of late 19th-century Danish scientist Valdemar Poulsen, who was the first person to record sound magnetically using this technique.

Recently, Hitachi Global Storage Technologies (www.hitachigst.com/hdd/research/recording_head/pr/index.html) has begun field tests of hard disks that use perpendicular recording. In addition, laboratory experiments have achieved the industry's highest data density of 230 Gb/in$^2$. As well as more closely packed, vertically aligned grains, the distance between the read/write head and disk surface must be decreased to accurately record and recover the data; in the Hitachi tests, that distance is 10 nanometers.

Testers worldwide have been using perpendicular-recording hard drives as part of their daily routine since December 2004 to evaluate the long-term performance and reliability of the technology. Among the testers is Professor Shun-ichi Iwasaki, president and chief director of Japan's Tohoku Institute of Technology, who is considered to be the father of modern perpendicular recording. "Around 1975, I began to feel that the vertical direction was the right way to go to attain high-density recording," he says, "and I began leading the activities to make perpendicular recording a practical technology. I am glad to see that the technology will come into use soon."

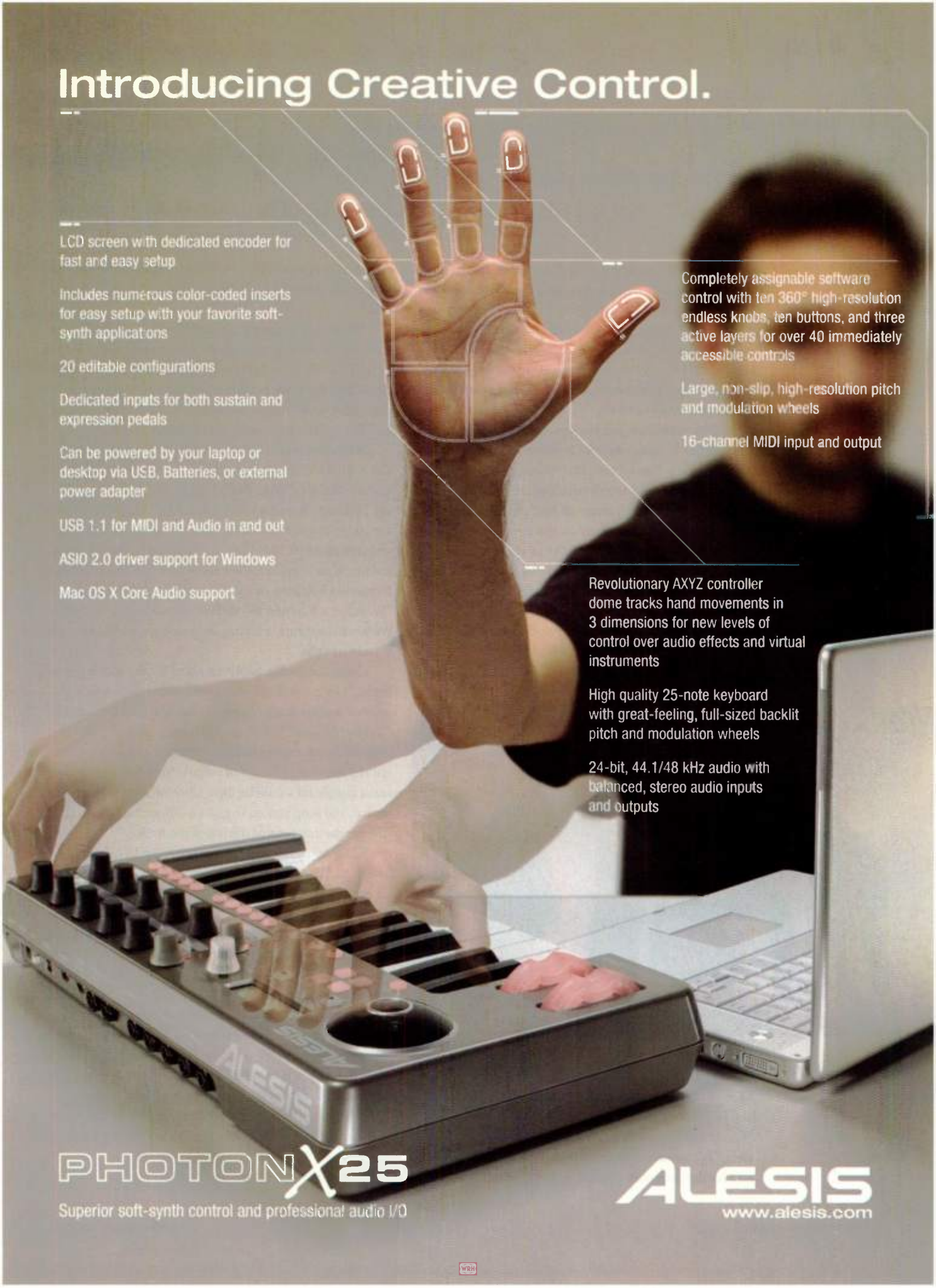
Hitachi expects commercially available hard disks with perpendicular recording to achieve a data density of 230 Gb/in$^2$ by 2007, which would allow 1-inch microdrives to offer capacities of 20 GB and 3.5-inch drives to provide 1 terabyte of storage. The company anticipates a tenfold increase in density over longitudinal recording in the next five to seven years, which would increase the capacity of 1-inch microdrives to 60 GB and 3.5-inch drives to 3 TB. That ought to keep electronic musicians happy for a while. EM




ADAPTED FROM GRAPHIC COURTESY OF HITACHI

FIG. 1: Conventional hard disks use longitudinal recording, in which the magnetic grains are parallel to the disk surface (a). In perpendicular recording, the grains are vertically aligned, allowing higher densities before superparamagnetism sets in (b).

# Introducing Creative Control.



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# Group Dynamics

By Matt Gallagher

## STS9 creates studio magic as a team.

Sound Tribe Sector 9 (STS9) is one of the hardest-working improvisational bands in show business. Founded in Atlanta in 1997, STS9 quickly gained a loyal national following because of its energetic, spontaneous, interactive, three-hour long live shows. The band consists of Hunter Brown (guitar), David Murphy (bass), David Phipps (keyboards), Jeffree Lerner (percussion), and Zach Velmer (drums).

STS9's music—an eclectic stew of electro-acoustic pop, funk, drum 'n' bass, hip-hop, ambient, dub, and more—integrates rhythm-section instruments with samplers, drum machines, and soft synths. Each band member uses an array of electronic instruments, and four of the five band members tote Mac G4s in their touring rigs, all of which are loaded with Ableton Live and Digidesign Pro Tools LE. In addition, Brown, Phipps, and Lerner use Propellerhead Reason and Native Instruments Reaktor.


Artifact (1320 Records, 2005) is STS9's fifth release and the product of intense collaboration and revision. "We worked for a year and a half," Brown says. "We started by passing Reason files back and forth." Phipps adds, "We would create a sequence, bring it into Pro Tools, and let the drummer play [along] to it with slight inflections at the end of 16 bars or 32 bars. Then we'd edit the drums and loops, and add acoustic instruments and sound effects.

IAN MCFARLANE

*Artifact*/Sound Tribe Sector 9

"Most of the music I create becomes a whole new song in the hands of another band member," Phipps says. "I'd make recordings at home on the piano. Hunter could find the most perfect eight bars, loop them, put a drumbeat underneath them, and it's beautiful. I never feel like I'm the lone bedroom producer."

While on tour, the band tracked its ideas into Pro Tools LE on Phipps's PowerBook G4 through an Mbox audio interface. "We did all of the sound effects, most of the percussion, and a lot of guitar and bass parts in the moment," Brown says. "What we sacrificed was preamps and compressors." Most of Artifact was tracked in band members' homes and rehearsal spaces. "All the overdubs happened between our different houses," Brown says. "We have a 32-channel Midas console and a Digi 002. We were constantly moving our gear back and forth, and it wore us thin."

Compositionally, band members let the music guide them. "On a couple of songs, the overdubs became the essence, and we stripped away the foundation," Brown says. "'Trinocular' and 'Vibyl' are both examples of that. The original foundation came from experimenting with different rhythms using pieces of sounds from field recordings and a sample off a cassette tape. Once we started recording to that, the song started to go in a different direction. The counter rhythm became the feel of the track."

STS9 sometimes overwhelmed its DAW with its overdubs. "The final track count for 'Tokyo' was 101, and LE stops at 32," Phipps says. "We bounced whole sections of the song, almost by frequency range. The drums were bounced to two tracks, all the high-pitched synth effects to one track, and all of the Rhodes stuff to one track. After what we've learned, we could do a similar album in half the time."

"We won't stick to a certain process just for comfort," Brown says. "We always have to change something. We're not so eager to be portable." Phipps elaborates: "One idea is to strip back down to our original five instruments, record for a few days in someplace tropical, and then bring that stuff back here to edit and add new sounds, but [this time] knowing Pro Tools." EM

*For more information, go to www.sts9.com.*

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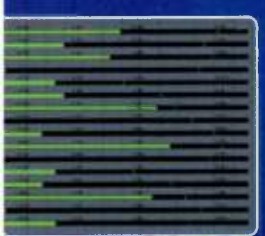

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MIKE CRUZ

# Nine Essential Online Resources

By Geary Yelton

The Internet has done more to advance the spread of information than any technological advance since the invention of the printing press. Electronic musicians and anyone else concerned with changing technologies have been the prime beneficiaries of online connectivity. Because our tools are always evolving and our work is so dependent on innovation, it pays to keep track of daily changes. Thanks to Web sites and discussion forums, the Internet enables us to learn about what's happening almost as soon as it happens.

The technical information you need is only a mouse-click away.

I want to share with you nine of my favorite sources for obtaining music information online. Some of them I visit several times a day, and others I visit whenever I need answers or I want to catch up on the latest news about a particular product or musician. In selecting resources for this article, I chose sites and newsgroups that aren't product specific or, at the very least, ones that concentrate on a type of product rather than on a single product from one manufacturer. Many sources allow access to information about a range of products or techniques, and it's up to you to narrow your focus to the resources that interest you.

## Usenet

Usenet is a phenomenon that's been around longer than the worldwide Web. It grew out of the bulletin board systems (BBSs) that were once popular for exchanging messages among computer users who owned modems and were willing to pay outrageous fees for the privilege of being pioneers. I began using BBSs and Usenet in the 1980s, years before the Web made online communication

virtually universal. Although the Internet has made many BBSs obsolete, Usenet lives on.

Usenet is a massive collection of messages posted to literally thousands of discussion forums called newsgroups (see the **Web Clip** "Netiquette 101"). Messages are sent from one news server to another in service of the people who use those newsgroups. Nobody owns Usenet, just as nobody owns the Internet, but newsgroups owe their existence to the system administrators who preside over and operate the servers that host them. You can access Usenet using your Web browser, or you can use a software application called a newsreader (see the sidebar, "Nuts and Bolts: Newsreaders"). There are many Web-based pathways leading to Usenet, including Google (http://groups-beta.google.com).

Dozens of Usenet newsgroups are devoted to various aspects of music and audio. Many concern musical equipment and software, and many of those begin with the prefix rec.music. Rec.music.makers is a collection of discussion forums, with newsgroups about hand drums, songwriting, chamber music, guitar tablature, and 20 other topics. One forum is rec.music.makers.synth, in which participants discuss synthesizers, music software, and related topics, as well as offer synthesizers for sale and advertise in search of rare vintage instruments. Another place to buy and sell music gear is rec.music.makers.marketplace, in which you can find anything from Neve consoles and Soviet guitar amplifiers to parts for your antique Teac tape recorder. It might take some time to find the newsgroup that suits your interests, but when you find the right one, you'll know it.

## Yahoo Groups

Another means to connect with newsgroups is by logging on to Yahoo Groups (http://groups.yahoo.com). Like Usenet, Yahoo has thousands of discussion forums. To find one that's right for you, go to the Yahoo Groups home page, click on Entertainment & Arts, and browse the selections under the heading Music or Audio and Visual Equipment. There you'll find lively discussions about virtually every piece of music hardware and software ever made. You might be surprised by how many others use the same gear as you do and want to talk about it. Most groups require that you register to read or post messages, but some let you browse without becoming a member. You can subscribe to XML feeds so that you receive updates in your newsreader. In addition, you can set up your subscription so that messages are sent to your email in box.

The number of Yahoo Groups might amaze you. When I followed Music > Instruments > Electronic > Synthesizers and Samplers, I found 584 related groups. I regularly visit more than a dozen Yahoo Groups, ranging from Korg Legacy Users and Moog Modular V to K5000 and OASYS PCI. The Logic Users Group (logic-users) currently has nearly 20,000 members and occasionally more than 4,000 messages a month. Yahoo Group users

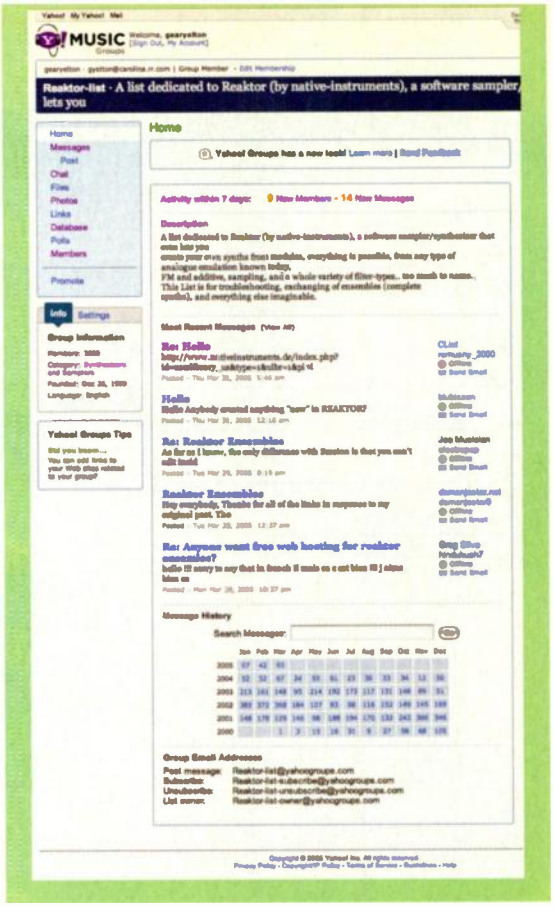


FIG. 1: Yahoo Groups offers an easy-to-navigate assortment of discussion forums on subjects ranging from electronic music production to bagpipe repair.

discuss technical problems and solutions, share rumors about new products, read about the latest updates, gripe about bugs, and suggest new features for the next update. Some groups are run entirely by independent users, and others are sanctioned by the product's manufacturer, who might have representatives available to answer your questions and take note of your concerns.

Finding your way around Yahoo Groups is easy. On any forum's home page, you'll see the group's description, links to the five most recent messages, and a grid that shows you how many messages were posted each month every year since the group began (see **Fig. 1**). Simply click on the grid to read any month's messages, or click on View All to read the most recent messages. On every page, you'll also see a menu that lets you post messages, enter real-time chat mode, look for files that other users have posted, see photos and Web links, participate in polls, and view a list of members. Because Yahoo Groups are supported by advertising, sometimes you'll need to get past a full-page ad before you can read a message. Sure, it's a minor inconvenience, but it's well worth your while to join the online community at Yahoo Groups.

## Harmony Central

Every morning when I turn on my computer, one of the first Web sites I go to is Harmony Central (www

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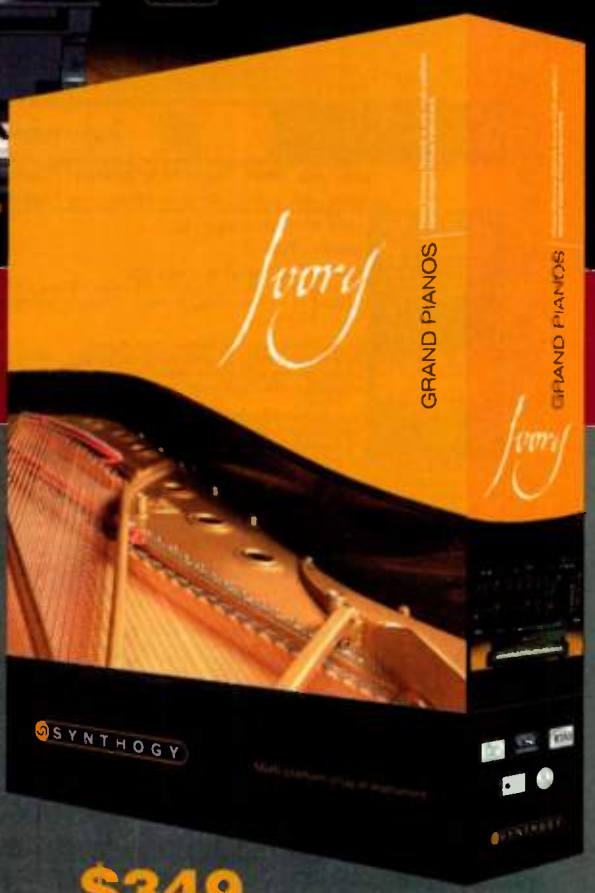


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.harmony-central.com). Harmony Central is an excellent source of news, discussions, reviews, and other useful and timely information about the world of audio and music technology. According to site administrators, I'm not alone: Harmony Central claims 70,000 unique visitors every day and more than a million every month.

Foremost on the home page is HC News, a collection of headlines from individual press releases about new or updated products (see Fig. 2). Typically, there are links to more than a dozen of the most recent releases, most accompanied by photos or screen shots. Additional links lead to a couple months' worth of news about music software, soundware, instruments, and similar products. The information that you'll find there is nearly identical to the news releases that EM editors receive directly from product manufacturers and their press agents, often on the same day that we receive them.

FIG. 3: On KVR Audio, you'll find the latest news on audio plug-ins and hosts that support VST, DirectX, Audio Units, and LADSPA formats.

HC News is available in the form of RSS feeds that you can access with your newsreader program. You can specify whether you want to see all of today's news or limit it to only news about bass, computers, drums, effects, guitars, recording, or synths.

Harmony Central also offers extensive coverage of product-related trade shows. In the past year, Harmony Central has covered AES, Musikmesse, and both NAMM shows. You'll find all show-related news releases and links to streaming video demos and interviews all in one place.

In addition, the home page offers quick access to exclusive online columns and links to gear reviews, artist features, and instructional articles posted by *Electronic Musician*, *Mix*, and numerous other magazines and audio Web sites. Harmony Central's thousands of user reviews can be especially enlightening. It's not unusual to find more than a dozen reviews of a particular instrument or device, each rating it for factors such as features, sounds, reliability, and customer support. Additionally, you'll find links to online contests such as performance competitions and product giveaways.

The Services page is especially handy if you want to buy or sell used gear or if you're trying to hook up with other musicians. It offers free classified ads in 11 product categories. A typical week might feature 75 ads offering to buy and sell synthesizers, for example, and well over 200 ads for effects processors. I've seen some amazing deals and hard-to-find gear there.

FIG. 2: For product news, newsgroups, show reports, and user reviews, Harmony Central is an extensive source of up-to-date information.

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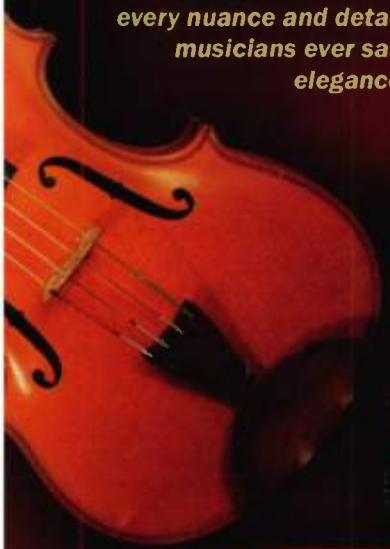


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Solo Piccolo

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1st through 3rd chair section

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1st & 2nd chair Tenor Trombones
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C Tuba
E Flat Tuba

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Not surprisingly, some of the busiest portions of Harmony Central are the user forums. Forums are available for more than 20 topics ranging from the music business and guitar lessons to live sound and configuring your Windows PC. Several forums have more than 100,000 posts. All in all, Harmony Central is a versatile Web site with something to offer musicians of every persuasion.


FIG. 4: With thousands of users and more than 20 discussion forums, Recording.org concentrates on topics that interest audio professionals.

## KVR Audio

Another Web site that I frequent is KVR Audio (www.kvraudio.com), formerly known as KVR-VST. In its mission statement, KVR defines itself as "a community and news site for open-standard audio plug-ins" for Linux, Windows, and the Mac OS. It further defines "open standard" by stating that "the software development kit (SDK) required to create them must be freely obtainable and available to all." That includes VST, DirectX, Audio Units, and LADSPA, and it excludes MAS, RTAS, HTDM, and a few other formats.

KVR is an invaluable source of news about audio software plug-ins and hosts—even freeware and shareware from companies you've never heard of. Like Harmony Central, KVR updates its news releases several times daily. The home page displays the ten most recent news items in their entirety, along with icons that indicate each product's computer platform and plug-in format (see **Fig. 3**). Each item also supplies four links: one to the developer's Web site, one to a KVR page devoted to that product, one to spread the news by email, and one to display the news item in a format that is suitable for printing. Below the news items on the home page are links to 20 less recent news items. As soon as KVR tells me that an update is available for software I use, I click on the developer's link, which usually takes me directly to the product's download page.

You can select the specific type of news that you want to view in your Web browser, either by doing a search or by simply clicking on the appropriate heading. You can view products by manufacturer, by type (instrument, effects, hosts, hardware, or development tool), platform, and so on. News headlines are available in RSS format as well, so that your newsreader can receive all news items or news only about instruments, effects, hosts, sounds, SynthEdit, or special offers. You can also subscribe to KVR's newsletter, which delivers the previous week's headlines to your email every Monday.

One page on KVR is dedicated exclusively to each product or family of products. The page on Steinberg Cubase, for example, covers all versions and offers specifications, user reviews, and related news items, as well as links to its support forum and KVR pages about related software such as Steinberg plug-ins. Another page lets you download banks, patches, and drum kits for a long list of instrument plug-ins.

KVR has a lively bunch of online forums. An extended FAQ and a list of rules is posted on the site, and membership is required if you want to post messages. In addition to topics such as instruments, effects, and hosts, you'll find the support forums for a number of developers, such as Wizoo and FXpansion.

KVR's user reviews are generally interesting and informative. Each product is rated for traits such as its sound, features, support, and stability. Each review has an icon that makes it easy to report to the sysop if you read something inappropriate. In general, KVR does an excellent job of deleting messages that are insulting, obscene, or far off-topic.

KVR is so extensive that it is almost hard to believe that it is operated by a single individual named Ben

## NUTS AND BOLTS: NEWSREADERS

The most popular means of accessing online forums is by using a Web browser such as Microsoft Internet Explorer or Apple Safari. Web browsers have many advantages, including easy maneuverability and the ability to display full graphics. Another means to receive the latest news is by using a newsreader, an application in which you subscribe to an RSS (which stands for *rich site summary* or *really simple syndication*, depending on who you ask) feed. When you run or refresh your newsreader, it will download the most recent messages so that you're always up-to-date about the topic at hand.

Most of the online discussion groups discussed in this article make news available in a format understood by newsreaders. Popular newsreaders include NetNewsWire for the Mac, SharpReader for Windows, Straw for Linux, and AmphetaDesk for all three computer platforms. Whether you'd rather access newsgroups using a newsreader or a Web browser is a matter of personal preference.

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Turl. It was recently purchased by Muse Research, makers of the Receptor VST plug-in player. KVR is an essential resource for electronic musicians, and one that you'd do well to visit often.

## Recording Org

With more than 23,000 registered users and nearly 150,000 articles posted, RecordingOrg (www.recording.org) is one of the busiest discussion sites for musicians and audio enthusiasts and professionals. At RO's core are more than 20 forums devoted to subjects such as pro audio gear, recording studio techniques, the music business, home and project studios, and live sound. Each is independently moderated by individuals who take care of day-to-day maintenance. RO currently has 15 moderators, all music and audio professionals with a wide range of experience. Although RO generally allows anyone to read the forum, you need to register and log in if you want to post messages. If you'd prefer to use a newsreader, you can also subscribe to RO's forums.


FIG. 6: All Music Guide offers detailed information on virtually any recording artist and recording.

It's revealing to see which forums are the most popular, as determined by the number of posts and topics for each. Pro Audio Gear rates highest, probably because the topic is a catchall that covers almost any audio hardware-related subject (see Fig. 4). Other forums may cover some of the same products, but they're not limited to discussions of hardware. In the Audio Video Film forum, for example, you'll find posts about video cameras and recorders, video-editing software, dialog recording techniques, sound effects collections, DVD mastering, and so on.


FIG. 5: If you want to learn more about almost any synth on the planet, a visit to Vintage Synth Explorer is essential.

Other RO sections include free classified ads and product-specific forums. Classified ads are divided into job postings and used-equipment sales. I was surprised to see how many ads were from users wanting to buy gear. Predictably enough, the job posting section is primarily filled with ads written by members offering their services, but it also has ads from sound-design companies and major manufacturers looking for employees.

RO is one of the few musician-oriented sites that charge a membership fee for its premium services. For $20 a year, the RO Club offers benefits such as real-time chat, detailed statistics, and the ability to submit news and post announcements. But it doesn't cost a cent to participate in RO's online community. For timely information and lively discussions, Recording Org's forums offer something new every day.

## Vintage Synth Explorer

For anyone interested in synthesizers, one of the very best resources is Vintage Synth Explorer (www

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.vintagesynth.com). VSE is basically an online storehouse of information on more than 500 synthesizers and samplers of every type: hardware and software, analog and digital, vintage and new. In fact, you'd be hard-pressed to think of a model that VSE doesn't feature in some detail.

A list of nearly 80 synth manufacturers appears on VSE's home page. Clicking on a manufacturer name reveals a list of every instrument (and sometimes a few other products) made by that company, arranged in alphabetical order. Clicking on Oberheim, for example, displays a list that has 15 synthesizers (from the SEM to the OB-12), the DX and DMX drum machines, the DPX1 sample player, the OB-Xk MIDI keyboard, the Prommer (a device for burning EPROM chips for drum machines), the DSX digital sequencer, the analog Mini Sequencer, and the Echoplex Digital Pro.


FIG. 7: Sweetwater's Web site proves that online stores can make tremendous contributions to the virtual music community.

Clicking on any instrument name opens a page that contains one or more photos or screen shots, a description, and detailed specifications that include the dates that the instrument was produced and the current estimated street value (see **Fig. 5**). You'll also find data on related and alternative gear and on the artists who used that product in their music. For software, there might even be a link to download a demo from its developer. Each page also lets you rate the product from 1 to 5 and displays the average rating given by other visitors.

One unique feature of VSE is the Synth Finder. It allows you to specify five parameters and then makes recommendations based on your selections. You begin by indicating the musical genre (electronic, pop/hip-hop, or other), synth format (analog, digital, or sampler), price range (over or under $500), features (modern or old school), and sound types (synth/pads/bass, acoustic reproduction, or drums/percussion). When you click on Find Synths, the online application will generate a list of instruments that fit your specifications.

VSE is more than a compendium of product information. It also has discussion forums on synth-related topics. In addition to discussions of samplers, soft synths, and synthesizers in general, you'll find an area in which you can solicit help with a technical problem. In another section, a timeline traces the development of synthesizers from 1970 to 2004. An archive section profiles a dozen recording artists, provides a MIDI setup guide, offers user-submitted technical tips, presents a synth FAQ, and gives you a glossary of electronic music terms. If synthesizers are your thing—especially learning about the history of electronic instruments since 1970—you'll find plenty of rich knowledge to explore at Vintage Synthesizer Explorer.

## All Music Guide

For information on recording artists and their recordings, nothing beats All Music Guide (www.allmusic.com). AMG attempts to catalog nearly every CD and LP ever released, and although it inevitably falls short of that lofty goal, it comes impressively close. There you'll find descriptions and reviews of hundreds of thousands of recordings, along with facts and opinions about the musicians who recorded them, written by full-time editors and knowledgeable contributors. AMG can teach you a tremendous amount about all sorts of musical genres and tell you about music and musicians you never knew existed. It can also give you the skinny on artists that you listen to every day.

Anyone can search and browse AMG, which allows you to view the biographical details of more than 75,000 recording artists as well as track lists, cover images, and reviews of most if not all of their recordings. Pick a musician or band and type that name into AMG's search field, or enter the name of an album or a song title. Every artist

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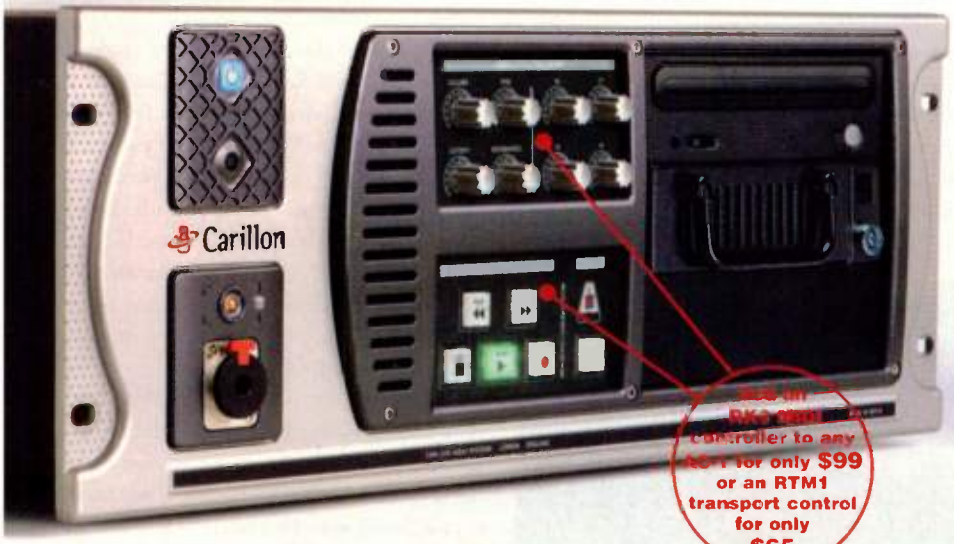


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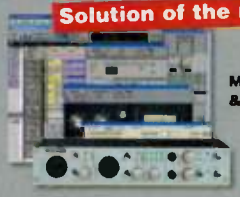

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and band has a dedicated page telling you who they are, where they came from, and when they were active (see Fig. 6). You can even view a collection of each artist's photographs, see whose songs they've recorded, and read about similar artists.

If you want to access AMG's premium content, registration is free; all you need to do is provide minimal demographic information such as your zip code, but not your mailing address. Registration authorizes you to listen to music clips, view album credits, and explore by musical style or mood. Advanced search capabilities let you find information by specifying details such as birthplace or see how well a song might have done on the Billboard charts. For anyone interested in modern music and musicians, All Music Guide is without peer.

## Sweetwater

Quite a few music stores have an online presence, but none of them can match Sweetwater (www.sweetwater.com). Sweetwater's Web site is more than just a wealth of product information. In addition to the company's detailed online catalog, you'll find lots of good advice on using modern studio tools and techniques. inSync Daily News, for example, offers technical tips and terms of the day. The Sweetcare 24/7 Support page features a searchable knowledge base, an online technical reference library, and links to inSync Summits, in which audio professionals discuss subjects such as vocal recording techniques and the practical differences between –10 dBV and +4 dBu levels.

Like several other resources I've mentioned, Sweetwater has a good selection of discussion forums. Anyone can view messages, but you'll need to register if you want to post. Sweetwater forums are neatly divided by topics under headings such as pro audio, computers, and instruments (see Fig. 7). In the Manufacturer and Gear forum, a handful of groups discuss particular products such as the Korg OASYS and Tascam GigaStudio. In some groups, posts run into the thousands.

The Sweetwater site also gives you access to online publications such as The Complete K2000 (a useful resource for Kurzweil users) and Jim Miller's Tech Notes. You can download catalogs and newsletters and read reports from NAMM and AES shows going back to 1996. Another Sweetwater resource of which I'm particularly fond is the Trading Post. On several occasions, I have bought and sold mixers, synths, and other hardware on Sweetwater's Trading Post, and using it is absolutely free. You can view ads sequentially or search for a product by name, manufacturer, or category. The people at Sweetwater have done an admirable job of creating a Web site that contributes to the online community of musicians, regardless of whether you're one of their customers.

