ANTON FIG'S PRODUCTION SECRETS • REDUCING STUDIO NOISE

Electronic Musician

www.emusician.com

November 2002

96 kHz

Bridging the Gap

Avoiding the Pitfalls of High-Resolution Digital Audio

Novation K-Station,
Mackie Designs UAD-1,
Korg Triton Studio,
Steinberg WaveLab 4.0,
and 9 more reviews

ATTENTION STEINBERG MOTU & OTHER DAW USERS

STOP MOUSING AROU

Touch-sensitive motorized Penny &

GET SUPERCHARGED WITH UAD-1

A BONUS AD-WITHIN-AN-AD *for our powered plug-in suite and accelerator card. Even the fastest computer bogs down when you try to run multiple instances of complex plug-ins like reverbs. The UAD-1 supercomputing PCI card takes the processing load off your CPU so it can run Cubase, Nuendo, Performer and other programs at maximum speed.*

You get six awesome plug-ins from the modeling wizards at Universal Audio including RealVerb™ Pro (possibly the finest sounding reverb ever), spot-on emulations of classic analog processors like the Teletronix LA-2A™ Leveling Amp, Pultec Filter and 1176™ Limiting Amp and the award-winning Nigel™ Guitar Modeler. Demo the UAD-1 package today or visit www.mackie.com/UAD-1

UAD-1 POWERED PLUG-INS RUN ON WINDOWS® 98, ME, 2000 & XP
Emagic Logic Audio
Steinberg Cubase
Steinberg Nuendo
Steinberg WaveLab
SAW Studio v2.6e and higher
D-Sound RT Player Pro
Ableton Live

UAD-1 POWERED PLUG-INS RUN ON MAC® OS 9x
Steinberg Nuendo
Steinberg Cubase
Emagic Logic Audio
BIAS Peak 2.63 and higher
BIAS Deck
BIAS Vbox
Emagic Waveburner Pro
Spark FX Machine
Ableton Live
AudioDesk

OPTICAL TOUCH FADERS BY Penny+Giles

Until now, million-dollar consoles were the only place you found Penny+Giles® faders. They're the best in the world. And you get their silky-smooth performance when you buy a Mackie Control.

WRH

tools for artists

ND. EXPERIENCE MACKIE CONTROL.

Giles® faders and direct mapping of all major program parameters!

GET IN TOUCH WITH YOUR DAW.

Once you've used a Mackie Control, you'll never screw around with those little on-screen faders again. Mackie Control™ is the only control surface with direct mapping (and customized Lexan overlays) for Steinberg Nuendo, Cubase SX/SL, MOTU Digital Performer, Mackie Soundscape 32, plus other DAWs.

You run every important function of these programs with real buttons, rotary encoders, transport controls and a jog/shuttle wheel. LED and LCD displays show your settings and track titles at a glance. Bank switching lets you control as many channels as your DAW supports. Eight-channel Mackie Extenders let you add more faders to your system as needed. Mackie Control is also the only control surface to feature premium Penny & Giles *touch-sensitive*, motorized 100mm faders that let you make level and automation changes on the fly just by moving a fader.

Lexan overlays for Mackie Control's master section customize your music program's main functions.

Put an end to mouse mania. Check out Mackie Control™ today at your dealer or on our website at www.mackie.com/mackiecontrol

ENHANCES PRODUCTIVITY WITH

MOTU Digital Performer (Mac)
Steinberg Nuendo (Mac & PC)
Steinberg Cubase SX & SL (PC)
Mackie Soundscape 32 (PC)

MAPPING SOON TO

Cakewalk SONAR 2 (PC)
Syntrillium CoolEdit Pro (PC)

log onto www.mackie.com/mackiecontrol for latest software availability — more are coming soon!

1.800.898.3211 • www.mackie.com

MACKIE.

SPARK FX MACHINE

PC • MacOS

Virtual Multi-FX Processor and VST Synth Generator with 21 native Plug-Ins and modular Synth Kit – supports any VST application on Mac or PC.

VST

SPARK XL 2.5

MacOS • OSX

The hi-end Spark with even more features, including Native Audio Restoration, Direct I/O support and Native Bundle (28 Band Graphic EQ, 10 Band Parametric EQ, Reverb, Compressor/DeEsser, Filtrator and Limiter).

VST

NATIVE BUNDLE 3.0 *NEW*

PC • MacOS • OSX

Professional native Plug-In bundle for Mac and PC with 28-Band Mastering Graphic EQ, 10-Band Parametric EQ, Native Reverb PLUS Filtrator Filter Plug-In, Limiter, Compressor/DeEsser incl. SoftSat Vintage Emulation.

VST

ASSIMILATOR *NEW*

PC • MacOS • POWERCORE

The new Assimilator is a truly powerful mixing and mastering tool for POWERCORE: learn the sound of your favourite mix and apply it to your own. Assimilator is even capable of morphing between curve sets.

POWERCORE

The open DSP Platform for Mac and PC. Includes MegaReverb, EQSat, Chorus/Delay, Vintage Compressor/Limiter and PowerCore 01 Synth. Seamless integration with any VST or MAS sequencer.

WALDORF D-CODER

PC • MacOS • POWERCORE

The Vocoding Instrument with classic WALDORF sound. Up to 100 bands of vocoding and 8-voice synth, carrier Plug-In for external input.

MASTER X3

PC • MacOS • POWERCORE

The virtual Finalizer for POWERCORE – 3-Band solution with Expander, Compressor and Limiter per band as well as integrated dithering. Knock-Out Punch for your Mixes and Masters!

POWER

POWERCORE

THE OPEN DSP PLATFORM FOR MAC AND PC

Stop compromising. Unleash pro studio power inside your native recording environment. Run 24/96, multiple reverbs AND compressors AND synthesizers – without maxing out your CPU. **POWERCORE**'s unique design with 4 industry-standard Motorola DSPs plus onboard PowerPC™ provides that power and more.

Fill up your virtual racks with rackmount-quality processors right out of the box: lush TC-quality reverbs, smooth chorus/delay, vintage compression, de-essing, a complete vocal channel, mastering EQ and even a virtual analog Synthesizer.

All inclusive – and no significant hit on the CPU! Need even more power? Add another **POWERCORE**. And as if that's not enough, pick your favourite tools from the growing number of 3rd parties, such as SONY, D-SOUND, WALDORF – and many more to come! **Join the party.**

NEW

CLASSIC VERB

The alternative classic reverb sound – now included with **POWERCORE**!

