MAKE YOUR PERSONAL STUDIO ECO-FRIENDLY
NOTATION BASICS
MAY 2008

em

ELECTRONIC MUSICIAN

MASTER CLASS:
ABLETON LIVE 7
DRUM RACKS

REX TIPS FOR
PROPELLERHEAD
REASON 4

ENHANCING
DRUM RECORDINGS
WITH LOOPS

Large-Diaphragm Condensers

UNDER $100

CD BABY'S FOUNDER ON SUCCEEDING IN THE MUSIC BIZ

REVIEWS:

CAKEWALK SONAR 7
SONY PCM-D50
DANGEROUS MUSIC D-BOX
DIGIDESIGN PRO TOOLS LE 7.4
ADOBE AUDITION 3
AND 7 MORE

A PENTON MEDIA PUBLICATION

EMUSICIAN.COM

GO GLOBAL

AUDIO • FILM • PRODUCTION

CERTIFICATE • DIPLOMA • DEGREE*

SAE INSTITUTE

www.sae.edu

OPEN HOUSE

May 17th: Atlanta, Los Angeles, Miami, Nashville
May 18th: New York City

*programs not offered at all locations

New York 212.944.9121 • Atlanta 404.526.9366
Los Angeles 323.466.6323 • Miami 305.944.7494 • Nashville 615.244.5848

Over 50 Institutes in: USA FRANCE GERMANY HOLLAND SWEDEN BELGIUM AUSTRIA SWITZERLAND SPAIN ITALY SLOVEN
GREECE KUWAIT JORDAN AUSTRALIA NEW ZEALAND UNITED ARAB EMIRATES INDIA MALAYSIA SINGAPORE
Soon in: TURKEY and JAPAN

FROM THE KEYS TO THE CROWD: CONNECT.

Roland

You've practiced your set, and you know your songs inside and out. But to really deliver your performance, you need a serious stage piano. Meet the new **RD-700GX** and **RD-300GX** from Roland, and experience a whole new level of power and expression when you dig your fingers into the incredible PHA II **"Ivory Feel"** keyboard (RD-700GX) – a true extension of your creative voice. The pristine stereo-sampled pianos deliver that elusive high-end acoustic piano sound, and you can even custom-design your own piano voice with the Piano Designer feature. So don't just run your set; connect with your audience and get inspired with the new RD-700GX/-300GX. Because the ultimate stage piano performance starts with you.

To see the new RD-700GX and RD-300GX in action, visit **www.RolandUS.com**.

RD-700GX

RD-300GX

BRIAN CULBERTSON
#1 Billboard Contemporary Jazz recording artist, songwriter and producer

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.

CROSSBREEDER **GOLDEN EAR** **BITMEISTER** **CONE HEAD** **NIT-PICKER**

These are some of the 3500 technicians, assemblers, designers, software programmers and engineers who are BEHRINGER.

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.

Uli Behringer supervised development of the B412DSP.

To hear the B412DSP is to be totally blown away. By keeping signal processing in the digital domain, it's able to deliver a whole new level of accuracy — as well as butt-kicking dynamics and smooth audience-wide dispersion.

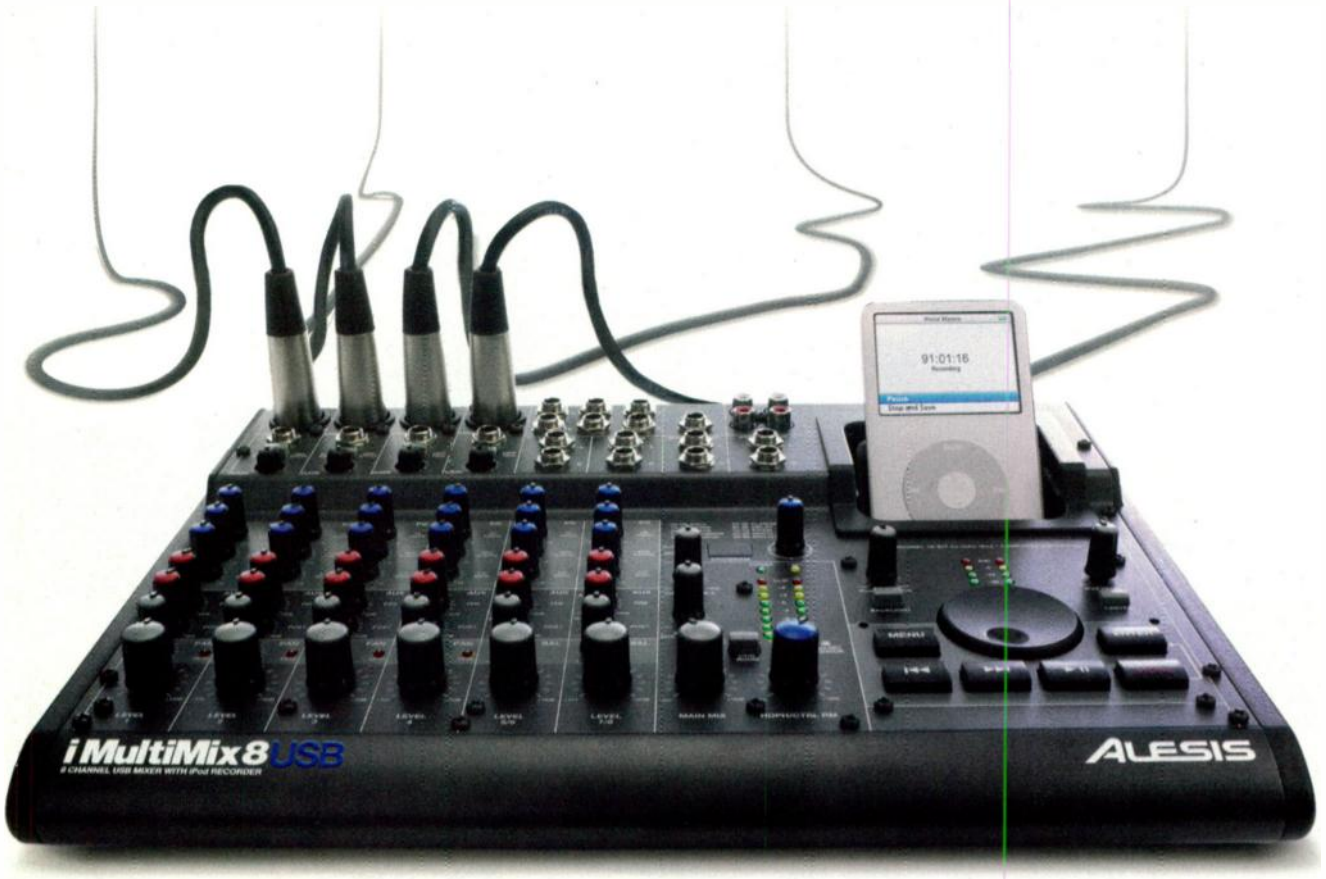
Log on for the complete story or get your nether parts whooped at a BEHRINGER dealer today.

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

BEHRINGER

Professional recording—straight to your iPod



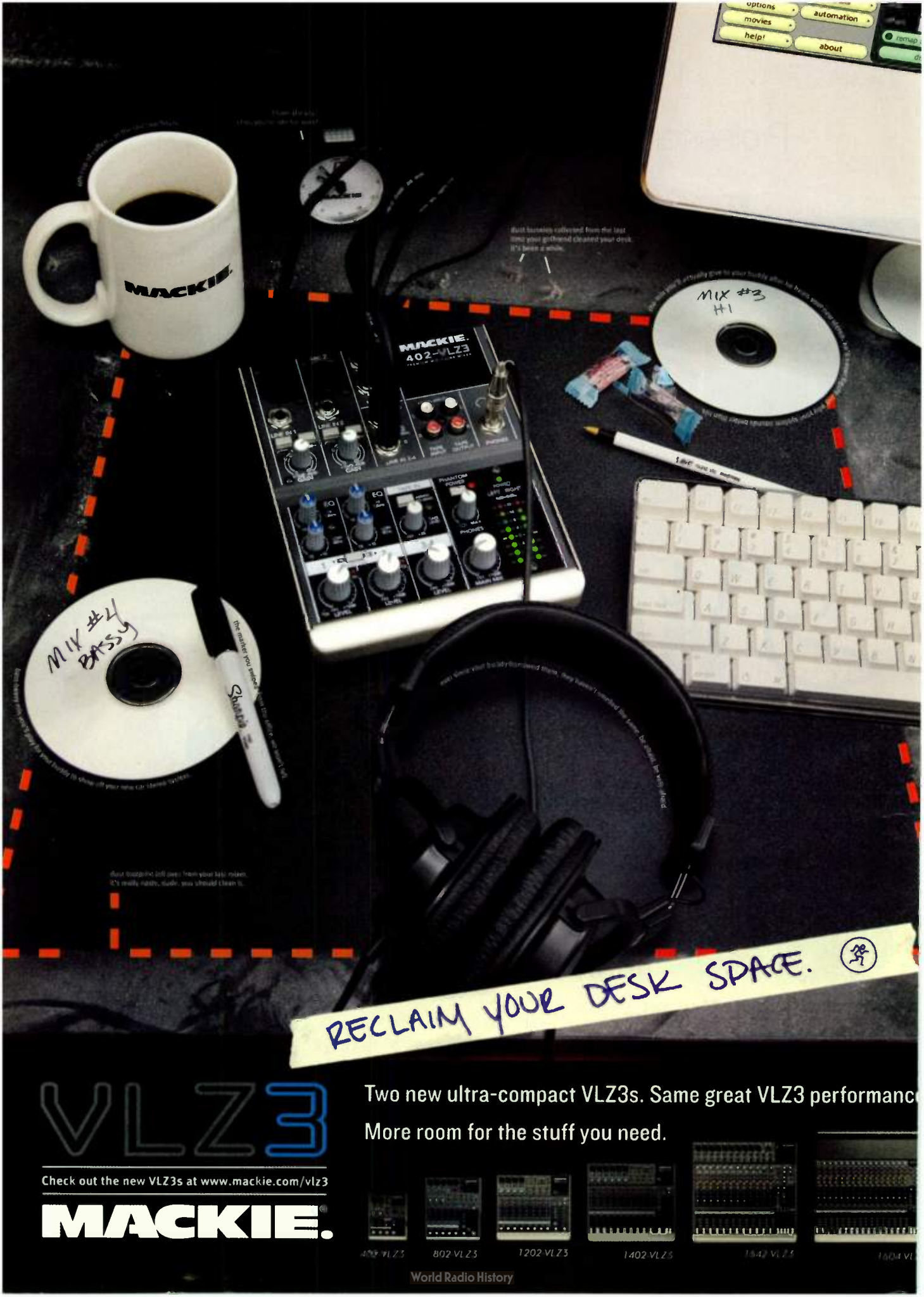
No matter where you make music capture your performance perfectly with an iPod and the iMultiMix8 USB

8 channels › 4 mic preamps › guitar inputs › 3 band EQ › USB recording › built-in effects

iMultiMix8 USB

Records to any 5G iPod or 2G Nano

ALESIS



ELECTRONIC MUSICIAN

MAY 2008 VOL. 24, NO. 5

FEATURES

BOB MONTESCLAROS

46

BUDGET MICS, BIG SOUND

In the past, few home-studio owners could afford quality large-diaphragm condenser microphones. Today, a mere C-note buys a good large-diaphragm condenser. We compare four inexpensive models, focusing on sound quality and craftsmanship.

By Rusty Cutchin

38

MASTER CLASS: RACK 'EM UP

Ableton Live 7's Drum Rack virtual instrument opens up a wealth of new sequencing and slicing techniques. Here are five ways to get more life out of Live.

By Len Sasso

COURTESY CHUCK CONOVER/ZAPPS.COM

54

IT'S EASY BEING GREEN

It's in everyone's best interest to adhere to eco-friendly practices. We show you practical ways to reduce consumption and lower your studio's impact on the environment.

By Jon Chappell

DEPARTMENTS

EM (ISSN 0884-4720) is published monthly with an extra issue in October by Penton Media, Inc., 9800 Metcalf Ave., Overland Park, KS 66212 (www.penton.com). This is Volume 24, Issue 5, May 2008. One year (13 issues) subscription is $24. Canada is $30. All other international is $50. Prices subject to change. Period cals postage paid at Shawnee Mission, KS, and additional mailing offices. Canadian GST #129597951. Canadian Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 40612608. Canadian return address: Bleuchip International, P.O. Box 25542, London, ON N6C 6B2. POSTMASTER: Send address changes to EM, P.O. Box 15605, North Hollywood, CA 91615.

em ELECTRONIC MUSICIAN

30

COLUMNS

QUICK PICKS 114

- >> **Notion Music Progression (Mac/Win)** notation program
- >> **CEntrance MicPort Pro** USB audio interface
- >> **Novation nio 2|4 (Mac/Win)** USB audio interface
- >> **Synaptricity Flashback 1.0 (Mac)** recording plug-in
- >> **MusicLab RealStrat 1.0 (Mac/Win)** software instrument

REVIEWS

HOW'S YOUR SIGNAL?

Pro Tools™

SONAR™ 7

TRUE HD

SONAR 7 is still the only end-to-end 64-bit Digital Audio Workstation.
That means you are working with the highest audio-quality in the industry
...no rabbit ears required.

> BETTER MIXES
> HIGHER AUDIO FIDELITY
> MORE HEADROOM
> EXTENDED DYNAMIC RANGE

Visit www.cakewalk.com/SONAR for more information.

Also available in Pro Suite, a collection of the finest Cakewalk has to offer: SONAR 7 Producer Edition, Project5, Dimension Pro & Rapture

cakewalk

Online @emusician.com

The Electronic Century Part 1: Beginnings

When and where did electronic music start? This article from the EM archives is the first in a 4-part series that explores the instruments, artistic ideas, business concepts, musicians and entrepreneurs, and technical breakthroughs in music technology beginning in the early 1900s and leading into the 21st century. Part 1 covers the earliest instruments, from Thadeus Cahill's Telharmonium to the RCA Mark II synthesizer. **emusician.com/tutorials/electronic_century1**

By Joel Chadabe

EM Spotlight

Shoptalk with Shel Talmy

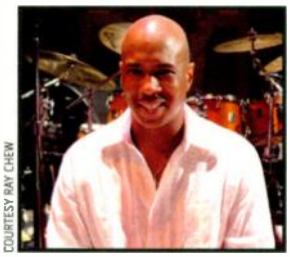
The sounds of the '60s British Invasion can be attributed in part to the work of American-born producer Shel Talmy. In this archive interview, Talmy shares some of the secrets that helped him make bands such as the Who, the Kinks, Manfred Mann, and Small Faces a success. **emusician.com/em_spotlight**

By Michael Molenda

Resonance and Radiation

A little knowledge about the physics of sound can go a long way in the personal studio. Learn about the resonant radiation patterns of various acoustic instruments—strings, brass, woodwinds—which will allow you to determine mic placement that will yield optimum audio reproduction. **emusician.com/tutorials/resonance_and_radiation**

By Scott Wilkinson



COURTESY RAY CHEW

EM Cast

Our twice-monthly Podcast features interviews with Stacy Jones of American Hi-Fi, producer-engineer Michael Barbiero (Counting Crows, Ziggy Marley, the Allman Brothers), producer–music director Ray Chew *(Showtime at the Apollo)*, and sound designer Scott Sanders (Ear Candy studios). **emusician.com/podcasts**

Helping you choose the right gear...

Making sure it arrives on time...

Taking care of you after the sale...

That's our job...

SALES

"I'm all about the gear — how it works, why it does what it does, how it compares to other products. I spend time in my own studio and a lot of time each week before and after work training with manufacturers so I'm on top of what's new. This way I can quickly narrow down my customers, needs, and make sure they get exactly the right piece of gear."

SHIPPING

"As a musician with a home studio, I know what it's like to pick out just the right gear, and get excited waiting for it to arrive. When the box shows up on the day you expect it, and you open it up and see that everything's perfect — that smile comes across your face. I want every Sweetwater customer to have that feeling."

TECH SUPPORT

"Every customer's setup is unique to them, and I understand the challenges that come along with getting all those pieces to work together. For all of us, any technical issue can be such a creative roadblock. I like knowing that I'm helping customers get on their feet and right back into their projects."

Whatever project you're working on, whatever music you're creating — our job is to help you see it through. Call us today.

Sweetwater.com Goes Mobile!

We're the first in music retail to let you browse and buy on the go with your IPhone, Treo™, BlackBerry® or other mobile device! Shop online, check our knowledge base, or keep up with the latest gear info with InSync daily news.

Just go to Sweetwater.com. Your device will display our fast mobile website. You can also log on directly at m.sweetwater.com

Sweetwater

Music Instruments & Pro Audio

sweetwater.com • 1-800-222-4700

Giving Back

Do you have a personal studio and use it for pro-level, for-hire projects? Can you use an assistant engineer on some of your sessions? Got room in your schedule to be a mentor? All around the country, the engineers of tomorrow are graduating from recording programs today. With the number of large-scale studios—once the proving ground for people interested in pro audio—on the decline, where are these graduates going to cut their teeth in high-level, real-world situations once they've mastered the fundamentals in school?

Sure, anyone with a few hundred bucks can assemble enough gear to build a simple studio. But there is more to the recording arts than having the latest DAW or a collection of Class A mics and preamps. And spending a few years of trial and error doesn't guarantee a solid skill set or golden ears.

Besides the major-league schools, such as Ex'pression College for Digital Arts, Full Sail University, Conservatory of the Recording Arts and Sciences, and the SAE Institute, there is a remarkable number of music-production programs in city, state, and community colleges, and nonprofit groups such as the Women's Audio Mission in San Francisco, not to mention public and private high schools. Once they finish their courses, the students from these institutions will be looking for ways to hone their skills and pay their dues.

JANE RICHEY

As a part-time instructor at Diablo Valley College, in Concord, California, I have first-hand experience with some of these budding recordists. The course I teach, Introduction to Pro Tools, is part of the school's Music Industry Studies program. But it is just as much a Recording 101 class, where I cover basic recording tools, miking techniques, and effects processing. Agewise, my students range from teenagers, some of whom are still in high school, to retirees.

The more motivated of my students are chomping at the bit to get out there and gain experience, and on occasion I've been able to foster contacts for them with local studios. They want to learn how to solder cables; they want to learn how to organize a patch bay; they want to learn mixing and mastering techniques. In fact, they usually want to know it all. Is that where you come in?

We all have projects where, at some point, having an assistant would be handy. Why not look to your local schools? I'm not suggesting you offer a full-on internship program—it could be as simple as inviting a student to help set up the mics and DIs for a series of recording dates, and then help tear them down and put them away. If you're doing live sound for a band, it might be as simple as letting a student assist you on a sound-reinforcement gig. It might even be as easy as inviting an interested student to a mixing session and letting them observe the process as well as ask appropriate questions. Although the latter scenario doesn't let you exploit their muscle, you do get the satisfaction of knowing that you helped someone who's just starting out.

Obviously, one of the things the student will constantly be reminded of is that it takes a lot of work to get things to sound their best. But knowing how things *should* sound is the key, and this is where your experience will be the most helpful. For example, anyone can figure out how to use a compressor. Knowing exactly how much to use it during a mix—perhaps that's where you come in.

So even though you may have the humblest studio in your area, if you're doing pro work, consider sharing your time and wisdom with someone just getting into the game. Chances are you'll also learn something valuable in the process.

Gino Robair
Editor

em ELECTRONIC MUSICIAN

EMUSICIAN.COM
A PENTON MEDIA PUBLICATION

EDITOR
Gino Robair, grobair@emusician.com

EDITOR IN CHIEF/DIRECTOR OF TECHNOLOGY
Steve Oppenheimer, soppenheimer@emusician.com

EXECUTIVE EDITOR/SENIOR MEDIA PRODUCER
Mike Levine, mlevine@emusician.com

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

COPY CHIEF
Marla Miyashiro, mmiyashiro@emusician.com

GROUP MANAGING EDITOR
Sarah Benzuly, Sarah.Benzuly@penton.com

GROUP EDITORIAL ASSISTANT
Tracy Katz, tkatz@emusician.com

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

EDITORIAL DIRECTOR
Tom Kenny, Tom.Kenny@penton.com

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

ONLINE PRODUCT DEVELOPMENT MANAGER
Tami Needham, Tami.Needham@penton.com

GROUP ART DIRECTOR
Dmitry Panich, Dmitry.Panich@penton.com

ART DIRECTOR
Earl Otsuka, Earl.Otsuka@penton.com

INFORMATIONAL GRAPHICS
Chuck Dahmer, chuckd@chuckdahmer.com

SENIOR VICE PRESIDENT
Kim Paulsen, Kim.Paulsen@penton.com

VICE PRESIDENT
Jonathan Chalon, Jonathan.Chalon@penton.com

EXECUTIVE ASSISTANT
Natalie Stephens, Natalie.Stephens@penton.com

GROUP PUBLISHER
Joanne Zola, Joanne.Zola@penton.com

ASSOCIATE PUBLISHER
Joe Perry, Joe.Perry@penton.com

EASTERN ADVERTISING DIRECTOR
Michele Kanatous, Michele.Kanatous@penton.com

NORTHWESTERN/MIDWESTERN ADVERTISING MANAGER
Erika Lopez, Erika.Lopez@penton.com

SOUTHWEST ADVERTISING MANAGER
Albert Margolis, Albert.Margolis@penton.com

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

MARKETING DIRECTOR
Kirby Asplund, Kirby.Asplund@penton.com

SALES EVENTS COORDINATOR
Jennifer Smith, Jennifer.Smith@penton.com

CLASSIFIEDS/MARKETPLACE ADVERTISING DIRECTOR
Robin Boyce-Trubitt, Robin.Boyce@penton.com

CLASSIFIEDS/SPECIALTY SALES MANAGER
Kevin Blackford, Kevin.Blackford@penton.com

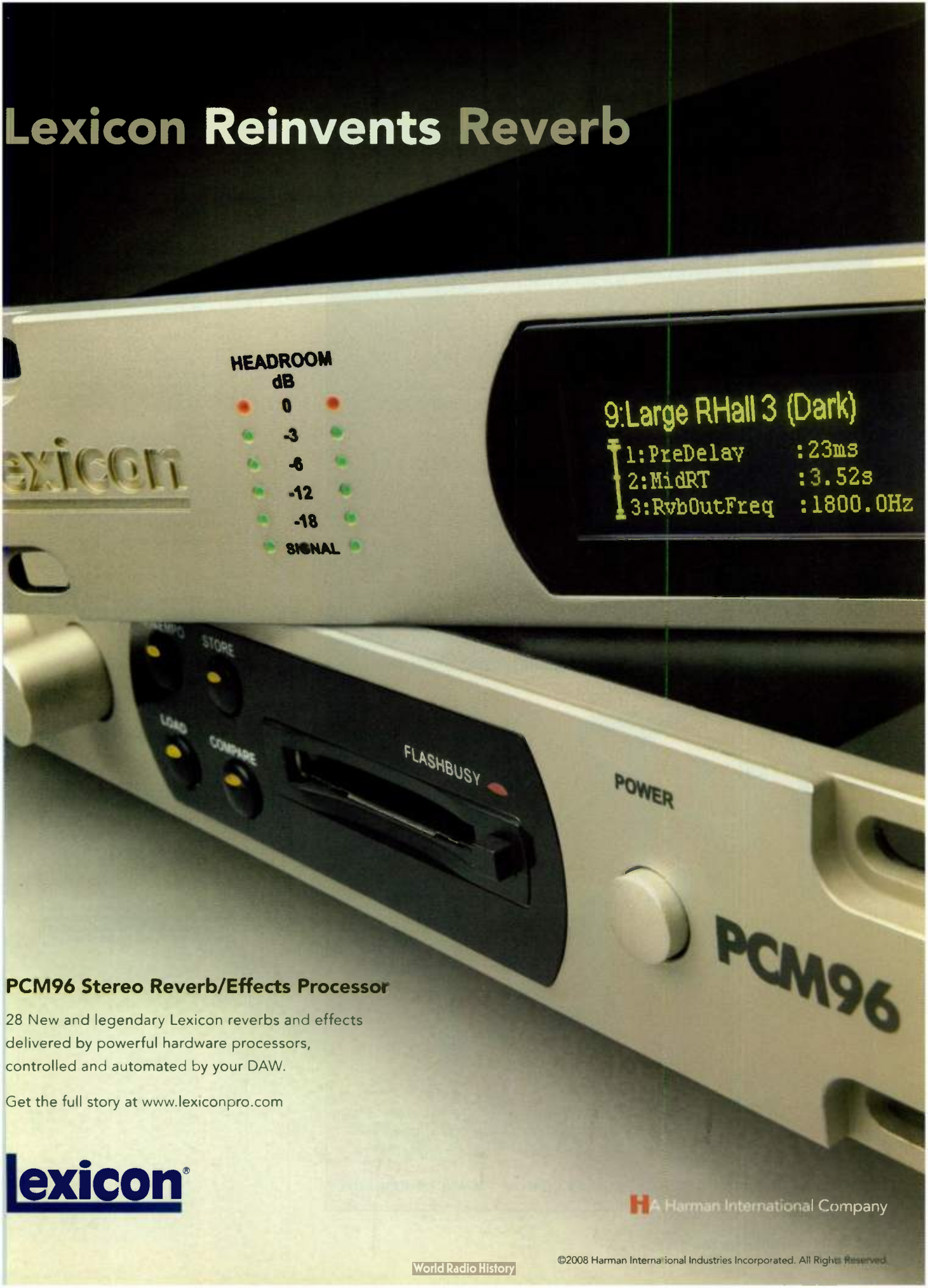
CLASSIFIEDS PRODUCTION COORDINATOR
Jamie Coe, Jamie.Coe@penton.com

GROUP PRODUCTION MANAGER
Melissa Langstaff, Melissa.Langstaff@penton.com

ADVERTISING PRODUCTION COORDINATOR
Jennifer Scott, Jennifer.Scott@penton.com

OFFICE MANAGER
Lara Duchnick, Lara.Duchnick@penton.com

Lexicon Reinvents Reverb



PCM96 Stereo Reverb/Effects Processor

28 New and legendary Lexicon reverbs and effects delivered by powerful hardware processors, controlled and automated by your DAW.

Get the full story at www.lexiconpro.com

Lexicon®

A Harman International Company

Penton Media

CHIEF EXECUTIVE OFFICER
John French, John.French@penton.com

GENERAL COUNSEL
Elise Zealand, Elise.Zealand@penton.com

EDITORIAL, ADVERTISING, AND BUSINESS OFFICES
6400 Hollis St., Suite 12, Emeryville, CA 94608, USA, (510) 653-3307

SUBSCRIBER CUSTOMER SERVICE
To subscribe, change your address, or check on your current account status, go to www.emusician.com and click on Customer Service for fastest service. Or email electronicmusician@pubservice.com, call toll-free (866) 860-7087 (U.S.) or (818) 487-2020 (outside the U.S.), or write to PO Box 16886, North Hollywood, CA 91606.

REPRINTS
Contact FosteReprints to purchase quality custom reprints or eprints of articles appearing in this publication at (866) 436-8366 ((219) 879-8366 outside the U.S. and Canada). Instant reprints and permissions may be purchased directly from our Web site; look for the RSiCopyright tag appended to the end of each article.

BACK ISSUES
Back issues are available for $10 each by calling (866) 860-7087 or (818) 487-2020.

PHOTOCOPIES
Authorization to photocopy articles for internal corporate, personal, or instructional use may be obtained from the Copyright Clearance Center (CCC) at (978) 750-8400. Obtain further information at www.copyright.com.

ARCHIVES AND MICROFORM
This magazine is available for research and retrieval of selected archived articles from leading electronic databases and online search services, including Factiva, Lexis-Nexis, and ProQuest. For microform availability, contact National Archive Publishing Company at (800) 521-0600 or (734) 761-4700, or search the Serials in Microform listings at www.napubco.com.

PRIVACY POLICY
Your privacy is a priority to us. For a full policy statement about privacy and information dissemination practices related to Penton Media products, please visit our Web site at www.penton.com.

CORPORATE OFFICE
Penton Media, Inc.
249 West 17th Street
New York, NY 10011

ABM BPA

PRINTED IN THE USA.

ALSO PUBLISHERS OF MIX®, REMIX®, MUSIC EDUCATION TECHNOLOGY™, COMPUTER MUSIC PRODUCT GUIDE™, PERSONAL STUDIO BUYER'S GUIDE®, AND PERSONAL STUDIO SERIES.

"Acoustic music has never sounded so good"

~ Jerry Douglas

"Radial makes a DI box that does exactly what it is supposed to do. No compromise."

Paul Boothroyd
(FOH engineer - Paul Simon, AC/DC, Paul McCartney)

"I'm really happy... I replaced my old DI's and found the J48's to have more output and less coloration. Acoustic music has never sounded so good."

Jerry Douglas
(Alison Krauss & Union Station, 12-time Grammy winner)

"I thought Radials only worked on cars, but since my sound man hooked them up to my guitar, I like them even better. Great clear and pure sound!"

Phil Keaggy
(world renowned guitarist/performer)

"It is nice to find great sounding industrial grade equipment still being made today!"

Daniel Lanois
(U2, Robbie Robertson, Bob Dylan, Peter Gabriel)

"Over the past 13 years I have used a variety of DI boxes. The Radial J48 is without a doubt the best, cleanest and most versatile DI I've ever used."

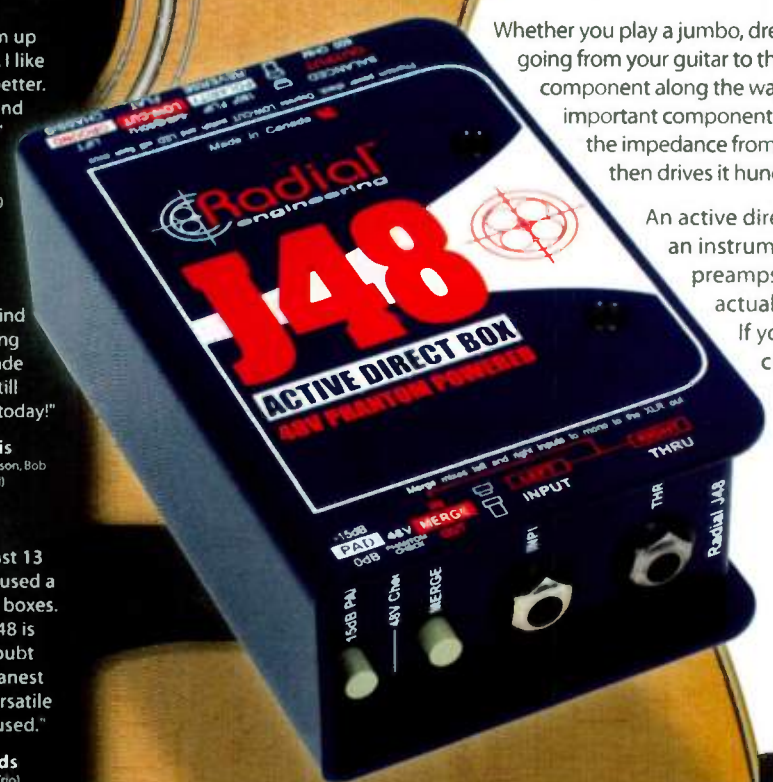
Paul Richards
(California Guitar Trio)

"With a Radial DI, the difference is surprising and dramatic. The sound is punchy, warm, solid and accurate. There's no going back!"

David Oakes
(Front of house engineer - Pat Metheny group)

"When it comes to sonic integrity, nothing touches Radial. Great gear built by great guys."

Steve Stevens
(Billy Idol, Atomic Playboys, soundtrack - 'Top Gun')



Whether you play a jumbo, dreadnaught, dobro or triple-0, the tone going from your guitar to the PA system depends entirely on every component along the way. And your DI box is the most important component of all: It takes the guitar signal, converts the impedance from hi-Z to low-Z, balances the line and then drives it hundreds of feet to the mixing console.

An active direct box like the Radial J48 is in fact an instrument preamplifier. And like studio mic preamps, the quality varies. But what actually makes a great direct box? Simple: If you take the time to design the circuitry so that you get the lowest harmonic distortion, virtually zero phase-shift, reduced inter-modulation distortion and then provide sufficient headroom so that even the loudest guitar will not choke the input stage, a funny thing happens... It sounds better.

Radial...
true to the music™

The Radial J48 active DI employs a unique digital switching power supply to maximize headroom. (Like having a turbocharged 500 horsepower engine in a luxury sedan). More headroom means more signal, less noise and less distortion. This ensures the natural tone, dynamics and feel of your guitar is delivered without artefact. To get the full story, visit our web site and check out the Radial Blue Report. It compares the Radial J48 with other popular DIs. The results are clear — the Radial J48 outperforms them all.

Radial® engineering

www.radialeng.com

1638 Kebet Way, Port Coquitlam BC V3C 5W9 tel:604-942-1001 email:info@radialeng.com

LETTERS

Music in Second Life

Good article on performing concerts in Second Life! (See the March 2008 issue of EM.) The real electronic musicians out there will be interested to know that there are many musical opportunities in Second Life apart from concerts. I have collaborated with several visual artists in Second Life on musical scores for ballets and machinima (movies filmed in Second Life), art installation soundscapes, and on creating specific sounds for various uses within SL.

—ZEROONE PAZ (AKA M. KOHL), VALLEJO, CALIFORNIA

SAVE A TREE: DELIVER DIGITAL

Since for some reason I didn't get my "analog" copy of EM this month, I took a look at the "digital" copy. Unreal! I have to admit I'm up on the latest technology, thanks to you guys, but when it comes to reading, I'm old-school. But your team thought of everything, including point-and-click page zoom. Great stuff. We could save a lot of trees this way. Plus my wife will stop bugging me to trash my over 100 old copies placed sporadically over our house.

You guys keep amazing me.

MITCH CLYMAN/MUSO PRODUCTIONS LTD.
VIA EMAIL

INDIE INSIGHT

I recently received EM for the first time (with the February 2008 issue), and I enjoyed it very much. I was particularly happy to read the "First Take" editorial page and the comments of Amber Newman in the letter called "Real Indie Request." I was glad to see Gino Robair's response about offering more on indie artists and how they create their music.

MIKE FLETCHER
VIA EMAIL

CELLOS TO CELLOS

I am a long-time fan of your magazine and look to it for guidance and unbiased opinions on the myriad of electronic toys out there. I look forward to reading new product reviews each month, especially about sound libraries, as my purchasing decisions are based largely on your review assessments. Until now, that is.

I was anxiously awaiting an EM review of the new Garritan Gofriller Cello. I was expecting your reviewer (see the September 2007 issue) to compare Gofriller Cello with other cello libraries, as is the norm—apples to apples. Instead, the comparison was made against a real cello, which your reviewer just happens to own and play. That is plainly unfair. We all know that sampled sounds will never replace real instruments, so the reviewer did EM a huge disfavor and caused me to seek other reviews from magazines that did the job properly. I can only conclude that your reviewer may have a personal agenda, or, more likely, he was more bent on extolling his virtuosity and profound experience on the intricacies of cello technique. This is not your usual standard of reviewing, and I wonder if anyone else feels as I do.

JOHN BONICA
PORTLAND, OREGON

Author Jim Aikin replies: Mr. Bonica—You're right that a product review should compare apples to apples, not apples to oranges. In the case of a software instrument or library that is aimed specifically at realism, however, a comparison with the real thing will be of vital interest to musicians. If we didn't compare a software emulation to the real thing, we would have no benchmark by which to measure its success or its shortcomings. This is equally true of reviews of software-based emulations of analog synthesizers, by the way. Wherever possible, EM compares the software with the real thing.

I'm far from a virtuoso cellist; I'm a very decent amateur, but I'm not conservatory trained. The point of comparing specific cello techniques with the possibilities offered by Gofriller Cello was certainly not to boast about my abilities. Rather, my goal was to educate readers (many of whom are not string players) on some of the subtleties of string technique, in order to illustrate how Gofriller reproduces these subtleties, or attempts to.

In any case, Gofriller Cello is not a sampled string library, so there are really no other computer-based products with which it could be fairly compared. Gofriller uses some new approaches to produce more-realistic

WE WELCOME YOUR FEEDBACK

Address correspondence to:

Letters
EM
6400 Hollis Street, Suite 12
Emeryville, CA 94608

or email us at emeditorial@emusician.com. Published letters may be edited for space and clarity.

