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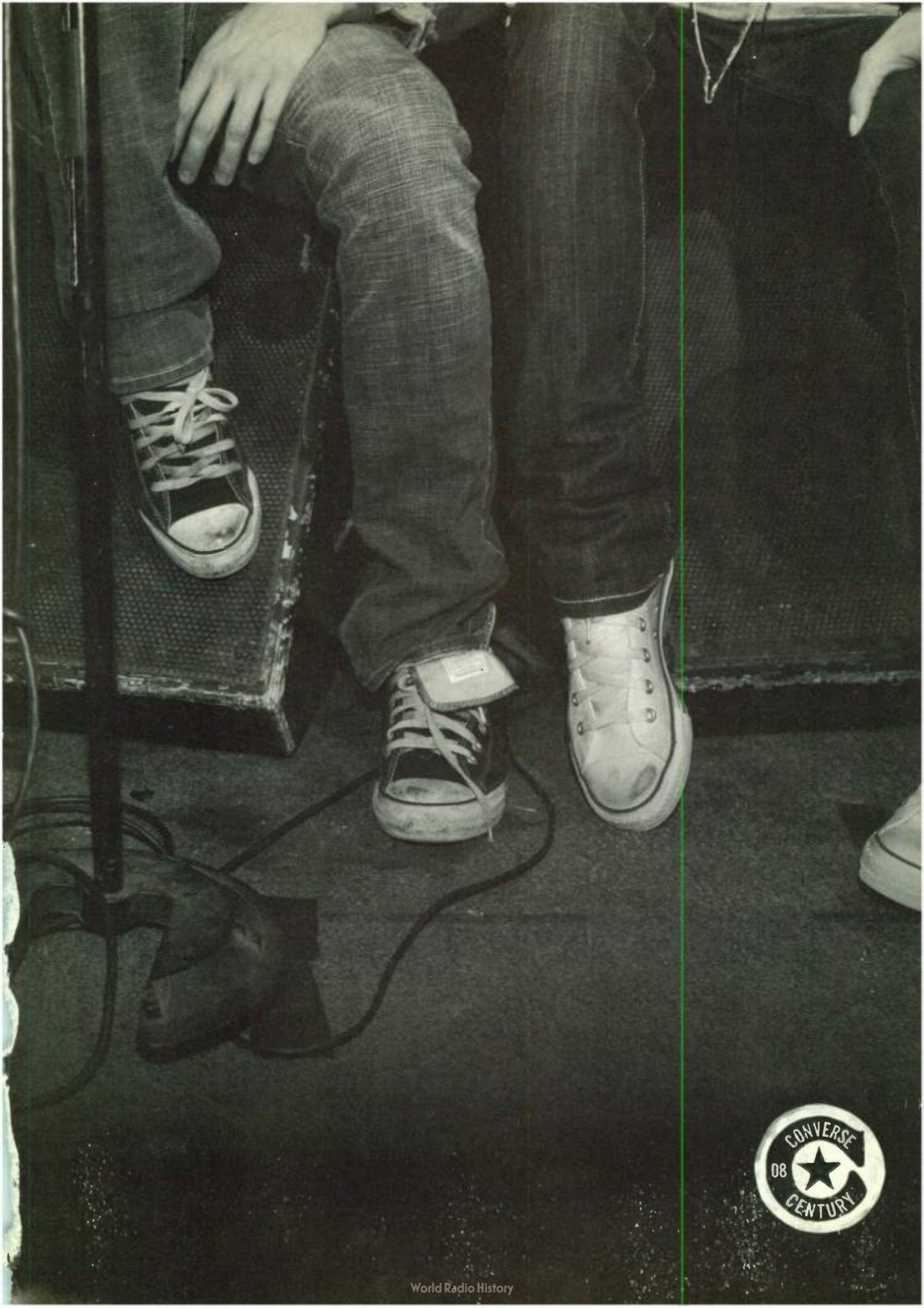
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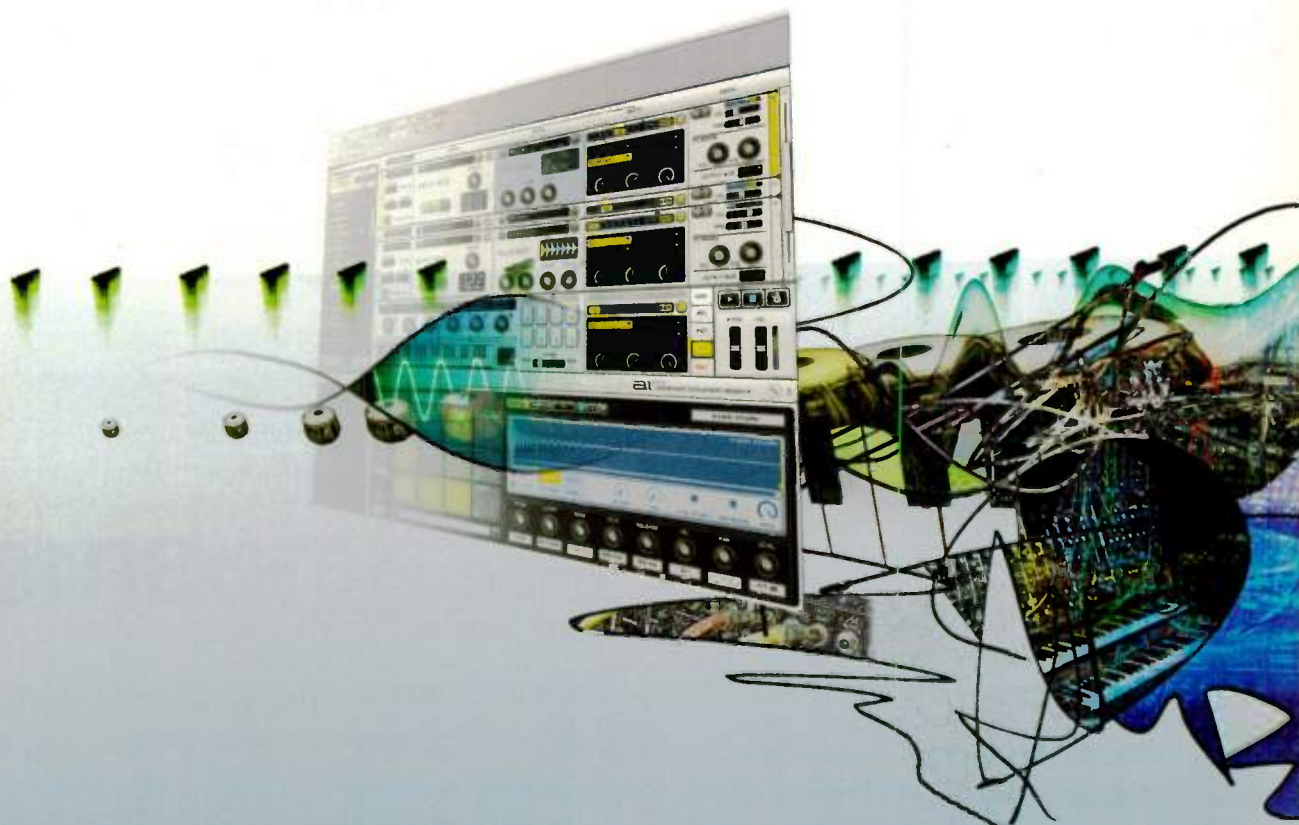
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By Dennis Miller



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emusician.com/tutorials/electronic_century3

By Joel Chadabe

EM Spotlight

»» Ben Burt: R2-D2 2.0

Ben Burt is one of the most influential sound designers in the film biz. You've heard his pioneering work in the *Star Wars* series, not to mention many other movie classics. In this exclusive online interview, Burt talks about taking his classic robot vocalizations a step further in Pixar's latest animated release, *WALL•E*. emusician.com/em_spotlight

By Jason Jurgens



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»» Synths for the Stars: David Frank

Producer-composer-keyboardist David Frank's star-studded 30-year electronic-music career includes work with Phil Collins, Chaka Khan, and Steve Winwood. In this archive article, he talks about producing Christina Aguilera's hit "Genie in a Bottle."

emusician.com/interviews/feature/emusic_bottle

By Paul Myers



EM Cast

Our twice-monthly Podcast features interviews with Ramin Djawadi, composer for the film *Iron Man*; Gina Fant-Saez of eSession.com; and producer-engineer Michael Barbiero (Counting Crows, Ziggy Marley, the Allman Brothers). emusician.com/podcasts

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Listen and Learn

I'm always surprised that people have so little interest in hearing the sounds around them. The ubiquity of portable

MP3 players is great for a struggling tech industry, but it lulls people into thinking that we need distraction from the banality of everyday life. But I see such times as waiting in a shopping mall or an airport or traveling by bus or train as a chance to have unusual and unique auditory experiences. Before you accuse me of stealing a lick from the John Cage songbook, I dare you to remove your earbuds, turn off your iPod, and see if you can't take something away from your immediate environment. There are many practical things to learn—even enjoy—in our everyday soundscape.

The world around us offers not only interesting sounds, but also a chance to focus on production values. For example, sitting in the St. Louis airport as I write this, I hear a serendipitous symphony that provides an impromptu exercise in sound design, with interesting aspects in all three dimensions. In the vertical spectrum—frequency—there's the low rumble of jets taking off outside, sometimes noticeable in the subtly shaking floor. Other plane-related sounds fill in the lower mids when a door opens for departing passengers. Nearby, a man empties a garbage can, shaking open a new bag that creates a complex mélange of mids and highs. Narrow, band-limited voices and music, ostensibly tuned to

the strongest parts of our auditory sense, come from various speakers. The highest registers are filled with electronic sounds, both intentional (cell phones, cash registers) and unintentional (door and wheel squeaks). How would I synthesize or process sounds to re-create this scene?

Examining the horizontal aspect, it's interesting to hear how the sounds surround me. Announcements overlap from various speakers in the ceiling, while carts and rolling luggage clatter by in both directions on a tiled floor, creating sublime polyrhythmic patterns.

Hearing how the sounds bounce off of the reflective surfaces as they move through the terminal yields the perception of depth. I try to imagine them being processed in a digital reverb: how would I modify them to change their position in a mix?

Later, in an airport restaurant, I'm confronted by an intense walla (a term for crowd chatter used in film sound) with a hit parade of pop music floating on top. In front of me, a man talks on his cell phone. If I were mixing this in postproduction, how would I increase the legibility of his voice while keeping the intensity of the background? Or, depending on the plot, slightly mask his voice? How would I morph the song from a midrangy annoyance in the corner to its full-frequency glory front and center, say, right before my imaginary credits roll?

If you find yourself stuck listening to canned music that makes you cringe, try concentrating on the technical aspects of the song. (Why does a James Taylor song sound good even on crappy speakers?) It's one of the tried-and-true ways engineers get through sessions where the music is aesthetically challenging.

I'm not against portable music players or the mood-engineering use of a well-thought-out playlist. But it's a shame to miss the auditory opportunities your surroundings can provide when you really tune in.



JANIE RUCKENY

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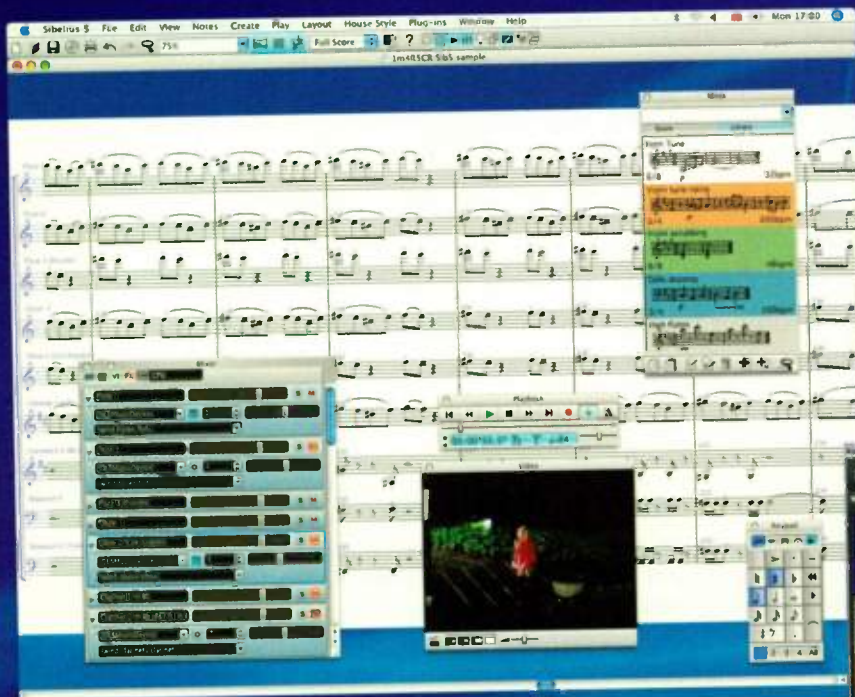
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Does It Make a Difference?

First of all, I love EM. I look forward to every issue. However, I am a little puzzled by the "It's Easy Being Green" article, by Jon Chappell (May 2008). He says that my home studio is contributing to global warming and environmental problems. Without getting into a debate, I'd just like to point out that global warming (as caused by mankind) is far from being an established scientific fact. While Jon's tips might save me a few pennies (and that's fine—we all feel the effects of the rising costs of energy), please don't try to sell me the ridiculous notion that my little home studio is hurting the planet, which was here 4.5 billion years before my studio.

—THAD REIST, VIA EMAIL

CONVOLUTION ADDITION

Thanks for the great "Master Class" on convolution (see the April 2008 issue). It is a very fertile area for sound design. I use and have enjoyed both the Spirit Canyon and Virtuasonic libraries, and the information from their creators was very inspiring. Your readers might also be interested in the pioneering work of Ernest Cholakis at Numerical Sound (numericalsound.com), who created the first convolution library (Drone Archeology) back in 1998. He related to me that it took five months of offline processing at that time to generate the impulses—a measure of how powerful our tools have become. Also, the SIR2 convolution software is now available for Mac users as a Universal Binary.

SCOTT SIMONS

VIA EMAIL

IT'S JUST NOT LOGICAL

I've read many fabulous reviews of Apple Logic Studio. I've been a Logic user for a long time and I use it to make my living, so I was happy about all the additions and improvements that have been made to the program.

However, something that Apple didn't do was so simple and so impor-

tant to the creative process that I felt I should write to you. Logic needs to have the Core Audio Real-Time Sample Rate Convert implemented for auditioning loops, samples, and other audio files.

For example: I'm working at 96 kHz and want to audition and import audio files from my sample library. The audio files are 44.1 kHz files. I choose Import and the browser window comes up, showing my available samples. I can highlight them, and there is a Play button. I hit Play to audition the samples, and they play back at more than two times the pitch and two times the speed because their sampling rate is 44.1 kHz (as is that of most sample CDs on the market). They don't play back properly. Not sure why Logic can't play them correctly, as QuickTime, Peak, Battery, and Kontakt can. Even hitting the Spacebar on an audio file from within the system plays back the audio file at the right pitch and speed, no matter what my studio master clock is set to. But Logic Pro 8.0.2 can't, which is incredibly frustrating.

AARON JAFFE

VIA EMAIL

Associate Editor Len Sasso replies: Mr. Jaffe—It is not as easy as it might be, but Logic can do what you want. First, there's the project's sampling-rate setting, which appears both in the Project Settings—Audio tab and the transport (if enabled). You can temporarily change that to match the library files' sampling rate and, therefore, audition them correctly. Apple is aware of that limitation and will probably address it in a future version of Logic. In Project Settings—Assets, you can choose to have Logic convert imported files to the project sampling rate. That works when files are imported to Logic tracks or to the Audio Bin.


THE MISSING MIC?

While I understand the merit of such an article ("Budget Mics, Big Sound," May 2008), I cannot for the life of me understand why you would use a Studio Projects C3 and not include the Studio Projects B1, which is an exceptional LDC that would have blown away the ones tested. Granted, it retails for \$20 over the \$100 limit, but I'm sure that the additional 20 percent is small in comparison to the massive difference in quality and features. (The B1 has both selectable

filters, 75 Hz or 150 Hz, and selectable pads, -10 dB or -20 dB.)

COLT

VIA EMAIL

Editor Gino Robair replies: Colt—You may be right about the better sound and feature set of the B1. However, if we move up to \$120, we have to let other mics in as well. Then it becomes a different article. Believe it or not, there are readers who really, really want to spend less than \$100 for a mic. And we wanted to see what it would bring us if we kept that price cap. The Studio Projects C3 in the article was used merely as a reference point. 

WE WELCOME YOUR FEEDBACK

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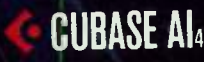
The Motif XS is already the #1 synth workstation in the market, but we didn't stop there. Go to the #1 community support site in the industry – www.motifator.com to get more.

More features in the newly released OS, more sounds and sample libraries from the best in the business, and more inspiration with the Yamaha Music Production Powerpack of 4 DVDs filled with how-to videos and over 5GB of VST instruments. And, of course, there is friendly 24/7 support from all the mobros on the Motifator forums.

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FRONT PANE

By Gino Robair



Stop Missing Out: SonicLiving

It's hard to ignore a company that promotes itself as the "digital-to-analog lifestyle converter." The concept behind the Emeryville, California, startup SonicLiving (sonicliving.com) is simple: never miss live shows again. If you're like me, you've missed too many shows because of your questionable calendaring skills. Fortunately, with very little effort on your part, SonicLiving takes your iTunes, Pandora, and Last.FM favorite artists, generates their individual show dates, and syncs the information with iCal or Mozilla. What's more, you can find out where your friends are going or chum up with fellow users who share your musical interests.

What started out as a lunchtime hobby for founder Gabe Benveniste has turned into a seemingly profitable dot-com venture. "So much of the

Internet is spread out globally. SonicLiving is an opportunity to connect locally with people that you have something in common with, which is becoming more and more rare these days," says Benveniste, who launched the service in 2005 while working at Pixar.

Leaving Pixar was a difficult decision for him to make, but ultimately the company's ethics became the basis for his departure. "Pixar is one of the best places in the world to work, which is actually one of the reasons I left," admits Benveniste, who was in charge of Mac infrastructures there. "I felt like the values that Pixar had should be passed on to other companies."

That's good news for us, because missing that show where all your friends had the time of their lives won't happen again. —Jason Jurgens

OPTION-CLICK By David Battino

Make Quick(Time) Work of It

Discover cool features lurking inside popular programs and gear.

Apple gets raves for its multimedia software, but the engine behind it—QuickTime—runs on Windows as well. For just \$30, you can add recording, editing, and exporting capabilities by upgrading the free QuickTime Player to QuickTime Pro (see quicktime.com). I use QuickTime Pro to record voice-overs because its modest CPU hit doesn't trigger my Mac's fans. It's also handy for grabbing excerpts from long audio files because it doesn't have to draw the waveform first. And its multitrack architecture lets you layer numerous audio, video, and text files.

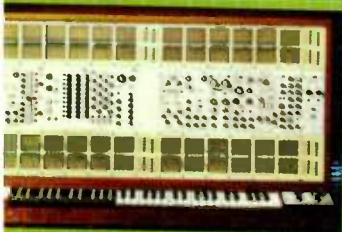
The secret is to open each file in a separate QuickTime player, copy the part you want, then paste it into a master movie file. Paste normally, and the files will line up sequentially. Paste with the Add To Movie command, and QuickTime will overlay the new file at the current playback point. Paste with the Add To Selection & Scale command, and it will time-stretch the new file to fit. (For more about David Battino's work, visit batmosphere.com.)

ONLINE BONUS MATERIAL



QuickTime Pro lets you combine media files quickly. The author made this captioned movie (see [Web Clip 1](#)) by importing 16 still images and then overlaying two audio files and a text file.

ARP Synthesizers from 1970 to 1980



1970

2500

A large duophonic modular analog synthesizer that uses slider matrices to make module connections



1971

2600

The classic duophonic 3-oscillator, semimodular analog synth with built-in monitor speakers and spring reverb

1972



Odyssey

An analog duophonic monosynth designed to handle stage and studio use equally well

THIS MONTH'S SOUNDTRACK

These albums encompass a diverse range of styles and composition methods, from ambient and experimental to jazz and pop.

1. The Orb: *The Dream* (Liquid Sound Design)
2. Frank Rothkamm: *just 3 organs* (Flux)
3. Frank Zappa: *Wazoo* (Vaulternative)
4. PGT: *Temporary Habitations* (Loochtone)
5. Richard Lainhart: *The Beautiful Sky* (O-Town)



1.



THE ORB

Dr. Alex Paterson and Youth offer a soulful blend of sumptuous beat-based beauties.



FRANK ROTHKAMM

These retro-sounding micro-tonal works feature three Yamaha organs tuned 33 cents apart.



FRANK ZAPPA

Played live by Frank's 20-piece big band in 1972, this album contains exceptional songs and arrangements.



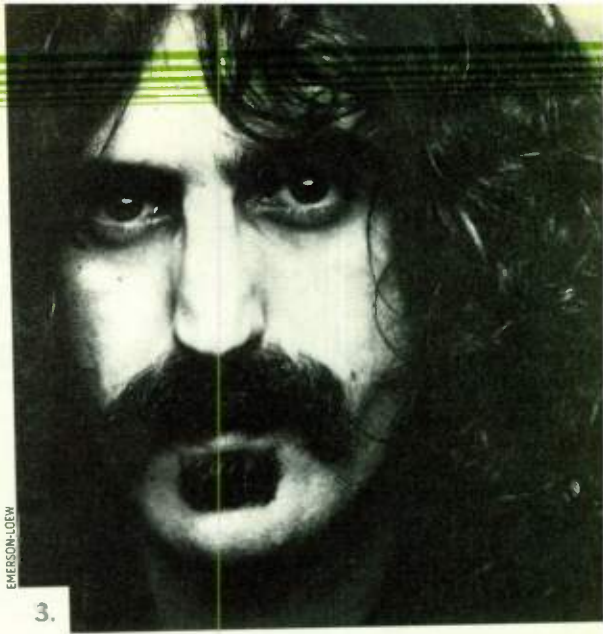
PGT

The soothing set of improv presented here combines a mandolin and real-time laptop processing.



RICHARD LAINHART

These six luscious synth tracks were created with a Haken Continuum controller and a Buchla 200e.



EMERSON-LOEW

3.



B. GAUDON

4.

2.



MINNA SCHWEIDER

5.



How would you rate your knowledge of synthesizers? a) Novice, b) competent, c) advanced, d) expert. Submit your answer to this poll and others at: emusician.com. This is not a scientific poll but a tabulation of readers' responses and is just for fun!

1975

Axxe
A single-voltage-controlled-oscillator version of the Odyssey that includes an audio input



1975



Little Brother
An expander module with a single VCO that offers four waveforms and four simultaneous octave divisions

1975



Omni
A popular polyphonic string synth with bass presets and stereo output

Download of the Month

XO Wave (Mac) *By Len Sasso*

XO Wave (free) and XO Wave Pro (\$95) are digital audio editors that emphasize ease of use. Their design focuses on CD mastering, scoring for picture, and Podcasting, but you can do multitrack recording and mixing as well. The Pro version sports a 64-bit engine, allows more simultaneous effects, hosts AU plug-ins, exports in all QuickTime-supported formats, and writes CD subcodes (ISRC, MCN/UPC, CD Text). A free Linux version, XO Wave Open, is also available from the company Web site (xowave.com).

XO Wave makes burning your own CDs and mastering them for professional reproduction about as easy as it can get. It will even let you start with an iTunes playlist, which is great for making custom CDs of your favorite tracks. You have two ways to create a CD mastering session (a necessary first step to burning a CD). You can simply launch a new session and do everything manually, or you can use XO Wave's CD Mastering Wizard to guide you through the necessary steps. If you haven't created Red Book-compliant music CDs, the Wizard is a great way to start because it creates the appropriate

gaps and markers. Once your session is set up, you use the Memory Locations manager to edit CD Text (Pro version only) for the individual tracks. When everything is to your liking, XO Wave creates a CD Master folder with all the information it needs to burn a CD. Another wizard, which you can invoke immediately or in a later session, guides you through the burning process.

All audio editing in XO Wave is nondestructive.


It loads the audio files into a session folder, automatically creates regions as files are dragged to and adjusted on tracks, and performs any necessary DSP in real time. You don't get all the bells and whistles found in high-end DAWs, but you can accomplish most audio tracking and editing tasks. A new, free update with improved effects, major GUI improvements, middle-side support, advanced automation, and batch processing is due out in the near future.



Can't Live Without It

Jack Barnett, vocalist and laptopper for the U.K. art-rock quartet These New Puritans, can't say enough about his Yamaha SU-10 sampler. "I once sent an email to everyone on our mailing list telling them to buy one," admits Barnett, whose band recently released *Beat Pyramid* (Domino Records). About the size of a videotape cassette, the SU-10 is so small that, he says, "you can sit in the park or at the beach and make a beat or edit sounds.

I use mine to sketch out ideas."

Relatively inexpensive and durable, the unit offers stereo digital phrase sampling and real-time scratch and filter effects. "One of my favorite things about it is the x-y ribbon pad. Basically, you move your finger around and the sound changes," says Barnett. "With it, you can control the direction of the sample. It's one of the most peculiar ways of warping a sound that I've ever come across." —Jason Jurgens 



ARP Synthesizers from 1970 to 1980

1977 Avatar
A monophonic guitar synth that borrows its filter and oscillator components from the Odyssey



1978 Quadra
ARP put several of its instruments into one package offering bass, strings, synths, and leads under microprocessor control



1980 Chroma
One of the first programmable multitimbral polysynths with a touch-sensitive keyboard and a computer interface



MUSIC ON DELIVERY



Photo by Kajuni



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* Please Note: Reason doesn't actually arrive in multiple separate product boxes that occupy a whole apartment block, its sheer masa of devices just makes it feel that way.



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propellerhead

www.propellerheads.se

M-AUDIO FAST TRACK ULTRA 8R SPEED DEMON



M-Audio (m-audio.com) has expanded its Fast Track series of USB 2.0 interfaces with the Ultra 8R (\$499). The 1U rackmountable 8 × 8 audio and MIDI interface incorporates eight Octane-technology preamps, phantom power, and M-Audio's MX Core DSP mixer, which allows you to mix eight audio streams from the computer with the eight hardware inputs, complete with reverb and delay effects for cue mixes. It features 24-bit, 96 kHz resolution throughout the signal path, and all input channels accept mic-, instrument-, and line-level signals. You get two front-panel 1/4-inch instrument inputs along with a 1 × 1 MIDI interface and two channels of S/PDIF digital I/O.

NOVATION NOCTURN

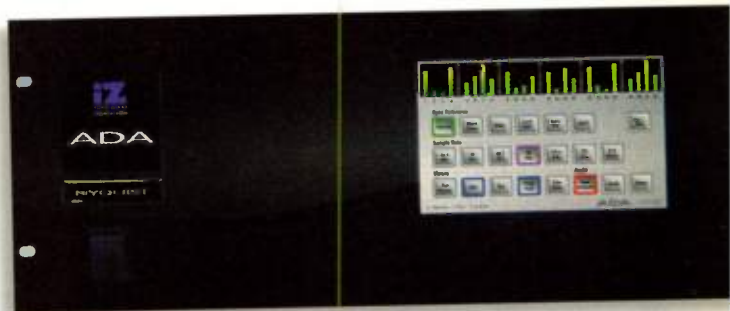
Novation (novationmusic.com) has just released its latest control surface, which features Automap Universal 2.0 technology. The 9.4 × 5.4 × 1.1-inch Nocturn (Mac/Win, \$149.99) has eight touch-sensitive rotary encoders, eight assignable buttons, and the Novation Speed Dial, which automatically links wherever your mouse hovers. Although designed primarily for home recordists, the unit's 45 mm crossfader and bright backlighting of all buttons and rotaries also make it ideal for DJ'ing in the dark. Automap Universal offers instant, intelligent mapping of Nocturn controls to plug-ins in any major DAW, but you can remap the encoders with a simple touch. A transparent GUI lets you see all parameter assignments.