## Native Instruments

Although many manufacturers have very fine sites, Native Instruments' Web site (www.nativeinstruments.de) is exceptional. There, you can quickly find product updates, software demos, audio examples, video clips, news releases, artist interviews, and more. NI's user forums offer more than 100,000 posts about virtual synths, samplers, and effects. Patch

libraries let registered users download presets created by other users—perhaps even the original software programmer. You can personalize NI's home page and see a quick overview of anything on the site that has changed in the past two weeks.

In addition to helpful beginner's guides, online tutorials guide you in exploring the depths of Reaktor, Kontakt, and other products (see Fig. 8). Granted, much of the site tries to persuade you to buy NI software, but the magnitude of product support and education you find there, combined with a thriving user community, make it well worth a visit for NI users and nonusers alike.

## Online All the Time

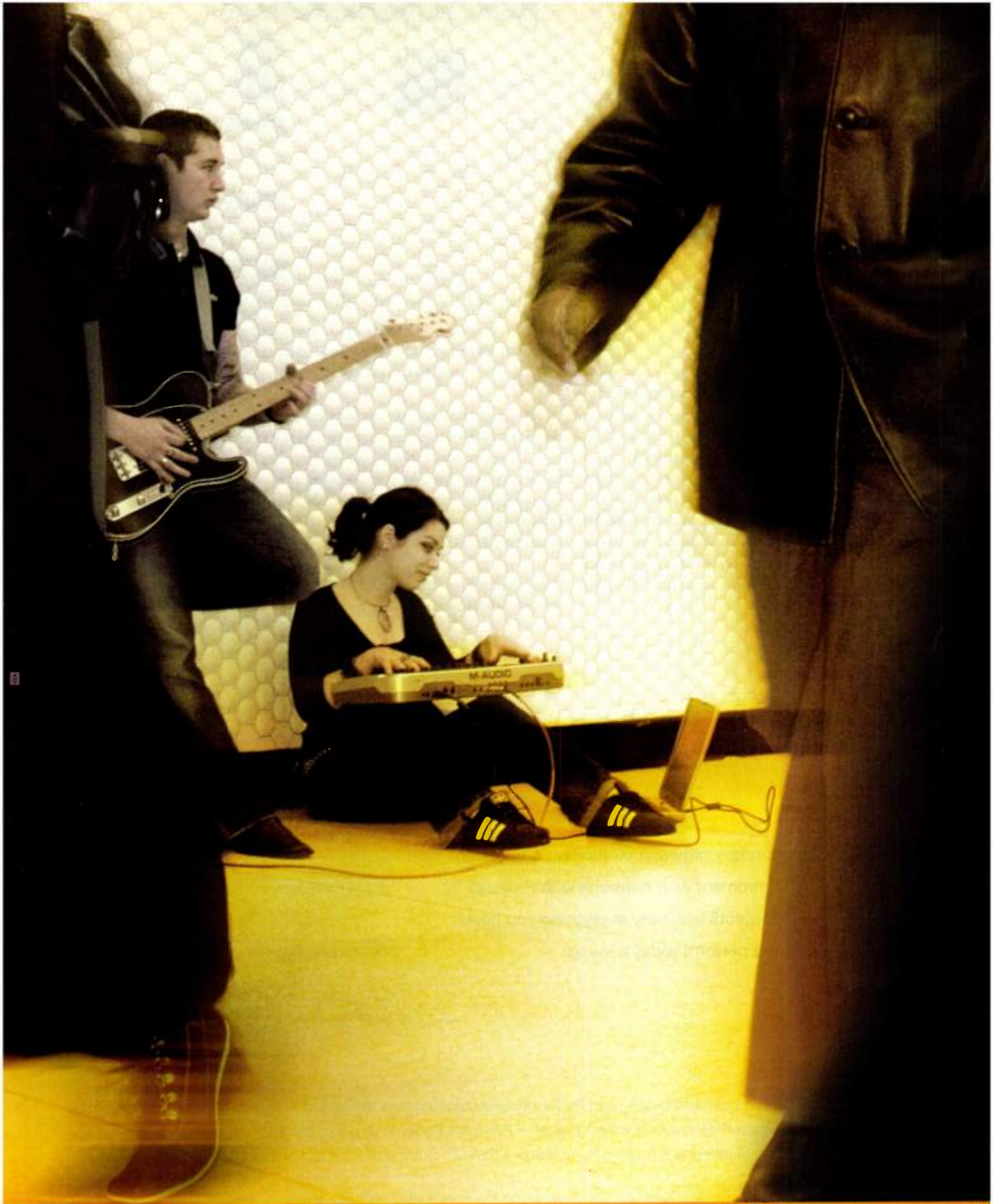
Cyberspace is filled with resources that cover any aspect of producing music using modern technology. I've covered only a few of the many useful sources of knowledge and communication that you'll find online. Because I chose resources that were general in nature, I had to omit many Web sites and discussion groups that focus on individual products. At the risk of shameless self-promotion, I would be remiss if I didn't at least mention one more Web resource you shouldn't miss. If you enjoy the print version of EM, you'll certainly find plenty of fascinating news, knowledge, and advice on EM's Web site (www.emusician.com).


FIG. 8: In addition to product information, news, user groups, and downloads, Native Instruments' site furnishes detailed tutorials to help educate you about the company's software.

Although the term *information highway* has fallen into disfavor from overuse, it is bigger, better, and faster than ever. There's no doubt that the Internet offers quick access to the knowledge you need to make better music and better recordings. Visit some of the sites and newsgroups I've suggested and get involved in the virtual community of electronic musicians. EM

EM WEB CLIPS

*Geary Yelton lives in Charlotte, North Carolina, with his lovely wife, Pam, and their amazing cat, Sadie.*

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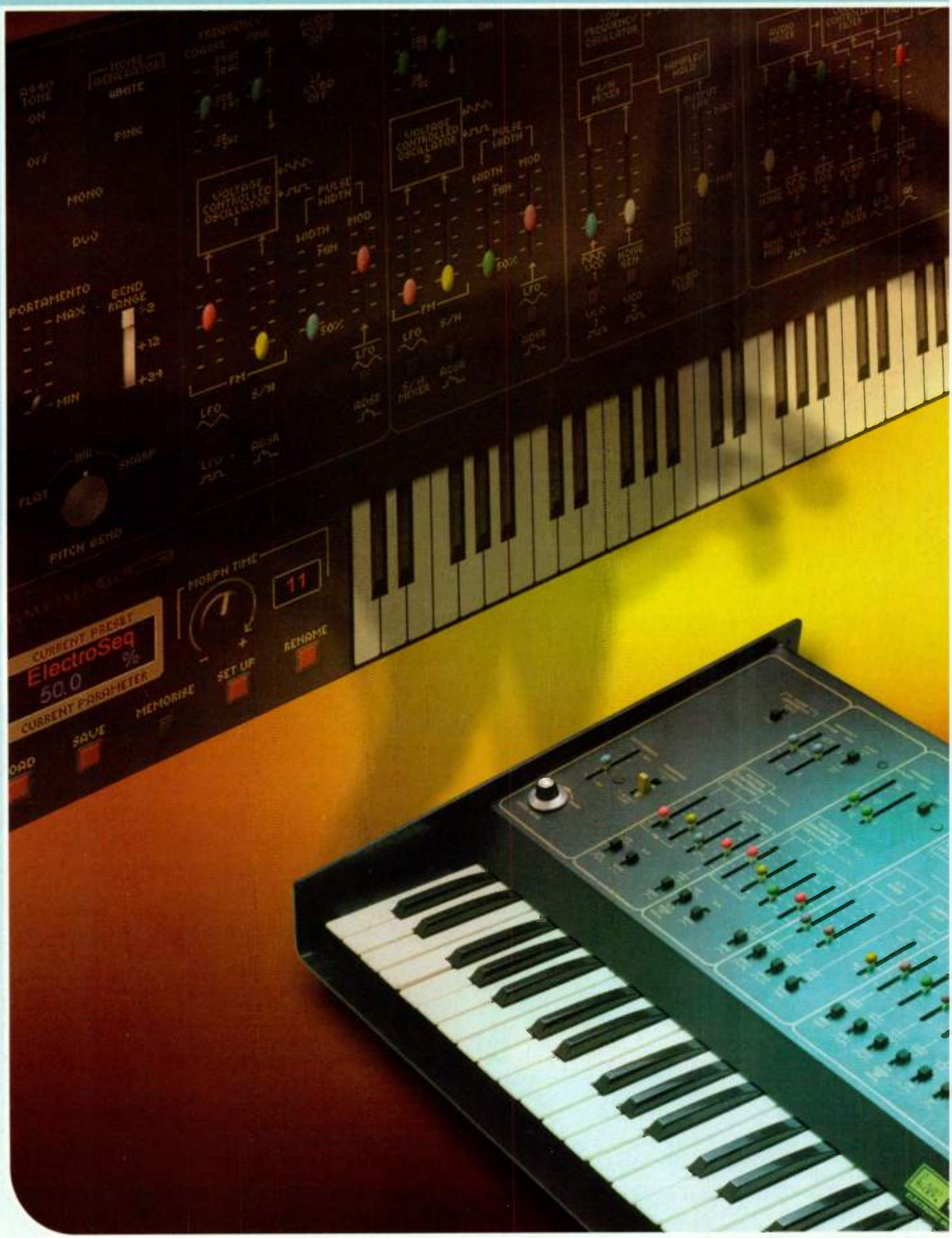
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BRUCE BROWN

We audition eight virtual synths to find out whether they re-create the sound of the dinosaurs.

# THE LOST WORLD REDISCOVERED

By Brian Smithers

They say the more things change, the more they stay the same. When it comes to synthesis, that statement certainly seems to be true. Names such as Moog and ARP come up in conversation as often as they did 30 years ago. This time around, however, the discussion is tempered by decades of improvements and conveniences in synthesizer design, such as patch memory, MIDI controllers, and computer synthesis.

The era of software synthesizers is in full bloom. Although many original synthesizers are being built entirely in software, numerous others are intended to emulate classic instruments from days gone by. EM decided it was time to check the state of the art in synthesizer emulation, so I tucked a computer under my arm and headed off to the synthesizer retirement home (yeah, I live in Florida) to do some comparisons.

The retirement home in question is the Audio Playground Synthesizer Museum in Winter Park, Florida (www.keyboardmuseum.com). Founder and curator Joseph Rivers has assembled an awe-inspiring collection of synthesizers and drum machines, from the classics to the curiosities. In actuality, retirement home is an inadequate description because the museum is housed in a full-fledged modern recording studio and features many of the latest synthesizers right next to the oldies.

## Matchmaker, Matchmaker

The matchups for our comparison consisted of an ARP 2600 with Arturia's 2600V and Way Out Ware's TimewARP 2600; a Minimoog with Arturia's Minimoog V (and a Minimoog Voyager just for fun); a Roland TB-303 with Muon's Tau Bassline Mk2; a Korg MS-20, a Polysix, and a Wavestation with their counterparts in the Korg Legacy Collection; and a Yamaha CS-80 with Arturia's CS-80V.

Our goal was to find how closely the virtual instruments sounded like their namesakes, therefore blind comparisons were in order. It was immediately apparent

that numerous challenges had to be addressed. Some older instruments clearly gave themselves away by the level of hum and other noise they produced even before I played a note. To minimize the prejudicial effect of that unavoidable reality, we kept the real instruments live while playing the virtual instruments, so the virtual ones were heard with the same background noise as the real ones.

One of the most challenging parts of the comparison process was trying to ensure that any bonus features of the virtual instruments didn't leave telltale signs. I played everything in mono, turned off all effects, watched for unison modes where none originally existed, and matched polyphony carefully. Some virtual instruments made that easier than others. For example, Arturia's documentation usually identifies virtual-only features clearly for those obsessed with veracity.

Another noteworthy aspect of the testing was that the wilder the sounds got, the harder it was to make comparisons. For one thing, many of the (usually excellent) presets that ship with the virtual instruments under our microscope make a point of using built-in effects such as chorus and delay and using extra oscillators or modulation matrices. Turning those features off often robbed the patch of its essence, so it was often not useful to start a comparison from a preset. Because of that, in some cases the comparisons start with a single oscillator and build from there.


FIG. 2: The TimewARP 2600 from Way Out Ware is almost more real than the real thing. It stood out for the smoothness of its filter sweep.

BRIAN SMITHERS

FIG. 1: Shown below is our panel of experts (from left to right): Lee Riley, Sam Zambito, Andy Hagerman, and Joseph Rivers.

Similarly, the range of certain controls was often quite different between the real and virtual instruments. That could be attributable to age-related drift in the real instruments or to shortcomings in the design of the virtual instruments. In some cases it was possible to match sounds closely by using different settings, such as a filter cutoff set significantly lower and with much less resonance on one instrument than on its counterpart.

The first round of comparisons, which included the 2600s, Minimoogs, TB-303s, and MS-20s, took place in Audio Playground's Studio B, which fittingly features more than 1,000 active MIDI channels connecting 80 or more keyboards and synth modules. Of course, given the vintage synths under examination, we used none of those channels.

I set up in the producer-performer area at the back of the room, and the esteemed panel of experts (see **Fig. 1**) sat at the console. An improvised screen shielded my activities from their eyes while allowing easy communication. Occasionally, panelists would ask to hear an example repeated or suggest a variation. The entire session was recorded in Pro Tools, and **Web Clips** are available online for most of the comparisons.

To keep the playing field as level as possible, all but one of the virtual instruments was played from the Open Labs OpenSynth neKo 64 keyboard workstation at 24-bit, 96 kHz resolution. The Way Out Ware TimewARP 2600 was available only as an RTAS plug-in at the time (AU and VST versions are in the works), so it was played through a Digidesign Mbox at 24-bit, 48 kHz resolution. Real and virtual instruments were patched to the console in mono and panned dead center. Levels were hand-matched carefully and often had to be changed from one patch to the next.

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The first round was besieged by a number of time-consuming difficulties with the vintage instruments (score one for the virtual instruments), so a second round had to be completed remotely. I returned to the museum to record the comparisons for the Wavestation, CS-80, and Polysix, and I posted uncompressed mono files online for the panelists to analyze.

As the operator, I have to confess an unbridled preference for the virtual instruments. In fact, after spending many hours wrestling with drifting oscillators, sticky sliders, noisy outputs, faded silkscreens, persnickety connectors, and other assorted electronic maladies, I felt the need to spend a good solid week playing my bamboo flutes barefoot high in a tree just for balance. Certainly enough time and money would make playing the vintage instruments less like playing Russian Roulette, but for me the cost-benefit analysis weighs heavily in favor of spending that money on a fast CPU and a low-latency audio interface so I can spend my time making music with the soft synths. Our priority here is the accuracy of the emulation, however, so let's see what the guys with the golden ears thought.

Be wary of drawing inferences of superiority based on descriptive terms such as warmer or brighter. We each had preferences here and there, but they were often based on analyses more complex than isolated timbral distinctions.

## ARP 2600

The first synth under the microscope was the first synth to cause problems. Although the museum's ARP 2600 functioned pretty well, its companion keyboard didn't. To be fair, it wasn't clear whether the keyboard or the synth was at fault, but there was no way to get the two cooperating well enough to play musical phrases. The ever-resourceful Rivers brought out a MIDI keyboard with a MIDI-to-CV converter, and that was better, but still not up to the task. We had to resign ourselves to comparing the oscillators and filters more like scientists than musicians.

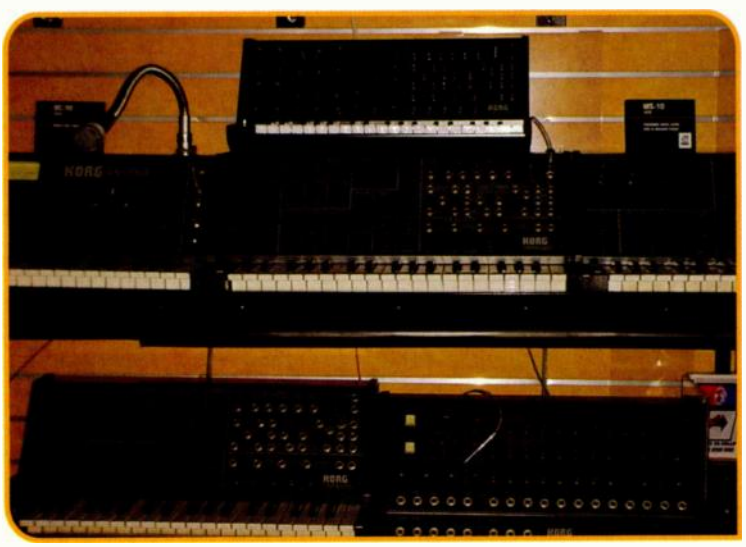

FIG. 3: The Korg MS-20 Controller is shown sitting atop its namesake and surrounded by its ancestors at the Audio Playground Synthesizer Museum.

After carefully matching output levels between the 2600 V (running on the neKo 64), the TimewARP 2600 (running on the Mbox), and the ARP itself, and doing everything possible to eliminate LFOs and filters as variables, I played raw waveforms for the panelists. Starting from silence, I ramped up the level to full volume, held it there for a few seconds, and pulled it back down. I immediately repeated the process with the other two instruments. Some differences revealed themselves immediately. I had expected that moving the onscreen control with my mouse would make the TimewARP (see **Fig. 2**) an obvious virtual, but in fact it was the ARP that gave itself away with a sticky slider. On subsequent examples, I was able to coax somewhat smoother behavior from the ARP.

In comparing sawtooth and pulse waves, the panelists had no trouble identifying the real 2600, although not necessarily for the reasons that one might expect. Bassist and composer Andrew Hagerman declared all three instruments "astonishingly alike except for some subtle color differences." The 2600 V's sawtooth was unanimously declared brighter than the others, with the TimewARP's sounding rounder, fuller, and more interesting. The 2600 V's pulse wave sounded fuller than its counterparts, which were described as nasal by comparison.

Interestingly, when I swept the 24 dB-per-octave lowpass filter on each instrument, the most satisfying result for all of the panelists was from the TimewARP, with the ARP exhibiting a much coarser behavior than the others. Based on that, three of four panelists felt the TimewARP sounded more real than the real ARP. The ARP's cutoff control was jittery enough to be described as bad digital stair-stepping. The 2600 V also sounded stepped to three panelists, albeit less so than the ARP.

The ARP's sticky pot made me wonder about the differences between the physical controls involved. The Arturia was being controlled from the neKo 64's touch screen, whereas the TimewARP was being controlled from my notebook's Accupoint pointing device. (Accupoint is Toshiba's term for the eraser-head-style pointing stick, which I have always preferred to the more common glide pad. Now I have one more reason to prefer it!) It is hard to gauge the extent to which the difference was attributable to the physical control, but it's important to note that the expected superiority of a physical control clearly diminishes when that control is 30 years old.

For the final 2600 example, I cranked up the resonance and swept the filters again. The resonance characteristics varied more widely than any other parameters

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we tested, with the real ARP self-oscillating earlier in the control's range and more wildly than either virtual. That generated the only "yikes!" of the evening. The TimewARP again scored points for smoothness, with the Arturia displaying interesting artifacts, which were regarded positively by one panelist and negatively by another.

## Korg MS-20

You would expect the instruments of Korg's Legacy Collection to be dead ringers for the originals, but the MS-20 was tough to match. Still, it managed to cause a bit of confusion. Two technical challenges, one analog and one digital, caused major delays in preparing the examples. The first real MS-20 we tried had such bad drift in the oscillators and in multiple components that by the time I got the virtual instrument matched, the sound of the real one had changed dramatically. Fortunately, the second unit was better behaved.

I had hoped to use the Legacy Collection's MS-20 Controller (see **Fig. 3**)—a USB device slightly smaller than the original MS-20 that reproduces its controls right down to the patch cables—to simplify the setup process. I quickly discovered, however, that settings on the controller don't always line up very well with the settings in the software. For example, raising a knob from a setting of 0 to 1.5 often failed to move the onscreen control at all, and higher settings were off by one or more values often enough to make the controller more hassle than it was worth in this context. (In performance, of course, you're usually not trying to match the settings of another MS-20 on the fly, so this is not an indictment of the controller when used for its intended purpose.)

FIG. 4: A vintage Minimoog shares the stand with its virtual counterpart, the Arturia Minimoog V, running on the Open Labs OpenSynth neKo 64 keyboard workstation.

One of the nice touches about the Korg Legacy Collection is the inclusion of the original manuals on the installation disc, including the *Setting Examples*, consisting of patch documents to be used as examples and blank patch sheets for user settings. I started with a couple of the example patches, first dialing them up on the real MS-20 and then matching the settings on the virtual instrument. Matching the knobs as carefully as possible did not result in a convincing sonic match. With a bit of imagination and effort, however, I was able to get the two to sound much closer.

The first patch was labeled Trumpet in the *Setting Examples*, and the drifting oscillators seemed to give the real instrument away. Despite its erratic pitch, it was described by synthesist and trumpet player Sam Zambito as "vibrant, rich, and detailed," with a "stronger character" than the virtual version. The rest of the panelists agreed, calling the real instrument "more substantial" and "beefier" and the virtual instrument "thin" and "too clean."

On the second patch, the comments ran along similar lines, so I decided to experiment with the virtual MS-20's Analog knob. Like some other designers, Korg has decided to allow users to determine how much old-school random behavior they want their soft synths to exhibit. I cranked the knob way up and reversed the order of the examples, and all of the panelists were convinced that the real MS-20 had simply gone further out of tune. Thus I scored the first and only successful deception of the evening.

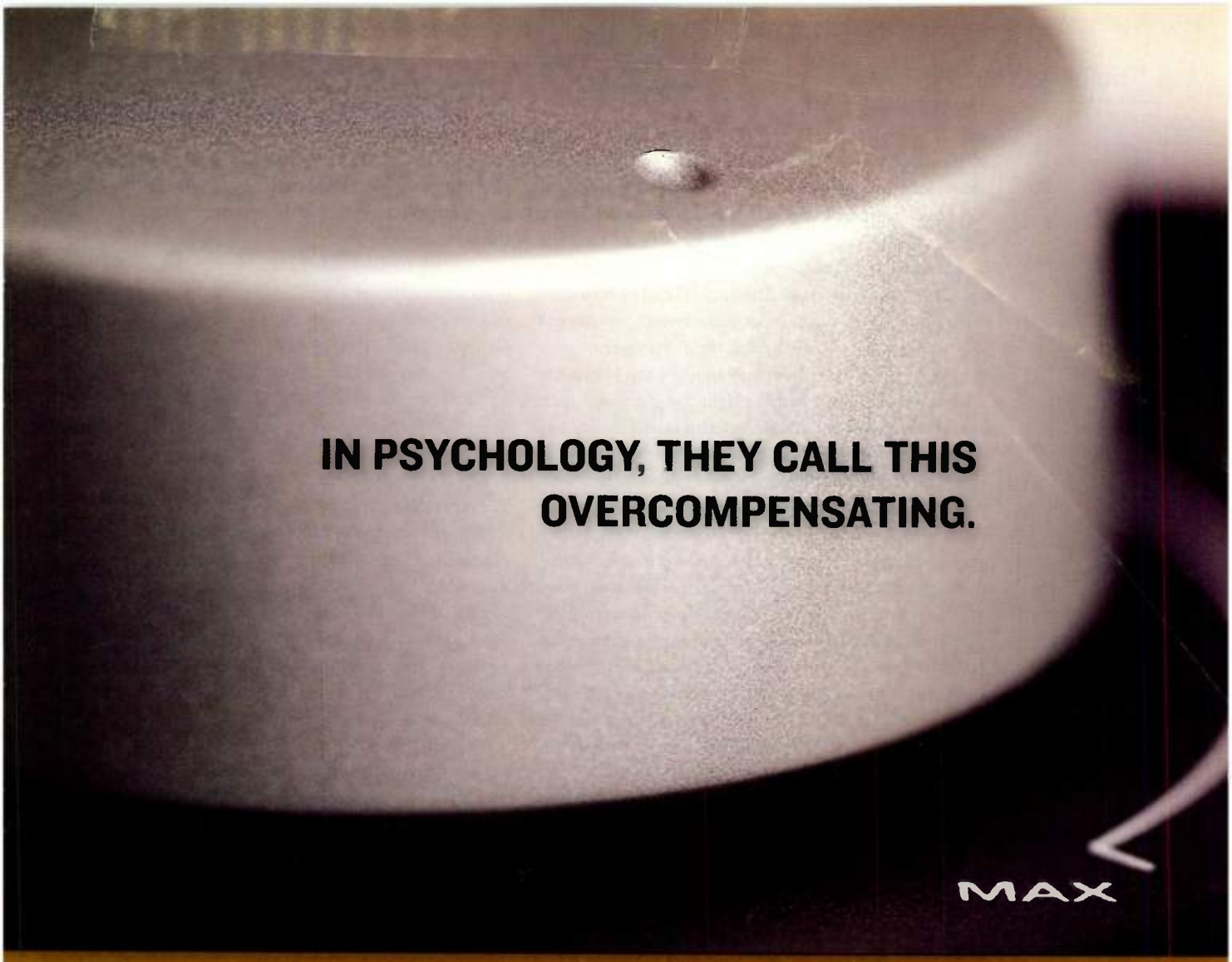
The real MS-20 generally sounded bigger and richer than its virtual cousin, but as Hagerman put it, "Do I really want to battle drifting oscillators to get a slightly more present sound?" It was difficult to get rid of a persistent ensemble sound in the virtual MS-20, a characteristic that was not disliked but was taken as a digital giveaway. The most convincing part of the emulation was the analog-misbehavior knob, a mixed blessing outside of our context.

## Moog Minimoog

The Minimoog (see **Fig. 4**) was one of the highlights of the shootout, both for the relative good behavior of the real Moog and for the quality of Arturia's emulation. There was actually a split decision from the panel on which was which, validating the accuracy of the Minimoog V's sound.

I started with a one-oscillator patch, playing a few examples and varying the patch slightly as I went. Rivers used the term "rich" to describe the real Minimoog, while Zambito used the same word to describe Arturia's virtual version, demonstrating once again that musicians don't adhere to the same descriptive standards as scientists. Their description of the real Minimoog's high end was more revealing—one panelist said it sounded "more open," and another said it had a "thinner" sound.

Three panelists independently used the term "reedy" to describe the Minimoog's sound as I tweaked the filter a bit. I tried hard to emulate that quality in the virtual version, but I experienced only a limited amount of success. There was always a bit of grit in the Minimoog's filter that the virtual one couldn't quite replicate. On the other hand, our experts agreed that at times, Arturia's

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virtual version sounded "dense" compared with the real Minimoog. At least one patch was described as better able to cut through a mix than the real instrument.

I couldn't complete my comparison of the Minimoog without trying my hand at a bass patch, and I took the liberty of switching the order just to keep everybody honest. Everybody knew immediately that I had switched the order; not everybody, however, picked which instrument was which correctly. Although the instruments were distinguishable, the entire panel thought the Minimoog V captured the sound of the original well enough that, as Hagerman put it, "given the extra functionality and consistency of the software, I'd probably opt for the soft synth on practical grounds." Rivers added, "great software—I think they did the Moog justice."

The Museum counts within its collection a signature-edition Minimoog Voyager, and we couldn't resist matching it against the others, so I dialed in the bass patch as closely as I could. This test was not blind, and we had already discussed the other two in detail, but it was nonetheless interesting to hear. Composer-keyboardist Lee Riley described the Voyager as "analog by nature, but with a clean digital approach—like Sean Connery in an Armani suit." He went on to opine that the Minimoog V came closer to the Voyager than to the original Minimoog. Zambito felt the Voyager "seemed to deliver the best attributes of the [classic] Minimoog and virtual synth."

## Roland TB-303

Muon's Tau Bassline Mk2 (see Fig. 5) models the synthesis, but not the sequencer, of the original TB-303, so I had to play both by hand. Given the tiny buttons that pass for keys on the 303, it took some doing to match the performances. Once I did, however, the differences between the real and virtual almost completely disappeared.

"Wow" appears in Hagerman's and Rivers' notes, with Zambito concurring, "great!" Riley and Zambito found the Tau "thicker" and "richer" than the original, but all agreed that the two could be made to sound almost identical. At one point I simply played alternating notes on the two, and it was difficult to tell that they weren't all coming from the same instrument.

Getting to the same place on both instruments took several minutes because the range of the cutoff and resonance controls on the two overlapped but did not completely coincide. As Hagerman put it, "The soft synth has a bit more range of expression and a bit more edge, but [at best] they are so close!" Score one for the fine art of doing one thing and doing it well.


FIG. 5: One look reveals that Muon's Tau Bassline Mk2 is a software emulation of the classic Roland TB-303. It's as much a sonic dead ringer as it is a visual match.

## Korg Polysix

The Polysix (see Fig. 6) was well-behaved except for being slightly flat, even when tuned as high as it would go. The variability of its controls, however, made for some challenges in trying to match sounds. If you've ever tried to hang a picture and found that every time you tried to level it you over- or undercompensated, then you've got an idea of the difficulty that I had. (The original Polysix has 32 user memories and tape backup, and thank goodness it does!)

As with the MS-20, I started with some of the example patches from the original Polysix settings manual. A brass patch with a delayed pitch modulation sounded similar on the two, but there was a pop in the attack of the original instrument that I couldn't reproduce on the Legacy Collection virtual instrument. Conversely, there was a nuance in the virtual instrument's attack that didn't seem achievable in the vintage version. Ideally, I would have liked to get both attributes at the same time. Composer Riley noted the warm ensemble character of the virtual version, and indeed the real Polysix sounded timbrally flat by comparison, contrary to our biased expectations.

Next I took a preset from the soft synth and tried to match it on the hardware instrument, with mixed results. In this example, the software revealed itself by its consistency from phrase to phrase and from note to note. Hagerman felt that it had "a great core to the sound, and a constancy that makes me say that it's the plug-in." The hardware had a long-cycle modulation that took the heart out of the sound periodically despite my best efforts to remove all modulation sources from the equation. It sounded similar to the software at the brightest end of the cycle, but its variability was telling and frustrating.

In setting up a pizzicato bass patch, it turned out that getting a timbral match was not nearly as difficult as getting an articulation match. It felt as though the real instrument needed a fine-tune knob to go with each of its envelope controls because the smallest turn of the knob seemed to move from too short to too long. It seems almost sacrilegious to say that it was much

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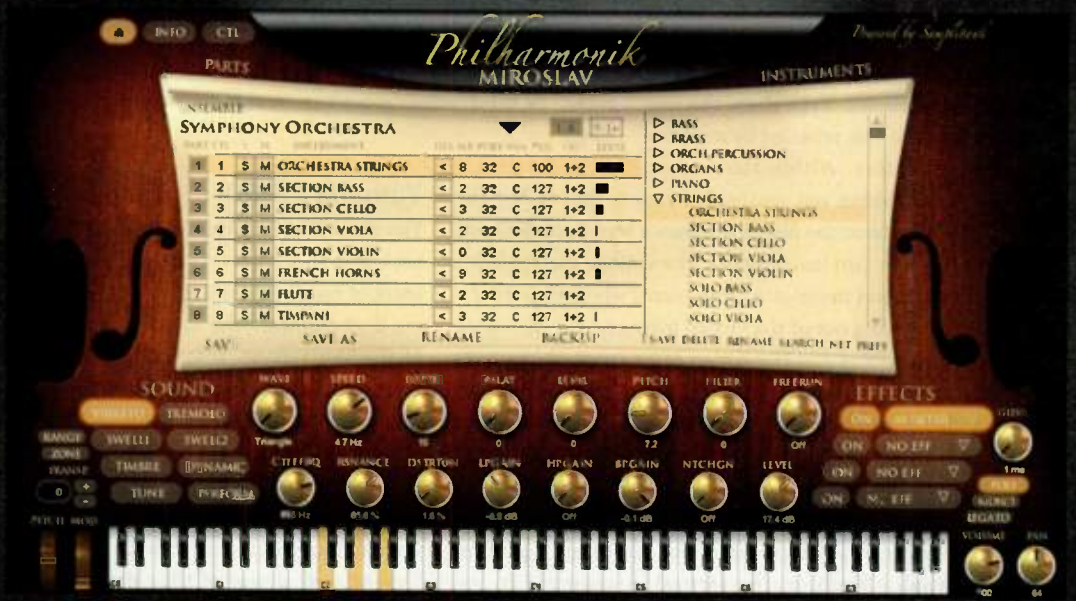


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easier to use the mouse than the real knob, but in this case that was true. Bass player Hagerman felt the soft synth lacked the weight of the hardware, sounding "a bit sterile." He concluded, "I'd choose the second device [the real Polysix] in a heartbeat, and layer it with another sound that can give me a little more attack; then I'd have the best of both worlds!"