STUDIO POWER in your POCKET

The POCKETRAK 2G is the smallest, easiest to use and most portable digital recorder available today. It easily fits in a shirt pocket so you can take it everywhere. The 2G features 2GB of built-in memory so you don't need external memory cards, and the built-in USB 2.0 connectivity makes it easy to transfer your linear PCM or MP3 recordings to and from your computer. Long battery life with the eneloop battery technology, a high sensitivity tilt-up stereo microphone and built-in stereo speakers make the POCKETRAK 2G a complete recording studio in your pocket. The bundled Cubase AI DAW software lets you easily edit and master your audio recording on your computer.

1.7 Ounces and slim true pocket-sized design

Tilt-up mic for tabletop recording

Eneloop rechargable battery with up to 19 hours of battery life

Built-in speaker and headphone outs

Bundled Cubase AI4 DAW software for editing and burning CDs

Built-in 2GB memory and USB2.0 for easy transfers to your computer

YAMAHA

www.yamahasynth.com

NEXT MONTH IN EM

JUNE 2008

COVER STORY

Production Values: Victor Wooten

Virtuosic electric-bass player Victor Wooten talks about recording his latest CD, getting great bass sounds, playing live versus recording in the studio, and more.

FEATURES

Portable Field-Recorder Roundup

EM compares nine portable stereo field recorders.

Windows on the Mac

We describe the ups and downs of running Windows on a Mac—in particular, the tribulations of loading and running different audio applications and installing audio hardware.

COLUMNS

Square One: All About Dither

We explain what dither is, why and when you need it, and which dither to use for various purposes.

Making Tracks: Say What?

Find out what happens when you set up a speech synth and hijack its output.

Sound Design Workshop: REX Tips for Propellerhead Reason 4, Part 2

Learn how to process REX-file beats using NN-XT, effects, and modulation routings.

Industry Insider: Q&A: Jordan Tishler

The head of Digital Bear Entertainment talks about how you can develop new business opportunities from your studio.

. . . and much more!

LETTERS

emulations of string playing than are possible with normal sampling. The review highlighted both the successes of these approaches, which are considerable, and the areas where more work remains to be done.

STREET-SMART

I just read Gino Robair's editorial about using MAP prices instead of MSRP (see "First Take" in the December 2007 issue), and I want to thank you for doing this. The manufacturers should

thank you as well.

There are many reviews in publications from many industries that use MSRP, and these prices are often pretty shocking. MSRP turns me off to the product because it seems to put it out of my price range, even though the street price may be half of the MSRP.

Thanks for a great magazine.

CHRIS ADAMS
VIA EMAIL

EM'S MAKEOVER—YEA OR NAY?

Here is a little feedback on your magazine redesign:

It appears that the type size has dropped from 9 point to 8 point (or you've just switched to a more-difficult-to-read typeface). While this may be great for an "airier" and more contemporary look, it's hell on old eyeballs. I have no doubt that your average reader is considerably younger than I, and perhaps you shouldn't be concerned about the more fossilized of your readers. But if it comes to a choice of wearing reading glasses to peruse your magazine or to stop reading it altogether, I will opt for the latter. I vote for larger type.

Small type is one thing, but putting it on a black background with blue heads, like on page 50 of the February 2008 issue, is really over the top. Just the headline (on page 49, I think; I don't have my glasses on) scared me all the way to page 59, where I hit that 8-point type again and had to write this letter.

As far as the EM logo goes, knock yourselves out. I hope your newsstand sales don't suffer too much, though. I fear that you might be a little too close to your publication in figuring that if you refer to the magazine as EM, everyone else does, too. For the guy buying off the newsstand, Electronic Musician is a lot more descriptive. The new logo looks decent, though.

Okay, I'm done. All sarcasm aside, I really enjoy the magazine and get a lot of useful information from it. But come on guys, give me something I can read.

Old guy with faltering vision . . .

JOHN STONEHAM
VIA EMAIL

> There are many musical opportunities in Second Life apart from concerts.

I wanted to absolutely rave about the direction that you have taken EM in! The integration between print and online is the best I have seen anywhere in the publishing business (and I've been really studying this with my music partner and longtime professional magazine editor Joel Schalit). It is no small feat, and I do not make this statement lightly.

And the content, the choice and quality of the articles, have really taken a quantum leap. The inclusion of more-detailed, high-end how-to articles is very much appreciated. Finally, content that I can use: technical articles that describe more-advanced uses of technology. Tips and tricks that are actually useful to those of us who have been working with electronic-music tools for more than a few years are a welcome change. The quality of the writing seems to be up across the board, too.

There was a time when I was ready to blow all of the U.S. music mags off as technologically simplistic advertising books . . . but no longer. Go cat go!

VANCE GALLOWAY
VIA EMAIL

START MAKING SENSE

I just wanted to drop you a note to say I really enjoyed your March article on vinyl mastering. (A big part of my childhood music-listening experience now makes sense!) I also thought your intro remarks ("First Take," March) were very poignant.

VIVEK MADDALA
VIA EMAIL

ERROR LOG

March 2008, "Apple GarageBand '08 4.1.1," p. 109. To test GarageBand, the reviewer used a late-model dual-core 2.4 GHz MacBook Pro with 4 GB of RAM and Mac OS X 10.5, not 10.6.

EuCon • Apple LOGIC PRO • Steinberg NUENDO • Apple SOUNDTRACK PRO • Steinberg CUBASE • MOTU DIGITAL PERFORMER
• Apple FINAL CUT PRO • Propellerhead REASON • Ableton LIVE • Digidesign PRO TOOLS (HD/LE/M-Powered)

the perfect mix...

...of form and function

The new MC Mix brings the unparalleled speed, resolution and DAW integration of Euphonix' high-end professional consoles to your studio in a revolutionary ergonomic, slim-line design. Effortlessly switch between multiple applications and even workstations at the touch of a button – the touch-sensitive knobs, motorized faders, and high-resolution OLED displays automatically set themselves to the currently active application to deliver an unmatched mixing experience.

Mac Universal

20 YEARS

euphonix.com

Euphonix artist

FRONT PANEL

By Tracy Katz

Play with the Pros

Traditional instrumentalists, especially guitar players, should add the video tutorials at iVideosongs (ivideosongs.com) to their arsenal of musical resources. Through its beginner-, intermediate-, and advanced-level videos, iVideosongs provides focused instruction on how to play popular songs (in a number of genres, from rock and folk to pop and R&B), taught by studio musicians and/or the artists who wrote them.

Unlike the videos found on YouTube, these are presented in sharp, high-definition MOV format and can be downloaded and viewed chapter by chapter (Intro, Verse, Chorus, for example). You can also view tab and notation for each song to help you nail a certain chord or melody.

Each video shows close-ups of the instrument as the instructor plays it, so you can see the correct finger placement and playing technique. The biggest advantage is that you can play the lesson over and over until you get it, without the pressure of an impatient instructor watching you. At about $10 each, these tutorials are a real steal considering that the price of a typical one-hour lesson from a professional musician often starts at $50. The site has free tutorials as well, which teach playing basics such as chord transitions and alternate picking.

Although iVideosongs is still in beta, its existing collection of tutorial videos and instructional material is impressive and is sure to grow extensively over the years. The site offers players at any level an efficient way to learn a complete song and hone their skills at the same time.

OPTION-CLICK

By David Battino

Unless you right-click, you might never know that Stylus RMX comes with dozens of trippy effects presets. You can even save your own.

Strutting in Stylus

Discover cool features lurking inside popular programs and gear

Spectrasonics Stylus RMX serves up great-sounding drum grooves as fast as you can click, but it also has several hidden time-saving features: 1. Right-clicking (Control-clicking on the Mac) on an effect panel in the FX rack pops up a menu that lets you save and load presets. Right-click on the rack itself, and you can save and load entire racks of effects. Stylus comes with quite a few tasty presets. 2. Like to explore? Beginning in version 1.5.1c, right-clicking on the browser window shows a list of the sounds you've just auditioned. 3. Say you've edited a Groove Element and want to hear what those settings (filter, effects, chaos, and so on) sound like applied to a different groove. Just turn off the Settings button, select the new Element, and click on the Settings button again. (For more about David Battino's work, visit batmosphere.com.)

True or False?

1. The first theremin virtuoso was Lydia Kavina.

2. The first tape recorders became available in the 1930s.

3. The first instrument that Robert Moog built and sold in the late '50s was the modular analog synthesizer.

THIS MONTH'S SOUNDTRACK

These albums encompass a diverse range of styles and composition methods, from down-tempo, electro, and chiptune to electronica and acoustic.

1. 46bliss: *Wish Me Away*
2. Pavmire: *Cryosleep*
3. Laromlab: *Laromlab*
4. Drifting in Silence: *Fallto*
5. Spottiswoode & His Enemies: *Salvation*

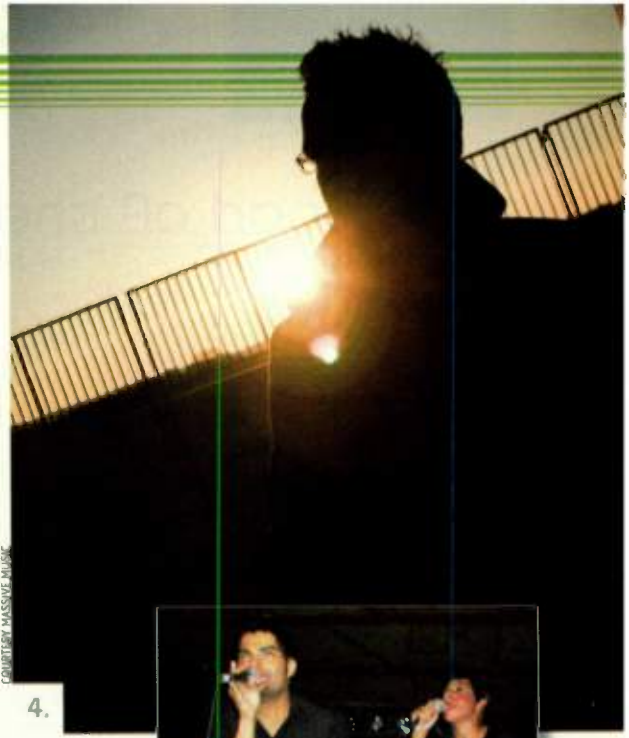
46BLISS
Dreamy and nostalgic songwriting combines with uplifting beats and sweet vocals to awaken the senses.

PAVMIRE
Inspired by the likes of Depeche Mode and other retro luminaries, this dark electro album is completely original.

LAROMLAB
The funked-out pairing of old-school games, beats, and songs proves that you can indeed rock out to chiptunes.

DRIFTING IN SILENCE
Unexpected yet complementary timbres come together, melting the boundaries between all genres.

SPOTTISWOODE & HIS ENEMIES
Composed with steel guitars, piano, and mandolin, this album is chock-full of acoustic goodness.


COURTESY MASSIVE MUSIC

1.


ROBERT CALDAROLA


2.


COURTESY ERRANT PROMOTIONS

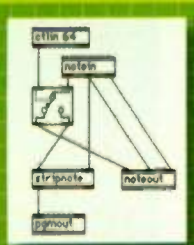
3.


NICK PINTO

5.

EM POLL

What is your main application for using a handheld recorder? a) Recording gigs and rehearsals, b) capturing song ideas, c) recording ambient and nature sounds, d) recording interviews, e) music mixdown and archiving, f) something else, g) I don't want or need one. Submit your answer to this poll and others at emusician.com. Your participation allows the editors of EM to learn more about you!



4. The first computer music composition was played by Max Mathews's Music I sound-generating program.

5. Frequency modulation (FM) was developed by Jean-Claude Risset.

6. The first E-mu Emulator I was sold to Tangerine Dream.

Download of the Month

U-he

MFM2 (Mac/Win) By Len Sasso

MFM2 ($79) is a reincarnation of Urs Heckmann's first VST plug-in, More Feedback Machine. It could be subtitled "Everything you always wanted from a delay effect and a few things you probably didn't." It starts with four stereo delay lines and a four-by-four feedback matrix that lets you feed the output of any delay to the inputs of any combination of the others as well as itself. Needless to say, the feedback can get out of control in a hurry, and, fortunately, there's a large Panic button. Six factory feedback-matrix presets also help keep you out of trouble.

Each MFM2 delay has its own multimode filter, which you can insert at seven points in the delay signal path: at the left, right, or summed input; at the left or right dry output; at the delayed output; and between the delay and the feedback matrix. Each pair of delays also has a multi-effects processor with five effects: SoftClip, Decimate, Phaser, SideBand, and Filter. Unless bypassed, the effects always come between the delay and the feedback matrix. My favorite is SideBand. It's a frequency shifter that shifts all the harmonics (sidebands) of the signal by the same amount, thereby distorting their harmonic relationship and producing a clangorous effect. A 4-band modulation matrix lets you route various MIDI messages, four built-in LFOs, and two multisegment envelope generators to virtually any MFM2 parameter. Furthermore, you can modulate the modulation amounts by the same sources.

MFM2's flexible feedback system coupled with delay times as short as 1 ms, sync to tempo, and sync to pitch make MFM2 ideal for resonator effects as well as long multitap sequences (see **Web Clip 1**). The large, categorized collection of factory presets is a great starting point for exploring MFM2. From subtle to extreme delay effects, you won't find a more capable or reasonably priced plug-in. A demo version for both platforms is available from the u-he Web site (u-he.com).

ONLINE BONUS MATERIAL

Broken Toys

COURTESY BENT FESTIVAL 2007 LA GALLERY

The Bent Festival is making its way to Minneapolis, L.A., and New York City for three days (per city) of hardware-hacking fun in late April/early May. Those fortunate enough to attend will experience in its full glory the fantastic art form known as circuit bending, which involves the transformation of existing instruments and toys into new, unique instruments. If you like modifying hardware, messing with do-it-yourself electronics, and making weird noises, you'll enjoy getting Bent.

The festival boasts the largest number of circuit benders and DIY electronics performers in one place; they will teach workshops, perform nightly concerts, and inspire attendees with their interactive art installations. The Bent Festival is produced by the Tank, a nonprofit organization run by volunteers. To learn more, visit bentfestival.org. em

Want to circuit bend? The following sites will help you get started:

- The Art of the Creative Short Circuit
  emusician.com/diy/art_creative_short
- Reed Ghazala's Anti-Theory Workshop
  anti-theory.com
- Oddmusic Circuit Bending Section
  oddmusic.com/illogic
- GetLoFi Blog
  getlofi.com

True or False?

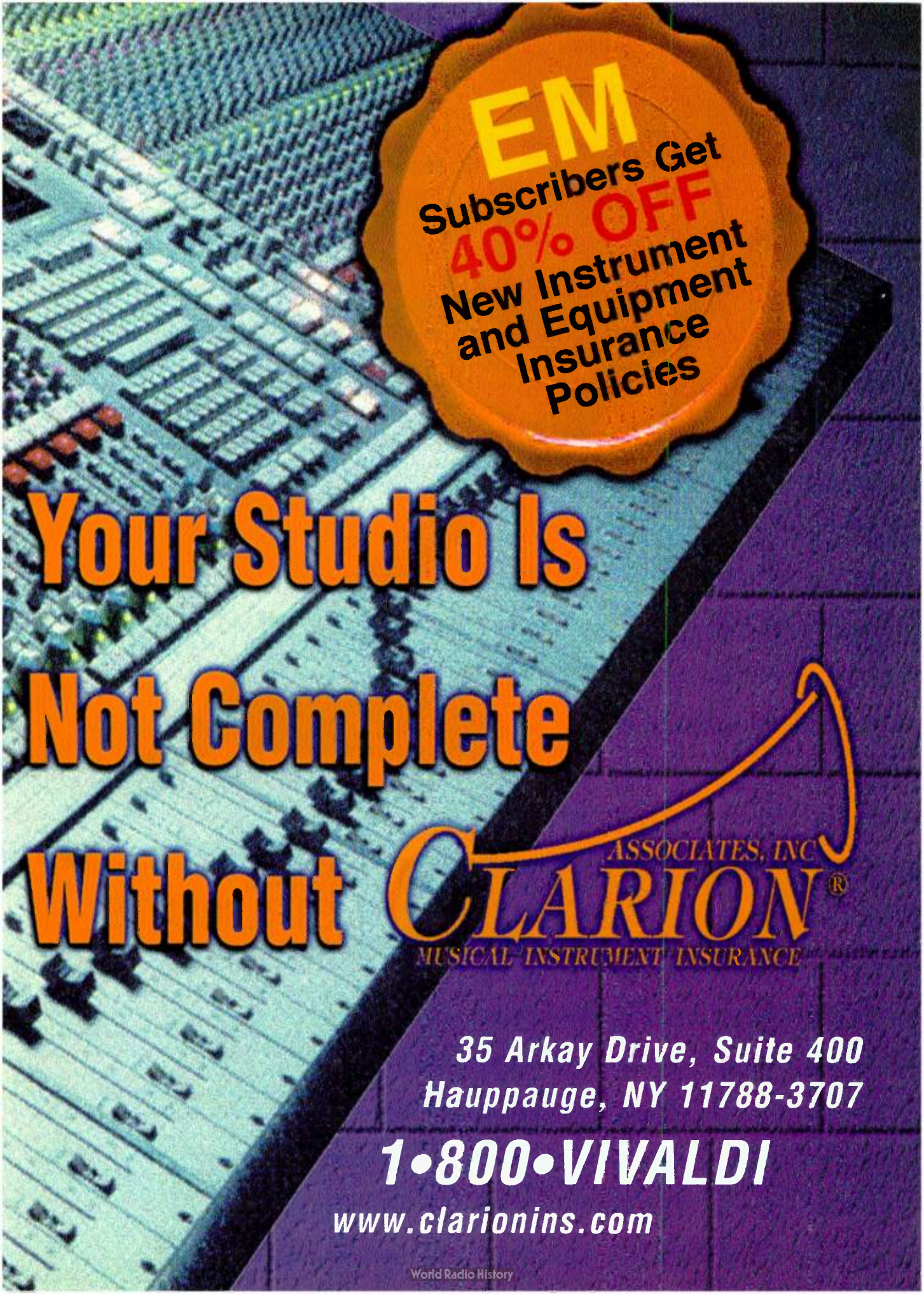
7. In 1963 Don Buchla introduced the Music Easel.

8. Wendy Carlos's *Switched-On Bach* was the first platinum-selling classical music album.

9. The RCA Mark II Electronic Music Synthesizer, finished in 1957, still resides in the Columbia-Princeton Electronic Music Center.

10. The first widely available music font was Adobe's Sonata.

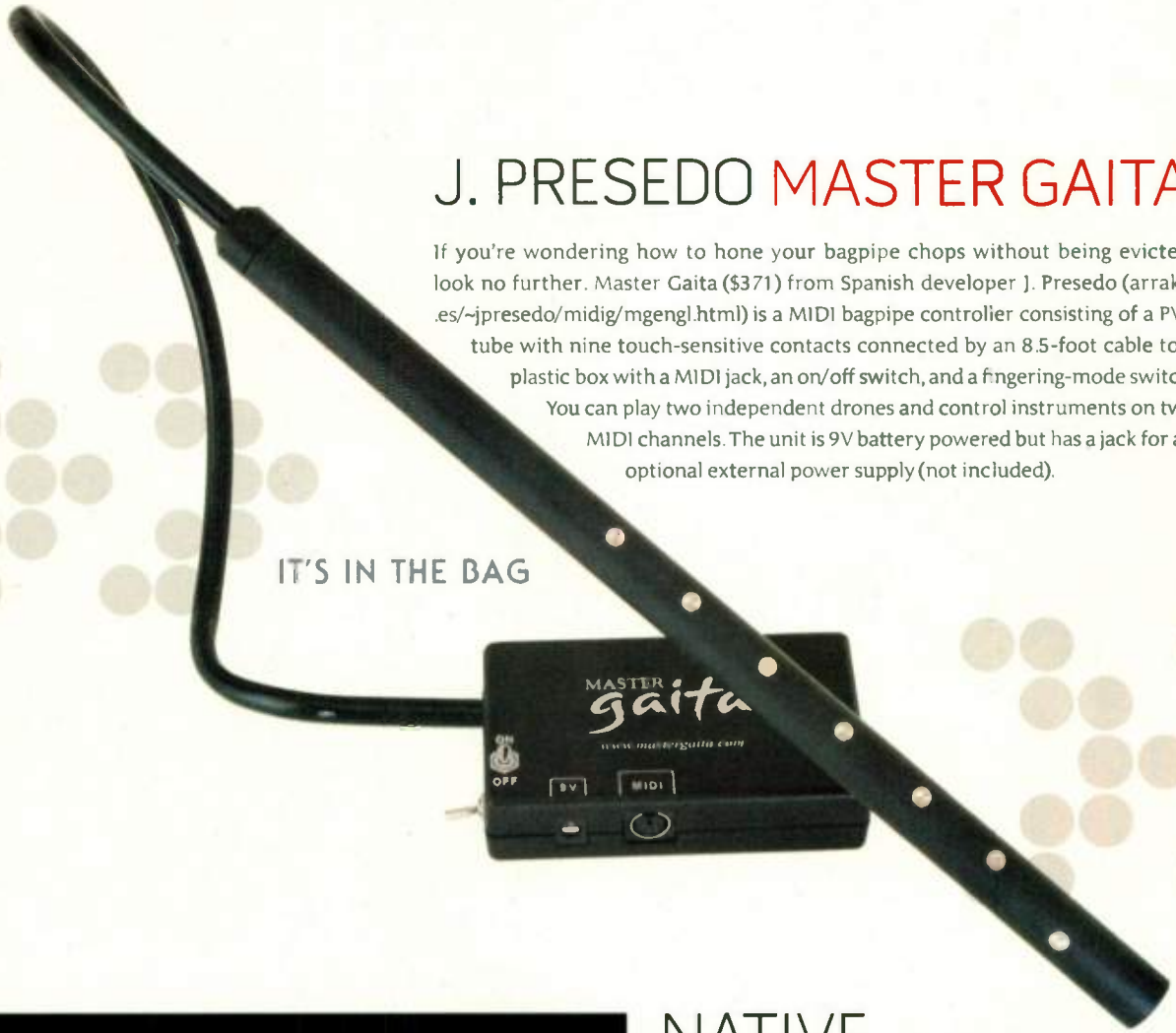
1. False; it was Clara Rockmore. 2. False; it was the 1940s. 3. False; it was the theremin. 4. True. 5. False; it was developed by John Chowning. 6. False; it was sold to Stevie Wonder. 7. False; he introduced the Series 100 Modular Electronic Music System that year. 8. True. 9. True. 10. True



By Len Sasso

J. PRESEDO MASTER GAITA

If you're wondering how to hone your bagpipe chops without being evicted, look no further. Master Gaita ($371) from Spanish developer J. Presedo (arrakis.es/~jpresedo/midig/mgengl.html) is a MIDI bagpipe controller consisting of a PVC tube with nine touch-sensitive contacts connected by an 8.5-foot cable to a plastic box with a MIDI jack, an on/off switch, and a fingering-mode switch. You can play two independent drones and control instruments on two MIDI channels. The unit is 9V battery powered but has a jack for an optional external power supply (not included).



IT'S IN THE BAG

THE KORE OF THE MATTER

NATIVE INSTRUMENTS KORE 2

Native Instruments (native-instruments.com) has upgraded its combination hardware-and-software virtual-instrument and -effects workstation. Kore 2 (Mac/Win, $559 [MSRP]) offers an improved hardware controller, a much easier software interface, and a built-in sound engine integrating the engines in Absynth, FM8, Guitar Rig, Kontakt, Massive, and Reaktor. You get more than 500 KoreSounds, with new KoreSound Packs being released regularly. Third-party plug-ins are also supported. Each KoreSound has up to eight variations through which you can morph seamlessly in real time using the hardware or onscreen controller.

LIVID INSTRUMENTS OHM

ULTIMATE CONTROL

Livid Instruments (lividinstruments.com) is now shipping the Ohm (Mac/Win, $790), an innovative MIDI control surface aimed at the live-performance DJ or VJ. The 17.6 × 1.5 × 10.5–inch, 6-pound wood-paneled tabletop unit and the 5U, 8-pound rackmount unit feature switchable blue backlighting and include a USB cable, a 12V wall-wart power supply, and the full version of Livid's video mixing program, Union 2.5. Two 4-channel mixers flank a 36-button clip-triggering matrix and crossfade slider at the center of the unit. You also get 20 function buttons, 10 rotaries, and a bpm tap button.

Mackie MR Monitors

AFFORDABLE FIDELITY

Mackie (mackie.com) has just released the MR series of powered studio monitors. The MR5 ($149.99) and MR8 ($199.99) have baffles molded to minimize diffraction, and a waveguide designed for smooth frequency transition. Both units feature Class A/B amplifier architecture for flat frequency response, and both have controls for high- and low-frequency adjustment. The MR5 combines a 55W/30W biamp with a 5.25-inch woofer and a 1-inch tweeter. The MR8 gives you a 100W/50W biamp, an 8-inch woofer, and a 1-inch tweeter.

DAVE SMITH INSTRUMENTS PROPHET '08

Dave Smith Instruments (davesmithinstruments.com) has released a new tabletop, knobby-module version of its Prophet '08 synth. The 18.5 × 7 × 3.5–inch, 6-pound Prophet '08 Synthesizer Module ($1,499) presents a reorganized control panel and lacks the keyboard but has the same classic Prophet look and wood sides. Road warriors can replace the sides with rack ears (included) and mount the unit in a road case. Under the hood, the unit is the same as the keyboard model; it includes split or stacked layers, Velocity and Aftertouch support, and the full-featured modulation matrix.

PROPHET SHRINKS

Acoustica Mixcraft 4

BUDGET MULTITRACK STUDIO

Mixcraft 4 (Win, $64.95) is the latest version of Acoustica's (acoustica.com) virtual multitrack audio and MIDI recording studio. With it, you can simultaneously record multiple audio and MIDI tracks, use built-in virtual instruments and effects as well as VST and DirectX plug-ins, mix down to MP3 or WAV audio files, and burn CDs. Most audio formats are supported, including Apple Loops and Acid Loops. Mixcraft has a 32-bit sound engine and supports up to 192 kHz audio recording and playback. The download comes with a royalty-free loop library and a variety of song starters.

Get Smart

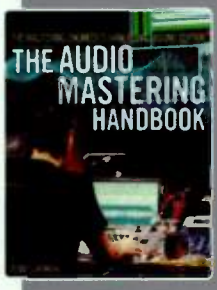
Focal Press's Sound FX

Sound FX: Unlocking the Creative Potential of Recording Studio Effects ($39.95), by Alex Case, explores effects processing, with emphasis on the home studio. The book starts with audio essentials such as waveform, signal flow, and perception. It then covers amplitude- (distortion, EQ, compression, and volume) and time-based effects (delay, pitch-shift, and reverb). It wraps up with chapters on basic and automated mixing and examples of applying effects to snare drums and piano tracks. Full details are available at the Focal Press Web site (focalpress.com).

MacProVideo.com

MacProVideo.com (macprovideo.com) is a purveyor of downloadable video tutorials for Apple Macintosh users. A variety of Mac products are covered, with an emphasis on audio and video production software such as the various applications bundled in Apple Logic Studio and Final Cut Studio. You'll also find coverage of Ableton Live, Digidesign Pro Tools, Propellerhead Reason, and Apple GarageBand. Prices range from $9.50 to $49.50, and with a fast Internet connection, you can download most titles in 10 minutes or so. The tutorials do not expire or self-destruct, and you're free to burn them to DVD.

Course Technology's The Audio Mastering Handbook



Bobby Owsinski's *The Audio Mastering Handbook* ($34.99 [MSRP]) from Course Technology (courseptr.com) is an updated edition of his *Mastering Engineer's Handbook*. It covers mastering for optical media (CD, DVD, and so on), compressed and streaming formats, surround, and vinyl. Owsinski reveals the secrets of making hot masters and addresses compression, frequency balancing, and mixing with mastering in mind. Throughout the book, legendary mastering engineers Bernie Grundman, Bob Ludwig, Glenn Meadows, Doug Sax, and others share their experiences, tips, and tricks.

YELLOW TOOLS INDEPENDENCE PRO

Yellow Tools (yellowtools.us) has bundled and updated versions of three flagship products in the new Independence Pro (Mac/Win, $499). You get Independence 2 with a 70 GB sound library, Independence Live for using Independence 2 projects onstage, and the VST and AU plug-in Independence FX, which gives your DAW access to 40 Yellow Tools effects, including the impulse-response processor Origami. Independence 2 sports a redesigned audio engine with multicore management, hosts third-party VST instrument and effects plug-ins, and has a sophisticated new browser with attribute matching.

AN INDEPENDENT TRIO

It's all about the sound.

palm size

MicroTrack II Professional 2-Channel Mobile Digital Recorder

Sound matters–that's why the MicroTrack™ recorder has become the only choice for audio professionals worldwide. Now M-Audio has designed the MicroTrack II, featuring even higher audio fidelity, an extended input gain range, workflow enhancements including faster file transfer rate, and more. A new standard from the people who set the standard, the MicroTrack II delivers what's most important–superior-quality recordings.

- 2-channel WAV (BWF) and MP3 recording and playback
- new features include extended input gain range, analog input limiter and BWF file marking ability
- balanced ¼" TRS inputs with line inputs and 48V phantom-powered mic preamps
- drag-and-drop file transfer to PC and Mac via high-speed USB 2.0
- storage via CompactFlash or Microdrives (not included)

Includes stereo electret microphone, earbuds, headphone extension cable with lapel clip, power supply, USB cable (A to Mini B) and protective carrying case with mic pouch.

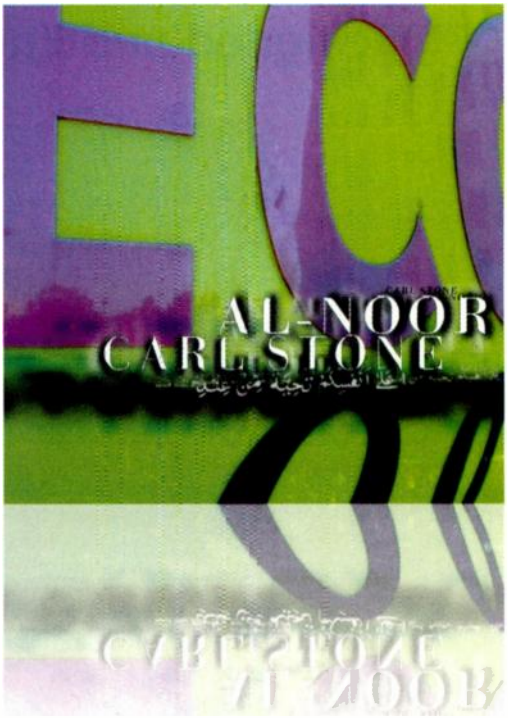
GET M-POWERED

M-AUDIO
www.m-audio.com
20 years

DAVID AGASI

CARL STONE

Home bases: Los Angeles and Tokyo
Primary computer: Apple MacBook Pro
Key software: Cycling '74 Max/MSP
Web site: sukothai.com



>> *Al-Noor*

Mystic Voices

Carl Stone finds many-splendored ghosts in the machine.

Signal and sample processing have progressed by leaps and bounds since the dawn of computer-based music, and Carl Stone is one of the privileged few who have been there for many of the highlights of the last three decades. As a student of the legendary Mort Subotnick at Cal Arts in the early '70s, Stone learned at a young age about the different ways electronic music could be integrated into live performance. Since then, he has cleared his own path as an innovator in electroacoustic composition, working with everyone from dance choreographer Bill T. Jones to experimental turntablist and guitarist Otomo Yoshihide.

By Bill Murphy

Al-Noor (InTone Music, 2007), which gets its title from the Arabic words for "the light," is Stone's latest album and was created entirely using Cycling '74's Max/MSP graphical-programming-environment software. As a nearly 20-year veteran of the program, Stone knows a thing or two about visualizing and constructing signal processing chains, often using organic sources as a point of departure. "I've been working with samples of voices for a very long time," he says on the phone from Tokyo. "There's something about the human voice especially that speaks to our soul. It communicates in mysterious and powerful ways, and I think that's part of my attraction to the voices I use."

A woman singing a Vietnamese lullaby is the main character of the album's title track—an 11-minute opus of at least four different movements. The song opens with the dry solo vocal but then changes gradually—and dramatically—as Stone applies layer upon layer of MSP-based "objects" to the voice, bringing out an alien chorus that seems to spin in space, creating key changes and moods that move from elegiac to uplifting.

"I've just developed the process over the last year or so," Stone reveals. "The technique is called FFT processing—fast Fourier transformation, which basically applies high-level mathematics to sound samples for the purpose of resynthesis, so you can take any sample and manipulate the spectra of the sound. You could also call it cross-synthesis because I'm using one set of samples to cross-modulate another set. It can give you some pretty interesting results."

"Interesting" is putting it mildly. "LOs à Moelle" opens with the sound of a garage band straight out of L.A.'s late-'60s psychedelic scene—all very familiar to fans of the Byrds or Arthur Lee's Love, until it morphs into something even more way-out, like acid rock on real acid. "I like to establish some expectation about what the music is about, and then destroy it," Stone explains. "It's almost like a parasite invading the body of a piece of music and gradually eating it up from the inside—this riff just gets eaten and destroyed."

"Flint's" is another epic piece, based on a live performance recorded in 2000, with a vocal track that cycles through two different layers of filter processing—one of them a phased vocoder that would make even Herbie Hancock (who used the vocoder heavily in the '70s and '80s) blush with envy. "The vocoder imbues the life of one sound with another," Stone says, "and that kind of alchemy fascinates me. Even though I wasn't that into Herbie's particular approach, I've always been drawn to the concept of infusing one sound with the quality of another. And on another level, that's what this whole album is about." em

Who needs the H2 Handy Recorder?

Every Musician on the Planet.

SIMPLICITY IS A BEAUTIFUL THING.

It's a simple idea: provide brilliant stereo recording in an easy-to-use, ultra-portable device. With the H2, every musician has a way to record high-quality audio.

WHY FOUR MICS ARE BETTER THAN TWO.

The H2 is the only portable recorder with 4 mic capsules onboard in a W-X/Y configuration for 360° recording. Audio is decoded instantly for unrivaled stereo imaging.

PUSH A BUTTON...

That's all it takes to start recording! The H2's intuitive user interface makes it easy to capture the moment. Onboard Auto Gain Control ensures your recordings are at the right level. And you get over 4 hours of continuous operation with 2 AA batteries.

PLAY IT BACK!

Play back your recordings on your home audio system or listen to your masterpiece with the included earbuds. Enjoy studio-quality audio directly from your H2.

SECURE YOUR DIGITAL MEMORIES.

The H2 comes with a 512MB Secure Digital (SD) card. With a 4GB card, the H2 provides 2 hours of recording at 96kHz, 6 hours at 44.1kHz, or a staggering 138 hours at MP3. You can store your recordings on a PC or Mac with the H2's USB interface and then share them online.

WHAT'S LIFE WITHOUT ACCESSORIES?

Your H2 comes with a mic clip adapter, tripod stand, earbuds, a 10' USB cable, stereo cable, AC adapter and a 512MB SD card.

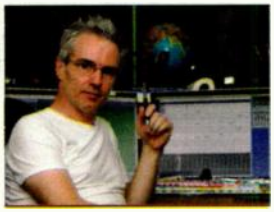
ENJOY YOUR BRILLIANCE!

Recording high-quality audio has never been so easy. You'll be amazed by your sound.

THE ZOOM H2 HANDY RECORDER.
BRILLIANT STEREO RECORDING.

zoomfx.com

ZOOM
CATCH US IF YOU CAN



NOAH STONE

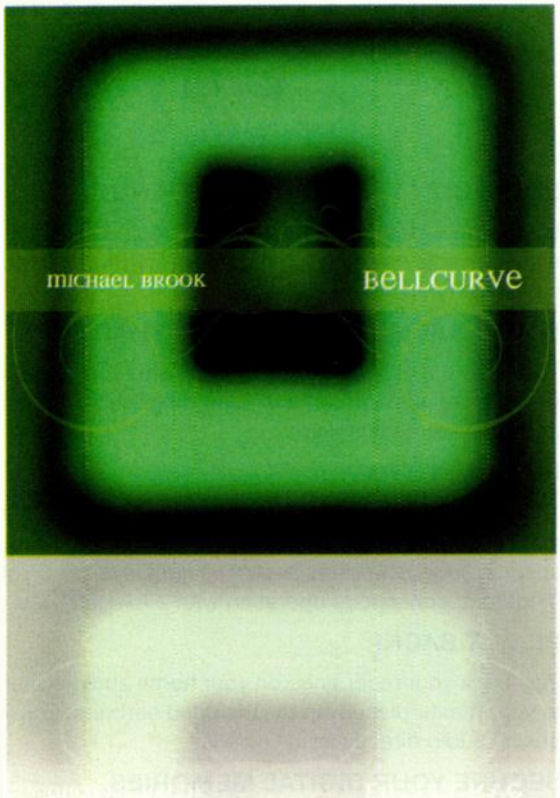
MICHAEL BROOK

Home base: Los Angeles

Sequencers used: Digidesign Pro Tools HD (James Hood), Apple Logic Pro (Michael Brook)

Preferred soft synths: Korg Legacy, Arturia Analog Factory (James Hood)

Web site: michaelbrookmusic.com



>> *BellCurve*

Trance Formation

Michael Brook reinvents his previous album.