TAKE THE NIGHT SHIFT



IZTECHNOLOGY ADA

After years of perfecting the Classic, Nyquist, and S-Nyquist converter cards used in its iZRadar multitrack recorder, iZTechnology (izcorp.com) has made its A/D/A converter technology available to DAW users. You can configure your made-to-order ADA unit with 8, 16, or 24 channels of 48, 92, or 196 kHz conversion, then expand the I/O ratios and channel counts later as needed. Eight-channel ADA units start at \$7,500 with standard MADI digital I/O, and other I/O options are available. The units interface with all major DAWs, and touch-screen front-panel controls along with a graphical user interface make them easy to set up.



OFF THE RADAR



KRK ROKIT MONITORS

The Generation 2 Rokit monitors (\$299 to \$499 per pair depending on model) represent a major improvement to KRK's (krksys.com) popular line of powered studio monitors. Models are available with 5-, 6-, or 8-inch glass aramid composite cone woofers, and all feature 1-inch neodymium soft-dome tweeters. The company's specs claim a peak SPL of 107 dB and 52 Hz to 20 kHz frequency response. The Rokit's radically curved edges provide a wider sweet spot by virtually eliminating diffraction, and front-firing ports reduce port turbulence. You get RCA, 1/4-inch TRS (balanced and unbalanced), and XLR inputs, as well as an input-gain control with +6 to -30 dB range.

HELPS YOU ROKIT

TC Electronic Nova Line

Two new effects grace the TC Electronic (tcelectronic.com) Nova line of guitar pedals. Modulator (\$249) adds a triple chorus, a through-zero flanger, and upgraded vibrato to the chorus, phaser, flanger, and tremolo from TC's G-System. Dynamics (\$249) combines a stomp compressor, a studio compressor, and a noise gate. Both units sport dual engines, allowing you to combine effects and reconfigure the signal path.

Modulator offers tap tempo, LFO synchronization, and nine user presets. You can use Dynamics' two engines in series or have completely separate signals.

STOMP ON THIS



Get Smart

Multi-Platinum Pro Tools DVDs

Multi-Platinum Pro Tools' (multiplatinumprotools.com) new suite of five tutorials (Mac/Win, \$9.95 to \$74.95 each) and accompanying Pro Tools session files is available for



download or on eight DVDs. More than 26 hours of HD Quick-Time movies cover mixing; track editing;

ing; mastering; vocal editing, including comping; song construction; and final production. Each tutorial author boasts production credits with well-known artists and offers real-world tips and tricks. You can buy the tutorials individually or in various bundles, including the entire set for \$219.95.

Course Technology PTR's Musician's Legal Companion

The Musician's Legal Companion, 2nd ed. (\$26 [MSRP]), from Course Technology PTR (courseptr.com), will keep you out of court while sparing you the mind-numbing legalese of music



law. It covers the four main music contracts—recording artist, songwriter, management, and performance—in plain English and guides you to a more cost-effective relationship with your attorney. The second edition expands coverage of topics such as independent producers, distribution and marketing,

and media and merchandising agreements. Author Michael Azcon recounts many of the lessons he's learned during his 25-year career as a music-business lawyer.

Focal Press's Recording Studio Design

Recording Studio Design, 2nd ed. (\$84.95 [MSRP]), by Philip Newell shares the author's extensive knowledge and experience in the acoustics of recording-studio design. The



hardcover book discusses basic principles, electroacoustics, and psychoacoustics in full detail, then updates the original edition to reflect current technology and practice. New and expanded topics include digital signal processing, design for soundtrack mixing and Foley room, control rooms, studio monitors, and surround sound. Newell, former

technical director of Virgin Records, has designed more than 200 studios over his 30 years in the recording industry. More details are available from Focal Press (focalpress.com).



IZOTOPE RX PLUG-INS

IZotope(izotope.com) has added plug-in versions to its RX suite of audio-restoration software (Mac/Win, \$279). The plug-ins, which come in all major formats, are included in the stand-alone package and are a free upgrade for existing RX and RX Advanced users. The suite, consisting of Denoiser, Declipper,

AUDIO FIRST AID

Hum Removal, Declicker, Spectral Repair, and Advanced Spectrogram, is ideal for applications requiring spot-

less audio. In addition to removing unwelcome artifacts, the Spectral Repair algorithms will analyze and fill gaps in audio files. RX Advanced (\$1,199) adds more-precise control and multiresolution processing to the mix. A fully functional ten-day trial version is available from the iZotope Web site.

IMAGE LINE SOFTWARE FL STUDIO 8 FRUIT FOR THOUGHT

FL Studio 8 (Win, \$99 to \$299) brings new plug-ins, an improved interface, a revised mixer, and a new sound engine to Image Line Software's (image-line.com) flagship DAW. You can design your own plug-ins with the FL-native version of SynthMaker. The Slicex drum loop slicing and rearrangement tool includes time-stretching and piano-roll sequencing. The Edison audio editor adds audio-to-MIDI analysis. A MIDI Score Logger remembers the last 3 minutes of MIDI input. The multilink controller



function permanently remembers links you set up between FL plug-ins and your controllers. A mixer track system for creating visual effects rounds out the new features.

Joerg, BEHRINGER Germany Software Engineer and professional Mad Scientist, mutated groundbreaking DSP algorithms for our active speakers.

"CK" harnessed the power of the B412DSP's internal DSP engine for ultra-flat and musical frequency response.

Jason did the super-complex CAD/CAM mechanical design of the B412DSP enclosure.

Hua runs the machine that makes all of our speaker cones. All BEHRINGER transducers are made in-house for ultimate quality control.

Susan, BEHRINGER Speaker Engineer, helped design the high-resolution compression driver. You hafta hear it to believe it.



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These are some of the 3500 technicians, assemblers, designers, software

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B412DSP. 600 watts of whoop ass meets the ruler- flat precision of 24-bit digital signal processing.



Mega-expensive touring systems sound so good because their sound is processed through racks of sophisticated digital signal processing gear. We know. We're one of the companies that make those 24-bit outboard speaker processors. Now BEHRINGER

has applied a whole chain of DSP including crossover, dual mode limiters, dynamic equalization processing to super-affordable twelve and fifteen-inch active speaker systems. Powered by high-efficiency internal amplifiers with a hefty 600 watts total output.



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The new 600-watt B512DSP, B415DSP and B412DSP active systems. Each also includes a built-in 3-channel mixer with mic preamp!

www.behringer.com



PEAVEY REVALVER MK III



ReValver MK III (Mac/Win, \$249) from Peavey Electronics (peavey.com) takes amp modeling to a new level. You drag-and-drop to add and configure individual components—amps, preamps, stompbox effects, and so on. Then right-clicking

VALVE JOB

on any component takes you under the hood to the circuit level, where you can swap tubes and calibrate their voltage parameters. Stompbox effects include chorus, distortion, wah, tremolo, compression, delay, octave doubling, and FFT-based convolution reverb into which you can load your own IR samples. Normal and HQ (with 64-bit oversampling) operation modes meet the needs of CPU-limited and hi-fi-minded users, respectively.

Sound Advice

Samplebase's Phat Brass

Deep Sea Music: Phat Brass (Mac/Win, \$29) is a collection of

funky 4- and 8-bar brass-section and baritone-sax loops meant for mixing and matching. The collection is in

SoundBlock format, requiring Satellite (free) or Satellite Pro (\$149) for playback.

These are big-band-style phrases with a 4/4 funk, pop, and soul feel. They come in four tempos and three keys (95 bpm in A, 118 and 130 bpm

in E, and 126 bpm in D), but you can time-stretch and pitch-shift them within reasonable limits in Satellite. Visit samplebase.com to purchase and download these and other SoundBlocks.

Big Fish Audio's Jazz Drums

Big Fish Audio (bigfishaudio.com) has released *Jazz Drums* (\$99.95), a collection of more

than 1,000 drum loops at 21 tempos ranging from 50 to 200 bpm. Most tempos contain numerous loops of the same style but differing feels (half time, double time, polyrhythmic, and

so on). Having several loops of each style makes it easy to create authentic, nonrepeating sections for your songs. This 24-bit, 44.1 kHz collection comes in Apple Loops, REX, RMX, and Acidized WAV formats on a 3.5 GB DVD, which also contains a demo version of Ableton Live 6.

Soniccuture's Scriptorium


Scriptorium (Mac/Win, \$99) is a download collection of 35 scripts for Native Instruments Kontakt 2 and 3 from Soniccuture (soniccuture.com). The powerful Kontakt Script Processor (KSP) is used to build a variety of tools ranging from custom



control panels to performance enhancers such as arpeggiators, step sequencers, and chord generators. Most factory and third-party Kontakt instruments employ scripts, and this is a collection of Soniccuture's best. You get 60 ready-built instruments from Soniccuture to illustrate how these scripts work. Four video tutorials and a detailed 35-page manual show you how to use them in your own Kontakt instruments.



PSP AUDIOWARE MIXPACK2 FIXED IN THE MIX

PSP Audioware (pspaudioware.com) MixPack2 (Mac/Win, \$199) updates five mastering and tracking utility plug-ins with new features and an upgraded 64-bit double-precision floating-point engine that supports sampling rates up to 192 kHz. MixBass2 and MixTreble2 add low-frequency punch, treble clarity, and sparkle to any kind of material. MixPressor2 is a full-featured sidechain compressor intended to complement MixSaturator2's analog-emulating algorithms. MixGate2 rounds out the bundle with high-precision noise-gating. The plug-ins, in AU, VST, and RTAS flavors, model the sound and features of analog circuits but not specific hardware units. 

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Capture a Dragonfly and get \$200 cash back.
Purchase a pair and get \$400.

This is one dragon that won't burn a hole in your pocket.

With summer in high gear there's never been a better time to let a Dragonfly loose in your studio. Just purchase a Dragonfly microphone between July 1st and August 31, 2008, from an Authorized Blue Retailer and you'll receive a \$200 rebate. Or become a Frequent DragonFlyer and buy a pair (great for drum overheads) and get \$400 back. The sky's the limit. You'd have to be crazy (or a competitor!) to pass up an offer like this one.

The award-winning, hand-tuned and tested Dragonfly is a unique cardioid condenser mic featuring a rotating spherical capsule head that can be positioned and adjusted in the smallest of spaces. Offering superb detail, the Dragonfly is ideal for recording vocals, drums and percussion, electric guitar, bass and just about any acoustic instrument.

Check in with your local Authorized Blue Retailer for more details or to hear a Dragonfly in action. But hurry! With savings like these, they're likely to zip off the shelves in record time. And that would be a fire-breathin' shame.



Microphones

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Use this Blue Rebate Coupon to save \$200.00 on the purchase of a Blue Dragonfly mic. To be eligible, simply purchase a Dragonfly from a Blue Authorized Dealer between July 1st and August 31st, 2008. Completely fill out, clip and send in this rebate coupon (incomplete coupons will not be accepted), along with a copy of the sales receipt and the original (no copies) UPC code from the bottom of the box to the address at the bottom. Multiple purchases require separate rebate coupons, sales receipts (if applicable) and UPC box codes. Additional rebate coupons are available for download online at www.bluemic.com.

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PLACE BETWEEN PLACES

Home base: Los Angeles
 Sequencer used: Digidesign Pro Tools LE
 Key effect: DigiTech Whammy 2 pedal (for violin)
 Web site: lilihaydn.com



STEVE APPLEFORD

»» Lili Haydn

Tracking in Lililand

Lili Haydn's studio plays a key role in *Place Between Places*.

The impetus for singer-songwriter-violinist Lili Haydn's third outing, *Place Between Places* (Nettwerk, 2008), was a desire to make a recorded journal of her emotional and spiritual evolution—a “distilling,” she recalls, “of my particular journey of the heart in song and poetry.” Prior to launching a solo career, Haydn had established herself as a sought-after violinist working with a range of artists including Herbie Hancock, Nusrat Fateh Ali Khan, the Los Angeles Philharmonic, Robert Plant and Jimmy Page, and George Clinton (who dubbed her “the Jimi Hendrix of the violin”).

By Diane Gershuny

Song-driven in nature, *Place Between Places* runs the gamut from stripped-down, pristine gems featuring Haydn's soaring vocals and violin to pop-oriented rockers with lush orchestrations, crunchy guitars, and gritty electronic loops. “Kate Bush meets Pink Floyd meets Air meets Led Zeppelin meets Barry White's Love Unlimited Orchestra,” she laughs.

Whereas previous recordings had sprung from lo-fi demos created on a Roland VS-1680 at home and later transformed in commercial rooms under the guidance of producers like Tony Berg and Bill Laswell, for this recording she

took a more hands-on approach. Within her upgraded Lililand studio, Haydn put together an intimate, velvet-encased space composed of an Apple Mac G5 running a Digidesign Digi 002 Pro Tools LE system. Other gear included an Apogee Big Ben, a Neve 2-channel preamp, Neumann TLM 103 mics, and various keyboards, including her dad's '60s Rhodes piano and her grandmother's baby grand.

Haydn recorded her violin both acoustically and electrically. For the former, she used a Blue Bottle or Royer R-122V mic. For electric sounds, the signal chain started with the L.R. Baggs

pickup on her violin into a pedalboard featuring a Line 6 DL4 delay; DigiTech Wah, Whammy 2, and Space Station effects; and then went into a vintage Silvertone amp miked with an Audio-Technica 4050.

Haydn also spent hours creating her own organic loops with, she says, “laborious Rain Man-like persistence.” For example, on the title track she took a recording of a breathing pattern, looped the rhythm, and combined it with a bass sequence and bell and glockenspiel sounds from a Korg XP50 synth. “I programmed a lot of my last record with

[Propellerhead] Reason and Ableton Live, but on this record, I chose to create my own organic loops, grabbing sounds that I liked from other songs of mine, importing them into Pro Tools, and literally chopping up and nudging them manually in order to find the magic.”

Many of these recordings, done solo or in tandem with musical pals like Marvin Etzioni, found their way onto the CD under the expert guidance of Grammy-winning producer-engineer Thom Russo. He recorded basics with the group at Dusty Wakeman's Mad Dog Studios, then moved those tracks to his Womb Room studio, where they were combined with the product of the Lililand sessions.

The album's “guilty pleasure” was Haydn's cover of Funkadelic's “Maggot Brain” (the only cut created within a commercial facility, Capitol Studios), lushly orchestrated thanks to the daKAH Hip Hop Orchestra. “I added it at the last minute and Thom was furious. But I was vindicated after getting a call from [Pink Floyd's] Roger Waters, who especially loved my playing on that and invited me to perform with him at the Coachella festival!” **EM**

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let you effortlessly navigate and edit your projects without ever touching a mouse, and place everything from simple keystroke commands to complex custom macros at your fingertips to deliver an unmatched editing and mixing experience.



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MARCHING IN

Home base: Los Angeles
 Sequencer of choice: Digidesign Pro Tools LE
 Lifesaver: Peterson StrobeFlip tuner
 Web site: dansindel.us

» Dan Sindel



SHOBY SINDEL

Guitars on the March

Dan Sindel's unique take on Sousa.

It's not every day that you can say "electric guitar" and "John Philip Sousa" in the same breath, but the music of the March King has helped pave the way to national recognition for L.A. guitarist Dan Sindel. What started out as an exercise in learning how to use Digidesign Pro Tools led Sindel to create unique multitrack, electric guitar orchestrations of Sousa's tunes (see Web Clips 1 and 2) on his new EP *Marching In* (DSS Unlimited, 2008). The disc also features Sindel's "symphonic guitar" take on three excerpts from Handel's *Messiah*. The guitarist plans to release a full-CD version of *Marching In* later this year.



By Emile Menasché

"When you first turn on Pro Tools, it can be intimidating," recalls Sindel, who runs a Digi 002 control surface with Pro Tools LE software on a Windows XP-equipped AMD Athlon 6000+ dual-core CPU. To get comfortable with the software, he pulled out some classical guitar books and began tracking 3- and 4-part baroque pieces. "I was amazed," he says. "It started sounding like Brian May with three or four parts in harmony."

At that point, Sindel was recording direct through the line out of a Line 6 Flextone III amp. "I was testing out all the different sounds because the amp

was new to me, too," he says. "One project led to the next, so I decided to try some more-challenging scores. I found Web sites like mutopiaproject.org and free-scores.com, which collect public-domain scores. I started downloading those and multitracking things like Vivaldi's *Four Seasons* and Handel's *Messiah*."

As Sindel studied the software—he later took a Pro Tools HD Operator certification course at AudioGraph International in Santa Monica, California—he started to let his imagination run wild. "I would call it an exercise in self-indulgence," he says. "In my mind, I pic-

tured an orchestra where you have six people sitting in the first violin chair, six in the second, and so on to build up to a 60- or 100-piece orchestra, so I asked myself, 'Do I need to record each individual part?'"

At first, he did just that. "I ended up with 500 individual guitar parts in a 15-minute mini epic!" he says with a laugh. "I dumped 500 tracks on engineer Phil Moore and asked if he could make music out of it. He deserves the Purple Heart! It was a big learning experience for me."

Sindel soon realized that too many

tracks actually made the guitar sound smaller, and he used a more manageable approach on the Sousa material, which still features 45 to 50 guitar tracks per song. For sonic variation, Sindel calls on an array of guitars, amps, and preamps—sometimes miking them, sometimes going direct. The key, he says, is to understand the pitch range, tone, and attack of each instrument you're trying to emulate with the guitar; for example, using a mellower tone and a more legato, sliding approach for trombone parts than for trumpet parts. "Tuning is also important," he says. "My Peterson StrobeFlip [tuner] really saved me because it's so accurate."

Although he records at home, Sindel emphasizes the benefit of taking the tracks out to professional engineers and producers. (An article in EM's August 2007 issue inspired him to contact Carmen Rizzo, who ended up mixing some of the Sousa material.) "I did the best reproduction I possibly could, knowing I would be passing the torch to professional engineers," he says. "There comes a time when you can't do it all yourself."

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FIG. 1: The Neuromonics tinnitus treatment relies on a small, portable device that plays customized noise and music to mask the symptoms of tinnitus. The audio signal is programmed by an audiologist or physician according to the patient's hearing profile.

Lord of the Ringing

New treatment could spell relief for tinnitus sufferers. | By Scott Wilkinson

Among the maladies to which electronic musicians are especially susceptible, hearing damage caused by prolonged exposure to loud sounds is perhaps the most pernicious. When you're young, you normally don't think about the consequences of cranking the amps to 11, but if you do that routinely, you are sure to suffer some form of hearing deficit in your later—or, in some cases, not so later—years.

One of the most common problems that arise from overexposure to loud sounds is called tinnitus (pronounced TIN-ni-tus or tin-NIGHT-us), which is usually described as a ringing in the ears. It can manifest as one or more steady frequencies, hissing, and/or clicking (see [Web Clip 1](#)), but these sounds are not being perceived from the outside world. Instead, they are generated within the auditory system. In some cases, the effects are temporary, but for some 12 million Americans, the sounds are a permanent accompaniment to every waking moment, and can range from merely annoying to completely debilitating.

The condition remains mysterious and there is no cure, but recent research has shed some light on its underlying causes. It now seems clear that overexposure to loud sounds, certain kinds of che-

motherapy, head and neck trauma, and multiple sclerosis can actually change the activity level of the auditory nerves. This change is then interpreted by the auditory cortex of the brain, which leads the individual to perceive sounds. One theory suggests that tinnitus is the brain's compensation for hearing loss.

To make matters worse, your natural perceptual filters, which normally allow you to focus on one thing while ignoring other stimuli, tend to assign an increasing importance to the "sounds" of tinnitus, constantly bringing them to your attention. This, in turn, raises your level of stress and anxiety, which leads to even more auditory sensitivity and awareness, resulting in a vicious cycle.


Because tinnitus occurs deep within the brain, treating it effectively can be very difficult. However, a company called Neuromonics ([neuromonics.com](#)) has developed a new treatment that shows great promise.

Based on the principle of neural plasticity (the brain's ability to form new neural pathways), the Neuromonics system uses an iPod-like device (see [Fig. 1](#)) to deliver broadband noise with a frequency and intensity spectrum that's tailored specifically to each user's hearing profile. This is intended to reduce

the neural sensitivity that starts the vicious cycle. In addition to the noise component, relaxing music is added to reduce the stress and anxiety caused by tinnitus.

The Neuromonics system addresses the perceptual filters by using systematic desensitization. After several months, the audio signal is adjusted so that the user is momentarily exposed to the tinnitus while in a relaxed state. As a result, the brain is retrained to pay less and less attention to it.

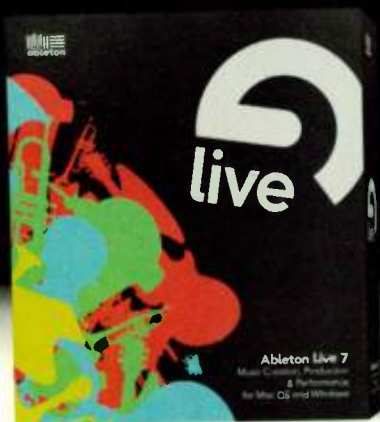
Initial results have been very encouraging. In one recent clinical study conducted at Curtin University of Technology in Perth, Australia, 90 percent of the subjects reported a reduction of 40 percent or more in their tinnitus-related disturbance, with a mean improvement of 65 percent. Further, significant benefits were reported after only two months. After six months, 80 percent of the subjects reported a level of disturbance that was no longer clinically significant, leading to better sleep and a higher level of general well-being.

Clearly, the best way to avoid the trauma of tinnitus is to protect your hearing in the first place. But the Neuromonics treatment could mean that sufferers might finally be able to enjoy life despite the ringing in their ears. 

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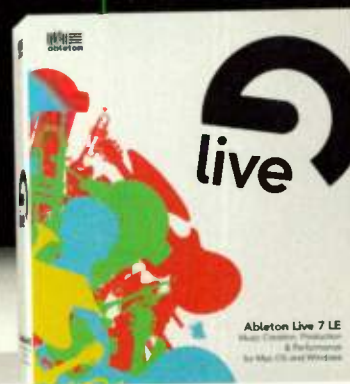
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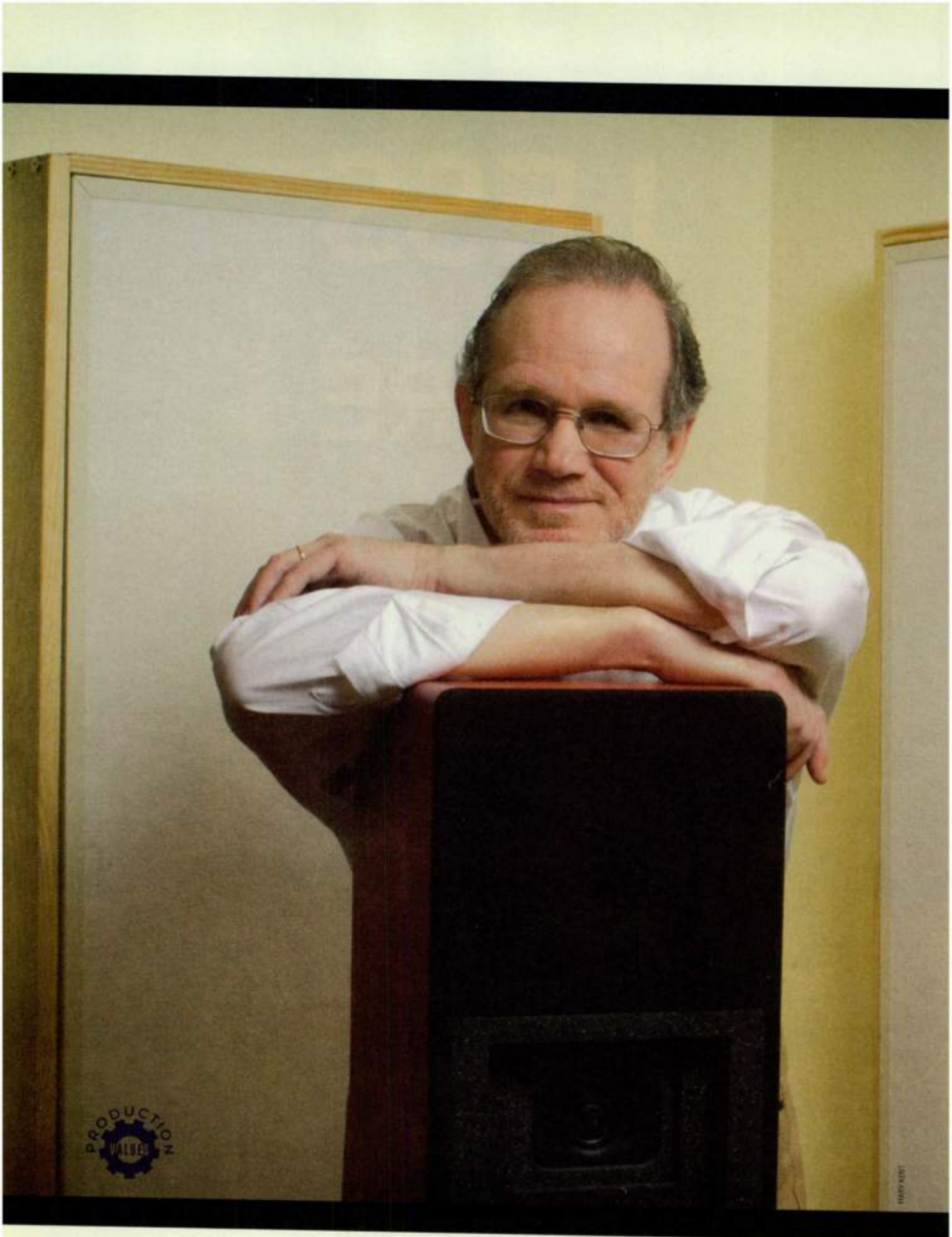


PHOTO: KENT

Keeping It

DYNAMIC

How mastering whiz Bob Katz improves recordings without overcompressing them.

By Mike Levine

Outspoken would be an accurate term to characterize mastering engineer Bob Katz. He has strong opinions on many audio-related topics and is particularly adamant in his condemnation of the “loudness race”—the continual increase in average level, and the consequent reduction of dynamic range, that has resulted from the heavy compression of CDs.

Katz devotes an entire chapter of the recently released second edition of his book, *Mastering Audio: The Art and the Science* (Focal Press, 2007), to this very subject. He makes a convincing case, backed up by a slew of charts and graphs, for proving how overcompression has hurt the overall sound quality of contemporary music. But Katz’s book offers a lot more than that, also giving a thorough explanation of the mastering process—from setting up the studio to sequencing the material to monitoring levels, among many other issues.