(available autumn 2002)

MEGA REVERB | EQ SAT | CHORUS DELAY | VOICE STRIP | VINTAGE CL | POWERCORE 01

CHOICE

SONY OXFORD OXF-R3 EQ

The OXF-R3 EQ for POWERCORE now brings the renowned Oxford quality to VST platforms. This is the only EQ you will ever need.

www.sonyplugins.com

WALDORF D-CODER

The Waldorf Vocoding Instrument with up to 100 Bands of Vocoding and integrated 3-voice synthesizer. Distributed by TC Works.

DSOUND VL2

DSound VL2 Multichannel Valve Interface breathes new life into otherwise clinical digital recordings.

www.dsound1.com

MASTER X3

Complete Mastering processor - the virtual Finalizer (TM) for Knock-out Punch. Includes 24/96 processing and dithering.

ASSIMILATOR

Learns complex EQ curves and processes them on target material. Includes Morphing between 2 complex curves.

(from october 2002)

RESTORATION SUITE

Based on all-new technology - DeNoising, DeClicking and DeScratching tools.

(from november 2002)

POWERCORE

PRODUCTION POWER FOR MAC AND PC.

System Requirements: *Mac/PC, POWERCORE, VST/MAS Sequencer.*

www.tcworks.de

INSIDE

FEATURES

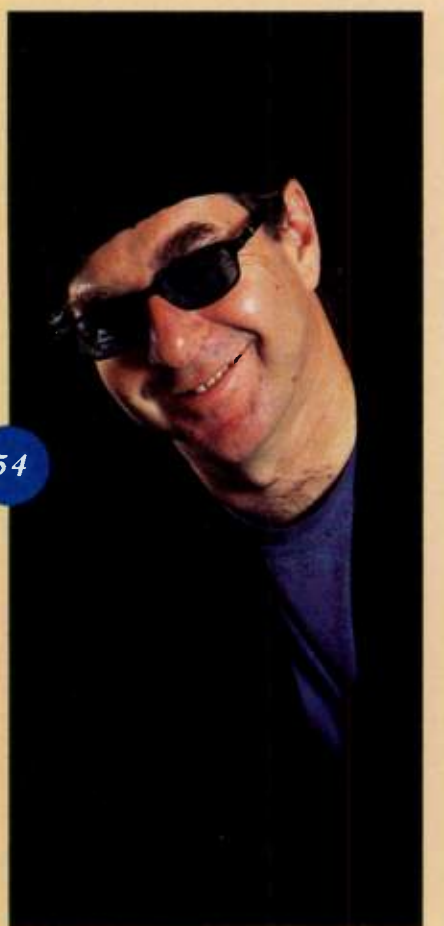
Cover Illustration by David Ball

DEPARTMENTS

***Electronic Musician*®** (ISSN 0884-4720) is published monthly except semimonthly in January at 6400 Hollis St., Suite 12, Emeryville, CA 94608, and is ©2002 by PRIMEDIA Business Magazines & Media Inc., 9800 Metcalf Ave., Overland Park, KS 66212 (www.primediabusiness.com). This is Volume 18, Issue 12, November 2002. One-year (13 issues) subscription is $40, outside of the U.S. it's $75. POSTMASTER: Send address changes to *Electronic Musician*, P.O. Box 1929, Marion, OH 43306. Periodicals postage paid at Shawnee Mission, KS, and additional mailing offices. Canadian GST #129597951. Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 40597023.

Electronic Musician®
NOVEMBER 2002 VOL. 18, NO. 12
www.emusician.com

COLUMNS



REVIEWS

If at First You Don't Succeed


ANTHONY PIDGEON

As the great W. C. Fields put it, "If at first you don't succeed, try, try, and try again. Then give up. There's no use being a damned fool about it." Any creative artist knows that sometimes what seems to be a fine idea just doesn't work out. If you're lucky, while struggling to realize your original idea, you discover another idea that works better. In that case, there is no shame in putting aside the first idea and pursuing the new one. There's no use being a damned fool about it.

This month's cover story, "Bridging the Gap" (see p. 38), is a good example of Fields's point. Initially, author Michael Cooper and I had planned to do a roundup of 96 kHz digital-to-analog converters. We looked at the available DACs designed for audio production, narrowed the field to a manageable number of products, and started accumulating test units.

Before long, though, I started fielding phone calls from a vexed Cooper, who was having a devil of a time coming up with a reliable, low-jitter, multitrack system in which products from different manufacturers interfaced properly, supported a large number of tracks at 24/96, and operated as smoothly and simply as they would in a lower-resolution system. Cooper attempted to get answers from a number of engineers and tech-support folks who worked with high-resolution audio. He found some answers, but many issues remained unresolved.

Eventually, Cooper started questioning whether he could—or should—complete the project as planned. Although he was well aware of new, high-resolution delivery media and understood the advantages of archiving a high-resolution original for future releases, he also knew that most projects are still being mastered for delivery on 16-bit, 44.1 kHz CDs. He wondered whether going to 96 kHz at this time was really worthwhile.

As he continued to test converters and discuss the issues with converter-design engineers, mastering engineers, and others, Cooper learned more about the trials and tribulations of 24-bit, 96 kHz production and how to overcome them. But many issues remained, and conducting meaningful comparative tests of high-resolution DACs was still a formidable challenge.

At last, Cooper called me up and told me that he had learned far more about the issues surrounding migrating to 24/96 than he had about which 24/96 converters performed best. Perhaps, he mused, the problems, solutions, and underlying issues were the real story. After some back and forth discussions to develop the idea, I gave him the green light. The result was "Bridging the Gap," yet another fine Michael Cooper effort.

The studio world is inexorably moving to 24/96, and a roundup of high-resolution DACs is still very much of interest. But it's wise to figure out how to make a high-resolution system work properly before leaping into acquisition mode, and you need to know you're ready to make that leap. Otherwise, you may be setting yourself up for expensive frustration, and there's no use being a damned fool about it.

Electronic Musician
A PRIMEDIA Publication

Editor in Chief
– Steve Oppenheimer, soppenheimer@primediabusiness.com
Managing Editor
– Patricia Hammond, phammond@primediabusiness.com
Associate Editors
– Brian Knave, bknave@primediabusiness.com
– Dennis Miller, emeditorial@primediabusiness.com
– Gino Robair, grobair@primediabusiness.com
– David Rubin, emeditorial@primediabusiness.com
– Geary Yelton, emeditorial@primediabusiness.com
Assistant Editors
– Marty Cutler, mcutler@primediabusiness.com
– Matt Gallagher, mgallagher@primediabusiness.com
Senior Copy Editor
– Anne Smith, asmith@primediabusiness.com
Contributing Editors – Michael Cooper, Mary Cosola, Larry the O, George Petersen, Scott Wilkinson
Web Editor
– Paul Lehrman, plehrman@primediabusiness.com