Producer, guitarist, and composer Michael Brook was looking for a follow-up to *RockPaperScissors* (Canadian Rational, 2006), a world music album that melded diverse elements like Bulgarian choirs, a Lebanese violinist, a rock rhythm section, and Brook's guitar work. Rather than starting anew, he decided to rework those same tracks into something more electronic and ambient.

By Mike Levine

The Canadian-born Brook has had an eclectic career, with much of his work focused on world music. He has produced artists such as Brian Eno, the Pogues, and Nusrat Fateh Ali Khan, to name just a few. For a couple of years he was doing so much production at Peter Gabriel's Real World Studios that he literally moved in there. He has also composed music for films, including *An Inconvenient Truth* (Lawrence Bender Productions, 2006) and *Into the Wild* (Paramount Vantage, 2007). In addition, Brook invented the Infinite Guitar, which was popularized by the Edge of U2.

So last year, when Brook was toying with different ideas for following up on *RockPaperScissors*, he hit on the concept of a remix that would serve as a companion piece to the original. "You're always trying to find some sort of angle or way to introduce stuff to people who may not find it in their normal exploration," explains Brook. "I thought, what would interest me more: hyping it all up and putting on drum loops and that kind of thing, or turning it into something more ambient, textural, and atmospheric?"

Brook turned to James Hood, a former drummer for the Pretenders and founding member of the ambient group Moodswings, to remix it. "He just went to town with it and did quite an amazing job of turning it into a continuous piece of music," says Brook. The result was *BellCurve* (Canadian Rational, 2007), which took the organic-sounding tracks from *RockPaperScissors* and gave them a more trancelike feel.

"I was sent an iPod with 80 GB worth of sound files on it," says Hood, "and a brief, which was to make it brilliant—and ambient." So Hood hunkered down in his studio with his Mac and a Digidesign Pro Tools HD system and began editing, layering, and mixing. He even added his own music in a few spots. Hood's tools included SoundToys effects plug-ins and Korg Legacy and Arturia Analog Factory synth plug-ins, among many others.

"James did this great job of it," says Brook, "and then as that progressed, it became apparent that the direction he was heading in created some musical implications that basically required me to play a little more on it. I gave it to him, he worked on it, he gave it back to me [Brook worked in Apple Logic Pro], and I played guitar on it a bit. I didn't really do any of the mixing or production."

Because it was Brook's project, Hood had to get approvals as he went along. "He'd say, 'I didn't like that bit,'" recalls Hood, "and then I thought, 'God, he didn't like that, I spent a whole week on it.' But [it turned out] what he didn't like was one tiny little thing. That's why it was such a dream gig, because my heart would sink—'Oh God, I have to change everything'—and then he would say, 'You know that tiny little thing there. I don't like that.' And I would say, 'Great, it's gone. Anything else?' And he'd say, 'No, it's great.'"

Brook sums up the process this way: "It was, for me, this really positive, collaborative experience of just kind of letting somebody have their way with your work." em

JOSH BOUGHEY

>> FIG. 1: The Stribe has eight high-precision, touch-sensitive strips flanked by rows of 64 LEDs. The device connects to a computer via USB, and the strips can be mapped to any software parameters. The LEDs are controlled by the software and can indicate anything you wish.

DIY Resurgence

Two new projects let you get your hands dirty. | By Scott Wilkinson

EM's first issues were published in 1985, but for ten years before that, the magazine was called *Polyphony*. Published by PAiA (paia.com), *Polyphony* presented a variety of articles for electronic musicians and home-studio owners, but it was best known for its do-it-yourself (DIY) electronics projects. That's not surprising, considering that PAiA manufactures numerous interesting musical-electronics kits to keep inveterate solderers busy.

These days, music-technology products have become so sophisticated and affordable that DIY seems to be a lost art. But I recently discovered a thriving DIY community that has grown up around something called the *monome* (monome.org). This simple array of illuminated buttons connects to a computer via USB and can be programmed to control any parameter of music software, such as Max/MSP from Cycling '74. It also has hooks for other applications, such as Ableton Live and Native Instruments Reaktor 5, via Open Sound Control—a music-control protocol originally developed at the Center for New Music and Audio Technology at the University of California, Berkeley.

The illumination of each button is controlled by the software; there is no hardwired connection between each button and its light. Columns of lights might indicate steps in a sequencer, with each light representing a different sound that is added to the sequence when you press its corresponding button.

The central tenet of the monome's creator, Brian Crabtree, is aligned with the so-called open-source movement. All designs and source code for the system are freely available on the monome Web site, and anyone can modify them in any way they wish. You can buy the device in completed or kit form and let your creative side have at it.

Josh Boughey, a member of the monome community, felt that there was something missing—specifically, that the monome offers no continuous control. So he designed a new general-purpose interface he calls the Stribe (soundwidgets.com/stribe). Like the monome, the Stribe is a completely open-source device that you can buy in either kit or finished form. It's based on the Arduino prototyping platform (arduino.cc), which lets you write and compile your own firmware and burn it into the microcontroller.

The Stribe consists of eight high-precision, touch-sensitive strips that were originally designed for medical-control applications. (*Stribe* is Danish for *stripe*, and the word has the added advantage of acting as both a noun and a verb.) Each strip is flanked by two rows of 64 LEDs (see Fig. 1). The Stribe connects to a computer via USB, the strips can be mapped to any parameter, and the LEDs can be programmed to illuminate independently of where you're touching the strips. For example, the lights might indicate stereo volume levels or sections of a sample to play back when you touch the strip in a particular area.

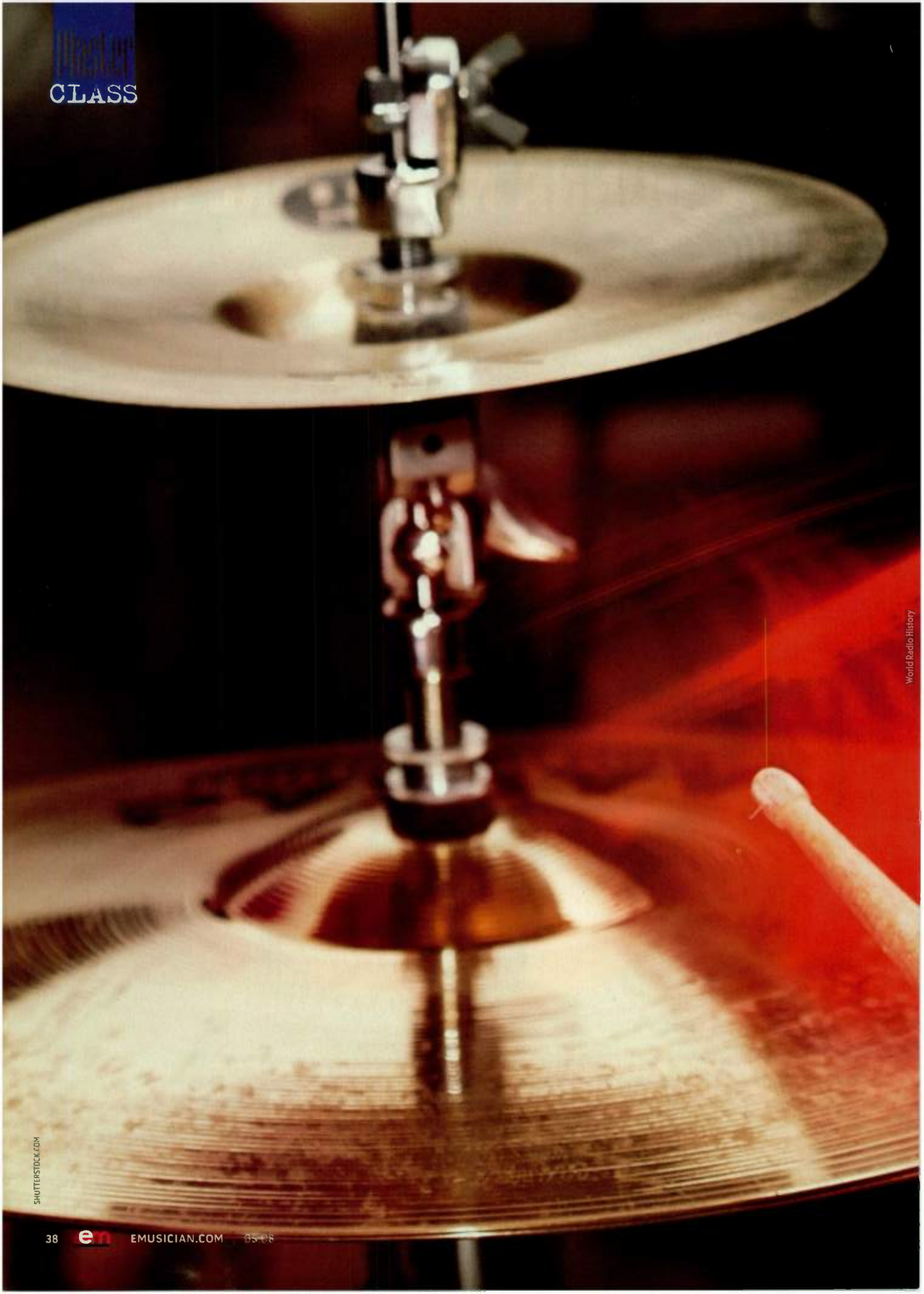
When paired, the monome and Stribe form a unique and powerful musical instrument. Boughey likens it to a stringed instrument, such as a cello: the left hand might control the monome, selecting discrete things such as pitches or loop fragments, while the right hand might control the Stribe, adding continuous gestural nuance much the way a cellist does with a bow.

The idea of a minimalist controller has not escaped the big companies; Yamaha recently introduced a device that is similar to the monome. Called the Tenori-on (global.yamaha.com/tenori-on/index.html), it has a 16 × 16 array of illuminated buttons. Unlike the monome, though, it is preprogrammed and self-contained. Still, the ideas drawn from the monome and the Stribe clearly point the way toward ever more creative musical interfaces, and I applaud Crabtree and Boughey for their ingenuity. EM

With sixteen inputs, the TASCAM US-1641 is the ideal choice for musicians to record the whole band to a computer. Eight mic/line inputs plus six line inputs gives you plenty of channels for a large ensemble, drumset, live recording or worship service. It includes Cubase LE4, Steinberg's latest version, for 48 tracks of 96k/24-bit recording power. Using the latest high-speed USB 2.0 technology, the US-1641 packs the interfacing power of a big console into only one rackspace. The well-connected TASCAM US-1641.....you're gonna need one.

TASCAM
MAKE IT HAPPEN

For more information about this jam-packed state-of-the art recording power box, visit
www.tascam.com



SHUTTERSTOCK.COM

RACK 'EM UP

CREATIVE USES FOR LIVE'S NEW DRUM RACKS.

By Len Sasso

The Drum Rack instrument is one of Ableton Live 7's most interesting new features, and its creative potential is enormous. You can build a virtual drum machine with different MIDI and audio effects for each drum sound. You can slice Live-warped or REX audio files automatically, allowing you to resequence the slices effortlessly. You can use it as a triggering device for loops and resampled Live Scenes and then use Live's other tools to manipulate those loops and Scenes. I'll start this master class with a brief account of how Drum Racks work, then cover these applications and more.

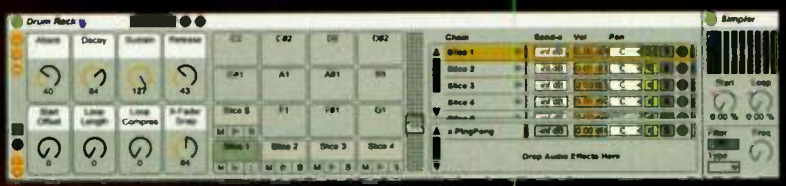


FIG. 1: In a Drum Rack, each pad corresponds to a MIDI note. Sixteen pads are visible at a time, and supported MIDI pad controllers always play the visible pads.

Like Live's Instrument Racks, Drum Racks house parallel chains of virtual instruments. You can place Live's built-in MIDI effects before the instrument and follow it with audio effects plug-ins. But unlike with Instrument Racks, you do not need to set up key, Velocity, or controller zones to select the chains. Instead, you can tie chains to Drum Rack pads, which represent MIDI notes. When a pad is triggered by its associated MIDI note or by a mouse click, it sends a note (C3 by default) to all chains tied to it. (For convenience, you can also set a chain to receive all MIDI notes directly, in which case it is not triggered by any of the pads.)

Control, Mix, and Load

A Drum Rack's pads are arranged in a four-by-four matrix just to the right of the rack's Macro knobs (see Fig. 1). When the rack is completely folded (Macro knobs, chains, and plug-ins suppressed), the pads remain visible. There are 128 drum pads, corresponding to the 128 MIDI Note Number range, and you use the slider to the right of the pad display to bring other pads into view. If you have a supported MIDI control surface with physical drum pads, their assignment follows the slider, so they are always mapped to the visible Drum Rack pads.

Three of Live's MIDI effects are especially useful with Drum Racks. If your control surface pads send short triggers, you may want to precede the rack with a Note Length MIDI effect to convert the triggers to fixed-length gates. (Use Time mode to create gates up to 60 seconds long.) For chains that receive all MIDI notes, use Pitch and Velocity effects at the beginning of the chain to set key and Velocity ranges. You can also transpose and perform various Velocity alterations with those plug-ins.

A Drum Rack can house up to six effects chains, and as effects chains are added, the Chain List sprouts send-level controls to the left of the volume, pan, mute, and solo controls. Those are all duplicated in a graphically more convenient foldout Session-view submixer. Each effects chain can house any number of effects or even nested Effects Racks.

Although you can plug any Live or third-party virtual instrument into a Drum Rack chain, the most common choice by far is Live's Simpler sample player. Whether you want a pad to trigger a single event (such as a drum hit, a sound effect, or an audio file slice), an imported loop, or a rendered Session-view Scene, Simpler is the simplest way to go. For that reason, dragging an audio clip from Live's browser or from a Session- or Arrangement-view track to a Drum Rack pad automatically inserts a Simpler in the chain and loads the dragged sample into it.

Scrambled Beats

Swapping slices of a REX or other sliced-format audio file is well-trod territory, especially with drum loops. It usually works better to swap similar-sounding slices, which might, for example, be found at the same beat position within different measures. Therefore, random swapping is not typically a viable option, but Drum Racks make it easy to introduce some randomness into the process.

> Drum Racks make it easy to introduce some randomness into slice swapping.

The first step is to convert the audio file to a Drum Rack with each slice on a different pad. Live will do that automatically for any audio clip: just right-click on the clip in the browser or project to bring up its contextual menu, and select Slice To New MIDI Track. That brings up a dialog box in which you choose slicing parameters. For any format other than REX (for which Live uses the REX slices), you choose whether to slice by Live's Warp markers or some beat division. You also choose a slicing preset, and either Built-in or Built-in 0-Vel is a good choice. (With the latter, MIDI Velocity has no effect when triggering the slices.) You can create your own slicing presets by saving appropriately configured Drum Racks in the Library/Defaults/Slicing folder.

Once you have the file sliced into a Drum Rack, play each slice and mark down which ones are similar and, therefore, swappable. For each group of similar slices, Command-click (Ctrl-click in Windows) in the Drum Rack's Session-view submixer to select each chain in the group, then drag all the selected chains to an empty MIDI track or to the mixer's drop area (see Fig. 2). A new Drum Rack will be created, along with a MIDI clip containing the trigger notes for the moved slices.

To randomly swap the slices, first click-and-drag the Drum Rack pads so that the slices are contiguous. Next, double-click on the triggering MIDI clip to reveal it in the Clip view, and drag each of its notes down to the bottom row. (If you play the clip now, it will trigger only the first slice.) Now insert Live's Random MIDI effect before the Drum Rack.

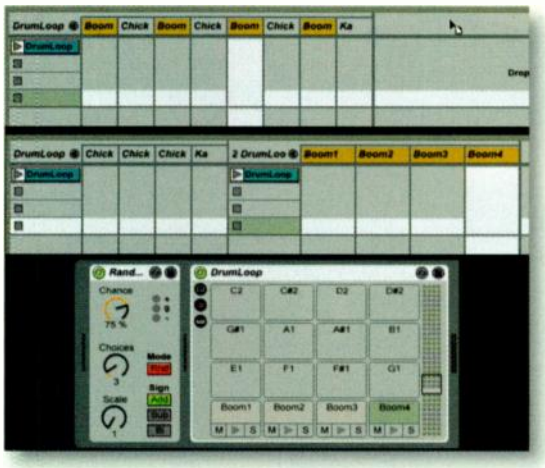


FIG. 2: You can select and drag several chains from the submixer to the drop area to create a new Drum Rack and associated MIDI file.

The Random effect randomizes the MIDI Note Numbers of incoming notes based on five settings: Chance, Choices, Scale, Mode, and Sign. Set Choices to one less than the number of slices, Scale to 1, Mode to Rnd, and Sign to Add. Some MIDI notes played by the trigger clip will then be randomly transposed up by a number of semitones between 1 and the Choices setting. How often notes are transposed depends on the Chance setting. If you divide the number of slices into 100 and subtract the result from 100, each slice will be equally likely. For instance, if there are 10 slices, you would set Choices to 9 and Chance to 90 percent (see Web Clip 1). When you use lower Chance settings, the first slice is favored, which can be very useful.

ONLINE BONUS MATERIAL

If you have a percussion part that is particularly boring (a sequenced drum-machine loop, for example), try adding insert effects to chains playing similar slices. Although slice swapping is easiest to set up with unpitched material, it is not limited to that. Rhythm-section instruments with repetitive parts also make good

CME

• Always • One Step • Ahead •

Power! Integration! Control !

UX5/6/7/8

Motorized Faders, Up to 64 Programmable Controllers, 12 Trigger Pads, 2-channel USB Audio, Mic/line inputs, Balanced 1/4"TRS Outputs, 2 Mic pre-amps, The Best feeling keyboard found on any controller, Aluminum Chassis, U-CTRL for All major DAW software including Pro Tools, Digital Performer, Cubase, Nuendo, Logic, Sonar, and more. Class compliant with Vista/XP and Mac OSX

UF50/60/70/80

Built-in Duplex Wireless Midi up to 260 feet, Superior Keyboard action, Aluminum Chassis, Transport Controls, Breath Controller Port, Easy set up with U-CTRL for All major DAW software, Optional Firewire Audio Expansion Board, Class compliant with Vista/XP and Mac OSX

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

Distributed by KAYSOUND www.kaysound.com

Sam Ash Sweetwater Musician's Friend zZounds

fodder; just ensure that the swapped slices play the same pitch or chord.

Catch the Groove

Unlike many other sequencers, Live does not provide a way to automatically apply the groove of one audio file to another. But the aforementioned Slice To New MIDI Track feature makes it easier to do so manually, at least with short, similar files.

Suppose, for instance, that you have 1-bar bass and drum loops with different eighth-note swing feels, and that you want to conform the bass to the feel of the drum loop. Furthermore, suppose that the drum loop is not already sliced. (If it is, you won't need to use the slicing trick I'll discuss next—just proceed to matching up the slices.)

> Drum Racks provide a great way to turn a collection of Session-view Scenes into a real-time instrument.

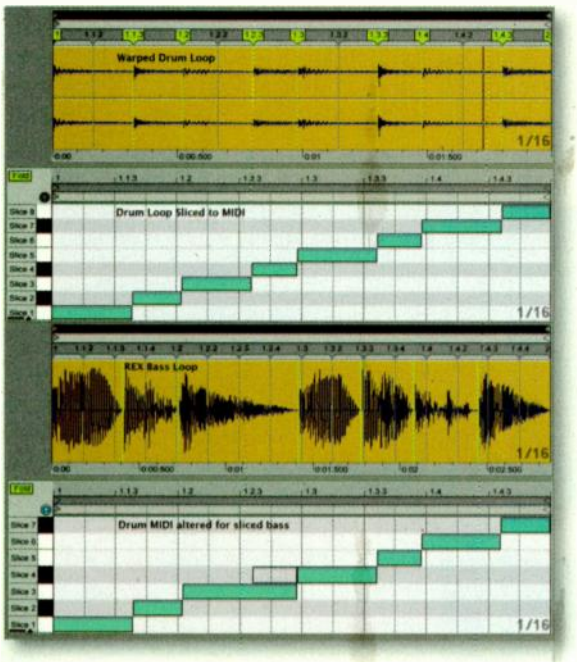


FIG. 3: After slicing drum and bass audio loops to new MIDI tracks, you may need to adjust the drum MIDI file to accommodate differences in the bass slices.

Place the drum loop on an Arrangement-view track, set Live's tempo to match, and turn on both warping and tempo master for the clip. Making the clip the tempo master lets you move the Warp markers as the file plays without hearing the effects of warping, which are irrelevant in this example. Set the Arrangement-view loop region to match the drum loop. In the Clip view, ensure that there is a Warp marker at the end of the drum loop (at the grid marker for bar 2) so that creating and moving other Warp markers won't change the overall clip length.

Set Warp markers for each of the eighth-note grid markers by double-clicking on them. (The leftmost number of a grid marker is the bar, the middle number is the beat, and the rightmost number is the 16th note within the beat. For instance, 1, 1.2, and 1.2.3 are all eighth-note markers, but 1.2.1 and 1.2.4 are not.) Move each of the Warp markers to the audible beginning of the note to which it corresponds. For a cleanly played swing-eighth drum loop, you will mostly be moving the 3-digit Warp markers to the right (see Fig. 3).

Turn tempo master off and slice the warped loop to a new MIDI track using the Warp markers. Mute the original loop and play the new MIDI track; it will sound just like the original (whereas the warped audio file will now have the swing removed).

To conform the bass to the drum loop, set its Warp markers as just described for the drum loop and also slice it to a new MIDI track. Instead of using the generated MIDI clip, copy the MIDI clip from the drum track. It's unlikely that the bass will slice as nicely into separate events as the drums. You may need to merge some of the bass loop slices and adjust the copy of the drum MIDI clip accordingly (see Web Clip 2).

A Steady Clip

Although you can trigger audio clips in Session-view slots directly from a MIDI keyboard, Drum Racks provide an interesting alternative. You can sequence the triggering of Drum Rack pads, whereas you must go through some convoluted MIDI routing to sequence triggering of Session-view slots. You can use Simpler's looping feature instead of warping the clip as you must do to loop its playback in a Session-view slot. On the other hand, you cannot apply real-time quantization to triggering Drum Rack pads as you can when triggering slots. Probably the biggest advantage to using a Drum Rack rather than slots for playing audio clips is that you can control multiple clips with individual effects processing from a single track.

You can drag audio clips directly to Drum Rack pads from the Live browser, Session-view slots, Arrangement-view tracks, or your computer's desktop. If you want the clips to adapt to the song tempo, ensure that warping is set up the way you want it in Live's Record/Warp/Launch preference tab. (If the clips have already been warped and analysis files have been saved, they will retain their warp settings regardless of the preferences.) Because Live sometimes guesses wrong about a clip's length and tempo, it's a good idea to check each clip before inserting it into the Drum Rack. To lock in the tempo in Session view, you need to somehow render the warped clips. You can resample the clips on a different audio track, or freeze them and then either copy the frozen clips to a new audio track or flatten their track (which is destructive).

When dealing with several clips, I prefer to consolidate them on an Arrangement-view track and slice them to a new MIDI track as in the previous example. Although it involves a bit more work, this method lets you use Drum Rack preset templates. Consolidating

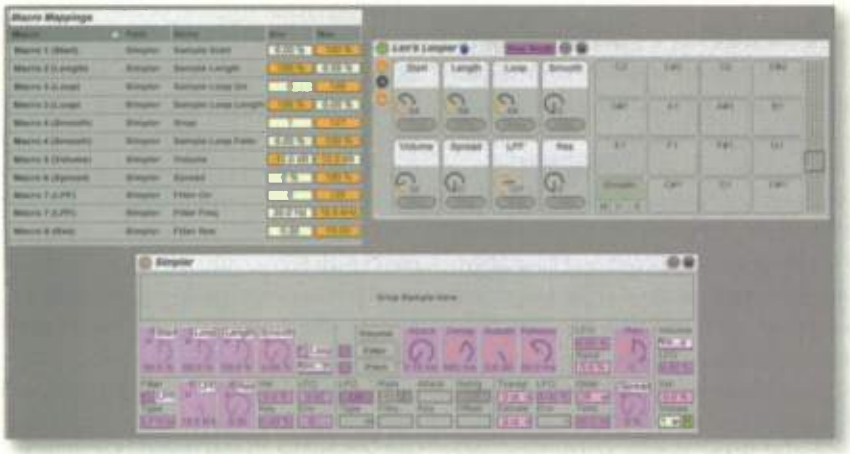


FIG. 4: Map Macro knobs to control each Simpler's Start, Loop, and Length, then assign a range of MIDI notes to those knobs to manipulate the loop from your keyboard.

automatically locks in the song tempo, so you needn't worry about rendering. Before consolidating in Arrangement view, ensure that each clip starts on a bar line, and note which bar lines begin new clips or place a marker at the beginning of each clip for future reference. After consolidation, create a Warp marker at the beginning of each clip (and nowhere else) before slicing to a new MIDI track.

Built-in 0-Vel is a viable preset template, but I prefer a different mapping of the Macro controls. You'll find my template, called "Looper," in Web Clip 3. I use the top four Macro knobs to control each Simpler's clip-start, clip-length, loop-length, and loop-fade parameters (see Fig. 4). Notice that the Macro 2 and Macro 3 knobs have their range reversed, and that the Macro 3 knob, at its maximum value of 127, also turns looping off.

It helps to keep in mind how a Simpler's Start, Length, and Loop knobs interact. Each is calibrated in percent, but, except for the Start knob, that's a bit deceptive. The Length knob has no effect if its setting is larger than the portion of the clip after the start position. The Loop setting is in proportion to the adjusted length. For instance, if Start is 50 percent, Length is 40 percent, and Loop is 50 percent, then the portion of the clip between 50 and 90 percent plays, and the last half of that portion is the loop.

FIG. 5: Resample Live Scenes and load them into a Drum Rack for real-time sequencing.

You can assign MIDI note ranges to control Live's knobs and sliders, and that's very useful here because the settings are equally divided over the note range. If, for example, you assign a range of five notes, they will set the knob to 0, 25, 50, 75, and 100 percent of its value range, respectively. For Start, Length, and Loop, a 5-note range divides the clip into quarters; a 10-note range, into eighths. On a 3-octave keyboard, I use C1 through F#2 to gate Drum Rack pads, and I use G2 through B2, C3 through E3, and F3 through A3 to control the Start, Length, and Loop Macro knobs. Reversing the range of the Length and Loop knobs makes the use of the keys more natural—higher notes always shorten.

Once you've embedded your clips in a Drum Rack, keep in mind the trick from the "Scrambled Beats" section of dragging some Drum Rack pads to new tracks to create separate racks for different kinds of material. For instance, you might want different racks for percussion (usually looping), chord instruments (looping but probably not transposable), and solo instruments (usually not looping but transposable).

Scenic Tour

Drum Racks provide a great way to turn a collection of Session-view Scenes into a real-time instrument. Each chain in the resulting Drum Rack holds another Drum Rack whose chains, in turn, hold audio clips rendered from the tracks in one Scene. Triggering a main Drum Rack's chain triggers a rendered Scene. You retain control of each Scene's mix, but as with the loops in the previous example, the tempo is locked in. You can even nest playable instruments in the main Drum Rack to create a band in a box.

First, create some Scenes that work well together—alternative bass, drum, and rhythm-guitar Scenes of the same length that follow the same chord changes, for instance (see Fig. 5). I often use this technique with Follow Actions on several Scene tracks to capture the Follow Actions in a new Scene. Don't overlook Live's new External Instrument, which lets you use standalone virtual instruments (if your system is set up for that) and ReWire devices such as

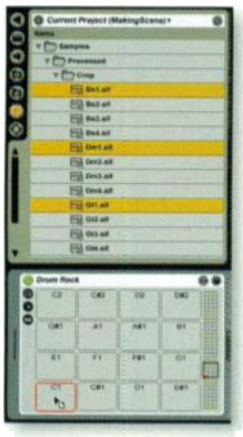


FIG. 6: Drag all the resampled clips for a Scene to the same Drum Rack pad.

Propellerhead Reason in your Scenes.

For each Scene track, create a new audio track and route the original track's output to it. Record-enable all the new audio tracks and ensure that their clip Slots have Clip Record buttons. Trigger each Scene and dub one pass (including any Follow Actions) to new audio clips.

Once you've recorded the dubs and saved them in the project's Samples folder, create a new MIDI track with an empty Drum Rack. Hold the Command key (Ctrl in Windows), select the clips that belong to the first Scene, and drag them to a Drum Rack's C1 pad (see Fig. 6). That pad will be relabeled Multi, its chain will contain a nested Drum Rack with a separate chain for each clip, and each of those chains will be assigned to note C1. Repeat that process, dragging the clips from the other Scenes to different pads, and you'll have each of the original Scenes triggered by a Drum Rack pad.

You can do a number of things with the main Drum Rack to make it more playable. As mentioned earlier, you can add a Note Length MIDI plug-in before each of the nested racks and set its Length knob (in Time mode) to the length of the Scene to convert triggers to gates. In order to switch between trigger and gate mode for all Scenes, map each Note Length plug-in's Device On button to a Macro knob of the main rack.

I like to map each of the nested Scene's chain-volume controls to Macro knobs of the main rack. To do that, you first need to map them to the Macro knobs of the nested racks, then map those Macro knobs to Macro knobs of the main rack. At the same time, you can create an overall volume knob by mapping each of the main rack's chain-volume controls to the same Macro knob. If you insert send effects (reverb, for instance) in the main rack, you might want to map all the send-level controls to a Macro knob as well.

After Hours

You can make your Scene-playing Drum Racks self-contained instruments by adding one or more chains of virtual instruments—for example, a lead sound to play along with rhythm-section Scenes. To keep Scene triggering and playing out of each other's way, use an Instrument Rack for the virtual instrument, and use the instrument chain's key zone to avoid overlaps. If you install more than one virtual instrument chain, use the Instrument Rack's chain selector to switch instruments. To cover different instrument ranges with a small keyboard, insert a Pitch MIDI effect before the Instrument Rack.

Of course, you're not limited to triggering the dubbed Scenes manually. You can use MIDI clips to trigger them, and if you use a separate clip to trigger each Scene, you can use Follow Actions to sequence them—something you cannot do with Scenes directly in Live. Furthermore, you can use clip automation to control mixing and other parameters in the Drum and Instrument Racks.

Only clips on the Drum Rack track have envelopes for Drum Rack parameters. If you want to separate clip automation from Scene triggering, put the clips with the automation on the Drum Rack track and put the clips with the triggering notes on another MIDI track whose output is routed to the Drum Rack. Clip automation is especially effective for soloing Scene tracks and controlling the sends to dense effects such as Grain Delay and Beat Repeat that are best when used sparingly (see Web Clip 4).

Drum Racks open up a whole range of new sequencing and live-performance possibilities. Getting a Drum Rack to do what you want, especially when you're nesting Instrument and Drum Racks inside each other and using their Macro controls, can take some planning. But it's well worth the time invested, and the process gets faster as you become more familiar with Drum Racks. EM

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

BUDGET MICS, BIG SOUND

Four large-diaphragm condensers that won't break the bank.

By Rusty Cutchin

Decades ago, large-diaphragm condenser mics (LDCs) were the Holy Grail of gear acquisition and usually cost anywhere from several hundred dollars to several grand. Prized for their round, smooth attack, these mics sound great when recording voices, acoustic guitar, and bowed string instruments, or when used as room mics (see the sidebar "The Right Response"). This can be partially attributed to the large-diaphragm condenser's transient response, which is slower than the small-diaphragm condenser's. (For a technical overview of large-diaphragm condenser mics, see "Supersize My Mic," by EM contributor Michael Cooper, at mixguides.com.)

LDCs have become something of a commodity in recent years, ranging in price from the $10,000 Neumann Solution D digital mic at the high end all the way down to sturdy and functional LDCs costing less than $100. Because we like a good bargain as much as anyone, we looked at four popular mics with a street price of just under a C-note: the Behringer B-1, the M-Audio Nova, the MXL 2006, and the Sterling Audio ST51.

> The low prices make it easy for anyone who doesn't have a large-diaphragm condenser to get one.

All of the mics are single-pattern (cardioid), side-address condensers with 1-inch gold-sputtered Mylar diaphragms, and they require 48V phantom power to drive their internal FET preamps. Two of the mics tested here include shockmounts in their packages.

The goal of this roundup is not to provide a thorough review of each mic, but to investigate just how much—or how little—LDC you get for a hundred bucks. My hope was to gauge whether a project studio owner would be better off adding a few low-priced LDCs for specific tasks or investing in one versatile, high-priced mic that could cover every situation.

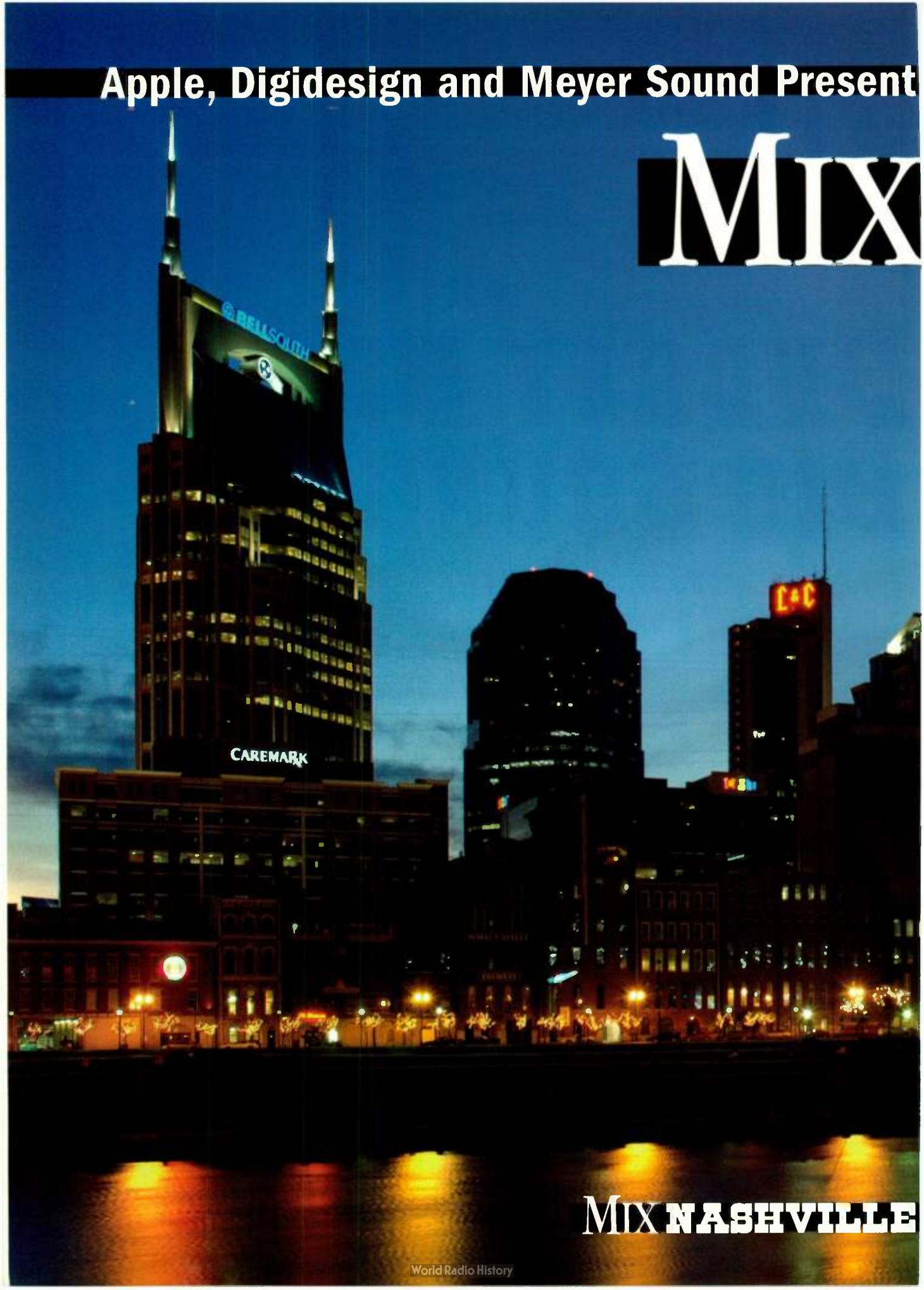
In the Studio

To begin, I set up a typical vocal session, recording both a male and a female singer. Because I had two of each model of microphone, I also used them in pairs to record an acoustic guitar, using a close-mic-and-room-mic arrangement as well as a sound-hole-and-neck configuration. The recordings gave me a good idea of the overall character of each model.