Mastering since the 1970s, Katz has a number of Grammy Award winners on his résumé. He has also patented a couple of mastering-related products, including the K-Stereo DD-2, which is a processor that gives the mastering engineer control over ambience and stereo image.

Katz works from his own studio, Digital Domain (see Fig. 1), which is located outside of Orlando, Florida. I had a chance to talk with him at length about a variety of mastering issues, including practical advice for recordists who are bringing their products in for mastering, techniques that mastering engineers use, and, of course, his feelings about the loudness race.

What kinds of improvements can a mastering engineer make to a recording?

In some cases, all that’s needed is the most subtle polish that you can imagine; in other cases, mastering can be a major transformation. And it depends on whether the mix engineer or producer is expecting a large transformation because they were having trouble with the mix, or because they are looking for the best possible translation of their existing good mix.

Are frequency issues—such as an overly boomy bass—easier to compensate for than some other types of problems?

Well, yes and no. When it comes to frequency issues, the extremes of the spectrum are easier to handle than the middle. For example, if someone says the electric piano stands out too far, that really is a mix issue. If I start to deal with the frequencies of the electric piano, I’m probably going to affect the vocal, I’m probably going to affect the guitars and other instruments that are there in the midrange. But if somebody comes in with a boomy recording, we have to look to see whether the recording is fairly neutral to begin with. If the relationship of the bass drum to the bass is very good to start with, then some careful equalization on the mastering side might just keep that relationship intact, and we’ll end up with a good result. But if the problem is caused by the bass drum, and the bass drum is too loud and the bass instrument is a little bit weak, then we’ll have to work really hard to find a way to reduce the bass drum without affecting the bass.



FIG 1: Katz's mastering room at Digital Domain Studios outside of Orlando, Florida.

What might you do in a case like that?

There are many tricks that we've learned over the years. Let's start with a bass drum that's going *kuh-thump, kuh-thump, kuh-thump*—and it's too loud, but the bass instrument is too weak. In the first (and, hopefully, the easiest) case, I might take a highpass filter and put it in at, who knows, 40 Hz, you never know, and see if I can get the bass drum to be softened enough so that it isn't perceived as being too loud. That's the easy solution.

Are you talking about the thumpy part of the bass drum or the clicky part?

That's part of the problem, because you can't distinguish the beater that well from the body of the bass drum. The beater has harmonics right on up to 1 or 2 kHz. So imagine if someone tried to apply the kind of equalization that you might apply to a bass drum [in the mix] in a mastering situation. When you're mixing the bass drum, you might add a significant amount at 1 kHz, 2 kHz, 900 Hz, 800 Hz, 700 Hz—that would certainly make a vocal sound pretty nasal, wouldn't it? So we have to resort to other tricks. If it's the clicky part of the bass drum, we might [be able to] ignore it. That's usually the best solution, because often in cases like this, the cure sounds worse than the disease. And often it's the mix engineer who brings it up and says, "Listen, the

bass drum's really clicky." And we say, "Well, you know, it didn't bother us too much." Because when the mix engineer is really close to the music, he's still going to be hearing mix issues, even if he comes and attends the mastering session. And we have to say, "Sit back, because now we're trying to make your existing mix sound the best way possible, not remix it."

But with the clicky part of the bass drum, it's possible to take a multiband compressor and adjust the center frequency fairly narrowly around where that area is, and adjust the attack time of it so that it just touches that part of the bass drum without touching anything else. And then you cross your fingers. But in many cases, if we end up doing more than 1 dB of that kind of correction anywhere, it starts to affect something else. But if it's the boomy part of the bass drum, certainly, getting in under 40 Hz (if the bass instrument doesn't touch those notes too much) may produce a very acceptable result.

So you'd roll off at 40 Hz?

I'm not saying this as a general rule, but for a bass-drum problem, it's a good place to start.

So in the technique that you're describing, you're using some sort of shelving filter below a certain frequency.

The steepness of that filter can be very important,

actually. If it's the bottom of the bass drum that's offensive, and you want to stay away from the bass, [using] a very steep, linear-phase filter such as what can be done in the Weiss or the Algorithmix Red [see Fig. 2] might be the most transparent solution. Because if you do a gentle filter, you might get up into 50 or 60 or 70 Hz, right into the bass. So a very sharp filter might be the solution. But a sharp filter with a normal equalizer, known as a minimum-phase equalizer, tends to produce a phase shift several octaves above it. You can really hear that, so you want to use an equalizer that's as transparent as possible. And I nominate a linear-phase highpass. Now in the reverse situation, where the bass drum is too light, you can have some good luck centering a fairly narrow—say, half-an-octave wide—boost at around 60 Hz to get a little bit of that *kuh-thung* back into the bass drum. Another situation where the linear phase sounds best is dealing with "1-note bass," as the linear-phase EQ does not produce phase shift when doing a narrow-band cut.

Do you come across bass-frequency problems a lot?

Yes, bass-instrument problems are the most prevalent of all the kinds of problems that we find in mastering. That's because more and more mixes are being done in tiny control rooms with tiny loudspeakers. That's why we have to

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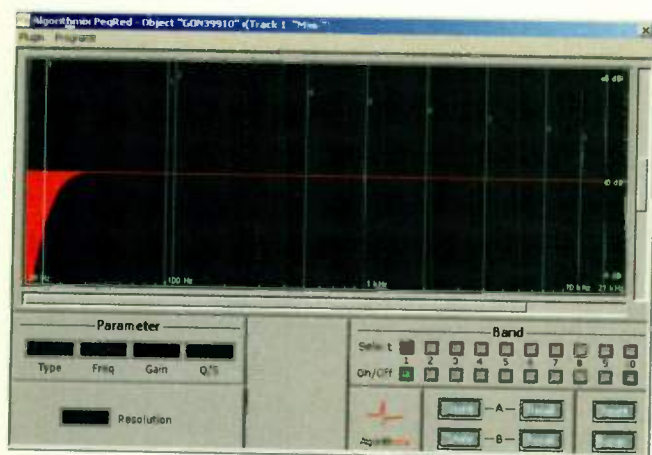


FIG. 2: To reduce the boominess of a bass drum in a mastering situation without affecting the rest of the program material, Katz says he might use a linear-phase equalizer with a steep highpass filter, such as the one shown in this screen shot of the Algorithmix Red EQ plug-in.

have a very neutral room ourselves, so that we know that the problem is not being caused in our own room. And I've resorted sometimes to producing an equalization that looks like the Grand Tetons. Finding out the key [of a] song is sometimes the easiest and quickest way to deal with it. As soon as you know the key of the song, and [if] you have good relative pitch, you know when the bass is playing the tonic or the dominant or the second or whatever, and I can look it up on our frequency chart faster than I can sweep an equalizer—especially if it's a walking bass. How can you possibly sweep an equalizer for a note that goes by so quickly?

So you figure out what the note is, then you figure out its frequency, and then you apply EQ at that point?

Exactly. It can be much, much, much faster than any of the traditional techniques, [such as] sweeping the equalizer. Just think about it as a musician, and you can see the logic in it [see Fig. 3].

Talk about how you use M-S (middle-side) technique to manipulate individual elements within a 2-track mix.

M-S manipulation is something that we mastering engineers turn to when and if the mix has a problem, and they couldn't remix. It's a remix tool. M-S, when used properly by someone with good ears and a set of monitors that has good stereo separation, can be an amazing tool

center), and you make the attack long enough that the snare doesn't lose its snap, and you only have about 1 dB of gain reduction. If you try to stick within the vocal frequencies, you can polish that mix and take it from an A to an A+. If the mix was so bad that you need more than 1 dB of gain reduction in the M channel to try and cheat that vocal down, it should have been remixed in the first place.

So you would be treating only what's in the very center of the stereo image.

In that case, yes. So in that case, M-S manipulation can be done so transparently and so beautifully that it becomes a cure with no perceptible disease.

As a mastering engineer, is there a huge difference in approach that you take between, say, an acoustic project and an electronica dance-music project?

Every project is unique. But definitely, you have to have a different approach for each one, and if you go in with a preconceived notion, it's also just as bad. One of my specialties is that my ears were trained classically from day one, much like Bob Ludwig. He was a classically trained musician before he became an engineer. I know what live music sounds like produced by live musicians. And that helps in every kind of music that I've dealt with, including dance. Sure, you have to know the genre. You have to know it really

to minimize artifacts. For example, if the vocal is sticking out a little bit too far on the peaks but the band has great dynamics, if you use a stereo compressor on that, you're going to squash the band as well as cheat the vocal down. But [it can work] if you use a compressor that only compresses the M channel, and you limit its bandwidth so that it stays away from the bass (which is also usually in the

well. But one of the secret weapons that I'll pull out, if I'm working with dance music that might have come in a little overcompressed, is to try to enhance the dynamics. What moves your body when you're on the dance floor? The rhythm. I know what a good, real, live bass drum sounds like. And if the samples they used are wimpy and not too involving, and they can't remix it (because I'll tell you that the best solution is to go back and remix), I will apply my sense of what a live rhythm section sounds like to this electronic form. I may use an expander on the bass frequencies, up to a decibel, to try to get the impact back that they lost using cheap samples and maybe overcompressing them.

Speaking of overcompression, let's talk about the loudness wars. I know you feel strongly about how the dynamic range in pop music is being reduced to unacceptable levels in an effort to make the final product sound louder and louder.

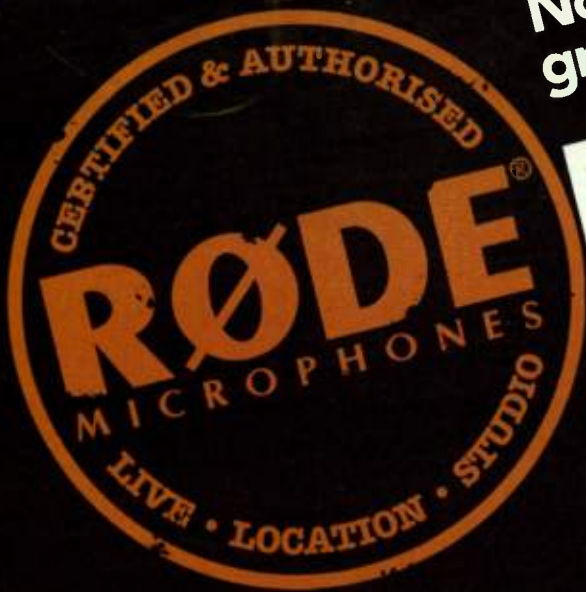
In the second edition of my book, I was privileged to get a diagram of ideal dynamic range for different venues [listening environments] from my good friends at TC Electronic. And that, in color—right there on the front cover of the book, there on the left-hand side—you see what their research found [see Fig. 4]. You could put the dance floor, which isn't in the diagram, around the fourth or fifth bar. [By overcompressing the music,] producers are currently making dance and metal and hard rock fall into the eighth bar, where in-flight entertainment is. Now you know what the in-flight entertainment sounds like—you've put the earphones on.

So the green bars in the chart represent average level?

And the orange is peak level, and the blue is the noise floor (or what we would consider the unacceptable low level). And that really tells a story. I can tell you that a good piece of dance music—disco or whatever from the '70s or '80s—will have the dynamic range right around the third bar. Put on Donna Summer or you name it, and it's going to really kick. But notice how these are all normalized on this to an average level of 0 dB. If I were to put on the Donna Summer from the '70s disco in a current disco, she would sound way too low. That's because her average level on the disc is relatively low, and the disc jockey would

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FIG. 3: This example shows how Katz dipped a single offending bass note and added a slight shelf to enhance the level of a weak bass instrument.

have to turn up his fader to play it. And when he did, she [Donna Summer] would then have all the impact and “shake-your-body-and-move-it,” and would totally blow away any electronica (except some, where my clients are enlightened) that’s being made today. The point is that the increase in CID levels has gone too far.

Is there ever a situation in which compressing a song that heavily actually helps it?

Oh sure, but usually because it’s not a good mix. Our expectations have changed as well. Take the Black Sabbath song “War Pigs,” from the

’70s. That was considered to be radical [in terms of level], and you put it on today and you just turn it up—it’s incredible. That thing really kicks. That was called “metal” back then, and today we call it “hard rock.” Today’s metal in general, Limp Bizkit or whatever you want there

in that genre, really, really sucks—there’s no dynamics left.

So with more-current heavy bands, the peaks are all getting squashed down so that the overall level can be raised.

If you compare it to the Led Zeppelin or the Black Sabbath of 1978, Limp Bizkit sounds—limp. Does that help? This is the first time that any book has ever talked about this in as clear a manner. I think we’ve crossed new boundaries, because while it may seem like this is pretty evident stuff, I really didn’t quantify it until seven years after my first edition. And Thomas Lund

of TC Electronic, whose research resulted in that graph [represented in Fig. 4], and I had a simultaneous revelation. We’ve been in this industry for 20 or 30 years, and it hit both of us at once. So this is really groundbreaking material. I’m sorry for sounding repetitive, but we need people to understand that the ability to peak-normalize is the root cause of why the digital loudness race has resulted in such extreme compression.

But doesn’t peak-normalizing simply raise the level of the program material relative to the highest peak? Isn’t that basically harmless?

If you took your album that you had for mastering, and at the end of the day the highest peak was -1 dB from below full scale, and [then] you

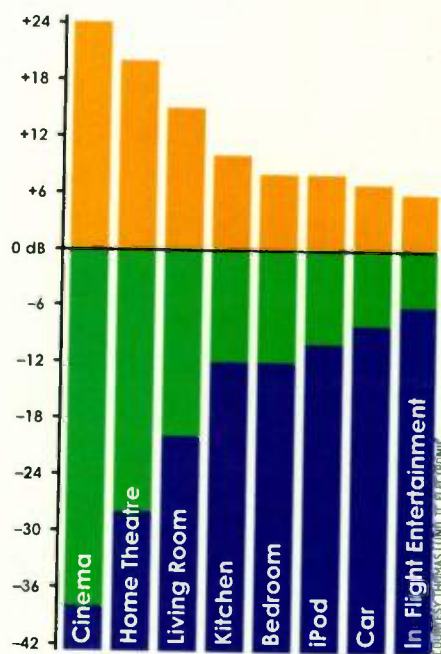


FIG. 4: This graph shows the average level (green), peak level (orange), and noise floor (blue) for a number of typical musical listening spaces. Katz says that a lot of today’s heavily compressed music has a dynamic range closer to in-flight entertainment.

raised the entire album by 1 dB using your peak-normalization algorithm (which is the same as measuring it and saying, “Okay, I’ve got 1 dB headroom, I can add 1 dB”), that’s relatively harmless in the following sense: all of your careful aesthetics between the songs remain the

Bob Katz: A Selected Discography

Mastered

Steve Dyer, *Native Art* (Sony/BMG, 2007). World music. Afro-influenced rock/pop/jazz.

Marley’s Ghost, *Spooked* (Sage Arts Records, 2006). Folk/rock/reggae/country, with incredible harmonies. Produced by Van Dyke Parks.

Shrift, *Lost in a Moment* (Six Degrees Records, 2006). A journey through real-world sounds, music, and dreamlike textures.

Afro-Cuban All Stars, *Step Forward: The Next Generation* (Globe Star Recording, 2005). The best Cuban salsa musicians around. Produced by the Cuban genius Juan de Marcos González.

Midival PunditZ, *Midival Times* (Six Degrees Records, 2005). Hot electronica, mixed with traditional East Indian vocal.

McGill, Manring, Stevens, *Controlled by Radar* (Free Electric Sound, 2002). Hot fusion trio.

Remastered and Restored

Willie Colón and Rubén Blades, *Siembra* (Fania Records, 2006). The biggest-selling salsa album of all time.

Joe Cuba, *Bang! Bang! Push, Push, Push* (Fania Records, 2006). Classic boogaloo. Great studio sound from 1966.

Recorded Direct to 2-Track and Mastered Rebecca Pidgeon, *The Raven* (Chesky Records, 1999). Folk/pop artist, audiophile.

Paquito D’Rivera, *Portraits of Cuba* (Chesky Records, 1996). Big band, audiophile. Grammy Award winner for best Latin jazz performance.

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same, and your album gets 1 dB hotter. But if you tried to peak-normalize on an individual song basis, you would screw up the whole relationship of the feeling from song to song. If a ballad was 4 dB below the top, and the hottest song was only 1 dB below, then the ballad would be raised too high, relatively speaking.

Okay, but how does peak normalization contribute to the loudness race?

It encourages people to compress.

Because a song with a compressed dynamic range, and therefore lower peaks, can get much louder than an

uncompressed song when peak normalization is applied?

Yes, with extreme average levels that could never have been produced in the days of analog.

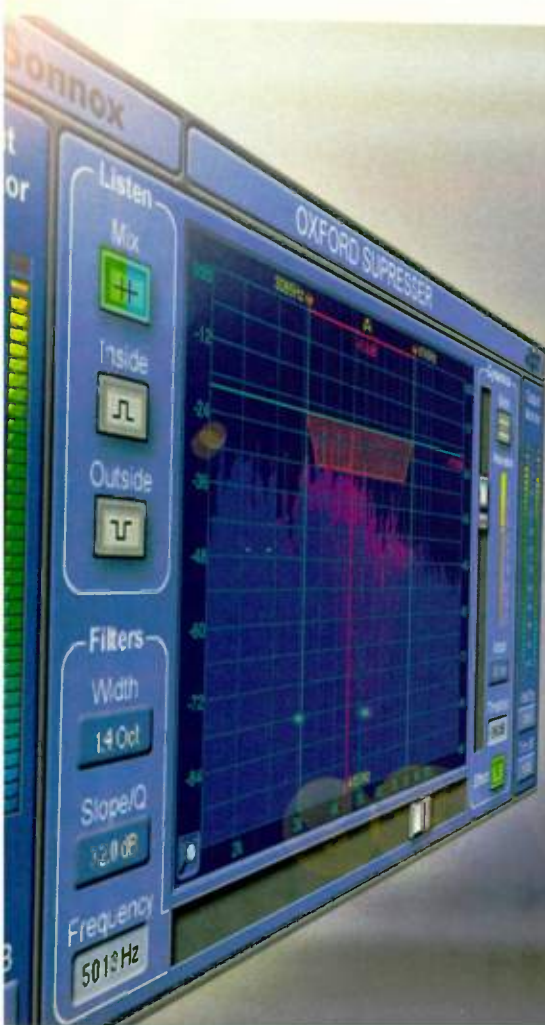
Do you find a lot of sonic issues with projects that come out of people's home studios?

Yeah. There's a lot of inexperience out there. A lot of people are saying, "Well, gee, I can save \$1,000 by not hiring a mix engineer. I can do it myself." Or "I worked with mix engineers for a few years. I can mix this one myself." I'm doing a project now for a jazz singer, and I've worked with the producer on several of his albums before, where he

worked with pros. But now he's mixing it himself, and the mixes came in clipped, overloaded, distorted. And I told him, and he looked back and he said, "Oh yeah, my levels are really hot, aren't they?" So the most fundamental things get lost.

Other than being organized with their files, what do you recommend clients do when preparing to bring their material in for mastering?

One of the best things that people can do is to communicate. If you're in the middle of a mix and you know that you're going to be done tomorrow, it's kind of late for you to be consulting the mastering engineer to find out if you did it right. The time to do it is right after your first mix, the one you think you're really happy with. Send it to the mastering engineer that you think you're going to be working with. Let him or her listen to it and [tell you] if you might need stems, if your bass is in good shape, if you're overcompressing, or if you have good dynamics. Many



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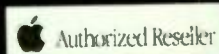
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WINDOWS ON THE WORLD

By Dennis Miller

Apogee, Apple, and Sweetwater... the Sweetest Sounding Symphony



The Symphony System
Up to 96 channels of I/O



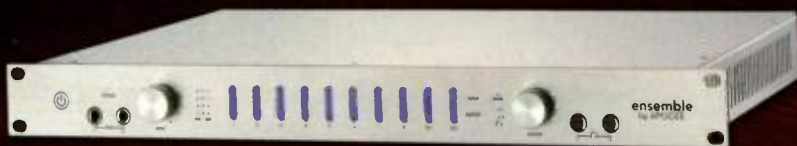
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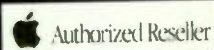


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World Radio History

mastering engineers will do this on a consultation basis for no extra charge. At no charge for maybe one song. If a client asks me to listen to their whole album, I'd have to charge them.

You're saying that if they consult in advance, then you won't have to go through as much trying to fix things.

The less we have to do, the better it will probably sound.

When people are mixing, should they go light on the master bus compression, leaving that for the mastering session?

I'm not a fan of it. Instead of saying to be light with it, maybe we can get to that through a different philosophical approach. Let's talk about old-school mixing, and this is for the mixing engineer: if you're not sweating bullets when you're mixing, you're probably overcompressing. A good mix engineer will probably be riding faders a lot in order to get the balances to work.

These days, it may be riding using DAW automation.

That's right. But I'll tell you, the mouse encourages overcompression, because you tend to get lazy the tenth time you have to move that little rubber band up and down in Pro Tools. And you tend to say, "Let's just turn the compressor up a little bit more." Are you telling yourself to turn that compressor up a little bit more because you don't want to go in there and move that little automation line, or are you doing it because, as an experienced listener, you think that it may need a little bit more compression? So if you're sweating bullets and you're actually using a controller in a DAW—moving faders up and down and doing a lot of passes—then you're probably not overcompressing. But if all your faders are in a straight line and the mix mixes itself, then I think the answer is self-evident. So in answer to your question about being light on the bus compression: it depends on what your musical philosophy is. If you're looking for a particular sound,

I'm not going to tell you what to do. But if you're trying to get a great open sound that has impact, you should reserve [using] the bus compressor, if at all, for after you've gotten the best balance possible or you're well along into the mix.

But also, aren't you concerned that if people compress the master bus a lot, it will leave you with less room to work with dynamically?

Right, but I prefer not to express it in those words, because it gives the impression that the mastering engineer wants to have control over things. No, what we're trying to say is if you're looking for a recording that sounds open and impacting, that the bus compressor actually works against that. As things go up in your mix, it takes them down. Isn't that kind of counterintuitive? **EM**

Mike Levine is EM's executive editor and senior media producer and the host of the twice-monthly Podcast "EM Cast" (emusician.com/podcasts).

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WINDOWS ON THE WORLD

By Dennis Miller

How to run Windows on a Mac.

Like many musicians, you might be wondering if it's time to run Windows on an Intel Mac. Perhaps you're already a Mac user and want to try out some free or low-cost Windows-only software, or maybe you're a Windows user thinking about buying a Mac and having two operating systems in one. I fall somewhere in between—a longtime PC owner who got his first Mac about a year ago and wanted to look at the various options for having one computer run both operating systems.

To test this out, I installed Vista Ultimate x64 under Apple Boot Camp 2.0, Windows XP SP2 under VMware Fusion 1.1.2, and Vista Ultimate 32-bit under Parallels Desktop 2. As I discovered, the capabilities and performance that each of these configurations provides are quite different, and during the installations a number of unexpected issues arose. I'll describe the steps I went through in each case and give some tips about how you might make the process easier. I'll also discuss my findings when loading and running different audio apps and installing audio hardware, as well as lay out a few real-life scenarios for working with audio in a hybrid system (see the sidebar "Inside the Box").

Keep in mind that *none* of the manufacturers that make Windows audio hardware or software that I spoke with officially support the use of their products on the Mac. So don't expect them to walk you through the process or answer your tech-support calls. Hopefully, after reading this article you'll have a good idea of what to expect and how to overcome some of the hurdles. Then again, your results could be different depending on the specific hardware and software, both Mac and Windows, you plan to use.

Getting Started

To run Windows on a Mac, you'll need either Boot Camp, which is included with the Mac OS, or virtualization software such as VMware Fusion (vmware.com/products/fusion) or Parallels Desktop (parallels.com). With Boot Camp, Windows runs natively, as if you had installed it on a Dell, Gateway, or other

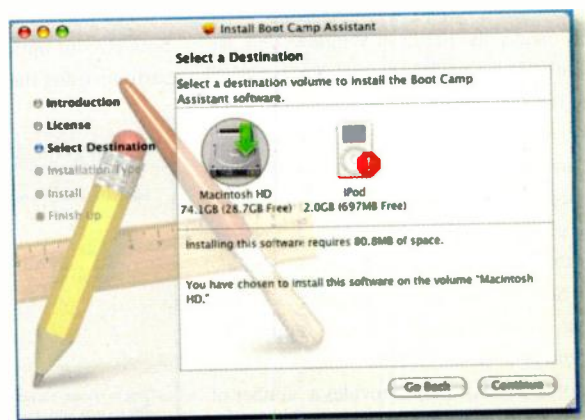


FIG. 1: Apple's Boot Camp Assistant is included with all recent versions of the Mac OS and is used to set up a new partition for a Windows install.

Windows machine. In theory, you get access to all the RAM and processors your Intel Mac has to offer, but 32-bit versions of Windows are still limited to around 3.5 GB of RAM, and you'll need a way to access the data on your Mac system drives

(which I'll discuss in a moment). This was a hugely exciting deal for me, as I recently purchased a second Mac that is vastly more powerful than any of my current Windows computers: a new Mac Pro running Leopard 10.5.2 with 16 GB of RAM, 3 GHz 8-core processors, and a 1.5 TB RAID 0 drive array.

To get started with Boot Camp, you use the included Boot Camp Assistant utility, which creates a new partition for Windows (see Fig. 1). Apple's Web site states that Boot Camp supports "32-bit versions" of Windows, but I successfully installed the x64 version of Vista Ultimate. Apple also intends Windows to run on your internal Mac system drive, but I've seen numerous reports of people who claim to have installed it on an external drive. That involves a good bit of tweaking, and with an equal number of failed attempts being reported, I decided against trying that option.

Note that Boot Camp doesn't actually install Windows—that's the job of the Setup program on your Windows DVD. You'll also use the Setup program to reformat the partition if you want to use the NTFS file system. Boot Camp merely creates the partition Windows will use. In addition, because Windows requires a BIOS (Basic Input/Output System), a software interface between the operating system and the hardware, and Macs use an EFI (Extensible Firmware Interface), a new and improved approach, Boot Camp provides, in effect, an EFI-to-BIOS converter that keeps both operating systems happy. (Vista SPI, which was just released as of this writing, supposedly offers direct support for EFI. Due to time constraints I was not able to test this, however.) It also provides a number of Windows drivers for your Mac hardware; you'll find them on the Leopard install disc.

Boot Camp Assistant lets you specify how much drive space you want to allocate for Windows, and because the recommended system requirements for Vista Ultimate are a 40 GB drive with at least 15 GB of free space, I decided to allocate 50 GB, leaving lots of extra room for software, a few sample libraries, and other data. (A Boot Camp-created partition must be at least 5 GB and still leave another 5 GB free for the Mac OS X partition, but that shouldn't be a problem for any modern system.)

With the Vista install disc in my DVD drive and the setup process in progress, I ran

into several unexpected questions. The first was whether I wanted to "auto-activate Windows while online." I'd seen reports of people receiving a request to reauthenticate every time they ran Windows, and as I didn't want to lose an authentication and have to call Microsoft to plead my case, I chose not to enable this option until things were stable. The installer next prompted me to select which partition I wanted to install on (all of my system's partitions appeared on the available list), and it was easy to find the Boot Camp partition, as it was clearly labeled. (Picking the wrong partition could hose your Mac OS.)