To test the behavior of the filter, I experimented with a tinkly space-harpsichord until I got a near match. The Polysix was noticeably out of tune from octave to octave, so I was restricted to playing narrow-range examples. Even then, the real instrument was revealed by its drifting oscillators. Within that range, the basic timbre was reasonably easy to match, but the characteristic of the filter's resonance was quite different between the two instruments. The vintage instrument's resonance was more often dissonant, whereas getting a pleasing twang out of the virtual instrument's resonance was easier. Riley and Hagerman came down on opposite sides as to preference. Riley felt that the virtual "had trouble with the subtle nuances inherent" in the real instrument's sound, whereas Hagerman found the pitch problems distracting, preferring the "bit of extra shimmer" in the virtual instrument's timbre.

For the final Polysix example, I once again pushed the Analog knob on the virtual instrument to see what happened. In this case it took an organesque patch and grunged it up quite successfully. Ultimately, it made the soft synth sound older and more messed up than the old Polysix.


FIG. 6: The Korg Polysix is part of the Legacy Collection, along with the MS-20 and the Wavestation.


FIG. 7: With CS-80V, Arturia reduced the behemoth Yamaha CS-80 to laptop weight. As shown, the virtual version allows layering of as many as eight patches and a modulation matrix.

## Yamaha CS-80

Yamaha's CS-80 features two layers of push-button presets, but those presets predate ROM-based memory, instead recalling settings stored on small sets of sliders that duplicate the main sound controls on the face of the instrument. That makes the presets stored in a vintage instrument unreliable as indicators of what the instrument's designers really had in mind; they still, however, provided a convenient point of reference for our comparison.

The CS-80 (see Fig. 7) proved to be one of the hardest instruments to match with its virtual counterpart. I spent a good deal of time trying simply to re-create a patch on one that sounded good on the other, and I came away frustrated every time. That is not to say that the virtual instrument doesn't sound like the original; it does, but not in the carbon-copy sense. Compared to this particular vintage CS-80, the CS-80V is more of a fraternal twin than an identical twin—they are clearly born of the same lineage, but not of the same DNA. After hearing several examples, Hagerman concluded, "This might not be the best example of a plug-in copying a vintage model, but it certainly captures the spirit."

That qualification is no small factor in a comparison such as the one we are doing for this article. It's impossible to tell how much a particular specimen sounds like it was intended to sound 30 years ago. If you fell in love with the sound of your friend's classic CS-80 and then found one of your own on eBay, could you realistically expect them to match each other perfectly?

Each of the examples started with the presets, most of them a 50/50 mix of a Part I preset and a Part II preset. From that point, I tried to eliminate variables and match filter settings for the best timbral affinity. In general, the real CS-80 enjoyed a deeper bass response and

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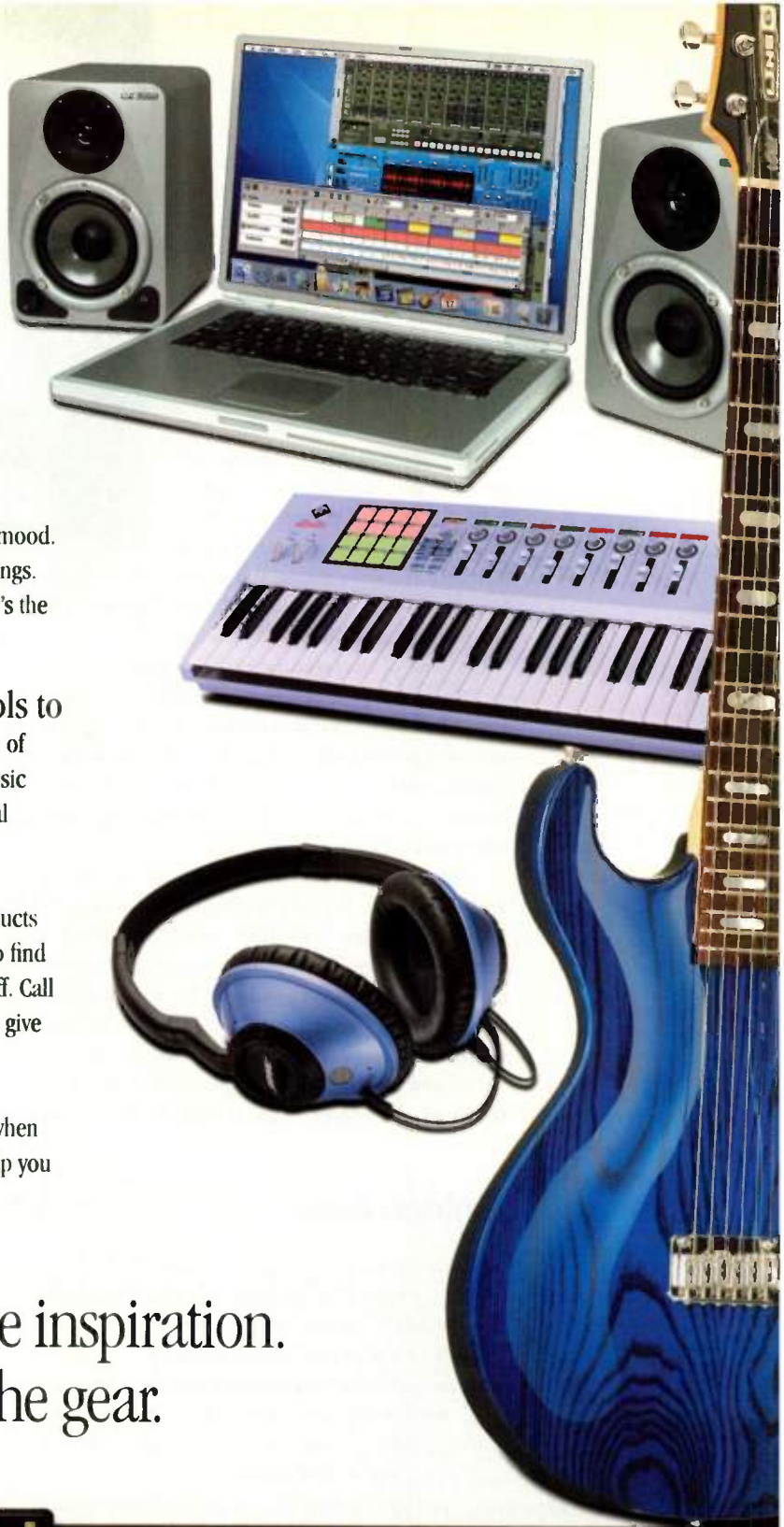

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meatier filter modulation than the Arturia version, although the range of timbres and amount of modulation control offered by the virtual instrument were impressive.

The Strings 1 and 2 presets for the virtual instrument didn't sound very close to those of the real instrument, but layering Strings 3 and 4 produced a better match after some filter tweaking. The low end of the real CS-80 had more of a core to the sound, but both instruments achieved the thick, sinewy texture that one would expect from a brass patch, despite the name. The panel heard a bit more "Aftertouch" in the virtual instrument, along with "a lot more of that traditional analog fuzz."


FIG. 8: Korg's virtual Wavestation, another part of the Legacy Collection, matched up extremely well with its namesake due to the digital nature of the waveforms.

Next up was the Flute patch, which exists only on Part I, so I mixed Part II out completely. The Arturia version of that patch was respectably flutelike, whereas the Yamaha version was more nasal and variable over the course of a phrase—an interesting but pretty strident effect, and less like a real flute.

There are two pairs of Funky presets on the CS-80, and both made for interesting comparisons. Funky 3 and 4 use a big, slow filter sweep that made for a dynamic fanfare. The real instrument again sounded a bit fuller on the bottom end, but the virtual achieved a more intense edge at the peak of the filter sweep, teetering on the brink of self-oscillation.

Funky 1 and 2 sounded like a bass line to me, so that's what I played. The Arturia had a nice touch wah sort of attack that wasn't present in the Yamaha, whereas the Yamaha almost sounded as though it had a subharmonic generator fattening the bottom end. Once again we turned to Hagerman, our resident bassist, who said, "Personally, I prefer the [Arturia], but based upon any given project's needs, I might choose either."

The final test of the CS-80 was an equal layering of Organ 1 with Organ 2, and the results were in line with the previous examples. The Arturia CS-80V was easily distinguished from the Yamaha CS-80 by its clarity and evenness. Nevertheless, all of the things that are interesting about the original—richness and variety of sound coupled with impressive modulation possibilities—are present in the emulation. Its additional modulation matrix, effects, and layering capabilities make it even more distinct from the original.

## Meet the Golden Ears

Andrew Hagerman (www.singularityarts.com) is a bass player, composer, and author of *Pro Tools LE 6 Ignite!* (Muska & Lipman, 2003) and *Digital Music Making for Teens* (Muska & Lipman, 2004). He also coordinates Pro Tools training in the Asia-Pacific region for Digidesign Japan.

Lee Riley is a Pro Tools engineer, keyboard player/programmer, and film composer who has recently been involved in post-production stereo and surround-sound mixing. He is an associate course director of advanced audio workstations at Full Sail Real World Education.

Engineer, producer, and synthesizer authority Joseph Rivers operates the Audio Playground studio and its world-famous Synthesizer Museum. He has also worked as a consultant and sound designer for major synthesizer manufacturers.

Trumpeter Sam Zambito (www.samzam.com) is one of the first and most prominent proponents of Nyle Steiner's Electronic Valve Instrument. He has done sound design and programming for the likes of Michael Brecker and Bob Mintzer.

## Korg Wavestation

The Wavestation (see **Fig. 8**) made for a particularly interesting comparison, pitting two digital devices against each other. Unsurprisingly, that made for some of the most perfect matches of the entire session. Still, some patches sounded different from real to virtual instrument.

The real instrument was the rackmount version, the Wavestation A/D, which slightly predates the Wavestation SR modeled in the Legacy Collection. The A/D's joystick controller, used to control the Wavestation's Advanced Vector Synthesis, is quite small, giving the neKo 64's touch screen or even a regular mouse a bit of an advantage for subtle timbral control. It was also convenient on the virtual instrument to be able to Ctrl + click to center the control or double-click on a corner to jump to that spot.

I paired up the first wave sequence that caught my ear, called The Wave Song. It was nearly impossible to

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hear any difference between the real and virtual versions. Being a decade or so newer than most of the other synths that we heard and not being dependent on lots of knobs and sliders to create its sounds, the Wavestation produced the best emulation right from the start. Riley commented, "Wow, this is a toughie. These two samples are pretty much identical." There was no issue of excessively noisy output or oscillator drift, and the digital nature of the PCM waveforms and the patch information gave us a true apples-to-apples comparison.

## Contact Information

**Arturia**, www.arturia.com
**Muon**, www.muon-software.com
**Korg**, www.korg.com
**Way Out Ware**, www.wayoutware.com

The second wave sequence, Deep Atmosphere, exhibited some subtle differences between real and virtual. The fundamental pitch seemed to blossom a bit more fully in the soft synth, and the wind noise was a bit more interesting. After a bit of hedging over the differences, however, we concluded "that any differences between the two are almost not worth mentioning."

On the third wave sequence, Sting Waves, the Legacy Collection's virtual Wavestation had a heavier metallic component, and its character was more dynamic right from the start of the note. Hagerman described it as "more intricate [with] a lot of internal detail and motion to it—definitely a more interesting sound." The real Wavestation was a bit mellower and delayed the onset of modulation slightly. The character of the soft synth excited our memories of how these synths sounded to us back when they were new, with Riley declaring, "It has that typical Korg 1990s M1, pre-Triton aura about it."

Next up was a searing lead sound called Mini Lead. Moving the vector controller changed the timbre by rebalancing the oscillators, which added life to the melodic line that I played. On the final note, I attempted a feedback-guitar effect, which was more effective on the real instrument than it was on the virtual one. The virtual instrument, however, had a percussive attack that wasn't present in the original, much like the attack that the virtual MS-20 sometimes exhibited. In Hagerman's estimation, it seemed to have "greater sensitivity to Velocity."

Guardians is a hybrid between glockenspiel, electric piano, and subtle angel voices, with an arpeggiated burbling sound overlaid. The hardware and software versions were almost identical, but the software burbling was a tiny bit more pronounced. Whether that is a good thing or a bad thing would depend entirely on the context.

When I heard Song Bells, I couldn't resist stacking fourths in tribute to a classic sci-fi theme. The virtual and real stars fell back into alignment, with the two instruments matching very closely. After demanding semiseriously, "Come on, these are both the same synth, right?", the panel observed "a bit more definition to the attack" in the virtual version.

## To Emulate or Not

Make no mistake—our strong consensus was that the makers of the virtual instruments deserve our respect for the quality of the emulations and our thanks for giving us great sounds with the convenience of software. Still, all things being equal, in several cases there were still reasons to prefer the hardware for pure sonic quality. For example, in discussing the MS-20, Hagerman noted a certain "it" factor that distinguished the vintage instrument from its emulation. It's difficult to be less vague about the distinction, but we all heard it.

Musicians have had this sort of debate since before synthesizers ruled the earth. How many violin makers have tried unsuccessfully to copy a Stradivarius? Nothing else sounds the same, no matter what we try. But then, as age and accident take their toll, there are fewer and fewer such antiques available, and musicians must have instruments they can play.

For that matter, how much does a Stradivarius sound like it did when it was made? How much does one Minimoog sound like another? The vintage Minimoog and the Voyager are cut from the same cloth, but they didn't sound identical. The virtual versions generally came as close to their namesakes as the Minimoogs were to each other, and sometimes closer.

Software emulations keep getting better, and the vintage instruments they model keep getting older. Like the paleobiologists in *Jurassic Park*, manufacturers search for the essence of what made the great old synthesizers so great and then do their best to reproduce that in living, breathing instruments.

At the risk of kicking a good metaphor too hard, consider that the reproduced dinosaurs in the movie picked up where their ancestors left off and started evolving and adapting to their new surroundings. Our assembled brain trust found that aspect of the emulations most fascinating. Sure, we can do a good job of capturing the classics in a more convenient format, but where do we go from there? It turns out that we can go quite far, as became evident from all the evolved features I had to defeat to do fair comparisons. Eight-layer multis of a CS-80? 32-voice polyphony (or unison) from a Minimoog? To our panel of experts, that sounded like the basis for a new generation of classics. EM

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*Brian Smithers is course director of Advanced Audio Workstations at Full Sail Real World Education and is the author of* SONAR 4 Ignite! *(Muska & Lipman, 2004).*
*Special thanks to Andy Hagerman, Sam Zambito, Lee Riley, and Joseph Rivers for their invaluable assistance.*

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ED COLVER

# Garage of Dreams

By Maureen Droney

Producer and engineer Tony Shepperd constructs his ultimate personal studio.

There's an old Los Angeles joke that goes like this: "What's the fastest way to the Valley?" The answer: "Marry a musician!" The joke refers to the San Fernando Valley—the area of Los Angeles over the hill from Hollywood, Beverly Hills, and Santa Monica that was made famous by Frank and Moon Unit Zappa's 1982 single, "Valley Girl."

The Valley has always been relatively affordable by Los Angeles standards and, as a result, is home to numerous musicians, producers, and engineers. It often seems as though every Valley home has a recording studio of some kind. Although there are a lot of personal studios in the Valley, Tony Shepperd's Tonysound has been referred to as one of the top ten home studios—not just in the Valley, but in all of Los Angeles.

Tonysound, like so many other L.A. studios, is located inside a converted garage. It's the fourth studio Shepperd has owned, and this time around he decided to make it as close to perfect as possible. He designed and helped build the studio, and the result has been a huge success—so much so that Shepperd is now in demand as a studio consultant and designer.

Shepperd's bread and butter, though, is his work as an engineer, a mixer, and a producer. His credits include superstars such as Take 6, the Backstreet Boys, Whitney Houston, and Kenny Loggins. He's also recorded commercials for Coca Cola, spots for the NBC Olympics with Neil Diamond and Melissa Etheridge, the Take 6 CD-ROM for Kurzweil (see **Fig. 1**), and the Yamaha C7 piano portion of the *Synthogy Ivory* sound library.

A music-business professional for almost 20 years, Shepperd is one of the most personable, practical, and adaptable people you'll meet. I had a chance to speak with him about the design and construction of his studio, the gear he's using, his work style, and more.

**What were your goals in building this studio?**

I have four kids. As an engineer, I was spending 13 to 15 hours a day away from home. With this studio, I can do almost all my projects here at home, where I can see my family at breakfast and dinner. That was the main goal. Beyond that, I wanted a room that was sonically accurate. I wanted a place where clients would be comfortable and where they could feel confident that the music they created sounded great—not just here, but anywhere they listened to it. That's something that definitely doesn't happen in a lot of studios.

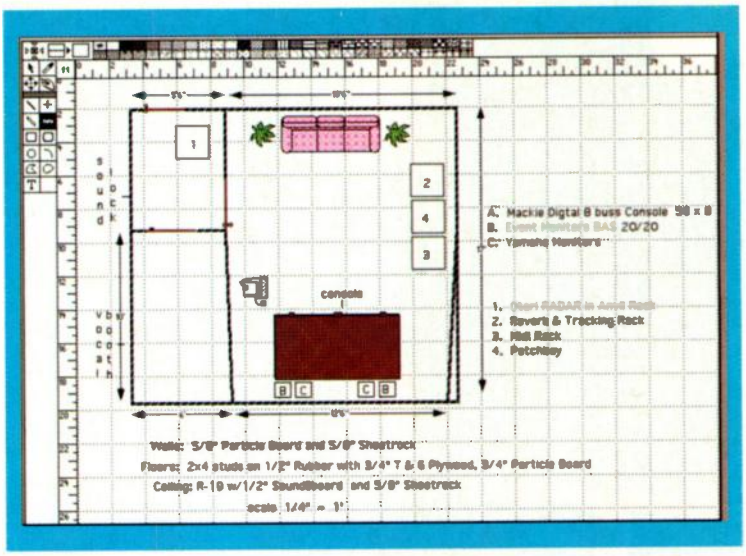


FIG. 2: Shepperd used an old Mac OS 9 interior-design program called Interiors 2.02 (Abracadata, Ltd.) to help configure the layout of Tonysound. This Interiors 2.02 screen shot shows the final plan that he ended up using.

**Can you describe the studio for someone who hasn't seen it?**

*[Laughs]* It's been described as a bat cave. It's a room within a room, based on a typical A-frame garage. It has high ceilings, the walls are covered in a fabric that feels like Ultrasuede, the colors are muted, and there are no windows. Some people like natural light in a studio, but I think it's distracting. For me, it's an advantage to have an environment that stays the same all the time. People can drive themselves crazy looking out the window thinking: "The day is going by, we've got to go!" I find it easier to concentrate, chill out, and let the music happen in a controlled environment where I can work until it sounds right without worrying about the time.

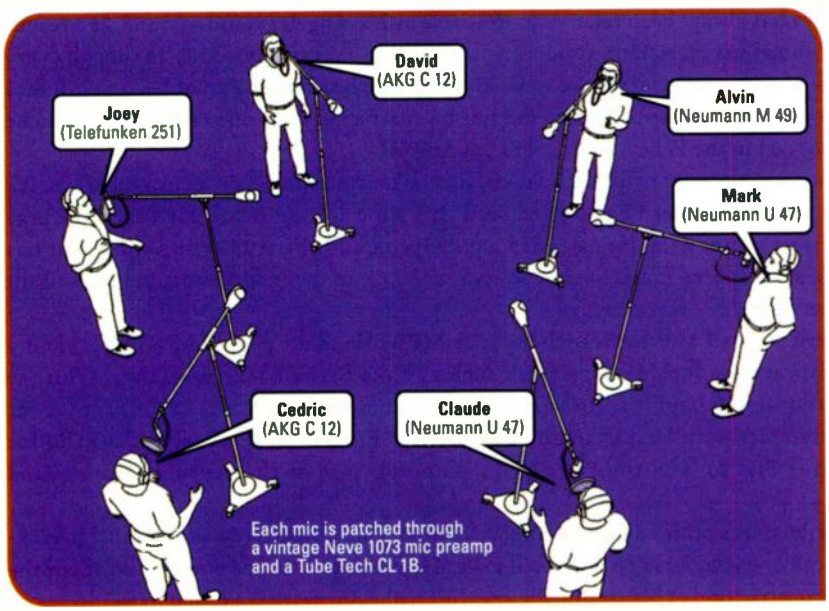


FIG. 1: Shepperd, who has engineered several Take 6 CDs, used the below configuration when recording the group for the Take 6 CD-ROM for Kurzweil at Emerald Studios in Nashville.

**The ceilings are high and there are no parallel walls, although that's not immediately apparent because the angles are very slight. How did you work out the acoustic specifications?**

I went for high ceilings because I don't like low compression-style studio ceilings. For one thing, I'm six foot one and I don't like feeling closed in! But also, I just don't like the sound that low ceilings produce. I like to have some air around me rather than surfaces that provide reflections. In my control room, the ceiling is 14 feet. In the iso room, the highest point is 10 feet.

I worked out all the specifications myself. It's the fourth studio I've built, so I've learned by doing. I've also been a connoisseur of other people's studios, so I know what works and what doesn't. And I've read a lot. One of the most useful books around is an old one, from the early '80s, by Jeff Cooper called *Building a Recording Studio* [Artistpro.com 1984]. It has all the fundamentals: things like STC [sound-transmission class] ratings, which is something I pay a lot of attention to.

If you have half an inch of Sheetrock between you and the other side of the wall you'll have a poor STC rating. If you have two-by-fours with insulation, Sheetrock and soundboard, you'll have a much higher STC rating. The higher the rating, the less sound transmission you have [through the wall]. Most home studios have only half-inch Sheetrock on the wall; if you tap on the wall you'll hear it on the other side. That's an STC rating of 30 to 35, which is equivalent to the amount of decibels that it takes to penetrate the wall. If you add thicker materials, you

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FIG 4: Shepperd considers his Apogee Big Ben Digital Master Clock to be the most important piece of gear in his studio. He says that syncing his digital devices to it noticeably improves sound quality, especially for his digital reverbs.

can get the STC rating as high as 50 or 55. You want to raise that class as much as you can.

**And the reason you want to raise that class is two-fold: to keep unwanted sound out of your studio and to keep the sound that you do want inside, away from your neighbors.**

Exactly. You can just about blow your head off with volume in my control room, but [if you're standing] six feet away from the front of the garage you won't hear anything. I have double walls with ⅝-inch Sheetrock, half-inch soundboard and insulation on each layer of the wall, and a dead space air gap between the wall. Not everybody can do that, of course, but you do want to add as much mass as you can to the wall.

**Did you do a lot of the construction yourself?**

No *[laughs]*, ⅝-inch Sheetrock is really heavy! The guys who did the construction for me are animals, and they worked fast. Since all the plans were basically in my head, I had to be here all the time during the construction of the studio. I used a program called Interiors 2.02 (see **Fig. 2**) to organize my design ideas, but I had to physically lay out every wall with two-by-fours. I'd say, "Cut it at this angle, lay it on the floor, and let's look at it." Then they'd cut it, and I'd say, "Okay, it needs to go about two inches to the right."

**What are the wall treatments?**

I was going to use [Owens Corning] 703 fiberglass, which is a standard acoustic treatment. But when I brought in a bunch and put it up, it sounded too dead. Instead, I found some fabric that's soft yet a bit more reflective. Behind it is padded material, like you would find in a couch. There's no padding in the ceiling, the front wall is wood, four-by-eight-foot sheets of stained oak. The floor is wood, and there's a wood panel in the back.

**What did you do to the floor?**

It has a sub floor. The floor is floated on half-inch neoprene, then on green plate—the technical term for it is pressure-treated sill plate; you'd know it if you saw it at Home Depot. It's treated wood that won't rot. Then there's ¾-inch particleboard, ¾-inch tongue-and-groove plywood, then the finished floor. The walls float from the floor, and the ceiling floats from the walls. In the control room, there's also sand in the floor, in between the studs, which provides very dense insulation. But in the iso, there's no sand in the floor. It's more hollow because when I have a drum kit in the iso, I want the kick to have some resonance from the floor. You need to know your purposes, then you think about the sonics. If you have the right materials in the room, it aids the sound.

**Do you record a lot of instruments in the control room?**

I don't, not a lot of live instruments anyway. If they're in the control room, most of the time they're playing direct.

**So the acoustics of the control room were designed more for listening than for recording.**

Yes. If it's a live instrument—drums, horns, acoustic guitar—it's in the iso room. The actual size of the iso is 6 × 6½ × 10 feet, and it varies from 10 feet high at the very top to 8 feet at its lowest. With room mics way up in the corner, it can sound like a much bigger room.

**How do you mic drums in here?**

Generally, I use a [Sennheiser] 421 on the kick and a Shure SM57 on the snare top. I don't do top and bottom on the snare in that room because of phase issues. I use the Marshall 600 series on the hi-hat and 421s on the toms. My overheads are CADs, which are really good yet inexpensive microphones. The floors in there are wood. For percussion I take out the rug, but for drums we'll have the kit on carpet.


MAUREEN DROMEY

FIG. 3: This photo of one of the racks at Tonysound shows several of Shepperd's favorite pieces of outboard gear. Top to bottom: two Brent Averill (Neve) 1073 Class A Equalizer/Preamp Modules, an Aphex 1100 mic pre, and a Tube Tech CL 1B compressor.


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**When you worked with Kenny Loggins, you recorded a lot of acoustic guitar. How do you like to do that?**

On acoustic guitar, especially on a rhythm track, the Marshall 603 works great. I used them on two acoustic guitarists on the track "Little Drummer Boy" for Whitney Houston's Christmas record. It was Paul Jackson Jr. on steel string, and Dean Parks on nylon. We used the Marshalls on both of them, with a Focusrite Red Series mic preamp and a dbx 160X compressor. We wanted them to sound similar, even though they had different strings, and it worked great. They're really naked and exposed at the front of the song, and they sound great.

**You've got some expensive mics; do you generally use them on vocals?**

I do. I have a Sony C800G and an AKG C12 VR. I have high-end microphones, and I believe in them. I want to buy more. But it doesn't stop me from doing great recordings with less expensive mics as well.

I think it's more important to have a great mic preamp than a great mic. That's where you should spend your money. People don't seem to get that. If you've got an [Electro-Voice] RE20 or a [Sennheiser] 421, which are great inexpensive mics, and if you run them through a Neve or an API, they'll sound terrific. If you run them through a piece-of-junk mic pre, they will sound like junk.

There are a lot of relatively inexpensive microphones out there now. The [Audio-Technica] AT 4033/CL is great, and it's only $300. We used that a lot on Kenny Loggins's record. We also used the Marshall MXL-603 microphone on his acoustic guitar. You can get a recording pack of two separate Marshall mics for $110. That's an amazing deal. The CAD mics I use cost $400 or $500. You can have a selection of different-toned, inexpensive mics, and if you put them through something good at the front end, they'll sound great.

## SELECTED DISCOGRAPHY

**Backstreet Boys,** *Never Gone* (Jive, 2005); recorded

**Whitney Houston,** *One Wish: The Holiday Album* (Arista, 2003); recorded and mixed

**Kenny Loggins,** *It's About Time,* (All the Best, 2003); recorded and mixed

**Lionel Richie,** "Ball and Chain," from *Just for You* (Island/Def Jam, 2004); recorded

**Ruben Studdard,** selected cuts from *I Need an Angel* (J Records, 2004); recorded and mixed

**Take 6,** *Join the Band* (Warner Brothers, 1994); recorded

**Vintage Neve mic pres are rare and pricey. What else do you like?**

The Aphex 1100 [Thermionics Class A tube mic pre]. It has its own 24-bit A/D converters. It's got a mute button, a built-in mic limiter, and phantom power. It generates tone so you can check your signal flow. It also has polarity, a pad, and a low-cut filter. It's an amazing value. It's sonically great, and it has two channels—all for $1,800. It's a wonderful tool.

ED COLVER

Building Tonysound helped Shepperd get more work as a producer/engineer and as a studio designer.

The API, which is a one rackspace unit with four mic pres, is very cool. There's no EQ, but I'd rather have a great single-purpose mic pre than have one with EQ. Unless you know what you're doing with EQ, don't mess around with it. Keep the signal clean.

In general, you should get quality pieces that will last you. You want something that you'll be able to keep for a while so you can really get to know it.

**How about compressors?**

I love my [Tube Tech] CL 1B; it's a great tube compressor (see **Fig. 3**).

**What are the most important pieces of equipment in your studio?**

My [Apogee] Big Ben master clock (see **Fig. 4**) and my power backup, which has 30-minute backup time.

**Why the Big Ben?**

It's one of my biggest assets. For one thing, it makes reverbs sound so much better. You can hear the tail end on them like you've never heard it before. I've discovered that, by using a $1,200 clock, you can make any decent reverb sound like a $12,000 one. I use Reverb 1 a lot—the one that comes with Pro Tools. With the Big Ben clock, you hear it trail off and ease out of the picture instead of cutting off and truncating. It sounds so much better.

**What else do you do to maximize your Pro Tools system?**

Instead of routing all the tracks to output 1 and 2, I route all of the outputs to bus 31 and 32. Then I assign a new stereo audio track with an input of 31 and 32, and

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**"Jazz Chord-Symbol Graphics"** (triangles for major, circles for diminished and a circle with a slash for half-diminished) are now supported. A new **"Vocal Wizard"** displays and transposes to the best song keys for your vocal range.

Editing of the Audio Track is now **non-destructive**, so changes only become permanent if you save the file. The TC-Helicon Audio Harmonies have been enhanced with **Vocal Pitch-Styles** (automatic "Vibrato" and "Scooping") that can be added to the vocal harmony parts. **Multiple sound cards are supported**—you can now choose which sound card to use. **Full Stereo or Mono support** has been added for the Audio Track. There are now on-screen **VU meters** to monitor the Audio Track.

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an output of the analog out 1 and 2. Instead of bouncing to disk, I then record to disk. Because of the superior sonics of the internal structure of Pro Tools, I actually like the sound of it better.

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I use a Gefen Extend system, which is basically an amplification system. On the one end I plug in my Mac, and it pumps up the USB for the keyboard, the video, and the mouse, allowing it to run on an Ethernet cable, 60 to 70 feet if I want, off of a single Cat-5 cable. That way, I have anything that makes noise in my entryway behind a door, instead of in the control room. I also use it like an umbilical cord in the control room. If I'm mixing, I roll my keyboard to the middle of the room. But when the producer comes in, I just slide off to the side, and he sits in the sweet spot.

**What do you monitor on, and why?**

Yamaha NS10s without a subwoofer. But some producers want to hear a lot more bottom, so I also have Yamaha MSP10s, with a Yamaha SW10 powered subwoofer. At the end of the night, if I'm getting tired, I crank that up. When that bottom hits you're definitely fully awake.

"I think it's more important to have a great mic preamp than a great mic."

**Working out of your home can be isolating. And, you work a lot. Your time is at a premium. How do you keep up with new products and technologies?**

There's a group of people that I get together with—engineers, producers, and artists—at least once a month for what we call tech breakfasts. There are anywhere from 10 to 20 people, and we just talk tech. The sense of community that you get from working at commercial studios is gone now, for most people. I can count on both hands the amount of commercial studios I've been in in the past year and still have some digits left over, so getting together specifically to talk tech fills a need.

**Give us an idea of a how a typical project works for you these days.**

Lately, a large amount of what I do is mixing. For example, I got a call the other day from Eric Dawkins, who was producing Ruben Studdard from *American Idol*. I was at lunch when I answered the phone, and he told me he had two songs that needed mixing. They absolutely had to be done that day, but he said rough mixes would be fine.

Since he was working at a studio near where I was having lunch, I went over and picked up a DVD of the two songs. I started mixing; he came by around 9 p.m. to check the mixes out. After he left, I finished them up and put them up in AIFF format on [Apple] iDisk, where I have a gigabyte of storage. I gave him my password. The next morning he downloaded the mixes, checked them out, then sent them on to Clive Davis at J Records who was waiting to hear them.

I didn't hear back from him for almost two weeks, so I gave him a call and said, "Whatever happened to those mixes—do we need to tweak them?" And he said, "Oh, one of them is going on the record." I was surprised that we didn't need to change anything. It went straight to mastering for the record.

As it turned out, they had me do two more songs. When I sent those out, they asked for some small changes on one of them: to take Ruben and the choir down a decibel, so that it would sit more in the groove, which, now that I'm mixing in the box, was easy to do.

The funny thing is, they were surprised at how fast I could turn things around. Especially fixes. When they called and I said I could have it done and back to them in 30 minutes, they didn't believe it. At major labels, I guess they're still working with engineers who are using big consoles—recalls take more time on those.