Purely as a reference point, and not to unfairly compare the sound quality, I also recorded the same sources with a couple of more expensive LDCs from my own closet: an AKG 414-BLS and a Studio Projects C3. I've

Apple, Digidesign and Meyer Sound Present

MIX



MIX NASHVILLE

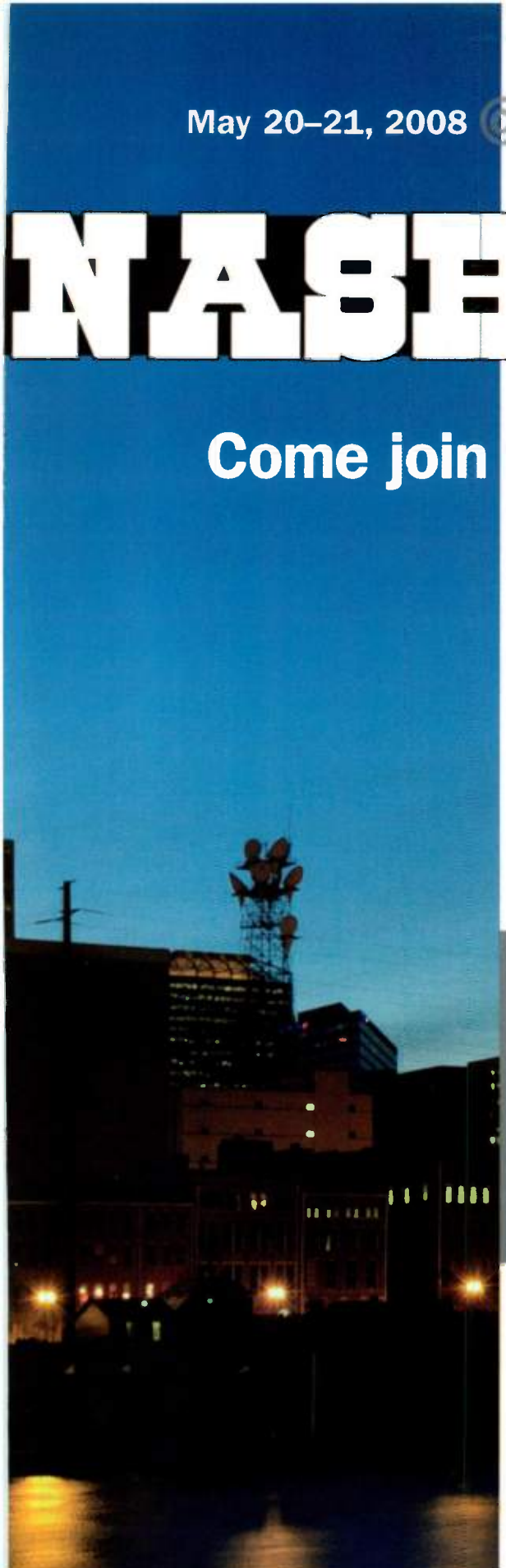
May 20–21, 2008 @ Soundcheck Nashville

NASHVILLE

Come join the editors of *Mix*

as we pull into Nashville for two full days of music and recording master classes, product demos and songwriting sessions.

Taking our cues directly from Nashville insiders, we will dissect the scene through a series of industry panels focusing on everything from cutting a demo and producing in Nashville studios to recording live shows and developing new distribution models.



***American Songwriter* will host a demo derby in which singer-songwriters will perform to a panel of three judges, with instant critiques and suggestions.**

And live-sound engineers will gauge their speed in setting up an "acceptable" mix in no time flat.

em

American ★ songwriter magazine

Above Sound Amazing

digidesign

MADSP

Meyer Sound

IT'S ALL ABOUT THE MUSIC, STUDIOS, BUSINESS, PERFORMANCE, SONGWRITING, STARS AND WANNABES.

Find full programming and special-guest details at mixonline.com/ms/nashville08

used these mics on lots of projects, so I have a good idea of how much deviation from their performance I can accept from a new mic before it becomes unusable to me.

Behringer B-1

The Behringer B-1 ($99.99) has been around for several years, and I've used this model in demo situations before this roundup. Off the bat, one advantage the B-1 has is that it comes with the most complete set of accessories of the four mics covered here. You get a sturdy road-style case with metal corners and deep foam padding, a large foam windscreen, and a true spider-band shockmount. The mic slides easily into the mount when you squeeze the attached metal tension bands, and the mic stays put once it's in there.

The B-1 is also the only mic in this group with a switch to engage either a bass rolloff (6 dB per octave at 75 Hz) or a –10 dB pad, standard features on higher-priced LDCs (see Fig. 1). You can engage only one or the other on the B-1—a single slider switch moves left for the bass cut or right for the pad. The B-1, at 6.8 inches, is the shortest of the mics I looked at.

FIG. 1: The Behringer B-1 offers the most extras of this group, including a pad/bass rolloff switch, a large windscreen, and a shockmount.

Sonically, the B-1 has a pronounced and audible high-frequency boost that begins to rise at 5 kHz and reaches 5 dB at 10 kHz. This boost was acceptable on the recordings I made with a male baritone whose round tones were offset nicely by the boost. However, a female vocalist with a bright upper-register tone brought out the worst in the B-1, and I quickly retired it from her session.

Recording my mahogany Martin D-18, the B-1's boost gave some life to the guitar's slight midrange boxiness. With the other B-1 set up about two feet away, I liked the character the mics imparted to my semidead control room. The B-1 also sounded good on small wooden percussion instruments like claves, but it sounded strident on anything metallic, like cymbals or triangle. But overall, the B-1 worked for me as a brightener of overly dark or muted sound sources.

M-Audio Nova

M-Audio's Nova ($99.99) is the only microphone here that comes with a mic cable, albeit a short (7 feet) and somewhat flimsy one. The mic is packaged in a cardboard box, with a vinyl pouch and a mic clip with a threaded ring that screws onto the mic stand.

Despite the spartan package, the Nova is one of the most versatile mics of the four that I tested. Right out of the box it had a rich tone quality that belies its price. The Nova has Class A electronics and exhibited low self-noise. Like all cardioid condensers, it was subject to the proximity effect, in which low frequencies build up as a sound source gets closer to the mic. But the Nova retained its richness and consistency better than the other mics in this group as the singers moved off-axis (see Fig. 2).

FIG. 2: The M-Audio Nova's sound stood out as comparable to that of higher-priced large-diaphragm condensers.

My recordings confirmed my initial impression of the Nova. The female vocalist sounded great on it, and the baritone seemed to get richer without turning into a "bass" through increased low frequencies.

My guitar recordings also sounded good, although they leaned toward a mellow

The Right Response

All other factors being equal, the mass of a mic's diaphragm is indirectly proportional to its ability to capture transients. That's why condensers generally grab more detail than dynamic mics fitted with relatively heavy magnet assemblies hanging off the back of their membranes. Generally, the larger diaphragm of an LDC mic responds more slowly to transients than a small-diaphragm condenser's diminutive membrane does. But slower response is not necessarily a bad thing. Some small-diaphragm condensers are criticized for having too fast of a transient response, producing a glassy sound in some applications. An LDC mic, on the other hand, excels where the nuance of a condenser mic is called for but a slightly rounded attack is desired, as is usually the case when the user is recording vocals or voicelike instruments, such as cello and violin.

—*Michael Cooper*

Budget Large-Diaphragm Condenser Features Compared

Model	Behringer B-1	M-Audio Nova	MXL 2006	Sterling Audio ST51
Diaphragm	1"	1"	1"	1"
Polar Pattern	cardioid	cardioid	cardioid	cardioid
Pad	–10 dB	none	none	none
Rolloff	6 dB/octave @ 75 Hz	none	none	none
Frequency Response	20 Hz–20 kHz	20 Hz–18 kHz	30 Hz–20 kHz	20 Hz–18 kHz
Maximum SPL	138 dB (0 dB), 148 dB (–10 dB)	128 dB	130 dB	134 dB
Size	6.8" (L) × 2.28" (D)	7.3" (L) × 1.9" (D)	7.5" (L) × 1.96" (D)	7.5" (L) × 1.8" (D)
Weight	1 lb.	1.5 lbs.	1.3 lbs.	1.1 lbs.
Price	$99.99	$99.99	$99.95	$99.99

Manufacturer Contacts

Behringer	M-Audio	MXL Audio	Sterling Audio
behringer.com	m-audio.com	mxlmics.com	sterlingaudio.net

roundness rather than a sizzling shimmer. If I had needed a steel-string solo to really burn, I might have chosen a brighter mic. But on singer-songwriter accompaniment, the Nova made a great impression. When using a pair of them on the Martin, I preferred a sound-hole-and-neck arrangement, with added digital reverb, rather than using one Nova as a room mic. My control room was just too dead for a mellow mic like this one. In overall sound quality, however, the Nova stands out in the roundup.

MXL 2006

The MXL 2006 ($99.95) comes nestled in a black plastic case with adequate foam padding, and it includes a nice shockmount with an extra elastic (see Fig. 3). The mount is a bit sturdier than the one that comes with the Behringer and is somewhat easier to use because the metal tension arms are a bit bigger, giving you more leverage with which to squeeze the holder open and slide the mic in. The case also includes a soft cloth for keeping the screen free of moisture. (MXL offers an optional stand-mounted pop filter, the PF-001, for $24.95.)

This Class A FET condenser has a pronounced rise across its frequency-response graph, reaching up to 10 dB at about 9 kHz. The mic's graph suggested that the MXL 2006 might have very good off-axis response. And in operation, the mic exhibited good uniformity at a distance of about eight inches and within about 30 degrees left or right of center. I felt that the mic could be a good choice for small vocal group recording. At closer distances, though, the proximity effect required individual singers to maintain their center position as well as their distance.

That said, the MXL 2006 was clearly a winner in terms of sound quality for the buck. The steady rise in output at upper frequencies sounded pleasing when my baritone stretched out on some Michael McDonald–style soul riffs. Male vocals had punch and presence without any of the honkiness I feared might come through, based on a first listen to the mic.

The female singer came across well, too, though I preferred the sound of the Nova for her voice. Instead of highlighting this singer's occasionally strident sound at the top of her chest voice, as some mics do, the 2006 flattened out those frequencies and simply sounded crisp rather than coarse.

I liked the 2006 on my Martin as well. The mic's high-end boost seemed to bring out some buried ambience in my studio when placed about two and a half feet back from the guitar

FIG. 3: Despite a steady increase in output up the frequency scale, the MXL 2006 maintained a mostly transparent crispness.

and paired with the other 2006, which was about six inches away and angled toward the sound hole.

Sterling Audio ST51

The Sterling ST51 ($99.99) is the best-looking mic I examined in the roundup—its sleek black housing and screen are offset by silver trim (see Fig. 4). The mic comes with only a pouch and a screw-on mount similar to the one that comes with the Nova. And like the Nova, the out-of-the-box sound quality of the ST51 indicates that the value of the product may be all in the mic and not in the accessories.

Of these four mics, the ST51 came closest to having the natural sound of a more expensive large-diaphragm condenser, and it maintained its transparent and clear sound working with all the recording applications I set up. On my male vocal recordings, this Class A FET condenser added very little color to the natural sound of the singer's voice, letting the baritone's rich low notes fill up the track without creating any problematic honk or bass buildup in any part of his range. Similarly, my female vocalist was held in check by the ST51's flat frequency response in the high end, and she could wail without her upper register turning into a tinny screech during loud passages on rock tunes.

I also liked the ST51 on my acoustic guitar, finding several mic positions that resulted in usable recordings. The ST51 reminded me of why studio owners audition multiple mics, especially when they need a single mic to cover lots of ground. Although not perfect, the ST51 handled basic recording tasks in a workmanlike fashion and sounded good on anything I used it on.

Miked Up

All of this testing left me with a few clear impressions. The Sterling Audio ST51 and M-Audio Nova showed the most versatility and the most consistent high-quality sound in the most applications. Close behind was the MXL 2006, which includes a good shockmount in the deal. For specialized recording tasks, the Behringer B-1's pad or bass rolloff, not to mention its accessories, would come in handy.

I also feel that the budding studio owner who wants a large-diaphragm mic that records everything equally well will have to spend more than $100. However, inexpensive LDCs make it possible to obtain several mics for specialized situations, such as choosing one that best suits a particular vocalist, even if it is less than optimal for other studio tasks. And having a collection of low-cost mics allows you to record more musicians and different types of instruments simultaneously.

But with so many mics available at tempting prices, it's important to audition the ones you are considering on as many different sound sources as possible. The low prices make it easy for anyone who doesn't have a large-diaphragm condenser to get one, and those who do will generally see improvements in the sound quality of their recordings.

FIG. 4: The Sterling Audio ST51 sounded very good on vocals, acoustic guitar, and percussion. It didn't add undue color to the recorded sound.

Rusty Cutchin is a producer, engineer, and music journalist in the New York City area. Michael Cooper owns Michael Cooper Recording (myspace.com/michaelcooperrecording).

ALL AROUND THE WORLD...

Artists around the world know that whether you play jazz, rock, pop, classical, or music theater, Receptor is the ultimate platform to run your favorite virtual instruments and effects. Receptor helps you play your best and unleashes your creative potential with its superb sonic performance, stunningly fast response, and powerful versatility. Artists also know that Receptor is a real workhorse both live and in the studio and holds up to the rigors of the road, tour after tour.

Check out what Receptor has to offer you.
Visit www.playreceptor.com

All around the world, artists are using Receptor. Why have they adopted Receptor as part of their rig?

"Receptor – It sounds great, it's rock solid, I love it."
–Paul Wickens
Musical Director / Keyboardist Paul McCartney

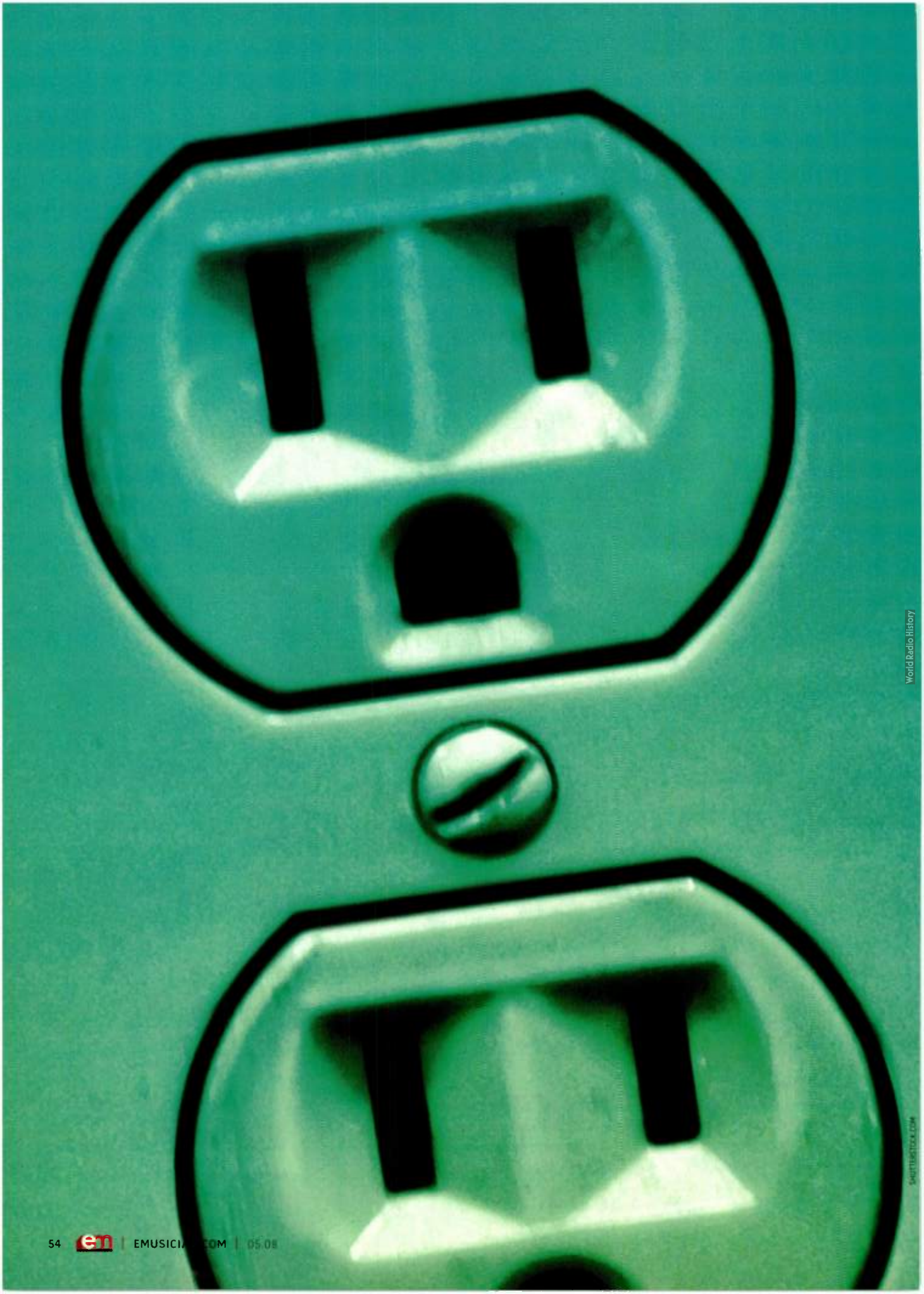
"This machine has become such a central part of my way of making music that I bought a second one for my studio!"
–Ric'key Pageot
Cirque du Soleil's Delirium-Band director, keyboardist & accordionist; recording singer/songwriter

"Receptor is powerful, reliable, and easy to use. It does what I ask it to do. Anything I ask it to do."
–Paul Mirkovich
MD/Keyboardist for Rockstar (CBS TV), Janet Jackson, Pink, Cher

"With its unlimited expandability and roadworthiness, the Receptor is truly the swiss-army knife of the modern synthesizer."
–Adriana Balic, Keyboardist, Background Vocalist, Pink, Il Divo, Jersey Boys, Sheila E., Peabo Bryson, Brenda Russell, Norman Brown

MUSE RESEARCH
RECEPTOR

www.playreceptor.com



IT'S EASY BEING GREEN

Make your personal studio eco-friendly—and cost-efficient, too.

By Jon Chappell

Is your studio contributing to global warming and other environmental problems? Unfortunately, the answer is almost certainly yes. Between the electrical energy you use to run your gear, the climate-control system in your studio (that is, your heater and your air conditioner), and the disposable media and old gear you throw out, you are, statistically speaking, adding to the problem.

That problem, of course, is the pollution of the environment from greenhouse gases and other harmful elements, the depletion of nonrenewable energy sources, and the taxing of the earth's already-bulging capacity to contain the waste we have created. And members of the developed Western world (obviously, personal-studio recordists are just a minuscule fraction of that group) are among the worst culprits. The root of the problem is consumption: the oil used to run vehicles; the coal, natural gas, and nuclear energy used to heat and power homes and businesses; and the energy used in the manufacture and distribution of goods.

In light of these ecological challenges, it's in the best interest of all members of society to adhere to eco-friendly habits in their daily lives. As a home-studio recordist, you are in a position to couple your home and professional lifestyles and adopt many conservation measures with great efficiency. In this artic e, I'll take a look at the key areas in which you can reduce consumption, lower your negative impact on the environment, and operate your studio in a greener way.

Recycling, Life Cycling

An excellent way to start being a better eco-citizen is by putting less junk into the planet's landfills. You likely recycle plastic and paper goocs from your home, but what about those CDs and DVDs that you use in your studio? They are a recycling nightmare. Discarded CDs, in particular, are a horrible example of wastefulness; recordists must use the low-capacity, write-once kind to create audio discs that will play

> It's not as if you can switch to a wood-burning DAW.

in regular CD players, so that nonrenewable technology quickly becomes waste. And until recently, you couldn't recycle CDs because in addition to their plastic core, they contained aluminum, lacquer, and other chemicals that made them problematic for recycling facilities to handle.

Fortunately, that's changing, and many towns now take CDs and DVDs away at curbside—but you must check with your particular municipality first. If you need to destroy the data on certain CDs before disposing of them (because, say, they contain sensitive backup data), don't zap them in the microwave, as some people suggest. That may obliterate the data, but it uses a lot of juice and creates another problem by increasing your energy consumption—just to perform a small task. Instead, grab some gloves and heavy-duty scissors and cut the discs in half.

Unlike a CD's relatively simple construction, a computer is made up of a complicated jumble of metals and plastics. But computers should still be recycled rather than dumped into a landfill. Patrick Stefurak, a recording engineer and eco-journalist, suggests, "Donate your computer to a school. That's a form of recycling—by keeping it in use, even though it leaves your possession. A school doesn't need state of the art, and you get a tax write-off."

Even if you have to remove your computer's hard drive for security purposes, or you remove other components, most school districts have IT departments that can refurbish and reuse computers, says Stefurak. "The best way to recycle is to keep something alive. It helps another person and prevents them from having to spend more money to buy something new, which in itself reduces consumption."

If you have old, obsolete gear (analog signal processors, outboard graphic EQs, and so on), Stefurak points out that selling and buying used gear is a form of recycling: "It delays new-gear purchases for the buyer—reducing consumption—and it's good for your pocketbook. In this way, craigslist is helping the environment. Most of us have a lot of gear we don't use for an extended time. This means we're paying to store it and heat it while it collects dust—and it gets in our way. Letting someone else 'borrow' your unused gear is a good way to store it and do the maintenance on it." And if you can't find a happy new home for your computer gear, many towns and municipalities have computer and electronics recycling days, when you can drop off your old computers, monitors, and peripherals.

Electron Reduction

Recycling is important, but it's even more critical to reduce your energy consumption. Doing so benefits the earth in two ways: it slows the depletion of nonrenewable resources—chiefly oil, natural gas, and coal—and it lessens pollution, including the production of carbon dioxide, which accelerates global warming. In the United States, most oil goes to transportation, and most natural gas and nuclear, hydro, and coal fuels go to generating electrical power. So there are twin, pressing obligations for us to change our driving habits and rethink how we juice up our buildings. Because driving isn't really a part of the home-recording process (unless you count the car-stereo mix test), in this article I'll focus on electrical power and the home studio.

Without electricity, you would be unable to operate your studio. After all, it's not as if you can switch to a wood-burning DAW. So given that the flow of electrons is a vital component of studio operation, it's intriguing that most recordists—even technically minded ones who know the specs of their gear cold—don't know how much electrical power they consume. Do you know, for example, what it is your utility company charges you for? Here's a hint: your monthly statement lists your use of kilowatt-hours (or kWh). So is the company billing you in units of a) power, b) energy, c) time, or d) some combination of the three? The answer is *energy*, and the clue is in the combined terms of *watt* and *hours*. A watt is a unit of power (the rate of energy transferred, or energy divided by time). And if you multiply that by a time factor (in this case, hours), the result is an energy unit: W × T = E, or watt-hours (Wh).

Bills, Bills, Bills

Because a watt is rather small stuff in daily-living (and billable) terms, the utility uses the unit of the kilowatt (1,000 watts). So if you burn a 60W lightbulb for two hours, you'll be charged for 0.12 kWh. At a typical rate of $0.15 per kWh, leaving that light on in your living room while you do a mixdown in your control room costs you $0.018, or just less than two cents. Not a huge penalty for such a "mistake," but if you extrapolate that out over a year, along with all the other energy you waste without even realizing it, the cents can add up to a lot.

And it's not just the money wasted; it's the extra electricity that the power plant has to manufacture. Now remember, I'm not just talking about you. I'm talking about the entire population of the United States—more than 300 million people (see the sidebar "Watts Up").

So the simplest thing you can do to reduce energy consumption immediately is to turn off

FIG. 1: Auralex's StudioFoam Eco uses a soy-based additive and, as a result, contains less petroleum than previous formulations.

Introducing the Fast Track Ultra

DSP-enabled USB 2.0 interface

As the world's best-selling manufacturer of audio interfaces, M-Audio has introduced many innovative products over the years. Now our legacy continues with the new Fast Track Ultra 8 x 8 interface–complete with high-speed USB 2.0 and on-board digital signal processing. Our MX Core DSP technology provides flexible channel mixing–plus ultra-low-latency monitoring complete with reverb. Four preamps with award-winning Octane technology offer pristine signal quality. High-speed USB 2.0 delivers 24-bit/96kHz on all eight inputs and outputs simultaneously. The Fast Track just got faster.

On-board MX Core DSP lets you:

- monitor with reverb while tracking vocals and instruments–with no CPU load
- record up to eight tracks simultaneously while monitoring other tracks in a 16 x 8 software/hardware environment
- create two separate headphone mixes
- set up and mix external effects loops

8 x 8 audio interface with S/PDIF and MIDI I/O

GET M-POWERED

M-AUDIO

www.m-audio.com

20 years

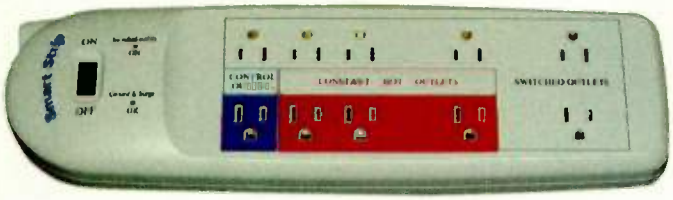


FIG. 2: A Smart Strip will automatically shut off the power to unused gear when it senses no current draw.

the lights when you aren't using them—even if only for a minute. (By the way, there's no truth to the rumor that turning on a light consumes more energy than just leaving it on.) You can also replace an incandescent bulb with a CFL (compact fluorescent lamp), which I'll cover in the section called "Light Me Up." But "turning it off" is what all eco-conscious experts advocate—and not just for lightbulbs. Any device that is left either on or in standby mode draws energy. It may be a tiny amount, but the utility company is certainly tracking it—and charging you for it.

Get More Info

The following are valuable online resources (including links to the manufacturers and organizations mentioned in this article) for helping you become more aware of environmental issues and green products.

Energy and the Environment

energy.gov
epa.gov
pluginamerica.org
solarcity.com
treehugger.com
trinifar.wordpress.com

Green Gear for the Home Studio

auralex.com
environbiocomposites.com
lutron.com
p3international.com
smartstrip.net
suffolkstudiodesign.com

Green Gadgetry

Just as recording technology is continually improving, so are the materials and the machines specifically designed to manage energy use. Although using green products is not a substitute for good conservation habits, it can definitely help.

Auralex produces several eco-friendly products, including its new StudioFoam Eco (see Fig. 1). Tim Martin, Auralex's director of sales, describes the new foam: "Instead of a petroleum-based additive, we went to a soy-based additive and reduced our petroleum use for the creation of this foam by 60 percent. It's actually improved our product from the durability and longevity perspective, and it also holds color better than our previous formulations. The best part is there's no perceptible difference. We would have been hesitant to release it otherwise, but we were able to improve the product, go green, and maintain the acoustical quality that Auralex is known for."

Not all companies are as active in making their products eco-friendly as Auralex is. One persistently annoying aspect of technology—the dreaded wall wart, or the external power supply—still plagues recordists, even on some of the latest gear. These evil little devices hide out in plain view and suck energy 24/7 without your even realizing it. Power supplies aren't just a menace to your power strip's real estate; they also pull energy when they shouldn't—especially on devices without a power switch (like your USB hub).

Fortunately, there's a tidy way to quash wall warts when they aren't in use: put them all on a power strip and manage them through a master control switch. If you chain your power strips together, keeping the master (the one that plugs into the wall outlet) accessible, then you can turn off all your wall warts with a single switch. But there's an even more intelligent way to manage your power connections: add a brain to the chain. "Smart" power strips, such as the Smart Strip (see Fig. 2) from Bits Limited, use a sensing technology that can determine whether a device is turned on or off, based on how much current it draws. If the strip decides that the unit is off, then it will shut down the circuit entirely, making sure that even small amounts of current don't leak through. In this way, smart strips act similarly to gates—their counterparts in the audio domain. In addition, other outlets are slaved to this master outlet, so when the master is off, all subsequent outlets are shut down as well.

One way to set this up is to put your computer's CPU in the master outlet and have all peripherals (printer, USB hub, and so on) in the slave outlets. When the CPU is off, the peripherals automatically shut down.

If you're nervous about turning off your CPU every night and rebooting it in the morning, at least turn off your monitor and all your peripherals. Hard drives are much more reliable than they were in the past, but people still don't like to have to watch their computers

COURTESY CHUCK CONOVER/SOLARCITY.COM

FIG. 3: If you have the property, you can employ a ground-mount system for your solar panels.

boot and load system utilities. So if you don't want to turn off your computer during your workweek or a mission-critical project, at least turn if off for the weekend.

Of course, even the smartest power strips aren't as crafty as technology that's specifically designed to reduce your energy draw over the long term. Several devices of varying complexity and expense are available that monitor how much energy you use in your daily activities. The Kill A Watt, from P3 International, is a meter that measures how much energy a particular device uses. In addition to accurately

TL Audio®
PASSIONATE ABOUT TUBES

FatTrack

COOLEST SOLUTION, WARMEST SOUND

THE COMPLETE SOLUTION FOR TRACKING, SUMMING AND MONITORING

Designed to be the centerpiece of any home, project or semi-professional studio, the Fat Track combines some of the best features of TL Audio products into one compact unit. Hand-made in England, the Fat Track adds warmth and sonic pleasure to all recordings.

The Fat Track captures your recordings with premium TL Audio **tube** preamps and 3-band swept *musical* EQ. You can also use the Fat Track for mix down and summing with up to 4 stereo and 2 mono returns.

Full-featured master and monitor sections provide alternate speaker modes, 2 headphone outputs with independent level control. effects return, balanced insert on stereo bus and channels, tape out and I/O switchable between +4 and -10.

All connectors are handily placed at the rear top of the unit for quick-access and easy cable changes and the Fat Track can also be fitted with the TL Audio DO-8 ADAT interface for easy digital connectivity with your DAW.

The Fat Track is perfect for the producer, musician, singer-songwriter or digital engineer. It adds warmth, is very flexible, easy to use and produces fantastic, professional results.

MAIN FEATURES

- 2 Mic | Line | Inst. inputs
- 3-band swept EQ on input channels
- Tube stages on channels and master
- Balanced insert points on channels and master
- Effects send | return
- Phantom power, 30dB pad, phase reverse
- 4 stereo returns [DAW | tape returns] switchable +4 | -10
- 2 headphone outputs with individual level control
- Alternative speaker mode
- Main volume large knob
- Balanced I/O +4 | -10
- Optional ADAT I/O
- Warms & Fattens

The Fat Track is available at finer music retailers across the USA and Canada.

DISTRIBUTED BY mm music marketing

To find a dealer call 866 273-4178
or visit www.musicmarketing.ca

HAND MADE IN THE UNITED KINGDOM

MICHELLE QUAZI

FIG. 4: This photograph was taken during construction of Vole Studios. The walls are made of recycled wood, with mineral board used for insulation. No virgin wood or fiberglass was used.

monitoring a unit's energy consumption—including specific data such as volts, amps, and watts—the display offers other diagnostic tools and features a calculator that forecasts projected costs and converts energy use into dollars per month.

If you leave a meter plugged in between your power strip and the power amp for a month, you can get a very accurate picture of how much energy that amp is drawing. This feedback is the first step in understanding how much energy you actually use, and can inspire you to set goals for reduction.

Light Me Up

In your studio, as in any work environment, you need adequate lighting. Many people still prefer the quality of incandescent bulbs to the lower-energy and longer-lasting CFL types. But if you must use incandescent bulbs, you can economize by turning them off when you aren't using them and by employing dimmers.

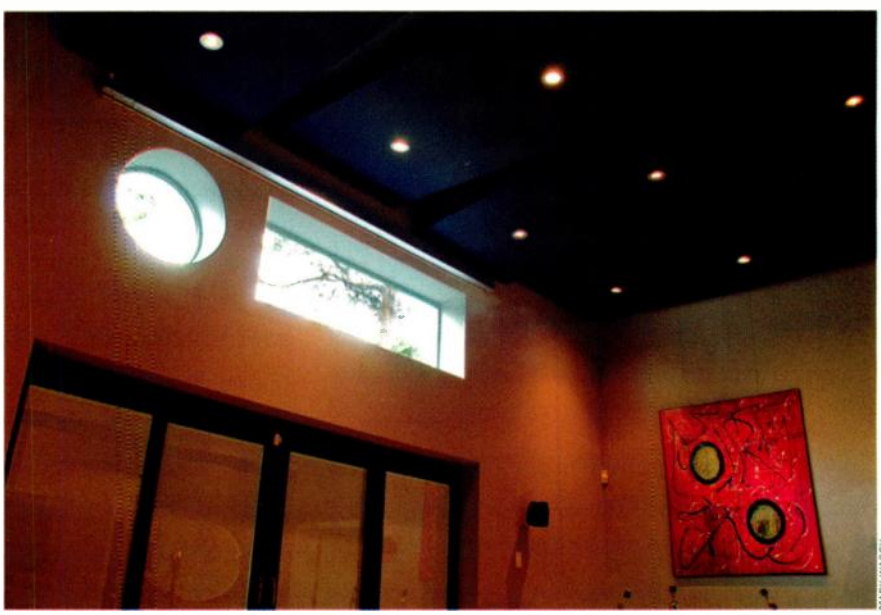
Modern microprocessor-based dimmers, such as the Lutron Maestro series, are far better than the older rheostat models. Today's dimmers vary brightness by turning the lights on and off up to 120 times per second, which is too fast for the human eye to detect. This method uses less energy than the rheostat models, but it still isn't 100 percent efficient. In other words, if you run a 60W bulb at half strength, you aren't using just 30W; you're using more. But using dimmers is still a good way to save energy, and dimmers have the ability to vary the mood in a room, which is often important for establishing an environment conducive to creativity. So if you have to use incandescent bulbs, try to keep them under dimmer control and consider letting CFLs do their part in illuminating restrooms, closets, hallways, and outdoor areas.

Improving your daily energy-using impulses and employing these gadgets will help you cut down your energy costs in significant, if incremental, ways. But you never really escape the clutches of the utility company, which sells you the juice from the wall, unless you go off of Big Power's grid altogether. That isn't a practical route for many people, but it's doable for some. The precedent is there: for instance, last fall Thomas Dolby disclosed to EM his plans to record an entire album completely off the grid, using solar and wind power.

Soak Up the Sun

Does solar power make sense for your home studio? It may, depending on your location. Paul Scott, an adviser and consultant on solar energy, is a cofounder of Plug In America and was featured in the documentary film *Who Killed the Electric Car?* He explains some of the conditions you have to meet: "You've got to have the sunlight falling on your property," he stresses. "Most people put the panels on the roof, but you could also have a ground-mount system, if you have property in the country [see Fig. 3]. The amount of sunlight might vary, too, even if you have direct exposure. For example, in Oregon you have really long, dry summer days with a lot of light, but the winter is terrible. Southern California is great because days are not that much shorter in the winter, and we have sunlight year-round. So each area will generate more or less energy depending on those factors."

Scott also cautions that it doesn't make sense to do a small system (say, for just the studio), especially if the studio is part of the house or detached but on the same meter. "A company in the business of installing solar panels won't do a system that small," said Scott, after I told him the dimensions of some typical home studios. "The fixed costs—the expenses that are the same whether it's a big system or a



MARK MACCY

FIG. 5: Note how the acoustic panels in the ceiling have alternately convex and concave shapes. Skylights allow for natural lighting, reducing the need for powered, artificial light.