I also selected the Advanced Drive Options so I could format the partition as NTFS, which would allow me to use files of unlimited size under Windows but also meant that the Mac OS could read but not write to the drive (see the online bonus material "Move It" at emusician.com for some work-arounds). So to provide better integration of files between operating systems, I installed a 120 GB Maxtor external drive and formatted it on the Mac as FAT32, which both operating systems can access. (Be sure to choose the Master Boot Record option when creating the FAT32 partition using the Mac's Disk Utility program.)



sure enough, it reported I had two 3 GHz processors and 15.9 GB of RAM. Nice!

See It My Way

Of course, not everything was perfect at the outset. My monitor, a 30-inch Apple Cinema Display (ACD) with an nVidia 8800 GT display adapter, was maxing out at 1,600 × 1,200 (it can reach 2,360 × 1,770 on the Mac side), and some of my keyboard's functions weren't working—pressing the Eject button on the Mac keyboard could open the drive but not close it, among other things. As instructed in the Boot Camp documentation, I put my original Leopard install disc into the DVD drive and followed the prompts to load a number of Windows drivers, and sure enough, the problems went away. Just for good measure, I went to the nVidia Web site and got the latest Vista x64 drivers, which installed without a hitch. I also tweaked Vista to improve its audio performance using various tips I had been collecting just for this purpose (see the online bonus material "Tricked Out").

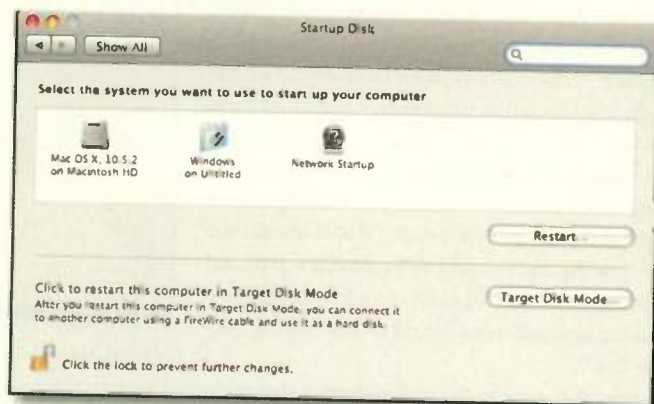
I looked into the Boot Camp Control Panel to see what other options were there, but it listed only choices to pick which OS would start by default, whether I wanted to dedicate my


Function keys to be used by PC applications, and some other minor tweaks. (You can also set the default startup behavior by accessing the Startup Disk in the Mac's System Preferences and choosing whichever OS you want. See Fig. 2.) It does, however, allow you to reboot directly from Windows into the Mac OS without holding down the Option key at boot

time, which is the normal way you'd determine how you want your Mac to start.

Now Hear This

Very few true 64-bit audio programs are available, but Cakewalk Sonar 7 Producer Edition x64, which I own, happens to be one of them.



 **FIG. 2:** You can pick the operating system you want to load by holding down the Option key when you start your Mac or by setting the default behavior in the Startup Disk window shown here.

After about 10 or 15 minutes, the Vista interface appeared on my Mac and I was prompted for User and Computer names. Following a few more reboots, during which time Vista detected my Mac's network and built-in audio settings, I was up and running with Windows. I immediately checked Windows' Device Manager, and

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Inside the Box

One of the most appealing aspects of setting up a dual-boot or virtualized OS X and Windows system is the ability to integrate audio apps running on the two operating systems. Need to open a specific Sonar or Fruity Loops project on a Mac and then bounce an arrangement to Logic or Digital Performer? No problem: just

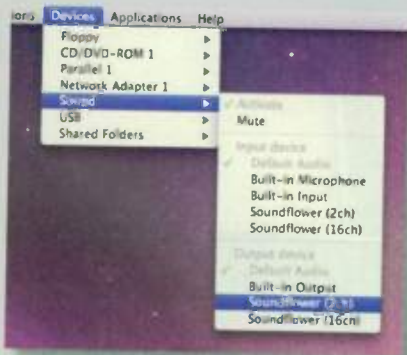


FIG. A: To send audio from a Windows app to a Mac program, set the Parallels Desktop audio output device to Soundflower (2ch).

set up a shared folder or hard drive as a “content pool” for all your audio software, then import and export to that location. Imagine tracking audio inside an OS X program and then processing the bounced tracks with one of the hundreds of high-quality Windows-only VST effects. Or if you prefer, track inside of Windows, then take advantage of OS X-only effects, synths, and utilities.

More than simply sharing audio files, you can route audio and MIDI between your audio applications in real time with a virtual machine running under Parallels Desktop or VMware Fusion. The following examples, which I configured while running Windows XP under Parallels on a MacBook Pro, show you how. (To duplicate this configuration under Fusion, set the Mac’s System Preferences Sound I/O to Soundflower (2ch).) This scenario was tested with the integrated audio interface of the MacBook Pro and an Apogee Rosetta 200 external FireWire

device for monitoring. The ASIO4ALL driver was used on Windows because Sonar and other applications don’t allow use of the integrated audio drivers in WDM mode.

Recording Windows Audio to an OS X Application

In order to pass audio from an audio app under Windows to an OS X audio host, you’ll first need to install a Mac interapplication audio-routing utility such as Soundflower, a free open-source program distributed by Cycling ’74 (available at cycling74.com/products/soundflower). With Soundflower installed,

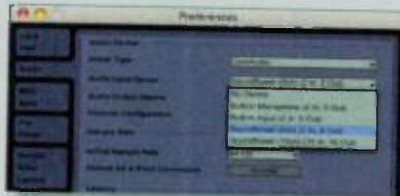


FIG. B: This screen shot shows Live’s Preferences panel, where you’ll choose the audio I/O device.

navigate to the Sound menu in Parallels’ Devices menu. Here you’ll find controls for activating and muting your Parallels sound drivers, as well as Input Device and Output Device driver settings. Set the Output Device to Soundflower (2ch) (see Fig. A).

Next, launch your desired OS X audio software (I’m using Ableton Live 7), open its audio preferences, and set Soundflower (2ch) as the audio input device (see Fig. B). Then insert a new audio track in your Mac program and arm it for recording. Start the record feature within your OS X host, switch back to your Windows app (I’m using Cakewalk’s z3ta+ in standalone mode for my configuration), and start playing back using real-time MIDI input or a prerecorded sequence (see Fig. C). Note



FIG. C: When running in Parallels Coherence mode, your Windows applications open directly inside OS X.

that you don’t need to change the audio settings on the Windows side, as Parallels is managing audio I/O.

To record the output of an OS X application directly into a Windows host, configure the Parallels sound drivers so that the Input Device is Soundflower (2ch), then open your Windows program and arm a track for recording. Launch your OS X audio application, pick Soundflower (2ch) as the audio output device, and set the sound output in the Mac’s System Preferences to Soundflower (2ch). (Some apps don’t have an audio control panel and use only the System Preferences—that’s why you need to pick it in both places.) Initiate recording in your Windows program, then start playback of the audio or a soft synth of your choosing on the Mac.

It’s MIDI Time

Working with MIDI is a bit trickier, as I’m not aware of any virtual MIDI drivers that are cross-platform, and neither Parallels nor Fusion manages MIDI data at this time. To pass MIDI data between a Windows and a Mac program, you’ll need to have a home network installed or at least have access to a router. I’ve put step-by-step instructions for configuring such a setup along with a video showing the process online at emusician.com (see the online bonus material “Mac and MIDI” and Web Clip 1). Enjoy!

—Chad Beckwith

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Running Windows on a Mac can add a ton of options to your studio.

I grabbed my Sonar 7 Producer Edition DVD and, with Vista running, got it installed in no time. Sonar scanned my system for audio interfaces and found the built-in option, which comes up as Realtek Audio. But when I ran some tests by loading a few audio tracks and triggering a few supported soft synths (several of Sonar's included synths don't run under x64), I encountered unexpected problems.

Even with a single track of audio, I got glitching and hiccups during playback. The same problems occurred with a single soft synth playing just a few notes. I adjusted the buffer settings and tried Sonar's WDM driver mode, but nothing really helped. A quick check of Cakewalk's Sonar forum revealed some major problems with the Realtek driver that Microsoft originally shipped with Vista. According to Cakewalk, that driver does not support Event/Notification mode, which is the only acceptable protocol that Sonar can use in this scenario and the only way to achieve low-latency performance with the Realtek audio interface. The work-around is to install a new driver recently released by Realtek itself, called the Realtek HD audio driver, available at www.realtek.com.tw/downloads/downloadsCheck.aspx?Langid=1&PNid=14&PFid=24&Level=4&Conn=3&DownTypeID=3&GetDown=false.

You'll have to agree to a disclaimer before downloading, and as you install the new driver, the old one will automatically be uninstalled. You'll then be prompted to reboot and asked to install the new one yet again, but just be patient and you should be all set. (You can follow the thread on this subject at forum.cakewalk.com/tm.asp?m=987874&mpage=1&key=realtek%F3%B1%8B%AE.)

With the new driver installed and Sonar running happily, I still figured I would get better performance with an external interface running 64-bit ASIO drivers. Many of the more popular devices—for example, those from M-Audio and Digidesign—aren't yet x64 compliant, but I noted

on the 64-bit compatibility list at Cakewalk's site (cakewalk.com/Tips/audiohw.asp) that most of MOTU's hardware runs under x64. I borrowed an UltraLite FireWire interface from MOTU and, after downloading the newest drivers, reran all my audio tests using the UltraLite's ASIO drivers. In this new configuration, I easily got a dozen audio tracks playing, several with Sonar's CPU-intensive Perfect Space convolution effect, as well as low-latency input from my MIDI keyboard controller triggering the Rapture soft synth. I also installed Sony Vegas 8, a 32-bit app, to see how it would perform, and after running ten stereo tracks, each with two Track inserts (and a 10-minute animation for good measure), I figured I was in good shape. Overall, both programs seemed very responsive, and since installing the UltraLite, I've had no further problems.

It's worth noting that there are many reports on the Web of people having trouble with their audio apps while running Vista under Boot Camp. It seems that either disabling AirPort or updating the Broadcom 802 Wi-Fi drivers (available at drivers.softpedia.com and elsewhere) has helped in several cases, so if you do run into problems, you might try those two options. Another common fix is to disable your wireless adapter in Windows' Device Manager (no guarantees, though). The RME Web site (rme-audio.de/forum) is really up on this topic, so be sure to do a search there for any specific issues you come across.

Virtual Worlds

Creating a "virtual machine" with a program such as VMware Fusion or Parallels Desktop adds a lot of options that you won't find with Boot Camp. For starters, you can drag-and-drop files between an open Windows desktop and your Mac's desktop, and, with the right setup, pass audio between applications running simultaneously on the different platforms. You can also save setups to capture the state of your virtual machine and restore it to that state if your computer crashes

or becomes corrupted, and create shared folders that appear under both systems.

To try out this approach, I decided to run a 32-bit version of Windows XP SP2 under Fusion 1.1.2. (Unlike Parallels, Fusion also supports 64-bit versions of Vista and XP.) Fusion's installer recognized my Boot Camp partition and I could have saved some disk space installing Windows XP there, but I chose to create a new 50 GB partition on my external RAID array because that hardware runs extremely fast. When you're setting the partition size with Fusion, you can choose to either allocate the entire amount when installing or let Fusion manage the drive space dynamically, increasing the size as needed. Though I knew it would add a minor performance hit, I selected the dynamic option because I wanted to check how much space I was actually using once all my programs had been installed.

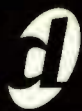
I made the new FAT32 partition read- and write-enabled so I could more easily move data between the two OSs, and I chose the option to make my Mac's Home folder accessible to Windows for the same reason. After allocating 3.5 GB of RAM for XP (Fusion offered to allocate up to 8 GB) and enabling both my processors for use by Windows, I entered my product code and started the installer. Keep in mind that you need to install a version of XP that has Service Pack 2 included—you can't update to SP2 after the install of an older XP. See the article at theeldergeek.com/slipstreamed_xpsp2_cd.htm on how to slipstream an old XP disc to SP2.

The XP install went off without a hitch: the Setup program rebooted Windows several



FIG. 3: Fusion's control panel is where you choose the options you want. It's easy to add or remove shared folders, configure peripherals, and alter RAM and processor settings.

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 **FIG. 5:** Parallels and Fusion both place icons on the edges of the Windows display that provide you with quick access to a number of their most common functions. Icons to start, stop, and pause (among other things) are shown at the middle right, and icons to enable or disable various ports on your Mac are shown in the bottom right corner.

Let's Hear It

In this configuration, I wanted to test an audio program with a hardware dongle, so I installed Magix Samplitude Pro 10. The installer asked me to insert the CodeStick dongle, but for some reason, it didn't show up as a new USB device on the Windows desktop. At that moment, I just happened to minimize my Windows screen and noticed that the dongle had appeared on the Mac desktop, under the Windows display. I ejected it from the Mac and sure enough, Parallels then popped up a prompt asking if I wanted the dongle to be available under Windows. Once I said yes, the Samplitude install completed.

With Samplitude running, I tried to load an AIFF file from my RAID drive, but when I pointed to the file, Samplitude told me that my system didn't have QuickTime installed and that it didn't support AIFF without it (I'd forgotten that Windows does not install QuickTime automatically). Fortunately, there was a QT installer on Samplitude's own distribution disc, so that was easy to resolve.

For audio I/O, I installed the drivers for the MOTU UltraLite and hooked up the interface to the FireWire port, but this was a no-go. It turns out that Parallels doesn't support FireWire devices under the guest OS—a huge pain, to be sure. Luckily, I had the M-Audio Fast Track on hand. After plugging in the device and answering Yes when Parallels asked if I wanted it to be available for Windows use,


the Fast Track was ready to roll.

Note that if you don't have an extra USB interface around, you can squeeze a little better performance out of the Mac's internal audio chip when running under Windows by using ASIO4ALL (asio4all.com), which I installed with no trouble. When I reopened Samplitude Pro 10, I set the Audio Devices option to ASIO4ALL, played back a few tracks, and saw no problems of any kind.

Open Windows

Running Windows on a Mac can add a ton of options to your studio. In addition to loads of Windows-only freeware and shareware, there are some very powerful commercial Windows programs, including Sony Vegas and Adobe Audition, that don't have exact Mac equivalents. And if you don't want the (minimal) hassle of setting it up yourself, you can find ready-to-purchase Macs preloaded with different flavors of Windows. (See [MacOutfitters at macoutfitters.com](http://MacOutfitters.com), for example.)

As to whether you should run Vista or XP on your Mac and whether to go the 32- or 64-bit route, that becomes more of a personal preference, and deciding what audio hardware and software you plan to run might make those decisions more obvious. Personally, I had some trepidation about running Vista (all of my Windows computers run XP), but after a little tweaking, I found it to be snappier and rather pleasant to use.

Keep in mind that this article just scratches the surface and that you might run into other problems with your configuration, or, hopefully, none at all. Be sure to look at the **online bonus material** "For More Information" if you want to learn more before deciding which way to go or if you do encounter problems once you've completed the installation. Also check out the demos at both the Parallels and VMware sites. Whatever route you choose, good luck with the undertaking. No doubt you'll find many creative and practical uses for adopting a two-in-one approach. 

Associate Editor Dennis Miller is enjoying the benefits of cross-platform computing. Chad Beckwith is a composer, sound designer, and editor of PatchArena (patcharena.com), an online community for sound designers and electronic musicians.

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times, and it was great to see XP booting in less than 10 seconds. Fusion installs a utility called VMware Tools that improves graphics performance and manages some other house-keeping, such as drag-and-drop and copy and paste between Windows and the Mac. It appeared to be doing its job, as my network card was working (all of the machines in my Windows workgroup were detected), the right mouse button was enabled, and my display adapter worked fine at its highest resolution.

Fusion lets you start up Windows applications directly from the Mac interface—you'll find a mirror image of the Windows Start→Programs menu in the Fusion menu bar at the top of the Mac desktop—and you can run Windows apps without seeing the entire Windows desktop (only the application and its interface appear). Its Unity View utility also lets you put other Windows components, such as the Control Panel and Taskbar, directly onto the Mac desktop. You'll find links to My Computer, My Documents, My Network Places, Control Panel, Run, and Search in Fusion's Applications menu (see Fig. 3).

Sound It Out

To explore audio performance under XP, I installed Adobe Audition 3.0 and drivers for an M-Audio Fast Track Ultra USB interface. I used Fusion to enable the USB ports on my ACD, then plugged in the Fast Track, which was immediately detected. Audition's Audio Hardware menu gave me the option of using either the "Creative Sound Blaster" drivers, yet another name for the Mac's internal audio, or the M-Audio drivers, which I chose. I loaded several WAV files from my RAID drive, all of which played with no problem.

As a test, I tried to run audio under the Mac OS using Apple Soundtrack Pro while Audition was looping its audio, but at first that was a total no-go. I couldn't select the M-Audio drivers in Soundtrack, even though I had also installed them on the Mac, while Windows was running. (M-Audio confirmed that the drivers are not accessible to both OSs simultaneously.) But as a work-around, I was able to play audio in Soundtrack using the Mac's built-in while Audition used the Fast Track. Too bad there aren't more options for this type of interaction. (Perhaps other audio interfaces provide this capability?)

Parallels Desktop with Vista 32

Like Fusion, the Parallels Desktop installer lets you use an existing Boot Camp partition or create a new partition for your Windows OS. After updating to the newest version, 5584, I ran the Parallels installer and was presented with three installation options: Express, Typical, and Custom. Each offers a different level of customization, and because I wanted more than the default amount of RAM (512 MB) the first two provided, I chose Custom and elected to create a new partition.

The Custom option gave me the chance to go beyond 512 MB of RAM but offered only a total of 2 GB, hardly the maximum of what a 32-bit OS can handle. I accepted the default of 32 GB for the hard-drive size and chose the Fixed option, which allocates the space in advance (as opposed to constantly changing the size). I also chose to let Windows share the Mac's networking capabilities, then named the new computer and set the Mac's Home folder to be accessible to Windows. Other than a few trivial house-keeping options, the final choice was to optimize the system for better performance under Windows or the Mac OS, and I chose Windows.

Installing Vista came next; here you just follow the prompts to load your Vista DVD, and Parallels takes it from there. When prompted, I again chose not to autoactivate nor to enter my product code. I had to partition the 32 GB drive space—it came up as Unallocated—and I also chose to format it. As the installation neared its end, I was prompted to install all the recommended Vista updates and did so. When the install finished, Windows' System Properties reported only 2 GB of RAM, one processor, and a standard VGA display adapter.

With Vista running, I wasn't able to access my network under the Mac OS, and the mouse wasn't working very well, so I installed Parallel Tools, which manages numerous

things, including various peripherals, network connections, and file-sharing and drag-and-drop options. Vista complained about a lot of the drivers Tools installed, but I blew past the warnings and the installation completed fine. One of the more interesting tools is called Shared Profile; it redirects files you copy to Windows' Documents, Picture, and Music folders to the similarly named folders on the Mac and does the same for files copied to the Windows desktop.

There's other nice integration as well. For instance, if you have shortcuts (aliases) on the Mac, they'll show up on the Windows desktop, and you can start up programs for either OS from either side. I also like Parallels Desktop Explorer, which lets you access Windows files and folders from the Mac side without even starting up the virtual machine, and the SmartSelect feature, which allows you to open a Windows file with a Mac app or vice versa. You can even create a default configuration so that, for example, all Windows WAV files will open with your preferred Mac audio program, even if you access them while under Windows (see Fig. 4).

I did have to modify my network settings on the Mac side, though, as I wasn't getting network access under Vista. Changing the Network Emulation option in the Parallels Setup window to Bridged Ethernet got the job done. Like Fusion, Parallels places icons on the borders of the Windows desktop screen that give you easy access to numerous functions (see Fig. 5).

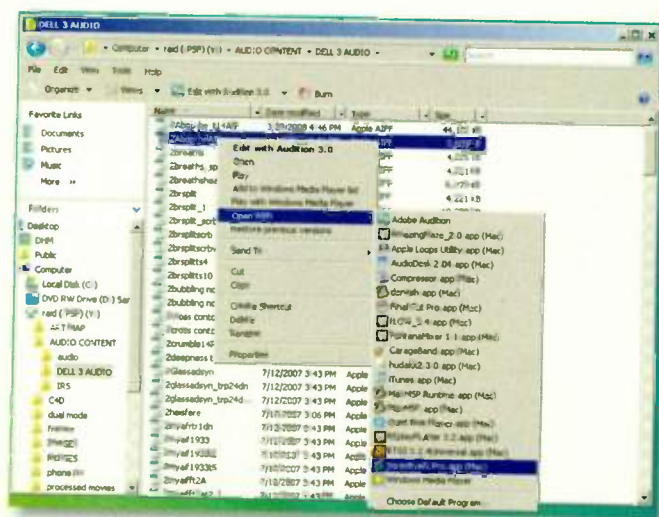


FIG. 4: Parallels Desktop Explorer lets you access Mac audio programs while under Windows and vice versa. Here I'm using Apple's Soundtrack Pro to open an AIFF file while Windows is running.



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 **FIG. 5:** Parallels and Fusion both place icons on the edges of the Windows display that provide you with quick access to a number of their most common functions. Icons to start, stop, and pause (among other things) are shown at the middle right, and icons to enable or disable various ports on your Mac are shown in the bottom right corner.

Let's Hear It

In this configuration, I wanted to test an audio program with a hardware dongle, so I installed Magix Samplitude Pro 10. The installer asked me to insert the CodeStick dongle, but for some reason, it didn't show up as a new USB device on the Windows desktop. At that moment, I just happened to minimize my Windows screen and noticed that the dongle had appeared on the Mac desktop, under the Windows display. I ejected it from the Mac and sure enough, Parallels then popped up a prompt asking if I wanted the dongle to be available under Windows. Once I said yes, the Samplitude install completed.

With Samplitude running, I tried to load an AIFF file from my RAID drive, but when I pointed to the file, Samplitude told me that my system didn't have QuickTime installed and that it didn't support AIFF without it (I'd forgotten that Windows does not install QuickTime automatically). Fortunately, there was a QT installer on Samplitude's own distribution disc, so that was easy to resolve.

For audio I/O, I installed the drivers for the MOTU UltraLite and hooked up the interface to the FireWire port, but this was a no-go. It turns out that Parallels doesn't support FireWire devices under the guest OS—a huge pain, to be sure. Luckily, I had the M-Audio Fast Track on hand. After plugging in the device and answering Yes when Parallels asked if I wanted it to be available for Windows use,


the Fast Track was ready to roll.

Note that if you don't have an extra USB interface around, you can squeeze a little better performance out of the Mac's internal audio chip when running under Windows by using ASIO4ALL (asio4all.com), which I installed with no trouble. When I reopened Samplitude Pro 10, I set the Audio Devices option to ASIO4ALL, played back a few tracks, and saw no problems of any kind.

Open Windows

Running Windows on a Mac can add a ton of options to your studio. In addition to loads of Windows-only freeware and shareware, there are some very powerful commercial Windows programs, including Sony Vegas and Adobe Audition, that don't have exact Mac equivalents. And if you don't want the (minimal) hassle of setting it up yourself, you can find ready-to-purchase Macs preloaded with different flavors of Windows. (See [MacOutfitters at macoutfitters.com](http://MacOutfitters.com), for example.)

As to whether you should run Vista or XP on your Mac and whether to go the 32- or 64-bit route, that becomes more of a personal preference, and deciding what audio hardware and software you plan to run might make those decisions more obvious. Personally, I had some trepidation about running Vista (all of my Windows computers run XP), but after a little tweaking, I found it to be snappier and rather pleasant to use.

Keep in mind that this article just scratches the surface and that you might run into other problems with your configuration, or, hopefully, none at all. Be sure to look at the **online bonus material** "For More Information" if you want to learn more before deciding which way to go or if you do encounter problems once you've completed the installation. Also check out the demos at both the Parallels and VMware sites. Whatever route you choose, good luck with the undertaking. No doubt you'll find many creative and practical uses for adopting a two-in-one approach. 

Associate Editor Dennis Miller is enjoying the benefits of cross-platform computing. Chad Beckwith is a composer, sound designer, and editor of PatchArena (patcharena.com), an online community for sound designers and electronic musicians.

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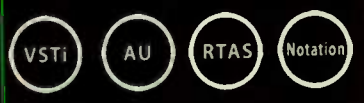
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By Jon Chappell

Say the word *headphones*, and some people may picture those bean-size earbuds flimsily tethered to personal MP3 players. To recording musicians, however, the image conjured is more traditional, even historical in nature: the almost-toilet-plunger-size cups enveloping the ears, dangling from a semicircular headband resting on top of the head. For those of us in the recording business, the paradigm of studio headphones hasn't changed much since their inception, even though music-listening habits, recording technology, and even studio monitors have undergone drastic changes.

Just because today's headphones look and work pretty much as they always have doesn't mean they haven't seen improvements, especially with regard to construction and materials in the drivers, magnets, and voice coils. Because development is so active and production so healthy, recordists have a galaxy of models to choose from at surprisingly affordable prices. And all the phones auditioned here are a heck of a lot more comfortable than the set my father and I used in our ham radio days.

For this roundup, EM established a range of street prices between \$150 and \$220. The quality of the submitted products proved that for around \$200, you can get a professional set of headphones that would not be out of place in top-call recording studios and would be a worthy addition to any project studio.

Round 'em Up

When EM approached the manufacturers about this roundup, the editors presented the price criteria and the headphone makers selected the appropriate models. As a result, you may find alternate models from the same manufacturer at about the same price. Some makers

provided headphones that were better for tracking (with high SPL handling and an emphasis on bass response), whereas others submitted phones optimized for mixing (with balanced, flatter response). Because EM's only guideline was price, I received different types of headphones—mostly closed-back dynamic, but one open air type from Grado Labs. Even with seven models that looked, felt, and sounded similar, I found differences in features, feel, and sound.

Unlike the iPod-listening masses, you will probably have multiple

A cranked kick has blown up many a headphone driver.

uses for your headphones. You may want them to be as transparent and sound as close to your existing studio monitors as possible. Or you may want heavy-duty transducers that can handle tons of bass, because you're a drummer playing along while tracking or you're behind the board doing spot-check prefade listens (PFLs) on your mix's low-end content, which is so important in urban music. A quick PFL on a soloed channel with a cranked kick has blown up many a headphone driver.

Many recordists don't need their phones to mix; they use monitors for that. However, they'll use them in other ways—to complement or augment their speakers, for example. If you're monitoring mixes to ferret out the integrity of individual performances, you might opt for headphones with a markedly different response than that of the speakers you're mixing on. A transcriber may want different phones for notating music than he or she would for creating a listening



FIG. 1: AKG's K 240 Mk IIs are among the most comfortable and best-sounding headphones in this roundup.

experience. Recognizing that headphones can serve different purposes, some of the participating manufacturers submitted models that weren't based on flat frequency response. For instance, Ultrason and Sennheiser wanted to feature headphones that emphasize heavy-duty bass-handling capabilities rather than transparency.

Criteria

Listening is obviously a huge part of judging headphones. My tests were centered around commercial CDs I know quite well and have used for many situations: room tuning, mastering, and other acclimating purposes. Before donning the cans for each listening session, I would warm up by listening to my faithful CDs over my Mackie HR824 close-field monitors. Once my ears were acclimated and things sounded as they should, I would then go to the headphone amp. Because some headphones are, for various reasons, louder than others, I used the different meters in my 2-track editor to monitor and compensate for any level discrepancies between models.