**You use the server on Apple's iDisk for your clients to get references.**

Having an iDisk has made my life so much easier. When you're having a conversation with somebody, you don't have to second-guess. You can just say, I'll send it to you.

I go to my public folder on my iDisk account, where I just drag-and-drop the file. It loads in the background while I'm working on other stuff. A 50 MB file takes only ten minutes. You can use any format that you want, and it's only $60 a year for the initial amount of space, although I pay an extra $40 for 512 MB.

**A lot of composers and songwriter-producers come to you to mix their work.**

Yes. Sometimes they just want me to get it in a rough kind of order so they can present it to people. They'll say to me, "Can you just throw something together?" But I don't do that. I don't just throw things together. I work fast, but I'm always doing a real mix. For example, I did a mix on a theme for *General Hospital* for a friend of mine. Again, I didn't hear from him for a while, then he called to say that they were at a local commercial studio and were having trouble matching my mix. They wanted me to come over and finish it off.

I said, "Okay, but all I really need is two faders." Because I'd mixed it in Pro Tools, I just needed to bring over my drive and play it back for them. Some of the

people from the show were there, and some of them had requests for changes, which I was able to do on the fly. They were knocked out. Everything they asked for, I was able to do really quickly. When we started listening locked to picture, I had some ideas for adding reverse cymbals as the graphics were going by, which was easy to do because I bring an arsenal of my own sounds with me wherever I go. I just popped them in, did a pan, and they said, "This is great!"

**So you bring a lot of your sounds around with you.**

I've started keeping a template with previous mixes that I've done, so if someone says, "You know that song you did with so and so, and that effect you were using? Can you do that on this song?" I say, "Sure," and just import session data off those mixes. I keep storing all my mixes. I have some on the desktop, and I have the full mixes archived on DVD. So it's easy to steal from myself if I want to.

**What's some studio-designer advice you can offer to other people with home studios?**

Use your ears. If it doesn't sound right, it probably isn't. People will be doubtful, and they'll kind of come to me for reassurance. "It sounds okay, doesn't it?" Well, no, it doesn't. If your initial reaction was that it didn't sound good, go with that feeling and make it better. I walk into a lot of people's rooms that don't sound good. And they just sit down and start working. Turning knobs. But you need to make your room workable first.

Take a CD; take a lot of CDs. Take a day, or a week. Listen to projects that you like and ones that you don't. Don't work, just listen. Then move the furniture and get some drapes for the back wall or gobos if you need them. I see people go into any room and just throw their gear in. They can't trust what they hear in there; but they start EQing based on what they're hearing in the room. Let's first make sure what we're hearing is accurate. EM

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*Maureen Droney's engineering credits include Carlos Santana, Aretha Franklin, Kenny G, and Tower of Power, among many others. Currently she is Los Angeles editor for* Mix *magazine and general manager of House of Blues Studios.*

# Organize on the Fly

By Dave Darlington

## Using playlists for easy comping.

Because most desktop audio applications offer an unlimited number of virtual tracks, recordists can keep every take of an artist's performance. All the parts, from rehearsals and warm-up passes to the final "magic" take, can be stored, edited, and then cobbled together into a perfect composite take. Virtual tracks, called playlists in Pro Tools, facilitate the job of organizing those takes. Whether you like to keep a clean track list with multiple takes hidden underneath the main audio track, or you prefer to use what I call the WYSIWYG method—keeping subsequent takes visible and lined up vertically in their own tracks—a number of techniques can make the job of comping easier.

### Two Setups

Before you start recording, set up your session to facilitate a smooth workflow. That will help you move quickly between takes for recording and playback, and cause the least amount of distraction to the artist you're recording. If you prefer the "clean" type of track organization, this is relatively easy. Once your input track is set up with the proper recording level (and any chosen dynamics or effects processing), it becomes the repository for all new recording and the sole playback track for a given part. After recording Take 1, you simply add a new virtual track for Take 2. Take 1 will reside in either the Playlist or the Takes menu (depending on your audio application), and Take 2 will be ready to record with the same settings as Take 1. Subsequent takes will also reside in the window, underneath the current playback take in chronological order (see Fig. 1). One advantage of this method is that you can audition different takes in a particular section by flipping between virtual tracks without navigating to the Play Enable and Mute buttons. The disadvantage is that the artist's mic will be "off the air" during playback, because the playback audio track is also the input track. When punching in on an existing take, duplicate a playlist so that the previous material isn't lost underneath the new recording.

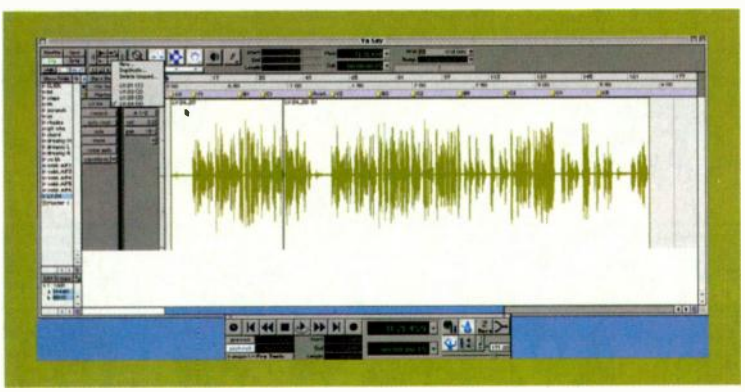

FIG. 1: In Pro Tools, a pop-up playlist menu shows the virtual tracks that are assigned to the main playback track for the part being recorded. Clicking on a take in the menu assigns that playlist to the main track.

Using the WYSIWYG method, with all takes lined up vertically, is more involved but allows for a smooth workflow once you get rolling. I set up 12 to 16 audio tracks, all bused to one aux track; that lets the aux track provide my "master" fader for all takes. I mute all the audio tracks except the topmost one in the window, making it my input/record track. The other audio tracks are for playback only. As a take is recorded, it is dragged down to the next available (muted) audio track in chronological order, ready to be auditioned by unmuting. There is no need to disable Record on one track or enable Record on another, which helps keep your session moving. All takes will have a similar playback sound because they are being routed through the same aux fader, and you can easily identify takes by their position in the Tracks window (see Fig. 2). As you listen to a playback, the artist stays "on-the air," because the record track stays in input mode. Problems can occur when two tracks are left unmuted simultaneously (impossible with the other method). Also, if you're not careful when dragging, audio can get shifted in time accidentally. (Hint: in Pro Tools, holding the Control button while dragging keeps audio correctly time aligned.) That method keeps artists and producers happy; because they can see the work accruing, they can work quickly yet feel confident that nothing important is getting lost.

### Major Labels

As with all digital audio files, file naming is crucial and should be addressed before recording. Labeling for the virtual track method is straightforward, because most sequencers label new takes with the name of the previous take followed by a numeric suffix. Usually when you ask for a new take, a dialog box appears asking you to name it. On a vocal session, I name my first take Vocal.01; therefore, when I ask for a new take, the DAW automatically names it Vocal.02, and I can dismiss the dialog box by pressing the Enter key. That makes for a faster workflow and avoids making a producer or singer wait around while you type in a name. Each take of audio

sound line
dj line
sampling line
effects line
synths line
guitar line

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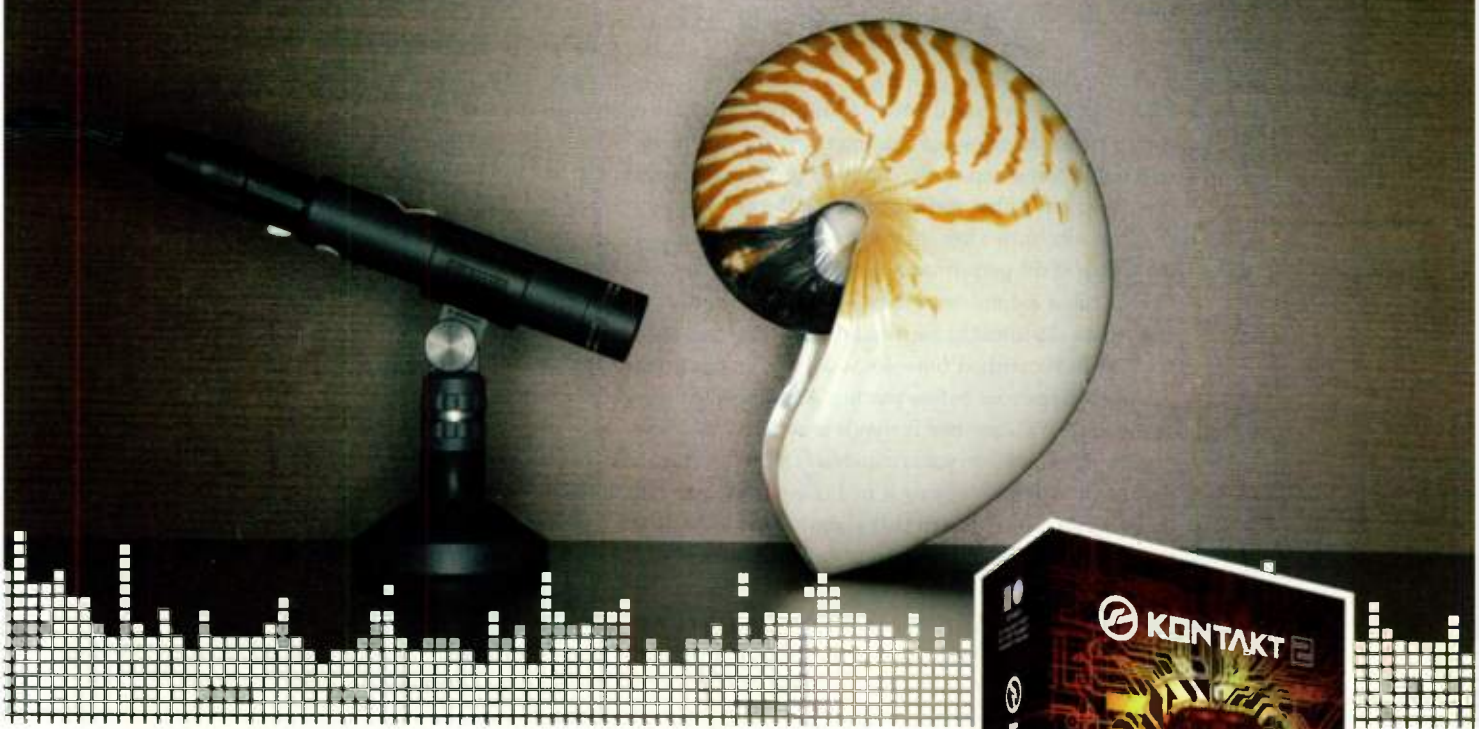


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will get its label from the track name, enabling you to keep tabs on it once the comping begins.

Labeling for the WYSIWYG method is slightly less elegant and more time-consuming, since you must type names for each audio track. I name the input track as before, then name the first playback track Vocal Take 1. Before closing the naming dialog box, I copy that text (without the numeral 1) so that I can quickly paste it (using keyboard shortcuts) into the next dialog box without retyping. Often, after the audio is recorded and placed on the appropriate playback track, I will rename the audio file to correspond with its playback number, Vocal_01, Vocal_02, and so on. That becomes helpful later in the comping process when assembling audio.

## Cut, Copy, Comp

With the clean method, cobbling a final comp track from virtual tracks involves highlighting takes, copying them, selecting a new comp track, and pasting. One disadvantage, however, is that you can't know if the takes line up rhythmically until after they have been pasted. Unless the timing of the performances is identical, you may have to slide takes around until they line up. You can always edge-edit a clip until the performance makes sense. With the WYSIWYG method, however, you would be able to see timing discrepancies before pasting. Another advantage to the WYSIWYG method is that it is easier to trace the origins of the audio on your comp track. By separating an audio region before copying it to a comp track, you can create a visual reference to that audio, clearly indicating that one piece of audio came from Take 1, another came from Take 5, and so on, by seeing the separation of the regions (see **Fig. 3**). Of course, good labeling of the audio files can provide the same function in both methods and is ultimately more accurate, although the files may be more difficult to reference quickly because the fonts are often small and hard to read.

Working with a grid or tempo map is advantageous when moving musical material from one point in the song to another. Copying a certain number of bars and pasting them later in a tune is easy, but what if your region doesn't begin on the bar line? Most sequencers allow you to view the region definition or "spot" of the original audio. By "spotting" the audio to a similar point in another bar, you can be certain that the timing will be accurate. For example, if I separate a region at bar 33|1|233, I can the paste it to bar 41|1|233 and know that it will feel right. In Pro Tools, you can always click on the audio in Spot mode to get a dialog box telling you where the region is now and where it originated. (Be sure to deselect Autospot Regions in the menu or the audio will jump to its original spot.) If your sequencer doesn't have that time-stamp feature, copy and paste the audio by bar line, and then edge-edit it to fit.

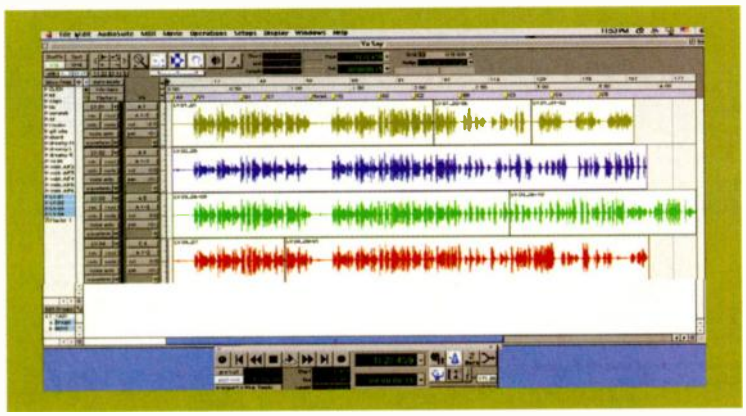

FIG. 2: Consecutive tracks are displayed in descending order using the method of immediately dragging newly recorded audio to its own track. The audio file's name and appended number are derived from the original track name, which makes it easy to keep track of takes.

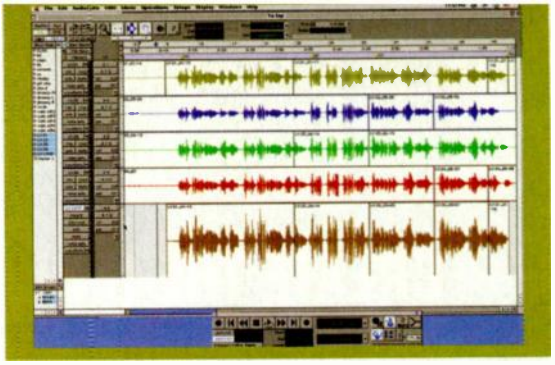

FIG. 3: Shown above is a comped vocal track (the expanded track at the bottom of the list) made from various takes. The numbering conventions built into Pro Tools have helped give the regions clearly identifiable labels that indicate the take's origination.

## Fade Out

The final frontier of creating a decent comp track is crossfading between the individual regions. Use as small an area as possible to crossfade, so as not to interrupt the performance or create a region that sounds doubled. I use an "equal gain" or linear crossfade whenever possible to avoid that doubling. Be conscious of breaths and lip noises, and listen often in Solo mode to ensure that the comp track sounds like one performance, not a patchwork of takes. Usually, the breath before a phrase should come from the audio that follows it, but sometimes you need to use the breath from the preceding phrase. I have even pasted breaths from completely different phrases (or takes) to make a vocal sound natural. If you need to alter a piece of audio (its tuning or gain for example), select a region that's slightly larger than the target audio that needs altering, so that you will have ample room to create crossfades to and from the unaltered region.

Ultimately, we all learn to use our DAWs in a somewhat customized mode. But with unlimited virtual tracks and a few audio tricks, making a "supercomp" track can be easy for everyone. EM

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*Dave Darlington was the composer for HBO's series* Oz. *He won a Grammy Award for Best Instrumental Jazz Album, 2003, for his mixing on Wayne Shorter's* Alegria. *His new solo LP,* D>Tour, *is available from Templar Records. For more information, visit davedarlington.com.*

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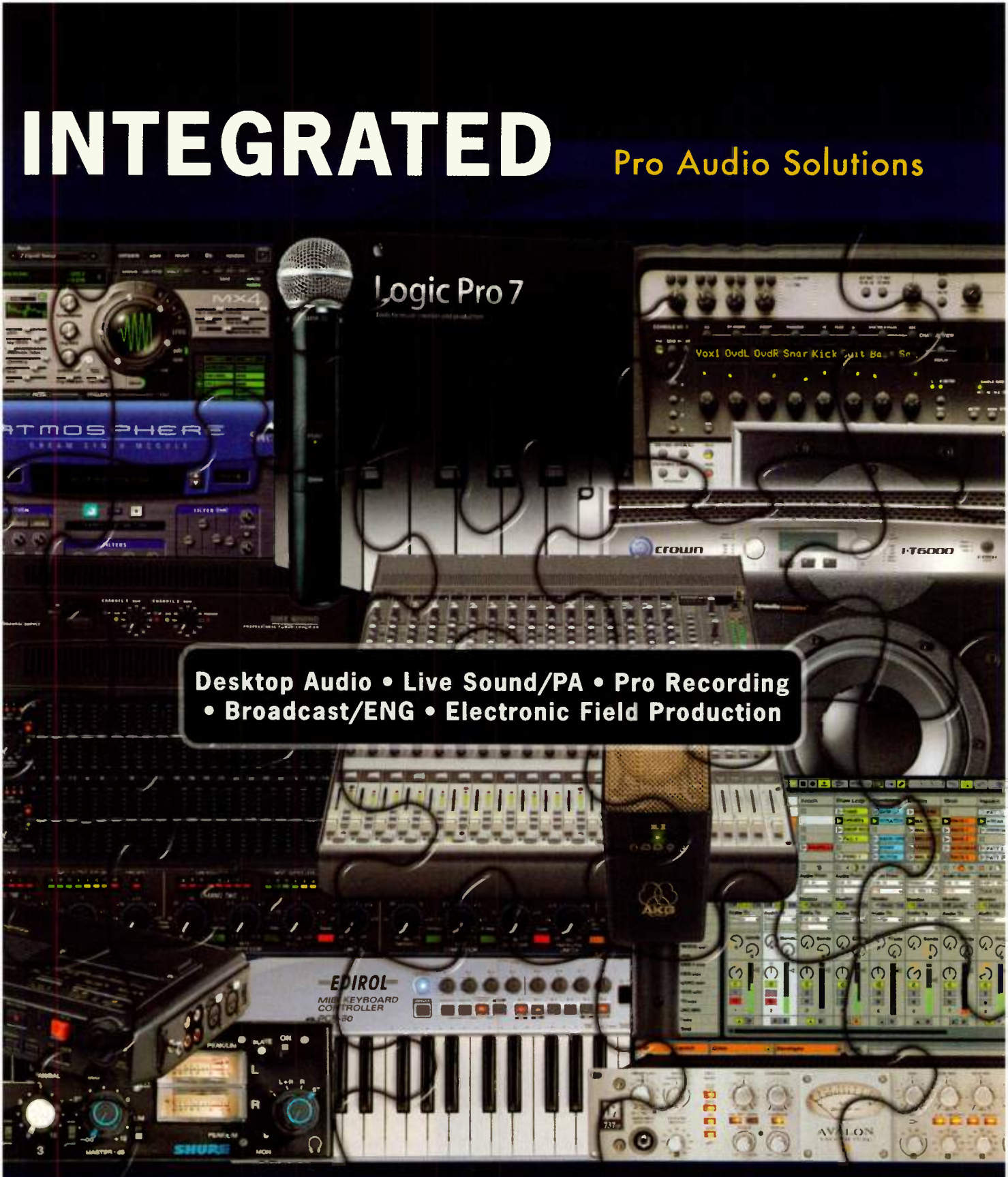


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# Guitar Processors in Disguise

By Orren Merton

## Creating guitar effects with software instruments.

A growing number of software synthesizers offer audio inputs, which opens up entire new vistas for effects processing. Here, I'll discuss using virtual-instrument plug-ins for processing recorded guitar tracks. You can, of course, use standalone virtual instruments, and you can process real-time input, although you may experience some latency.

Setting up a virtual instrument for effects processing depends on the design of the instrument and the plug-in host application. The instrument must support audio input, and how it allows that input to be routed determines what kind of processing is possible. The instrument and host must have either a sidechain input to route external audio from an audio track to the plug-in or a special "FX" version of the instrument for insertion in effects-plug-in slots. The latter is frequently the case.

Virtual instruments' envelopes usually need to be triggered by MIDI note messages to process external audio, just as they do to play notes. For hosts such as Logic that don't route MIDI note messages to effects plug-ins, you need to use the sidechain approach or limit yourself to virtual instruments that can lock their envelopes on. For the examples here, I'll use Native Instruments' Pro-53 synthesizer, which comes with an FX version and an envelope-hold switch.

## Echo of the Past

Modeled after the classic Prophet 5, the Pro-53 has a typical analog-synth signal path: oscillators and a noise generator followed by a multimode filter, an enveloped amplifier, and a feedback-delay effect. External audio enters the signal path at the same point as the oscillator-noise mix and can, therefore, be subject to all the aforementioned processing. Virtual instruments following other paradigms often make other kinds of processing available—examples include frequency and ring modulation, analysis resynthesis, granular effects, and extended multi-effects chains.


FIG. 1: Native Instruments' Pro-53 allows external audio to be processed by its filter and delay effect, and offers numerous modulation possibilities.

The simplest Pro-53 processing is to use its delay effect. To do so, turn all mixer controls to Minimum; set the filter cutoff to Maximum, making sure that the HPF button is off; ensure that the amplifier-envelope's sustain is set at Maximum; and click the amplifier's Hold button on. After routing audio into the Pro-53, use the Ext In knob to adjust the level, turn the delay effect on, and play with its controls.

Delay times can be set from 1 millisecond to 1 second, and there's a built-in LFO for delay-time modulation. Use the left half of the time range together with moderate to high feedback and depth settings for flange, phase, and chorus effects; use the right half of the time range with minimum depth (no modulation) for echo effects. Turning on the Sync button will sync the echoes to tempo.

## Good Filtrations

Next, bring the filter into play by reducing the cutoff and adjusting resonance to taste; the filter is often the best feature of classic synth emulations. At this point, you can play a MIDI keyboard or route a MIDI sequence into the Pro-53 and turn off the amplifier's Hold button. The incoming MIDI notes will then control the filter and the loudness contour according to their ADSR envelope settings.

Alternatively, you can leave Hold on and use the LFO to retrigger the envelopes by turning on its Trig and MIDI buttons (for tempo sync). No waveform is necessary for that, but you can also route the LFO to filter cutoff, in which case you'll need to route Wheel-Mod to the filter and turn the Mod Wheel up. Try that with the triangle waveshape and with LFO triggering still on. Adjust the filter's Env Amt knob to control the relative influence of the envelope and triangle wave.

Finally, you can take a walk on the ugly side by using the Poly-Mod section to route Osc B to modulate filter cutoff. That produces an effect similar to frequency modulation, which you can control using Osc B's tuning and waveshape. **Fig. 1** shows the full setup, and **Web Clip 1** gives an audio example of each stage in the process. EM

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*Orren Merton is the author of* Logic Pro 7 Power! *(Muska & Lipman, 2004) and* Logic 7 Ignite! *(Muska & Lipman, 2005).*

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# Some Like It Hot

By Mark Ballora

## Achieve the most gain with the least pain.

Mastering has become a critical step in producing a CD or DVD—almost as important as tracking and mixing. Much of this final step involves tweaking various loudness levels, a process called dynamics control. Two of the most common types of dynamics controls are *normalizing* and *maximizing*. Here, we'll look at their similarities, their differences, and why they are important components of a mastering engineer's toolbox.

### What Floats Your Boat?

Imagine that you control a harbor's water supply and that you can make the boats go up or down at will. Now imagine that all the boats are under a bridge and that you can raise the boats only until the tallest mast brushes the underside of the bridge. If you must raise the boats further, you can shorten the tallest masts, but if you raise them too high you risk causing a flood.

The harbor scenario described above—all boats are raised until the tallest mast hits the bridge—is the basic concept behind normalizing and maximizing. A normalizing algorithm scans an audio file and finds the highest sample level. It calculates the percentage that that sample needs to be raised in order to hit 0 dB Full Scale (0 dBFS), and then it raises every sample by that percentage. Many normalizers allow you to choose what your maximum level should be, whether it's 0 dBFS or some percentage (with 0 dBFS being 100 percent of the maximum possible level). **Fig. 1** shows a sine wave with two amplitude peaks: one before normalizing and one after.

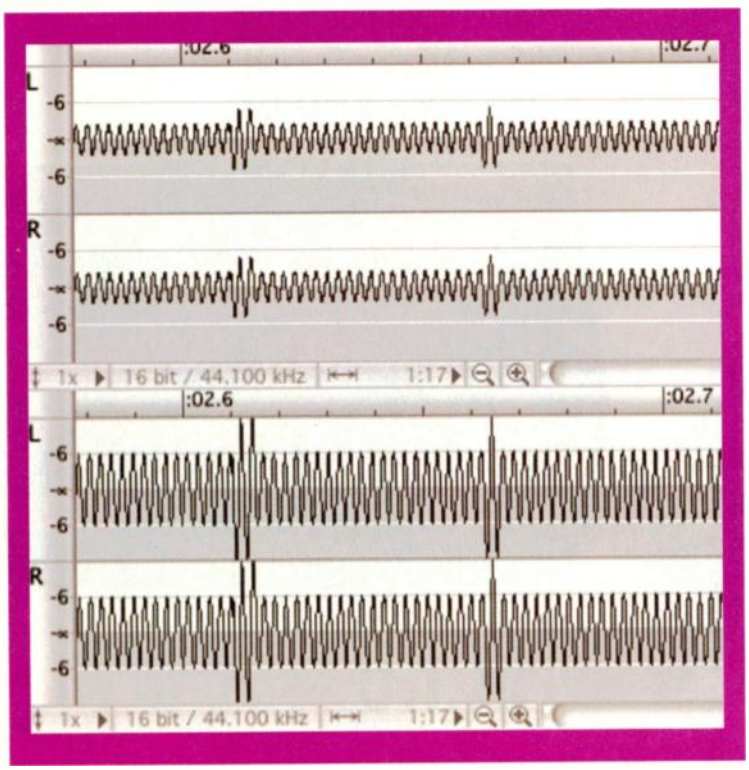


FIG. 1: The sine wave pictured below has two small amplitude peaks: one before normalization (top) and one after normalization (bottom).

Normalizing is useful when the lowest levels in an audio file are a bit too low. It's also fairly easy computationally, which is why just about any audio editor can do it. Normalizing can also be useful when transferring samples from a computer to a device such as a Kurzweil sampler, which adds a great deal of dynamic headroom. Normalizing in the Kurzweil allows the samples to play at optimum levels.

Normalizing is commonly used when mixes are assembled into an album. Often, different tracks have been recorded and mixed at different times and places. Each sounds fine in isolation, but when they're put together there can be overarching differences among tracks, such as overall EQ and volume levels. Normalizing allows you to set the volume context of your album, with carefully adjusted volume balances among the tracks.

Normalizing, however, works only if you have the headroom for it. The top panel in **Fig. 2** shows a sine wave with a peak close to maximum. As the middle panel shows, normalizing accomplishes next to nothing. In real life, an occasional peak from a plucked string or snare drum can defeat normalizing. Adding insult to injury, that peak might not make much difference in volume, because the ear doesn't judge loudness by occasional peak levels; rather, it judges loudness by RMS levels. (RMS is a mathematical method of measuring the effective power of an AC signal. When an AC signal is an audio signal, its RMS value is closely tied to its perceived loudness. For sine waves, the RMS value is 0.707 times the peak amplitude level.) If those occasional peaks have little effect on the overall RMS level, they'll likely have little effect on peak loudness.

### Max Headroom

Maximizing is an attempt to inject your tracks with digital steroids, increasing the overall RMS level of a


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file without clipping it. The audio is first compressed, lowering the tallest peaks. With the added headroom, the track can be normalized, allowing all peaks to be raised. The bottom part of Fig. 2 shows a maximized sine wave.

Maximizing depends on the quality of the compression, and some software gives you lots of control over the process. The Normalize feature in Sony's Sound Forge, for example, has an option called Normalize Using Average RMS power and includes settings for the compressor's attack and release times. Sound Forge has the ability to apply varying amounts of normalization to different frequency ranges within a file. You can also keep extremely quiet and silent sections from being processed by setting the appropriate threshold in the Ignore Below option.

The Waves L1 Ultramaximizer plug-in has a proprietary look-ahead technique that anticipates upcoming amplitude peaks in the file and trims them down before it's time for them to go into the DAC. It's like an ultracompressor, lowering peaks with zero attack and release times.

## Loud . . . Louder . . .

While maximizing can be a beautiful thing, it's also possible to get carried away. And our ears can fool us: because of the way our brain processes sound, when the same material is played at different volume levels, the louder one often sounds more present (at least in the short term). That increased presence adds impact, especially when broadcast over the radio, which leads many producers to adopt an "ours goes to 11" approach to audio levels. (I even heard an audio producer at a seminar describe mastering as intended primarily to raise the album to the loudest possible level.)

Maximizing raises a file's RMS level, but it does so at the expense of dynamic range. Look again at the bottom of Fig. 2 and notice how squashed everything has become. Too much maximizing can result in music with little dynamic range and a distorted sound. A great deal more wisdom on this subject can be found on mastering engineer Bob Katz's Web site at http://digido.com.

It's also possible to be fooled into thinking that a DSP operation has improved things, when in truth all it's done is made things louder. To address that pitfall, TC Electronic's Finalizer Express Studio Mastering Processor has a matched-compare feature that adjusts the gain following processing to match the preprocessing volume level. Processed and unprocessed versions can be compared at the same apparent volume levels so that users aren't misled by a volume increase.

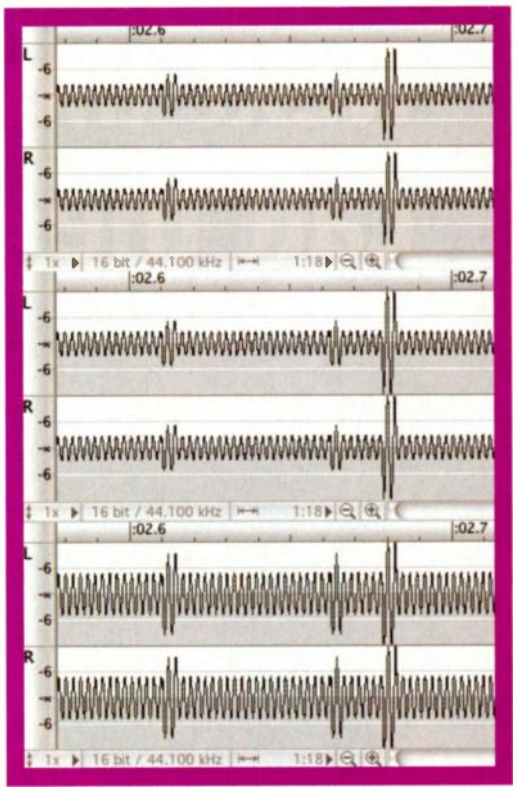


FIG. 2: Normalizing works best when there's dynamic headroom in the file to support it. In the top figure, the large peak limits the effect of the normalization, as shown in the middle image. Maximization is more effective (bottom), but the price is a loss of dynamic range.

## All in a Dither

Contrary to occasional appearances, however, maximizers do not perform miracles, and their results come at a price. Like any DSP operation, normalizing and maximizing inevitably exacerbate that Achilles heel of digital audio, quantization error (see "Square One: What's in a Word?" in the May 2005 issue of EM). Maximizing, like many processing operations, bumps up a file's word size while it does its work. Eventually, those words have to be pared back down, and maximizers make that trimming part of their standard procedure. That is one of the selling points of the Waves L1 Maximizer plug-in, whose proprietary Increased Digital Resolution (IDR) is optimized for trimming samples back down to the target word size (24-, 16-, or even 8 bit) following maximization. Ideally, maximization is a last-step procedure, particularly if its redithering involves noise shaping. It's meant to be a final coat of polish, not something that gets done over and over.

Effective normalizing and maximizing are subtle, fine arts that are learned over time. Used properly, they can add a touch of class to your album, giving it that final coat of polish and making every track sound as though it belongs with all the others. EM

*Mark Ballora is trying to master teaching music technology at Penn State University.*

# "A Dozen Labels and Publishers Came To Our Showcase Because We Joined TAXI"

*Sugardaddy Superstar – www.sugardaddysuperstar.com*

We stopped by TAXI's office to pose for this photo because we wanted to thank them for all the great things they've done for us.