Group Art Director
– Dmitry Panich, dpanich@primediabusiness.com
Art Director
– Laura Williams, lwilliams@primediabusiness.com
Graphic Artist
– Mike Cruz, mcruz@primediabusiness.com
Informational Graphics – Chuck Dahmer

Vice President – Entertainment Division
– Pete May, pmay@primediabusiness.com
Publisher
– John Pledger, jpledger@primediabusiness.com
Advertising Director
– Joe Perry, jperry@primediabusiness.com
East Coast Advertising Manager
– Jeff Donnenwerth, jdonnenwerth@primediabusiness.com
Northwest/Midwest Advertising Associate
– Stacey Moran, smoran@primediabusiness.com
Southwest Advertising Associate
– Mari Deetz, mdeetz@primediabusiness.com
Sales Assistant
– Larissa Gamarra, lgamarra@primediabusiness.com
Marketing Director
– Christen Pocock, cpocock@primediabusiness.com
Marketing Manager
– Angela Muller Rehm, arehm@primediabusiness.com
Marketing Events Coordinator
– Alison Eigel, aeigel@primediabusiness.com
Classifieds/Marketplace Advertising Director
– Robin Boyce-Trubitt, rboyce@primediabusiness.com
West Coast Classified Sales Associate
– Kevin Blackford, kblackford@primediabusiness.com
East Coast Classified Sales Associate
– Jason Smith, jasmith@primediabusiness.com
Classifieds Managing Coordinator
– Monica Cromarty, mcromarty@primediabusiness.com
Classifieds Assistant
– Heather Choy, hchoy@primediabusiness.com

Vice President – Production
– Thomas Fogarty, tfogarty@primediabusiness.com
Senior Production Manager
– Curtis M. Pordes, cpordes@primediabusiness.com
Group Production Manager
– Melissa Langstaff, mlangstaff@primediabusiness.com
Senior Advertising Production Coordinator
– Julie Gilpin, jgilpin@primediabusiness.com
Vice President – Audience Marketing
– Christine Oldenbrook, coldenbrook@primediabusiness.com
Group Audience Marketing Director
– Philip Semler, psemler@primediabusiness.com
Audience Marketing Manager
– Austin Malcomb, amalcomb@primediabusiness.com
Audience Fulfillment Coordinator
– Jef Linson, jlinson@primediabusiness.com

Human Resources/Office Manager
– Julie Nave-Taylor, jnave-taylor@primediabusiness.com
Receptionist/Office Coordinator
– Lara Duchnick, lduchnick@primediabusiness.com

This changes everything.

kantos 1.0

AUDIO CONTROLLED SYNTHESIZER

From the company that revolutionized vocal intonation processing comes kantos 1.0, a software-based synthesizer that finally liberates you from the tyranny of MIDI, keyboards, controllers or, in fact, anything that stands between you and the music you hear in your mind.

kantos 1.0 is controlled by audio. Any pitched monophonic audio.* Like your voice. Or a musical instrument. Live, in real time. kantos 1.0 analyzes incoming audio and instantaneously extracts pitch, dynamics, harmonic content and formant characteristics. This information is then used to control the kantos 1.0 sound engine. In ways never before possible with a conventional MIDI synth.

To learn more about kantos 1.0, visit our website at www.antarestech.com for audio demos, guided tours and more. Whether you are looking for an alternative to traditional controllers, or are looking to produce electronic music with a level of sonic innovation and dynamic expression that's simply not otherwise possible, kantos 1.0 will, quite literally, change the way you make music.

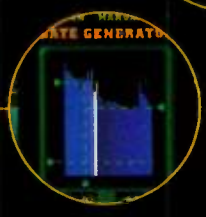
*Actually, kantos 1.0 can also respond to unpitched or polyphonic input. While the output isn't always predictable, it's rarely less than interesting. And particularly with rhythmic input, you can get extremely dynamic (and sometimes downright surprising) results.

TIMBRAL ARTICULATOR

The heart of kantos 1.0. The articulator takes the harmonic and formant information from the input signal and dynamically applies it to the synthesized signal. It can reproduce the input's characteristics with uncanny accuracy or warp them into a universe of mutant forms.

WAVETABLE OSCILLATORS

Each wavetable oscillator includes its own independent multimode resonant filter and chorus generator. Additional wavetables will be available from our website. Or create your own with pretty much any sample editor.



GATE GENERATOR

The Gate Generator gives you control over the triggering and duration of the envelopes as well as retriggering the oscillators' wavetables. Also included is a variable-threshold noise gate to help clean up any annoying background noise in the control audio.

KANTOS 1.0 WILL INITIALLY BE AVAILABLE IN MAS, RTAS (MAC) AND VST (MAC) FORMATS, WITH DIRECTX FOLLOWING NOT TOO FAR BEHIND. CHECK OUR WEBSITE FOR DETAILS.

ANTARES

WHERE THE FUTURE'S STILL WHAT IT USED TO BE

1.0 ANTARES AUDIO TECHNOLOGIES 231 Technology Circle, Scotts Valley, CA 95066 USA
voice: 831 461 7800 | info@antarestech.com | www.antarestech.com

PRIMEDIA
Business Magazines & Media

Chief Executive Officer
– Timothy M. Andrews, tandrews@primediabusiness.com
President
– Ronald Wall, rwall@primediabusiness.com
Chief Operating Officer
– Jack Condon, jcondon@primediabusiness.com
Sr. Vice President – Business Development
– Eric Jacobson, ejacobson@primediabusiness.com
Vice President – Content Licensing & Development
– Andrew Elston, aelston@primediabusiness.com
Vice President – Corporate Communications/Marketing
– Karen Garrison, kgarrison@primediabusiness.com
Sr. Vice President – Finance
– Tom Flynn, tflynn@primediabusiness.com
Interim Vice President – Human Resources
– Kurt Nelson, knelson@primediabusiness.com
Vice President – New Media
– Andy Feldman, afeldman@primediabusiness.com
Vice President – Technology
– Cindi Reding, creding@primediabusiness.com

PRIMEDIA Business-to-Business Group
– 745 Fifth Ave., New York, NY 10151
Interim President & Chief Executive Officer
–Charles McCurdy, cmccurdy@primedia.com
Chief Creative Officer
– Craig Reiss, creiss@primedia.com
Creative Director
– Alan Alpanian, aalpanian@primediabusiness.com

PRIMEDIA Inc.
Chairman & Chief Executive Officer
– Tom Rogers, trogers@primedia.com
Vice Chairman & General Counsel
– Beverly C. Chell, bchell@primedia.com
President
– Charles McCurdy, cmccurdy@primedia.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. Call toll-free (800) 245-2737 or (740) 382-3322, or write to P.O. Box 1929, Marion, OH 43306.