Listening is only one criterion I used in this roundup. I also considered factors such as comfort, isolation (with the exception of the open-air Grado Labs model), features (not many moving parts on headphones, but I was surprised at the ingenuity), and design (some unusual choices and nice surprises here as well). And now, on to the players.

AKG K 240 Mk II

AKG's K 240 Mk II headphones (\$199) replace the previous K 240 model, which was one of AKG's best-selling headphones. The headband consists of a thin, unpadded leatherette strip with curved, coated steel rails above it that act as the ear-cup suspension system (see Fig. 1). This setup is unique among the seven models covered here; most use a stiff metal band with padding. The results are undeniable: AKG has one of the most comfortable and lightweight-feeling headphones in the group.

The self-adjusting headband does not feature detents or any other way to maintain the ear cups' position. The K 240 Mk IIs are one of the three models in the roundup with detachable cords. They employ a locking mechanism so that no inadvertent yanks will disconnect them. The headphones use a mini XLR connection to the ear cup housing for security and signal integrity. And because the cord has a somewhat unusual configuration (3.5 mm stereo to mini XLR), AKG graciously includes an extra cord—a 16.5-foot coiled one at that. So users not only have a backup, but they also have the option of using a coiled or straight



FIG. 2: The Audio-Technica ATH-M50s are an excellent value, boasting great sound, comfort, and a competitive price.

cord depending on preference. AKG also supplies an extra set of ear pads in a velour finish. The fit and feel are quite comfortable and natural.

Though the ear cups are gimbal suspended, they don't fold or rotate widely, so they're not completely collapsible. Nor do they favor single-ear listening without readjusting and repositioning the headband. However, the flexible nature of the band and suspension rods make this a quick adjustment that, once learned, can be performed instantly.

In addition, the K 240 Mk IIs feature AKG's patented Varimotion driver, which is thinner at the edge and allows for greater excursion. The results are better low-frequency reproduction and less coloring in the higher frequencies. In the listening tests, the K 240 Mk IIs had a very true, unhyped bass sound and the most transparent mids in the group. On balance, the highs, mids, and lows all occupied the soundstage with equal felicity.

Audio-Technica ATH-M50

Audio-Technica's ATH-M50 headphones (\$159) feature ear cups that are not perfect circles but oval shaped, which enables them to fit comfortably and snugly around the ears (see Fig. 2). The ear cups are hinged on three axes: one that allows them to collapse inward for compact storage and transport, one for rotational movement on a spindle that goes into the headband, and one on a horizontal spoke for top-to-bottom tilting. This arrangement allows for maximum adjustment of the ear cups. A series of indentations in the blades that slide into the headband, though unlabeled, allow for precise, consistent adjustment to the listener's head.

The headband is substantial and stiff, so I could sense its presence when the cans were adjusted for a snug fit, but the padding afforded a comfortable feel. Care has been taken in the cord connection at the far end: there's spring for tension relief, and the knurled barrels on the adapter and cable end make it easy to connect and disconnect the adapter.

The manufacturer intends for these headphones to be used for studio monitoring applications. I found that for acoustic-oriented material (the transients on pizzicato bass, the bell-like clarity of a Dobro), the ATH-M50s

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The ATH-M50s provide a different perspective, but one that's every bit as true.

excelled. Though not as punchy as some other models, the headphones had a bass response that sounded very balanced and not under-hyped, with nice detail in the midrange. There was an honesty and integrity to the sound, with all the instruments playing nicely on the soundstage. Going back and forth between my loudspeakers and the phones proved instructive; the results were consistent in terms of balance and evenness, but other aspects of the mix revealed themselves only in the headphones—some midrange detail in the snare drum and rhythm guitar in one of my test recordings, for example. The ATH-M50s are a good companion to studio monitors; they provide a different perspective, but one that's every bit as true.

Manufacturer Contacts

AKG
akg.com

Audio-Technica
audio-technica.com

Grado Labs
gradolabs.com

M-Audio
m-audio.com

Sennheiser
sennheiserusa.com

Sony
sony.com

Ultrasonics
ultrasonicsusa.com

Grado Labs SR225

If you aren't concerned with blocking out ambient noise or containing the audio from your headphones, you may prefer the sound and feel of open-air cans. Grado Labs' SR225 headphones (\$199) are the sole open-air type in our roundup. The company states that this design is better for bass response, as the open-air connection, vented diaphragm, and non-resident air chamber all work to incorporate the space around your head for more-natural sound reproduction. Indeed, I found that the SR225s had a particularly appealing low end.

Their design is rather retro; the ear cup spindles that protrude through the headband caps recall headphones of yore (see Fig. 3). The



FIG. 3: The SR225s from Grado Labs will appeal to audiophiles thanks to their retro design, open-air ear cups, and natural, 3-D sound.

ear cup material is unusual, too—a foam that has roughly the consistency of an ink pad. Because the SR225s are supra-aural phones, the cushions rest directly on your ears. They feel a little unusual, too—not luxuriant like the padded cups of the other six models, but not uncomfortable. The SR225s are lightweight, and the headband is a thin, metal-reinforced leatherette.

The cable connection to the ear cups is

unique among the phones in this roundup. Separate cords exit the bottom of each ear cup and join at a nonadjustable point around chest level, forming a sort of yoke. Because you can flip the yoke over your head (where the joint will fall between your shoulder blades), I couldn't find anything disadvantageous with this approach.

The SR225s have a vintage look and no-frills housing (the package doesn't include an adapter) that make it seem like these phones aren't competing in the same league as the others. And in some ways, this audiophile-oriented maker isn't competing. But the SR225s have a lovely, open sound that definitely is on a par with that of their more well-appointed competitors.

M-Audio Studiophile Q40

The Studiophile Q40 (\$149) is M-Audio's only headphone model, and the company itself is new to the headphone arena. Nonetheless, it has managed to contribute some canny design elements. For starters, the Q40s get the award for being the most portable: the combination of their collapsible ear-cup mechanism *and* detachable cord allows them to curl up into a tight circle, so you can stuff them into a coat pocket. The ear cup blades that slide up into the headband are detented and labeled for consistent setting, and the cord screws securely into the ear cup to avoid being yanked out (see Fig. 4).

When I first put them on, the Q40s felt a little too snug. The manufacturer told me they were intentionally shipped a little tight and that flexing the band would make them looser. Although that's true, you're actually creasing the soft metal strip inside the band when you flex it, so you must take care to make this adjustment symmetrically or you'll end up with lopsided headphones that are hard to restore.



FIG. 4: M-Audio's Studiophile Q40s are compact, collapsible, and well designed and have very balanced, clear sound.

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FIG. 5: The Sennheiser HD 25-1 IIs feature modular assembly, high-SPL handling, and a lightweight supra-aural design.

The ear cups are hinged in two places (one for the collapsing mechanism and the other in a center axle for top-and-bottom rotation), but the cups don't move or flex side to side. In addition, the headband is rigid, making single-ear listening difficult. Still, the phones are well designed and handsome. They also sound very good, especially in the low end, which was tight and punchy. There was less breathing room in the mids, but the highs were sufficiently bright and airy. With their low price (the lowest here), M-Audio makes this solid performer a very appealing choice.

Sennheiser HD 25-1 II

Of the six closed-back units in this roundup, the Sennheiser HD 25-1 IIs (\$199) stand apart in several ways. Every element has been designed to be lightweight, including the cable, which is made of steel instead of braided copper. Like the open-air Grados, the HD 25-1 IIs feature a supra-aural design, so they fit on top of and against the ear rather than around it. This creates a snug feeling, but if you're in a particularly loud environment, you will appreciate the fit because it helps to block out the sound. These phones had the best isolation capabilities of the bunch. And because they also had the highest SPL rating at 120 dB, they can handle those instant PFL checks on thundering kick drums

and popping bass lines with aplomb.

The HD 25-1 IIs' size is unique for studio headphones (see Fig. 5). The cups are light and of smaller diameter, of course, because they go on top of the ear, but the headband is quite

The HD 25-1 IIs had the best isolation capabilities of the bunch.

thin, lightweight, and scantily padded. Here's a twist: the band splits apart into two even thinner bands, allowing you to position them on two different places on top of your head, which creates a more secure grip without making you sacrifice comfort.

Another notable feature is that the HD 25-1 IIs are completely modular. Each ear cup disconnects readily from the split cable, and the ear cup housing detaches easily from the headband by means of two exposed hex screws. Sennheiser says that any element can be replaced, from the ear cup to the cable to the headband, without soldering. For road-based repairs, this is an important feature.

Despite their light weight and small ear cups, the HD 25-1 IIs are not particularly compact. The ear cups don't hinge, and the ear cup blades don't retract into the headband. However, this is the only model in the roundup whose ear cups easily detach from the headband, allowing for single-ear listening. Because the split cable unplugs from the ear cups, setting up a semi-permanent single-ear listening configuration takes seconds.

These headphones would be quite at home for a mobile recordist or someone who works with particularly high SPLs. Indeed, the short cord (4.9 feet) makes them more ideal for a field recordist or video camera operator than for a deskbound engineer who scoots around in a rolling chair.

Sony MDR-7509HD

Sony's MDR-7509HDs (\$219) feature an *auranomic* design, in which the outer edge of the ear cup follows the contour of the pinnae. As with the Grado Labs model, the diaphragms

are angled outward, parallel to the way the ears flare away from the head, rather than parallel to the sides of the head (see Fig. 6). This places the drivers more on-axis with the ear itself.

The headphones feature a collapsible hinge, and the cups rotate slightly on a spindle, but



FIG. 6: Sony's MDR-7509HDs boast a unique auranomic (ear-shaped) design and place the drivers forward of and off-axis to the ear canal, for a more realistic listening experience.

not in the more-than-90-degree angle of the Ultrasonics HFI-580s or the 180-degree sweep of the Audio-Technica ATH-M50s. The Sonys are among the most comfortable of the group, and their detented, labeled ear-cup blades ensure a predictable fit every time. Another interesting feature is Sony's "reversible ear cup for easy single-sided monitoring." The cup rotates on a horizontal axis and snaps into place with a sort of power-assist feel.



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FIG. 7: The Ultrasonics HFI-580s offer a comfortable, classy design and are built for handling low-end, high-SPL situations, such as tracking for drummers and bass players.

highest marks for ergonomics; they are the classiest looking and feeling of the group.

Ultrasonics HFI-580

Based on the success of its HFI-550 headphones, Ultrasonics has released the improved HFI-580 model (\$199), which sports a gleaming black-and-silver motif that looks like it's right out of a German automobile showroom (see Fig. 7). The ear cups swivel, rotate, and collapse, making them good for storage and single-ear listening. The ear cup blades are detented (though not labeled) and slide into position with a substantial click, allowing for consistent positioning.

The HFI-580s feature Ultrasonics's S-Logic system, which purports to create a natural three-dimensional sound field not through DSP, but by physically positioning the diaphragm lower than and to the front of the ear cup. This design aims the sound at the pinnae instead of directly down the ear canal. As a result, the sound gets filtered off the outer ear, as it does when you hear sound naturally. The theory is supported by practice, because I did experience a sense of depth and separation in the sound field that was quite apparent.

But the crux of the HFI-580s is their heavy-duty application—for tracking in loud environments, and for drummers and bass players who apply particular punishment to their headphones. The manufacturer reports using 50 mm drivers (along with the Sonys, the largest in the group) and even recommends the HFI-580s as being "perfect for bass players and drummers." Listening bears this out, as the phones have a pronounced low-end punch. The mids and highs are well balanced, if a little undistinguished. But if you're in the music environment where the low end pays the bills, and you need to track loudly and monitor your low-frequency content with PFL moves during the tracking process, the HFI-580s will do the job.

The manufacturer points out that the frequency response goes up to 80 kHz, which is way too high for human hearing but nevertheless figures into the high sampling rates of current recording and playback technology for which these headphones are targeted. Even without supersonic hearing, I found the highs quite nice—transparent and clear without being hyped.

The input power rating (see the online bonus material "Headphone Features Compared" at emusician.com) of these phones is the highest of our review units: 3,000 mW, which means they can take a beating. And beat them I did (sonically speaking). They held their own, along with the Sennheisers, as the least distortable in the roundup. Sony stresses that some models will overemphasize certain frequency bands for a pleasing effect, but the MDR-7509HDs are for reference monitoring, accurately producing what you should be hearing.

The comfortable fit, well-designed auronomic contour, and offset diaphragms show a well-thought-out ergonomic approach coupled with a top-notch sound that's good for high-SPL and highly dynamic program material. The MDR-7509HDs and the HFI-580s get the

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Gibson HD.6-X Pro

Analog meets digital in this hybrid Les Paul.

By Michael Cooper

PRODUCT SUMMARY

multichannel digital guitar \$4,399

PROS: Retains full analog functions and sound of a Les Paul Standard. Mono, stereo, and Hex modes. Headphone output and mic input on jack plate. High performance with a long cable. Includes case, Cat-5 cable, breakout box, multi-channel snake, and Sonar 5 Producer Edition.

CONS: Output levels not equal for all strings in Hex mode. Weak documentation. Pricy. No Mac recording software included.

FEATURES	1	2	3	4	5
EASE OF USE	1	2	3	4	5
AUDIO QUALITY	1	2	3	4	5
VALUE	1	2	3	4	5

Gibson
gibson.com

>> In our reviews, prices are MAP or street unless otherwise noted.



The Gibson HD.6-X Pro brings to mind the old axiom “There’s a first time for everything.” With this newest addition to Gibson’s product line, the company has given its iconic Les Paul guitar—an all-analog stalwart for the past 56 years—a hex pickup that provides a separate digital output for each of its six strings. What’s more, the HD.6-X Pro also provides mic and headphone facilities right on the guitar’s jack plate, making it the nexus for a complete performance setup.

Guitar heroes, don’t panic. This instrument can still play and sound exactly like an all-analog Les Paul; it just has a digital alter ego.

Look Familiar?

At first glance, the HD.6-X Pro looks the same as a Les Paul Standard with a blue metallic finish (see Fig. 1). A single-cutaway body, Tune-o-matic bridge, two humbucking pickups (each with its own volume and tone controls), 3-way-toggle pickup switch, and traditional neck and headstock all lend an air of familiarity. However, a closer inspection reveals a digital hex pickup (mounted between the bridge and the bridge

pickup), a blue status LED parked just below the neck pickup, and a jack plate replete with connectors that are atypical for an electric guitar (all of which I’ll explain shortly). Knurled cylindrical tuning knobs—nothing digital here—make a modern aesthetic statement.

Included with the HD.6-X Pro is a padded hard-shell case featuring a velour lining and an external, zippered storage pocket for accessories. This beauty also sports wheels on the bottom, protective skid rails on the back side, and an extra handle at its head, making it ready for the road.

Inside the case, an oversize accessory-storage compartment holds the HD.6-X Pro’s companion breakout box, affectionately dubbed “BoB” by Gibson (see Fig. 2). BoB connects to the HD.6-X Pro using a supplied Cat-5 Ethernet cable measuring roughly 30 feet in length. The Cat-5 cable is bidirectional and transmits digital audio between the guitar and BoB by way of latching Cat-5 connectors on BoB’s front panel and the HD.6-X Pro’s jack plate. To learn how the system works, it’s helpful to first look at signals sent from the guitar

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Waxing Conclusive

For sheer comfort and ease of use, the Audio-Technica, AKG, Sony, and Ultrasonic models get high marks, with a decided tip of the hat to the Sonys for their auranomic (ear-shaped) contour and forward-placed drivers. For value, M-Audio, the newcomer to the field, has apparently benefited from the wait-and-see approach, capturing all the right features and a competitive listening experience in its low-priced Q40s. But the Audio-Technicas, at nearly the same price, have amazing sound and more-versatile positioning. The Grados are an acquired taste, as the design is deliberately retro, and the ink pad feel of the ear cushions takes some getting used to. Still, there's a definite naturalness to the sound (afforded in part by the effective use of the open-air design), and the SR225s will appeal to certain audiophiles.

The Sennheisers are a breed apart, with their small, light drivers and ultralightweight frame, but their crisp, clear sound, low-impact presence, and all-modular construction have definite benefits for live, mobile, and studio applications. Only their rather short cord seems out of place in the recording environment. For people who like their music loud, the Sennheisers and the Ultrasones both fit the bill nicely, but the Ultrasones have the edge for classy design, luxuriant feel, effective S-Logic system, and more-maneuverable ear cups.

My personal, subjective choice is most influenced by sound, as all these phones are comfortable and ergonomic. In this regard, it's a toss-up between the AKG, Audio-Technica, and Sony models. All three reproduce sound in slightly different ways, and for my sensibilities, the AKGs and the Audio-Technicas are too close to call. Both produce a smooth, true sound with superior balance, but all three are transparent and revealing, and they wear well in terms of both physical comfort and faithful sound reproduction without fatigue. **em**

Jon Chappell is the author of four music-based For Dummies books (Wiley Publishing) as well as The Recording Guitarist: A Guide for Home and Studio (Hal Leonard, 1999), Build Your Own PC Recording Studio (McGraw-Hill, 2003), and Digital Home Recording (Backbeat Books, 2002).

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Pickup Sticks

Comp convincing drum tracks from MIDI loops. | By Jon Engel

Mixing and matching MIDI drum loops from different libraries can give your drum tracks a creative boost. But keeping them consistent and getting a human feel can pose some challenges. Here, I'll provide a method and some tips for building great drum tracks from MIDI loops. I'll use Digidesign Pro Tools to highlight some of the newer MIDI features introduced since version 7.0, but you can use this process with any full-featured DAW (see Fig. 1 and the sidebar "Step-by-Step Instructions").

Lay Them Out

Start a new session, import the MIDI drum loops you want to use to separate MIDI tracks, and route them to your drum module. Loop libraries

that offer MIDI Type 0 files let you quickly load multiple loops onto a single track.

Solo or mute tracks to audition individual loops, then copy and paste or use the Grabber tool to drag-and-drop them onto a master drum track. Give the new regions meaningful names (for example, Drums Verse-01) and organize them into song sections (intro, verse, chorus, bridge, and so on) on the master drum track.

MIDI drum-loop libraries usually conform to the General MIDI (GM) specification: C2 (MIDI Note Number 36) for kick, D2 for snare, and so on. If you load a non-GM kit into your drum module, refer to the GM spec to make reassignments. Set note durations to 64 ticks so that notes are easy to grab. Click on the minikeyboard to select all of a single

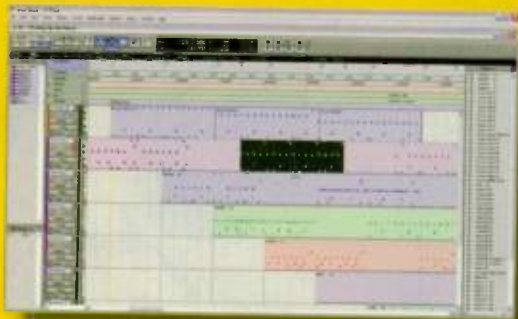
note's events, and then drag the notes to the new location.

Put Them Together

Listen for loops that work well together, and use them to create variations. Build more variations by pasting 1- or 2-beat fills and snare rolls, adding ghost notes with the pencil editor, or deleting note events to simplify a beat. Remember to consolidate and rename new regions. Assemble song sections by alternating variations with the main beat; evolve the part over 8 or 16 bars and add or reduce complexity to make it more interesting. Use playlists to experiment with different arrangements.

As the pieces come together, bring up the Velocity view in the Edit window and notice

STEP-BY-STEP INSTRUCTIONS



1 **Step 1:** Import MIDI loop library files to separate MIDI tracks and route all their outputs to your drum module.

2

Step 2: Rename regions to indicate their function, listen for loops that work well together, and organize them on the master drum track.



3

Step 3: The Velocity view shows inconsistencies between loops from different sources, which you can fix with the Trim tool.

the differences between loops from different libraries. Use the Trim tool to edit Velocities so they are consistent and best match the Velocity response of your drum module (see **Web Clips 1 and 2**). When extensive editing is required, use the Grabber tool or the Select/Split Notes page of the MIDI Operations window to either move regions and note events to an empty MIDI working track or split drum instruments to separate tracks.



immediate feedback. Applying quantization or groove templates selectively to kick, snare, or hi-hat parts gives the best results. Values of 5 to 7 percent in the Include field maintain the feel of the original performance while catching any stray events. Use the Delay parameter to move a part ahead of or behind the beat. When you're finished, you can Write To Region in one click. If you need to go back to a region's original values, use the Restore Performance command in the MIDI Operations window.


Subtle randomization is the simplest way to make MIDI loops sound more like a live performance (see **Web Clips 3 and 4**). Start with between 3 and 10 percent when quantizing or applying groove templates. Similar values work well for kick and snare Velocities. You can use values of up to 50 percent with hi-hat and ride cymbals and get great results. With multilayered sampled instruments, randomization can absolutely transform a snare or cymbal roll.

When recording live MIDI data for variations and fills, use a separate MIDI track or a new playlist so your edits to library loops remain intact. Enable Real Time or Input Quantize, and apply settings consistent with



➤➤ **FIG. 1:** With enhancements to the MIDI Operations window and the addition of Real-Time Properties, MIDI editing in Pro Tools is much more powerful than before.

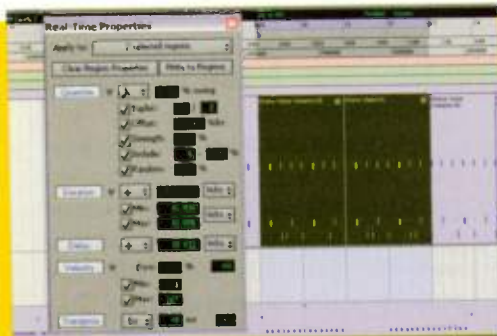
those used for the library loops. Use the Paste Special/Merge command to selectively combine recorded parts with library loops without overwriting the original data.

As you go along, export your best edits to MIDI files for use in future projects. Over time you will build up a loop library customized for your drum modules that is easily accessible and has your own unique signature. 

When Jon Engel isn't tweaking MIDI tracks, he's either writing and recording original music for Malaren (soundclick.com/malaren) or playing guitar and keyboards in Central New Jersey cover bands.

Make It Real

When parts sound too mechanical or the groove is inconsistent, bring up the Real-Time Properties window. There you can experiment nondestructively with quantization values, groove templates, and Velocity effects and get



Step 4: Use the Real-Time Properties window to experiment nondestructively with quantization, groove templates, delay, and Velocity effects.

5

Step 5: Randomize Velocities to make MIDI loops sound more like a live performance.



6

Step 6: Record live MIDI data for variations and fills. Use Real Time or Input Quantize with settings consistent with those used for the library loops.





FIG. 1: Cakewalk Sonar's V-Vocal Pitch Follow control determines how the formant tracks pitch changes. The formant envelope lets you fine-tune the results.

Guerrilla Tuning Tactics

Abuse your tracks with extreme pitch processing. | By Brian Smithers

When you're accustomed to fixing performance errors by using pitch- and time-correction plug-ins, it's easy to overlook their more creative applications. Despite being overused to the point of absurdity, the infamous Cher effect is a shining example of the imaginative misuse of a pitch processor. In that spirit, I'll show you what happens when I abuse some tuning software.

What better place to start than with an unpitched drum loop? I tried a couple of different automatic-tuning plug-ins, but because their first objective was to identify pitches, they didn't like my drums very much. I turned instead to Digidesign X-Form.

Because X-Form doesn't care about the starting pitch of an audio region, it's perfectly content to operate on unpitched material such as drums. Pitch-shifting drum loops is gratifying not only for the added heft created by unnaturally large-sounding drums, but also for the distortion caused by feeding the processor inappropriate source material.

Like many current pitch processors, X-Form offers independent control of formants. For no better reason than perverse curiosity, I cranked the formant control in the opposite direction of the pitch control. To hear the result, listen for the drum pattern that enters second in Web Clip 1.

For the first loop in the

Web Clip, I used a different approach. The only thing I changed in that loop was the first kick drum in the first and third bars. I wanted to emphasize the downbeat with a larger-than-life drum and simultaneously suspend the rhythm for a moment, pausing the driving pattern every two bars. For this, I cheated.


Digidesign Pro Tools 7.4's Elastic Audio is not intended for correcting pitch. However, one of the algorithms available for its time-stretching, called Varispeed, accomplishes its time manipulation by speeding or slowing the slice in question, thus changing its pitch. I enabled Elastic Audio, chose Varispeed as the track's algorithm, and made the track tick based. I then deleted the three 16th notes between the kick on beat 1 and the snare on beat 2 and stretched the kick to fill in the hole. The kick now stretches to four times its original length, giving a nice sustained pause. At this speed, it sounds two octaves lower than before. The fact that it had a lot of tone to begin with made it a good candidate for this treatment.

Next in line for abuse was Antares Auto-Tune 5. I ran a 4-note vocal phrase through it and restricted the phrase to a single pitch. Because the original was a repeating motif of four notes, none of which was the pitch I selected, Auto-Tune had to retune every note by a different and comparatively large amount. The plug-in came too close to doing a convincing job, though, so I had to beat up on it a bit harder.

I adjusted the Retune Speed to its fastest setting in order to increase the artifacts on each attack. Last but not least, I lowered the Pitch Tracking slider (under Options) all the way to Relaxed (100) to make it even worse—that is, *better*.

For my final crime against tuning plug-ins, I recorded a single word and transposed it across a 4-octave range. I used Cakewalk Sonar's V-Vocal plug-in because it offers easy graphics tools to manipulate pitch, formant, and timing. I sang the word four times, intending to transpose the words in the order I sang them. I found, however, that the third and fourth transposed up with fewer glitches than the first two, so I rearranged them.

V-Vocal offers variable formant tracking. A setting of 100 yields the classic chipmunk effect, and zero gives the most natural effect. I set it to about 35 so that the timbre would track the pitch without sounding too cartoonish. I then edited the formant envelope to fine-tune the results (see Fig. 1).

Striving every day to learn the right way to use processors is all well and good. But it's important to occasionally set the manual aside and experiment. Give yourself permission to do something bizarre, dumb, or just plain wrong, and keep your ears open for that happy accident. 

Brian Smithers is course director of Audio Workstations at Full Sail Real World Education.



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FIG. 1: To subscribe to a Podcast, access the iTunes Podcasts directory, browse through the categories, click on the Podcast you want, and select Subscribe when prompted.



RSS 2.0 Feed Basics

How to get your Podcast up and running. | By Jack Herrington

As every musician knows, Podcasting provides a great way to get your music out to the public and let people know what's coming out of your studio. With an interesting Podcast that you update regularly, you can attract steady listeners and possibly generate professional opportunities that might not be available otherwise.

So where do you start? Building your own Podcast begins with becoming an avid consumer and critic of other Podcasts. Start by subscribing to some Podcasts to see how they're done. Fortunately, Apple has made this easy by integrating Podcast support into its iTunes music service (iTunes is available free from Apple at apple.com/itunes). Once you have iTunes installed, navigate to the Podcasts item under the Library tab, then click on the Podcasts directory link at the bottom of the window. That takes you to the iTunes store in a special Podcasts section. From there you can browse the available Podcasts by genre or by doing a search (see Fig. 1). Subscribing is easy: just click on a Podcast you like, and then click on the Subscribe button.