The New Benchmark Has Arrived

The PC3X is Kurzweil's ultimate performance keyboard combining an enormous collection of new stunning sounds, a virtual track "looping" sequencer with the world's most powerful synthesizer - V.A.S.T.

very PC3X and PC3 (76-note) comes bundled with Sound Tower's V.A.S.T. computer editing software for PC and Mac, making your V.A.S.T. enabled PC3 vastly easier to program.

PC3X

KURZWEIL

MSRP
PC3X $3,630.00 PC3 $2,820.00

visit the all new
kurzweilmusicsystems.com

KURZWEIL... IT'S THE SOUND

Kurzweil Music Systems
19060 S. Dominguez Hills Drive
Rancho Dominguez, CA 90220

small system—work out better for a big system, because you can divide those costs into smaller parts, which results in less money per kilowatt. Practically speaking, you need to go with at least a 2 kW system," he says. Let's look at the math to see how you would calculate your solar-energy needs, assuming that your roof or property has lots of unobstructed exposure to sunlight.

"A single kilowatt of solar power will generate approximately 150 kWh of energy in a given month," says Scott. "A typical house uses roughly 1,000 kWh a month. So take that 1,000 and divide it by 150, which will tell you how big of a system you need—about a 6.5 kW system, in this case, to supply the entire house. If you didn't have room for a 6.5, then you'd bid for a 4 or a 3 or a 2.5 or whatever you could fit up there. And that would generate a portion, which would at least zero out the studio. And in round terms, that's how it's done. But if you don't have the sun and the orientation, then you're a nonstarter."

> These evil little devices hide out in plain view and suck energy 24/7.

So solar power may not be for everybody (like apartment dwellers and those in cloudy, northern climes), but you can still do your part to support solar power, even if you live in a middle-floor apartment in downtown Manhattan. One way is to buy green energy from your utility company. Even if the actual power you get is from a coal plant (as it is in much of the East), by paying a little extra, you can buy power from solar and wind farms, ensuring that at least some of that makes it to the grid. So while you may not be using the sun to run your DAW, by purchasing green energy from your utility company, you make sure that it meets some of the total demand through clean, renewable sources.

Watts Up

Saving wasted energy in your home studio is perhaps the best way to reduce your consumption. Even if you save only 3W an hour, which you can easily do by employing a smart power strip, it can make a difference. Consider this sobering bit of math, inspired from a discussion on Treehugger.com, which shows that such a savings is not an insignificant amount when scaled up to the level of the current U.S. population.

Given:

3W of saved energy per hour.

105,480,101 U.S. households (according to the 2000 U.S. census).

Taking into account the above conditions, the saved-energy math works out as follows:

3 watts × 24 hours = 72 Wh or 0.072 kWh per day;

0.072 kWh × 365 days per year = 26.28 kWh per year, per strip;

26.28 kWh × 100,000,000 homes = 2,628,000,000 kWh saved by the United States per year;

2,628,000,000 × $0.104 per kWh (national average 2006*) = $273,312,000.

That's $273,312,000 worth of energy saved.

So if every household in the country saved 3W an hour, it would amount to not only a monetary savings to consumers, but also a reduction in how much energy the utility companies have to produce to meet demand. And less energy production means less impact on the environment.

Going green means thinking globally and in scalable terms. It means factoring everything you do in yearly terms and by the U.S. population or its total number of households (and the math is fairly easy here: 100 million). Then you take measures, recalculate, and consider the difference you made by changing your habits. Doing the math allows you to see what the impact would be if everyone followed your example.

*Source: U.S. Department of Energy, Energy Information Administration (eia.doe.gov).

Ground-Up Green

All of the approaches I've explored so far have been for modifying an existing studio. But not only has Dallas-based studio designer Bob Suffolk of Suffolk Studio Design made a career of studio design, but he and partner Michelle Quazi also are early adopters of eco-friendly materials specifically designed to make recording studios. Suffolk recently designed and—with the help of Quazi and their personal staff—built an award-winning space called Vole Music Studios, which was created with the environment in mind from its inception.

"Most of the wood we used for framing the interior was recycled," explains Suffolk. "We used Fibrex mineral wall, a rock-based fiber, between the wood for insulation [see Fig. 4]. We stay away from anything fiberglass, like R-11 or R-13. We then put Sheetrock over that, and then a layer of Auralex SheetBlock Plus, a dense vinyl-based material which is ⅛-inch thick and shielded, then another layer of Sheetrock. This allows us to keep the walls thinner than just building layers of Sheetrock and paper and fiberglass.

"The Auralex Elite wall system is then applied, [composed] of 1-inch S-Core, a recycled condensed cotton material, and finished with Interfaced fabric, a recycled material. It's

digidesign + Sweetwater

digidesign

virtual instrument box set

Anything but ordinary, Digidesign's revolutionary virtual instruments deliver amazing sounds, unprecedented features, unparalleled integration with Pro Tools, and outstanding playability to drive your artistic ambitions and put an end to any musical void.

And now with the Digidesign® Virtual Instrument Box Set, it's simple and more affordable than ever to add the entire collection of A.I.R. instruments to your Pro Tools® arsenal. From professional sampling and just about every possible musical instrument to realistic drums, electric pianos, and synths, the Digidesign Virtual Instrument Box Set gives you the tools to explore and push your creativity.

Hybrid™
High-definition synthesizer

Strike™
The ultimate virtual drummer

Structure™
Professional sampler workstation

Velvet™
Vintage electric pianos

Xpand!™
Sample-playback/synthesis workstation

air advanced instrument research

Since their debut, Digidesign's A.I.R. instruments have already become favorites with Sweetwater; visit www.digidesign.com/vibs_em or call your Sweetwater sales engineer to learn more about this special box set.

(800) 222-4700 www.sweetwater.com

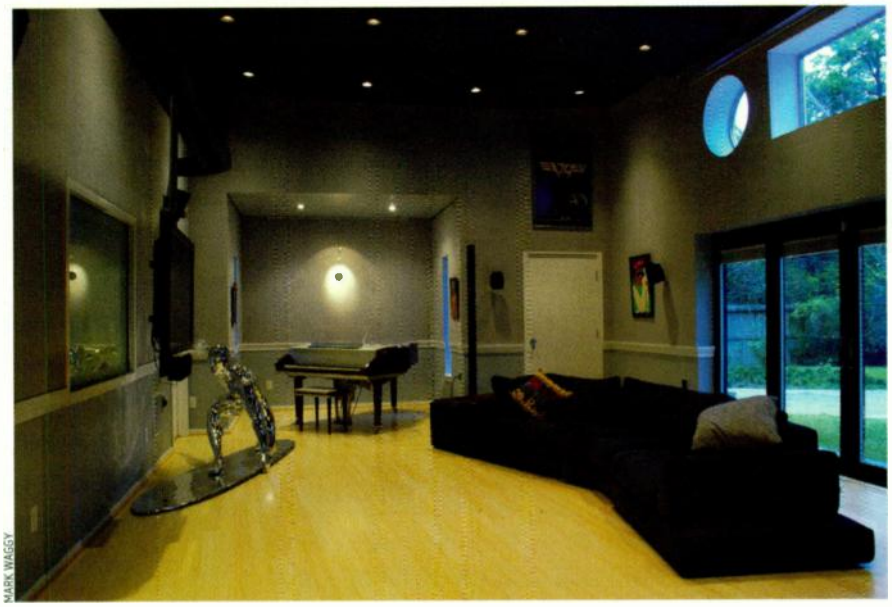


FIG. 6: This photograph shows the finished live room. Its floor was made from bamboo.

all about knowing the transmission points and isolation points and sealing. The custom-made acoustic ceiling clouds were made from recycled materials as well [see Fig. 5]." Suffolk recommended bamboo for the floors because it's one of the world's fastest-growing woods and is therefore sustainable. And that was four years ago, when bamboo was just becoming popular (see Fig. 6).

The attention to green processes didn't stop at the walls and the floor. "The new studio furniture and cabinetry that we make are from pressed wheat and sunflower seeds, with no formaldehyde," says Suffolk. "The material is more expensive than something like particleboard or MDF [medium-density fiberboard], but that contains formaldehyde and toxic glues. We strive to use all of our materials from Environ Biocomposites to make our studio furniture and consoles. It's an incredibly good material to work with—more expensive than plywood, yes, but we're using wheat straw and sunflower hulls, which will all go into a compost and break down organically. And it's beautiful looking when finished with a water-based varnish."

Suffolk offers this advice regarding a ground-up build of a home studio: "When building a home studio, there's a whole bunch of different materials you have to consider. And it is a little bit more expensive than going the traditional route, but in the long run it's worth it." He also says that it isn't just the selection of materials, but how you work with them. "We have a rule when we work—whether it's with our staff or with a freelance crew—and that is that anything over a foot does not get thrown away. We'll use it again. We always save all our building materials right to the very end, so that if we need additional materials, we're not buying a small piece from the company, which would require additional shipping."

Go Green and Save

While some eco-friendly materials and energy plans may cost more, it is money well spent. And you can offset those costs by reducing your consumption, which is the most immediate threat to the planet. As Paul Scott says, "Make a conscious effort, and you will get into habits that will save you money just by thinking about it. And it's stuff that won't affect your lifestyle at all. It's a matter of flipping a switch." This relationship of economy and ecology equates to a simple and elegant axiom: if you're saving money, you're helping the environment. It's a win-win situation. em

---

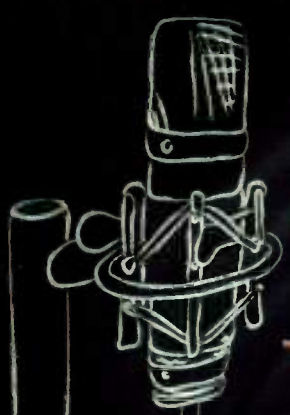
Jon Chappell is the author of The Recording Guitarist—A Guide for Home and Studio *(Hal Leonard, 1999) and* Build Your Own PC Recording Studio *(McGraw-Hill, 2003).*

RØDE UNIVERSITY

ONLINE NOW!
www.rodeuniversity.com

LEARN
AT YOUR OWN PACE
WITH FREE
EXCLUSIVE
VIDEO TRAINING

- mic techniques
- studio and location
- audio theory
- choosing the right mic



www.rodeuniversity.com

THIS IS SAE INSTITUTE OXFORD DEGREE CENTER

PROGRAMS COMMENCE OCTOBER 2008

Accelerated programs in:

DIPLOMA OF ***AUDIO ENGINEERING***
BACHELOR OF ARTS (HONS) DEGREE IN ***RECORDING ARTS****
MASTERS LEVEL - ***SAE TONMEISTER*** ®

BACHELOR OF SCIENCE (HONS) DEGREE IN ***GAMES PROGRAMMING****

DIPLOMA OF ***DIGITAL FILM MAKING***
BACHELOR OF ARTS (HONS) DEGREE IN ***FILM MAKING****

Degrees validated by Middlesex University (UK) and issued in partnership with Qantm College and SAE International Graduate College

Middlesex University

qantm

SAE INSTITUTE

SAE INSTITUTE is located on 5 continents
NEW YORK::LOS ANGELES::NASHVILLE::ATLANTA::MIAMI::LONDON::LIVERPOOL::GLASGOW::PARIS
LJUBLJANA::VIENNA::STOCKHOLM::ZURICH::GENEVA::BERLIN::HAMBURG::COLOGNE;; FRANKFURT
MUMBAI::BANGALORE::SYDNEY::ADELAIDE::PERTH

THE WORLD'S LARGEST CREATIVE MEDIA CAMPUS

(YES, THE WHOLE BUILDING)

SAE OXFORD::The SAE Oxford campus is unique. It offers a complete creative learning environment within one of the most traditional English university towns. The township of Oxford is made for students. Oxford is located only one hour from London with a regular (every ten minutes) bus and train service.

OPTIONS:: Students can commence their studies at any SAE Institute around the world and transfer to SAE Oxford for their second year or could choose to study their complete course at SAE Oxford. Students from other schools or colleges can be accepted by attending an entrance examination.

GET YOUR DEGREE FROM SAE OXFORD - it's for life.

www.sae-oxford.com

Armstrong Road, Oxford OX4 4SX United Kingdom Tel. +44 845 017 9044

www.sae.edu

In USA call 1.866.723.2983

SAE INSTITUTE OXFORD

1976-2006 30 YEARS SAE

INDIVIDUAL HANDS ON TIME

ESTABLISHED IN 1976

ACCELERATED DEGREE

INTERNATIONAL RECOGNITION

LATEST STUDIO TECHNOLOGY

THE SAE OXFORD DEGREE ADVANTAGE

23 countries - over 50 locations - established since 1976

MADRID::BARCELONA::AMSTERDAM::ROTTERDAM::BRUSSELS::MILAN::ATHENS::ISTANBUL

STUTTGART::MUNICH::LEIPZIG::AMMAN::DUBAI::KUWAIT::SINGAPORE::MALAYSIA::BANGKOK::CHENNAI

BRISBANE::BYRON BAY::AUCKLAND::MELBOURNE::TOKYO

Loop-Overs

Enhance your live drum tracks with loops. | By Steve Skinner

Live drums, no matter how well played, have variations in timing and feel. If you want a drum loop to work with a live drum track and you want to avoid flamming, you must either quantize one to the other or—my preference—align both to a quantize grid of your choosing. In this month's "Making Tracks," I'll take you through that process using Digidesign Pro Tools Beat Detective (see "Step-by-Step Instructions"). If you don't have a file-slicing program, such as Beat Detective or Propellerhead ReCycle, you can carry out these steps by hand.

To use Beat Detective effectively, you must first consolidate each of the drum tracks so that you are dealing with just one audio file per track. Then you must go through each track visually, bar by bar, to make sure that Beat Detective's analysis of the track is correct; it will often mark transients where there are incidental noises, such as kick-pedal-return clicks, and miss the actual attacks. Through trial and error, you will find that Beat Detective works quite well (see Fig. 1).

All Together Now

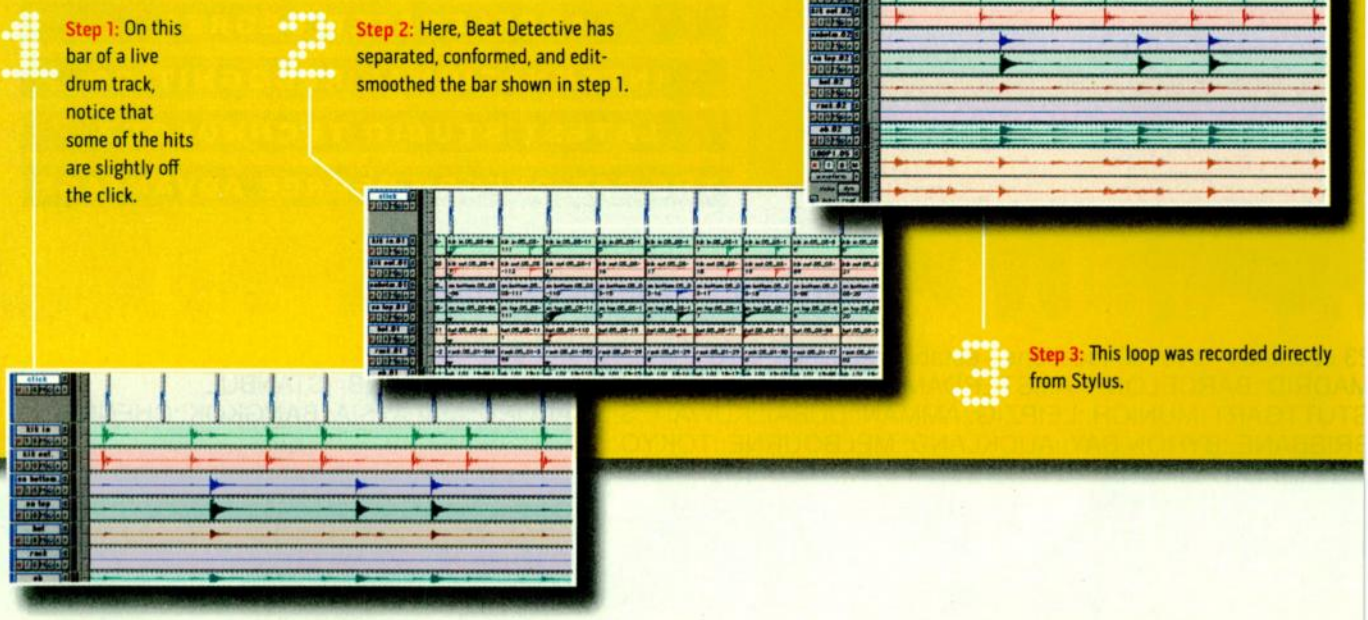
It is important to slice and align all of your drum tracks together. If, for example, the overhead mic tracks are aligned differently from the hi-hat track, the hi-hat leakage on the overhead tracks will be out of phase with the hi-hat track.

It isn't necessary for you to quantize every nuance of a live performance. For instance, if the drummer swings the 16th notes, it may sound better to quantize just eighth-note slices, leaving the swung 16th notes where they were in relation to the eighth notes.

It is important that you choose compatible loops. Doing so can take quite a bit of time, even with a small collection of loops. I usually listen to loops that have tempos as much as 20 bpm faster or slower than the live drums. Smaller-sounding loops usually work better; larger, fuller loops tend to conflict with the live drums. To make a big loop sound smaller, filter out the top and bottom frequencies and apply heavy compression.

The key when auditioning loops is to listen for a part of the loop that will fit when it

STEP-BY-STEP INSTRUCTIONS



Step 1: On this bar of a live drum track, notice that some of the hits are slightly off the click.

Step 2: Here, Beat Detective has separated, conformed, and edit-smoothed the bar shown in step 1.

Step 3: This loop was recorded directly from Stylus.

is mixed with the live drums. Avoid phasing effects, 32nd notes, very bright sounds, and pitched elements, which all stick out when a loop is mixed in.

Once you've chosen one or more loops, you'll need to quantize them. If the live drums swing, try to match that swing in the loop. You may also want to slice the loop and rearrange the order of the slices to fit the pattern of the live drums.

Be particularly aware of how the kick drum of the loop interacts with the live kick. Also consider how the low frequencies in the loop interact with the live drums. If the low end is too messy, apply a highpass filter to the loop with the cutoff between 60 and 100 Hz. I often try adding a second or third loop as the song builds.

FIG. 1: This Beat Detective window shows the settings I used to quantize the audio loop.

Let's Be Frank

I asked a talented drummer friend of mine named Frank Vilardi to record some short drum beats for me in his home studio (frankvilardi.com). He gave me two challenging examples—one with swing and one without. The faster, nonswing beat has a side-stick backbeat, so most loops that have snare backbeats would overshadow it. The swing loop is played at 65 bpm, and because there aren't many very slow loops on the market, I didn't have as many loops from which to choose.

ONLINE BONUS MATERIAL

The loop player I used was Spectrasonics Stylus RMX (spectrasonics.com). I like Stylus because you can bounce the loop directly to the track or use MIDI with Stylus to sequence the slices of the loop. I use both methods, depending on the situation. Using SAGE Converter, you can import REX files into Stylus.

I started by quantizing Vilardi's first beat (see **Web Clip 1**). I then added a loop from Spectrasonics *Retro Funk S.A.G.E. Xpander* (see **Web Clip 2**). Next, I added another loop from Sonic Reality *R.A.W. Urban Grooves Style Pak* (ikmultimedia.com). To hear the loops before and after processing, see **Web Clip 3**.

I took a similar approach with Vilardi's second example (see **Web Clip 4**). First, I added a pop-country loop from the *R.A.W.* collection (see **Web Clip 5**). Then I added another loop from the Stylus Core library (see **Web Clip 6**).

Even with excellent tools like Beat Detective and Stylus RMX, choosing appropriate loops and aligning them carefully with your drum tracks is time-consuming. But the results can often take a good track to the next level. em

Steve Skinner has programmed, arranged, and produced many recordings. He recently added loops to live drums on Steve Carlson's new release, Groovin' on the Inside.

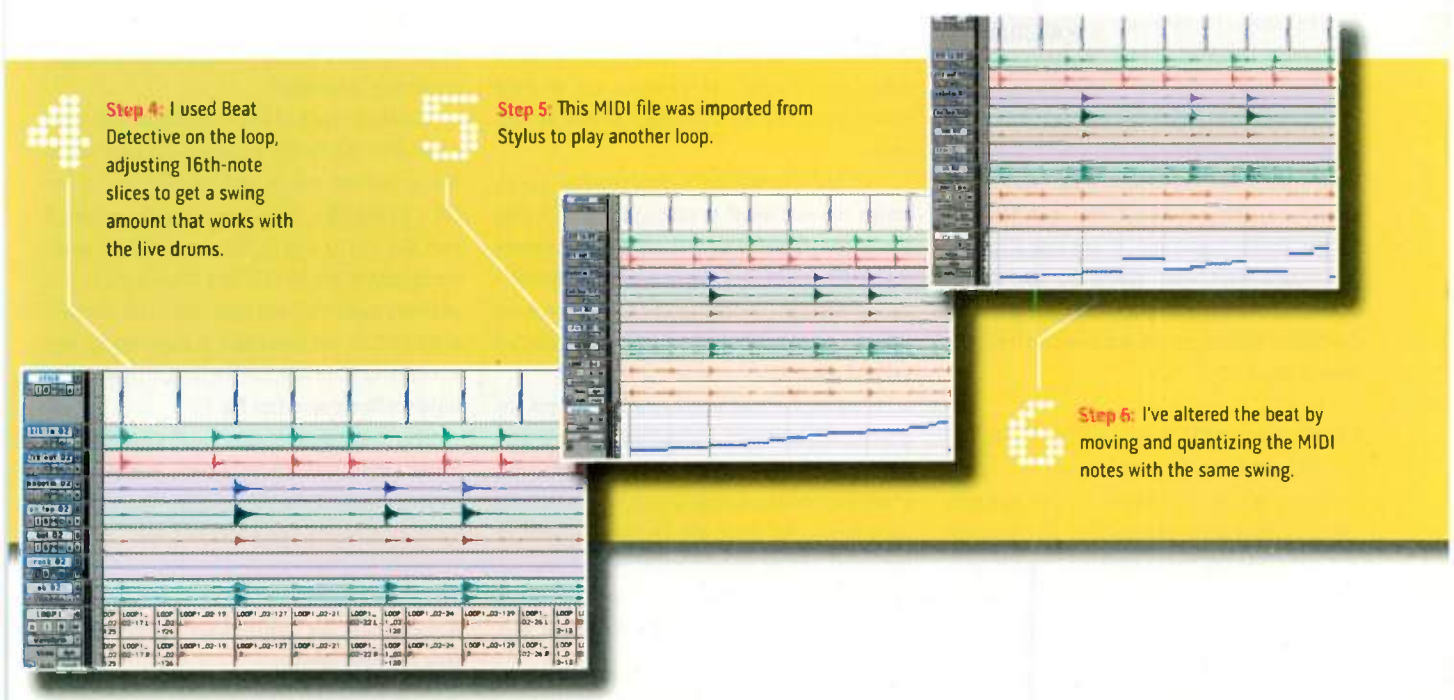


FIG. 1: These are the Reason devices used in the Ringing Echoes Combinator.

To the REXcue

Salvage tired drum loops with creative processing in Reason

By Jim Aikin

Sometimes a sampled beat sounds perfect just the way it is. But a little creative patching can transform it into something wildly new.

You can adapt the techniques that are described here to work in almost any DAW. If you have Propellerhead Reason 4, you can download the song file and tinker with these patches (see **Web Clip 1**). If not, you'll have to listen to the MP3s and experiment (see **Web Clips 2 and 3**).

ONLINE BONUS MATERIAL

To reproduce the patches, create a Dr.REX loop player inside a Combinator. From the RnB HipHop folder in the Dr.REX Drum Loops folder, load RnbO1_SupaDupa_060_eLAB.rx2. This loop has some built-in rhythm variations; it isn't just a straight 16th-note pattern. After loading the loop, use the Dr.REX To Track button to install the MIDI data in the Combinator sequencer track, and then turn the tempo down to about 62.

Filter Squash with Mod Wheel

Set the Dr.REX filter to bandpass and turn up the resonance. Set the filter frequency near the middle (about 70) to produce a narrow band that lacks lows and highs. Set the amp envelope sustain to zero. The decay time should be very short, producing a clipped sound. Turn the oscillator pitch Octave knob down to zero so that the drum hits turn into noise bursts. The beat will sound vaguely like the imitation of horses' hooves produced by banging coconut shells together.

To even out the peaks, add an MClass Compressor to the output of the Dr.REX. Turn the compressor's input gain up, turn its threshold down, and increase the ratio to 16:1.

Using a modulation wheel, you can make this beat "speak." Add a line mixer and a DDL-1 delay line to the Combinator. Then patch the DDL-1 to the aux send/return of the mixer, route the Compressor's output into channel 1 of the mixer, and send the mixer's output to the Combinator's From Devices jacks.

In the Combinator's Programmer panel, assign the mod wheel to control the Dr.REX Amp Env Decay (range 19 to 127) and filter resonance (range 82 to 34), and the line mixer's channel 1 aux send (range 0 to 90). On the Dr.REX panel, set the mod wheel to adjust the filter frequency with a value of about 12.

Pushing the mod wheel up will transform the dry coconut beat into a sustained wash of noise by increasing the decay time. Short jabs with the wheel work better musically than long, sustained movements. The filter will be swept upward by the wheel, and its resonance will drop so that the sweep doesn't become overwhelming. The sweep sound will be routed through the delay line, so it will echo.

Ringing Echoes

Begin again with a Dr.REX in a Combinator. Run the output of the Dr.REX through a PEQ-2 that is set to produce a sharp midrange peak. Create a Subtractor synth, but don't attach its audio to anything. Instead, use its LFO 1 CV output to modulate the frequency of the PEQ-2. Set the LFO to a slow rate.

Attach the output of the PEQ-2 to a Spider Audio splitter section. Create a line mixer, and then attach one of the Spider's output pairs to a mixer channel. This is the almost-dry drum channel; it has been processed only by the PEQ-2.

Create a couple of DDL-1s, and then give them inputs from the Spider. Leave both of them set to 100 percent wet, but increase the delay time of one DDL-1 to five 16th notes. Next, route the output of each DDL-1 to its own CF-101 chorus/flanger, patch the outputs of the CF-101s into the line mixer, and pan them slightly left and right. Add lots of feedback to the CF-101s and sweep each of them with its own internal LFO. Make sure that the three LFOs are set to slightly different rates (see Fig. 1).

The CF-101 modules add a metallic ringing to the echoes coming from the delay lines. Keep them at a low level compared with the almost-dry drum channel: a little bit of ringing echo goes a long way.

Jim Aikin (musicwords.net) is the author of Power Tools for Synthesizer Programming *(Hal Leonard, 2004).*

To Do:

- ☑ Record entire band
- ☑ Program drum beats
- ☑ Comp together guitar solo
- ☑ Fix vocal pitch problems
- ☑ Tighten timing in bridge
- ☑ Add string section
- ☑ Add synth bass
- ☑ Warm tracks with VC-64
- ☑ Add convolution reverb
- ☑ Mix with 64-bit engine
- ☑ Create dance remixes
- ☑ Master mixes with LP-64 Effects
- ☑ Burn CD + upload to web

Pro Suite is a collection of the finest tools that Cakewalk has to offer:

> SONAR 7 Producer Edition
> Project5 Version 2.5
> Rapture
> Dimension Pro
> Bonus Expansion Packs

Visit **www.cakewalk.com** to learn more

cakewalk.

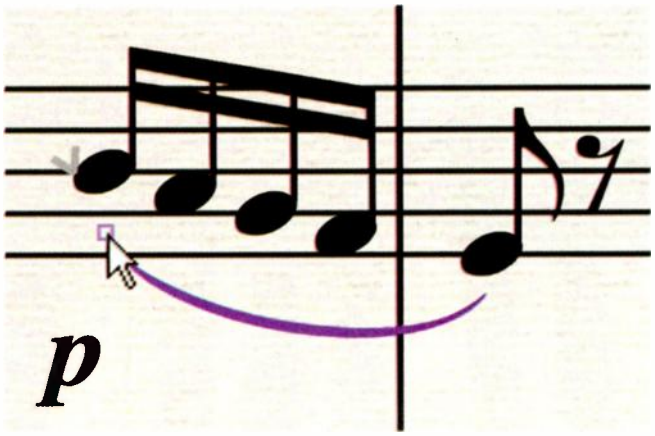


FIG. 1: If you aren't satisfied with the default positioning of a slur, Sibelius allows you to zoom in, grab it with the mouse, and move it in small, precise increments.

Duly Noted

Notation software brings music publishing to the desktop. | By Jim Aikin

Until around a hundred years ago, the only way to send music over long distances or preserve it for posterity was to write it down on paper. Electronic media have changed the picture dramatically, and today many musicians don't bother with notation at all. But printed sheet music is still important for a number of types of musicians: classical composers; arrangers who need to print out charts for live performers; teachers who prepare materials for their students; librarians who need fresh copies of old, tattered music; and songwriters who want to share their work but can't sing or aren't set up to record their own demos.

If you need to create printed music, you may be wondering how computer software can help you. In this column, I'll take a look at what specialized notation programs do and how you would interact with one.

Product Choices

There are several high-end notation programs on the market today, each of which is capable of producing fully professional results. Among these are longtime favorite Finale (finalemusic.com), formerly from Coda Music and now published by MakeMusic; Sibelius (sibelius.com), which is published by Avid and has a reputation for ease of use; and Notion Music's Notion (notionmusic.com), which, like the others, includes a high-quality orchestral sound set. Because this isn't a product shootout, you'll need to look elsewhere for detailed comparisons, but I'll use Sibelius for the following examples.

Many MIDI sequencers include utilities for printing basic notation. If you only need to print out occasional charts for a small group, your sequencer may have the features you need. Sequencers' notation abilities usually fall short when it comes to the more complex challenges at which specialized notation programs excel.

Entry-level programs are available as well. Windows users may want to look at NoteWorthy Composer (noteworthysoftware.com), for instance. For Mac users, Adept Music Notation's NightLight—a free, scaled-down version of the company's Nightingale—is one of several choices if you're just getting started (note that Leopard is not supported).

Technical Challenges

The conventions of European music notation developed over hundreds of years. To be useful, a notation program must handle a number of surprisingly tricky chores. Some of these, such as how to space the notes and accidentals in closely voiced chords, come up often. Notation software usually handles graphic spacing automatically yet allows you to make adjustments as needed (see Fig. 1). Other jobs, such as using note heads with unusual shapes, show up only once in a while (unless you're notating drum parts). Professional-quality software will handle both everyday and exotic demands intelligently.

Notation software combines graphics with musical meaning, and users may want or need to interact with absolutely anything on the page. Fingering numbers might collide with beams, for example, and have to be moved up. That's a purely graphical decision. Whether to spell a given note as a G-sharp or an A-flat, however, is a musical choice, not a graphical one, and the software needs to give users an easy way to switch from one enharmonic spelling to the other.

Notes and accidentals need to be spaced properly so that the music is easy to read and has one or more complete measures on each line. And if, as occasionally happens, that's just not practical, the software needs to be smart enough to allow you to break a measure in the middle. Songwriters need a program that can lay out several verses of lyrics and respace the notes as needed so that the lyrics are readable.

Reference monitors you can wear.

Introducing the

Studiophile Q40 Dynamic reference headphones

The M-Audio engineers who created the industry's best-selling studio monitors are advancing mobile monitoring with the new Studiophile Q40 reference headphones. Working closely with the LA recording community, M-Audio set out to design a headphone that delivers a true studio monitor experience. While some headphones have a hi-fi EQ curve, Studiophile Q40s deliver the flat frequency response and precise imaging needed for professional mixing and tracking. Their closed-cup, circum-aural design results in optimal isolation, making them perfect for recording in noisy environments. With 40mm Mylar drivers and fine-tuned enclosures, the Studiophile Q40 headphones provide what matters most—an accurate listening experience you can trust.

- **flat frequency response from 10Hz to 20kHz**
- **tight, percussive bass**
- **mids that don't fatigue**
- **crisp highs without the bite**
- **40mm Mylar drivers**
- **comfortable for hours of use**
- **sturdy and collapsible for travel**
- **detachable, replaceable cable**

GET M-POWERED

M-AUDIO

www.m-audio.com

2 years

> Listening to your score, or "aurally proofing" it, can be very useful.

Many types of rhythms, such as triplets and quintuplets, need to be dealt with. If you try to insert too many beats in a measure, the software needs to prevent it, and if you don't insert enough beats, it needs to add rests to fill out the measure.

If you're writing for ensembles, you'll need to print out individual parts, perhaps with cues (using small note heads) showing the performer what other instruments are doing. Some instruments, such as trumpet and saxophone, transpose—that is, their staves have to be displayed with a different key signature than the rest of the score. If certain parts rest for several consecutive measures, the software will need to produce multimeasure rests in the parts, but not in the score.

Numerous symbols—including slurs and ties, dynamics markings, and ornaments (such as "tr" for a trill)—need to be attached to individual notes. If a note moves horizontally because it's aligned rhythmically with notes in a different part and that other part is being edited, the markings attached to a note need to move with it. Piano parts occasionally require beam groups that cross from one staff to the other. Instruments such as cello sometimes need to change from one clef to another in the middle of a measure.

The spacing of symbols and the curvature of the slurs may need to be adjusted by hand. Though most software tries to guess what you want, being able to edit objects with the mouse is absolutely necessary to achieve a good-looking page.

Recording and Playing Back

Modern notation software will provide several input methods. You can enter data using the computer's QWERTY keyboard and mouse, which is easy to understand but rather slow. You can attach a MIDI keyboard to the computer and step enter notes fairly quickly, which is my preferred method. Using Sibelius's keypad, for example, I can touch-type with one hand on the computer and the other on the MIDI keyboard, switching rhythmic values and inserting rests and ties quickly (see Fig. 2). If you're an accomplished keyboardist, another option is to play the keyboard in real time while the software produces a metronome click, and then let the program figure out what rhythms you played.

If you're doing real-time recording, the software needs a way to adjust the notes having a duration that is either slightly too short or too long, or that starts or ends just before or after the intended beat. The notes' actual start times and durations have to be rounded up or down as needed to produce standard note-duration values rather than a maze of ties and 64th-note rests. You'll typically find some options in the Preferences box that will help you deal with this.

Another input option is scanning. Sibelius includes a program called PhotoScore Lite, which can interpret printed sheet music and produce a Sibelius file. (PhotoScore Ultimate is available as an optional add-on.) If you have old music that's falling apart, scanning can save you the endless hours it would take to recopy by hand. Scanning handwritten scores, however, is still in its infancy as a technology. I've tried this with PhotoScore Ultimate but found that it was no faster than using Sibelius's standard data-entry methods and was more error-prone.

Some notation programs include sound-playback engines or allow you to assign General MIDI sounds to individual staves. Listening to your score, or "aurally proofing" it, can be very useful: you may be able to hear the errors that elude your eye. You can also save the playback as an audio file, but notation software can't compete with a sequencer/recorder program such as Steinberg Cubase, Apple Logic, or Digidesign Pro Tools as a platform for producing professional-quality recordings.

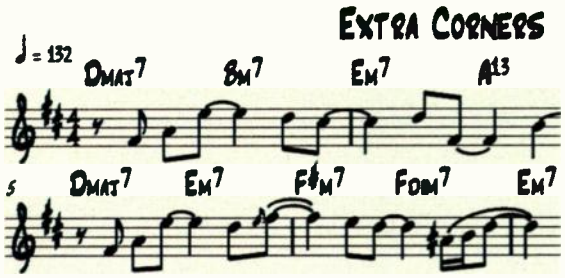


FIG. 3: For swingin' jazz charts, Sibelius lets you choose a pseudo-handwritten font. Though it appears jagged onscreen, this font prints out with smooth edges.

Publishing

Notation software typically includes a variety of fonts, such as pseudohandwritten fonts suitable for jazz charts (see Fig. 3). Printing scores and parts on standard 8½ × 11 paper in an ink-jet printer is a no-brainer. If you need to print out large sheets, such as an 11 × 17 orchestral score, you can save a PDF file and take it to a local print shop.

Sibelius includes a Web-based publishing utility called Scorch. The Scorch browser plug-in is a free download. Once visitors to your Web site have installed the plug-in, they can display, listen to, transpose, and print out sheet music that you have uploaded.