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# TASCAM DP-01FX

## An 8-track Portastudio continues a proud tradition.

By Rich Wells

Some recordists gravitate toward convenient and portable devices that let them get their ideas down quickly and easily. Although the glory days of the cassette 4-track recorder are over, the concept is still going strong in the form of the portable digital studio (PDS). Tascam (and Teac before it) has long contributed to the evolution of the portable studio, and it continues its track record with the introduction of the DP-01 and DP-01FX.


FIG. 1: Dedicated controls for essential functions makes the DP-01FX easier to use than other personal digital studios.

Both units are 8-track hard-disk-based digital Portastudios (the same name the company used for its original cassette machines), each with an internal 40 GB hard drive, easy-to-use controls, and computer connectivity via USB 2.0. The DP-01FX, which I will focus on in this review, offers two phantom-powered XLR inputs (the DP-01 has ¼-inch mic/line inputs only) and a basic but well-stocked effects section. That's just the beginning. Although there are a few quirky elements to the design, these units are well equipped for a variety of uses but are user-friendly and inexpensive.

### Updating a Classic

Aside from a pronounced price difference, what sets the DP-01FX apart from the many other portable digital studios are its plentiful and dedicated single-function knobs and buttons (see Fig. 1). This is a welcome throwback to the time of the cassette 4-track recorder, well before the portable studio user was expected to memorize a labyrinthine-layered menu. That's not to say the DP-01FX doesn't use a menu system, or that there are no buttons with multiple functions; its menu layers just aren't as deep or unintuitive as those on competing devices. The buttons that do double duty are clearly

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marked with blue screen printing, and their second function is just a shift-click away.

The inputs are primarily on the front edge of the DP-01FX, facing the user. The two main inputs are available simultaneously. Input A is the more extensive of the two, with a balanced XLR mic input and unbalanced ¼-inch input. A switch next to the ¼-inch input allows you to select either mic/line level or instrument level. Input B is similar, but the ¼-inch input is mic/line only. Each input has a gain knob and an LED overload indicator. To the right of the inputs are a ¼-inch headphone jack with accompanying level pot, and another ¼-inch jack that allows you to connect a momentary footswitch for punch-in recording. There are also two switches: one applies phantom power to both XLR inputs, and the other, called Input mode, toggles between dual-mono and stereo input operation. These are used for monitoring while tracking only.

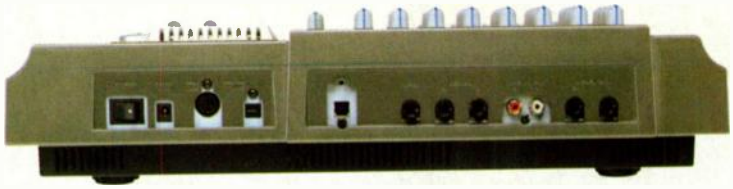

FIG. 2: The DP-01FX has USB 2.0 connectivity, so you can transfer your files to a computer workstation.

On the rear panel are the power switch, a DC power input, MIDI Out, a stereo optical S/PDIF digital output, a USB 2.0 jack, ¼-inch jacks for a mono effects send and a stereo return, stereo line outputs on RCA jacks, and two ¼-inch mix inputs (see Fig. 2). The stereo mix inputs are largely intended for mixing in the audio signal of a machine linked by MIDI to the DP-01FX. The signal going into the stereo mix inputs is available at the analog line outputs, but not the digital outputs.

Below the front panel's main channel strip section are track assign buttons for the A and B inputs. Used in combination with a given track arm button, you can direct the signal from either input to any desired track. The track assign buttons can be secondarily used to activate or disable their respective inputs. When an input is activated, its signal can be heard through the main analog line outputs, the digital outputs, and the headphone outputs, regardless of whether a track is armed.

On the DP-01FX, input signals aren't tied to any particular track: you can direct the signal to a track, and then arm the track for recording. But the track's EQ and pan pots do nothing—they function on playback only. When you record two mono signals, switching Input mode to dual mono pans both signals to the center. When you have a stereo pair of inputs, switching the Input mode again lets you hear the stereo spread, as it will sound during playback.

The DP-01FX has eight channel strips, each with a dedicated fader, and individual pots for pan, effects send, and low- and high-frequency EQ adjustment. Each strip also has a record-arming button, which doubles as a track mute. To the right of the channel strips is the master fader, Master and Source buttons, and a master Effect Return knob. The master Effect knob controls the amount of onboard reverb returned to each channel and the amount of effect returned by any outboard gear connected to the rear-panel send and return jacks.

In the lower-right section of the control surface are standard transport controls, buttons for setting and working with location points and punch-in recording, and controls for the multi-effects section and the reverb. The onboard multi-effects can be applied to one of the inputs while tracking, but cannot be used on a track

## DP-01FX SPECIFICATIONS

| | |
|---|---|
| **Analog Inputs** | (2) XLR; (2) ¼"; (2) ¼" mix inputs |
| **Analog Outputs** | (2) RCA; (1) ¼" headphone |
| **Additional Analog I/O** | (1) ¼" send; (2) ¼" return; (1) ¼" footswitch input |
| **Digital Output** | (1) S/PDIF optical |
| **Data Transfer** | USB 2.0 |
| **MIDI Ports** | Out |
| **Channels** | 8 |
| **Faders** | (8) channel; (1) master |
| **Simultaneously Recordable Tracks** | 2 |
| **Simultaneously Playable Tracks** | 8 |
| **Virtual Tracks** | 0 |
| **Bit Rate** | 16-bit |
| **Sampling Rate** | 44.1 kHz |
| **Hard-Disk Capacity** | 40 GB |
| **Frequency Response** | 20 Hz to 20 kHz, +1/–3 dB |
| **Signal-to-Noise Ratio** | >85 dB (A-weighting, 22 kHz LPF) |
| **Total Harmonic Distortion** | <0.05% (1 kHz, –10 dBV, 22 kHz LPF, master fader at nominal) |
| **Dimensions** | 17.8" (W) × 4.3" (H) × 12.1" (D) |
| **Weight** | 9 lbs. |

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*Amber de Laurentis & Sarah Blue,*
*Grand Prize Winner, 2002 Northeast IMWS*

*"It didn't seem like a contest. It seemed like a festival. The bands were so good – I didn't think we were going to win. It didn't matter because I was having such a good time."*

*Orbert Davis,*
*Grand Prize Winner, 2003 Midwest IMWS*

*"The IMWS created a ton of hits on our website and got us a lot of press, a mention in Guitar World and Billboard, and a lot of emails and telephone calls."*

*Patrock (Dirty Power),*
*Grand Prize Winner, 2003 West IMWS*

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that has already been recorded. The reverb, accessible by the individual track effects sends, can be used only by recorded tracks.

## On Display

In the display's regular, nonmenu view, the LCD shows the elapsed time for the song at the top of the screen, either as minutes and seconds or as bars and beats (if you're working with the onboard metronome or with an external MIDI device). Below that appears the A and B input levels, the levels of all eight tracks, and the stereo output levels.

To delve into the menu system, just push the Dedicated button. That is where you create, name, load, edit, and delete songs; manage the disk drive; make final-mix files; and perform backups. Navigating the system is simple using the Enter and Exit buttons, the cursor arrows, and the data wheel. In addition to the song- and disk-management capabilities, the menu lets you do other things, such as change the center frequencies of the high- and low-frequency EQs for each channel, set in and out points and pre- and post-roll during punch-in recording, use the onboard guitar tuner, and change the nature of the built-in noise gate.



## Up and Running

Getting started with the DP-01FX is easy: it took only a few minutes of referring to the manual and poking around the menu to get a feel for the various procedures and to begin recording tracks. Navigating the menu to perform fundamental actions, such as creating and loading songs, was intuitive, and if I couldn't figure it out immediately, a quick flip through the manual answered my question. For example, I was able to set up MIDI control over a drum machine and use it as a metronome in a short period of time. Having worked on other portable digital studios in the past, the DP-01FX was noticeably easier, and it didn't crash once during the test period.

All aspects of punch-in recording were straightforward, and I was even able to begin using the DP-01FX's extensive track-editing capabilities without much fuss. You can isolate sections to edit by setting In and Out points, either during playback or through the menu system. You can perform an edit on an individual track, on adjoining odd/even pairs of tracks, or on all eight tracks.

The edit itself can consist of copying a section and pasting it in another part of the song, or simply moving the section to a new place. In both cases, you insert the copy at the designated "to" point. You can also choose to either force the rest of the song to slide later in time (to accommodate the time taken by the new material), or overwrite material previously existing in the time taken by the copied section. For material that has been moved, you can choose whether to leave the gap open or to close it by pushing the rest of the tracks back in time. Although loop-based editing is easier to do in a dedicated software

editor, you can certainly do it on the DP-01FX.

You can also selectively undo and redo almost any action by using the dedicated Undo/Redo button and moving through a list of past actions. The DP-01FX can perform digital bounces and make 16-bit WAV-file masters of your completed songs (using the Master and Source buttons above the master fader). When you're done, you can transfer the finished pieces or individual files to your computer via USB for further work.

## Sound Judgment

Although the DP-01FX is a 16-bit machine, it sounds very good overall. The effects include four reverbs, each with a single decay parameter. The sound of the reverb is fine in small amounts.

The multi-effects are abundant and dominated by distortion sounds, which are the most useful of the effects offered—they're especially good on drum machines. The various types of distortion include versions with echo, flanging, and so on. However, I found the other multi-effects that involve chorus, delay, and flanging to be a bit cheesy.

On a practical level, the implementation of the effects is a bit strange. For example, you can use only one of the multi-effects while tracking, so that whatever you record is printed with the effect. In addition, you can use only the reverb on recorded tracks and not while tracking. Both types of effects can be turned on simultaneously, so these limitations don't seem to be for memory reasons. Nonetheless, Tascam crammed a lot of effects into the DP-01FX, and they serve as helpful guides while tracking demos.

Each effect has one editable parameter, and the nature of that parameter changes according to the effect. Neither the device, nor the manual, describes what the parameter will be for any given effect. For example, with effects that include delay, the editable parameter is either delay time (for longer delays) or decay rate (for shorter slapback-type delays), as you might expect.

A more critical problem is that you can record only two tracks simultaneously with the DP-01FX. On many cassette multitracks, and even with the original Roland VS-880, which started the portable digital studio revolution, you could record four tracks at a time. Having owned two Tascam Portastudios and a VS-880 in the past, I usually recorded more than two tracks at a time, especially when making band demos for myself or for friends.

## Done Deal

There are other quirks with the DP-01FX, but they are meaningless when you think about all the things this machine *can* do. And although there are benefits to having onboard effects, a more compelling reason to pony up the extra money for the DP-01FX is for the XLR inputs and phantom power. Overall, the DP-01FX performs well and is great for quick and portable recording.

PRODUCT SUMMARY

**TASCAM DP-01FX**

portable digital studio
$649
DP-01: $499
OVERALL RATING [1 THROUGH 5]: 3.5
PROS: Inexpensive, versatile, easy to use.
CONS: Records only two tracks simultaneously. Only 16-bit capable. Implementation of effects is awkward.

MANUFACTURER
Tascam
www.tascam.com

*Rich Wells oversees the Supreme Reality, a recording studio and band in Portland, Oregon.*


FIG. 1: The Alesis Micron's streamlined user interface includes an inconveniently placed Pitch Bend wheel.

# ALESIS Micron

## An analog modeling synth in a pint-size frame.

By Doug Eisengrein

Building on the technology in its other instruments, Alesis has released the Micron, a compact digital analog-modeling synthesizer with a simplified feature set that is easy to use yet doesn't sacrifice sound quality (see Fig. 1). The Micron comes with basic I/O, but doesn't have USB, FireWire, a disk drive, and other workstation amenities. The rear panel has two unbalanced ¼-inch inputs, two balanced ¼-inch outputs, a ¼-inch headphone output, jacks for an expression pedal and a pedal switch, and MIDI In, Out, and Thru (see Fig. 2).

The user interface is uncluttered: the Micron's sound engine and styling are based on its sibling, the Ion, with a brushed-silver chassis, fire-engine red side panels and volume knob, two sliders (labeled m1 and m2), three rubberized knobs (X, Y, and Z), and a transparent Pitch Bend wheel. The Micron can load an Ion's program data through MIDI using the SysEx Dump function.

The Micron can play eight voices, each with three oscillators, two multimode filters, three envelope generators, two LFOs, and a sample and hold. The voices can be configured in a variety ways, from 8-layered monophonic operation to single-voice 8-note polyphony and Unison mode. The Micron's 37-key bed feels strong, and the instrument is small enough to fit on a crowded desktop. The instrument's apparent simplicity tempts you to start playing it as soon as it's unpacked (although Reference and Quick Start manuals are provided if you need them).

> The Drums are original and thick, but very electronic sounding.

### Keeping It Simple

The Micron's four playing modes are Programs, which houses the basic preset synth sounds; Patterns, which contains melodic sequences and arpeggios; Rhythms, which has patterns of drum programs; and Setups, which combines all of the aforementioned modes. The Micron's 575 preset Programs are conveniently grouped into categories. The first group, Recent, automatically remembers the last ten Programs played, and the second, Faves, bookmarks user favorites. The other categories include Bass, Lead, Pad, String, Brass, Key, Comp, Drum, and SFX. You can scroll through all of the Programs sequentially or jump to a group with the press of a button and a key. The All group lists all Programs alphabetically.

## MICRON SPECIFICATIONS

| | |
|---|---|
| **Sound Engine** | modeled analog |
| **Audio Inputs** | (2) ¼" TRS |
| **Audio Outputs** | (2) ¼" TRS; (1) ¼" TRS headphone jack |
| **MIDI Connectors** | In, Out, Thru |
| **Keyboard** | 37 keys, with Velocity and Release Velocity sensitivity |
| **Polyphony** | 8 notes |
| **Multitimbral Parts** | 32 |
| **Program Memory** | (500) preset; (400) user |
| **Oscillators** | (3) per voice, with continuously variable wave shapes, sync, and FM |
| **Filters** | (2) per voice |
| **Envelope Generators** | (3) per voice |
| **LFOs** | (2) per voice |
| **Effects** | voice effects; drive<br>output effects; 40-band vocoder, reverb, delay |
| **Pedal Inputs** | (1) expression pedal; (1) sustain pedal |
| **Dimensions** | 22.2" (W) × 2.75" (H) × 8" (D) |
| **Weight** | 8 lbs. |

As soon as you make a change to any Program with the sliders or knobs, the Store LED lights and you have the option to overwrite any preset in its current location. If you scroll off of a Program and then return to it, the Program will be just as you left it. The default assignment of the two sliders depends on the preset, but most often they affect vibrato amount and filter frequency (see **Web Clip 1**). The Micron's keys are touch-sensitive, and with some of the presets, the sensitivity appears to be linked to envelope attack or resonance, lending a good amount of expressiveness to the sound (see **Web Clip 2**).

### The Model for Modeling

The 44 bass tones in Programs are overwhelmingly monophonic. The selection is surprisingly good, ranging from dirty, growling Oberheim-esque basses to quirky ones reminiscent of a Sequential Circuits Six-Trak or Roland Juno.

The 43-preset Leads category also contains many monophonic sounds, ranging from sweeping windy tones to rich harmonic fifths. The Leads category showcases plenty of warm sounds, yet some presets have digital delay built in, giving away the fact that these are indeed only emulations of an analog synth. On the other hand, many of the patches have convincing analog-like properties, showcasing Micron's diversity (see **Web Clip 3**). The Pads category leans more toward polyphonic patches, ranging from warm tones with long filter sweeps to ghostly environments and pulsating, panning timbres. The smaller Strings and Brass categories, which are almost exclusively polyphonic, include 18 String and 26 Brass Programs. With both categories, I didn't experience the wide variety as with the other categories, and these two were the most digital sounding that I came across. They are undoubtedly not just a pile of samples, and while they aren't bad, they are fairly straightforward.

The Keyboard programs focus on classics, such as Wurlitzers, Clavinovas, harpsichords, and a nice assortment of organs. Though not overwhelmingly original, many are interesting and have a full sound. The Comp category also has a lot of variety, with convincing analog-like tones ranging from panning and delayed whistles to strange staccato sounds and pure weirdness.

The Drum category has 118 individual percussive sounds, such as gongs, ride cymbals, hi-hats, Kraftwerk-esque blips, laser zaps, and 29 killer bass drums (including emulations of classics such as the Roland TR-808 and TR-909 kicks). Overall, the drum sounds are original and thick, but they are electronic sounding: there aren't any acoustic drums here (see **Web Clip 4**).

The 50 Programs in the SFX category cover everything from plane flybys to infinitely morphing sonic experiments. I found myself spending a lot of time in that category.

### Return of the Classics

After listening to the Micron's first ten Patterns, I was sold. They are very rhythmic and expertly programmed, and they sound excellent. The first subsection, Analog Style, is aptly named. There are patches appropriately named after classic synths (Arp) and artists (Moroder), and there is enough variety in there to keep everyone from Joe Zawinul to Erasure happy. The patches, which alternate between monophonic and polyphonic setups, span the squarest of waves to the glassiest of tones and just about everything in between (see **Web Clip 5**).

I am usually skeptical about preset drum patterns in any piece of gear, but Micron's Rhythms are chock full of goodies for the electro and techno crowds. Like the

Drums, the Rhythms are strictly an electronica affair, but they are well programmed and sound good. One key press anywhere on the keyboard plays the same rhythm in one pitch, and the patches are reminiscent of analog sequences and old-school drum machines (see **Web Clip 6**).

Some Rhythms are usable as main grooves, while others are better suited for breaks or bridges. As a bonus, the individual sounds used with each Rhythm are mapped across the keyboard above the trigger keys, allowing you to jam on top in real time. The m1 and m2 sliders, along with the Pitch Bend wheel, allow you to morph the sequences.

The Setups section, which contains the heart of Rhythms and Patterns rolled into one, is great for those who just want to press a button and let some live music fly. As with all else on the Micron, each of the setups are analog-electronic sounding and contain a variety of percussion sequences under percolating pads and basses. They are all user-programmable, and the X, Y, and Z knobs affect the sound of the arpeggios but not of the drums (see **Web Clip 7**).

## At the Controls

The Micron's controls have a comfortable rubberized feel and are fun to play because of their visual feedback. The spring-loaded Pitch Bend wheel, which can raise or lower the pitch by one octave, progressively glows brighter red as you push it more toward either side. Unfortunately, it's inconveniently located above the keyboard, forcing the player's left hand into a slightly awkward position when using it. The Octave +/– buttons allow you to transpose the keyboard up and down three octaves, and with each press the buttons glow progressively brighter red while a miniature keyboard in the display highlights the key span.

The latch button substitutes as a sustain pedal and, when lit, sustains the current Rhythm, Pattern, Setup, or Program. The backlit Tap button pulsates in time with the current tempo and can be used as a tap tempo or in conjunction with the Control knob to manually set the global tempo in tenths of a beat per minute. The Phrase button allows you to record a riff and then play it back by holding down any key. Riffs



PRODUCT SUMMARY

**ALESIS Micron**

analog modeling synthesizer
$699

OVERALL RATING [1 THROUGH 5]: 4

PROS: Great sounds. Simple to use. Well built. Small and light. Attractive price tag.

CONS: Spotty reference manual. No direct computer connectivity other than MIDI. Pitch Bend wheel awkwardly placed.

MANUFACTURER
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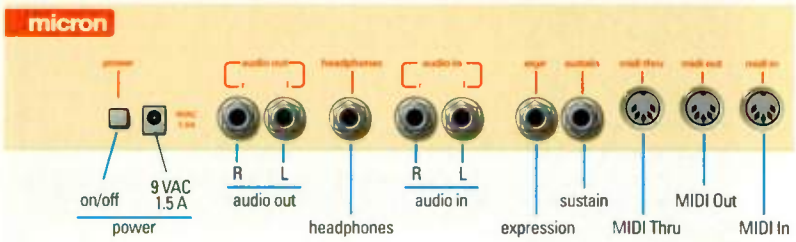


FIG. 2: The Micron's no-nonsense rear panel includes a pair of analog inputs and MIDI In, Out, and Thru.

are automatically transposed up and down according to the key pressed: they work across presets and are saved when you power down.

The Accomp button works along with Setups and, when lit (its default), it triggers patterns and rhythms. When Accomp is not lit, setups become like Programs and sound only the notes you play. The three assignable knobs— X, Y, and Z—are preset to alter different parameters depending on the patch. Typical parameter mappings include Filter Frequency, Pan, Noise, Attack, and Ring Mod (see **Web Clip 8**). As soon as you turn one of them, the green display shows its assigned parameter and value. A simple two-button operation maps any parameter to any knob.

The Control Knob Circle on the right has a master Control surrounded by a Config button and buttons for selecting Programs, Setups, Patterns, and Rhythms. The Control knob sweeps through Micron's presets or changes the value of the currently selected parameter, allowing you to, for example, edit each oscillator's waveform and waveshape or pan the filters. The Config button is for editing global settings such as tuning, transposition, Velocity sensitivity, MIDI, and SysEx.

## Good Things in a Small Package

The Micron is impressive. It sounds great, the presets are well programmed, and it is a breeze to use. The documentation is somewhat spotty, and a few of the instrument's features can be cumbersome to use. But those are small issues in light of the Micron's sound quality and overall value.

EM WEB GEMS

*Doug Eisengrein is an electronic-music composer and software developer living in the San Francisco Bay Area.*

FIG. 1: Apple enhanced its entry-level audio sequencer GarageBand 2 by adding 8-track audio recording, MIDI file import, notation display, and the ability to correct pitch and timing errors. Now you can import a wider range of audio formats and roll your own Apple Loops, too.

## APPLE COMPUTER GarageBand 2

# The Mac's most popular sequencer is yours for a song.

By Geary Yelton

When Apple updated iLife in January 2004, it introduced GarageBand, an audio sequencer and software instrument collection at no extra charge. Immediately, GarageBand was a hit with casual Mac users and pro musicians alike. A few months later, GarageBand 1.1 (reviewed in the July 2004 issue of EM, available online at www.emusician.com) was released, offering numerous enhancements such as ReWire connectivity and better Audio Units support. Now Apple has updated its creativity suite to iLife '05 (Mac, $79). New GarageBand features include MIDI file import, multitrack recording, real-time notation display, and lots of other goodies.

Like the previous versions, GarageBand 2's minimum system requirements call for a minimum 600 MHz G-series CPU, a DVD drive, and 256 MB of RAM. You'll need a Mac G4 or G5, because a G3 can't handle GarageBand's software instruments. The new version also requires 3.5 GB of disk space and Mac OS X 10.3.4. I installed iLife '05 on my dual-processor Power Mac G4/1 GHz with 1.5 GB of RAM and Mac OS X 10.3.8. My audio interface was a MOTU 2408mkII with a PCI-424 card.

Installation was straightforward: I ran the installer from DVD-ROM, clicked on a few buttons to agree with the defaults, and waited patiently while the program finished its business. In addition to GarageBand 2 and its samples and presets, the disc installed iPhoto 5, iDVD 5, iMovie HD, and iTunes 4.7.1 at the same time, placing everything on my startup drive, with no option for storing presets or sample content elsewhere.

## New and Improved

The most anticipated new feature in GarageBand 2 is its ability to import multitrack Standard MIDI Files (SMFs). Simply drag an SMF from the Finder to the Timeline, and GarageBand will automatically assign a software instrument to each track (see **Fig. 1**). For the most part, SMFs imported flawlessly, with tracks assigned to instruments as expected. Occasionally, when I tried to import an SMF without an extension in its name, it failed to import at all. After I added an SMF or MID extension and dragged it to the Timeline, GarageBand recognized the file even if I later deleted the extension. GarageBand still doesn't export MIDI files, but

A new software-instrument category called Synth Textures includes some of the finest electronic timbres that GarageBand offers.

Apple Logic Express and Logic Pro 7 can import GarageBand files directly. Additionally, GarageBand 2 can't play external MIDI instruments, another desirable feature that most sequencers offer.

GarageBand 2 lets you record as many as eight audio tracks and one software-instrument track simultaneously. You can capture a band's entire live performance or record a drum set with individual mics on each drum. You'll need an audio interface with multiple inputs, as well as enough microphones or direct instrument sources for multitrack recording.


FIG. 2: GarageBand 2's Musical Typing feature lets you play software instrument with your computer keyboard. You can even control MIDI Velocity, Pitch Bend, Sustain, and Modulation. At the top of the window, a tiny keyboard shows the active pitch range.

Using an algorithm borrowed from Logic, GarageBand can now display software-instrument tracks in traditional musical notation as you play. To make editing as easy as possible, selecting a note plays it and also displays it in piano-roll form. Although Notation view occasionally had a hard time interpreting triplets (especially if I played with any degree of swing), tracks always played back exactly as I had recorded them. Notation view is a handy feature, although it would be even handier if GarageBand could print musical scores, but that might be asking too much from an entry-level program.

GarageBand 2 can convert MIDI or audio recordings to Apple Loops. When you select a region and drag it to the Loop Browser, a dialog box appears in which you can specify instrument, genre, mood, major or minor scale, and whether it will follow tempo changes. I appreciated this new feature, but I wish you could add your own descriptors. Curiously, when I saved a MIDI loop and changed the key signature from C to G, the track transposed up a fifth while the loop transposed down a fourth.

GarageBand now imports audio files from various formats such as Acidized WAV, MP3, unprotected AAC, and Apple Lossless. Just drag the file from the Finder to the Timeline. Unlike Apple Loops, imported files are unaffected when you change key or tempo. To convert audio to an Apple Loop, drag it from the Timeline to the Loop Browser.

Two new features enhance the tuning and timing of audio tracks, effectively pitch correcting and quantizing them. For pitch correction, move the Enhance Tuning slider from minimum to maximum; at high settings, you'll hear Cher-effect artifacts. You can also select Limit to Key to keep pitches within the Master Track's current scale. The Enhance Timing slider is accompanied by a quantization grid with four duration settings. When I tried it, the highest settings produced some bizarre results. Nonetheless, you might be hard-pressed to find any other such inexpensive software with such advanced capabilities.

## But Wait, There's More!

When you select Musical Typing from GarageBand's Window menu, you can play software instruments using your computer keyboard—a practical feature when you're sitting in an airport with your PowerBook, I suppose. Eighteen keys on the top two letter rows are used to play notes (see Fig. 2). Other keys let you shift octaves, enable sustain, control Velocity, and apply vibrato and Pitch Bend. You can even play six-note chords with a different Velocity for each note. GarageBand's implementation of computer-keyboard note entry is the most comprehensive I've seen.

GarageBand 2 introduces several new software instruments and effects. Vocal Transformer, for example, lets you change a male voice to a female voice or a cartoon falsetto. Vocal Transformer also transposes tracks as much as a fourth up or down, enabling you to sing harmony with yourself using only one recorded take. For guitarists, three new amp-simulation presets are available: Big Wheels, English Channel, and Thick Jazz. Among the new software instruments is a category called Synth Textures, which includes some of the finest electronic timbres that GarageBand offers.

PRODUCT SUMMARY

APPLE COMPUTER GarageBand 2

digital audio sequencer
$79 (iLife '05)

OVERALL RATING [1 THROUGH 5]: 4.5

PROS: Intuitive user interface. Impressive value. Imports Standard MIDI Files. Records eight simultaneous audio tracks. Converts several audio formats to Apple Loops. New effects and additional high-quality content. More fun than ever.

CONS: Stiff CPU requirements. Still doesn't support external MIDI sound sources.

MANUFACTURER
Apple Computer
www.apple.com

GarageBand 2 features several additional enhancements. You can lock tracks to conserve CPU cycles—a function called Freeze in Logic. Just as you've always been able to specify volume changes graphically, now you can draw Pan changes for any track. You can scale your MIDI keyboard's Velocity, too, and GarageBand 2's onscreen keyboard is resizable. For people who have Apple Jam Packs installed, GarageBand 2 gives you the ability to show only loops and instruments from the standard GarageBand complement, from individual Jam Packs, or from any third-party add-ons.

## Problem Solved

My only real complaint about GarageBand 2 is that it still requires you to store its content on your startup disk. The 80 GB drive that came standard in my Mac G4 (like the 80 GB drives that come standard in most PowerBook G4s and iMac G5s) already demands constant housekeeping just so you can find enough space for additional new programs, updated system files, new audio plug-ins, and all the other data necessary for living the digital lifestyle that Apple encourages. I could reformat a larger drive and make it my startup disk, but when you own as much copy-protected software as I do, that's a major hassle.

Fortunately, I discovered a little-known work-around. After you install GarageBand's content (including any Jam Packs) to your startup drive, copy the Apple Loops folder to another drive, and then delete it from your startup drive. Open GarageBand and drag the folder from its new location to GarageBand's Loop Browser. From within the dialog box that appears, select Current Location. That will create a *symlink* (symbolic link), which is the Unix equivalent of an alias in the Mac OS or a shortcut in Windows. I understand that Apple wants to keep installation simple, but it should spotlight this work-around for more advanced users.

## Studio on a Budget

When Apple released iLife '05, its price increased by $30. Is it still a bargain? Absolutely. Where else can you get so much creative functionality and sample content for so little? Without a doubt, GarageBand is still the best deal in the world of computer music. If you're one of the thousands of amateur and pro musicians who use and love GarageBand, GarageBand 2 is an essential upgrade.

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*EM associate editor Geary Yelton lives in Charlotte, North Carolina, with his lovely wife Pam and their amazing cat Sadie.*

FIG. 1: The OpenSynth neKo 64 combines a powerful Windows XP computer running virtual instruments or your favorite audio applications with a gig-worthy keyboard and numerous MIDI controls for real-time tweaking.

OPEN LABS OpenSynth neKo 64-220

# Computer, DAW, keyboard, and virtual-instrument host.

By Brian Smithers

The OpenSynth neKo 64 from Open Labs might just be too flexible for its own good. Put simply, it's a music keyboard built around a computer. It also functions as a DAW that hosts virtual instruments, and it has plenty of MIDI knobs, buttons, and faders for controlling the aforementioned keyboard/DAW. The neKo 64 is capable of so many things that it's difficult to concisely assess it. It represents a complete music-production system squeezed into one box.

## Inside and Outside the Box

When you place an order for a neKo 64, you can configure it to suit your needs. The model I received for review was a top-of-the-line neKo 64-220 ($9,871), running Windows XP Professional. It had dual 2 GHz AMD Opteron 64 processors; 2 GB of RAM; and an 80 GB, 7,200 RPM hard drive (see **Fig. 1**). Four RAM slots, five drive bays, and five full-length PCI slots are available for expansion. A DVD +/–R/RW drive is supplied for burning reference discs and backups. The instrument also has a Gigabit Ethernet port, two FireWire ports, and four USB 2.0 ports.

You could use any Windows XP–compatible audio interface with the neKo 64, but the M-Audio Delta 1010LT is standard equipment. It supports as many as ten simultaneous 24-bit, 96 kHz input and output streams. Open Labs has customized and panel-mounted the I/O jacks, providing eight inputs and eight outputs on unbalanced ¼-inch connectors, with two inputs and two outputs on balanced XLRs (see **Fig. 2**). XLR inputs 1 and 2 have microphone preamps, but no phantom power. One MIDI In, one MIDI Thru, and two MIDI Out ports are available, as well as coaxial S/PDIF and word-clock I/O.

The neKo 64's alphanumeric keyboard has a compact configuration similar to a notebook computer's, as well as a touchpad-style pointing device. Most of the time, however, I found myself reaching for the 15-inch color LCD touch screen.

The neKo 64 also has a 61-key synth-action keyboard with heavy-duty pitch and mod wheels. Assorted MIDI control panels surround the touch screen. One has 16 faders with two rows of 16 illuminated buttons, and another has two rows of 12 rotary controls with corresponding buttons. The third panel features transport controls, a numeric keypad, an LED screen, an eight-position joystick/rotary control, and various other buttons.

All of the neKo 64's resources come with a blank slate for whatever Windows-compatible software you want to run, and that software is responsible for a large part of the neKo 64's personality. The neKo 64 comes with a good software bundle, but you'll probably appreciate it more once you start installing your favorite programs.

The bundle includes Tracktion, a lean and mean digital audio sequencer from Raw Material Software; and Orion Pro, a loop-manipulation environment from Synapse Audio. Karsyn is a VST/DirectX host that turns your soft synths and plug-in effects into a virtual rack. To use neKo 64 as a performance keyboard, you would most likely use Karsyn to call up preset configurations, just as you would call up multis or combinations on a more traditional hardware synth.