Check out the top Podcasts in your category, noting how long each Podcast is. Do they use audio? Video? What about their show notes? In particular, pay attention to how often the hosts produce a Podcast. Podcast subscribers think of their subscriptions as

shows. The most popular Podcasts are not the longest ones, but the ones that update the most regularly. Before putting your own Podcast together, think about your level of commitment to your show. If you're considering putting out a 30-minute Podcast, it will take, on average, four hours of production each week. Do you really have the time for that?

What Is a Podcast?

At the technical level, a Podcast is very simple, consisting of just two types of files. The first is a media file (MP3 or video, for example), and the second is a text file (called an RSS 2.0 document, and commonly known as a *feed*). RSS 2.0 is a file format based on XML, and the feed lists the name and details of the Podcast, including its title, its description, and a link to the associated media files that are referenced by the feed.

The easiest way to start a Podcast is to associate it with a blog, and that's because a blog already has an RSS feed. You can use a service like FeedBurner (feedburner.com) to turn an RSS feed into an RSS 2.0 feed. (RSS feeds alone are not suitable for Podcasts because they don't point to the media files for the Podcast.) If you don't already have a blog, you can use a hosted service like Blogger (blogger.com) to start one. If you already have your own Web site, then you can use

software like Six Apart Movable Type (moveabletype.org) or Automatic's WordPress (wordpress.com) to get you going. These tools support Podcasting by default, and both can create RSS 2.0 feeds for you.

A valid RSS 2.0 feed is critical to getting your Podcast going. See the sidebar "Source Code" for a portion of an actual feed, including the header and the enclosure tag from a Podcast entry.

At the top of the feed are the iTunes tags, which start with either the word *media* or the word *itunes*. These describe the show in general and specify categories that are used later when you register a Podcast with iTunes. The really important part is the enclosure tag within the item tag, near the bottom of the code. This should point to the uploaded media and specify the correct length (in bytes) and file type. The enclosure tag must be in the RSS 2.0 feed for people to be able to subscribe to your show.

The First Podcast

Once your blog is set up, the next thing is to produce the first Podcast. To keep it simple, I'll assume that you want to make an audio Podcast. But be aware that there are popular video Podcasts (vodcasts) out there as well. You can even do a Podcast that sometimes has audio and other times has video. Video can be helpful

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The new Focusrite ISA One shares the same pre-amplifier topology, featuring the original Lundahl LL1538 transformer and bespoke Zobel network. A host of other features, including an independent D.I. and an optional class-leading 192kHz A-D converter, ensure this classic design fits seamlessly into your modern studio environment.

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Source Code

```
<?xml version="1.0" encoding="utf-8"?>
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<media:category scheme="http://www.itunes.com/dtds/podcast-1.0.dtd">Technology/Software
How-To</media:category>
<itunes:author>Jack Herrington</itunes:author>
<itunes:explicit>no</itunes:explicit>
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type="audio/mpeg" />
</item>
```

when you are demonstrating something—for instance, a guitar or keyboard technique.

To create an example Podcast, I'll use Audacity (audacity.sourceforge.net), a free audio editor that works on Windows, the Mac, and Linux, but any application that outputs MP3 files will do (see Fig. 2). Note that you can use any audio format, but most people expect MP3 or AAC. AAC is the standard iPod format, but it's not widely supported on other players.

Using Audacity's ID3 tag editor, set the appropriate title for the individual show. The artist and album should be the name of the Podcast. The comments should contain show notes. Show notes should provide the listener with a short summary of the content of the show so that they can decide whether it will interest them.

Audacity has a recording feature, so you can use that to record your Podcast. You can then edit out the ums, ahs, mistakes, delays, and so on using the simple

Select and Delete tools. Try to keep your first Podcast relatively short. Introduce yourself and the show, present a first topic, then wrap it up by inviting the listeners to contact you with their ideas.

To finish building your Podcast, export the complete final audio as MP3. Use only a single mono channel and the lowest possible quality you can get away with (perhaps even as low as 48 Kbps if you are just doing voice) in order to keep the file sizes small. If your subscriber count is low, the size of an individual Podcast might not make much difference. But as your subscriber base increases, the bandwidth costs will also multiply.

Next you need to decide where to host the file. At the end of the day, all that matters is that you have a specific URL for your media. If you have your own Web site, you can host it there, or you can use a .Mac account. If you don't mind going without a copyright, you can store your files for free on the Internet archive

(archive.org; you have to license the material under Creative Commons). Or if you're looking for a low-cost commercial solution, you might want to try Amazon's Simple Storage Service (aws.amazon.com).

Blogging Your First Podcast

Once your finished file is uploaded to the Web, the next step is to reference the

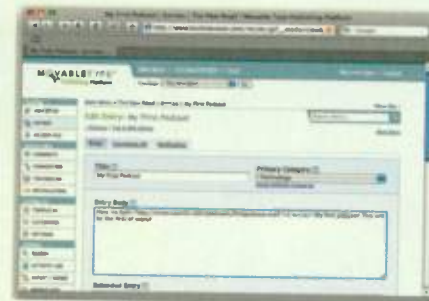


FIG. 3: Once your Podcast is finished, you'll reference it in your blog. Here, I'm entering the text I want using Movable Type.

file in a blog entry. In Fig. 3, I've used the blog-entry editor in Movable Type to demonstrate the first Podcasting entry. You can reference the media file as many times as you like and put as much extra information as you want into the blog entry to describe the show.

I strongly recommend that you use both the audio and text portions of your blog to the fullest extent so that you engage your audience regardless of how they want to interact with you. You might reach out to your listeners by encouraging them to send you audio questions, by reading aloud the questions and comments they've emailed you during your show, or by doing a live call-in at a specific time that is then recorded for the Podcast.

Getting the Word Out

At this point, you're ready to have people subscribe to your Podcast, which they can do using iTunes. All they need to do is type in the URL to your RSS 2.0 feed in the Subscribe To dialog box under iTunes' Advanced menu—so be sure to place your URL prominently on your blog page. To make a bigger impact, you'll want to get listed in the iTunes Podcasts directory. Apple makes this easy by putting a Submit Podcast link on its Podcasts directory home page. It might take a while to get up there, so you want to do that as soon as possible.

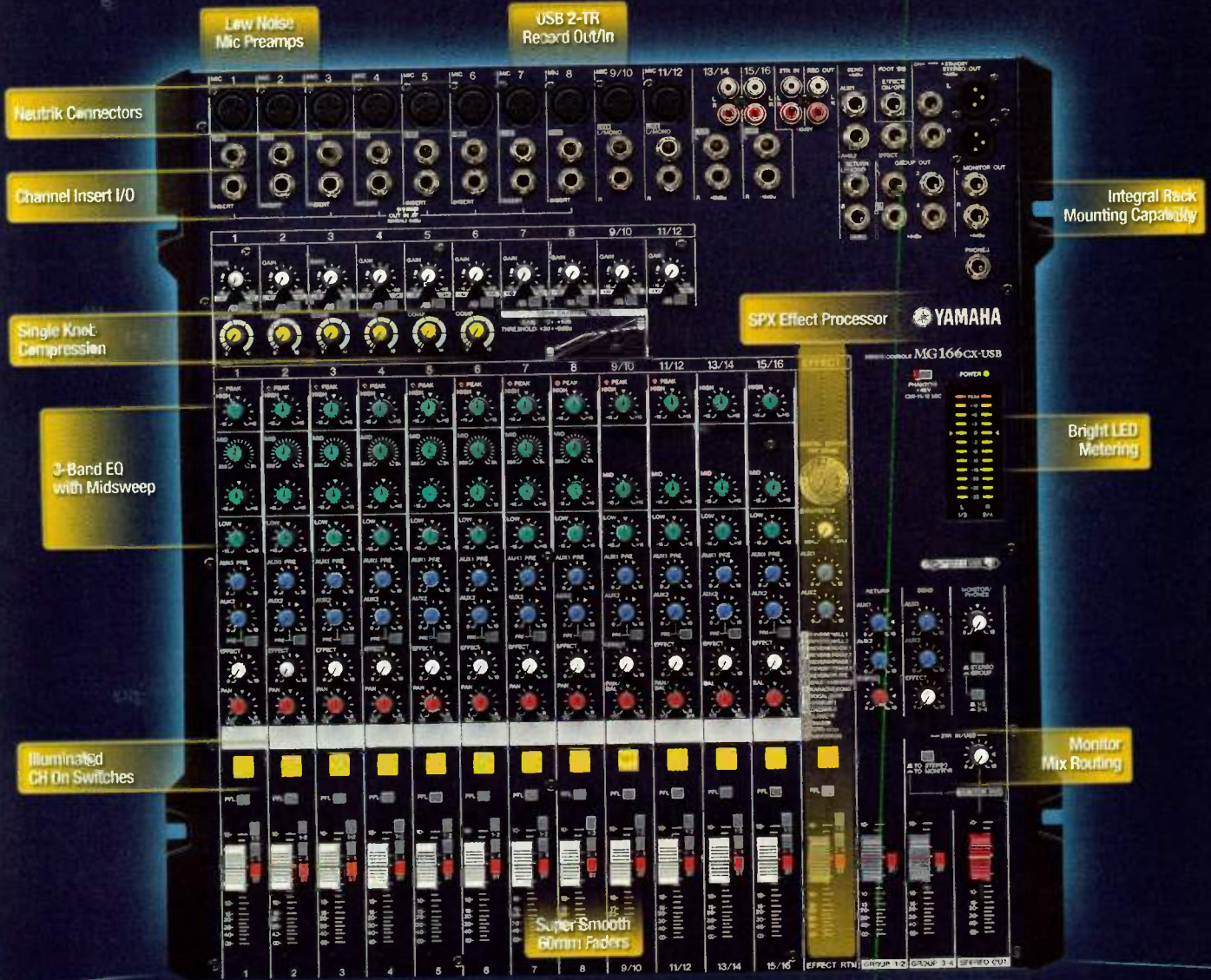
The real key to Podcast success is to put a show out regularly. Keep it short, keep the quality level high, keep the entertainment factor very high, and incorporate the feedback from your audience to build a better show. Podcasts always start roughly—listeners expect that. But in return, they want their voices and feedback heard and integrated into the show. If you do that, you will win the loyalty of your fan base and rise in the popularity rankings in the iTunes directory.

Jack Herrington is the author of Podcasting Hacks (O'Reilly, 2005). He is a software engineer and writer who lives with his wife, daughter, and two dogs in the San Francisco Bay Area.



FIG. 2: The freeware program Audacity (Mac/Win) is a good choice for creating your Podcasts, but you can use any software that supports MP3 output.

It's All In The Details



Yamaha's ten new MG-Series mixer models provide excellent audio performance and a varied combination of valuable features, many of which are highlighted here on our fully-loaded MG166cx-usb.* No matter your application, there's an MG configuration just right for you. Even better yet, all this "no compromise" quality comes at prices anyone can afford, ranging from \$99 to \$649.** So, if you're as detail oriented as we are, visit our website to check out the line and your favorite Yamaha Live Sound dealer for a hands on examination.

*USB models also come with Cubase AI4 recording software
 **Estimated street price



Q&A: Alan Friedman

A CPA's advice for self-employed musicians.

You may not think of yourself as a business owner, but if you're earning income as a self-employed musician, composer, producer, programmer, and so on, that's essentially what you are. Having a business not only gives you certain tax obligations, but it also opens you up to greater potential liabilities (that is, you're more likely to get sued). One of the best ways to help protect your personal assets is to set up a business legal structure beyond just filing a Schedule C on your tax return. The options for doing so have changed since I set up my company ten years ago. Back then I was advised to incorporate, but today there are other options.

By Ravi



FIG. 1: CPA Alan Friedman specializes in serving music-industry clients.

To find out how musicians can structure their businesses in the most advantageous manner, I turned to certified public accountant Alan Friedman (see Fig. 1) of Friedman, Kannenberg & Company. For more than 25 years, Friedman has provided accounting, tax, and consulting services for clients in the music industry including retailers, manufacturers, musicians, bands, and studios. He is also a faculty member of NAMM University (along with yours truly) and a financial consultant for Yamaha's Band and Orchestra Division and Customer Financial Services.

Why should the owner of a home-based business consider anything beyond filing a Schedule C on his individual tax return?

If your business has high exposure to potential lawsuits, as most do, you can limit exposure by purchasing adequate business insurance if you're a sole proprietorship. Alternatively, consider a different business form that provides greater liability protection. For not much money or effort, you can form a structure such as an LLC, or limited liability company.

What are the advantages of an LLC?

We live in a very litigious world where anybody can get sued for a variety of reasons. If you're writing music or doing projects for others, the best thing to do is to incorporate or form an LLC. If somebody sues you, the entity will put a wall between personal assets—like your home, car, or bank account—and business assets.

By funneling all contracts and payments through the business someone could only sue the business and therefore only attach the business assets. And if you're like most musicians, there are no real business assets—money earned is taken out the same day in the form of withdrawal or salary.

What are some of the other business legal structures?

You mostly find sole proprietorships. In general, there are no documents needed to organize the business. It can even operate under a different name from the owner as long as specific documents are filed with your local government informing them and the public that you are operating under a d/b/a ["doing business as"] name. Sole proprietorships are easy to set up and take down, but the problem is that you

have unlimited liability. So the more popular vehicle will be the LLC because every state in the country now allows a single-member LLC. You operate just like a sole proprietorship and report all income and expenses like a sole proprietorship on a Schedule C tax return. Yet you have limited liability protection. Then there is the corporation, either a "C corporation" (conventional) or "S corporation" (subchapter S). Whether you are a C or an S is merely a tax distinction. Unless one makes a tax election to become an S, corporations are considered C. C corporations pay tax at the corporate level, but in an S corporation, corporate income flows through to its shareholders

following year—that allows a one-year deferral of tax payments. Also, you may need your fiscal year to coincide with other events. For example, many music stores and schools have a June 30th year-end because that's when the school year ends. They have earned out all of their revenue for the school year by then and inventory is probably at its lowest and easy to count.

By comparison, you don't have the problem of double taxation in an S corporation. All previously taxed profits can be pulled out as a shareholder dividend (without additional taxation). While all income is taxed at a potentially higher rate individually, S


What are the advantages of corporations compared with LLCs?

Hardly any. There may be more case law on the books of a corporation defending its liability status, since LLCs are newer. But for most, an LLC makes the best sense. It's my favorite entity. It was born because everyone was looking for an easy way to account for and tax their business activities while having the liability protection that one could only get from a corporation. LLCs are easy to set up, easy to dissolve, flexible in their financial structure, and there's no double taxation to worry about. Even health-care expenses now flow through onto the individual returns of the owners of S corporations or LLCs and are 100 percent deductible—that level of deduction used to only be possible with C corporations.

Does one need a lawyer to set up these structures?

You want one to file the Articles of Incorporation with the state in which the company is doing business, generate the bylaws, etc. In an LLC, one can theoretically do it by oneself, especially as a single-member LLC. But I recommend hiring a lawyer regardless because if you get sued, you want to make sure that it was set up properly and you are in good corporate standing to protect you from extended liability. Otherwise, the other party's attorney has the ability to "pierce the corporate veil," which means that you didn't really operate as a separate legal entity, but rather as an extension of yourself. So factor in the one-time up-front cost of an attorney. A change in entity form can usually be made at any time, but there are often adverse tax effects and unexpected costs that can be avoided with a little forethought.

How about trademarks, business bank accounts, and separate credit cards?

You don't have to establish a trademark, but it's a good idea since the business name is only protected in the state in which you organize. However, you must have separate accounts since you are doing this primarily to limit liability. You ultimately want anyone doing business with you to think that they are dealing with a company, not you personally. You don't want to commingle personal and business funds. I would insist that any owner of any of these entities have separate accounts for business. 

Ravi (heyravi.com), former guitarist of three-time Grammy nominee Hanson, tours the country performing, lecturing, and conducting guitar clinics. He writes for several magazines, and Simon & Schuster published his tour journal.

The entity will put a wall between personal assets—like your home, car, or bank account—and business assets.

and taxable income flows onto the individual's tax return. Tax is paid individually.

How else do C and S corporations differ?

A corporation is separate legal entity like the LLC; however, much more administration goes on. You must have bylaws, annual meetings, records of corporate minutes, and a separate tax return. C corporations are subject to double taxation. If you have \$20,000 of net annual income after expenses, the corporation is taxed on that income. Since the only way to take profits out of a corporation is either as a salary or dividend, C corporation shareholders will get taxed again when they take a salary or dividend. Also, some C corporations are considered "personal service corporations." This may apply to those providing services in certain fields including the performing arts, and they are subject to the highest tax bracket of 35 percent from dollar one. On the other hand, a C corporation is generally the only structure that can have a fiscal year other than the calendar year. That could be advantageous by structuring your fiscal year from February to January so that income earned could be pulled out in January and taxed the

corporation distributions are free of payroll related taxes. However, S corporations do have some limitations in their structure, including calendar year-ends, shareholders cannot be partnerships or other corporations, and one class of stock, to name a few.

What kinds of structures are there for bands, cowriters, or co-studio owners?

Partnerships are the simplest entities to create for multiowner businesses. They require a little more effort to operate than sole proprietorships but aren't nearly as involved as corporations. Virtually anyone can be partners—individuals, partnerships, limited liability companies, corporations, or trusts. Additionally, partnerships allow profit sharing, loss sharing, and ownership percentages to vary by partner, making them far more flexible in their financial structure than most other entities. However, just like sole proprietorships, all partner/owners are deemed "jointly and severally liable" for the obligations of the partnership. So again, the LLC is a hybrid entity that combines the ease and favorable tax aspects of a partnership with the liability protection of a corporation or limited partnership.



Gibson

HD.6-X Pro

Analog meets digital in this hybrid Les Paul.

By Michael Cooper

PRODUCT SUMMARY

multichannel digital guitar \$4,399

PROS: Retains full analog functions and sound of a Les Paul Standard. Mono, stereo, and Hex modes. Headphone output and mic input on jack plate. High performance with a long cable. Includes case, Cat-5 cable, breakout box, multi-channel snake, and Sonar 5 Producer Edition.

CONS: Output levels not equal for all strings in Hex mode. Weak documentation. Pricy. No Mac recording software included.

FEATURES	1	2	3	4	5
EASE OF USE	1	2	3	4	5
AUDIO QUALITY	1	2	3	4	5
VALUE	1	2	3	4	5

Gibson
gibson.com

>> In our reviews, prices are MAP or street unless otherwise noted.



The Gibson HD.6-X Pro brings to mind the old axiom “There’s a first time for everything.” With this newest addition to Gibson’s product line, the company has given its iconic Les Paul guitar—an all-analog stalwart for the past 56 years—a hex pickup that provides a separate digital output for each of its six strings. What’s more, the HD.6-X Pro also provides mic and headphone facilities right on the guitar’s jack plate, making it the nexus for a complete performance setup.

Guitar heroes, don’t panic. This instrument can still play and sound exactly like an all-analog Les Paul; it just has a digital alter ego.

Look Familiar?

At first glance, the HD.6-X Pro looks the same as a Les Paul Standard with a blue metallic finish (see Fig. 1). A single-cutaway body, Tune-o-matic bridge, two humbucking pickups (each with its own volume and tone controls), 3-way-toggle pickup switch, and traditional neck and headstock all lend an air of familiarity. However, a closer inspection reveals a digital hex pickup (mounted between the bridge and the bridge

pickup), a blue status LED parked just below the neck pickup, and a jack plate replete with connectors that are atypical for an electric guitar (all of which I’ll explain shortly). Knurled cylindrical tuning knobs—nothing digital here—make a modern aesthetic statement.

Included with the HD.6-X Pro is a padded hard-shell case featuring a velour lining and an external, zippered storage pocket for accessories. This beauty also sports wheels on the bottom, protective skid rails on the back side, and an extra handle at its head, making it ready for the road.

Inside the case, an oversize accessory-storage compartment holds the HD.6-X Pro’s companion breakout box, affectionately dubbed “BoB” by Gibson (see Fig. 2). BoB connects to the HD.6-X Pro using a supplied Cat-5 Ethernet cable measuring roughly 30 feet in length. The Cat-5 cable is bidirectional and transmits digital audio between the guitar and BoB by way of latching Cat-5 connectors on BoB’s front panel and the HD.6-X Pro’s jack plate. To learn how the system works, it’s helpful to first look at signals sent from the guitar



»» FIG. 1: The HD.6-X Pro adds multichannel digital audio capabilities to an analog Les Paul Standard electric guitar.

to BoB and then at signals sent from BoB to the guitar.

From Guitar to BoB

Connect a standard guitar cable between a guitar amp and the high-impedance, ¼-inch Classic mode output phone jack on the HD.6-X Pro's jack plate, and the guitar operates and sounds exactly like an all-analog Les Paul (see Web Clip 1). This output jack is always active.

When the Cat-5 cable is connected to the HD.6-X Pro's jack plate and BoB is powered up (using its supplied coaxial power connector and lump-in-the-line transformer), the blue status LED below the guitar's neck pickup lights. The hex pickup then sends separate digital signals from each of the guitar's six strings to BoB. BoB converts the digital signals to analog and outputs them in mono, stereo, or 6-channel format (or combinations thereof).

I'll now examine BoB's channel-output formats in greater detail. A Classic mode output jack on BoB sums all six strings to mono, effectively duplicating the function of the Classic mode jack on the HD.6-X Pro's jack plate. BoB's Classic mode output is always active (as long as the guitar and BoB are connected and BoB is

powered up). BoB also provides six individual outputs (labeled 1-E, 2-B, 3-G, 4-D, 5-A, and 6-E) derived from the HD.6-X Pro's respective guitar strings. In this mode, only the guitar's Master Volume control (which doubles as the bridge pickup's volume control in Classic mode) is active; tone controls won't work. Outputs 1-E and 2-B can also be used to output summed signals from the top three strings and bottom three strings, respectively (more on this stereo format in a bit).

The guitar's jack plate also features a balanced ¼-inch minijack input intended for use with a condenser headset mic (the kind commonly used for live performance). Its signal is sent to a balanced ¼-inch TRS mic output on BoB by way of the Cat-5 cable. The mic input is served by 5V phantom power that is always on.

All of BoB's analog outputs can be connected to your DAW or mixer using a supplied 8-channel Hosa snake fitted with ¼-inch TRS connectors on both ends and measuring 10 feet in length.

From BoB to Guitar

In addition to outputting signals transmitted from the HD.6-X Pro, BoB can also send signals

to the guitar. BoB can accept a stereo cue feed (from your DAW or mixer, for instance) patched to its separate left- and right-channel input jacks. This cue feed is routed to a stereo minijack (¼-inch TRS) headphone output on the guitar's jack plate. Think of the guitar's headphone output as a substitute for an outboard headphone amp you would use in a recording session or onstage. (It doesn't monitor the guitar's output directly.) The guitar's jack plate provides a continuously variable headphone-output level control, which I found to be plenty loud when fully cranked.

All of BoB's analog I/O is on balanced ¼-inch TRS connectors that also work with unbalanced lines. According to Gibson, you can use a Cat-5 cable up to 100 meters long with the system without losing signal quality or incurring latency—a big plus for live performance on a humongous stage. Studio use receives equal favor: a copy of Cakewalk Sonar 5 Producer Edition (Win), a feature-packed DAW with a 64-bit audio engine, is included with your purchase of the HD.6-X Pro.

In the Mode

I mostly used the HD.6-X Pro with a MOTU HD192 High Definition I/O box, which

»» FIG. 2: The BoB breakout box outputs signals from the HD.6-X Pro's six strings in mono, stereo, and Hex modes. It can also route a cue feed to and accept a mic signal from the guitar's jack plate.



»» The bottom row of 1/4-inch jacks consists of individual analog outputs for each of the guitar's six strings.

»» Signals are sent back and forth between the HD.6-X Pro and BoB using a Cat-5 network cable, which plugs in here.

interfaced perfectly with Gibson's system in terms of delivering optimal levels to my DAW. Recording the output of each string to a separate track in MOTU Digital Performer (DP),

the sound quality was very good. I measured channel crosstalk (that is, the amount of signal bleed between two strings' separate outputs) to be approximately -33 dB, which is pretty darn

impressive. This crosstalk had negligible effect on stereo imaging when outputs were panned; stereo-field localization for individual strings was pretty crisply defined (see Web Clip 2).

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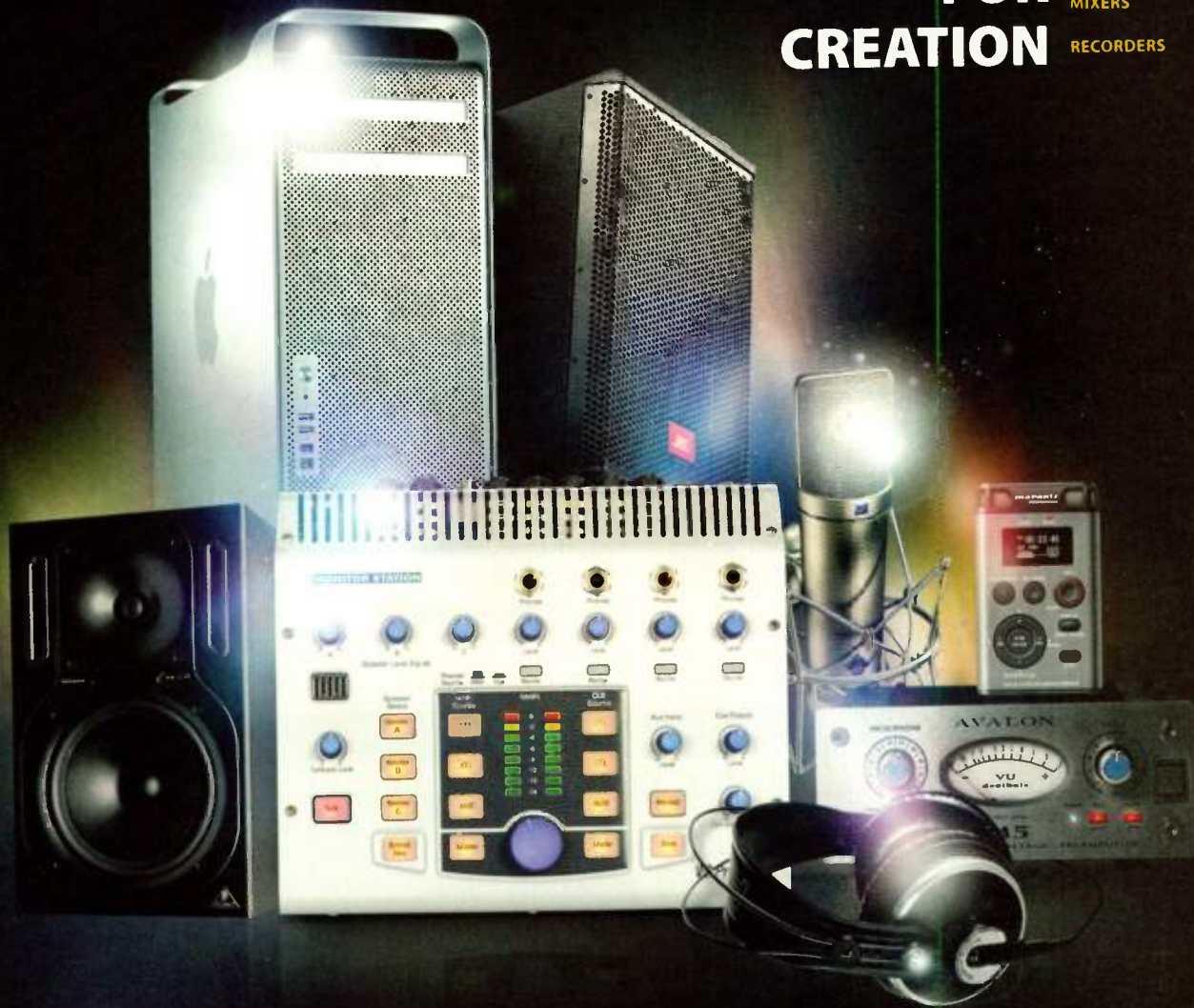
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Routing each string's output to a separate track in DP, I could give each track a unique volume, pan, and EQ setting. I had tons of fun adding different plug-ins to each string's

routed through an SSL Alpha Channel channel strip. I then added a chorus effect from my Yamaha 02R mixer and multitap delay from a Dynacord DRP 20 hardware processor to

I had tons of fun adding different plug-ins to each string's track.

track. In one session, I added MOTU Echo to the first string; MOTU Tremolo to the second string; Universal Audio Nigel and Waves MondoMod and TransX to the third string; Waves MetaFlanger to the fourth string; DaD Tape to the fifth string; and Universal Audio Nigel to the sixth string. I combined those tracks with a simultaneously recorded track of the amplified analog output of the guitar, miking a guitar cabinet with a Royer R-121 mic

all seven tracks, creating a wild montage that would've been impossible to produce using a standard guitar (see Web Clip 3).