Producing high-quality sheet music at home can be time-consuming, but with today's powerful tools, it's easier than ever. Check out the notation features that your current software provides, or download a demo of the programs mentioned here. Your music will never look better. em

FIG. 2: This small floating window in Sibelius corresponds to the number keypad on a computer keyboard. It has five pages of common rhythm values, accidentals, and other marks that can be selected by clicking or typing.

Jim Aikin (musicwords.net) writes about electronic-music technology, teaches classical cello, and creates text-based computer games.

TURBO CHARGE YOUR PRO TOOLS® RIG

ANY CLASSIC COMPRESSOR AND EQ IN HISTORY FOR THE PRICE OF A SINGLE PLUG-IN

Why pay for one plug-in, when you can have 60 plug-ins and a killer hardware control surface? Focusrite's Liquid Mix gives you 32 channels of classic compression and EQ, simultaneously across your entire Pro Tools™ session. Only Liquid technology gives you genuine emulations of the most revered signal processors used on countless hits throughout recording history.

Liquid Mix puts 40 classic compressors and 20 vintage EQ's at your fingertips, but then takes you much further. You can bring together individual EQ bands from any classic EQ emulation to create your own unique seven-band hybrid super-EQ. What's more, using 'free' mode, original compressors with limited or absent controls suddenly become fully featured - yours to use as you choose. The Liquid Mix hardware controller allows direct control of every Liquid plug-in throughout the mix. Just plug in, power up, and dial in the perfect mix.

Take the Liquid Mix Challenge and see if you can spot the original - visit **www.focusrite.com/liquidchallenge**

* $150 Liquid Mix Rebate. Valid March 1 - April 30, 2008. Visit www.americanmusicandsound.com/rebates for details!

LIQUID MIX

Mac Universal Windows XP COMPATIBLE Vista COMPATIBLE

audio heritage | sonic integrity | professional solutions

Sweetwater For more information: 800-222-4700 or www.sweetwater.com

Focusrite
www.focusrite.com

major entity in order to get noticed?

No. The incorrect preconception in your question is that there's just one big haystack. There are hundreds of little haystacks now. We're in a niche culture where because there are hundreds of ways for a music fan to get turned on to music that they'll like, there's actually more of a chance than ever for musicians to be the top of their little haystacks.

Explain.

If you don't mind, let me use this metaphor I've been using lately to explain it. Up until recently, success in the music industry or success as a musician was like an archery range where 100 feet away is like a tiny little 1-inch target. And you're at the other end of the archery range, you can just fire a bunch of arrows, and all of them fall onto the ground—unless by some amazing chance you are able to hit that 1-inch target dead in the center, and then you have a major hit. But now it's like the target is 50 feet across, and it's really easy to hit anywhere inside it. But the trick is that somebody cut out the middle. It's like there is no middle anymore.

Let's get more specific for EM readers. Although plenty of them are songwriters, there are also many who are composers and are looking for a way to market their instrumental music. Do you have advice for them?

Oh, absolutely. Instrumental music does surprisingly well on CD Baby for the artists who tie it into a lifestyle purpose. So instead of just saying, "Here's some great music with wonderful harmony and interesting production," you say, "Here is some music for massage." Or you say, "Here is some music for computer programmers to listen to while working and without being distracted," or "Here is some music for candlelight dinners," or meditation—wherever. I find that the instrumental musicians who specifically market their music as a purpose or to go along with somebody's lifestyle end up selling infinitely better than ones who say, "Hey, my name is Mark, I'm making some good music, check it out."

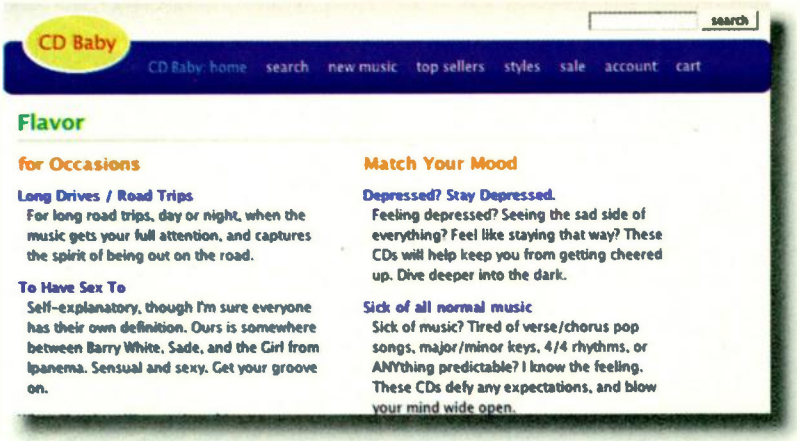


FIG. 2: In the Flavor section of the CD Baby site, music is categorized for a variety of purposes.

From your experience, do these people go into their recording project with that in mind or do they think after it's done, "Hey, this music is pretty spacey and mellow, it could be good for massage" or whatever?

I think it can come after. The marketing niche can come after the fact. The reason that can get pretty interesting is that you can take the same dozen pieces of music and rename it and repackage it a few different times, especially if you're doing purely digital distribution; why not? You can take the same songs and call them music for massage, take the same songs and call them music for dinner, and then put it all out there to see what works best.

Within CD Baby, are there any kind of marketing techniques beyond just being in the catalog to get site visitors to notice you?

Go to the home page at CD Baby and look at the right side, at that link called Flavor. Look at these, by the way, because they're sorted in order of popularity [see **Fig. 2**]. Notice, for the fun of it, that the most popular one on the right is called Depressed? Stay Depressed. It's funny, so much music is marketed in such an upbeat kind of way that people are drawn to the fact that this is about staying depressed. This is our way of trying to help the artist; we're almost playing editor by saying, for example, "Here are some albums we've found that help you sleep," or "Here are some albums we've found that make you want to smash things." So artists can do this themselves. There are tools on the site that allow you to create a group. For example, you can spend a little effort finding a few other artists who are in a similar vein to yours, and say, "Okay, why don't we make a gallery now and say this is good music for cooking." And this is not just CD Baby; I don't want to make this one of those boring things where I'm just telling you the features of my Web site. I think this applies to anywhere. Whether you're getting together with other artists or doing it yourself, you can make it a little mini-movement somewhere. You could say, "Here's a Web site we're setting up just for instrumental bubblegum music," and make a little movement and say, "These five artists are all the tops in their field of instrumental bubblegum *[laughs]*."

I can't wait to check that one out *[laughs]*.

So it's easier to market a lifestyle genre or a little movement like that than, again, it is to say, "My name is Jeff and I'm making music, I hope you like it." Instead, get together with a few people and say, "Hey, this is a collective of instrumental bubblegum artists." You find it's easier to get press and attention that way, too, because it seems less self-centered. Everybody else is saying, "Hey, check me out, check me out." But you come along and say, "Hey, check out this new genre of music." [For more of this interview, see **Web Clip 1.**] em

ONLINE BONUS MATERIAL

There are hundreds of little haystacks now. We're in a niche culture.

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

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

The Symphony System
Up to 96 channels of I/O

Ensemble
Multi channel FireWire audio interface

Duet
Portable, Two channel
FireWire audio interface

From the Garage to the Studio, advanced audio for any application

Whether you're recording a simple guitar part or an entire orchestra, capture it all with the legendary sound quality of Apogee and with the power and ease of Apple. The combination of Apogee interfaces, Mac computers and Apple audio creation software offers unsurpassed professional recording solutions for any application.

Let the pros at Sweetwater configure your custom Apogee/Apple System.

Authorized Reseller

Sweetwater
Music Instruments & Pro Audio

APOGEE
SOUND AMAZING

(800) 222-4700
www.sweetwater.com/apogee

Cakewalk

Sonar 7 Producer Edition (Win)

This Windows digital audio sequencer continues to evolve.

>> PRODUCT SUMMARY

digital audio sequencer	**$619**
upgrade from Sonar 6 Producer Edition	**$179**

PROS: Customizable, flexible MIDI editing tools. Sidechain control of compatible effects. External-insert plug-in. Powerful, mature audio and MIDI feature set, including surround sound.

CONS: Pitch-to-MIDI can yield unexpected results. CD-burning and streaming-playlist-publisher applets are minimally useful. PC only.

FEATURES	1	2	3	4	5
EASE OF USE	1	2	3	4	5
DOCUMENTATION	1	2	3	4	5
VALUE	1	2	3	4	5

Cakewalk
cakewalk.com

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

ONLINE BONUS MATERIAL

By Brian Smithers

In art, as in life, it's the little things that count. Sometimes that holds true for software updates, too. Cakewalk Sonar 7 Producer Edition is one of those upgrades. It's hard to identify one feature that clearly deserves marquee status over the rest, but the list of relatively minor fixes, improvements, and new features is long indeed. The list is somewhat shorter for the less expensive Studio Edition—see Cakewalk's Web site for details on Producer exclusives.

Of course, what's little to one user may be huge to someone else. For example, the feature most likely to make you roll your eyes in disbelief could have saved my butt on a live recording. Sonar 7 now supports the Sony Wave-64 audio file format, which allows audio files of more than 8 terabytes in size. Who needs to record a 64-bit, 192 kHz stereo file for over 800 *million* days? Nobody, that's who.

However, the old RIFF format (WAV, AIFF, and so on) limits files to 2 GB, which at 24-bit, 88.2 kHz resolution is just over an hour for a stereo file. That limit turned out to be pretty uncomfortable when I carelessly started a live choral recording in Sonar 4 to a stereo track instead of two mono tracks. As intermission drew nearer and my file grew ever closer to 2 GB, Sonar 7's ability to switch to Wave-64 on the fly would have done wonders for my blood pressure. (Luckily for me, the file lasted exactly 2 seconds into the intermission applause, where I could easily edit away any sign of my mistake.)

Modern Mixing

Two mixing features, small things though they may be to some, are undeniably overdue: sidechaining and external effects. Sonar finally allows plug-ins to expose a sidechain input for standard applications such as ducking and de-essing, as well as more creative uses. When a plug-in offers a sidechain input, that input automatically shows up in the list of track and send outputs.

This implementation allows you to combine multiple sources to a single sidechain input, but distributing a single source to multiple sidechains is a bit harder. To trigger multiple gated pads from the same drum loop, for

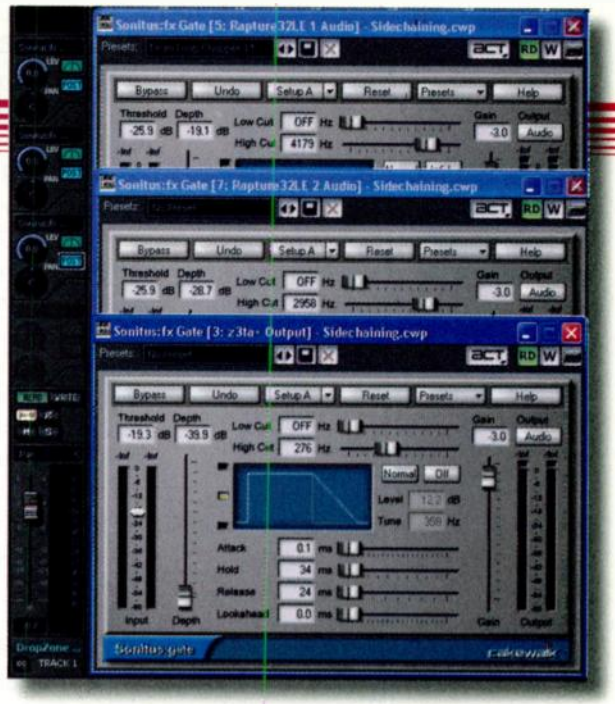


FIG. 1: Sidechaining is now possible in Sonar. Each sidechainable plug-in exposes its key input in the list of available send and track outputs. Here, three different gates are being triggered from sends on a single audio track.

instance, requires a dedicated send from the source track for each gate (see Fig. 1), whereas other programs can accomplish the same thing with a single send. Sonar's included Sonitus dynamics and Vintage Channel support sidechains.

Even as more and more audio production moves inside the box, to be seriously considered for use in a major studio, a digital audio sequencer must still be able to integrate external processors, something Sonar couldn't do adequately until now. A new external-insert plug-in directs a signal from a track to an output and expects the signal to return to the track from some input, allowing your favorite piece of classic hardware to be inserted directly into the signal flow of an audio track or bus. In contrast with sidechaining, the external insert is admirably flexible, enabling you to assign any unused output and input independently of each other. Sonar even measures the round-trip travel time and compensates for the delay.

Assigning inputs and outputs is now more efficient, allowing the user to assign the same audio input or output port to multiple tracks, or—my personal favorite—to assign a series of inputs or outputs to multiple tracks. Setting up multiple tracks and assigning them automatically to sequential input ports saves only a few seconds per track, but with a lot of tracks, that adds up.

> Who needs to record a 64-bit, 192 kHz stereo file for over 800 *million* days?

Macho MIDI

When Cakewalk rolled out the in-line piano-roll view (PRV) two versions ago, I was excited not to have to open the floating PRV to edit MIDI, but frustrated that changing tools required time-wasting mouse-clicks unless you created your own key bindings to switch between them. Sonar 7 fixes this and goes way beyond, letting you assign different tool behaviors based on the cursor's position within (or relative to) a MIDI note, which of the three mouse buttons is pressed, and which combination of the Shift, Alt, and Ctrl keys is held (see Fig. 2). This gives you more than enough tool behaviors at your fingertips, without ever needing to switch from one tool to the next.

The Select, Draw, and Erase tools are now simply tools 1, 2, and 3, and each tool is actually a set of customizable context- and modifier-sensitive behaviors. Assignments can be saved as presets, so editors who share a workstation can have their own tool sets. Presets resembling the tool sets of other audio programs are included. Editing MIDI in the

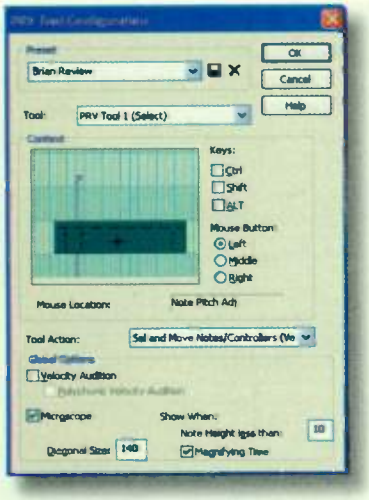


FIG. 2: Different MIDI editing tools can be called into action based on five different positions within a note (and two outside the note) crossed with any combination of three modifier keys.

in-line or floating PRV is now more efficient than ever.

The floating PRV has gained the ability to display multiple lanes of controller data. This makes for a much clearer view when a track has multiple controller types being automated. It also means you can copy and paste data easily between controller types.

A new step sequencer simplifies hard-quantized dance-style drum programming, and it will likely please users whose music leans toward repetitive patterns. It falls a bit short of my hopes, though, because its controller implementation—the part I usually like best about step sequencers—is no different than single-lane controller view in the PRV. A step sequencer that allows you to quantize controller events to the grid turns timbral variation into a rhythmic element. I hope that's an option in the next iteration of the step sequencer.

That beef aside, the step sequencer is quite powerful. It supports odd meters and features a "fit-to-quarters" function that squeezes a pattern to fit within a specified number of quarter notes. Imagine, for example, an 8-beat pattern squeezed into a 5/4 bar. Step-sequencer clips are MIDI groove clips, so rolling them out to the desired length is easy as pie. Optionally, step-sequencer clips can be made to follow project pitch as well.

Editing in the step sequencer is dead simple: left-click to add a note, and right-click to remove a note. Ctrl-click (or -drag) to join notes, and Ctrl-right-click to separate them. Shift-drag up and down on a note to adjust Velocity, and Shift-drag across the row to draw a series of Velocities.

Other MIDI enhancements abound, such as Velocity color coding of notes and MIDI Velocity/activity meters on tracks. The Erase tool now highlights notes to be deleted as you drag in the PRV, deleting notes only when you release the mouse. This allows you to see more clearly what you are deleting. Individual notes and controller events can be muted, and a new drag-quantize feature lets you Ctrl-drag upward to slide selected notes progressively closer to the grid. Very clever, indeed.

Much More

Sonar 7 comes with special editions of Cakewalk's new instruments, including Rapture LE, a rich-sounding, dance-oriented subtractive synth, and Dimension LE, a flexible sample-based synth that has a limited but quite useful version of the Garritan orchestral library called Garritan Pocket Orchestra. The full version of the powerful Z3TA+ waveshaping synth is also included. Synths can be renamed in the Synth Rack, making it easier to distinguish between multiple instances of a particular virtual instrument.

V-Vocal, Sonar's excellent pitch- and time-correction plug-in (based on Roland's VariPhrase technology), has been updated to include pitch-to-MIDI conversion. Once V-Vocal has analyzed an audio clip, you simply drag its pitch-to-MIDI icon to a MIDI track, and appropriate MIDI notes (and optional Pitch Bend information) are created. At its best, this is a great way to generate a synth track to double a vocal part, but I had trouble getting it to work consistently. For reasons Cakewalk and I have been unable to discern, V-Vocal doesn't like my desktop computer as much as my notebook. Generating MIDI from audio clips on my notebook worked as advertised—requiring some cleanup, but getting the important parts right—but on my desktop the clips were slightly time-compressed, didn't line up with the audio clips, and didn't even contain the expected notes. The 7.0.2 update fixed some known bugs related to this function, but it didn't rescue my desktop.

FIG. 3: The LP-64 Multiband compressor offers transparent linear-phase multiband compression suitable for bus compression or mastering.

> Imagine an 8-beat pattern squeezed into a 5/4 bar.

Two new plug-ins intended for mastering use are included. The LP-64 EQ is exactly what it sounds like: a 64-bit linear-phase equalizer with an uncolored sound. The LP-64 Multiband compressor (see Fig. 3) is no more mysterious, offering five user-defined bands of independent dynamics control. Both are worthy additions to Sonar's virtual gear rack.

I was somewhat less impressed with the deliberately quick-and-dirty limiter Boost 11. Its simplified design is admirable, and it is certainly capable of delivering the instant gratification that comes with hearing your mix suddenly hotter. That easy satisfaction carries a price, though—I had no trouble getting Boost 11 to pump and misbehave on dynamic material. (See the online bonus material at emusician.com for some other minor quibbles I have about the program.)

Sonar now imports directly from audio CDs. Cakewalk says the ripping algorithm rejects any reads with errors, but I didn't test its accuracy extensively. A CD-burning applet is included that is suitable for quick assembly of reference tracks, but not for anything more demanding. Cakewalk Publisher is designed to make it easier to maintain an updated playlist when you have an embedded audio player on one or more Web sites. After a bit of fumbling, I was able to get it to work as advertised: feed Publisher a series of MP3 files, and it generates a script for you to copy into your Web pages to link to a single copy of the player. If Cakewalk would make the player presentable and enlarge its buttons to a usable size, the company would have a useful little utility.

So do all the small changes make for a good value? Well, Sonar stands shoulder-to-shoulder with other professional digital audio sequencers, so if you work on a PC and like its look and feel, you can't go wrong. Is it worth upgrading to version 7 from 5 or 6? Absolutely, if features such as the MIDI editing improvements or audio sidechaining matter to you. You may find that the little things really do add up.

Brian Smithers is course director of audio workstations at Full Sail Real World Education in Winter Park, Florida.

RUDY TRUBITT

FIG. 2: The PCM-D50's built-in mics can pivot smoothly from a 90- to 120-degree stereo pickup pattern. Left and right mic signals are automatically swapped as required.

an assortment of 3.5 mm jacks: mic in (with plug-in power), a combo analog/digital optical input, a combo analog/digital optical output, and a headphone output. On the upper left side are two tiny switches for selecting a mic/line input and enabling a –20 dB pad, and on the back are two more tiny switches that engage the record-input limiter and low-cut filter.

Let's Record

The D50 records 16 bits at 22.05, 44.1, 48, and 96 kHz, as well as 24 bits at 44.1, 48, and 96 kHz. It can also play (but not record) MP3 files at any rate. When choosing 16-bit resolution, you have the option of using Sony's Super Bit Mapping (SBM) dither. The company originally developed SBM to squeeze a little more perceived resolution out of the 16-bit DAT format. However, the benefits of SBM are lost if you do any subsequent signal processing of the audio, which I nearly always do. So though I've owned other SBM-equipped gear for years, I don't use that feature. Anytime I record anything critical on my D50, I simply record at 24 bit.

An optional 5-second prerecord buffer lets you put the recorder in record-ready mode, and when the sonic event you're waiting for happens, you press Pause to capture the previous five seconds and continue recording. I love this feature—it's like a 5-second time machine. My only wish would be that the buffer refilled when you pressed Pause during a recording, but that's not the case; you'll need to stop and restart a new file instead. You can't drop markers within a file, but the Divide button will seamlessly split a track during recording or playback.

When recording, the main meters in the LCD give fast, high-resolution stereo peak metering. A pair of LEDs under each mic show signal present (–12 dB) and clipping (0 dBfs) for each channel, although left- and right-channel record levels are set together on the same knob.

> It's like a 5-second time machine.

The D50 shares the PCM-D1's novel approach to peak limiting. When the limiter is enabled, the D50 splits the signal into separate stereo analog and digital paths. The first path is recorded while the deck is operating below digital clipping. The second path is attenuated –12 dB in the analog domain before being digitized by a second, independent A/D converter. When digital clipping occurs, this second path springs into action, normalizes its –12 dB signal to full scale, and substitutes that audio instead of the clipped waveform. When the primary signal-path level drops back below zero, the limiter backs itself out of the picture at one of three release times: 150 ms, 1 second, or a full minute. If you slam the inputs, you'll hear the limiter working, but if you're just a toe or two over the line, it's transparent.

Got a Nice Spread Here

The tonal character of the D50's internal mics is similar to that of the PCM-D1's. Although it always sounds crisp and detailed, capturing robust low end requires closer proximity to the source. The D50's noise performance is very good, but it is noticeably noisier than the D1 in low-level situations.

Whereas the D1's built-in mics tilt up or down, allowing you to more conveniently see the front-panel controls or point the mics up at a talker when the recorder lies flat on a table, the D50's mics don't tilt. Instead, they can splay inward from a 90-degree, near-coincident pattern outward to a 120-degree, slightly spaced pattern. The two mic capsules literally swing outward, changing capsule angle and spacing (see Fig. 2). The difference is both audible and useful. The wide pattern gives a more spacious feel, whereas the 90-degree pattern offers better mono compatibility and a stronger center image.

The D50 doesn't include a windscreen, but you can buy Sony's ADPCM1 Windscreen (which also fits the D1) for about $50. It's well worth the price; this furry wind barrier is so much more effective than a little slip of foam. If you're doing any outdoor recording (or even plan to be walking around indoors while recording), this accessory is essential.

File It

The D50 records files in WAV format only and stores them in its generous 4 GB of internal flash memory. It can also record to a proprietary, removable Sony Memory Stick Pro High-Speed Duo or Pro-HG Duo (not included). The recording date becomes the file name (for example, 080422_03.WAV would be the third recording made on April 22, 2008). The D50's

file-naming convention is extremely simple yet highly practical.

A simple USB connection mounts the D50 on your computer's desktop. Data transfer times are quick with USB 2.0, but obviously a lot slower with USB 1.1. Note that the D50 can't run on USB power, so be sure you have enough battery charge to complete the transfer, or plug in the D50's included wall wart.

Battery life, always a key feature on portable recorders, is outstanding. Sony specifies 12 hours of record time at 96 kHz using alkaline batteries. Rechargeable NiMH cells work perfectly for the D50, too. I've been using Sony-, Duracell-, and Eveready-branded rechargeables, all with good results. The four AA cells are housed in an easy-to-remove sled, secured behind a sliding door mechanism. This door mechanism is elegant, but I've found that it can work itself loose in some situations.

Recording Outside the Box

Although the D50's built-in mics are good, it's nice to have external options—and you do. Unlike the D1, the D50 can provide *plug-in power* at its mic input jack. (Plug-in power provides a small voltage—typically 3V to 4V—to power electret condenser mics.) This is a menu-controlled option; the menu pops up automatically on the D50's display when you connect a mic—another nice touch.

But what about professional condenser mics that require 48V phantom power? One option is to use the D50's digital optical input with an external mic pre and A/D converter. I tested the D50's optical input using my trusty Denecke AD20, and it worked just fine.

RUDY TRUBITT

FIG. 3: This is the PCM-D50 mounted on Sony's optional XLR-1 adapter.

Another option is Sony's new XLR-1 adapter ($449), which makes the D1 or D50 compatible with the rest of your mic collection. The XLR-1 is a chunky, rounded metal box with a pair of XLR inputs and a stereo miniplug output at the end of a short cable (see Fig. 3). It's a transformer-based passive device, but it requires an additional four AA batteries to generate phantom power. Its bulk and cost are both related to the high-quality audio transformers required to take advantage of the recorder's maximum 96 kHz sampling rate.

Physically, the XLR-1 can be snapped to the bottom of the recorder, or they can be mounted side by side using the included metal mounting bracket. Though the XLR-1 easily doubles the size (and nearly doubles the cost) of the D50, it's a pleasure to be able to work with a fully professional mic rig in the field. I ran my Schoeps mics into the D50/XLR-1 combo and was really pleased with the results. I sometimes find my Schoeps mics to be clinical, bordering on cold. Perhaps the transformers in the XLR-1 imparted some subtle coloration, but whatever the cause, I actually thought the Schoeps mics sounded better through the D50/XLR-1 combination than any of my other rigs.

The XLR-1 is not a perfect solution, however. When mounted, it blocks access to the D50's low-cut and limiter on/off switches. Also, I wish the permanently attached end of the XLR-1's output cable were recessed. Though I've had no problems, it looks vulnerable and doesn't appear to be readily user serviceable. The XLR-1 is expensive, but it should tell you something that I'm buying one anyway.

Shine On

I've reviewed half a dozen portable 2-track recorders for this publication, and the Sony PCM-D50 is one fine deck. I'd still choose the PCM-D1 for gigs that required an extreme dynamic range—like symphonic, choral, or natural-sound recordings—because the D1 is audibly quieter in low-level situations. But the D50 easily outdoes the D1 on features and strikes an excellent balance between size, quality, and cost. The Sony PCM-D50 is the deck by which all others should be measured, and I recommend it highly.

Rudy Trubitt performs around the United States as a member of the Sippy Cups (thesippycups.com).

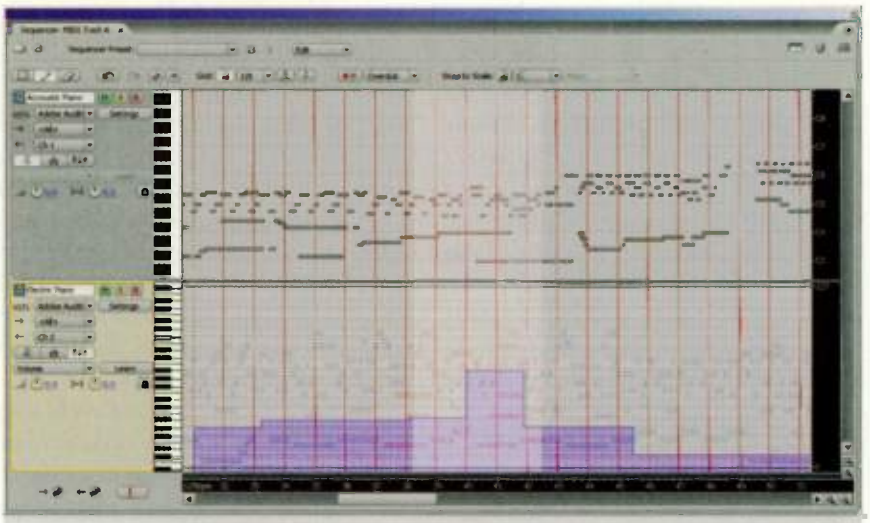


FIG. 1: Audition's Sequencer windows are accessible for each MIDI track. Here you'll find multiple Instrument tracks that can be assigned to MIDI channels and sent to either soft synths or hardware outputs.

Adobe

Audition 3.0 (Win)

More MIDI, more power for this capable DAW.

By Allan Metts

PRODUCT SUMMARY

digital audio workstation	$349

PROS: Clean and intuitive user interface. Comprehensive effects and processing tools. Excellent editing capabilities in the frequency domain. Support for MIDI and VST instruments.

CONS: Limited MIDI support for hardware synths. Simplistic implementation of quantization and other offline MIDI processing.

FEATURES	1	2	3	4	5
EASE OF USE	1	2	3	4	5
DOCUMENTATION	1	2	3	4	5
VALUE	1	2	3	4	5

Adobe Systems Incorporated
adobe.com

ONLINE BONUS MATERIAL

With its suite of products for graphic design, photography, document creation, and video production, Adobe is no stranger to the pursuit of creativity. And since acquiring Syntrillium's Cool Edit Pro (which it renamed Audition), the company has been offering a powerful audio workhorse as well.

Adobe releases significant improvements to Audition every year, and version 3.0 represents yet another solid enhancement. This time around, we get MIDI sequencing and virtual instrument support, some great new effects and audio-editing tools, and quite a few advances in performance and usability.

> Adobe is no stranger to the pursuit of creativity.

Move into MIDI

As a synthesist and longtime MIDI enthusiast, I was eager to check out the virtual instrument and MIDI support. Previously, Audition offered MIDI playback-only capabilities, and MIDI data could output to one or more hardware devices or to a ReWire application (all outputs received the same MIDI data, however).

In version 3, MIDI tracks reveal the same audio output, metering, effects, and envelope-automation controls as audio tracks. Click on a button in the MIDI track, and a Sequencer window appears (see Fig. 1). Here you can link a different VSTi soft synth to the MIDI

remix [hotel]

New York 2008

June 27-29 | SAE New York | Herald Square

Remix Hotel returns to SAE New York for another three-day weekend of industry panels, master classes, artist performances, product demos and much more. You won't want to miss Guitar Center Sessions at Remix Hotel, along with Technology Partners Pioneer Pro DJ, Rane, Serato and more.

Look for registration details at **remixhotel.com**!

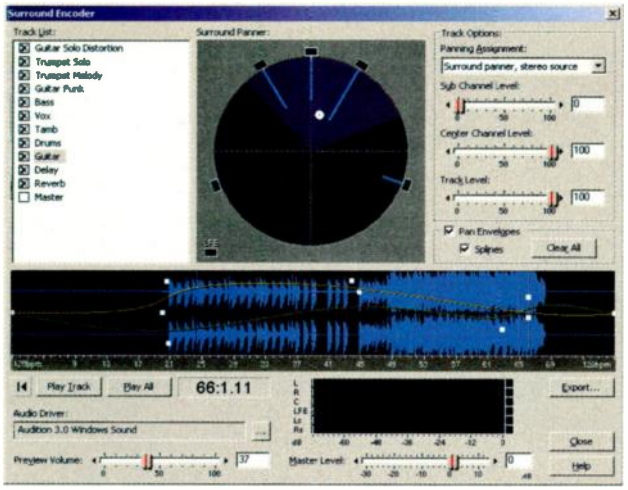


FIG. 2: Audition's surround encoder lets you place each track in your project exactly where you want it. Left/right and front/back envelopes are available for dynamic panning.

events in each channel of the track. You can then manipulate the audio output of these synths in the Main and Mixer views, which gives the program a nice symmetry and ease of use.

Like all Audition windows, Sequencer windows can float freely or dock in a tabbed windowpane. Unfortunately, there is no visual representation of the MIDI events in the Main panel, which makes it a little difficult to align audio and MIDI at times. I was able to work around this somewhat by splitting the window, with the Main panel on top and the Sequencer window beneath. I was glad to see that the two panels scrolled in tandem when I did this, but it took a bit of effort to get their timelines aligned perfectly.

Within each Sequencer window, you can add up to 16 Instrument tracks, one for each MIDI channel. These all combine into the corresponding MIDI track on the Main and Mixer panels. In each Instrument track, you can choose the VST instrument, adjust its settings, and specify the input and output channels. You also have your choice of piano-roll, Velocity-editing, or controller-editing views of the Instrument tracks. There is no event list or standard notation view.

Editing operations in the Sequencer windows are basic but intuitive. You can choose to select, insert, or delete events, with events restricted to MIDI notes and one of nine controllers with fixed names (Filter Resonance, Portamento, and so on). A MIDI Learn mode lets you map external hardware messages to the named parameters, but I would rather see either all 128 MIDI controllers or the automatable parameters from the soft synth in this list of controllers.

Snap To Grid and Snap To Scale features control the resolution and available note choices for note insertions, step recording, and quantization. I was happy to see choices for triplets and dotted notes in the grid selection. Step recordings can replace or overdub existing data.

Edit Away

Selected note events (but not controllers) can be cut, copied, pasted, and dragged as you would expect. I was disappointed that I couldn't select multiple note Velocities from the Velocity view and adjust them all at once, but then I discovered that I could select the notes of interest in the piano-roll view, switch to the Velocity view, and see that my selection remained intact. I could then slide the Velocities up and down at will, maintaining the relative Velocity differences between notes.

Selected notes (but again, not controllers) can be quantized, transposed, humanized, or have their Velocity randomized. That's it. And only transposition has any adjustable parameters: how many semitones to shift. Quantization is always 100 percent, with no swing or groove option (although quantizing to 8-note triplets should be similar to swing). Humanization and Velocity randomization is whatever the program chooses. The effects are reasonably subtle, but they may or may not suit your needs depending on the nature of your music and the sensitivity of your synth patch.

Rounding out the Sequencer windows are controls for importing and exporting MIDI files, configuring VST instruments and MIDI hardware ports, and opening a virtual keyboard (which unfortunately does not respond to QWERTY keystrokes).

If you have hardware synthesizers, you can use a Sequencer window without specifying a soft synth. In this case, MIDI data will simply stream to your chosen output ports on the channels you specify. However, the choice of MIDI output ports is not specific to MIDI tracks or Instrument tracks—any MIDI data sent over a particular channel goes to all MIDI outputs enabled for the program.

This choice limits you to 16 MIDI channels across all your hardware synthesizers, and if you use multiple multitimbral hardware synths and don't want to layer your sounds, you'll have to disable the MIDI channels the *other* synths are using in each device.

Other omissions leave the impression that Adobe intended Audition to be used primarily with soft synths. There is no support for other types of MIDI events you'd typically need in a hardware synth world, such as Program Change, Bank Select, and System Exclusive messages.

I Get Around

Audition now sports a capable surround encoder for multichannel audio (see Fig. 2). The surround implementation is a bit different from what I've seen in other programs, and I find it to be a cleaner, more intuitive approach. Multichannel audio is represented as individual mono or stereo components when you're working in the Edit and Multitrack views, which lets you do your initial tracking and editing without worrying too much about audio placement for surround sound. (That said, a disadvantage of this approach is the inability to see the context of all channels in a multichannel file while editing in the Edit view.)

When you're ready to mix your project to surround, the surround encoder shows you each track in your project and provides graphical panning tools to put each track's audio exactly where you want it. For stereo tracks, you can even choose whether to maintain the stereo field or sum to mono before panning. Audition supports only 5.1 configurations, though, so you'll need to look elsewhere if your surround needs are more esoteric.

The surround encoder has its own basic

transport control, a waveform display, and 6-channel metering. Mixing your project to surround is simply a matter of panning each track in your project and auditioning the results. Referencing to the Video panel is possible as you do so. Audition also provides envelopes to dynamically adjust the left/right and front/back levels over time.

Once you're done, you can export your multichannel audio directly from the surround encoder. Audition supports WMA files, as well as multichannel and discrete mono WAV files. (See the **online bonus material** at emusician.com for details on Audition's enhanced audio editing in the frequency, panning, and phase domains.)

A Bigger Toolbox

Audition has always provided a powerful suite of effects and other goodies, and I'm happy to report that version 3 expands this arsenal even more. An Automatic Phase Correction tool can help you expel pesky phase problems, and an Adaptive Noise Reduction effect can help clean up your audio. Noise-reduction tools are nothing new to Audition, but this new one works well on dynamic broadband noise where you may not be able to capture a noise print. And unlike the other noise-reduction tools, it's a VST effect that you can use in real time.

Also new are suites of effects for guitars and mastering. The Guitar Suite effect includes stages for compression, filtering, distortion, and amp modeling, while the Mastering effect gives you a parametric equalizer, reverb, an exciter, a stereo widener, a loudness maximizer, and an output gain stage. I was able to achieve reasonable results with both of these, although the Guitar Suite sounded a little too "digital" to my ears (I'm no guitarist, however, so your experience may be different).