Several virtual instruments are provided with the neKo 64, ranging from Green Oak Crystal to IK Multimedia SampleTank 2 LE. It's a reasonable lineup of respectable soft synths, albeit a bit short on star power.

## The Essence of neKo

The neKo 64 has an impressive list of hardware and software, and it worked for me as advertised. The essence of the neKo 64, however, lies in two factors. The first is its vast array of MIDI controls and the software that determines how those controls are applied to the task at hand. The second is Karsyn.

An application called mFusion lets you manage the neKo 64's assignable MIDI controls (see Fig. 3). You can freely assign the various rotary encoders, faders, and buttons to MIDI notes, continuous controllers, and program changes. You can also assign them to computer keystrokes, musical keyboard transposition, or Windows application shortcuts. The direction of faders and rotary encoders can be inverted. Rotary-encoder behavior can be relative or absolute (like a knob), and you can adjust the sensitivity for finer control.

mFusion was released while I was writing this review, and it's a big step forward in the neKo 64's MIDI implementation. For example, it immediately solved one of my major frustrations: the fact that the neKo 64's keyboard has no octave shift controls. Every time I wanted to play bass lines, I had

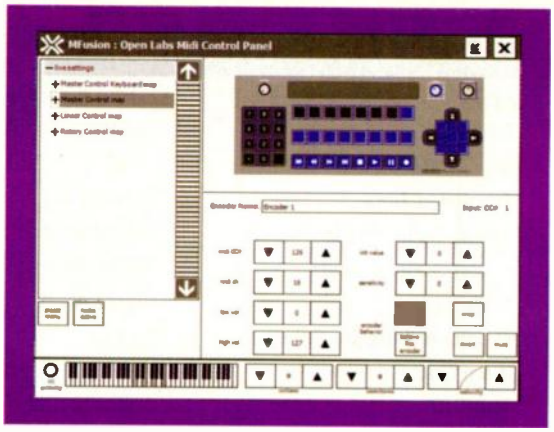


FIG. 3: mFusion provides centralized control over all attached MIDI control devices, including the neKo 64's modules and any other devices that you connect through MIDI or USB.

ment, allowing you to develop a modular system of partial maps that can be combined into purpose-specific presets. For example, I created a map that assigned the last two buttons in the fader module's top row to shifting the keyboard down and up an octave, respectively. I then included that map in every preset I created, giving me consistent octave-shift controls without having to re-create the assignment every time I created a preset for a different circumstance.

Regardless of what message an individual control sends natively, a host application (such as your DAW) recognizes mFusion's output. If your host application doesn't allow reassignment of MIDI Control Change messages (or if it makes the process difficult), you can create an mFusion preset that produces just the right messages to make life easier. If your host application allows reassignment and if it features a learn mode, you can use mFusion to define the behavior of the controls—relative or absolute, normal or inverted, and so forth.


FIG. 2: The neKo 64's rear-panel module has ¼-inch and XLR audio, S/PDIF, MIDI, and other connectors.

to go into the edit page of the individual synthesizer application or assign a pitch offset in my sequencer. With mFusion, I was able to change octaves either directly from the mFusion application window or by assigning buttons to transpose up and down by octaves.

mFusion organizes its reassignments into maps, and a collection of maps makes up a preset. A map can consist of as little as one control assign-

## The Host with the Most

Imagine a big, almost infinitely expandable rack of synthesizer modules all wired to a mixer that has snapshot recall, allowing you to freely change the mix of synths. Imagine that the rack also held innumerable effects processors, and that the mixer was able to reroute the synths and reorder the effects instantly. Now put the whole setup under MIDI control, so that you can send a single program change and reconfigure everything at

## NEKO 64 SPECIFICATIONS

| | |
|---|---|
| CPU | (1) or (2) 64-bit AMD Opteron |
| RAM | 512 MB, expandable to 8 GB |
| Disk Drives | (1) 80 GB, 7,200 RPM hard disk; (1) DVD-ROM/CD-RW optical |
| Expansion Slots | (5) PCI (4 available); (5) drive bays (3 available) |
| Analog Audio Inputs | (8) unbalanced ¼" TS; (2) balanced XLR mic/line |
| Analog Audio Outputs | (8) unbalanced ¼" TS; (2) balanced XLR; (1) ¼" stereo headphones |
| S/PDIF I/O | (2) stereo coaxial |
| Maximum Sampling Rate | 96 kHz |
| Word Clock | (1) BNC in; (1) BNC out |
| MIDI I/O | (1) In; (2) Out; (1) Thru |
| Additional I/O | (6) USB 2.0; (2) FireWire; (1) 10/1,000 Base-T Ethernet; (1) ¼" footswitch |
| Keyboard | 61-key semiweighted synth-action, Velocity and Aftertouch |
| Standard Modules | alpha control; rotary control; linear control; QWERTY keyboard |
| MIDI Controls | Pitch-Bend wheel; mod wheel; 8-position joystick; (16) faders; (24) rotary controls; (56) assignable buttons; (16) application buttons; transport controls; numeric keypad |
| Additional Features | 15" color LCD touch screen; 2-button trackpad; DVD +/– R/RW drive |
| Dimensions | 45" (W) × 7" (H) × 19" (D) |
| Weight | 49 lbs. |

once. That's essentially what Karsyn does (see Fig. 4).

Karsyn is Open Labs' version of Brainspawn Forte, a virtual live-performance workstation that enables users to load any number of VST or DirectX instruments and effects and configure them individually or in combination. The interface resembles a

rack of synth modules. Each module holds an instrument and optionally one or more insert effects and is assigned to an output bus. Each output bus may contain its own insert effects and is used to route the output of one or more synth modules to a physical output. Multiple synth modules can feed the same bus, and multiple buses can feed the same physical output.

From the main interface, you can open each instrument's edit window for control and editing. Karsyn also lets you remap program changes or channel numbers, split the keyboard, and assign MIDI controls from the neKo 64's various control modules. In combination with mFusion, that process can be easy if you have access to the synthesizer's controller mappings. Check your software instrument's documentation for details.

Karsyn's Scenes are what pull it all together. A Scene can be viewed as a multi (or combi) program insofar as it allows you to combine different individual patches. When you save a Scene, you are saving virtually every current Karsyn parameter, including the all-instrument and effects parameters (whether they're saved as presets or not), bus assignments, keyboard splits, channel mapping, and controller mapping.

You can set up your favorite virtual organ so that hardware faders represent drawbars. Additionally, with a simple Scene change, you can switch to your favorite analog synth emulation with the faders controlling the synth's onscreen controls. The next Scene could layer (or split) your favorite virtual electric piano and clavinet plug-ins and run them through a virtual amp for some tasteful distortion, with the distortion parameters controlled by the neKo 64's rotary controls.

## In Practice

The possibilities are staggering, which brings us back to where we started: it's a challenge to wrap your brain around what the neKo 64 can do. It takes some digging to figure out how to configure things, and it takes a bit of planning to find the best way to do it. Once you have everything set up, you'd better have it documented so that in performance, you can remember which knob controls which function. You may find yourself putting console tape below the control modules to assist your memory.

It would have been helpful if Open Labs had provided documentation, at least in the form of PDFs, for all of the soft synths and effects. Karsyn's PDF is there, and Open Labs offers a few printed documents that help you get started; the documentation, however, falls short of what I had hoped for such a sophisticated and expensive instrument.

The neKo 64's power would be more obvious to the beginning (or prospective) user if the included presets took better advantage of its possibilities. I found myself wiggling faders and knobs on Scene after Scene hoping for some cool results, but to no avail. The Scenes do demonstrate the layer and split capabilities, although using the Mute button to indicate which synth modules

are active in a given scene is counterintuitive.

If you were to put the neKo 64 next to the most popular keyboards available, you would be underwhelmed by its sounds. Although there are some decent soft synths, they are not utilized to their potential in the default Scenes. More to the point, such a comparison is a bit off target. The neKo 64 sounds only as good as whatever virtual instruments are installed—better, in fact, because it makes it so convenient to combine your favorite soft synths.

The neKo 64 is a heavy keyboard (49 pounds), but it isn't as heavy as some. It's noisy for a keyboard, but not noisy for a computer. Its keyboard action felt good to me, and it drew praise from some of my colleagues who are better keyboard players than I. Its pitch wheel tended to stick around its null point, occasionally failing to return to zero when I eased it back gently. Open Labs reports it had received a bad batch of pitch wheels and will replace them under warranty.

In an effort to offer the most stable environment possible, Open Labs has gone to the unusual length of replacing the Windows XP Professional shell with its own. The Open Labs shell is said to bypass many of the general-purpose compromises inherent in the standard GUI, stripping it down to the functions essential for music production. In practice it works well, but it's difficult to quantify just how successful its architects were. It's certainly not crashproof, but it crashed only once during my testing.

## The Final Analysis

I like what Open Labs has done with the neKo 64. I used it for everything from sequencing to composing and recording, and it rose to each challenge admirably. The more time I spent tweaking its MIDI configuration, the more I liked it. Most of the time, I absolutely loved the touch screen. It felt so natural to be able to grab a control onscreen and adjust it directly. Sometimes, however, it was a bit difficult

PRODUCT SUMMARY

OPEN LABS OpenSynth neKo 64-220

keyboard workstation
$9,871 (as reviewed)
$5,455 (base price)

OVERALL RATING (1 THROUGH 5): 3

PROS: Powerful computer with dual 64-bit CPUs. Keyboard, audio I/O, computer interface, and MIDI controls tightly integrated. Responsive 61-key synth-action keyboard. Touch screen interface. Extremely configurable MIDI implementation and virtual instrument host.

CONS: Expensive. Insufficient documentation. Default sounds are not great. No phantom power on mic preamps.

MANUFACTURER
Open Labs
www.openlabs.com

FIG. 4: Karsyn is neKo 64's virtual instrument and effects host. It presents an extensive virtual rack that can be completely reconfigured with a single button, keystroke, or program change.

to make fine adjustments or grab small controls. Open Labs suggests using your fingernail rather than your fingertip, and that's a useful suggestion, but an even better solution would be using a stylus that is similar to those used with a PDA.

Would I spend almost $10,000 on the neKo 64-220? That's a tough question, largely because it duplicates a lot of gear that I already own. The ability to put my computer and my keyboard controller into a single unit is appealing, and having MIDI knobs and faders built in is a great asset. Without options, the neKo 64's base price is $5,455, but if the price is still too high, less expensive models are available. Open Labs recently introduced the neKo GS and the neKo LE, more modest versions priced as low as $2,295.

If you were to judge the neKo 64 purely on its hardware components, you would probably consider it too pricey. By the time you calculate the value of its optimized configuration, integrated design, and customizable interface, however, you would come to appreciate its value.

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*Brian Smithers is Course Director of Audio Workstations at Full Sail Real World Education and is the author of* SONAR 4 Ignite! *(Muska & Lipman, 2004).*

FIG. 1: For the recordist on the go, the Fostex FR-2 field memory recorder is packed with professional features such as 16- or 24-bit audio resolution at sampling rates as high as 192 kHz. Powered by eight AA batteries or a DC adapter, it records direct to flash memory—either CompactFlash or a PC Card.

# FOSTEX FR-2

## A field recorder makes the cut without breaking the bank.

By Rudy Trubitt

I've found a replacement for my aging portable DAT recorder: the FR-2 from Fostex. The FR-2 is a little larger than the DAT, but it's lighter than it looks. The control layout makes sense. Slide your right hand down the strap; the first thing your finger hits is the Record button, which is accessible but well protected from unintended bumping. The dual-concentric input-level knobs are right under your thumb, exactly where you'd want them. When you're ready to start recording, there's no session to create or files to name. Just turn a rotary switch to choose the sampling rate (from 22 to 192 kHz), flip a switch for 16- or 24 bit and another for mono or stereo, then press Record.

Each new recording ends up as a Broadcast WAV file on your choice of a PC Card hard drive or a CompactFlash card (not included) (see the sidebar "Media Matters"). After recording, pop the media out of the FR-2 and stick it in your computer (with the requisite card reader or PC Card slot). Drag your recording to your hard drive, and it's ready for editing or CD burning.

### Show Me

The FR-2 is about the size of an 800-page hardcover book. You can slip it into a bag or hang it from its sturdy strap; in either case, the long edge of the unit will face up. The front panel (imagine the spine of a hardcover book) is where you find the controls you'll need to access most often (see **Fig. 1**). The top panel (our imaginary book's front cover) contains the controls that you'll use less frequently. You can easily access both surfaces when using the shoulder strap, but if you slip an FR-2 into a bag alongside other equipment, the top-panel controls are less accessible.

Critical front-panel controls include a big, red positive-acting Record button and a smaller Record

### FR-2 SPECIFICATIONS

| | |
|---|---|
| **Recording Tracks** | stereo/mono |
| **Recording Format** | Broadcast WAV |
| **Recording Medium** | CompactFlash, PC Card |
| **16-Bit Sampling Rates** | 22.05-, 44.1-, 48 kHz |
| **24-Bit Sampling Rates** | 44.1-, 48-, 88.2-, 96-, 176.4-, 192 kHz |
| **Analog Inputs** | (2) balanced XLR with 48V phantom power |
| **Analog Outputs** | (2) unbalanced RCA; (1) ¼" stereo headphones |
| **Digital I/O** | (1) XLR input (software-switchable); (1) XLR output (software-switchable); formats: S/PDIF, AES-EBU (176.4-, 192 kHz not supported) |
| **USB 1.1** | (1) Type A; (1) Type B connector |
| **Locate Memory** | 99 cue points |
| **Power** | 12V DC; (8) AA batteries |
| **Dimensions** | 9.84" (W) × 8.66" (D) × 3.03" (H) |
| **Weight** | 3.31 lbs. (without batteries) |

Standby button, which lets you monitor live input; it also pauses a recording in progress. Those critical buttons are well protected from inadvertent bumping. The front panel also has record and headphone levels, as well as a button to drop locate markers and skip between them.

A 1-by-2-inch dot-matrix monochrome LCD shows a number of details, including recording level, sampling rate, bit depth, mono or stereo selection, time remaining, and file-name information. Although that's a lot of data, it's efficiently displayed. A switchable backlight and an adjustable contrast for the display keep it readable in nearly all situations. A small click-and-turn menu knob selects various menu options and settings, which allow you to set the time and date clock, set the default file name for new recordings, and rename and delete existing files, among other options.

The larger top panel contains most of the set-and-forget controls using tactile, recessed toggle switches (one per function) and rotary controls. Sampling rate can be set to 22.05-, 44.1-, 48-, 88.2-, 96-, 176.4-, or 192 kHz, at 16- or 24 bits. Two flush-mounted trim controls with a 34 dB range let you adjust the gain of the mic preamps. Even with such a wide range of gain, the mic pre is somewhat noisy when it's wide open. The switchable peak limiter works well, and 100 Hz low-cut filters are independently selectable for each channel. There's also a small loudspeaker for playback, which I found surprisingly useful. It's nice not having to slip on headphones every time you want to hear a quick bit of a recording.

Play, Fast-Forward, and Rewind buttons are also located on the top panel. Holding down the Play and Fast-Forward buttons simultaneously results in double-speed audio, whereas holding down the Rewind and Play buttons gives you single-speed backward playback—a cool feature. Note that the Stop button doesn't stop a recording in progress; use the Rec Standby for that purpose.

## See the Other Sides

Analog and digital connections are on the right and left side panels, respectively. In the analog section are a pair of XLR mic/line inputs, a single +48V phantom-power switch, and RCA line outs (see Fig. 2). The power

## MEDIA MATTERS

For this review, I tested a 5 GB PC Card hard drive (model MK5002MPL, $199) from Toshiba and a 4 GB CompactFlash card ($399) from SanDisk. As the FR-2 does not include any storage, don't forget to factor media cost into your budget.

You can have either or both cards installed simultaneously, but you may record to only one at a time. After recording, pop the card out and stick in your computer's CompactFlash card reader or PC Card slot. It will show up on your desktop as a standard FAT32 volume so you can copy recordings to your computer's hard drive. You also can connect the FR-2 to your computer using USB 1.1 (recording and playback are not possible when the FR-2 is in USB transfer mode).

On my Windows XP computer, I read from the CompactFlash card using a USB card reader. My Apple PowerBook G4 (running Mac OS X 10.3) couldn't mount the card until I reformatted it on the Mac (use Apple's Disk Utility and check the OS 9 driver compatibility option to enable DOS formatting). From that point on, the CompactFlash card worked well everywhere. The Toshiba drive worked in my Mac right out of the box without reformatting.

Which media type is best for you? The spinning hard drive is much less expensive. I heard from two different sound recordists using FR-2s (with non-Toshiba PC Card drives), however, who encountered disk-write errors in extremely noisy acoustical environments (one was a low-altitude jet flyover, and the other was trackside at a NASCAR event). I suspect the massive low-frequency vibrations were enough to bounce the heads temporarily out of position. Though I didn't encounter any such acoustical extremes in my testing, the Toshiba drive I used worked 100 percent. Note that the drive did make an extremely quiet whirring sound during operation, similar to the noise from a MiniDisc recorder, but that isn't an issue except in the most quiet of recording situations.

CompactFlash cards lose out in a cost comparison, but they draw significantly less power, which translates into more recording time between battery changes. Additionally, I suspect that a CompactFlash card would be less sensitive to extreme vibration, as it contains no moving parts.

Both drives are fast enough to record at the FR-2's maximum data rate, 24-bit stereo at 192 kHz, which works out to about 9 Mbps. When you move your recordings over to the computer, be aware that your transfer times may vary. I recorded a 100 MB file onto both my PC Card drive and CompactFlash card (100 MB = 1.5 minutes @ 24-bit/192 kHz stereo, or 6 minutes @ 24-bit/48 kHz stereo). I timed the transfer of file to my PowerBook using several different methods (see the table "Transfer Times for 100 MB Audio File"). A rough rule of thumb is that recording at maximum FR-2 resolution will result in file-transfer times of roughly 1× real time. At normal resolution (24-bit, 48 kHz), you can expect a transfer speed of anywhere from 2.5× to 6×.

switch is there, too. It's small and partially hidden by the removable strap's buckle, making it nearly impossible to turn off by accident.

The digital-connection side panel furnishes two USB connectors—one to transfer files to a computer, and the other to attach a keyboard for typing in file names. Fostex warns that a keyboard with built-in USB hubs may not work, and I couldn't get my Mac keyboard to talk with the FR-2. While I appreciate the option of using an external keyboard, the Menu knob was adequate for entering text.

The left panel furnishes digital I/O on XLR jacks; you can select between AES/EBU and S/PDIF format in a menu. Note that the digital input supports sampling rates only as high as 96 kHz. You must use the analog inputs to record at 176- or 192 kHz. I ran into a few issues when recording through the digital inputs (see the sidebar, "High-Sampling-Rate Issues").

The FR-2's DC input is also on the left, using a slightly beefier-than-usual (but not latching) consumer coaxial power connector. (You can find a male version of that connector at well-stocked electronics supply stores.) For strain relief, you can thread your external power cable through a conveniently placed plastic hook.

FIG. 2: The FR-2's left side panel provides digital audio ins and outs, including two USB ports and XLR I/O that can be configured as S/PDIF or AES/EBU. The BCN connectors are for the time-code option.

## The Powers That Be

The FR-2's battery implementation is adequate, but not inspired. Eight AA cells fit in a well-latched compartment on the back panel. Because there's no battery sled, you can count on spending a full minute swapping eight individual batteries and placing the spent ones away in your pack. Using the latest generation rechargeables, expect from

## HIGH-SAMPLING-RATE ISSUES

I initially had trouble making 88.2- or 96 kHz recordings when patching my Grace Lunatec V3's digital out into the FR-2's digital in. The resulting files played back at the wrong pitch and speed, indicating an incorrect sampling rate in the file's headers. While sorting out the problem, I learned something that applies to the V3 and FR-2, as well as other high-sampling-rate devices.

You'd think that a digital audio recorder would know the sampling rate of an incoming signal, either by reading a hidden flag in the data stream or by measuring the time between samples. And you'd be right most of the time, but not always.

Although there is a flag indicating a digital audio stream's sampling rate, the information it conveys is surprisingly limited. The S/PDIF format (IEC958) mandates a subcode flag identifying the current sampling rate as either 32-, 44.1-, or 48 kHz. What happens when a S/PDIF device outputs an 88.2- or 96 kHz audio stream? One of the three sampling-rate flags must still be indicated, even if it is wrong (for example, inserting a 44.1 flag into an 88.2 data stream).

In the AES/EBU format, things are a little better. It has a fourth possible subcode flag called "sampling rate not indicated." That should be used when the actual sampling rate is not 32-, 44.1-, or 48 kHz. (An additional set of subcode bits in the AES3 spec can properly flag other sampling rates, but it's not clear how many manufacturers use this potentially more useful but optional flag.)

Essentially, S/PDIF may have the wrong flag in the subcode, and AES/EBU may be thinking, "I don't know what the sampling rate is!" What should the recording device do?

Regardless of the subcode flag, a recording device should derive its word clock from the incoming sample data (and the FR-2 does). But the FR-2 will attach any sampling-rate flag (even if it's incorrect) to the header of the recorded file. With the V3/FR-2 combination, then, the solution is to perform the following steps:

1. Set the V3 internal jumper to Professional mode, or use AES/EBU output 2, both of which allow the "sampling rate not indicated" flag when appropriate.

2. Manually set the FR-2's rotary sampling-rate selector knob to match the V3's output.

Some manufacturers work around this problem by adding hardware (at some additional cost). It's possible to design a circuit that measures the timing from sample to sample, thereby deducing the actual sampling rate, but the FR-2 doesn't do that kind of autoset. If you do end up with a file containing an incorrect sampling rate, you can change the header information with most sample-editing programs.

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one to three hours of operation between battery changes. Considering the physical size of the FR-2, I would have preferred an option for an internal rechargeable battery.

I often use an external EcoCharge system, which can power the FR-2 alone or the deck and other gear (such as my Grace mic preamp). Although the external battery adds considerable bulk and weight, I can run for many hours without ever thinking about power. One benefit of keeping a set of internal batteries is that if your external power goes down for any reason, the batteries will automatically kick in, and your recording will continue uninterrupted.

I ran a number of current consumption tests (see the table "Current Consumption"). Note that using a spinning hard drive draws about 20 percent more current than using a solid-state CompactFlash card.

## CURRENT CONSUMPTION

| Condition | Current Draw (milliamps) |
|---|---|
| FR-2 power on, no media | 215 |
| 5 GB PC Card, record standby | 580 |
| 5 GB PC Card, recording | 645 |
| 4 GB CompactFlash, record standby | 508 |
| 4 GB CompactFlash, recording | 510 |
| LCD backlight on | 9 |
| Phantom power on (with 2 Neumann KM140 mics) | 10 |

## What's My Name?

Although the FR-2 is almost as simple to use as a tape recorder, each of your recordings does need a unique file name. With a little forethought, you can come home from a day's field work with all your files sensibly labeled. I love this, as it speeds my workflow and improves record keeping.

Each recording creates a new file. All files go into a single directory called bwff. You can rename or delete files from the FR-2, but you can't split or join them as you can with a MiniDisc recorder, nor can you create subdirectories to groups files together.

There are two ways to name files. The first is a thorough time- and date-based name, such as B13h43m24s02Dec2004y. I prefer the second option, which Fostex calls its Scene/Take scheme. Using that method, you select a name from a user-defined list (by default, named Scene1, Scene2, and so on). Each subsequent recording inherits that Scene name with an incrementing take number appended to it.

I changed the Scene names to descriptions such as CREATURE, SCRAPE, and VOICE_OVER. That resulted in file names such as CREATURE_001 and SCRAPE _001 through SCRAPE _005. One minor problem was that the WAV files have a time-date stamp, but that information is stored in the last-modified rather than the date-created field. That means when you edit and save the file later, you lose the reference to the actual time of the original recording. I use the Mac OS X command-line utility SetFile to add the correct creation date as needed.

While recording, you can drop markers to use as locator points when listening back in the field. The markers are stored in the Broadcast WAV metadata, but I haven't found any Mac or PC programs that can read them. Instead, I find a pile of stray markers on the first sample when opening FR-2 recordings.

## Further Impressions

There's a lot to like about the FR-2. It's easy to use, and dedicated switches determine all the critical settings. The menu system offers many additional features, but you can explore those at your convenience; you don't have to dip into the menu while recording. The FR-2 has professional connectors and solid, easy-to-operate controls, and it makes fine-sounding recordings. You can even get an optional SPMTE timecode board, although my review unit didn't come with one.

Not to say that the unit's perfect: it is a little large and feels somewhat plastic. The battery implementation is adequate, but I'm not crazy about it. And the FR-2 lacks an onboard M/S decoder, which means that if you're using an M/S mic pair for single-point stereo, you'll have to wait until post-production to hear your recordings played back in left-right stereo.

But my few complaints are easily outweighed by the benefits of the FR-2, which I've now used for about four months in all sorts of situations. I've done a lot of recordings for the upcoming CD *Field Recording All-Stars* (www.dielectricrecords.com)—mostly in urban environments. I took the recorder into the field with a team from Wild Sanctuary (www.wildsanctuary.com) to record the ultrasonic calls of Townsend's bats, pairing the FR-2's top sampling rate of 192 kHz with the 50 kHz bandwidth of a Sennheiser MKH800 microphone.

The FR-2 is also a fine choice for recording music. I recorded an ambient drone band at a San Francisco club and a saxophone quartet on a street corner in Berkeley. I even used it to capture voice-over work. I chose the Fostex FR-2 instead of recording straight into my computer not because

PRODUCT SUMMARY

FOSTEX FR-2

portable digital recorder
$1,499

OVERALL RATING (1 THROUGH 5): 4

PROS: Great sound and features at a reasonable price. Surprisingly easy to use. Clever file-naming system speeds workflow.

CONS: No M/S decoder. So-so battery implementation.

MANUFACTURER
Fostex America
Web: www.fostex.com

of its portability, but because of the feeling of confidence that it gives. The FR-2 has never crashed on me, and its input section has an analog limiter, which is a nice safety net.

I have yet to miss a recording, thanks to the FR-2's prerecord buffer. When enabled, the FR-2 is constantly capturing sound to a RAM buffer, even though you are not in record mode. When the buffer fills, the earliest recorded audio is discarded to make room for new sounds. When you push Record, the contents of the buffer are written to disk, followed by the rest of the take. In other words, the FR-2 is a time machine that takes you back a few seconds to the moment that you wish you had started recording, but didn't. That is fantastic when recording unpredictable sources. Animal calls, crowd reactions, train whistles—the list is endless. Rather than risk missing the beginning of a great sound or recording minutes of nothing, you can simply hang out in Rec Standby mode, secure in the knowledge that when something cool happens, you already recorded it. Of course, the deck needs to be powered on for that feature to work; it takes about 18 seconds from powering on to the start of recording.

## We Have a Winner

I certainly haven't described every feature of the FR-2 here. For instance, an optional alert beeps if the battery is low, if you're clipping the A/D, or if you're running out of storage space. You can change the length of the prerecord buffer, control the metering's peak-hold time, and more. But what really sold me on this deck is its simplicity of operation. I'm sure I could strap an FR-2 over your shoulder, give you a five-minute orientation, and send you out to record, confident that you'd come back with the goods.

Rather than send my review unit back to Fostex, I bought it. The FR-2 is a highly functional and (so far) perfectly reliable recorder. I look forward to spending more time in the field recording great sounds.

*Author Rudy Trubitt thanks Michael Grace, Toshiba, SanDisk, Bernie and Kat Krause, Bill Rainey, Charles Maynes, Scott Gershin, Bruce Koball, and Drew Webster for their participation in this review process.*

### TRANSFER TIMES FOR 100 MB AUDIO FILE

| Transfer Method | Time (minutes:seconds) |
|---|---|
| FR-2 reading PC Card over USB 1.1 | 2:34 |
| FR-2 reading CompactFlash over USB 1.1 | 2:37 |
| PC Card in laptop slot | 1:07 |
| CompactFlash in USB 1.1 reader (FireWire card reader unavailable for testing) | 2:01 |

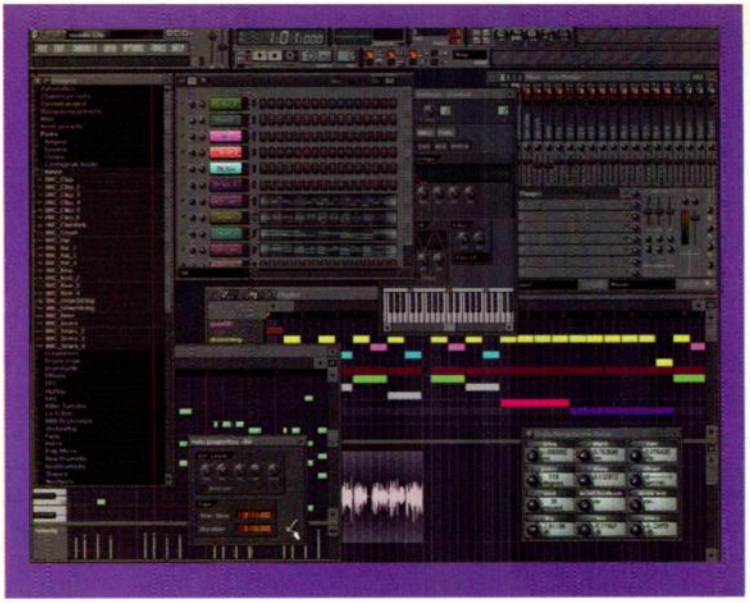

FIG. 1: Image-Line Software FL Studio's window-intensive interface has (clockwise from left) a drag-and-drop browser, a step sequencer, a channel settings window, a mixer, a playlist, an effects editor pop-up box, a piano-roll editor, and a pop-up note properties box.

# IMAGE-LINE SOFTWARE FL Studio 5 (Win)

## Fun features and exotic synthesis in a sequencer.

By Jim Aikin

With each new release, the program now known as FL Studio has become incrementally more powerful. It started life as a modest pattern sequencer with a couple of built-in soft synths, suitable for producing beat-oriented music. With the addition of stereo audio tracks and a video window, version 5 leapfrogs past other virtual workstations, and seems poised to take on the major sequencers as a tool for serious music production.

FL Studio 5 has a lot more to offer than just audio tracks and a video window. Audio time stretching is supported, as are clip-based envelopes for audio-level and pan automation. Beats can be automatically split apart (in the same fashion as with Propellerhead's ReCycle) for tempo changes, and a simple wave editor is provided, as well as several new synthesizers. Some of the new synthesizers are available in the XXL version; they are available only as optional add-ons, however, for the less expensive versions (see the sidebar "With Six You Get Elderberry"). Other features include highly configurable wave scratching, a built-in speech synthesizer that can read ordinary English spelling, pattern triggering in live performance, 64 mixer channels, the ability to read MP3 files, a non-real-time arpeggio creator in the piano-roll window, and a huge library of sampled percussion.

FL Studio, version 3.5, was reviewed in the November 2002 issue of EM (at that time, FL Studio was known as FruityLoops). In this review, I'll focus on the new features in version 5; for the benefit of those who aren't familiar with the program, however, here's a brief recap.


FIG. 2: The 6-operator Sytrus synth has multisegment envelopes (lower left). FM and RM amounts are programmed in the knob matrix at right.

### Apples and Oranges

The core of FL Studio is a pattern sequencer. Individual patterns can contain notes played by many different

Generators. For instance, one pattern may contain notes for six or eight drum samples playing a 2-bar loop; another may contain an 8-bar bass line and chord comp; and so forth. Patterns are arranged into a song in the Playlist window.

The graphical user interface (GUI) for creating patterns and a Playlist is so friendly that one is tempted to call it cute. You can make a drumbeat, for instance, by clicking on buttons in a 16th-note grid, and the beat can then be customized by giving each note its own Velocity, filter cutoff, and so on. On the whole, though, FL Studio is rather window intensive, as shown in **Fig. 1**.

For standard musical chores, FL Studio's Generators include sample playback, analog-style synthesis, two simple plucked-sound synths, and a MIDI output device for driving external hardware. Resonant multimode filters, envelopes, and LFOs are offered in many of the Generators, as are arpeggiators and other handy widgets. There is also an additive synthesizer that derives timbre information from graphics files, a granular synth, and a speech synth. New and noteworthy are Wave Traveller, Sytrus, and Fruity Pad Controller.

FL Studio hosts third-party DX and VST soft synths and effects. Going in the other direction, you can use FL Studio as a VST or DXi plug-in in another program. FL Studio can also work as a ReWire slave or ReWire host. The FL Studio mixer has a good suite of effects, including all of the expected types.