BoB's stereo mode (which Gibson calls 2x3 mode) was also a gas. It allowed such custom-effect treatments as adding a chorus to the top three strings and panning them hard left while applying Universal Audio Nigel to the bottom three strings and panning them hard right (see Web Clip 4).

As I am a studio engineer and not a live performer, I didn't have any condenser headset mics on hand to test the HD.6-X Pro's mic input. Gibson was smart to aim this feature toward live use, however, because that's where the mobility it provides is needed. On a minor down note, I was a bit frustrated by the guitar's owner's manual, which omits a lot of important information.

It's a Winner

The HD.6-X Pro is an awesome-sounding analog Les Paul, a string-warping multichannel digital guitar, and a central station for headphone output and mic input all in one. Throw in the Sonar 5 Producer Edition DAW, and the system is a good value, even considering its hefty price. For studio recordists, the HD.6-X Pro kicks butt.

EM contributing editor Michael Cooper is the owner of Michael Cooper Recording in Sisters, Oregon. Visit him at myspace.com/michaelcooperrecording.

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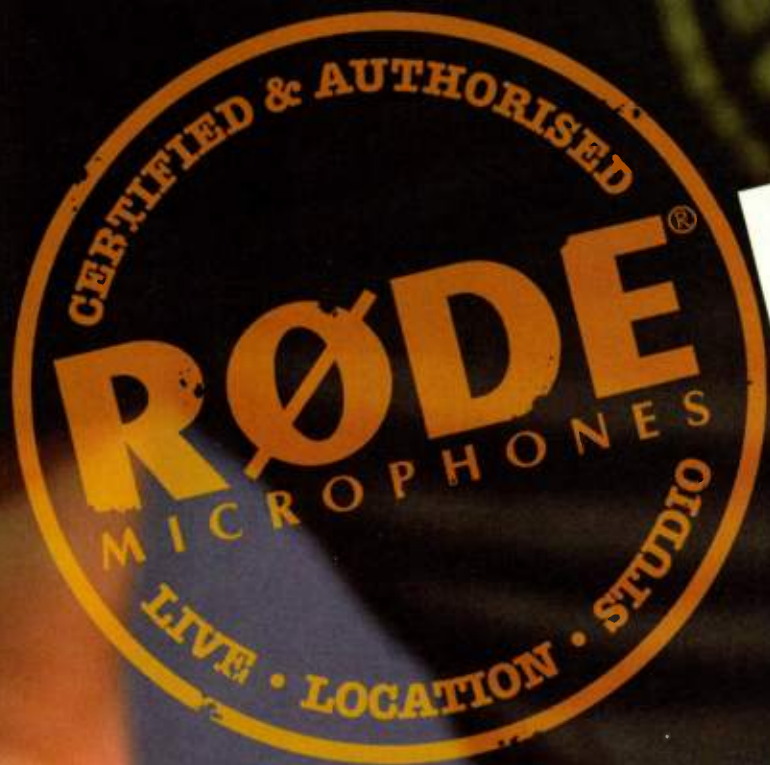
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Ask your local RØDE dealer for more information on the NT5 or visit www.rodemic.com/nt5

»» FIG. 1: BFD2 features an entirely new user interface with kit sizes up to 32 pieces.



FXpansion

BFD2 2.0.5 (Mac/Win)

FXpansion rolls out even bigger drums.

»» PRODUCT SUMMARY

virtual drum machine **\$399**
 upgrade from BFD 1.5 **\$199**

PROS: Outstanding-quality drum samples. Cutting-edge drum-engineering and composing features. Many work-flow enhancements to streamline tasks.

CONS: Ride cymbals lean more toward unusual than traditional. Playback-position wiper cannot be dragged. Capable of eating serious CPU resources.

FEATURES	1	2	3	4	5
EASE OF USE	1	2	3	4	5
QUALITY OF SOUNDS	1	2	3	4	5
VALUE	1	2	3	4	5

FXpansion
fxpansion.com



By Babz

When it was introduced, BFD shattered the previous standards for authentic emulation of acoustic drums with its ultradetailed sampling, unprecedented Velocity layering captured with multiple microphones, and integrated mixing environment and MIDI groove engine. FXpansion continued to develop and expand the product, releasing regular updates through version 1.5 as well as several sound-library expansion packages making crucial use of new features.

But eventually there was only so much that could be squeezed into the original BFD interface. Drum-note mapping and the groove engine were stepping on each other's toes. More articulations, kit pieces, and editing options were added, but they were scattered in windows throughout the interface. The team went back into the studio to emerge with an entirely new product: BFD2 (see Fig. 1).

How Do You Like Me Now?

BFD2 not only addresses all BFD issues, but also kicks things up several notches. It

features a new user interface, redesigned from the ground up, and an all-new mixing environment and groove engine, yet it manages to maintain backward compatibility with previous content and expansion libraries. Replacing the original BFD's mere 9 GB of drum library content are 50 GB of entirely new sample data including rare, vintage, and classic drum kits, all captured with even more meticulous detail. On top of this, FXpansion has added built-in effects plug-ins and kit presets that exploit them; thousands of new groove patterns; various work-flow enhancements; user sample import; and expanded support for easier mapping of controllers and electronic drum kits.

The new user interface is a leap beyond BFD's, ergonomically. Parameters are now organized and readily accessible in all screens despite what may be the most advanced and customizable drum-production environment ever created. There are a multitude of ways to tweak the sound and response of your drums and often several different places you can adjust the same parameters.

Buttons along the top navigate through five main pages: Kit, Mixer, Grooves, Keymapping/Automation, and Preferences. The Kit page lets you work with 10-, 18-, or even 32-piece drum kits. Selecting your kit size calls up a graphic display of a white drum set representing the current kit layout, and a grid below it where you load kit pieces. Clicking on a kit-piece slot changes the Kit-piece Inspector pane to the right, which contains all the main controls you need to mix and customize that piece (see Fig. 2). Four master faders appear in a minimixer to the lower right, which offers Direct, Overhead, Room, and Ambience (which replaces BFD's PMZ fader) preset channel strips.

BF Kits and Pieces

The 50 GB of samples make up ten drum kits, as well as a hefty helping of extra snares and cymbals, some basic percussion, and even a few electronic hits ported over from FXpansion's 8-Bit Kit library. The sampling sessions were done at London's AIR Studios, the recording

Bonham; and one of Ringo Starr's Ludwig Black Oyster kits from 1964. Both kits sound absolutely stellar and are certainly among the best-sounding material FXpansion has ever offered (see Web Clips 1 and 2). If you're looking for instant access to classic '60s and '70s rock drums, this is it. The rest of the kits are equally impressive and cover a full palette of tonal colors, from loose and deep to damped and crisp, and from pingy and resonant to beefy and punchy.

The kit-slot interface makes it easy to mix and match snares, cymbals, or any kit piece to build your own custom kit. I was delighted to find that FXpansion really delivered in the snare department this time around. Snares are the most critical component of any kit, yet in most drum libraries, including some of FXpansion's own earlier offerings, I've found myself struggling to find one or two decent snares. In BFD2, though, I'd be hard-pressed to find a single bad one. Sixteen snares are included (and an electronic one), and I'm



FIG. 2: The new Kit-piece Inspector pane provides centralized access to a myriad of parameters for kit-piece customization, including tuning, trim, damping, Velocity response, bleed, and more.

The new user interface is a leap beyond BFD's, ergonomically.

studio of Beatles producer George Martin, using a custom Neve console.

Up to 96 Velocity layers were captured at 24-bit resolution, and each layer of each kit-piece articulation includes 12 different mic channels. Snares include five different articulations: Hit, Rim, Sidestick, Drag, and a new Half Edge sample in place of BFD's Flam articulation. Hi-hats include up to 11 different articulations, and new to BFD2 are 3-way-articulation cymbals (Hit, Bell, Edge). All this detail blends together to form a highly organic experience of the sound characteristics of a real drum set.

The ten kits cover a range of modern, vintage, and custom sets from Ludwig, DW, Pearl, Rogers, Gretsch, and others. Of special note are two historic kits: a Ludwig Vistalite kit once owned by Led Zeppelin's John

happy to report that every one of them is A-list, first-call quality. In fact, I could say the same thing about the kicks and toms.

About the only thing I found less impressive was the ride cymbals. Of the nine rides, two are "crash rides" that sound like crashes, not rides. You get exotic, trashy rides like a Bosphorus, but a straight-ahead ride with a nice stick attack and not too many overtones was harder to find in the lot. You'll find better ride options in one of the many available expansion packs.

Mixer's Delight

One of the biggest changes in BFD2 is a new full-featured mixing environment that includes an extensive suite of effects-processing plug-ins (see Fig. 3). You get a channel strip with four effects inserts and four

sends for every mic channel, along with aux busing, sidechaining, submixing, the works. Effects include models of classic analog gear, including an 1176-style channel compressor, and a bus compressor and EQ based on the SSL G series. The modeled effects use FXpansion's DCAM (Discrete Component Analogue Modeling) technology, which allows the company to make extremely accurate re-creations of analog circuits down to the diode level. If more-radical drum processing is your thing, you'll also find a flanger, chorus, bit crusher, delay, and ring modulator—15 effects in all (see Web Clips 3 and 4).

One of the most exciting new mixing options is the Audio Export panel, which enables you to export multichannel mixes from BFD2 as discrete WAV files. In BFD, rendering your performance as separate audio tracks could involve all sorts of routing hassles; in BFD2, Audio Export greatly streamlines the task. Multitrack audio can also be exported from the Groove window faster than in real time.

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FIG. 3: BFD2's mixing window provides a total drum-engineering environment, including a full suite of effects-processing plug-ins, some of which are modeled after classic analog gear.

If you're looking for instant access to classic '60s and '70s rock drums, this is it.

BF Grooves

The new Groove window provides a comprehensive drum-sequencing, editing, and composition engine that goes way beyond BFD (see Fig. 4). An editor grid with access to individual articulations, along with groove processing such as quantization, swing, and humanization, gives you options rivaling those of many host sequencers' MIDI drum editors. Though you can't use the Groove window to create tempo or meter changes, grooves will follow and track host tempo and meter changes.

BFD2 includes more than 5,000 groove patterns and fills in a variety of styles. The grooves are assigned to 128 slots across a virtual MIDI keyboard that BFD2 calls the Palette. Previously, BFD used MIDI files as its groove file format. In BFD2, grooves function like MIDI files but are in BFD2's own proprietary format. This was necessary so that the MIDI Note Numbers assigned to grooves

could function independently of note mappings assigned to kits. However, in practice, the proprietary format is largely invisible. Grooves can still be dragged into a MIDI track in your host sequencer, where they become MIDI files, and any Standard MIDI File can be dragged into BFD2, where it is instantly translated into the groove format.

One thing I didn't like about the groove interface is that user positioning of the playback-position wiper in the Drum Track is not straightforward. I wished I could simply drag it wherever I wanted, but instead I found I had to click on the Drum Track ruler to set a Start Marker and then hit rewind. This quickly became tedious, especially when trying to do things like audition the transitions between grooves.

BFD-lightful

BFD2 is truly a work of art. It is also a work in progress with room for improvement.

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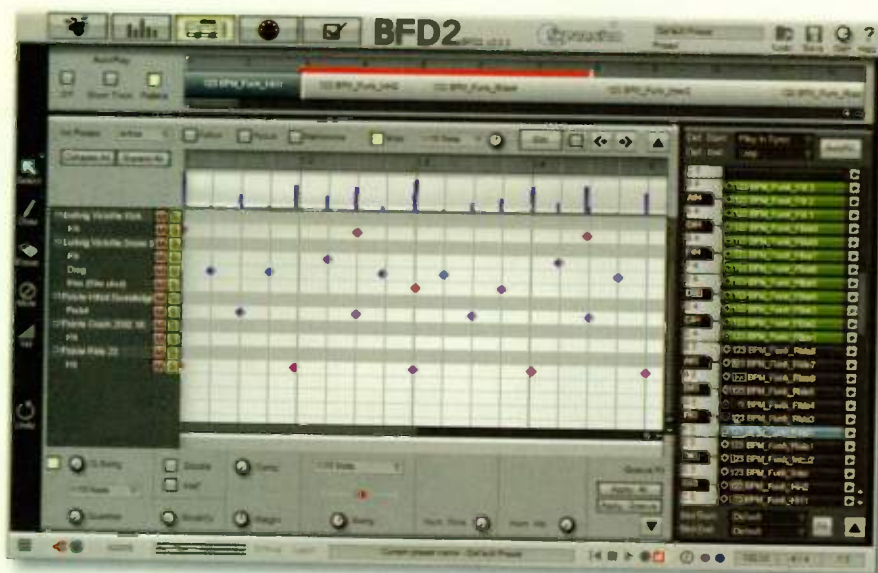


FIG. 4: BFD2's Groove window provides thousands of groove patterns and an extensive drum-sequencing and editing environment. Grooves can be exported as multiple audio tracks in a non-real-time bounce.

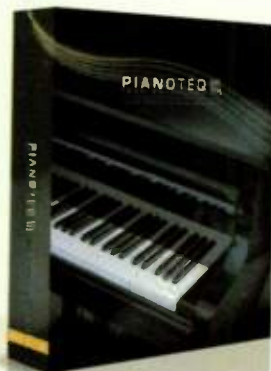
But if FXpansion's past record of constant updates is any indication, the program is well on its way to becoming a masterpiece. With so many options and features, however,

it does run the risk of collapsing under its own weight, and it can present the new user with a lot to absorb.

From the new Kit-piece Inspector to the

improved mixing and groove environments to the well-written 180-page PDF manual, FXpansion has done an excellent job of balancing maximum drum-processing power with the need for plug-and-play immediacy. The sheer sonic quality of the drum samples alone is enough to win me over. On top of that, you get the most comprehensive and advanced drum-production features ever assembled in a plug-in or standalone platform. If you're looking for a serious tool for creating the best-sounding desktop drum tracks possible, BFD2 should be at the top of your list.

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



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ASX Hardware Synth expansion board now available with hundreds of rich sonic possibilities.



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(see page 97) are identical to those on the FireStudio Project. A Cat-5 Ethernet connection lets you add the

Mojave Audio
by David Royer



On the MA-100

"How does such a small mic make such a big sound? This thing [MA-100] is fat!"

Ross Hogarth
(Grammy winning Producer/Engineer, Ziggy Marley, Jewel, Keb Mo, Black Crowes, REM)

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Ryan Hewitt
(Engineer/Mixer, Red Hot Chili Peppers, blink-182, Axlone Trio)

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MSR

Adding the MSR (\$199) makes the FireStudio a more formidable and convenient system than the FireStudio Project. The angled desktop unit has a footprint a little larger than that of a 4-button trackball. It interfaces seamlessly with the FireStudio's Control Console software and offers buttons for instantly monitoring each station in a 5.1 system (including LFE). Even if you lack a surround system, the MSR is a handy add-on, with two extra headphone jacks, a full talkback system (with a built-in mic as well as an XLR mic input connector and level pot), and pro-level monitor control with a large volume pot and dedicated mute and dim buttons.



optional Monitor Station Remote (see the sidebar "MSR"), a complete surround or stereo speaker manager, input switcher, and communication system.

The FireStudio's complement of software is different from the FireStudio Project's. Routing is handled by Control Console, a 36 x 36 x 18 mixer and router that lets you send any input to any output, including the headphone output, with zero latency. Control Console can handle as many as nine stereo mixes and then route them to the outputs for headphone mixes and various aux sends.

In addition, the FireStudio comes with ProPak Complete, which includes Steinberg Cubase LE, Propellerhead Reason Adapted, IK Multimedia AmpliTube LE, FXpansion BFD Lite, Drumagog LE, Sonoma Wire Works Riffworks Jr., and Wave Arts TrackPlug LE and MasterVerb LE.

Playing with Fire

To test the FireStudio Project's preamps, I recorded a guitar through one channel direct and through another channel using a large-diaphragm condenser mic. I strapped a guitar processor across the direct channel's insert point. I repeated these steps with the FireStudio. On both units, the XMAX preamps sounded very good; they were practically noise-free and some of the cleanest pres I've heard on units in this price range.

I also miked an amp and a percussion kit using a mix of dynamic and condenser mics on both units and got the same results as before. The mic pres of both units sounded very good, and the routing options the software provided were very flexible and useful. I always prefer to insert an analog compressor on any vocal track and consider the insert points of the PreSonus units one of their strongest features.

Which One?

Because of my personal recording habits and the projects I take on, I like the FireStudio Project. I also like its front-panel metering, which gives me one less window onscreen to keep my eyes on. Additionally, I like the flexibility of four phantom-power switches instead of two, even if the actual need for it rarely materializes. If I thought I would need more mic pres, however, I would absolutely go with the FireStudio. Its ADAT ports make it easy to add 8 or 16 more matched mic pres.

Carefully consider the present and future needs of your own studio, and then check out both FireStudios. While you're at it, take a look at the new FireStudio Tube (\$799), which should add a measure of warmth to some already great-sounding mic pres. To my ears, either FireStudio is a good bet.

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FIG. 1: The FireStudio Project has eight mic preamp channels on combo connectors, with channels 1 and 2 doubling as instrument-level channels.



FIG. 2: The FireStudio Project's rear panel includes eight General Purpose analog outputs you can use to create mono or stereo mic headphone mixes.

PreSonus

FireStudio Project and FireStudio

Versatile FireWire interfaces for any studio.

PRODUCT SUMMARY

FireWire audio/MIDI interfaces
FireStudio Project \$499
FireStudio \$699

PROS: Very good converters and mic preamps. Plug and play. Extendable through FireWire. Excellent software.

CONS: Rear-panel power switch on FireStudio Project. Phantom power in groups of four on FireStudio.

FEATURES	1	2	3	4	5
EASE OF USE	1	2	3	4	5
AUDIO QUALITY	1	2	3	4	5
VALUE	1	2	3	4	5

PreSonus
 presonus.com



By Rusty Cutchin

PreSonus has long been a major manufacturer of sleek and dependable audio interfaces for computers. Now the company has raised the bar with two rackmount audio/MIDI interfaces that can handle most any digitization task in the studio. Both interfaces sound great and come packaged with enough software to make the only other item on your shopping list a modern computer, if you don't already have one. The difference between the two units boils down to connectivity and control.

First Up: FireStudio Project

The single-rackspace FireStudio Project has eight mic preamps and supports audio formats up to 24-bit, 96 kHz (see Fig. 1). Its zero-latency mixer and matrix router lets you send as many as five individual mixes, providing a nice way to give each band member a custom headphone mix during recording. Like the pro-oriented FireStudio, the FireStudio Project is derived from PreSonus's FirePod, but with improved analog-to-digital converters and jitter-eliminating synchronization.

The FireStudio Project uses flash memory; settings are saved when you power down and recalled when you power up. You can configure the unit so that functions such as submixing, A/D/A conversion, headphone mixing, and format conversion will work without a computer.

The front panel has input connectors on the left and controls (along with a headphone jack) on the right. Eight XLR/TRS combo inputs access PreSonus's discrete XMAX Class A mic preamps. Eight 3-segment LED input meters for the analog inputs indicate signal at -40, -6, and 0 dB. Between each pair of meters is a button to engage 48V phantom power for that pair. The FireStudio Project's phantom-power buttons are backlit and glow bright blue when depressed.

Below the metering section are eight pots that control input levels. The panel is marked concentrically behind each pot, with Inst levels (-10 to +30) on the outside and Mic levels (0 to 60) on the inside. Phones and Main level pots are at the extreme right of the controls.

On the FireStudio Project's rear panel, a



FIG. 3: The FireStudio adds more input and sync options to the flexible routing options it shares with the FireStudio Project.



FIG. 4: The FireStudio's rear panel hosts ADAT SMUX and BNC word-clock connectors, as well as a port for the optional MSR unit.

3-pronged connector for a standard AC cable means the power supply is inside the unit (the FireStudio uses an in-line power brick). However, the rear-mounted power switch may be a hassle if you want to mount the unit in a rack (see Fig. 2). Two FireWire connectors let you connect your computer and additional FireWire devices. The FireStudio Project contains the DICE II FireWire chip set, which allows ten channels of simultaneous 24-bit audio I/O while minimizing latency and CPU load.

Also on the rear panel are S/PDIF and MIDI In and Out jacks, as well as two main outs and eight individual General Purpose Outputs. There's also an insert section (for channels 1 and 2) with two send and two return jacks—a nice change from the usual combination in/out insert jacks. All outputs are on balanced mono ¼-inch TRS jacks.

You control the hardware's signal routing using PreSonus's FireControl software (see the [online bonus material](#) at [emusician.com](#)). To top it off, the included PreSonus ProPak software suite is quite a plus. You get Steinberg's Cubase LE 4 48-track recording and production software; more than 25 real-time plug-in EQs, compressors, and reverbs; and more than

2 GB of drum loops and samples. You also get *Cubase LE 4 Demystified*, a tutorial DVD.

FireStudio, Front and Center

For studios that need more connection options, the full-blown FireStudio offers additional

DigiMax FS (a pair of those would give you 24 mic pres in only three rackspaces).

Another difference between the two units is that the FireStudio has its power switch on the front panel. The FireStudio also forces you to add phantom power in groups of four (rather

The difference boils down to connectivity and control.

capabilities (see Fig. 3). The 26-input, 26-output hardware handles 24-bit audio at rates as high as 96 kHz. Like the FireStudio Project, the FireStudio has eight XMAX mic pres, S/PDIF I/O, and MIDI I/O. The primary difference is that the FireStudio also provides ADAT Lightpipe with SMUX capability, which lets you add 16 channels of 16-bit, 44.1 kHz audio, or 8 channels of 24-bit audio with sampling rates as high as 96 kHz. You can also use the ADAT ports to connect expanders such as PreSonus's

than two on the FireStudio Project). The buttons, labeled 1–4 and 5–8, are on the extreme left of the front panel. Studios with lots of condenser mics on hand for recording several simultaneous tracks won't find this a limitation.

The FireStudio's rear panel provides word-clock sync in and out on BNC connectors and two analog Aux In connections on RCA jacks (see Fig. 4). The analog outputs and inserts are identical to those on the FireStudio Project. A Cat-5 Ethernet connection lets you add the

Mojave Audio

by David Royer



MA-200



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REVIEWS

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- Alpha-Link AX (top): ADAT ↔ Analogue
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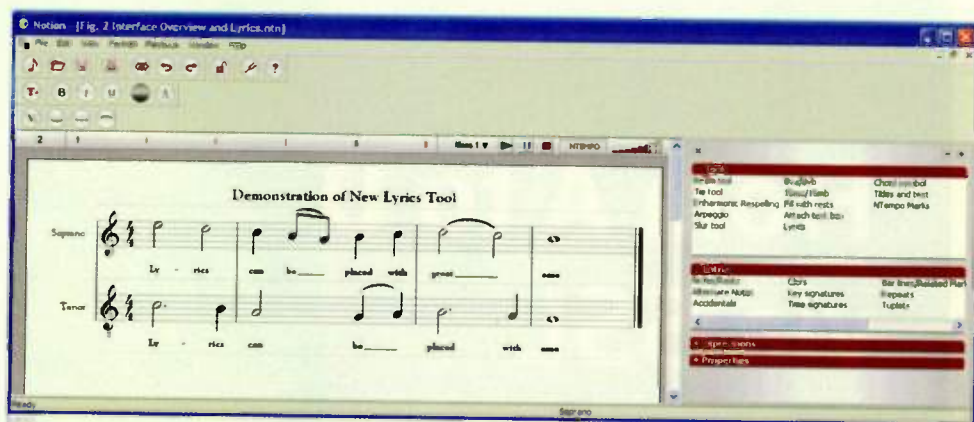
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FIG. 1: In this overview of Notion's work area, you can see the score in the lower left, the Sidebar to the right, a timeline and playback controls just above the score, and toolbars just below the menu bar. The score shows an example of the new Lyrics feature.



Notion Music

Notion 2.2 (Mac/Win)

Many improvements strengthen this unique music environment.

By Peter Hamlin

PRODUCT SUMMARY

notation/transcription software \$499
 academic price (for noncommercial use only) \$299

PROS: Easy to learn and use. Adapts to live performance. High-quality sounds. Complete integration between score symbols and sound playback.

CONS: Some limitations in score customization. No MIDI output.

FEATURES	1	2	3	4	5
EASE OF USE	1	2	3	4	5
QUALITY OF SOUNDS	1	2	3	4	5
VALUE	1	2	3	4	5

Notion Music
 notionmusic.com



Notion made quite an impression when it first appeared in 2005. The program offered an elegant, easy-to-learn interface and astonishingly good playback sounds, custom-recorded by members of the London Symphony Orchestra, that responded accurately and musically to symbols on the printed page. Now that version 2 has been released, it's time to take a look at what's new.

I'll describe Notion's new tools for working with lyrics; enhanced preview options; and score-layout updates; among other features. I'll also cover sound playback, one of the program's major strengths (for details, see the [online bonus material](#) at [emusician.com](#)).

Introducing the Interface

Notion has earned plaudits for its easy-to-learn and easy-to-use interface. Fig. 1 shows a typical window, with the score dominating the bottom left. The Sidebar to the right is a well-organized collection of headings and boxes where you access the musical symbols you want to enter. Selecting a symbol in the Sidebar changes the cursor to that symbol, which you then place on

the score where needed. There are also shortcut keys that make using the Sidebar unnecessary for many of the most common symbols, speeding up your work considerably as you get familiar with the program. (Pressing F2 brings up a reference window listing all keyboard shortcuts by category.) In general, the organization of the Sidebar is clear enough that you can typically find the symbol you're looking for quite easily without referring to the manual.

The work space also has playback and navigation controls just above the score and a series of toolbars just below the menu bar in the upper left. These give you quick access to commonly needed features. The new version looks essentially the same as the original, but a number of changes and improvements are worth noting.