Adobe added a convolution reverb with more than a dozen built-in impulses, and you can import your own. There's also an Analog Delay effect and a Tube-Modeled Compressor effect from iZotope.

IZotope's handiwork also appears in the program's time-stretching and pitch-shifting, where the company's Radius algorithm, which includes formant-preservation capabilities, is used to produce a much higher-quality effect than before. You can access this algorithm in the Stretch effect, but it is also used elsewhere in the program when time-stretching or pitch-shifting needs to take place (such as with looped clips in the Multitrack view). I tried this effect on several files, and the results sounded great.

Rounding out the version 3 improvements are clip grouping and automatic crossfades in the Multitrack view, automatic lookup of track information when ripping CDs, and batch processing. Batch processing is particularly welcome. You can apply any number of processes to any number of files, resample the results to a given sampling rate and bit depth, and output the results using the file format and naming scheme you choose.

Audition's documentation is complete and context sensitive and is available in both HTML and PDF formats. You even get a printed user guide—a rarity these days. Once again, Adobe scores big with a solid upgrade to this capable program.

> You can use a Sequencer window without specifying a soft synth.

Allan Metts is an Atlanta-based musician, software/systems designer, and consultant. Check him out at sonicbids.com/allanmetts.

FIG. 2: Most of the D-Box's I/O is on XLR jacks, with the exception of the eight summing inputs, which are on a DB-25 connector.

The Summing Input allows you to combine up to eight analog outputs from your audio interface.

Though labeled DAW and CD, the two digital inputs are functionally identical and are compatible with both AES/EBU and S/PDIF sources.

The summed audio is available from this XLR stereo pair for connection to a 2-track recorder or into a stereo track on your DAW.

Dangerous suggested using one of the headphone outputs to feed it. (There are actually two separate headphone amps in the D-Box.) Switching to the third speaker pair required me to turn the master volume control down and the headphone knob up, but the method worked well, and the speakers sounded fine when driven by the headphone output.

Switching In

The D-Box's input switching provides plenty of options. You get two digital inputs, one labeled DAW and the other CD. Despite their names, both inputs are functionally the same and can be used with any AES/EBU or S/PDIF source. The input senses which format it's receiving and sets itself accordingly. The D-Box's D/A converter offers excellent quality.

On the analog side, you get a stereo pair of inputs on XLR jacks, and an input for the eight channels of summing on a DB-25 connector. Plan to spend some additional cash on cabling, because you'll need a DB-25 breakout cable to go from your audio interface's individual outputs to the D-Box if you want to use the summing function. (Figure on spending at least $50 for such a cable.) If the digital gear you'll be connecting to the D-Box has S/PDIF outputs with RCA connectors, you'll need adapter cables that end in male XLRs on the D-Box end. (Thanks to Redco for providing cables for this review.)

In its default state, the D-Box lets you listen to only one input at a time. However, you can change this when you put the unit into Setup mode, which allows you to select either or both of two optional functions: monitoring multiple input sources simultaneously and increasing the gain for the Analog Input (which is normally set to +4 dBu) by 11.7 dB. This will let you accommodate gear with –10 dB consumer outputs.

> The D-Box was providing me with a whole new level of fidelity.

Having four inputs gives you lots of flexibility for A/B comparisons. For instance, you can check the analog Sum Output against your mix as routed through your interface's digital outputs, and you can A/B your mix against other sources coming through either the digital or analog inputs.

Talk to Me

For talkback, a small mic is built into the front of the unit, and pressing the TB button turns it on, letting you speak to those listening through the headphone outputs. The mic button is of the Momentoggle variety; that is, if you press and hold it, it will turn off when you release your finger. If you press and release it quickly, it will stay engaged. So if you want to give an extended soliloquy to the talent from the control room, you don't need to keep your finger on the button. Be careful, though: this feature opens you up to accidentally leaving the switch engaged and thus inadvertently letting the talent hear not-so-flattering control-room chatter (such as "When should we give up and call in the session singer?"). You can also control the talkback mic with a standard footswitch, which is not included. Any switch that when pressed shorts the tip to the ring (or sleeve) of a ¼-inch jack will work.

The D-Box contains a pair of headphone amps, one for each headphone output. Each output has its own volume control and can

audio insider

read • watch • listen • play • create

THE BEST INFORMATION ABOUT MUSIC PRODUCTION TECHNOLOGY & RECORDING

FROM THE EDITORS OF MIX,

ELECTRONIC MUSICIAN

AND REMIX MAGAZINE AND A

NETWORK OF MUSIC PROFESSIONALS

become an exclusive member

YOUR MEMBERSHIP INCLUDES THE FOLLOWING

- Web site, song and video hosting
- Digital Edition Magazine (of choice)
- Exclusive content from the editors (over 6,000 articles!)
- Video tutorials, music production, how to & more
- Samples, beats, loops, tracks, sound fx & more (download)
- Exclusive podcasts
- Special discounts to DVD/CD duplication & gear
- Exclusive Mixbooks discount and offers
- Special discounts to services
- Technical support offer
- Musician's community

Video Tutorials
From The Pros

Sounds From
The Hollywood Edge

CHECK IT OUT: www.audioinsider.net

Partners with:

Berklee Press	Disc Makers	Secrets of the Pros
Broadjam	Hal Leonard	The Hollywood Edge
Digital Music Doctor	Keyfax	Cengage Publishing
	Obedia	Backbeat books

and many other professional audio insiders...

supply plenty of volume for the cans. One drawback compared with some other monitor controllers (including Dangerous's own Monitor and Monitor ST products) is that there is no dedicated cue path, so you can't feed the talent a different mix from the D-Box than you're listening to in the control room. The headphone amps and the speaker outputs are both fed by what's coming through the selected input (or inputs). Of course, your audio interface most likely has a headphone output, so you could run a separate feed from it as a work-around, but then you wouldn't be able to utilize the talkback function.

> The experience was somewhat akin to driving a sports car after driving an economy car.

Sum of the Time

Space constraints prevent me from going into the controversial issue of analog versus digital summing. (For a full examination, see "The Sum of All Tracks," available at emusician.com for Audio Insider members.) Regardless of your opinion on that, however, it would be hard to argue with this statement: the sound quality you get through the D-Box's summing circuitry is excellent.

Here's how it works. The D-Box's summing feature allows you to combine three stereo pairs and two individual, pannable outs (channels 7 and 8, which also can be panned hard left and right and used as a fourth stereo pair if you want). These two mono channels with pan pots are there so you can route individual tracks through external processing (for example, an outboard compressor for the vocal track and an EQ for a guitar solo) inserted between your audio interface and the D-Box, and then set their pan positions for the mix.

Deciding which tracks to route through which outputs will depend a lot on what's in your particular project. Bob Muller from Dangerous suggests this simple approach: drums through one pair, guitars through another, vocals though the third, and everything else through the fourth. "Everything else" should include your aux effects tracks (like reverbs and delays), or they won't end up in your mix.

After passing out of your interface and through the DB-25 cable into the D-Box's summing inputs, the first thing that happens to the signals is that they're brought down in level 6 dB by input receiver amplifiers, and then they pass into the summing circuitry. According to Muller, this reduction of level at this point in the gain staging provides additional headroom and a lower noise floor, allowing you to slam those summing inputs with as much level as you can get from your individual DAW tracks (within the context of your mix, of course). By doing so, you can get as much resolution as possible from the digital signals before they hit your audio interface's D/A converters and pass into the D-Box.

The D-Box's circuitry adds back that 6 dB (bringing it back to unity gain) when the Sum Output knob, which controls the level going to your 2-track recorder or mix-track inputs on your DAW, is turned fully up. However, Muller recommends starting your mix with the output knob at 12 o'clock and then turning it up or down as needed, depending on the levels of your mix. I tried this and found that I usually ended up pushing it up to about 2 or 3 o'clock in order to get the ideal level into the A/D converters for recording the mix back into my DAW.

Another way to think about the D-Box's summing feature is that it lets you send your digital tracks through what's essentially a quality analog mixer without the knobs (and with much shorter signal paths). Because your faders and panners are in your DAW, the D-Box doesn't impact your ability to totally recall the mix in software (unless you use the panners on channels 7 and 8).

Sound of D-Box

Due to all the connecting of monitors and input sources that's necessary when setting up the D-Box (or any device that offers input switching and monitor control), there was no way to realistically A/B it against my previous monitor controller (a popular but considerably less expensive model). Despite that limitation, I remembered what my system sounded like through the other unit well enough to notice immediately that the D-Box was providing me with a whole new level of fidelity. The experience was somewhat akin to driving a sports car after driving an economy car. Everything sounded smoother and just better overall.

Mixing through the D-Box's summing inputs was a pleasure. I was able to really crank the levels of the tracks in my projects without clipping the D-Box, and the results sounded great. This was the case whether I was monitoring the analog or digital inputs.

Versatile D-Vice

Overall, the D-Box is a very impressive product. It handles all its roles—monitor controller, summing box, and D/A converter—with élan. The main drawback I found was its lack of I/O for a dedicated cue send. If you have a busy studio in which you're frequently recording ensemble-size projects, you might find that you need a dedicated monitor controller with a fuller feature set (you could then add the Dangerous 2-Bus LT for summing). But for most personal studios, the lack of a dedicated cue path won't be a deal breaker. In fact, the chance to add the D-Box to a studio's signal chain, with all its features, its impeccable sound quality, and its reasonable price, is going to be very hard for a lot of people to resist—myself included.

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

Great Audio begins with Audix.

Ask anyone who owns one.

AUDIX
MICROPHONES

For a dealer near you call Toll Free 800 966 8261
Ph 503 682 6933 Fax 503 682 7114 www.audixusa.com
Also check out www.MySpace.com/AudixMicrophones

One of the most exciting additions in Pro Tools LE 7.4 is the Elastic Time feature, which greatly improves the program's transient detection and time-stretching functionality.

Digidesign

Pro Tools LE 7.4 (Mac/Win)

Easier, faster, loopier.

By Brian Smithers

PRODUCT SUMMARY

digital audio workstation (M-Powered only; LE available bundled with Digidesign interface only)	**$250**
upgrade from 7.3	**$49 (download)**
upgrade from earlier versions	**$75 (download)**

PROS: Elastic Time. Mojo SDI support. Windows Vista support. Outstanding documentation. Structure Free sample player plug-in.

CONS: Persnickety (though well-documented) compatibility grid. No Leopard support as of review date. No surround mixing. M-Powered still doesn't support DV Toolkit 2.

FEATURES	1	2	3	4	5
EASE OF USE	1	2	3	4	5
DOCUMENTATION	1	2	3	4	5
VALUE	1	2	3	4	5

Digidesign
digidesign.com

ONLINE BONUS MATERIAL

Having significantly leveled the MIDI playing field with the introduction of Pro Tools 7.0, Digidesign has since turned its attention to the needs of loop-based musicians. Ironically, for a program that helped define the notion of nonlinear audio editing, Pro Tools' audio had started to seem downright linear compared with the looping and time-stretching work flows of programs such as Sony Acid and Ableton Live.

Version 7.4 introduces Elastic Time, Digidesign's unique take on making audio as flexible as MIDI. While still less radical than the cell-based approach favored by Live and Cakewalk Project 5, Elastic Time's presence means Pro Tools users will rarely have to stress over combining loops with different original tempos. Many other features—a total of 183 pages of What's New documentation—have been added since we reviewed Pro Tools 7.0, so this review will highlight the most significant new features in version 7.4. (See the **online bonus material** for a rundown of features new to Pro Tools LE 7.3.) Everything here applies to both LE and M-Powered unless otherwise noted, and nothing here is absent from HD.

I tested Pro Tools LE and M-Powered 7.4 on a dual-core Intel 2.33 GHz MacBook Pro with 2 GB of RAM running Mac OS X 10.4.10. OS X 10.5 (Leopard) is not supported as of this writing, but it should be by the time you read this. Windows XP (SP2) and Vista 32-bit Business and Ultimate Edition are supported. Digidesign notes that there are no known issues with Vista Home and Home Premium—they simply have not been tested for compatibility. Pro Tools users should never upgrade their OS or any component thereof (such as QuickTime), or even

> It would be silly not to upgrade.

Of Late

The main drawback of using any external plug-in processor is the latency induced by the round-trip to and from the DSP hardware. If your DAW has automatic latency compensation, you don't need to worry about it, but Pro Tools LE and M-Powered (one of which will be your version of Pro Tools if you're working on a laptop) don't. The trick is to have the same amount of latency on every channel (down to the sample if you are processing multiple microphones on a single source) to avoid phase or timing problems.

Luckily, you can Option-Command-click (Mac) on the decibel value at the base of any fader to view the latency of all of your tracks at once. Then, using the UAD Delay Comp plug-in, you can add the specific amount of compensating delay to any tracks that don't have enough latency. This all may seem rather cumbersome, but it is the price of using UAD plug-ins in Pro Tools LE, and I have gotten quite used to it. It's a testament to how good the plug-ins sound that so many engineers I know are willing to jump through these manual delay-compensation hoops in order to use them.

de-esser I've been waiting for—it's more musical, less intrusive, and more effective at curing pesky sibilance than any hardware or software de-esser I've ever used. You get knobs for Threshold, Frequency (2 to 16 kHz), and Bandwidth (from narrow to full highpass), as well as buttons for Speed (Fast/Slow) and Split (which compresses only the detected frequencies and leaves the rest alone). Split mode takes a little more processing, but I thought it sounded significantly better in most cases. This plug-in was effective at taming shrill trumpet notes and unruly hi-hats as well.

FIG. 4: One of the most outstanding audio tools available, SPL Transient Designer actually changes the envelope characteristics of the audio passing through it.

Precision Buss Compressor ($199) borrows a lot from the revered SSL G-Series stereo compressor but adds a few modern touches (see Fig. 3). Enhancements include a Mix knob for quick and easy parallel-style compression and a highpass Filter knob for filtering low frequencies out of the detector path. The plug-in also offers a Fade knob, which allows you to fade out (or in) the signal flowing through the compressor at a rate of from 1 to 60 seconds. This plug-in sounds unbelievably good. When you find the sweet spot at which all the compression artifacts are minimized, it makes the mix pop out of the speakers and into the room. And if heavy compression artifacts are what you're after, they sound great through this plug-in, too. I also had good results using it as a stereo drum bus compressor.

SPL Transient Designer ($199), which is based on Sound Performance Laboratory's unique and powerful rackmount Transient Designer, controls the envelope characteristics of a signal in a near-magical way. Other than Output Gain, it has just two knobs, for Attack and Sustain (see Fig. 4). With those two knobs, you can transform the tightest little click of a close drum microphone into a roomy wallop, or a diffused kick drum with zero definition into a beater-heavy punch in the gut. When I did an A/B comparison of the plug-in with my hardware Transient Designer, I slightly preferred the way that the hardware unit delivered, but the software version was highly effective and completely unlike anything else in my software toolkit.

Xpand Your Horizons

If you buy UAD-Xpander Xtreme and add the remaining seven plug-ins piecemeal, a fully loaded Xpander does not come cheap. However, the system is comprehensive and extremely portable, and it frees your host resources by running on its own CPU. Like any DSP host, it does introduce a bit of latency (see the sidebar "Of Late"). Did I mention that the whole package comes in a compact, durable flight case? When you consider the overwhelmingly meticulous approach that Universal Audio has taken toward modeling the best audio processors ever made, the price for what you get is actually quite fair.

> This is one of the best de-essers I've ever gotten my mitts on.

Eli Crews owns and operates New, Improved Recording (newimprovedrecording.com), a studio in Oakland, California. Special thanks to New, Improved's co-owner, John Finkbeiner, for his help with this review.

very easy on my 2.2 GHz Apple MacBook Pro. The included disc contains installers for Mac OS X and Windows (on a Windows laptop, the Xpander works only with Vista), as well as AU and VST versions of the plug-ins. For use with Digidesign Pro Tools, it also supplies a UAD-only version of FXpansion's VST to RTAS Adapter.

The software contains authorized versions of the 14 base-set plug-ins, as well as fully functional 14-day demos of all of UA's plug-ins. You will need an Internet connection to register with uaudio.com to get authorizations for the remaining plug-ins in your bundle or any additional plug-ins you want to purchase.

Three bundles are available for the Xpander. UAD-Xpander Xpress comes with a $500 voucher toward your choice of plug-ins at UA's online store, and UAD-Xpander Xpert includes a $1,000 voucher. In addition to the 14 base-set plug-ins, UAD-Xpander Xtreme contains 16 Powered Plug-ins. The Xtreme package is clearly the best value, because the additional plug-ins are worth more than $2,800 if bought one at a time (and in my experience, you're going to want most, if not all, of them).

FIG. 3: Precision Buss Compressor puts the finishing touches on a mix in a way that practically makes the music come alive.

For users of multiple computers, an adapter card (the $99 Xtenda) is available for connecting the Xpander to a desktop computer outfitted with PCIe slots. Because the Xpander's hardware contains the authorizations, the transition between stations is very easy.

Hardware Gone Soft

Because you can read EM's past reviews of UAD plug-ins (most recently in the June and December 2007 issues, available online at emusician.com), aside from the four newest processors, I won't go into how each one sounds and works. Every plug-in takes a different amount of processing power, and you can always check in with the UAD Meter application to find out where you stand in terms of the Xpander's CPU usage (see Fig. 2). In the roster of existing plug-ins, my personal favorites are Plate 140, Fairchild 670, 1176LN, Neve 1081 and 33609, and Helios 69. Boss CE-1, Roland Dimension-D, and Roland RE-201 Space Echo are also fantastic effects that get loads of use in my everyday studio work.

FIG. 2: UAD Meter shows how much of the Xpander's processing power and RAM is being used.

What follows are very condensed descriptions of the four newest additions to the UAD pack. As of now, none of them are included in any of the card bundles, but UA often offers special deals, so keep your eyes open for those.

Part of the Precision Suite (UAD's Mastering Series), Precision Maximizer ($199) makes material sound louder and more tube-like with the turn of a few knobs. According to UA, it does that without affecting the material's dynamic range, and therefore without the fatiguing artifacts induced by loudness-achieving limiters. Two knobs control Shape (harmonic content contour) and Mix (for blending in some of the dry signal), and a switch lets you select either one or three Bands; the latter, in effect, allows the plug-in to function as three Maximizers working on different frequency ranges. In practice, Precision Maximizer added a lot to the mastering jobs I employed it on, handily adding bushels of shine and presence to otherwise dull tracks while also getting the volume as hot as necessary.

Precision De-Esser ($99) is truly one of the best-sounding, easiest-to-use de-essers I've ever gotten my mitts on. This is the

> This plug-in sounds unbelievably good.

CAPTURE YOUR TONE

NO MATTER HOW BIG

FIRESTUDIO PROJECT

PROFESSIONAL FIREWIRE RECORDING SYSTEM

CRANK UP YOUR AMP, SCREAM, SING OR WHISPER.

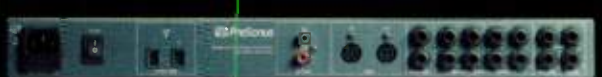
Use two microphones on your kick drum, or three on your guitar amp. The FireStudio Project is designed to capture every nuance of every tone you throw at it.

Most recording interfaces out there use cheap off the-shelf mic preamps delivering thin, harsh and colored results; not a good thing.

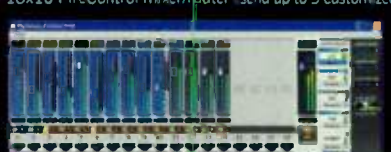
The FireStudio Project is loaded with EIGHT Class A, high-headroom, award-winning XMAX preamplifiers designed to flawlessly capture the ultra-loud volume levels of a guitar amp or drum kit, as well as the nuances of a sultry vocal performance.

The next-generation to the award-winning FirePod, the FireStudio Project combines superior analog circuitry with improved digital converter and synchronization technology enhancing your sound, your tone, and most of all, your music.

WWW.PRESONUS.COM



- 24-bit / up to 96k sampling rate, next-generation A to D converters
- 10 simultaneous record/playback channels
- 8 class A XMAX microphone/line preamps
- 8 analog line outputs plus main outputs
- S/PDIF & MIDI input and output
- 18x10 FireControl mixer/router (send up to 5 customized mixes for musicians)



- JetPLL – jitter elimination technology for enhanced clarity and imaging
- ProPak Software Suite featuring Cubase LE 4, BFD Lite, Discrete Drums, 25 real-time plug-ins and more than 2 GB of samples and drum loops included!
- Mac and Windows compatible

Sweetwater
Music Instruments & Pro Audio

Sweetwater sales engineers recommend PreSonus systems because the combination of sonic quality and reliability offered can't be beat. **www.sweetwater.com | 800-222-4700.**

PreSonus

Of Late

The main drawback of using any external plug-in processor is the latency induced by the round-trip to and from the DSP hardware. If your DAW has automatic latency compensation, you don't need to worry about it, but Pro Tools LE and M-Powered (one of which will be your version of Pro Tools if you're working on a laptop) don't. The trick is to have the same amount of latency on every channel (down to the sample if you are processing multiple microphones on a single source) to avoid phase or timing problems.

Luckily, you can Option-Command-click (Mac) on the decibel value at the base of any fader to view the latency of all of your tracks at once. Then, using the UAD Delay Comp plug-in, you can add the specific amount of compensating delay to any tracks that don't have enough latency. This all may seem rather cumbersome, but it is the price of using UAD plug-ins in Pro Tools LE, and I have gotten quite used to it. It's a testament to how good the plug-ins sound that so many engineers I know are willing to jump through these manual delay-compensation hoops in order to use them.

de-esser I've been waiting for—it's more musical, less intrusive, and more effective at curing pesky sibilance than any hardware or software de-esser I've ever used. You get knobs for Threshold, Frequency (2 to 16 kHz), and Bandwidth (from narrow to full highpass), as well as buttons for Speed (Fast/Slow) and Split (which compresses only the detected frequencies and leaves the rest alone). Split mode takes a little more processing, but I thought it sounded significantly better in most cases. This plug-in was effective at taming shrill trumpet notes and unruly hi-hats as well.

FIG. 4: One of the most outstanding audio tools available, SPL Transient Designer actually changes the envelope characteristics of the audio passing through it.

Precision Buss Compressor ($199) borrows a lot from the revered SSL G-Series stereo compressor but adds a few modern touches (see Fig. 3). Enhancements include a Mix knob for quick and easy parallel-style compression and a highpass Filter knob for filtering low frequencies out of the detector path. The plug-in also offers a Fade knob, which allows you to fade out (or in) the signal flowing through the compressor at a rate of from 1 to 60 seconds. This plug-in sounds unbelievably good. When you find the sweet spot at which all the compression artifacts are minimized, it makes the mix pop out of the speakers and into the room. And if heavy compression artifacts are what you're after, they sound great through this plug-in, too. I also had good results using it as a stereo drum bus compressor.

SPL Transient Designer ($199), which is based on Sound Performance Laboratory's unique and powerful rackmount Transient Designer, controls the envelope characteristics of a signal in a near-magical way. Other than Output Gain, it has just two knobs, for Attack and Sustain (see Fig. 4). With those two knobs, you can transform the tightest little click of a close drum microphone into a roomy wallop, or a diffused kick drum with zero definition into a beater-heavy punch in the gut. When I did an A/B comparison of the plug-in with my hardware Transient Designer, I slightly preferred the way that the hardware unit delivered, but the software version was highly effective and completely unlike anything else in my software toolkit.

Xpand Your Horizons

If you buy UAD-Xpander Xtreme and add the remaining seven plug-ins piecemeal, a fully loaded Xpander does not come cheap. However, the system is comprehensive and extremely portable, and it frees your host resources by running on its own CPU. Like any DSP host, it does introduce a bit of latency (see the sidebar "Of Late"). Did I mention that the whole package comes in a compact, durable flight case? When you consider the overwhelmingly meticulous approach that Universal Audio has taken toward modeling the best audio processors ever made, the price for what you get is actually quite fair.

> This is one of the best de-essers I've ever gotten my mitts on.

Eli Crews owns and operates New, Improved Recording (newimprovedrecording.com), a studio in Oakland, California. Special thanks to New, Improved's co-owner, John Finkbeiner, for his help with this review.

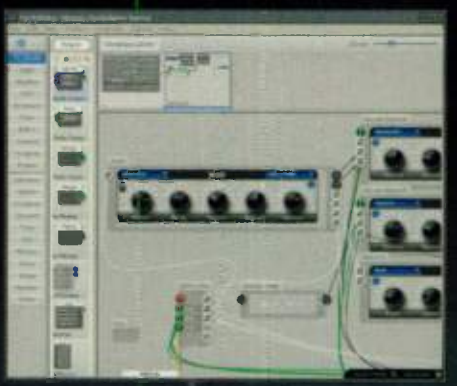
THE FASTEST WAY FROM YOUR
BRAIN TO YOUR SPEAKERS

FL STUDIO 8

Introducing :

Slicex : The ultimate slicer

DirectWave



FL SynthMaker

Do what almost **5.000.000** others do
every year : Download & get addicted
to our fully functional demo at :

www.flstudio.com

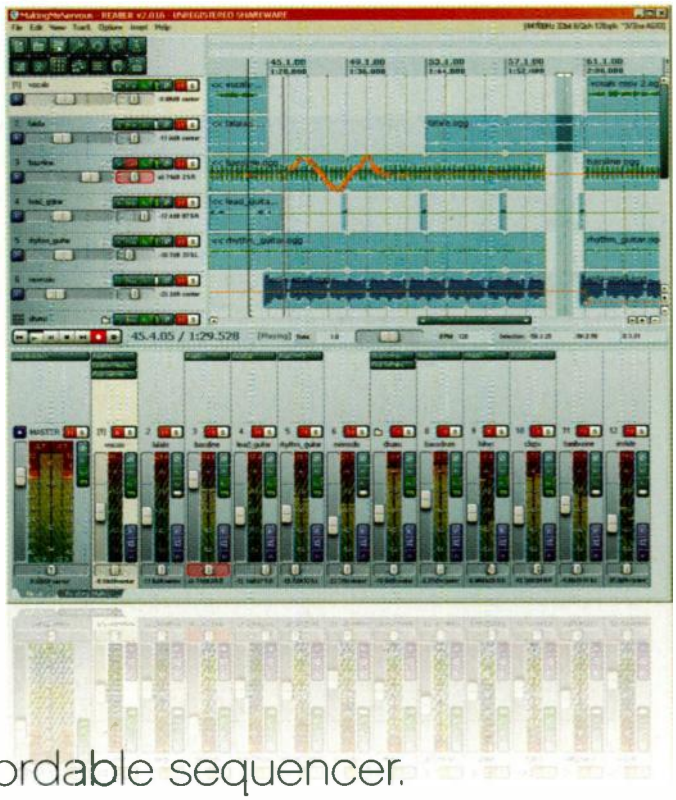


FIG. 1: Cockos Reaper offers many capabilities of more established digital audio sequencers at a fraction of the price. With its astounding flexibility and no-nonsense approach, the program excels.

Cockos

Reaper 2.0 (Win)

A surprisingly powerful and affordable sequencer.

By Allan Metts

PRODUCT SUMMARY

digital audio sequencer	**$225**
for noncommercial use	**$50**

PROS: Extremely flexible audio routing. Comprehensive features at a low price. Deep discount for noncommercial use. No trialware or code bloat. Extensive customization and productivity aids.

CONS: May be difficult for novices to use. Lacks advanced MIDI features such as a notation view and offline bulk edits.

	1	2	3	4	5
FEATURES				4	
EASE OF USE			3		
DOCUMENTATION				4	
VALUE					5

Cockos Incorporated
cockos.com

ONLINE BONUS MATERIAL

I had never heard of Cockos Reaper when EM asked me to review it. Reaper's developers don't pay for big advertisements, and the program hasn't been around for as long as Cakewalk Sonar, Steinberg Cubase, and the like. But after installing it and seeing a set of features rivaling those of the established players, my first reaction was "Wow, where did *this* come from?" (For the answer, see the sidebar "Don't Fear the Reaper.")

Reaper is a no-nonsense, full-featured digital audio sequencer. You won't find any trialware for third-party products or splashy eye-candy graphics. What you will find is a reasonably priced multitrack recording and production application that's just over 3 MB in size and has no copy protection. It's currently for Windows only, but a Mac version is in beta and should be ready by the time you read this.

If you want to try Reaper, you can simply download it. Its small size means that the program downloads quickly and is lean enough to run in nearly any version of Windows while residing on a USB flash drive. If you want to keep using it, just pay the registration fee—only $50 for noncommercial use. Like I said, there's no nonsense here.

Weed 'em and Reap

A glance at the program reveals that Reaper follows the same paradigm as most other digital audio sequencers. A main screen contains a Track view to assemble Media Items on a timeline, and a Mixer view is available to facilitate mixdown (see Fig. 1). You can open additional views as floating windows or attached to a Docker that presents each of them in an uncluttered, multitabbed pane. You can turn the Docker into a floating window with varying levels of transparency, which is a really nice touch.

Reaper furnishes a palette of tools for common operations, and the usual set of transport controls attaches to the main window or floats freely. Associated with the transport controls are controls for changing the playback rate (like a varispeed tape drive), tempo, looping, and the selected time range.

Right-clicking is the name of the game in Reaper. Nearly every element of the program offers up a contextual menu or other

STARR LABS

Unplug and Play

Wireless Receiver

The Z7S with Wireless AirPower Adapter

Play where you want to.

Lightweight, compact and beautiful the Starr Labs Z7S USB/MIDI guitar controller sets you free when combined with the optional AirPower wireless adaptor. No wires to tangle or clutter your performance. Compatible with any USB and MIDI equipped computers, systems and sound modules.

Z7S W/ installed AirPower transmitter $2,250.00 (pictured)
Z7S W/O AirPower transmitter $1,995.00
AirPower standalone Transmitter/Receiver pair $249.95
Option for Starr Labs controller systems

STARR LABS INC.

Starr Labs • 7734 Arjons Drive • San Diego, CA 92126
www.starrlabs.com

meaningful behavior when you right-click on it. Left-clicking usually performs the action that Windows users would expect, such as making a selection or activating a control. Some of the context-sensitive menus get rather verbose, but I found this approach to be intuitive nonetheless. Typically, the action I was hoping to perform was right there under my nose.

The program supports a wide variety of Media Items, including WAV, AIFF, Ogg Vorbis, MP3, MIDI, and the audio portions of AVI, WMV, MPEG, and MOV files (MOV requires that QuickTime be already installed on your computer). A window shows the first video file that you open, but unfortunately, the Track view has no filmstrip display to help you align audio to video.

I like the fact that Reaper supports so many formats without an importing or conversion step. Bring an AVI file and a few MP3 files into your project, record an additional track in WAV format, and everything will play together in perfect synchronization—even if the files have different sampling rates and bit depths. There's no need to clutter your hard drive with redundant copies of your source material that have been converted to a common format.

One interesting paradigm that is *not* common in other sequencers is a lack of track types. In Reaper, a track is a track is a track, whether it contains audio, MIDI, a vocal performance, or shared effects from other tracks (I'll discuss Reaper's flexible audio routing in a moment). The available operations on these tracks are identical, no matter what the contents.

Each track supports multiple takes, which you can display in separate lanes within the track. It's easy to mix and match the best performances to create a composite track, but even more noteworthy is the fact that MIDI and audio can exist together within a single track.

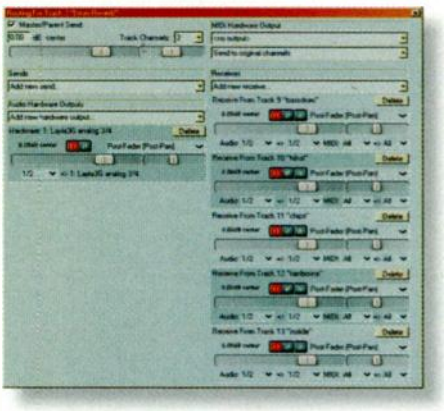


FIG. 2: Reaper's audio routing allows you to connect nearly any source to any destination in an intuitive manner.

I connected a soft synth and instructed Reaper to record my MIDI performance. Then I played back that performance and instructed Reaper to record the output of the soft synth instead. I ended up with one take of MIDI and a second take of audio on the same track.

Follow the Route

The example I cited hints at a philosophy that is pervasive in Reaper: mind-boggling flexibility. When recording, you can choose whether to record what is arriving at the track's inputs or leaving via its outputs. You can choose whether to record audio or MIDI. When recording audio, you decide the file format (be it MP3, WAV, Ogg, or whatever), as well as the sampling rate and bit depth of *each track*. You can compensate for latency if you want. MIDI can overlay or replace what is already there, and it can be quantized during recording.

Each track has its own effects bin, and Reaper supports DirectX, VST, and Jesusonic effects (Jesusonic is Cockos's own format). A substantial number of VST and Jesusonic effects come with the program, including several that process MIDI. The audio effects cover the spectrum from delays to sideband compressors to convolution reverbs, and the ones I tried all performed their intended functions with satisfactory audio quality.

DirectX and VST instruments are also supported, as is ReWire. You can insert effects in any order and mix and match any of these technologies; for instance, I connected a DXi instrument to a VST chorus, followed by a Jesusonic delay. You can save your favorite effects configurations into chains for use in any other track (in the current project or others).

Per-track effects bins are nothing new, but Reaper really starts to shine when you start routing audio *across* tracks. In Reaper, an effects bus is no different from a track; the key is in how you configure it.

Click on the IO button on a track, and you'll be presented with every routing option imaginable (see Fig. 2). You control how much of the signal goes to the master, how much goes to additional hardware outputs, how much goes to other tracks, and how much *comes from* other tracks. These send levels are also available in the Mixer view. You have control over panning, phase, pre and post effects, and MIDI as well. You can even map MIDI to other channels as you send it to other tracks. An example will help clarify the capabilities here—see the **online bonus material** at emusician.com.

What About MIDI?

Some programs designed for recording audio suffer from minimal MIDI capabilities. Although Reaper certainly isn't a MIDI powerhouse, it does contain enough MIDI-editing capabilities to get the job done. The basic views are there, including a MIDI event list, two piano-roll views (one offering named notes), and graphical controller editing (see Fig. 3). However, Reaper can't display MIDI events as standard musical notation.

You can apply basic MIDI quantization during recording, but you can't do groove quantization or quantize to triplets (although the Swing slider provides a similar effect). During playback, several MIDI effects help you with Velocity adjustments, keymapping, and even arpeggiation, but you won't find much to help you out with offline MIDI adjustments of entire tracks at once (other than the individual event editing you can perform in the piano roll and event list).

Reaper has support for certain control surfaces from Mackie, Behringer, and Frontier Design, though I wasn't able to test those capabilities. Even if you don't have one of these controllers, you can associate MIDI events with any action that responds to a keyboard shortcut

Don't Fear the Reaper

A quick Google search for Cockos's founder, Justin Frankel, reveals that he was one of the key players in the launch of the Gnutella file-sharing network. He also founded Nullsoft, which makes the popular Winamp media player. AOL purchased Nullsoft for an impressive sum in 1999, and Frankel founded Cockos after leaving AOL. In 2004, *Rolling Stone* called him "the world's most dangerous geek."

2008—Junkie XL
working in his studio

1935—Hammond Electronic Organ
Laurens Hammond's keyboard instrument uses spinning tonewheels to produce sound

SUBSCRIBE TO em

ELECTRONIC MUSICIAN

+ EXPANDED ARTIST COVERAGE

+ NEW SECTIONS

ON RECORD RELEASES, TIMELINES FOR GEAR-GEEKS, HIDDEN TRICKS FOR POPULAR SOFTWARE APPS, TECH TIPS, DOWNLOAD OF THE MONTH AND MORE

+ PRODUCTION TOPICS, PRESENTED BY A GRAMMY-AND EMMY-WINNING ENGINEER

+ GREATER FOCUS ON THE CREATIVE PROCESS

Subscribe today at www.mixbooks.com, or visit www.emusician.com.

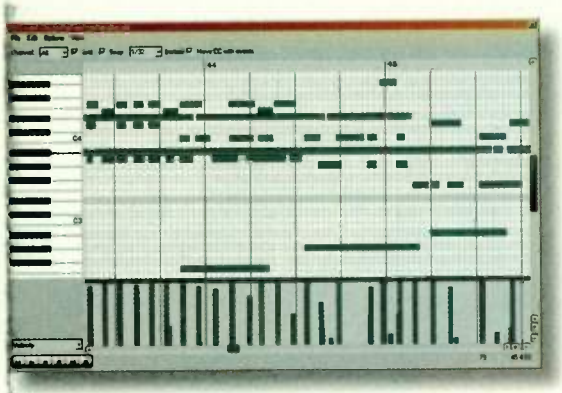


FIG. 3: Though Reaper isn't necessarily a comprehensive MIDI-sequencing product, it has enough of the basic editing tools for most jobs.