REPRINTS: Contact Wright's Reprints to purchase quality custom reprints or e-prints of articles appearing in this publication at (877) 652-5295 ((281) 419-5725 outside the U.S. and Canada). Instant reprints and permissions may be purchased directly from our Web site; look for the iCopyright tag appended to the end of each article.

BACK ISSUES: Back issues are available for $10 each by calling (913) 967-1710. Current and back issues and additional resources, including subscription request forms, are available at www.emusician.com.

LIST RENTAL: Please direct all inquiries to Marie Briganti at primedia@statistics.com.

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 ProQuest at (800) 521-0600 or (734) 761-4700, or search the Serials in Microform listings at www.proquest.com.

PRIVACY POLICY: Your privacy is a priority to us. For a detailed policy statement about privacy and information dissemination practices related to Primedia Business Magazines & Media products, please visit our Web site at primediabusiness.com.

CORPORATE OFFICE: PRIMEDIA Business Magazines & Media Inc., 9800 Metcalf, Overland Park, KS 66212 — (913) 341-1300 — primediabusiness.com

ABM
BPA

Printed in the USA.

Also publishers of *Mix®*, *Onstage®*, *Remix™*, *Desktop Music Production Guide®*, *Personal Studio Buyer's Guide®*, and *Digital Home Keyboard Guide™*.

MEET MUSIC'S HOTTEST NEW PRODUCER

Whether you're creating a simple demo disk or full-blown CD project, Yamaha's new AW16G digital audio workstation makes studio-quality recording easier and more affordable than ever. Check out all you get for only $1,299*:

- 16-Track recorder
- Record up to 8 tracks at a time
- 20GB Hard drive
- 24-Bit A/D and D/A conversion
- No data compression
- 2 Stereo digital effect processors
- 4-Band fully parametric EQ and dynamics on all inputs
- Mastering tools
- Integral CD-RW drive
- Guitar effects with amp simulation
- MIDI remote capabilities
- Cakewalk® Sonar™ 2.0 test drive software
- Data compatibility with AW4416 and AW2816 workstations
- Quick loop sampler
- Import/export .wav files

You've got to work with this guy! Once again, Yamaha gives you more for less.

YAMAHA

CREATING 'KANDO' TOGETHER

MAE LARDBIS

JUST THE FACTS

I just wanted to point out a couple of inaccuracies and omissions in your September 2002 cover story, "Groove Shopping."

First, Cakewalk's Sonar XL digital audio sequencer includes the DR-008 DXi Drum Sampler, developed by Fxpansion Audio. The article text (on p. 70) and Fig. 5 caption (on p. 66) mistakenly refer to it as the Fxpansion Session Drummer. In fact, the Session Drummer is a separate tool created by Cakewalk, which is also included in Sonar and Sonar XL; the Session Drummer uses MIDI drum patterns created by Vamtech Enterprises.

Also, while the article went into detail about REX files, it completely omitted any reference to the widely used Acid file format, which has always supported stereo and provides arguably better time stretching. You can also create your own Acid loops in products like Sonar without a separate editor. I think a discussion of both Acid and REX file formats in this article would have been appropriate.

Chris Rice
Cakewalk
via e-mail

THE GIG IS UP

Thanks so much for the Quick Pick review of my ArtistPro.com, LLC, book, *Studio-in-a-Box* (September 2002). I appreciate the review's thoroughness and thoughtful observations.

However, I would like to point out one oversight. [Review author] Howard Jonathan Fredrics criticizes the book for omitting Tascam's GigaStudio and GigaSampler products from the chapter on software samplers. The reason I didn't include them is because they currently do not function as virtual plug-in instruments, so there is no way to insert them into your digital audio sequencer's virtual mixer by way of a software extension such as Digidesign's DirectConnect or Propellerhead's ReWire. As a result, many studios dedicate an entire computer to running a Giga product, making it look more like a standalone hardware sound module than a true virtual instrument.

Tascam tells me that due to popular demand, a software extension for plugging their Giga products directly in to your digital audio sequencer (running on the same computer) will be implemented very soon. When this happens, I'll be sure to post a note about it on my Web site (www.erikhawkins.com) and mention the Giga software in the next revision of my book.

Erik Hawkins
via e-mail

PHANTOM EXTENSION

In the Master Class article "High-Powered Performer" (September 2002), author Rob Shrock offers a tip about using an extension from MOTU that he found on the Internet called OMS Emulator. Where can I download it?

Gerald Fercho
via e-mail

Gerald—OMS Emulator is no longer officially supported by MOTU, although according to a company spokesperson, it works fine with the current version of FreeMIDI. You can get OMS Emulator as a free download from several sites on the Internet. One of the best places is the DP Club's Web site at Berklee College of Music (www.orangewaves.com/omsemu.html). There you'll find a detailed description of OMS Emulator: what it does, how it works, and how to use it.—David Rubin

BETTER LUCK THIS TIME

I was surprised at your answer to Todd McKinney's letter ("Letters: No Such Luck," September 2002) in which he asked about processing cards that have built-in processing for Cakewalk's Sonar, such as the Mackie UAD-1 and TC Works TC PowerCore. I use the UAD-1 with Fxpansion's VST-DX Adapter and have experienced no problems. This allows me to use the UAD-1 with other VST plug-ins as well as with Sonar XL or any DirectX or DX program. It also allows me to use VST software synths. It's a great wrapper and has worked with any plug-in that I've tried. You can download a fully functioning demo version of VST-DX Adapter for free and also purchase it for $60 at www.fxpansion.com.

Danny Lovett
The Loft Audio Recording
Frolick'n Music
via e-mail

POWER TO THE PEOPLE

Larry the O makes some good points in his August essay on why so few musicians make a living at music ("Final Mix: You Bet Your Bottom Dollar," August 2002). We'd all like to believe talent is the key ingredient in success, but it just isn't so.

His mistake is assuming that solving the problem is up to us as individuals.

Dave Nicholson – Developer, Cubase SX – The Mixer

Cubase • SX

"See your mix differently."

"For a perfect mix you need the right mixer, with an ergonomic interface, flexible routing, and the best sound quality. Cubase SX has a brand new, freely configurable mixer that is fully automated and lets you mix in surround sound ready for DVD."

"Not just a work of art but art at work."

Find out more about Cubase SX and its new mixer at:
www.steinberg.net • US 818.678.5100 • Canada 416.789.7100

steinberg
Creativity First

That's what corporate America wants you to think. We can accomplish a lot more by banding together.

For instance, local musicians would do better financially if they could get more exposure. The airwaves are a publicly owned resource, licensed (rented) to broadcasters by the government. So why is local music all but unheard on local radio? Because the FCC has knuckled under to the Great God Profit, that's why. The idea that radio stations should be operated in a way that benefits their local community isn't even on the table.