Automation of just about every parameter is supported. After recording automation in real time by using the mouse to move a knob, you can edit the data graphically. Complex mathematical processes can be used to massage the controller data. While there's no event list, double-clicking on any note in the piano-roll editor opens a pop-up box in which you can change the note's start and end times, Velocity, filter cutoff, and so on.

Overall, FL Studio's GUI is well designed and packed with amenities. Among the new features are nameable time markers for the Playlist window. Double-click on a marker, and the region between it and the next marker is selected for loop playback. Version 5.0.2 adds multiple context-sensitive settings for the Snap grid, a welcome new feature.

You can solo one or more Generator channels, which is useful when you're developing a mix. Unsoloing, however, unmutes all audio and MIDI Generators, not just those that were unmuted before you soloed one of them. With songs that contain more than a few channels, that can be annoying.

## Hark! The Lark!

FL Studio 5's implementation of audio tracks is musically usable—I didn't have any problems overdubbing external instrument tracks. Recording without monitoring through FL Studio requires a little subterfuge, but it can be done. Each audio clip has its own pop-up menu, with which you can split the clip into beats, add various kinds of rhythmic stuttering effects, or create a volume or panning envelope. The curves of the envelope segments can be concave, convex, or S-shaped.

Unfortunately, the GUI for audio suffers from the fact that the audio tracks have been grafted onto a pattern-oriented sequencer. All of the sounds in FL Studio, including the sounds in audio tracks, come from Generators, and Generator channels are objects that live in the Step

## WITH SIX YOU GET ELDERBERRY

FL Studio is available in seven different versions. Full details can be found on the Image-Line Software Web site, but here is a quick overview. Most versions are available either boxed or by download, with slight differences in price. To make things more interesting, Image-Line Software gives more than one name to some of the packages. Lifetime free updates are offered with the download versions, but cost $29 if you buy the box. Purchasers of slimmed-down versions can upgrade by adding specific synths, whose cost varies from $19 for Fruity DX-10 (a simple FM synth) and $29 for Wasp (an analog-style synth) to a whopping $179 for Sytrus.

The XXL Edition ($299) comes with everything except for the Wasp and DreamStation synths.

The Producer Edition ($149) strips off SimSynth, DrumSynth, DX-10, VideoPlayer, Sytrus, and SoundFont Player.

The Fruity Edition ($99) eliminates audio tracks, WaveEditor, parametric channel EQ in the mixer, and some effects routing possibilities.

The Express Edition ($49), available only by download, is missing so many key features (including parameter automation, the piano-roll editor, and the bundled sound library), that I honestly can't recommend it.


**FIG. 3: The Fruity Pad Controller serves up 16 Velocity-cross-switchable percussion pads. The tabs at the top of the window bring up other editing pages.**

Sequencer window, not in the Playlist window. Yet the audio waveform data is displayed in the Playlist, which corresponds more or less to the Track window in a linear sequencer. As a result, audio tracks have no names in the Playlist window, nor can they be muted and unmuted there, because the mute and solo buttons are in the Step Sequencer window. To make matters worse, you can't mute or unmute an audio track during playback; you can do it only when the transport is stopped.

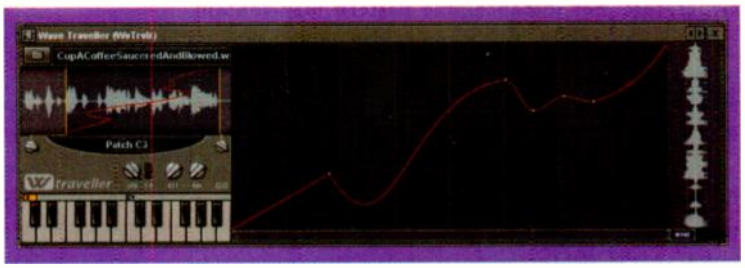

FIG. 4: Design your own scratches in Wave Traveller. The red curve shows the speed at which the sample will be played back.

If you've recorded six or eight vocal takes and you want to create a composite track containing the best phrases from each, you may be dismayed to learn that each take is being played by a different Generator. After you've clipped apart the phrases, the only way to create a single linear audio track containing the final vocal is to bounce it to disk.

To select and move several audio clips at once, you have to change mouse tools three times, because you can't select clips when the pencil tool is active, and you can't move clips when the selection tool is active. Once you've moved them, an extra step is required to deselect them, because you can't do that simply by clicking on one of them with the pencil tool, the way you would in some other audio multitrack programs.

Care is advised when dragging chunks of audio. If you click on a point that is too close to the right end of an audio clip, dragging it will lengthen the clip rather than move it. That time-stretch operation affects all of the clips derived from the same file, and the undo command can't be applied to it. It is an easy way to make a mess of a carefully crafted audio track.

PRODUCT SUMMARY

IMAGE-LINE SOFTWARE FL Studio 5

pattern-oriented virtual workstation
$299
OVERALL RATING [1 THROUGH 5]: 3.5

PROS: Great synths and effects. Audio automation and time stretching. Good starter sound library included. Supports VST, DX, and ReWire.

CONS: Audio tracks are not well integrated with pattern-oriented sequencing.

MANUFACTURER
Image-Line Software
www.flstudio.com

Although audio tracks are displayed in the Playlist window as monaural waveforms, all audio recordings made in FL Studio 5 are stereo. Mono recording isn't supported, but mono files recorded in other programs can be used, and a stereo recording can be collapsed to mono in the WaveEditor.

The WaveEditor window has a few basic utilities, such as cut, copy, paste, normalize, reverse, fade in, and fade out. You can also adjust the start and end points of a looped sample. At present, though, the manufacturers of standalone wave editors have no reason to fear losing customers to FL Studio. You can't reduce the level of a region, draw out a pop with a pencil tool, or even zoom in vertically to examine a low-level waveform. If the past history of FL Studio is a reliable guide, however, WaveEditor will probably turn into a great feature in the next version .

## Fruit of the Loop

The Sytrus FM synth (see Fig. 2) is a major addition to FL Studio. It provides access to a vast range of timbres that the analog-style Generators can't produce. Sytrus is a hybrid subtractive and 6-operator FM synthesizer with a mouth-watering array of features: three resonant filters with wave shapers; ring modulation; plucked-string synthesis; customizable waveforms; chorus, delay, and reverb effects; more than 50 syncable multisegment envelopes; more than 50 syncable LFOs; and an assortment of modulation mapping curves for things such as keyboard and Velocity tracking.

Sytrus comes with approximately 250 factory presets. It will also load DX7 patches in SysEx format. Such files are readily available on the Internet, which greatly expands the universe of Sytrus sounds. (I grabbed a bunch from Dave Benson's DX7 Page, www.math.uga.edu/~djb/html/dx7.html.) Image-Line Software doesn't claim that the imported patches will be completely accurate, but algorithm and operator tuning information and envelope shapes are handled well. One difference, for example, is that Sytrus doesn't produce nearly as much aliasing in the upper octaves as a real DX.

As I worked with Sytrus, I spotted some frustrating omissions from its feature set. First, it doesn't respond to MIDI sustain pedal messages. (Slayer is the only FL Studio synth that does.) Second, key Velocity can't be used to control envelope attack or decay times. Third, operator amplitude is always controlled by Velocity, even when you don't want it to be. That is especially irksome, because there are certain types of growly synth basses that you'd like to keep at a uniform volume while controlling filter cutoff from Velocity. Despite its flaws, I love Sytrus!

## Beat and Scratch

The Fruity Pad Controller (see Fig. 3) is a sample playback Generator designed to play drum kits. FL Studio

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has been able to trigger percussion samples using its Sampler Generator for a long time, so what's special about the Fruity Pad Controller? First, it lets you load 16 different drum sounds into one Generator slot, which can eliminate some of the clutter in the Pattern grid. Second, each of its sounds can be Velocity multisampled, using any combination of Velocity splits and layers per pad. Two acoustic kits are supplied. The Fruity Pad Controller also supports hi-hat mute groups, and a selection of 39 one-measure drum patterns (or the MIDI file of your choice) can be loaded from the Fruity Pad Controller panel. Those features help make up for the fact that, unlike some older Generators, the Fruity Pad Controller has no filter, envelopes, or LFOs.

Say you have an audio file that contains some rap music, and you'd like to add a few scratches—or maybe a lot of scratches. No need to press vinyl, simply create a Wave Traveller (see **Fig. 4**) and load the file into it. Every key on a MIDI keyboard can scratch the file using a different curve, and you can define each curve by creating as many envelope points as you need. A volume envelope for each key can be created the same way. For each envelope segment, you can choose from among several curve types (one of which is Bezier curves). It's not real-time scratching (you can't do it from a mod wheel, for example), but once you've set up the scratches in a programming session, you can trigger them onstage to create stuttering effects and so forth (see **Web Clip 1**).

Drum Synth is similar in some ways to Waldorf Attack, which was a great percussion VSTi that's no longer available. Like Attack, DrumSynth lets you program a different percussive tone for each MIDI key. (It has 120 programmable keys, as opposed to Attack's 24.) A few sampled waveforms of the TB-808 and TB-909 persuasion are offered, or you can go with straight analog-type oscillators or noise sources. DrumSynth's parameters are somewhat odd; clicking on the noise switch in one of the oscillators, for instance, provides a slider for moving from Sine through Band to White. The best way to program your own sounds may be to click on and drag things until you hear something that you like. Ring modulation, overdrive, hi-hat mute groups, and effects sends are provided, and morphing from one sound to another with the mod wheel is supported.

## Squawk and Talk

For thick, meaty analog-type synth pads, the 3-oscillator SimSynth Generator is a cut above FL Studio's older 3xOSC Generator. The resonant filter can crossfade between lowpass and bandpass or highpass outputs. Each SimSynth oscillator has a detune-double button (called Warm), and there's also a built-in chorus. While that makes fat sounds easy to produce, pointed one-oscillator sounds are not perfectly in tune, because alternate voices are always slightly higher or lower in pitch. That may be a feature or a bug. Because the tuning imperfections are not

lower in pitch. That may be a feature or a bug. Because the tuning imperfections are not large, dance music producers may like them or never even notice.

FL Studio's speech synthesizer is a great tool for those robotic speech phrases beloved by techno music fans the world over. After typing a phrase, you can choose a personality (male, female, child, munchkin, martian, troll, nerd, fly, choirboy, and so on) and play with a few other parameters, such as pitch and speed. The results are usually quite understandable. When you like what you hear, FL Studio will render it as a sliced-up sample file, whose individual slices can be triggered in any rhythm you choose, live or sequenced (see **Web Clip 2**).

## The Juice

Every time I use FL Studio, I'm amazed by its power and by how much fun it is. Unlike a standard sequencer, FL Studio is a production tool with an attitude. It definitely does things that no other software tool can do, and it usually takes only a few quick mouse-clicks. On the other hand, certain tasks, especially audio recording, are more difficult than they ought to be.

Although the release of version 5 brings FL Studio to a whole new level, making it more than competitive with loop-oriented applications such as Propellerhead Reason and Ableton Live, it's still not quite up to the standard of Steinberg Cubase and Cakewalk Sonar as a high-end production tool. The audio tracks are fully functional, but their user interface still needs work. If you're already using a sequencer that speaks VST or ReWire, you may prefer to use FL Studio as a plug-in sound source. Or you may prefer to sequence in FL Studio and use your other applications to handle the audio-recording chores. But if a novice in the world of music software asked me what single PC program he or she should buy to get started, I wouldn't hesitate for a moment: FL Studio is an unbeatable choice.

**FL Studio seems poised to take on the major sequencers as a tool for serious music production.**

EM WEB CLIPS

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*Jim Aikin writes about music technology, plays cello, and teaches in Northern California. He's also putting the finishing touches on a fantasy novel. For more on Jim's varied activities, you can visit him online at www.musicwords.net.*


FIG. 1: The MindPrint En-Voice MK II's front panel includes sections for mic pre controls; LF, MF, and HF EQ controls; a compressor section with low-pass filter; and true tube saturation.

# MINDPRINT En-Voice MK II

## A channel strip with tube compression and a USB interface.

By Rusty Cutchin

indPrint had a winner with its original En-Voice channel strip. So what did the company do? Redesign the product, of course. Fans wishing to add another En-Voice to their racks needn't fret, however. The En-Voice MK II is a step up in sound quality, functionality, and even looks. With true tube saturation and a choice of digital interfaces, the new En-Voice is a top contender in a field of audio "front ends" that offer expanding features and shrinking footprints.

### On the Strip

The new En-Voice packs all the essentials into a sleek, slim package with all controls except for a ground lift button on the front panel. The 1U En-Voice is an ergonomic triumph; although its front is jam packed with controls, the ends of the 14 long knobs are easy to grasp, allowing just enough room for large fingers like mine to handle them without affecting adjacent controls. An added bonus is the design of the clear plastic function switches, which glow a bright blue when depressed. These buttons, like the knobs, are nicely spaced and are unlikely to interfere with the status of other controls when pressed. Three mini toggle switches are easily reached on the front panel, and there's room left over for a large power switch and tube window.

The front panel is marked off in sections (from left to right): Input, LF, MF, HF, Dynamics, and Output (see Fig. 1). The input section handles mic or line level signals entering the XLR and ¼-inch TRS rear-panel connections or a high-impedance instrument input on the front panel. A mini toggle switch selects between Mic, Line/Inst., or Digital (if one of two MindPrint digital modules is installed in the rear-panel slot). A 12-stage LED can display input or output, depending on the position of the adjacent Meter Assign button. A Low Cut button, separate Line Gain and Mic Gain pots, mini toggles for 48V phantom power, and a –20 dB pad complete the input section.

> The En-Voice MK II is a great-sounding, ultraconvenient front end.

The three EQ sections each have parametric controls and an On button. The MF section adds a Q knob that sets the bell curve's bandwidth within a range of 3 (one-third octave) to 0.15 (six octaves). All Frequency


FIG. 2: The En-Voice MK II's rear panel hosts the unit's input connectors and a slot that accepts one of MindPrint's digital interface modules, such as the DI-Mod USB.

controls are variable and provide generous overlap from section to section, with a 15 dB boost or cut available on each of the three bands. Each level knob has a detent at the 0 position.

The dynamics section is an interesting combination of preset and variable controls. An 8-position Compression mode knob dials up one of eight preset Attack/Release combinations, which you then fine-tune with the variable Threshold, Ratio, and Tube Saturation pots. The compression modes feature helpful names such as V1 (vocals), G1 (guitar), B1 (bass), and P (percussion); the well-written En-Voice manual makes it clear, however, that these are just starting points for your own tweaking. The manual also has a table of suggested settings for various sonic goals, such as "gritty bass" and "fat vocals."

The dynamics section's Tube Saturation knob applies overtones generated by the unit's 12AX7A triode and is marked in percentages from 0 to 100. The section also has its own Low Cut filter (6 dB per octave at 300 Hz) in a sidechain path, allowing the circuit to compress mids and highs without compromising bass energy in a signal. The Tube Sat LED next to the circular tube window changes color depending on the level of distortion being produced—green for negligible effect, yellow for audible overtones, and red for audible distortion.

## Modular Addition

The En-Voice's rear panel (see Fig. 2) has balanced XLR and TRS connectors for line in and out, an XLR mic connector, and ¼-inch insert send and return jacks. A plate covers a slot designed to accept either of MindPrint's 1U digital interface cards, the DI-Mod 24/96, which has S/PDIF only, or the DI-Mod USB (which came installed in the review unit that I received).

The DI-Mod (see Fig. 3) enables 16- or 24-bit conversion of the En-Voice input signal for transfer to your recording software while accepting a stereo return from the computer over USB. The computer's output is available from the DI-Mod's ¼-inch TRS jack, which can be switched to an analog insert jack by the adjacent Mode toggle switch. That allows digital conversion of an external mono analog signal independent of the En-Voice's processing. A useful example would be using two En-Voices to convert a stereo analog signal with only one DI-Mod installed. The module sends the native signal out of the USB port as channel 1 and the inserted signal as channel 2.

The current word length and sampling rate can be changed only by software (usually through your audio application). If you want to take the En-Voice somewhere to work as a converter on a project with a different sampling rate than the one previously selected, you'll need

## EN-VOICE MK II SPECIFICATIONS

| | |
|---|---|
| **Preamp** | |
| Analog Inputs | (1) balanced XLR mic; (1) balanced TRS line; (1) balanced XLR line, (1) TRS insert return |
| Analog Outputs | (1) balanced XLR; (1) balanced TRS; (1) TRS insert send |
| Input Impedances | Mic: 10 kΩ; Line: 44 kΩ; Inst.: 470 kΩ |
| Preamp Gain | Mic: 25 dB to 70 dB; Line/Inst.: ∞ to 22.5 dB |
| Maximum Input Level | Mic: +25 dBu; Line: +20.5 dBu; Inst.: +23.5 dBu |
| Low-Cut Filter | 12 dB/octave (80 Hz) |
| **Compressor** | |
| Tube Saturation | 0–100% |
| Threshold | –28 to +2 dBu (variable) |
| Ratio | 1:1 to ∞:1 |
| Attack/Release Times | (8) switchable presets |
| Low-Cut Filter | 6 dB/octave (300 Hz) |
| **Equalizer** | |
| LF Frequency | 20–300 Hz, adjustable |
| MID Frequency | 100 Hz–11 kHz, adjustable |
| HF Frequency | 1.6–22 kHz, adjustable |
| EQ Boost and Cut | ±15 dB |
| **General** | |
| Output Impedance | 220Ω |
| Max. Output Level | +19 dBu |
| Gain | ∞ to +6 dB |
| Dimensions | 1U × 9.4" (D) |
| Weight | 7.6 lbs. |

the driver and a computer at the session. The module also has a S/PDIF output.

## MindPrinting to Disk

I tested the En-Voice MK II with Digital Performer (DP) on a dual 2 GHz Mac G5 running OS X (10.3.7). I connected several microphones, comparing the channel strip's mic pre to my similarly priced tube unit and the mic pres in my console. I also tested the En-Voice with bass, guitar, and full-mix mono signals. I was surprised and impressed with the En-Voice's flexibility and sonic character.


FIG. 3: The DI-Mod USB module enables monitoring of a stereo mix from a digital audio application, as well as independent digital conversion of an external mono source.

Used as a standalone channel strip, the En-Voice sounded clean and quiet. One of the first applications I tried was an electric guitar plugged in to the front-panel Instrument In jack. The compression circuit and tube-saturation feature were welcome additions, giving a smoothness and (in tandem with some EQ adjustments) a nice bite that allowed my Strat to be recorded without further processing. Although the unit offers helpful presets such as G1 and G2 for users with guitars, the En-Voice is no guitar processor; it's a studio-quality piece of gear that adds subtle refinements to analog signals.

A utilitarian Danelectro bass benefited greatly from the En-Voice's B1 and B2 presets, and the clean EQ introduced no additional noise to the sound. Using the sidechain lowpass filter, I could pop strings all day on a funk groove without losing the bottom end or "pinging the red" in DP.

Most people will be using the En-Voice primarily as a mic pre, and the unit is an excellent choice here as well. A female vocal matched to a large diaphragm condenser—a combination that I have recorded many times—sounded as good as it ever had with the V2 preset and just a hint of tube saturation. Similarly, a deep male spoken-word part that was recorded with a mic designed for broadcast applications was fine—the clean, crisp En-Voice gave a new twist on the speaker's rich baritone, which I have usually chosen to match with the somewhat warmer tube pre.

The only application that didn't suit me compared with what I had on hand was using the En-Voice with a dynamic mic on a guitar amp. It was a little too clean for my taste. In that situation, even with the amp providing the tube sound, I preferred the added warmth of the tube pre and the solid-state mixer mic preamp. In all other applications, however, the En-Voice was a solid, reliable, and rich-sounding performer.

## En-Digital

The DI-Mod worked well as a basic interface, and behaved exactly as described in the manual. After loading the driver into my Mac, the module became visible in DP's Studio Configuration window and provided a clean mix from DPs stereo bus to the module's monitor outputs. Vocal mic and guitar signals that I set up transferred to DP without a glitch. The USB implementation in the DI-Mod seems expertly achieved and makes the unit a handy all-in-one playback product as well as a pro-quality analog signal source, especially for laptops.

It's still best, however, to use the digitally equipped En-Voice with a mixer when monitoring computer output because there's no way to control the analog output from the DI-Mod when it's connected directly to powered monitors. Although a master volume slider in an audio app works fine, other types of computer audio (as well as audio clips from DP's Soundbites window) can suddenly hit your monitors at full blast. (Other basic USB audio interfaces we've reviewed work the same way. If you use them for all of your computer's audio output, you'll need to choose your powered monitors' gain pot settings carefully.)

That very minor heads-up aside, the En-Voice MK II is a great-sounding, ultraconvenient front end for digital recording when equipped with a DI-Mod. At just under $1,050 list price for the tandem, it's not the least expensive channel strip/digital interface on the market, but the En-Voice's quality, convenience, and great sound make it a wise investment for many studios.

*Rusty Cutchin is an associate editor of EM. He can be contacted at rcutchin@comcast.net.*

PRODUCT SUMMARY

MINDPRINT En-Voice MK II

analog channel strip
$ 799.00
DI-Mod USB interface
$ 249.99

OVERALL EM RATING (1 THROUGH 5): 4

PROS: Great control layout and design. Ample overlap on EQ bands. Tube saturation and low-cut filter in compressor circuit. Very clean and quiet. May be used as outboard converter with DI-Mod installed.

CONS: Presets instead of variable attack and release controls in compressor section.

MANUFACTURER
MindPrint
www.mindprint.com

# "Slammin'!"

**Anthony Roberts, Monitors - Tower of Power**


*"I'm in the studio with P.O.D and lovin' the i-5 on guitar cabs. Great punch in the upper mids and perfect for heavy guitars that need that special drive. Also fantastic on snare – it can sure handle some serious SPL's!"*
*Travis Wyrick, Producer, Engineer, Mixer - P.O.D., Charlie Daniels, Pillar*

*"So how does it sound? In a word, impressive. ...and on snare drum, it rocked hard. Overall, there's a clarity and openness to this mic that you don't hear from a lot of dynamics..."*
*Phil O'Keefe, EQ Magazine*

*"On the road I use it with The Dead and Phil Lesh and Friends. At home, I use it at the Phoenix Theatre in Petaluma with every act imaginable. From the top to the bottom, the i-5 sets a new standard!"*
*Ian DuBois, Monitors - Phil Lesh and Friends, The Dead*

*"Audix really delivers with the i-5. Performing well in about every application on which I tried it, the i-5 does justice to many sources both on stage and in the studio."*
*Karen Stackpole, Electronic Musician*

*"During our recent tour, I was very pleased with the results using the i-5 on guitar cabs. The sound was smooth and clear with great presence in the mix. The i-5 is rugged and solid. It qualifies as THE all-purpose dynamic workhorse in any mic collection."*
*Gary Hartung, FOH - Crosby, Stills & Nash*

*"The i-5 is an awesome utility mic—it is much tougher and sounds better than the 'old faithful' I am now able to replace."*
*Dave Rat, Rat Sound*

*"I've used the sams mic on snare drum for recording and live sound applications for 30 years. I've tried other mics from time to time but always returned to the old favorite. Recently, I tried the Audix i-5. No matter what style of music, the i-5 sounds great and now has become my new choice for snare drum."*
*Tom Edmonds, Engineer - Lenny Kravitz*

"We wanted to commend you on your new i-5 microphone. It proved be the crew's favorite for the Young Scientist Music Challenge, constantly adapting to anything we could throw at it. We used it in a variety of situations - recording vocals, overhead miking of drums, to reinforcing the Theremin amplifier. We found that it provided us with a very clean sound in every situation despite the difficulty of recording in a very noisy environment. Overall, the i-5 is an excellent all purpose microphone that we'll be using in future projects."
William White, Project Coordinator - The Discovery Channel

*"I have dreamed of this day—I can now retire the last of my SM57's. Now that I've been exposed to the future, why would I want to live in the past?"*
*Eugene "Gino" Mulcahy, Lead Audio Engineer - Mohegan Sun*

*"This mic is slammin'! And if you're tired of having the cap of your snare mic being blown into pieces from a heavy stick hit—you'll love the i-5!"*
*Anthony Roberts, Monitors - Tower of Power*

*"On guitar amps the i-5, compared to the 57, was less hyped in the high mids, but had a fuller overall tone...I'm really digging using the i-5 and will be buying the review mics I was sent, if that tells you anything."*
*Larry Crane, Tape-Op Magazine*

*"The i-5 is very impressive as a bass mic. It handles the SPL's and captures the clarity of the notes while still maintaining the warmth of the low end. It's a great new tool."*
*Deanne Franklin, FOH - Tom Waits*

*"With the i-5 on my snare drum, there's just no going back. I've just started using it on guitar with very good results there too. The i-5; it's my new little weapon."*
*Neil Citron, Head Engineer - The Mothership*

*"The i-5 is truly a multi-purpose microphone. It sounds great on a wide variety of sources, but it particularly shines on snare drums and toms...Sounds like a winner in my book."*
*Mark Parsons, Modern Drummer*

*"The i-5 is more than an impressive upgrade to my usual snare and guitar cab mic—it's a big leap forward."*
*Ed Tree, Studio Engineer - The Spencer Davis Group*

*"Who needs a condenser when you can get this sound out of a dynamic. Audix has again come up with a winning microphone."*
*John Gatski, Pro Audio Review*

*"The best thing to happen to snare drum since Charlie Watts!"*
*Paul Hagar, FOH - American Hi-Fi*

## "qualifies as THE all-purpose dynamic workhorse in any mic collection."

*Gary Hartung, FOH - Crosby, Stills & Nash*

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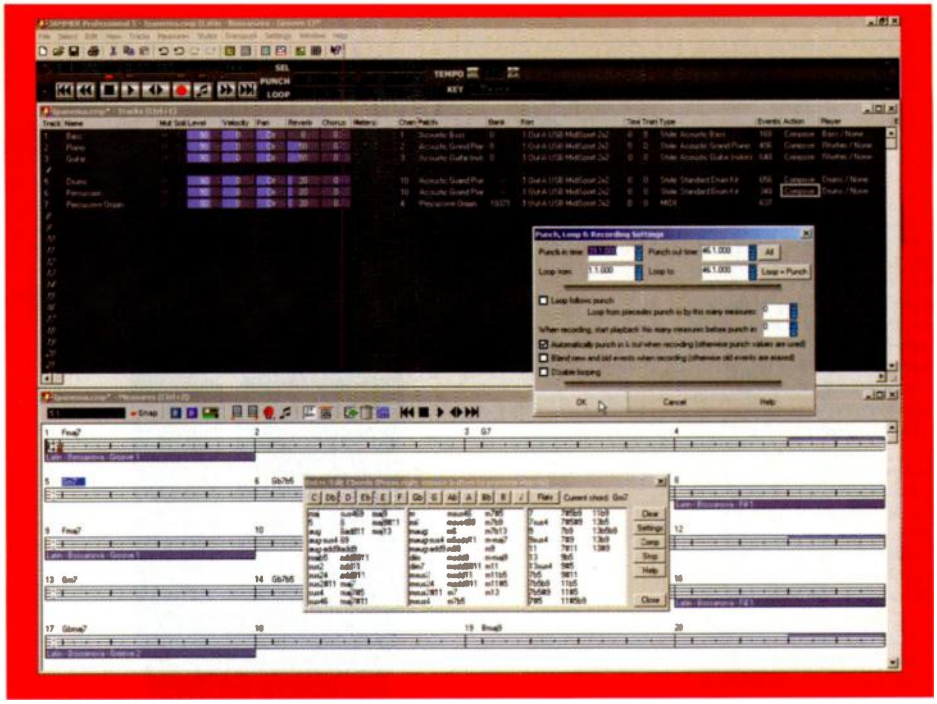

FIG. 1: Shown here is SoundTrek Jammer Professional 5's Tracks window (top) and Measures window (bottom). The upper dialog window is for setting loop and punch points, and the lower pop-up box is for entering chords.

# SOUNDTREK Jammer Professional 5 (Win)

## An auto-accompaniment program packed with features.

By Jim Aikin

oundTrek's Jammer Professional has been growing in power and depth for more than a decade. Version 5 of the program, which automatically composes and arranges music based on your choice of style and chord progression, is loaded with features. Jammer Pro can create backing tracks powerfully and quickly; half an hour after installing the program and without laying a finger on a MIDI keyboard, I had slapped together a recognizable version of "The Girl from Ipanema," complete with bass, piano, guitar, drums, and percussion.

Learning the program fully, however, requires some effort. Despite Jammer Pro's certain similarities with conventional sequencers (its Piano-Roll Editor window, for instance), it is in some ways more like the auto-accompaniment section of a home keyboard, providing factory styles that include intros, fills, and endings. But the program goes far beyond the typical home keyboard in letting you edit styles and create your own.

### The Jam What Am

Jammer Pro 5's primary tools are the Tracks window and the Measures window (see **Fig. 1**). The simplest way to use the program is to enter a chord progression of your choice in the Measures window, and then insert style elements such as an intro, grooves, fills, and an ending in the appropriate measures. You can add a few drum fills, make sure the Punch In and Punch Out points are set to the beginning and end of your chord progression, and then click on the Compose button. Jammer Pro will load the instruments needed for the styles that you've selected into the Tracks window and compose stylistically appropriate parts using your chord progression. It understands numerous types of major, minor, and dominant chord symbols, and you can enter a new chord on any 16th-note.

Playback starts immediately after composing is completed. (On a modern computer, the composing process is practically instantaneous.) But although the factory styles are fine for rough songwriter demos, you may find that Jammer Pro's arrangement doesn't quite meet your needs. The program offers several ways to zero in on the musical result that you're seeking.

First, you can recompose selected measures and instruments. Because Jammer Pro uses intelligent algorithms that include some randomization, it may come up with something better on a subsequent pass. Second, you can open any of the tracks that the program has created in a conventional piano-roll or MIDI event list editor. There, you can fiddle with the voice leading, fix funny-sounding voicings or bass lines, get rid of those

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annoying crash cymbals at the end of drum fills, and so on. Third, you can recompose the same progression using a different style. Fourth, if you're feeling really creative and have a bit of patience, you can customize the style itself to your heart's content or create an entirely new style from scratch before recomposing. You can even design custom chord voicings for Jammer Pro to use.

Another option is to overdub your own MIDI tracks. That feature is useful if, for example, you want to add a harmony line to a song. On one occasion when I was overdubbing, Jammer Pro stopped recording MIDI Note Off messages halfway through, resulting in lots of long notes; that was an isolated problem, though, not something I was able to reproduce. Conversely, you can let Jammer Pro compose a chord progression or melody for you at the same time it's creating the backing tracks. The progression composer creates some odd progressions, but it may also produce phrases that get your creative juices flowing.

Jammer Pro's user interface is somewhat eccentric. For example, it took me a while to figure out when I needed to double-click on items as opposed to right-clicking on them. The main window works best in the maximized position; it doesn't have scrollbars if you make it smaller. Some operations are buried deep in elaborate dialog boxes. In addition, the PDF manual needs more graphics, a better index, and page numbers in the spots where it cross-references other sections. I highly recommend going through the excellent tutorials at the beginning of the manual.

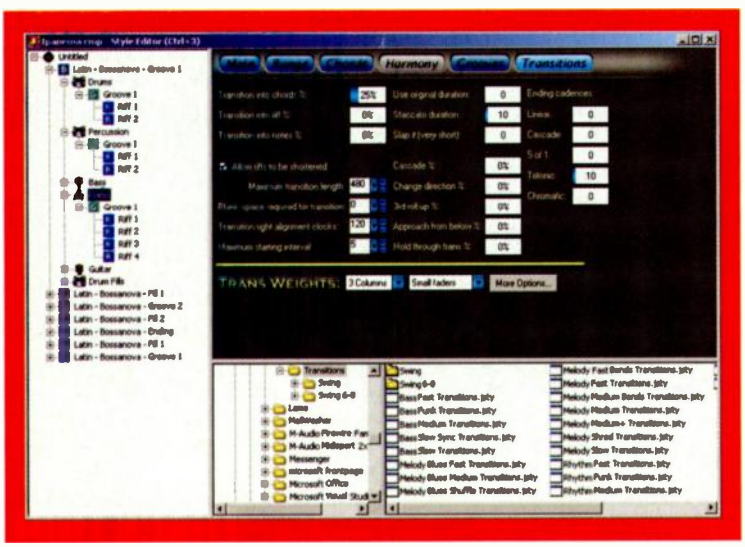


FIG. 2: One of the numerous data entry windows in Jammer Pro's Style Editor. The parameters shown here are for Transitions (the button in the upper-right side) made by the Piano instrument (highlighted in the tree at left). The file browser along the bottom is for dragging additional elements into the style.