(and there are many, many such actions). You can also map MIDI Control Changes to effects parameters. Though I'm happy to see support for MIDI hardware, Reaper could go a little further. I found myself trying to right-click on a Track Volume control and immediately associate it with a MIDI controller of my choosing.

However you move Reaper's controls (whether using the mouse or a supported control surface), you'll be glad to know you can automate those movements. The program supports envelopes for volume, pan, effects parameters, and sends for each track, and it provides you with the tools you need to manipulate those envelopes. You can record changes to the envelopes using their respective onscreen controls. In addition, you can choose how and when recording occurs using one of five automation modes, including Touch (which records changes only while you're making them) and Latch (which starts recording as soon as you make the first change).

The remaining Reaper features are almost too numerous to mention. Check out the **online bonus material** for details on performance monitoring, productivity aids, and extra bells and whistles.

Reap What You Sow

Make no mistake: Reaper is a deep program. It's easy to get up and running with basic recording and mixdown, but using the program to its fullest potential requires a bit of a learning curve. So with all this depth, how is the documentation? For starters, the PDF User Guide has several hundred pages to cover most aspects of the program, and the Cockos Web site maintains a wiki and an active community forum for the rest. Cockos usually releases a new version of Reaper every few days, so it's understandable that the documentation might lag a bit behind the application.

Reaper is a powerful program at a great price. I love the no-nonsense style, the power-user capabilities, and the gracious pricing that lets hobbyists use the application without breaking the bank. If you have a Windows PC, a desire to work with audio, and an Internet connection, you have no reason not to check this program out.

Allan Metts (sonicbids.com/allanmetts) is an Atlanta-based musician.

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

Elliott Park – TAXI Member

Photo: Elliott (left) with publisher, Michael Martin

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

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

I Used a 4-Track

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

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

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

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

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

#1 Hit on Two Charts!

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

Could that have happened without TAXI? Probably not.

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

Can TAXI do the Same Thing for You?

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

Make the phone call I did, and see what TAXI can do for you – no matter where you live.

TAXI®

The World's Leading Independent A&R Company

1-800-458-2111

NOTION MUSIC

Progression (Mac/Win)

By Jon Chappell

Notion Music has released an entry-level program called Progression ($99) that's designed primarily for notating guitar and bass scores with standard notation and tablature, though it's also capable of creating keyboard and drum parts. Note entry in Progression is very intuitive whether you use the palette or MIDI, as is inserting articulations, sizing the music, changing fonts, or applying chords.

Playback is smooth, offering WYSIWYH ("what you see is what you hear") results: scored dynamics and articulations are played, including bends, slides, and slurs. Notion recruited guitarist extraordinaire Neil Zaza, bassist Victor Wooten, and percussionist Futureman for the sampled sounds used during playback. The guitars and basses sound especially convincing and varied—from strummed acoustics to spanky-clean country leads and distorted rock shredding (see **Web Clip 1**).

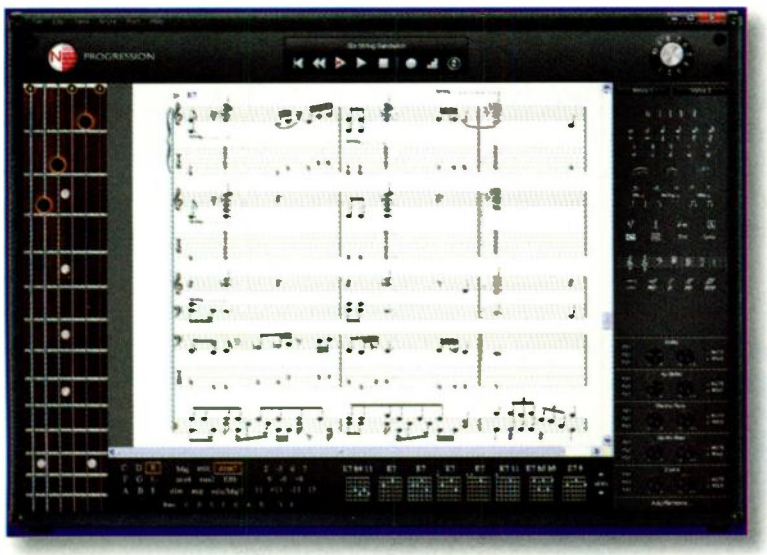
ONLINE BONUS MATERIAL

The interface's main screen has a guitar neck on the left side, a score window in the center, a tool palette and mixer on the right side, and a transport bar across the top. A second window, using a rack metaphor, appears when you want to apply and tweak the effects. The program exports WAV files (with effects) and MIDI files.

The only printed documentation is a handy card-stock foldout listing the keyboard shortcuts, but I got pretty far without having to invoke the help screens. When I finally did use them, I was impressed with the logic and presentation of the features.

ENGRAVE CONDITION

As a quick test, I entered a rather knotty-looking Van Halen solo transcription, complete with bends, slurred tuplets, and unusual graphics (tapping indications, whammy bar moves, and so on). Except for one or two purely graphical, nonmusical symbols, I got all of the conventional notation right where I wanted it in very little time. (Notation and tab update automatically no matter which is entered.) I discovered that some of Progression's tools aren't editable once they're on the page. If you make a mistake (as I did when applying a palm mute), your only recourse is to delete it and start over. But that's not too bad, given how quickly you can select, delete, and reapply the appropriate tool from the palette.



Progression offers professional-looking notation and powerful, guitar-specific playback tools in an affordable package.

You can apply any manner of bends—immediate, gradual, bend-and-release, and so forth—by grabbing the appropriate symbols from the palette. To change the immediacy of a bend's response, simply pull it horizontally (extending it in musical time). To change a bend's interval, just click-and-drag the arrowhead up or down to reach the desired result. (Microtonal bends are also available.) I would have liked the hammered and pulled notes to be more slurlike and less articulated; they retain some of their articulation, though it becomes subdued once it's within a slur.

When you select a chord grid, a new palette called the Chord Library opens showing a choice of related chord forms. Pick the chord you want, or edit an existing frame by moving the fingerboard dots. Unfortunately, you can't save your customized chords to a library.

FOLLOW MY LEAD

The Ntempo feature, which lets you control the tempo by tapping your controller's keys to the beat, works very well. I found I could speed up and slow down the music smoothly—handy for teaching purposes.

For a notation program, Progression has a compelling and versatile effects section. You can activate and bypass effects in real time and hear your parameter changes, too. However, once you're in the effects screen, none of the transport functions work. You have to activate the score screen (which deactivates the effects screen) to pause, rewind, or restart your music. Also, you can't resize the effects window, making it inconvenient to adjust effects and work on your score at the same time unless you have two monitors. Progression's capabilities for professional layout are limited: you can't save scores as a PostScript or EPS file, which limits further graphics work using other programs.

FINAL DOUBLE BAR

Progression's depth and editability, not to mention its excellent electric and

www.sweetwater.com/ssl

From A to D via SSL

- **Alpha-Link AX (top):** ADAT ⟷ Analogue
- **Alpha-Link MADI AX (centre):** MADI ⟷ ADAT ⟷ Analogue
- **Alpha-Link MADI SX (botttom):** MADI ⟷ AES/EBU ⟷ Analogue

Solid State Logic
SOUND | | VISION

In critical studio, live and broadcast applications, quality shouldn't be compromised at any point in the signal chain. Designed to avoid complicated workarounds and deliver pristine audio, the new Alpha-Link range is a collection of multi-channel audio converters, each featuring 24-channels of analogue I/O with SSL's premium A-D/D-A converters. The three models offer a choice of digital audio format options, for fast connectivity to MADI-, AES/EBU- and ADAT Lightpipe-equipped hardware.

XLogic Alpha-Link. This is SSL.

To find out which Alpha-Link is right for you, call a Sweetwater Sales Engineer today.

1-800-222-4700

Sweetwater
Music Instruments & Pro Audio

acoustic guitar sounds, make it useful to beginners and pros alike. The program offers a great way to get elegant-looking guitar tablature and notation and great-sounding playback for under $100.

Value (1 through 5): 4
Notion Music
notionmusic.com

CENTRANCE

MicPort Pro

By Rusty Cutchin

Lest anyone think digital audio converters can't get smaller and still maintain good sound quality, CEntrance's MicPort Pro ($124.95) stands ready to take on all doubters. The bus-powered device is a USB adapter that connects directly to almost any microphone and computer. It is suitable for Podcasts, field recordings, songwriting—in fact, just about any recording task that requires a mono mic. The MicPort records 24-bit, 96 kHz audio and has plenty of headroom and output power, and it sounds great.

The MicPort Pro is a handy, high-quality mic preamp and A/D converter that turns any microphone into a USB mic.

MIGHTY MITE

The MicPort Pro is cylindrical, with flat panels on opposite sides, and is about the size of an XLR-to-¼-inch high-impedance transformer. On one side are a pot for mic level and another for headphone level. The headphone pot allows you to adjust the level of audio routed from your computer to the headphones as well as from the microphone.

On one end of the MicPort Pro are a mini USB connector (like those on digital cameras), a stereo miniplug headphone connector, a tiny button that engages 48V phantom power, and an LED that glows when phantom power is on. The 48 volts are generated internally using the 5V USB connection. On the other end is a female XLR connector.

EM HOT PICK

Surrounding the device is a transparent plastic ring that houses an LED. When a USB cable with an active connection is plugged in, the ring glows brightly, leaving no doubt that the unit is ready to digitize a signal.

PORTED UP

When I first heard about the MicPort Pro, I was intrigued. Although lots of USB mics are designed for quick connection to a computer, the MicPort Pro gives you the same convenience with any mic. I was eager to give the device a whirl and grabbed a Shure SM57 to try with it. When connected, the SM57 and the MicPort, with its glowing blue ring and dangling headphone and USB cables, resembled some kind of alien medical probe from a '50s sci-fi flick. But as soon as I established communication with my Mac G5 and donned a pair of headphones, I knew I was dealing with a down-to-earth, high-quality audio device.

The audio signal had plenty of presence, even before adjusting the mic-level pot. The unit's headphone level was also ample and crystal clear without any boost from the headphone-level pot. When I did adjust the pots, the digitized mic signal sounded great, and when I fired up some iTunes material, the MicPort mixed its signal with the computer's audio, turning iTunes into a convenient, high-quality karaoke machine. The MicPort Pro provides zero latency by mixing the direct mic signal with the stereo return from the computer.

RECORDING

I replaced the SM57 with a Studio Projects large-diaphragm condenser mic, engaged phantom power, and set up to record some acoustic guitar. Again, the MicPort Pro digitized the signal cleanly, with the higher detail of the condenser coming through clearly.

With low latency settings in MOTU Digital Performer 5.1, I was able to add the guitar signal to the computer mix without causing any delays relative to the direct signal, which can't be muted, and boost guitar to whatever monitor level I needed while maintaining a constant recording level. All the time the MicPort Pro just did its job cleanly, without adding any questionable artifacts to the recording. When I wanted greater flexibility to reposition the microphone, I just inserted a standard mic cable between the mic and the MicPort Pro, which I left on my computer station.

For a majority of studio miking tasks, however, I prefer to have a high-quality dedicated mic pre and dynamics processor between the mic and the converter, because of the possibilities they provide for creating warmth and shaping the sound. The MicPort Pro was at its best when I used it for several Podcast interviews and video voice-overs on different computers scattered about my house, yet it seems almost overqualified for such jobs.

MICPORT IN A STORM

The MicPort is so handy and so clean that several variations come to mind. I would like to see a stereo unit without XLR or phantom power; you can already download a driver to use two MicPort Pros in stereo. How about an accessory to clip the MicPort Pro to your laptop? CEntrance has probably had similar ideas. However it evolves, the MicPort Pro is a great little audio interface and a very convenient mic pre and converter.

Value (1 through 5): 5
CEntrance
centrance.com

Remix®

Want to learn new production tricks, performance tips and everything there is to know about creating urban and electronic music? Suck it all up like a sponge by subscribing to *Remix*. Producers, engineers, DJs, bands, lonesome laptop musicians and even your mom dig *Remix* for its features on artists' studio methods, production and performance tutorials, product reviews, columns (including advice on how to make money from making music) and more. Have *Remix* sent to your mailbox each month, and get the answers to all your burning studio- and stage-related questions.

Subscribe online at remixmag.com

Or order toll free at 866-860-7087

Available on newsstands everywhere!

SUBSCRIBE

compressor and reverb as well as the distortion pedal and Marshall-amp emulations (see **Web Clip 1**). The delay also sounds quite good. Furthermore, all the effects are usable, and monitoring through latency-free effects while sending a dry signal to your DAW lets you play through effects when recording and then mix using more expensive (and latency-inducing) effects later. If you are looking for an interface for personal recording, the Novation nio 2|4 has a lot to recommend it.

ONLINE BONUS MATERIAL

Value (1 through 5): 3
Novation
novationmusic.com

SYNAPTRICITY

Flashback 1.0 (Mac)

By David E. Weiss

Synaptricity Flashback 1.0 ($199) is a Digidesign Pro Tools plug-in (RTAS and AudioSuite) that runs in the background, recording everything you do into a RAM buffer. This allows you to retrieve and save to disk up to 15 minutes' worth of work without having to be in Record mode.

As a result, Flashback opens up a new, more flexible way of working. You can experiment freely with overdubs, effects processing, or edits, knowing it will capture any happy accidents that may occur. For example, it finally provides a way to record the movements of the Scrubber tool (in Pro Tools 7.4).

Flashback is iLok protected and works in Pro Tools TDM, LE, and M-Powered systems. Synaptricity is finishing up a Windows version of the plug-in that will ship later this year.

Flashback is an RTAS and AudioSuite plug-in that records everything you do into RAM for up to 15 minutes at a time.

BLAST FROM THE PAST

To set up Flashback, insert the RTAS plug-in on the audio or instrument track you'd like to capture. To buffer all the audio in a session, including the sounds generated by MIDI instruments, simply insert it on a master fader track. Tracks you want to capture in Pro Tools LE and M-Powered need to be Record enabled; in TDM systems, disk tracks need to be either Record or Input enabled (auxiliary, instrument, or master fader tracks will pass audio directly through to Flashback).

Flashback makes use of two RAM buffers to ensure that it captures every sound—a streaming buffer to capture sound in real time, and a frozen buffer to hold selected sound before passing it to disk. Flashback's RTAS plug-in provides clear feedback on the status of both buffers, using graphic representations and digital clocks that measure to the tenth of a second. An input level meter with a clipping indicator shows that Flashback is receiving audio.

The default buffer size is 1 minute. When it's full, the Spilling light illuminates, indicating that sounds older than a minute will be lost to make way for new sounds. You can resize the buffer using the dial at the lower left of the window, and Flashback will immediately tell you how much RAM you'll need, accounting for both the streaming and frozen buffers. However, the buffer is resized only when you click on the Resize Buffer button: if you resize the buffer during recording, you'll lose everything in the old streaming buffer.

FREEZE FRAME

To capture the audio, hit the Freeze button, which pours the contents of the streaming buffer into the frozen buffer. Using a slider control, you can choose how much of the frozen buffer you'd like to save to disk. That's very handy if you have a 15-minute buffer and your stroke of brilliance occurred just seconds ago. You can automate many of Flashback's features, including the Freeze button.

To bring the captured audio into your session, open the AudioSuite version of Flashback and click on the Process button, with the insertion point placed in your chosen audio track. The AudioSuite plug-in also provides a Preview button, so you can hear your captured audio before you commit to placing it in your session. The captured audio will not be time-stamped, because time-stamping is dependent on the transport, and Flashback captures audio whether the transport is running or not.

KNOW YOUR LIMITS

To do its work, Flashback requires a lot of RAM, as you might expect, but never more than 1 GB. It can accurately capture audio in mono or stereo, at sampling rates up to 192 kHz, and it will always tell you how much you'll need based on your chosen settings. A 1-minute buffer of mono audio sampled at 44.1 kHz requires about 20 MB, whereas a 1-minute buffer of stereo audio sampled at 192 kHz requires nearly 176 MB. You can't use a 15-minute buffer to capture stereo audio at 192 kHz, because this would take the program over its 1 GB limit. That's unfortunate—pro systems with RAM to spare should be allowed to push the limits.

However, I never encountered a recording glitch, performance issue, or low-memory condition when running Flashback. Pro Tools, as well as all my other programs, behaved normally with Flashback running faithfully in the background. And I found the sound of the recordings to be indistinguishable from that of normally recorded material.

Overall, Flashback performs with remarkable ease and reliability. For Pro Tools users who don't want to miss those magic moments that happen when you least expect them, Flashback has got your back.

Value (1 through 5): 4
Synaptricity
synaptricity.com

ATTENTION INDIE MUSICIANS! THE IMWS IS NOW ACCEPTING ENTRIES.

IT'S YOUR TIME TO SHINE.

DISC MAKERS™

Independent Music World Series

IMWS

In 2008, the IMWS will award over $250,000 in cash and prizes to independent musicians. No matter where you live, you are eligible to enter now!

Whatever your act is...
we've showcased your style of music.

GOSPEL, METAL,
HIP HOP, PUNK,
JAZZ, COUNTRY,
EMO, ROCK, RAP,
REGGAETON,
AND MANY MORE!

Deadline for entries is May 14, 2008

2008 Showcases in LOS ANGELES, ATLANTA, CHICAGO, and NEW YORK CITY.

VISIT WWW.DISCMAKERS.COM/08EMUSIC TO ENTER, READ THE RULES AND REGULATIONS, FIND OUT ABOUT PAST SHOWCASES, SEE PHOTOS, AND LEARN ALL ABOUT THE GREAT IMWS PRIZE PACKAGE. CAN'T GET ONLINE? CALL 1-888-800-5796 FOR MORE INFO.

MUSICLAB

RealStrat 1.0 (Mac/Win)

By Marty Cutler

Most guitar sample libraries are multiple-instrument collections, and by virtue of their broad-scope nature, they rarely mine the wealth of tonal variety inherent in any one instrument. Because there are arguably more ways to get timbral variation from an electric guitar than from acoustic instruments, MusicLab's RealStrat ($249) fixes its sights on the Fender Stratocaster, providing even more sonic options than the company's acoustic counterpart to RealStrat, RealGuitar (see the review in the August 2006 issue, available at emusician.com).

Register the instrument, and MusicLab emails you an authorization key file. You can install your choice of sound banks at sampling rates from 44.1 kHz up to 192 kHz. It's a simple matter to add banks if you need them. I tested RealStrat as a standalone instrument on both platforms, as an AU plug-in in MOTU Digital Performer 5.13, and as a VSTi in Cakewalk Sonar 6 and Ableton Live 6.03. RealStrat also offers a DXi version. In addition to a MIDI keyboard, I used a guitar controller.

REALITY SHOW

The instrument is recorded dry, but it possesses subtly overdriven warmth and very understated ambience. MusicLab includes IK Multimedia AmpliTube 2 Duo, a lite version of AmpliTube. Naturally, RealStrat requires clever programming and a good deal of keyswitching to realistically duplicate some of the unique sounds an able guitarist can coax from the instrument. However, even basic funk-style rhythm-guitar parts played from my MIDI guitar were startlingly realistic without resorting to the keyswitching features. More forceful playing brings out a bit of string buzz, adding to the realism, and you can dial in the level for this and other guitaristic artifacts.

Round-Robin programming and samples for every playable fret of

The Technology Institute for Music Educators

TI:ME

Technology Workshops For Music Educators

Keep up with the latest music technology strategies for educators with TI:ME certified summer training courses – at a location near you!

Thousands of TI:ME summer workshop graduates agree – TI:ME training makes their teaching over 58% more effective. TI:ME summer courses are conducted at convenient locations throughout the country. Find out how you can reap the benefits of incorporating technology into your teaching strategies.

Join TI:ME this summer for training in a variety of technology-based areas:

1A - Basic Skills in Music Technology: Notation, Sequencing & Electronic Instruments
1B - Basic Skills in Music Technology: Instructional Software, Communications & Digital Media
2A - Advanced Notation and Sequencing, Electronic Instruments
2B - Multimedia Authoring, Interactive Internet Authoring, Digital Media, Digital Audio
2C - Integrating Technology into the Music Curriculum

Go to **www.ti-me.org/summer** for more information and a list of locations.

The Technology Institute for Music Educators, 305 Maple Ave., Wyncote, PA 19095, summer@ti-me.org

every string create amazingly convincing performances. My MIDI guitar provided a great way to test the chromatic sampling on every string. As with an actual guitar, the same pitch played on another string sounds different, and RealStrat can map its playback of notes based on realistic guitar fingerings and chord voicings if you use a keyboard.

RealStrat offers a number of ways to play the instrument. Solo presents the guitar in a relatively straightforward fashion, with notes mapped from low to high across the keyboard. As its name suggests, this setup is best for guitar solos. Notes played outside of the instrument's sample map trigger repetitions of the last played in-range notes: the white keys play normal versions and the black keys play muted versions that are great for reproducing telegraph-style unison guitar riffs.

Chords mode captures strums based on keyboard input within one zone of the virtual guitar, and you can trigger consecutive strums on adjacent keys, with muted tones on the black keys—all converted into authentic guitar-chord voicings. Bass and Chords delivers bass notes in one zone, with chords on the higher keys. With Alter Bass selected, subsequent bass notes will play alternating roots and fifths.

Keyswitch goodies include violining (volume-knob swells), feedback, pinched and natural harmonics, bridge mutes and slaps, string scrapes, and wah-wah-pedal effects. Ironically, because you trigger the keyswitches above and below the typical range of an electric guitar, a keyboard controller may be better suited than a MIDI guitar to get the most from the plug-in. RealStrat can also dole out some of the keyswitching control sources to Aftertouch, Modulation, and Sustain messages, so you needn't feel overwhelmed with memorizing key assignments.

By far, the most fun (and useful) playback feature is the Pattern Manager, which gathers a generous batch of previously prepared MIDI files and maps the chords you hold to guitar positions, playing them back in rhythmic picking or strumming patterns. Patterns sync to the host's tempo, but dragging different patterns into a MIDI track yielded plenty of themes and variations, adding an even more lifelike, interactive dimension to the playback (see **Web Clip 1**). You can add your own patterns to the user library.

ONLINE BONUS MATERIAL

One of the plug-in's most interesting features is the ability to simulate different picking positions in real time between the bridge and the neck. It worked well, and although pick position can be used to enhance the differences in sound between the Strat's pickups, I wish there were access to a discrete pickup switch.

em ELECTRONIC MUSICIAN AND THOMSON COURSE TECHNOLOGY™ PRESENT

PERSONAL STUDIO SERIES

Featuring Steinberg Cubase™

Electronic Musician magazine and Thomson Course Technology PTR have joined forces again to create the second volume in their Personal Studio Series, Mastering Steinberg's Cubase™.

Edited and produced by the staff of Electronic Musician, this special issue is not only a must-read for users of Cubase™ software, but it also delivers essential information for anyone recording/producing music in a personal-studio.

In addition to Thomson's easy-to-follow, step-by-step tutorials and color graphics examples for Steinberg's Cubase™ software, you'll get EM's famous in-depth applications articles and interviews. Use this single-issue magazine with the bonus DVD to get up to speed quickly with Steinberg's powerful cross-platform digital audio sequencer!

Other complementary topics in this publication:

- Top Pros Share Their Favorite Cubase™ Techniques
- Using Automation in Cubase SX™
- Loop Microsurgery
- Introduction to VST Instruments
- Cool Software Synths for Under $100
- Choosing and Using Keyboard Controllers
- And more!

MIX BOOKS

To order the *Personal Studio Series, Mastering Cubase™*, or any of our other publications, please visit **www.mixbooks.com**, or find it on newsstands wherever *EM* is sold.

» MusicLab RealStrat focuses on a host of sample-playback features to bring life to a virtual Fender Stratocaster.

KEEP IT REAL

A great deal of thought went into making RealStrat a deeply musical and accurate replication of its hardware namesake. Even so, it's remarkably easy to learn the myriad keyboard techniques that bring the plug-in to life. Thorough documentation outlines every feature and control.

Your choice of guitars may be a matter of taste, but anyone who can appreciate the Strat's glassy quack and funk embodied in a software instrument needs to take RealStrat for a spin. em

Value (1 through 5): 4
MusicLab
musiclab.com

PreSonus

DigiMax D8

Record drums right.

Introducing the most affordable DigiMax of all time, the **DigiMax D8**.

Sweetwater was there nearly a decade ago when PreSonus introduced the first eight-channel microphone preamplifier with ADAT output, and has been recommending the DigiMax ever since. DigiMax means huge sound, rock-solid build quality, and unbeatable value. Call Sweetwater today and add a DigiMax D8 to your recording system or digital mixer.

DigiMax D8 features

- 8 XMAX class A microphone preamps w/ trim control
- 2 instrument inputs
- 24-bit ADAT optical output
- 44.1 and 48K sampling rates
- External sync via BNC word clock
- Direct outputs on every channel
- -20dB pad on every channel
- LED input metering
- Works with the PreSonus FireStudio, DigiDesign's 002, 003 and HD systems, RME, Mackie, Yamaha, and any other device with ADAT optical input.
- $399

Your drums.

800-222-4700
www.sweetwater.com
Sweetwater
Music Instruments & Pro Audio

www.presonus.com

ELECTRONIC MUSICIAN CLASSIFIED ADS are the easiest and most economical means of reaching a buyer for your product or service. The classified pages of **EM** supply our readers with a valuable shopping marketplace. We suggest you buy wisely; mail-order consumers have rights, and sellers must comply with the Federal Trade Commission as well as various state laws. EM shall not be liable for the contents of advertisements. For complete information on prices and deadlines, call (800) 544-5530.

ACOUSTIC PRODUCTS

EMPLOYMENT

EQUIPMENT FOR SALE

FURNITURE

MASTERING & PRODUCTION

RECORDS, TAPES, CDS

RECORDING SERVICES

RECORDS, TAPES, CDS

SOFTWARE

The native MOTU studio — more power to you

Mackie HR824mk2

Active studio reference monitors

These high-resolution monitors sound as smooth as they look. The new Zero Edge Baffle™ minimizes diffraction for a crystal clear image and controls sound waves for wide, even dispersion. Acoustic Space, LF roll-off and HF controls let you tailor the sound to suit your MOTU studio space — and your taste.

Mackie Control Universal Pro

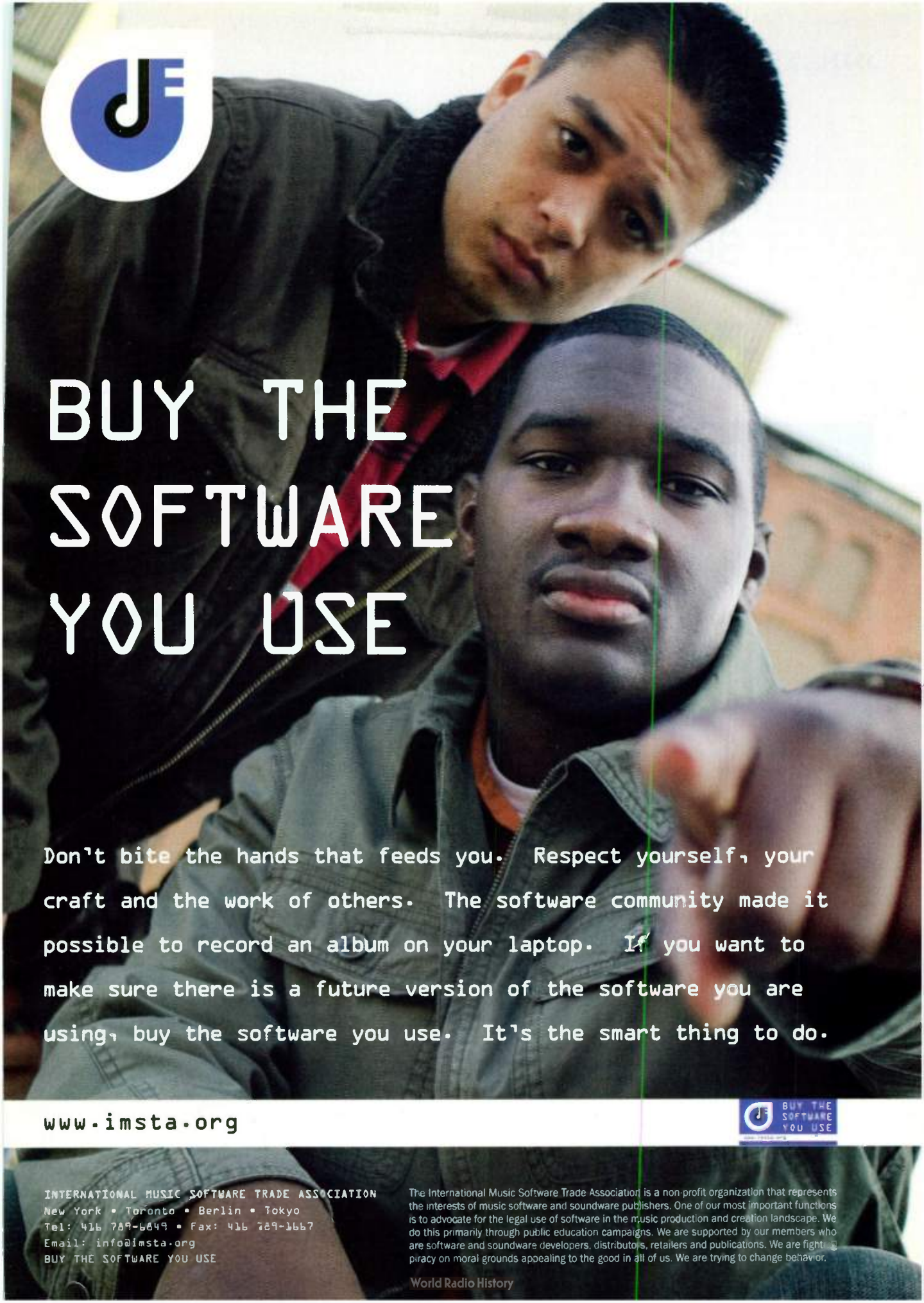
Automated control surface

The ultimate hands-on control for Digital Performer. Nine motorized, touch-sensitive Penny + Giles faders, eight V-Pots and more than 50 master buttons let you tweak to your heart's content. Apply the included custom overlay for Digital Performer for dedicated labeling of DP-specific functions.

Presonus Central Station

Control room monitoring with remote

The missing link between your MOTU recording interface, studio monitors, input sources and the artist. Monitor from among 5 sets of stereo inputs (3 analog and 2 digital) and manage your sessions with hands-on control room features like talkback and listenback.



My Goodness, I Have Been Here 15 Hours

By Nathaniel Kunkel

Why is it that we work longer hours with fewer breaks than we used to five years ago? Computers were supposed to make our jobs easier and quicker, so we had more time to live life. Whether you were working on a spreadsheet or comping a vocal, the computer was intended to provide speed and elegance to your gig.

Cut to 2008. We stare at a screen all day, play music less, and don't even get 20 seconds of rewind time to relax between takes. It seems that we are working even harder than before. The music business looked way cushier in high school, I'll tell you that.

So what the hell happened? It would seem that expectations grew with capability. We expect perfection—right now.

Here's the rub. With music, tools are meant to facilitate, not inspire. They *can* inspire, to be sure, but in my opinion, inspiration for a mix or a song comes from life. Not a new guitar or a new compressor. So while the expectations from content providers are skyrocketing, the time we all have to experience life outside of work is shrinking. Our time to dream is getting the short end of the stick.

Work has become life. The proliferation of live/work loft construction is proof of that.

So when are we supposed to get the good ideas? I myself always have different and fresh ideas about work when I get away from it for a minute or two.

In the short term, survival has required a new skill set for the producer-engineer. We must learn to do our jobs without much experimentation. There is just never any time, it seems. It's a shame, too, because experimenting with new sounds was one of my favorite parts of the gig.

If you're like me and audio is a passion, you experiment in your own time. You have to. But that requires even more of that fleeting commodity. It's time I still find, but with more difficulty every day.

Don't get me wrong; I am happy to be working, and I am blessed with an amazing client base. But I can't help but notice how much less time I spend in front of a person playing an instrument and how much more time I spend editing alone. Perhaps that's a product of the fact that I am mixing more than tracking these days. Or maybe it's a product of the fact that people are tracking less. Either way, these are new music-making processes that are here to stay. Though that is not necessarily a bad thing, I just wonder sometimes if we could get back to the charming imperfection of people playing in a room. I miss that aspect of production.

What does seem clear to me is that when someone does decide to spend the time exploring their craft, they usually make something new and very credible—in every medium. I guess, in the end, it is going to take some real discipline in this blazingly paced world to find the calm to inspire. I should probably meditate more.

That's all I have to say about that. I'm tired, it's 1:35 in the morning, and I have been here for 15 hours. Editing. em

---

Nathaniel Kunkel 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, and comedian Robin Williams.

alphatrack

One Fader To Rule Them All

MIX. EDIT. AUTOMATE. RULE.

Finally, a control surface that fits your desktop and the way you work.

Touch-sensitive 100mm motorized high resolution fader • Touch-sensitive jog and shuttle strip
Touch-sensitive parameter and effects knobs • 32 character backlit LCD
Foot-switch jack • USB interface

See the Online Demo

FRONTIER DESIGN GROUP

www.frontierdesign.com

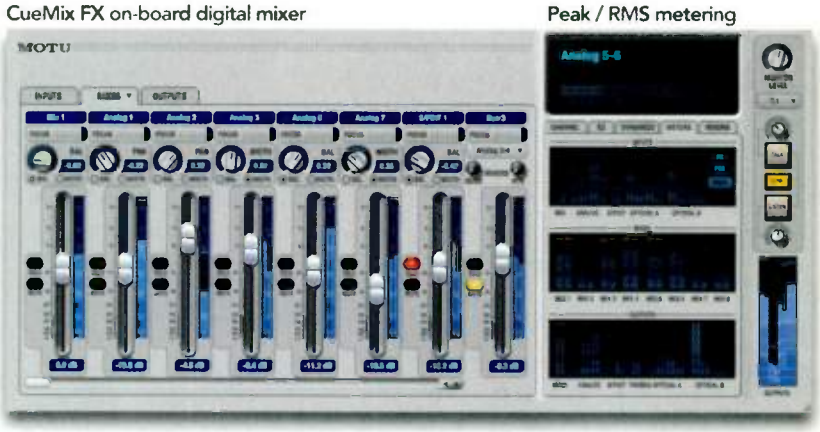
Introducing the

828mk3

FireWire audio interface with on-board effects and mixing

- **Comprehensive audio I/O** — 28 inputs and 30 outputs on balanced TRS analog, ADAT, TOSLink and S/PDIF, with XLR main outs.
- **192 kHz recording** — Supports 44.1, 48, 88.2, 96, 176.4 and 192 kHz sample rates.
- **Digital mixer with effects** — 28 input by 16 bus mixer with on-board DSP effects, including reverb with sends, plus EQ and compression on every input and output.
- **CueMix FX software** — Advanced graphic control for on-board mixing and effects with tabbed design and peak/RMS metering.
- **Vintage compression** — Automatic Gain Control faithfully modeled after the legendary Teletronix® LA-2A® leveling amplifier.
- **British console EQ** — 7-band parametric EQ available on every input/output modeled after legendary British analog consoles.
- **60-second reverb** — Classic reverb with five room types and length up to 60 seconds.
- **Two mic/guitar inputs with pre-amps** — True hi-Z 1/4" guitar input or low-Z XLR mic input with 48V power, pad & precision digital trim.
- **Clip protection** — Hardware limiter for mic & guitar inputs prevents digital clipping from overloaded signals up to +12 dB over zero.
- **Two banks of optical digital I/O** — 16 ch of ADAT lightpipe, 8 ch of SMUX (96 kHz) or stereo TOSLink. Mix and match formats.
- **Stand-alone operation** — Adjust mixing and effects quickly with intuitive LCD menus.
- **MIDI I/O** — Connect MIDI gear directly.
- **Includes drivers for Mac and Windows** — Works with all of your favorite software.

CueMix FX on-board digital mixer



Peak / RMS metering

Reverb

Compressor/Leveler

7-band para EQ

Clip protection

EQ and dynamics on every input and output channel

MOTU
motu.com