Because we have precious little chance of altering the deregulation mind-set in Washington, why not act locally? Why not boycott local stations that don't put local musicians in regular rotation? Stir up a ruckus!

Here's another idea: why not tax all chain-store CD sales? Slap a $1 surcharge on every CD sold in your community, and use the extra money to fund public music and art programs—free rock concerts in the park, the high school orchestra, you name it. Don't funnel the money through the state capital, and don't use it to hire out-of-town celebrity bands who suck your wallets dry and then sashay off into the sunset. Demand that concert promoters use local opening acts with their big tours, and boycott the concerts that don't. Educate your community about why supporting local music is important. Act locally.

You may say I'm a dreamer, but I'm not the only one.

Jim Aikin
Livermore, CA

IDEAS TO KICK AROUND

The article on techniques for recording bass drums ("Recording Musician: Get Your Kicks," July 2002) mentions phase problems when recording a kick drum with two mics (one inside the kick drum and one outside a few feet away). Because the outside mic is positioned farther away, the signal that it picks up will slightly lag behind the inside mic's. The article suggests using the mixing console's phase-reverse switch, which might correct a few frequencies while ruining others. In the world of the digital audio workstation (DAW), you can correct this type of phase problem more effectively by slipping one track earlier or later in relation to the other. By slipping the outside mic's track slightly earlier in relation to the inside mic track, the phase is correctly restored. In the track view of your DAW, zoom in close to see the big waves and line them up visually. Listen carefully to the results.

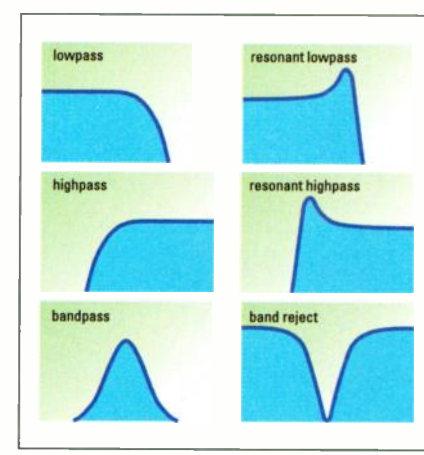
You could also use a digital delay on the inside mic. The only problem with this approach is that most digital delays offer a resolution of only 1 ms, which doesn't allow you to get a small enough delay to correct the phase. If you had a box that could create a small enough delay, you could correct the phase prior to recording and merge those two mic signals into one track.

Jon Stubbs
Lafayette, CO

ERROR LOG

October 2002, "Field of Dreams," p. 64: In the Contact Sheet sidebar, the listing for Event Electronics (tel. 805-566-7777; e-mail info@event1.com; Web www.event1.com or www.eventelectronics.com) erroneously lists 4Front Technologies as the distributor of Event Electronics products and gave 4Front's phone number. In fact, Event distributes its own products. 4Front Technologies develops digital audio software for various UNIX platforms.

October 2002, "Square One: Synth Programming 101," p. 100: Due to a printing error, the Fig. 2 graphic is a truncated version of Fig. 1. Here is the correct Fig. 2 graphic.



WE WELCOME YOUR FEEDBACK. *Address correspondence and e-mail to "Letters," Electronic Musician, 6400 Hollis Street, Suite 12, Emeryville, CA, 94608 or emeditorial@primediabusiness.com. Published letters may be edited for space and clarity.*

emagic

logic series

Music Production Software

Faster

Logic Platinum for Mac OS X is here. Already installed in thousands of studios, Logic Platinum is the first professional music production software for a next generation operating system. Users around the world are reacting enthusiastically to the outstanding performance, exemplary stability, ultra-precise timing and extremely low latency of Logic Platinum for OS X. Not only this, but OS X drivers for Emagic's USB hardware products are available as well, making the switch to OS X even easier. Get hold of Logic Platinum OS X and experience the very latest in music production technology. More information from specialist Emagic dealers or direct from Emagic.

Technology with soul.

www.emagic.de

FRONT PANEL

Download of the Month

By Len Sasso

Downloadable soft synths are popping up everywhere, but Crystal (Mac/Win)—a freeware VSTi from Green Oak (www.greenoak.com)—has several unique features that set it apart. A quick look at its user interface will tell you that Crystal is no ordinary synth. Its control panel is organized into five pages: one page for each of Crystal's three sound generators (referred to as Voices, but not to be confused with voices in the sense of polyphony), one page for its highly flexible modulation matrix, and one page for effects and output mixing. The features on those last two pages are what make Crystal unique.

Crystal's sound generators run on a single oscillator with five waveforms, including noise and a saw-pulse mix. An optional second oscillator can be switched on for frequency modulation. The oscillator section is followed by a 24 dB-per-octave lowpass filter. Both the filter and the output amplifier have nine-stage break-point envelopes, and in the case of the filter, you can set the low and high end of the envelope's range. The envelopes can also be looped to create a kind of draw-your-own LFO.

The Modulation Matrix lets you route six LFOs, two additional nine-stage envelopes, and a variety of MIDI messages to almost any Crystal parameter. The LFOs and envelopes can be synced to the host's tempo. With that much syncable modulation, Crystal is capable of a lot of motion, as many of the factory patches illustrate.

The output section consists of four feedback-delay lines with tempo-syncable delay times. What makes it unique is the complex routing available. First, a mix of the three Voices is fed into a 4-band crossover. Next, there's a separate send from each voice and each crossover band into each delay line. In short, you can devote each of the delays to a custom mix of voices and crossover frequency bands.

Hearing is believing: the MP3 file "Crystal" is made of five Crystal tracks with no other effects or sounds. While you're visiting Green Oak's Web site, check out the company's free effects plug-ins. Delayifier is especially interesting.

em links

TIPS

Cool Tip of the Month

Getting the most from EQ often means learning to coordinate your ears and eyes with the math centers of your brain.

Getting Started with EQ Plug-Ins

The **EM** *Cool Tip of the Month is presented courtesy of Cool Breeze Systems.*

You recently bought a new DAW and laid down a few tracks, and now you're ready to bang out a mix. But when you solo the kick, snare, toms, hi-hat, overheads, and bass, they just don't pack the punch you had hoped for. EQ to the rescue!

Equalizers can be a powerful tool for shaping the tone of your mix, but when you grab a knob for the first time, they can be a little confusing. Here's a tip for getting started on your tone-shaping adventures. I'll be using Pro Tools in this example, though the general concepts apply to most DAWs, including Cubase, Digital Performer, Logic Audio, and Sonar.

1. With a multitrack Session open, click the Solo button on the track you'd like to equalize first.

2. Select a region (maybe a four- or eight-bar phase) and choose the Loop Playback option from the Pro Tools Operations menu. Make sure that the Link Selection button is enabled.