## Spreadin' the Jam

Jammer Pro is strictly a MIDI program; it doesn't host VST or DirectX soft synths, nor does it offer audio tracks. There are, however, several viable workarounds. If you don't own a hardware synth, you can direct Jammer Pro to use the Microsoft GS Wavetable synth as an output device. That synth is installed as part of Windows XP, but unfortunately it can't use a low-latency audio driver such as ASIO. You'll hear a time lag if you try to play it in real time from a MIDI keyboard, which you might want to do while recording a MIDI solo into Jammer Pro as an overdub.

If you have a general-purpose software DAW, you can easily export Jammer Pro's creations as MIDI files, import them into the DAW, and then add audio tracks, loops, soft synths, or whatever you need to create a finished production. It's also possible to send Jammer Pro's MIDI output to an ASIO-compatible soft synth running on the same computer by using a MIDI utility such as Hubi's Loopback Device. SoundTrek recommends MIDI Yoke NT from MIDI Ox (www.midiox.com) for NT, 2000, and XP users.

Jammer Pro is set up to use General MIDI (GM) out of the box, which will be convenient for many users. GM program changes, effects depth controls, and drum maps are all loaded and active by default. Because the styles in Jammer Pro primarily make use of standard types of sounds, such as acoustic bass, Hammond organ, and steel-string guitar, GM makes the program and its styles highly portable. I used Jammer Pro with a Yamaha Motif 6 and was satisfied with the results.

Jammer allows you to override the GM program changes if you're using a non-GM synth, but doing that requires donning your scuba gear and diving into the program's deeper grottoes. If Jammer Pro "knows" about the factory presets in your synth, you can indeed set up the program to use those patches in your arrangements with no more than a little poking around in dialog boxes. The list of known devices is long, but some important newer synths, such as the Yamaha Motif and Roland Fantom, are not included. If you understand MIDI Bank Select messages, however, and are willing to spend a little time, you can tell Jammer Pro where to find your preferred acoustic piano, upright bass, drum kit, and so on. While this gives you some added flexibility, it also means that the reverb and chorus depth parameters in Jammer Pro's Tracks window won't be functional for those instruments, as those MIDI Control Change messages are defined only for GM modules.

## Stylin' the Jam

Jammer Pro does a respectable job on Latin, country, and pop styles. (The GM soundset is not ideal for creating hip-hop tracks.) The output inevitably sounds a bit prefabricated and wouldn't be suitable for a major-label production, but for lounge work and songwriter demos, it's kind of a kick to hear what the computer comes up with.

By my count, Jammer Pro ships with 394 style files. Since that number includes intros, fills, endings, and so on, however, the actual number of discrete musical styles is 48. The factory styles include groups such as Bluegrass (Quick Pickin', Upbeat), Blues (Slow, Upbeat), Country (12/8 ballad, Strumming Ballad, Swing), Dance (Club Beat, Synthetic '70s, Upbeat), Funk (B3 Funk Rock, Medium), Hip Hop (Street Vibe), House (Power House), and Jazz (Easy Swing, Piano Ballad, and Swing Upbeat).

Many rock variations are provided, and genres from Waltz to Tex-Mex are also represented. Four additional packs of styles are available from SoundTrek for $30 each. Jammer Pro is also available for $69 in a Songmaker edition that has fewer styles. SoundTrek's Web page gives the number as 116, but that includes intros and other elements as separate styles, so the real number for Songmaker is about 15 styles.

Explaining Jammer Pro's style creation features in detail would take many pages. For example, after entering each note in a chord riff (in Jammer Pro a riff is a component of a groove, which is a component of an instrument, which is a component of a style) you have to "compile" the note. There are 39 different compile options, which have obscure names such as "Wild-card transition note using pool scale" and "Chord-based fix-up note." An easier way to work is to use factory riffs and define a style by changing the relative randomization weightings of the riffs. Chord-to-chord transitions can also be given weights (see Fig. 2). I wouldn't guess that many Jammer Pro users will want to delve into these capabilities, but it's great to know they're there if you need them.

## Jammer Time

Jammer Pro is an excellent tool that should appeal to at least four types of musicians: lounge players who need to put together a large supply of backing tracks for gigs, songwriters who want to demo their songs easily, beginning or advanced students who would like an endless source of fresh accompaniments over which to practice soloing, and educators who are serving those students. (Note that Jammer Professional is designed strictly to generate tracks offline and then play them back. For real-time interactive accompaniment, SoundTrek offers Jammer Live.)

With version 5, Jammer Pro has matured into a sophisticated and unique program. There's nothing else like it. Beginners will appreciate its ability to create credible arrangements based on lead sheets—no knowledge of music theory or arranging is required. More advanced users will be able to take advantage of the program's almost endless array of esoteric features. Although the user interface is a bit quirky, if you need to compose usable MIDI arrangements quickly, Jammer Pro is the tool for the job.

*Jim Aikin writes, teaches, and plays music in Northern California. He has a maniacal gleam in his eyes because he's working on a new novel. Details are at www.musicwords.net.*

PRODUCT SUMMARY

SOUNDTREK Jammer Professional 5

algorithmic MIDI accompaniment generator
$129
upgrade from version 4, $59.95
OVERALL RATING [1 THRCUGH 5]: 3.5

PROS: Lots of tools for crafting arrangements and styles. Compatible with a wide variety of synths, as well as General MIDI.

CONS: User interface has awkward elements. Creating new styles from scratch is complicated.

MANUFACTURER
SoundTrek
www.soundtrek.com

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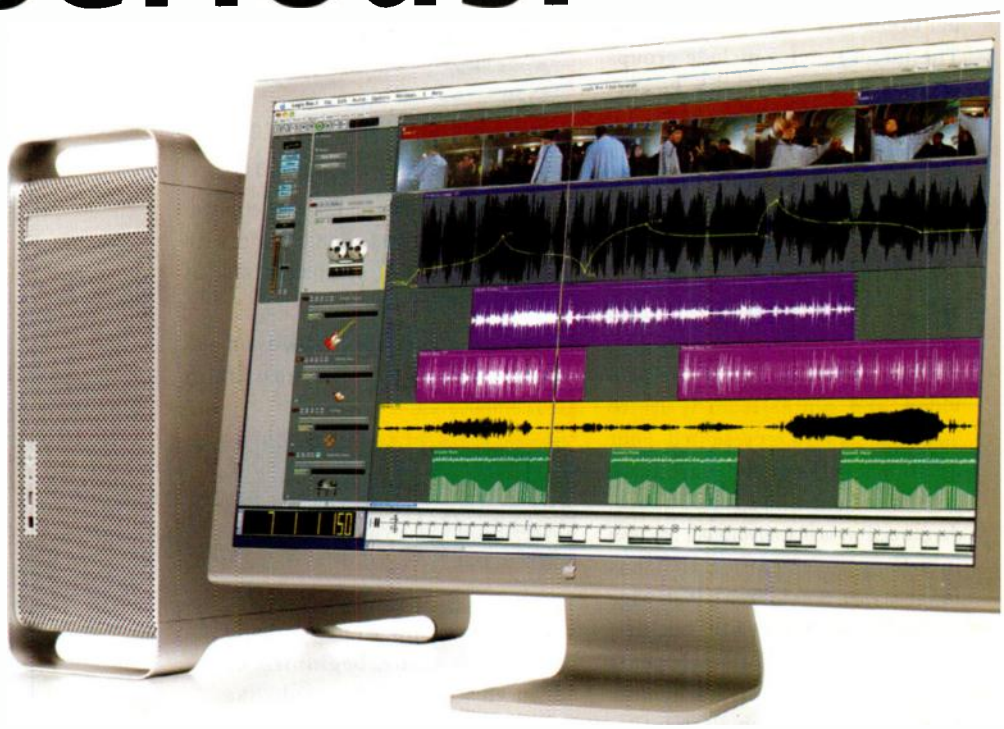

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# QUICK PICKS

## SM PRO AUDIO

### M-Patch

By Rich Wells

SM Pro Audio's M-Patch ($179) is a passive volume control that works as a patch-control device for routing audio signals from two stereo sources to two stereo destinations. The M-Patch is intended to fill the needs of video and computer recordists, especially those who want to avoid using a mixer.

The metal casing is one rackspace high and slightly less than eight inches wide. You can place it on a tabletop or mount it using the supplied rack ears. The package comes with rubber feet and a pair of short female-XLR-to-female-TRS adapter cables.

All inputs and outputs are on the rear panel. The input labeled Stereo is balanced and has two combination XLR and TRS jacks. The input labeled Aux is unbalanced and has a stereo minijack and two RCA jacks. Two pairs of balanced outputs are on XLRs. The front panel has a switch to select the input source and another to mute the inputs. Two additional switches let you select the output and choose from mono or stereo output. Two attenuator knobs, calibrated in decibels, control the Stereo and Aux input levels.


**SM Pro Audio's M-Patch is a passive volume control and patch router for analog audio. It features balanced and unbalanced XLR, ¼-inch, RCA, and minijack inputs and balanced XLR outputs.**

#### A Switch in Time

For use as a simple stereo input and monitor switcher, the M-Patch is handy. You can connect two pairs of speakers for comparison purposes; you can also switch between speakers and a stereo line-level device or use the M-Patch purely for routing line-level sources. The two sets of inputs were perfect for listening to mixes from my recording rig (on the balanced XLR inputs) and to music from my home-stereo unit (on the unbalanced inputs). Although I use a hardware mixer for recording, I like having an alternate way to route audio to my monitors; when I just want to listen to a CD, I don't have to turn on the mixer.

As with many SM Pro Audio products, the M-Patch is aimed at the mixerless computer-based recording rig. Theoretically, such a rig lacks a method to reduce volume in the analog domain, and the user therefore has to either turn down faders in the digital domain or run the monitors at full tilt. The M-Patch provides the means to attenuate audio coming from the computer. Because many monitoring systems already have a way to control volume, however, that solution is useful mainly for owners of standalone active monitors.

The M-Patch's two input attenuators let you easily set comfortable listening levels. With no output attenuation, though, you can't adjust the comparative levels of two sets of monitors. Consequently, you might find yourself frequently adjusting the input-level pots as you switch between speaker sets. Although you might be able to set comparable levels between monitor pairs if your monitors or power amps have level-adjustment capabilities, how badly do you need a separate attenuator device if you can do that already?

The best monitor mixers offer the opposite of what the M-Patch provides: rather than input attenuation, they incorporate output-level trim controls for the individual speaker sets as well as a master output-level control. For a stripped-down box, a more logical and useful design might be to have the unit accept a line-level signal as is, and then offer attenuation at the outputs.

The sound of such a device is another crucial issue; the prime directive should be the complete absence of signal degradation. I set up a comparison test with one active monitor connected directly to my mixer and the other monitor connected to the mixer through the M-Patch (both of them balanced connections), and then sent a mono mix of a sustained loop through both channels. The M-Patch matched the direct signal pretty closely, but I did hear minor differences that wouldn't be obvious in anything other than a sustained A/B comparison. The differences, although extremely minor, were a slight reduction in bass and a slight change in high frequencies. I didn't hear any differences when using the unbalanced input.

#### Making the Switch

A useful monitor switcher lets you control input and output levels. There are other products that offer more control than the M-Patch, but they cost considerably more. That makes the M-Patch a viable choice for very specific recording setups, such as a system that has monitors with no level-adjustment capability, a system in which you need to switch between two stereo sources and two speaker pairs, or a system in which you need outboard mono summing. If you own one of those setups, the M-Patch could be right for you.

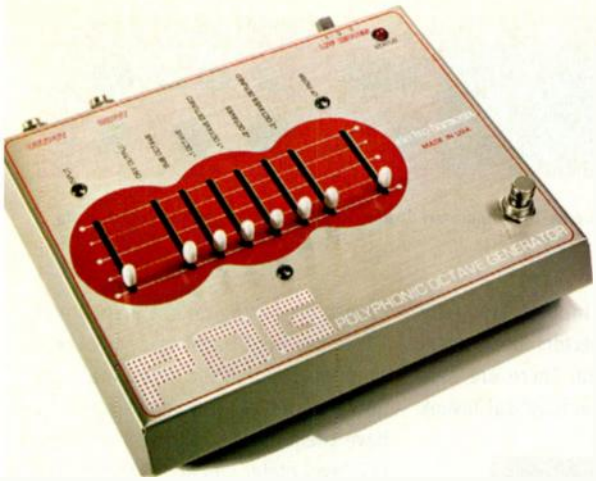
**Overall Rating (1 through 5): 3**
SM Pro Audio/Kaysound (distributor)
www.smproaudio.com

## ELECTRO-HARMONIX

### POG

By Orren Merton

In the world of guitar pedals, Electro-Harmonix has a reputation for creating unique modern effects and solid reproductions of classic pedals. The Polyphonic Octave Generator ($698) is the company's




**The Electro-Harmonix POG can generate signals one octave below, one octave above, and two octaves above the input signal as well as additional detuned versions of the higher octaves.**

modern take on the classic '60s analog octave pedal made famous by Jimi Hendrix. Octave pedals re-create an input signal an octave higher or lower in pitch, allowing guitarists to create thick, synthetic-sounding tones. Octave pedals aren't just for guitarists; Ike Turner was known for experimenting with them to create a suboctave harmony for his voice.

The Electro-Harmonix POG can generate polyphonic signals one octave below, one octave above, and two octaves above the input signal. In fact, for each higher octave, the POG offers two voices: one voice that is precisely the chosen interval, and a second detuned version of the generated octave. The unit also provides a variable Low Pass Filter (LPF) with three modes that help refine the unit's sound.

The POG is a large pedal; its brushed-aluminum case is about as tall as a normal guitar pedal, but it's slightly longer and more than twice as wide. The mono ¼-inch TS input and output jacks are on the back of the unit, as is the AC jack (the unit cannot be battery powered) and the 3-position LPF Modes switch. Eight sliders and the toggle button (or footswitch) are on top of the unit. The toggle button is placed at the bottom right away from the sliders, which guitarists will appreciate. I tested the POG by connecting it between my guitar (a Patrick Eggle Berlin Pro V) and my amp (a Soldano Avenger). I never accidentally stepped on the sliders while toggling the effect.

### Slip Slidin' an Octave

The POG is straightforward to operate. The first slider on the left, situated farther from the next six sliders, is the Input slider, which adjusts the gain of the input signal before the A/D stage. The next slider controls the output volume for the Dry Output signal, and can be used as a dry/mix control. The Sub Octave slider adjusts the output level of the suboctave, which is one octave below (half the frequency of) the input signal.

Next, the +1 Octave slider adjusts the output volume of the voice that is generated one octave above (twice the frequency of) the input signal. The +1 Octave Detuned slider controls the output level of another voice, which is a modulated, detuned version of the +1 Octave signal. To the right of those two sliders are +2 Octave and +2 Octave Detuned sliders, respectively, offering output volume controls of the voice that is generated two octaves above (four times the frequency of) the input signal. The frequencies of the detuned octaves are modulated at a fixed rate above and below the input signal. You can use all four octave sliders simultaneously, which can generate thick and rich walls of sound.

The final slider to the right is the LP Filter slider, which controls the cutoff frequency of the lowpass filter. All of the generated octaves go through the lowpass filter. The dry signal bypasses the lowpass filter if the LPF Modes switch is in position 1, but in positions 2 and 3, the dry signal passes through the lowpass filter as well. The LPF Modes switch sets the Q to either 1 (modes 1 and 2) or 2 (mode 3). In actual use, I couldn't see a significant difference between any of those Q settings. (According to Electro-Harmonix, the slider ranges are significantly different, and the effect offers many distinct tonal possibilities, especially when recording.) A status LED on the top of the unit near the LPF switch indicates whether the POG is engaged. In Bypass mode, the input jack is connected directly to the output jack, bypassing the AD/DA stages.

### Compensation Station

All of these octaves and level sliders provide extensive creative control in blending your dry signal with as many as three additional octaves. The POG itself is not transparent; it seems to thin out any input signal to some degree. You can compensate for that by using the various sliders to thicken your signal without creating an audible effect. The included instruction sheet offers suggestions on achieving 12-string-guitar-like tones, a bass sound, and an organlike sound, but the most effective use of the pedal will come from experimenting on your own.

Although the POG is not the least expensive way to generate octaves, because of its polyphony and filter implementation, the unit offers a level of creative control lacking in most other octave pedals. Musicians looking for a modern pedal to use for experimenting with octave effects should definitely give the POG a look.

**Overall Rating (1 through 5): 3**
Electro-Harmonix/New Sensor Corporation
www.ehx.com

## EDIROL

## Audio Capture FA-101

**By Kerry Rose**

The Edirol Audio Capture FA-101 ($625) is a half-rack-width FireWire audio and MIDI interface capable of 24-bit, 192 kHz recording. It has ten audio inputs and outputs (eight analog and two digital) and one MIDI port. The FA-101 is housed in a sporty red anodized aluminum chassis with a

block diagram silkscreened on the top, and it can be powered from the FireWire bus or from an included lump-in-the-line DC power supply. The minimum system requirements are a 900 MHz Pentium or Celeron processor running Windows XP, or an 800 MHz Mac G3 running OS X 10.3.3. Using the higher sampling rates will also require lots of fast storage.


**The Edirol Audio Capture FA-101 is a powerful, affordable, portable, high-resolution audio and MIDI interface.**

### Gozinta, Gozouta

The front panel has two mic-line inputs, one of which doubles as a high-impedance instrument input, served by Neutrik combo connectors. Both inputs have a gain control. There are also inputs and outputs with optical Toslink connectors for digital channels 9 and 10, whose front-panel location makes them best suited for occasional use. Space permitting, it would be better to have them on the back. A 4-segment LED level meter sits above the optical I/O, but strangely, it does not function at 192 kHz.

The front panel also has a switch to select external sync for the digital inputs, along with a sampling-rate-select switch that gives you most standard sampling rates between 44.1- and 192 kHz. In what seems like a glaring omission, 176.4 kHz is not offered, even though it is a multiple of the Red Book CD audio standard 44.1 kHz. There is a small monitor section with a mix control for main outputs and inputs, a switch that allows the user to enable software control of output and input mixing if using ASIO 2.0 on Windows, and a Mono button to collapse the stereo image. A ¼-inch headphone jack with volume control and power and FireWire LED indicators round out the front panel.

### Back of the Rack

The rear panel has a 48V phantom-power switch, main L-R (channels 1 and 2) outputs, and I/O for channels 3 through 8. All rear-panel I/O uses ¼-inch TRS connectors, which support balanced and unbalanced cables. Inputs 7 and 8 have a sensitivity knob for interfacing with lower output gear. A power switch, located next to the DC input allows you to select between bus and external power. Finally, there are MIDI input and output jacks and two 6-pin FireWire connectors.

I tested the FA-101 using Logic 6.3.3 on a 550 MHz Mac G4 running OS X 10.3.6. My G4 processor speed is slightly under the FA-101's minimum requirements, which can affect issues

such as monitoring latency. The FA-101 is one of the few (if not the only) audio interfaces to use Apple's driver, which is integrated into OS X. That means that there are no drivers to install—just plug and play. (If you use OS X 10.3.3, you will need to update the FireWire audio driver.) The documentation is clear, brief, and nicely laid out, and gives some basic setups for those just getting started.

### Let's Rol, Edi

The mic preamps have decent gain and are fairly clean, with a neutral, uncolored sound quality. At the upper end of the gain range, however, the level seems to jump suddenly, and the unit exhibits some noise. I would suggest using a higher output microphone when recording quieter material. There was some zipper noise when I adjusted the monitor mix knob, but because that is a set-and-forget control and doesn't affect the recorded signal, I could tolerate it.

I missed having insert jacks, particularly for recording bass guitar and vocals. There was the typical delay between input and software return when recording, but it was manageable and would be even less of a problem on a faster computer. There is also a direct-monitor option that allows you to monitor the input (although not the processed signal) without latency.

### One to Go, Please

Despite its anomalies, the overall sound quality is good for recording and monitoring, and the unit is easy to use. I was particularly impressed by the number of inputs and outputs, as well as the high recording resolutions offered in a portable package at this price.

The inclusion of a basic MIDI interface makes the FA-101 a complete portable studio solution suitable for a range of users. Its feature set definitely earns it a place in the growing field of mobile audio and MIDI portable interfaces.

**Overall Rating (1 through 5): 3**
Roland Corporation U.S. (distributor)
www.edirol.com

## PROPELLERHEAD SOFTWARE

### Reason Drum Kits ReFill Collection (Mac/Win)

By Doug Eisengrein

*Reason Drum Kits ReFill Collection* ($129) is the latest ReFill product from Propellerhead. ReFills are sound banks that have myriad samples and patches for Reason Instruments, and this latest release features goodies for several


**Propellerhead's *Reason Drum Kits ReFill Collection* contains thousands of individual snare and cymbal samples and employs extensive multisampling, with dozens of samples assigned to individual keys.**

Instruments, with an emphasis on the NN-XT sampler. There are 17 custom-tailored acoustic drum kits for NN-XT suitable for vintage soul and funk, indie-pop, and rock styles. You also get 70 ready-to-use ReDrum patches, 8 reverb patches for RV7000, 23 distortion and compression patches for Scream 4, and assorted MIDI files, song templates, and raw samples. A keymap, manual, and studio log (which documents how each kit was created) are provided in printed and PDF formats.

The drum samples are all original and were individually recorded using top-notch mics (such as Neumann

U87s) and vintage outboard gear at Stockholm's Atlantis Studio, a facility that has been in operation since the 1960s. A wide selection of drums is represented, including DW, Yamaha, and Gretsch, as well as Meinl, Paiste, and Zildjian cymbals.

Installation requires you to drag-and-drop the content (which is extensive) from the DVD to your preferred drive. The minimum system requirements are 512 MB of RAM on either a Pentium III/1 GHz PC or a G4/550 MHz Mac. The ReFill comes in 16-bit and 24-bit formats; other than bit count, the versions are identical. Either version puts a fairly substantial dent in your hard drive: the 24-bit version requires 1.9 GB, and the 16-bit version consumes 612 MB. The Instrument presets and songs also require different load times depending upon which version you're using. Loading the 16-bit version of the example song "Robotic" on my Mac, which exceeds the RAM requirement but has a processor that matches the minimum spec, took a healthy 2 minutes and 15 seconds, and the 24-bit version required a whopping 4 minutes and 15 seconds. Loading the 24-bit version of the song on a Pentium 4/2.4 GHz laptop with 512 MB of RAM took 2 minutes and 20 seconds. The songs and patches were usable on both machines; in both cases, however, I had to kick up the buffer in Reason to handle the 24-bit versions.

The drums and presets in this ReFill collection sound very good—the high quality is apparent. The samples themselves are not large, but in the case of the NN-XT patches, Velocity switching is used, and many samples are loaded on each key. For example, in one patch I counted 56 samples on a single key. In addition, the collection uses a feature that Propellerhead calls Hypersampling, which randomly selects a different sample, mic position, and dynamic level when you repeat a note (a snare-drum fill, for example).

### Sample This

I browsed through most of the sample songs (from which several of my Web Clips are derived) with delight. From rock ballads to funk, the songs showcase the collection's excellent potential, especially when using the NN-XT (**see Web Clips 1–12**). The downside is the sample songs' extremely long load times—most songs, though less than 32 bars, take several minutes to load. The same is true of the NN-XT patches—but like the songs, they're worth loading. I tried out all 17 kits, and each has its own nuances, flavor, and surprises, including muted and extra "live" drums, hand claps, finger snaps, drum rolls, and a variety of hats, cymbals, snares, and toms. There are even dedicated brush and mallet kits, though the brush kit unfortunately did not have much brushed-snare work. The sample songs take advantage of NN-XT's multiple outputs, which are used for the separate routing of different drums and mic angles. (Using the outputs with your own tracks makes for an unusually satisfying sample experience.)

I also cruised through many of the ReDrum patches, and although they are much less sophisticated than the NN-XT patches, they are fun in their own right. The ReDrum patches use the same sample library as the NN-XT patches, and the sounds are fat. But because there aren't any layered samples, the patches lack the subtle dynamics of NN-XT. (They require, however, a fraction of the load time.) For urban styles such as Hip-Hop or R&B, the ReDrum patches are the ticket.

Although I can't cover all the goodies here, I especially like the array of mic positions used and the natural mic bleed that comes through in the samples. The Reverb and Distortion presets also deserve a mention. Suffice it to say, there's plenty of quality all around. On the downside, you'll need a powerful computer to make proper use of all this juiciness, and the raw samples cannot be used outside of Reason. Overall, *Reason Drum Kits ReFill Collection* is an excellent selection of samples and plug-and-play presets. I recommend it. **EM**

EM WEB CLIPS

**Overall Rating (1 through 5): 4**
Propellerhead Software
www.propellerheads.se

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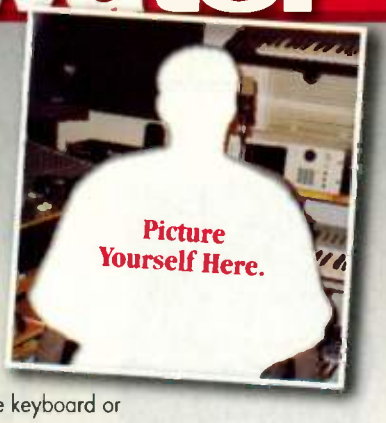


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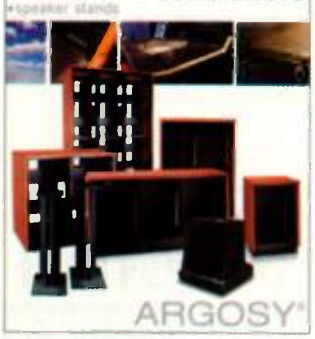


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music technology direct™

# Want to expand your MOTU studio?

## BIAS Peak™ 4.1

### Mastering and Restoration Edition

Peak 4.1 plus SoundSoap Pro and SuperFreq. Imagine the world's most popular stereo audio editing, processing, and CD mastering program for the Mac, combined with unparalleled noise reduction and restoration technology — all at a jaw dropping low price. You get Peak 4.1 (including ImpulseVerb, Sqweez, Vbox SE, Jam 6, SFX Machine LT, and more), SoundSoap Pro (combines four state of the art restoration and noise reduction tools in a single plug-in), and the SuperFreq suite of mastering EQs all in one great package. Launch Peak directly from DP4 for more editing and processing power. Run SoundSoap Pro within DP4 or in Peak as an AU plug-in. For the very best in sample editing, batch processing, file conversions, loop creation, sound design, restoration, and Redbook CD mastering on OS X, pick up the Peak 4.1 Mastering and Restoration Edition today — the perfect mastering and restoration companion for DP4!

## Glyph GT 051™

### High Performance Desktop Hot Swap FireWire Hard Drive


Perfect storage for a PowerBook/Traveler-based studio, the GT 051 tabletop chassis works with highly portable, Seagate 7200 RPM-equipped GT Key hot-swappable drives, available in capacities up to 400GB. Using Integrity™, Glyph's proprietary FireWire hot-swap technology, you can swap drives without rebooting your computer or restarting drives. GT Keys are housed in sound-dampening metal for ultra quite operation. With a stainless steel fan-cooled enclosure, the GT 051 has a built-in power supply and is rack-mountable. The GT 051 comes standard with a three-year warranty, while GT Keys carry an additional overnight advance replacement warranty for the first year.


## PreSonus Central Station™

### A Console Master Section Without the Console!

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

## Gator GRC-Studio-2-Go™

### Road-worthy case for your MOTU gear

The GRC-Studio-2-Go is a road ready, ATA style 2U rack case constructed of rugged Polyethylene with an extra, plush adjustable laptop compartment with web strap tie-downs for extra protection. Permanently connect your PowerBook, Traveler and rack gear through an accessory hole between compartments — convenient!

## Apple AppleCare™

### Extend the life of your PowerBook


Of course, the tech support wizards at Sweetwater can help you with any operational issues you might encounter, but if you want complete peace of mind, the AppleCare Protection Plan is the perfect insurance policy. No matter what dangers may meet your portable rig on the road, with AppleCare, you're totally protected.

# Call the DP 4.5 and MOTU experts.

## Mackie Onyx Mixers with Optional Firewire Interface

**High-quality compact mixers with direct connection to your studio**

When you're on the road and looking to record a full band, the Onyx series of mixers from Mackie is the perfect complement to your MOTU Traveler. Whisper quiet and built like a tank, Onyx mixers feature an all-new mic preamp design capable of handling virtually any microphone. With the optional Firewire card, you can connect an Onyx mixer to your laptop with a single Firewire cable and have all the extra mic preamps and line inputs you need to capture every drum mic, vocal mic, individual synth output and DI the band throws at you. Since Digital Performer works seamlessly with multiple Core Audio devices, configuring a Traveler/Onyx system is a snap.

## Mackie HR-series Active Studio Monitors

**Nearfield monitors for your MOTU studio**

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

## Mackie Control Universal and Extender

**Automated hands-on control for the DP studio**

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

**Your personal Sweetwater Sales Engineer offers much more than just a great price. They do the research, day in and day out, to ensure that you'll fine-tune your system to fit your exact needs.**

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# Win, Lose, or Draw

By Larry the O

As each of us travels through life—writing and playing music, editing and mixing sound, recording, designing, having relationships with people, and so forth—we accumulate victories and defeats. From a professional standpoint, this accumulation constitutes a track record that often serves as the basis for people judging our success. But the numbers do not tell the whole story. Each outcome of a particular situation carries its own richer tale, the details of which convey a larger picture of what transpired and who we are.

That is even more true from a personal standpoint. How we handle triumph and setbacks is more important to who we are than the simple fact that a situation is resolved in a way that is viewed as a win or a loss. Most significant is the way one responds to a rout or disappointment, much of which comes from one's inner sense of identity, strength of character, and self-confidence.

I admire those who, unaffected when their efforts do not bear fruit, pause only to absorb the lessons gained from the experience before embarking on another attempt. In contrast, I am affected when life knocks me down but usually have the strength to pick myself up and start moving forward again. As long as I have at least occasional victories to replenish my internal reservoir of belief and energy, that works. When that reservoir has been depleted by a succession of blows, it gets tougher for people like me to shake off defeat, as that situation challenges the essence of self-image. In the face of such fundamental questioning, my best response may simply be to keep putting one foot in front of the other out of faith that, eventually, clarity will prevail and inner strength will return.

Each outcome carries its own rich tale, the details of which convey a larger picture of who we are.

Still, while persistence in the face of adversity is a key to success, there are times when it is most sensible, and sometimes is the better choice, to admit defeat and close the book on a given enterprise. As W.C. Fields famously said: "If at first you don't succeed; try, try again . . . then quit. No use being a damn fool about it."

Yet bouncing back from defeat is not the full description of character in the realm of endeavor. How success is embraced is also important. For most, success brings confidence and strength, propelling a person forward with increased momentum. But there is every bit as much danger to the soul in success as in defeat, perhaps even more. Some people accept success almost as a birthright, something inherently theirs that places them above others who have not (yet) attained the same level of accomplishment. Such an attitude can be insufferable and have greater personal than professional consequences. Others can be intimidated by the pressures success can bring to continue a "streak" or a "meteoric rise." Staying on top can become an obsession that leads to poor decisions, professionally and personally. For those who are so driven by internal demons that the achievement of victory after victory is never sufficient to convince them of their worth, success is hollow.

As usual in life, the balance between accepting the validation and momentum of success and allowing oneself the pride of a job well done, while exhibiting grace that reflects the retention of some humility, is hard to attain. Beyond success and defeat, however, there are situations that cannot be defined clearly as either. In fact, these "no decisions" often include some aspects of both. Outcomes like that can be puzzling, leaving a person straining to determine what the real meaning was.

In the end, the way that people deal with wins, losses, and draws is not only vital to their own frame of reference, but it can be visible to others, who frequently respond as much to other people's attitudes as they do to their track records. This, however, is as it should be: the manner in which a person responds to the ups and downs of life says a great deal about his or her depth of character, and that is a very good basis on which to choose one's friends and colleagues. EM

# AUDIOFIRE™

## FIREWIRE RECORDING

**AUDIOFIRE12**

• 12 +4dBu Inputs • 12 +4dBu Outputs • 24BIT 192kHz Sampling • MIDI INPUT/OUTPUT • Word Clock Sync



**AUDIOFIRE8**

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