Because I write a lot of vocal music, the biggest addition for me is lyrics entry, something that was not supported in Notion 1.0. (Fig. 1 shows an example of lyrics after entry.) To access this feature, simply select Lyrics in the Tools area of the Sidebar (or use the shortcut key Shift + L), click below the note where

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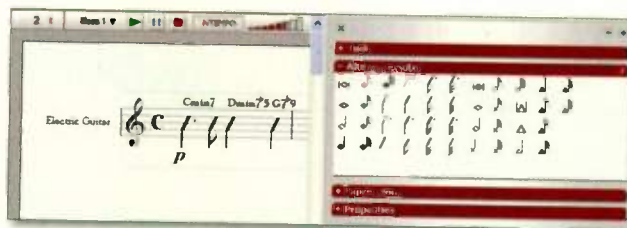


FIG. 2: Alternate note heads have been introduced in version 2, and chord symbols now play back. The palette of Alternate Notes is also visible in the Sidebar to the right.

you want the lyrics to appear, and enter your text syllable by syllable. (Click above the note if you want to place lyrics above the staff.) Use a hyphen for multisyllabic words and either a hyphen or an underscore for a melisma (more than one note per syllable).

Other improvements: you can now audition notes with the orchestral timbre that is set for a given staff. Notes sound when you enter them or

lower voice in a 2-voice staff. Conversely, Add Special lets you add any articulation to a series of selected notes, a huge time-saver when you have, say, long staccato passages in a piece. In that case, select the passage, right-click, choose Add Special, and select staccato, and every note in the passage will now contain staccato articulations. A new Go To dialog box has been added—if you click on the measure number at the left side

Because I write a lot of vocal music, the biggest addition for me is lyrics entry.

select them, and if the cursor is ready to enter a note, you can press the Equal key (=) to hear the pitch where the cursor is currently located. You can also select a note and drag it to a new pitch. Notion 2 has added alternate note heads and slashes. Fig. 2 shows a score example along with the palette of available Alternate Notes. You can also select the Chord Symbol tool and type in standard chord symbols that now play back in whatever rhythmic pattern is indicated in the music. (See Web Clip 1 for the audio of this short example.)

Notion 2 offers more control over how measure numbers are displayed and gives you options including every system, every measure, and every 10 or 20 measures. System and page breaks have been added, so you can now override the default layout of a staff if you want.

Two new editing features I find especially useful are Clear Special and Add Special. When you right-click on any selected area and choose Clear Special, you are given the option of clearing only one or more categories of symbols. You could, for example, clear only articulations, or only articulations and slurs, or only lyrics, and so on, and apply this to only the upper or

of the timeline, the Go To dialog box appears, allowing you to quickly navigate to any measure number or rehearsal mark.

One valuable strength of the interface is that Notion automatically places symbols and moves them around to accommodate any changes. Fig. 3a shows an example of a simple musical passage, and in Fig. 3b I've changed some notes and added dynamic markings, hairpins, grace notes, and titles. The existing notes and staves all moved automatically to accommodate those changes as they were entered. No additional manual editing was necessary.

Several other changes are worth mentioning. First, you no longer need to use a USB iLok device to run the program. It's now also possible to register and authorize your copy of Notion directly online. And, as of version 1.5, the program is now available on the Mac.

More Than Just Notation

Notion is carving out a niche for itself as more than just another music-notation program. For instance, you might use it in live performance to accompany a dance performance, using the NTempo feature to conduct and interpret the

creativity meets technology

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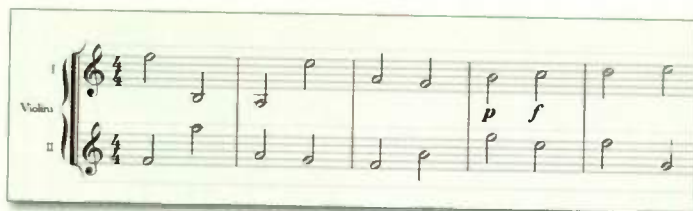


FIG. 3a: A simple score sample.



FIG. 3b: The same score after adding titles, dynamics, hairpins, and grace notes. The staves and notes have automatically changed position to make room for the new items, requiring no manual adjustments.

music as a conductor would do with a live orchestra. Notion has also been used in music-theater shows to supplement a live orchestra by adding, for example, a string ensemble. A performer at a laptop computer could follow the conductor so the Notion strings play along with the live performance even as tempos change spontaneously from moment to moment. And, given the excellent sound quality, another great use for Notion is the creation of film scores.

The program is also aimed at the educational market. There is a Notion Conducting program (see the Notion Music Web site for options) with instructional materials and scores that could provide practice for student conductors. Rather than conducting into a mirror with a static recording, a student could hear the response of the orchestra based on his or her tempo choices. And, finally, performers can purchase scores of concertos from Notion Music and play along with them. Unlike with a fixed recording, you could select your own favorite tempos for the piece, choose a slow tempo while you're still learning a difficult passage, and so on.

Caveats

It's important to note that while Notion has considerable strengths, there are some things it won't do. Though you can use MIDI input to enter notes, there is no MIDI output or other way to control an external or soft synth from within Notion. That means if you have, say, a beautiful set of vocal

samples on an external synthesizer, you wouldn't be able to use them with this program.

In addition, Notion will customize score appearance only to a degree. You can't change staff size or introduce smaller ossia staff lines. You can display only a transposed score, not a version with all the instruments in C. Nor can you optimize a score (that is, leave out instrumental staves that aren't playing on a given page) or fine-tune the shape of a slur. And though it is convenient that symbols like dynamic and tempo markings place themselves automatically, you can't move them if you want to. If you love to control every detail of your score, you may find that Notion is not the ideal tool for you. If, on the other hand, you don't want to hassle with those details, it will automatically take care of them in a satisfactory way.

If your priorities are excellent playback sounds, complete integration between the sample library and the score, the ability to "conduct" your score in real time, and an easy-to-use and low-maintenance approach to score creation, then Notion has a lot to offer. Worthwhile additions and improvements in version 2.2 make it a good candidate for a wide variety of creative and educational projects.

Peter Hamlin teaches composition, theory, and electronic music at Middlebury College and plays with the live electronic-music improv band Data Stream.

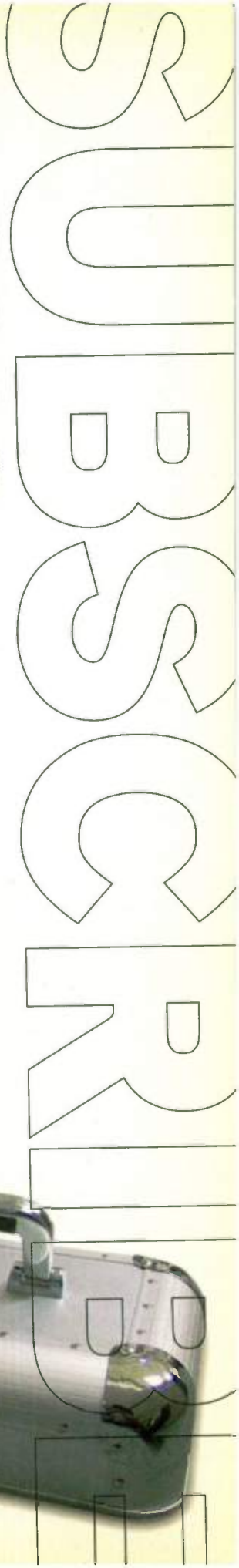
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APOGEE

Duet (Mac)

By Nick Peck



» The Apogee Duet's elegant design features an aluminum rotary-encoder knob that is the audio interface's only controller.

If you are one of the many EM readers who want a good, portable, Mac-based recording rig, Apogee's Duet (\$495) might be just the piece you're looking for. This small, bus-powered, FireWire 400 2-channel audio interface works with Macintosh G4 (1 GHz or faster), G5, and Intel models running Mac OS X 10.4.11 or later. It is incompatible with Windows PCs, however.

The Duet can simultaneously record and play two channels of up to 24-bit, 96 kHz audio. Current versions of Apple Logic Pro, Soundtrack Pro, and GarageBand directly support the Duet, and it is compatible with any Mac application that supports Core Audio.

The Duet is designed to sit next to a MacBook or MacBook Pro. The rounded edges, solid aluminum casing, and elegant, minimalist design make it look very much like an Apple product. At 6.3 × 4 × 1.5 inches, the unit is compact enough to fit neatly into a laptop case along with a pair of small, collapsible headphones.

IN, OUT, AND ABOUT

The front panel presents a ¼-inch headphone jack and a pair of LEDs that indicate whether phantom power is active, while the rear panel sports the FireWire 400 port and a DB15 connector that

attaches to a breakout cable. The cable fans out to six jacks on separate 18-inch cables: two balanced XLR mic/line inputs; two unbalanced ¼-inch high-impedance instrument inputs; and two unbalanced -10 dBV ¼-inch line outputs. (Unfortunately, the outputs cannot be configured for +4 dBu operation.) The breakout cable is as ungainly as the primary unit is elegant; I would have preferred a single multicore cable terminating in a small breakout box that held the I/O connections. (According to Apogee, the company prototyped a breakout box and found the fan-tail cable to be more portable and compact.)

The Duet's elegantly simple design is epitomized by its single user-interface device, a large, continuously rotating aluminum knob. All input, output, and MIDI-controller settings are controlled from this one encoder. Pressing down on the knob scrolls forward through the list of devices to control in the provided Maestro configuration software. The currently controlled device shows up briefly as a standardized Mac audio icon at the bottom of your computer screen. My wish list for future development includes the ability to scroll backward through the device list by pressing a modifier key while pushing the knob.

The Duet's control knob can also be configured to operate as a MIDI continuous-controller wheel. Up to four separate controller numbers can be assigned to the wheel. When configured, they are selected for operation by pressing down on the control knob until the desired controller number appears. The wheel can be used during mixdown to control a channel's level, pan, and other parameters. A pair of 7-segment LED ladders above the knob indicate the left and right input or output levels.

HIT IT, MAESTRO

Maestro is a simple, straightforward configuration program for Apogee's current line

of products, and it allows you to set up your Duet preferences. Maestro's mixer page enables low-latency monitoring by routing the input signal to the outputs in tandem with your DAW output. You also select 48V phantom power and phase inversion with Maestro. The mixer page includes mutes, solos, and over indicators, and it let me overdub tracks right in time with material coming back from Logic Pro.

THE TESTS

I tested the Duet by recording a variety of sources at 24-bit, 96 kHz using a 2 GHz Power Mac G5 and a 17-inch MacBook Pro, each running Logic 8.0.1. In one test, I recorded a Mason and Hamlin grand piano at a distance of 4 feet through a pair of Coles 4038 ribbon mics. The sound was absolutely gorgeous, with a well-balanced frequency spread and a lot of depth. The mic preamps were detailed and colorless. Ribbon mics require a lot of gain, and a bit of preamp hiss was noticeable in the piano tracks, though it would not be noticed in a mix with other instruments. I also recorded percussion, voice, and metallic sounds through a Neumann TLM 103 large-diaphragm condenser mic. This mic required much less gain, and as a result, preamp hiss was inaudible.

I compared the analog headphone output on my Mac G5 desktop machine with the Duet's headphone out using a trusted pair of AKG K240 cans and my gold-standard reference: Steely Dan's *Two Against Nature* CD. The G5's headphone output is fairly respectable, but the Duet won this duel handily. The Duet's stereo imaging was pinpoint accurate, the reverb felt much more present and enveloping, and I enjoyed hearing the thickening in the lower mids.

PORTABLE BLISS

The Duet is an outstanding product, providing excellent sound quality; simple, straightforward operation; and high-



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Stuart Ridgway - TAXI Member

www.pyramidmusic.com

I’d seen the TAXI ads (just like this!) hundreds of times over the years and I was very skeptical. But when I got their free information kit and saw that the money back guarantee was for a full-year, I decided to make the leap.

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Reality TV and Royalty Checks

We struck up a good working relationship, and when the supervisor needed music for a new daytime reality show, she asked me if I would like to join her team. For the next two years, I wrote music for an Emmy Award winning show, which aired every weekday on NBC. My first royalty check *alone* covered 10 years of TAXI memberships! All in all, those two seasons netted me more than \$50,000, and the company TAXI

hooked me up with has hired me to write for two other shows as well.

Being “Great” Wasn’t Enough

After making more than 1,000 cold calls, it dawned on me that music supervisors didn’t care *how* great I was as a composer. How could they? They don’t know me and that’s that! I could only get so far on my own.

I realized I needed someone or something to be my champion - somebody to connect the dots. TAXI worked for me, and if you’re really good at what you do, it just might do the same for you. If your music is up to snuff and you pitch it at the right targets, belonging to TAXI *can* change your life.



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resolution audio in a small, affordable, bus-powered package. Sure, I have a few small quibbles, but what's not to love? Nice job, Apogee.

Value (1 through 5): 4

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SYNESTHESIA CORPORATION

Mandala 2.0 (Mac/Win)

By Karen Stackpole

Synesthesia Mandala 2.0 (\$349) is a drum synthesizer with a MIDI trigger-pad-style controller that connects to your computer's USB port. The included Virtual Brain software gives you control of Mandala's extensive sound library, which contains a wide range of samples, effects, and presets. Bonus software called the Beauty, which includes 3,000 recorded samples of a vintage Ludwig Black Beauty, turns Mandala into a realistic-sounding virtual classic snare drum. Together, the libraries comprise 4 GB of content.

ON THE OUTSIDE

The polygonal drum pad has nine sides and a flat, rubber-covered striking surface. The base of its durable purple-and-black plastic casing is embossed with a stylized swirl pattern. A bracket for attaching the pad to a stand protrudes at an angle from one edge, but you can also mount it on a snare stand or set it on a tabletop. I found that the bracket made the pad a bit wob-

►► Mandala's rubber-covered, polygonal striking surface provides up to seven separate zones.



bly when placed on a flat surface, but putting a bit of padding under the unit solved the problem. The sole connection to the pad is a USB port. The unit comes with a 6-foot USB cable and a pair of sticks.

To install Mandala, you need at least 1 GB of RAM and a DVD drive. You also need a certain degree of technical know-how. The software runs on Mac OS X, Windows XP, and Vista. Synesthesia recently upgraded the software for the Virtual Brain and the Beauty, which took care of some problems I initially experienced getting audio to play and establishing smooth operation between the pad and the computer. The upgrade made setup more efficient and convenient.

ABOUT THE PADS

You can set up each drum pad with as many as seven zones, and it is possible to use five pads with the Virtual Brain. Each zone has its own sample (snare drum, xylophone, piano, and so on) and effects options. I found the lack of visual demarcation between zones on the pad frustrating, especially with higher zone counts. It was tricky to be accurate with stick hits across zones, but the number of the zone being struck is indicated in the pad graphic on the computer screen, and you can improve your accuracy with a little practice.

Hotkeys provide easy access to nearly 100 factory presets, and you can have more than 150 user-defined setups. You get two banks of effects (reverb, distortion, ring modulation, delay, and the like) to shape your sounds.

Parameters such as volume, pan, pitch, attack, hold, decay, and effects send are fully adjustable, as are all effects settings. The Virtual Brain provides three ways to modulate sound parameters: strike position (0–127), strike velocity (0–127), and LFO. The LFO rate is adjusted in the master window.

With the Beauty, Mandala mimics the natural sonic response of a snare drum. That's due to the unit's unprecedented sensitivity to strike placement and velocity. It sends very specific information to the software, which distinguishes up to

127 levels of intensity and 128 concentric zones. Multiple samples of each type of hit let you play with realistic variety; it's almost like playing a real Black Beauty.

DRUM ROLL, PLEASE

I brought the unit to the studio of Steve Orlando, fellow drummer and engineer, to try the drum pad (without the Virtual Brain software) as a controller for other applications. We put it through its paces with Digidesign Pro Tools' Strike and Hybrid, and it worked well as a trigger source in those applications. We did have to sort out the note values, and it did not have polyphonic capability. Several Mandala pads would rock for real drumming, but one is enough to augment an existing drum setup as well as for programming and triggering sounds and patches.

Mandala 2.0 offers a lot of power for the price. You get a ton of samples and a cool pad that you can divvy up into different zones for a variety of sounds, effects, and triggering options. You can add your own samples, and the Beauty software gives you a realistic snare drum. This is an extremely flexible creative tool that can add a whole new chapter to your musical endeavors.

Value (1 through 5): 4

Synesthesia Corporation
synesthesiacorp.com

CAD

Trion 8000

By Rich Wells

The Trion 8000 (\$399) is the top model in CAD's Trion series of externally biased condenser microphones. This multipattern tube mic ships with a suspension shockmount, a 25-foot 6-conductor cable, a 115/230 VAC power supply with a ground-lift switch, and an aluminum carrying case. The mic has a large-diaphragm (1.12-inch) gold-vapor-deposited capsule mounted in a lollipop-style grille on a bottle-type brass body. It is powered

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by discrete Class A electronics, with a transformer-coupled output and a 6J1 pentode tube housed within the body. A switch on the mic lets you select omni, figure-8, and cardioid patterns.

The 8000's output level is similar to that of other new low- and mid-priced tube condensers I've tried, and it's much louder than my circa-1970

Neumann UM57. Also like many newer tube mics (including the multipattern sE Electronics Z5600A I own), it has a fairly substantial and noticeable rise in frequency response at about 15 kHz.

TRY IT ON FOR SIZE

I used a close-spaced pair of 8000s, with one routed through an RME



▶▶ CAD's Trion 8000 is a cost-effective, large-diaphragm tube condenser mic with three selectable polar patterns.

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Fireface 800's preamp and the other through an API 312. In either case, the 8000 had extremely low self-noise. Through the API, it sounded as if the preamp's input and output transformers imparted some low end of their own, and the lower mids sounded more robust.

With the mic switched to the cardioid pattern, vocals sounded crisp but not overly bright. The proximity effect was quite pronounced through both preamps, but was noticeably more pronounced through the API. In figure-8 mode, the 8000 should be a good mic for vocal duets, as the response was quite similar on both sides of the capsule.

I placed the 8000 in front of a drum kit, about three feet from the ground and four feet from the kick drum. The mic emphasized and muddied the sound of the kick and toms more than the UM57 (with the CAD and Neumann



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both in omni mode), and much more than a Red Type B (with the CAD in cardioid mode and a cardioid capsule on the Red). The 8000's output transformer may have caused the low-end exaggeration I heard. Although the 8000 wouldn't necessarily be my first choice, I liked the aggressive bite it gave the kit when placed in front of the kick.

When I tried recording cymbals with the 8000 in an overhead position, however, it sounded a bit brash because of its 15 kHz bump. That same bump would ultimately affect my decision about whether to use the mic on cymbals or any other metallic, percussive instruments—or even a strident piano or raspy violin. At the very least, I might need to spend more time carefully placing the mic to abate the pronounced high end.

I felt completely comfortable using the 8000 on instruments containing a lot of mid frequencies, as long as they weren't too rich in high-frequency transients. It recorded a

Hammond M3 and a Wurlitzer 200A electric piano quite accurately, and it easily stood up to any other condensers I've used. Mellow acoustic instruments such as clarinet and classical (nylon stringed) guitar also sounded great.

SOME SURPRISES

I noticed one curious design choice: the hinge on the 8000's suspension mount positions the mic upright rather than upside down. Upside-down mounting is standard for tube mics to prevent the tube's heat from rising into the capsule and changing its response. This unusual design shouldn't be a major problem, because you can chain mic mounts or contort a boom stand to reverse the mic's position, but you can't easily take the suspension mount apart and reverse it.

I had originally requested two mics for the review, but CAD ultimately needed to send three complete packages and a fourth power

supply. After several days of use, one of the mics simply stopped working in the middle of a session, and I had to ask for a replacement. Then, two power supplies arrived DOA, blowing their supplied fuses the first time I powered them up. CAD assured me that the problems were isolated to a single faulty shipment, and that only about a dozen mic packages in all had to be replaced.

That issue aside, the Trion 8000 is a multi-purpose microphone that sounds quite good on vocals and a variety of instruments. It can handle high SPLs without flinching, and its 25-foot cable is much longer than those provided with other comparably priced tube mics. The 8000 delivers ample versatility at a good price, and its three polar patterns only enhance its flexibility and value. **em**

Value (1 through 5): 3

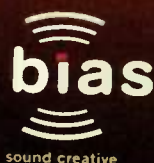
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Patrick Carroll / FADB-1 (Initial response)

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Patrick Carroll, Cedarhurst, NY

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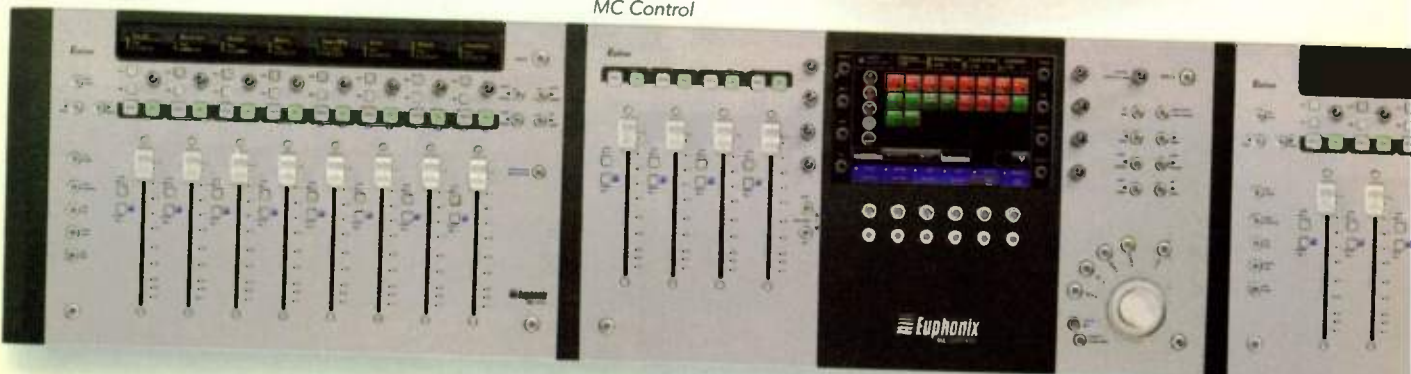
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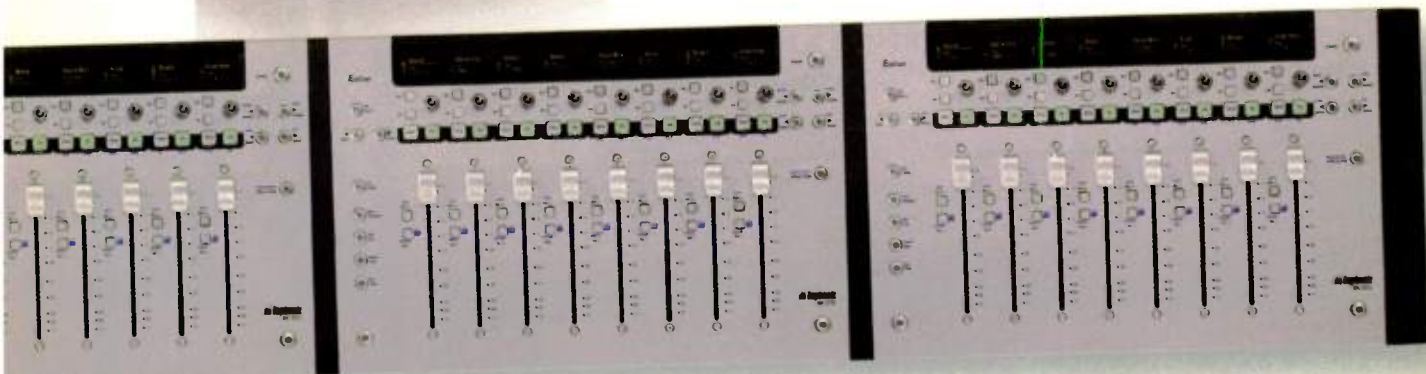
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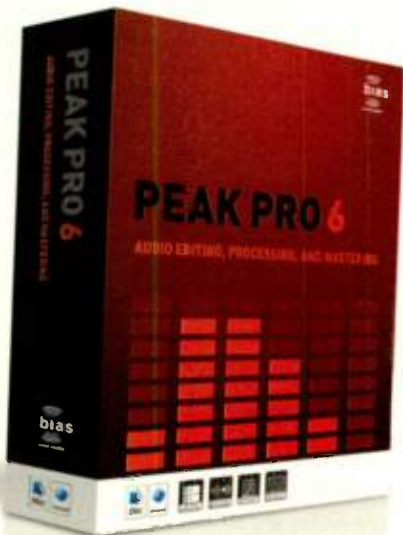
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World Radio History

So You're Graduating?

By Nathaniel Kunkel



I know quite a few of you graduating folk—and as you finish music or engineering school, you probably have a few ideas about what's going to happen in your career. Most likely, however, you don't really know.

I can dig it. As I pondered your predicament, I was reminded of all the things I thought about the business when I was 18, heading for my first studio gig. I'll tell you, I was wrong about so much stuff. But I was right about some things, too. The problem is, you go through those first few years thinking everything you think is right. So it's tough to tell when you're the one who's out to lunch, or when it's really your boss or your coworker who's a tool and just doesn't get it.

So I wondered, "If I knew then what I know now, what would I tell myself?" Here's my list to myself at age 18 of the things I wish I could tell myself then, now:

Dear Me,


Overall, things are going to work out fine for you. Really—you're going to have a great career. However, if you could keep the following things in mind this time around, it should make our life a lot easier.

1. Don't take stuff personally in the music business. It's hard not to, but don't do it. You will have outcomes to situations that are not what you were expecting. Don't sweat it; things all happen for a reason. If you handle all those situations with grace, it will come back good for you. I promise.
2. Work as hard as you want to, but don't let it get to you when others don't want to work so hard. Take what you do seriously, but don't let others derail your focus. Find different help, or do it yourself—but don't let the lack of enthusiasm of others diminish yours.
3. You can get anything you need to get done in a business meeting if you remove emotion from your argument.
4. Do not be a jerk and try to be fun to be around. A reputation for being an ass gets around so much faster than a reputation for being a great guy. People like to tell stories about jerks. Stories about nice guys are boring. But nice guys work more.
5. Never forget how hard it is to be on the other side of the glass, looking at someone behind a console making judgments about your work. It can be either the best experience in the world or the worst. Do all in your power to make it the former. This really matters.
6. If you have a great experience with a vocalist in the studio, ask to have your picture taken with them. This goes for players, too. I wish I had a picture of myself with Jeff Porcaro right now. Work that out for me, okay?
7. Become proficient at piano and guitar. Now.
8. Learn Linux.
9. Never, ever, ever, date the singer.
10. Save money (this could be No. 1—it's a toss-up).

Have fun—this is going to be a wonderful ride. Just don't worry too much!

Best regards,

You

Well, there you have it. I'm sure some of you will think that reading this was a waste of ten minutes. It certainly would have been for me; I didn't have it then. But on the off chance that there was something here you needed to read, then cheers. And, of course, congratulations and best wishes. 

Nathaniel Kunkel (studiowithoutwalls.com) is a Grammy and Emmy Award-winning producer, engineer, and mixer who has worked with Sting, James Taylor, B.B. King, Insane Clown Posse, Lyle Lovett, I-Nine, and comedian Robin Williams.



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