3. Insert a multiband EQ on the track you'd like to equalize. In most cases, EQs are inserted in-line on the channel that the audio file is playing back through.

Band on the Web

By Gino Robair

One of the ways a band can maximize the time a visitor stays at its site is to create something more than just a place to hawk merchandise. Such a site belongs to the band superjuice (www.superjuice.net), composed of Andy DiSimone (vocals, guitar, keyboards), Rick Heins (guitar, vocals), Bob Troia (bass, vocals, keyboards), and Pete Gilbert (drums, vocals).

Superjuice's four-song EP, *Last Against the Wall*, features intelligent pop lyrics married to intricate yet driving orchestrations. "Humble State" and "Listen," for example, are reminiscent of the post-Squeeze work of songwriters Chris Difford and Glenn Tilbrook. "Need It Now" features processed drums and vocals for a more contemporary electronic feel, and "Shine" has a catchy, anthemic, wall-of-sound quality.

Superjuice's Flash-based pages are clean and well organized, and they graphically tie in to the band's CD. The front page includes transport controls (so you can hear the band's music right away from a streaming player), a link for purchasing the CD, and a window that displays the latest news and schedule of appearances. If a visitor wants to dig deeper, the five main links—Bio, Music, Journal, Forum, and Contact—are easy to locate.

"I did the design and programming by myself," says Troia, "but the entire band had input regarding site structure, functionality, colors, and look and feel. We went through three design iterations, and the site took about one and a half months to build from start to finish." In addition, members of the band contributed the photos, which are placed behind the text and help give the site a relaxed feel.

The main purpose of a Web site is to get the word out about gigs and releases. "We've done a lot of online promotion to drive traffic to the site and build awareness of the band," says Troia. "We've used online guerrilla marketing tactics, such as posting giveaways on music-related message boards. We've also worked on optimizing our search-engine rankings and getting listed or featured on the popular independent music Web sites. Additionally, we have built up a large mailing list, and we put out regular newsletters—in both HTML and plain text—to keep fans up-to-date."

Hey Changes

By Marty Cutler

Apple Computer (www.apple.com) has introduced a new iPod series. The 20 GB model ($499) can hold a maximum of 4,000 songs. Windows users can now purchase the unit and receive MusicMatch Jukebox software, which allows them to manually transfer individual songs or to do batch transfers of entire playlists. It's also possible for Windows users to use Apple's Auto-sync technology to update iPod playlists . . . For $229, registered owners of Emagic EXS-series samplers, Steinberg HALion, or Tascam Giga-series samplers will be able to crossgrade to Kontakt, a software sampler from **Native Instruments** (www.native-instruments.com) . . . **Delaydots.com** (www.delaydots.com) has changed the name of its Spektral plug-ins pack to Spectral to avoid confusion with Native Instruments' Spektral Delay . . . **Shure Incorporated** (www.shure.com) has created a Global Support Services division to centralize and enhance end-user support . . . **TC Electronic** (www.tcelectronic.com) announced distributorship of products from Lab.Gruppen AB. The Swedish company is best known for its line of amplifiers . . . **Tascam** (www.tascam.com) has announced a version 2.0 upgrade for its 788 portable digital studios that supports import and export of WAV files, higher-capacity hard drives, and the ability to burn multiple CDs from a single disk image. There is no charge for the upgrade to those who purchased their personal digital studios after January 17, 2002; owners of units acquired before that date can purchase the upgrade for $29.99. To upgrade units with software versions 1.06 or earlier, users will be required to make a refundable deposit of $25 for an EPROM swap . . . **Ilio Entertainments** (www.ilio.com) is the distributor for Vienna Symphonic Libraries. The library gathers a massive collection of orchestral instrument samples; updates and additions will be provided on an ongoing basis.

TIPS

4. Set your monitors to a conservative level and press the Spacebar to begin playing a loop of your selection.

(When you first begin using equalization, one goal should be to develop your ears so that you can relate numerical values [frequency in hertz] to what you are hearing. To help train your ears, try sweeping through the frequency spectrum while exaggerating the gain of specific bands.)

5. In the EQ plug-in window, increase the gain of a midband Peak (parametric) EQ to, say, +8 dB. Be careful to set monitor levels so that you don't clip the signal or damage your gear or your ears. Adjust the Q (bandwidth) to a medium setting.

6. Sweep the frequency selection from the low to high settings. Notice how the tonal quality changes and what frequencies bring out the boom, ring, mud, snap, and sizzle in the track.

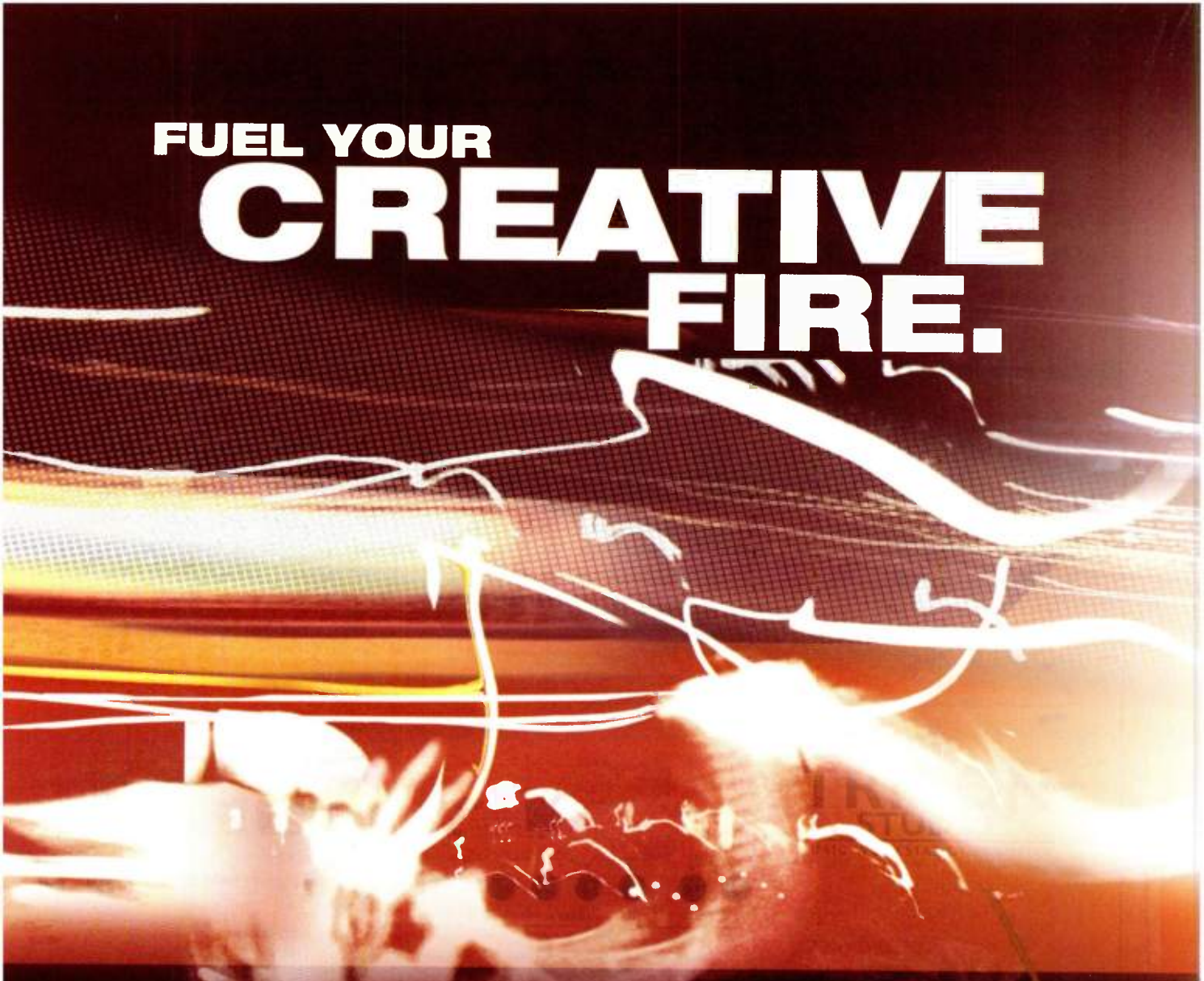
This little exercise should help you identify the track's tonal qualities and give you a picture of which frequencies to boost or cut to achieve the desired sound.

—Steve Albanese

Make sure to check out the CoolSchoolOnline library streaming movie of this tip to view this procedure and additional automation options.

Visit www.emusician.com/cooltip for this online adventure. Also, if you dare, take the quiz to review what you've learned!

For more EM Cool Tips, visit our Web site at www.emusician.com.



TRITON STUDIO has evolved from its rich TRITON legacy of world-class sounds, intuitive ease-of-use and towering musicality into the new workstation standard. In fact, it's the first workstation to take you from musical idea to finished CD.

From its stunning, new, stereo concert grand piano to its many new powerful Programs and Combinations, the TRITON STUDIO is sure to fire your creativity. And with room for up to seven PCM expansion boards, a DSP modeling synth and thousands of new sounds, you'll never run out of inspiration.

The TRITON STUDIO's all new Open Sampling System opens a world of possibilities. In-Track Sampling lets you sample directly into the sequencer, so you can add live instruments and vocals to your songs. Resampling enables you to create custom loops and remixed sounds. It can also extend the TRITON STUDIO's generous 120-note polyphony and eight simultaneous effects.

Add the internal CD-RW drive and you can burn audio CDs, import samples, save data and rip digital audio. With a built-in 5GB hard drive and SP/DIF digital I/O (ADAT® & mLAN® I/O optional) the TRITON STUDIO can function as the centerpiece of your growing digital studio.

No other keyboard brings so many elements together into a fully integrated musical instrument and music production tool. The new TRITON STUDIO — fuel for your creative fire.

TRITON STUDIO

SOUND: HI synthesis system, 48 Mbyte ROM including new stereo piano, up to 120 note polyphony, room for 1,792 Programs and 1,536 Combinations

EFFECTS: Stereo digital multi-effects system including 5 Insert effects, 2 Master effects plus 3-band EQ, 102 effects algorithms

FUNCTIONALITY: 61, 76 and 88-key versions, synthesis, sampling, sequencing, TouchView display, digital I/O, 5 Gbyte internal hard disk, dual arpeggiators, realtime controls, SCSI interface, 6 outputs

EXPANDABILITY: 7 PCM expansion slots (112 Mbytes), plus optional MOSS DSP synthesis engine, up to 96 Mbytes of sample RAM, ADAT® and mLAN® digital interfaces, internal CD-RW drive for data back-up, digital audio ripping and audio CD burning

TRITON Le | TRITON | TRITON STUDIO | KORG

SPONTANEOUS COMBUSTION

TRITON Le

The TRITON Le is packed with the powerful tools and cutting-edge technology you need to set your creative vision on fire. It takes the essential features of its namesake and distills them into one lean, mean, streamlined music workstation. Packed with exciting new sounds as well as TRITON classics, the TRITON Le delivers the award-winning sound that has made Korg a mainstay in studios and on stages the world over. A comprehensive 16-track sequencer, dual polyphonic arpeggiators, SmartMedia storage plus a powerful sampling option combine to deliver an explosive musical performance at a remarkably affordable price.

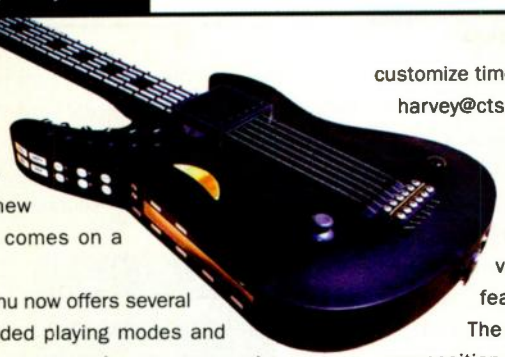
NEW TRITON Le 88!

The TRITON Le is now available with Korg's top of the line 88-note graded-hammer action (RH2). To complement this action, the TRITON Le 88 also features our new 16MB stereo Concert Grand Piano sample set. Visit www.korg.com for more info.

TRITON Le | TRITON | TRITON STUDIO | KORG

Rev Up

By Marty Cutler



Starr Labs

The Z6SP+ upgrade ($300) for Harvey Starr's MIDI guitar Controllers provides user-interface enhancements and new MIDI features. The upgrade comes on a user-installable EPROM.

The expanded Sensors menu now offers several screens to accommodate added playing modes and options, including screens for programming response settings. Sensor responses can include the alteration of chord voicings or preset scales based on Velocity. You can also apply Velocity to alter small sequences, and you can loop MIDI events generated from Sensors.

The new software offers 32 programmable fingerboard zones, and each zone can have its own Trigger mode. For example, you can set up zones that respond only to strums and others that activate only with tapping; you can overlap zones to perform both functions. Each zone can have its own response curve.

The unit's Poly-Trigger mode now allows you to fret keys after strumming to provide polyphonic hammer-on capabilities. Every fingerboard key can have a unique note and MIDI channel assignment.

The upgrade offers two sequencer types: one with eight-note, fixed-length buffers and one for patterns with variable lengths. The new Clocks menu lets you set sequence tempo; the 32-beat metronome offers multiple accents so you can customize time signatures. Starr Labs; tel. (619) 233-6715; e-mail harvey@cts.com; Web www.starrlabs.com.

Mil Productions

Version 3.0 of Modularing standalone synthesis and sequencing software (Mac, $320; upgrade from version 2.0, $220) brings new modules and improved features. Modularing ships on a USB Flash drive.

The SEQ Tracker is a new pattern-based sequencer for composition and live performance. It features eight locators for jumping to sequence areas during live performance. You can use locators to structure nested loops.

Samplesonic is a stereo, polyphonic sample-playback synth module that loads AIFF or WAV files. It offers two internal effects, a resonant lowpass filter, three envelope generators, and pitch shifting. All parameters support MIDI Control Change messages for tweaking on the fly.

AudioMixer is a virtual mixing-console module for recording Modularing's output to disk. The mixer supports Sound Manager, DirectConnect, and ASIO.

Improvements include four-bus ASIO routing; a more efficient audio engine; a MIDI In LED; and a VST plug-in that supports MIDIShare for interapplication synchronization. Modularing 3.0 also adds Net controller, which lets you sync other Macintosh computers over a LAN. The software requires a PPC G3/300 MHz with 8 MB of free RAM per module, MIDIShare Control Panel 1.86, and Mac OS 8.6. Mil Productions; tel. 33-474-025-195; e-mail support@milprod.com; Web www.milprod.com.

TIPS

Double Your Energy

Having problems getting an important track to cut through the mix? If adding EQ and extra makeup gain from the compressor doesn't give you enough of what you want to hear, doubling can be helpful. When you think of doubling, you probably think of doubling the lead vocal to get a fuller, richer sound; slight pitch variations often make for an enticing chorus effect. But I'm referring to a much easier form of doubling: copying the original track to another track.

I use doubling most often on bass and vocals. By doubling the signal's energy, you can get more gain without maxing out the mixer's headroom. Be sure to double the track before processing the signal. After doubling the track, try to put the two identical tracks on adjacent faders so that it's easier to bring up both faders together. You'll notice that the doubled instrument or vocal will be much more audible in the mix, even with the two faders considerably lower than the lone fader was prior to doubling.

Doubling often works so well that you can use less EQ and compression than you initially dialed in. In fact, I typically process only one of the tracks. Keeping the second track unprocessed helps maintain a more natural sound, but having two identical tracks also grants more creative processing options. For instance, try compressing two identical bass tracks with different types of compressors—one opto and one VCA-based—or use a plate on one vocal track and a flanger on the other. You'll have all the gain that you need, with precious headroom to spare.

—*Brian Knave*

For more EM Cool Tips, visit our Web site at www.emusician.com.

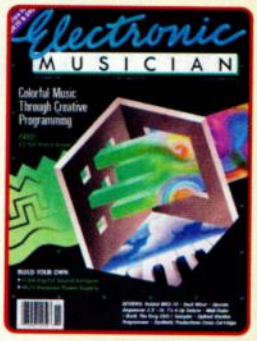
15 Years Ago in EM

By Steve Oppenheimer

Our main cover line for the November 1987 issue summed it up well: "Colorful music through creative programming." Craig Anderton kicked things off with a three-part special on programming analog synthesizers. In section 1, he analyzed the basic parts of a typical analog synth. Section 2, "Shopping for a Synth," suggested 16 less-than-obvious features to look for, including many we take for granted today: multitimbral operation, MIDI Volume (CC 7) support, and onboard effects. To that, Anderton added a dozen tips for customizing factory and third-party patches. Kevin Stratton then forged into digital territory with a tutorial on programming the DX7II FM synth.

To top it off, Anderton threw in a convenient patch sheet for the ever-popular Casio CZ-101 digital synth. (Patch sheets were charts that allowed synthesists to manually record parameter settings.) I've provided a copy of our CZ-101 patch sheet on our Web site at www.emusician.com.

David Kempton then shifted the focus to sampling with an article on sampling-rate selection for the Akai S900 sampler. He said, for instance, that sampling the lowest G on the keyboard (G1 = 49 Hz) at 48 kHz is a waste of sample memory, because you won't hear the highest harmonics. The S900 offered a staggering 4,000 sample rates, but instead of listing rates, the sampler listed the associated bandwidths. Kempton supplied a table showing the frequency of each note from A0 to C8, its MIDI note number, suggested sampling rates, and the bandwidth and number of reproduced harmonics associated with each sampling rate. The table is still handy, so I've supplied it on our Web site.



Walter Daniel contributed a story on how to efficiently sample periodic but time-varying sounds (such as sounds processed through a Leslie or phase-shifter.) Because those sounds continually change, capturing their full impact in a looped sample is difficult, especially before the advent of products such as Tascam GigaStudio, which lets you use samples so large that you don't need to make short loops of time-varying sounds.

Before Standard MIDI Files, you were stuck if you wanted to use e-mail to send music notation to someone with a different notation program. Leigh Ann Hussey's "Music Notation in ASCII" provided a system for representing basic music notation as ASCII (essentially, characters that could be entered from a computer keyboard). Today, that's not needed, but in 1987, it was a clever idea.

Thomas Henry gave us a particularly useful DIY project: a bipolar DC power supply that could deliver a wide variety of voltages up to ±15 VDC—good enough to power most DC-powered musical devices. (I'm almost tempted to build one.) Our other November DIY, Howard Cano's "Build SAM: A Simple Sound Sampler," is outdated now. Even then, it was not a project for the fainthearted.

Our review section included only a few memorable products. The best known was probably the Roland MKS-70, a hybrid synth that combined digital oscillators and control with analog circuitry. It got a thumbs-up from reviewer Craig Anderton. Geary Yelton (now an **EM** associate editor) reviewed Opcode's powerful MIDIMac Sequencer 2.5, a forerunner of the much-lamented Vision. Tim Tully took a gander at Seck's 1882 mixing console, while Anderton praised Hill Audio's ultraclean, 16-channel, rackmount Multimix mixer.

TIPS

Facts of Live Mode

If you own either a Kurzweil K2500 with a recent operating system or a K2600 and you haven't yet spent much time with Live Mode, you're in for a treat. Live Mode lets you process any real-time analog or digital audio signal the same way you would process a sample loaded into the Kurzweil's sample RAM.

To use Live Mode, go to the Sample Page and set Mode to LiveIn. Then select Analog or Digital in the Input parameter (don't forget to choose a sampling rate if you pick Analog). Now pick a Program to process your sound, access the Program's Keymap page, and assign Keymap 197 (LiveL), 198 (LiveR), or both if you have a stereo Program.

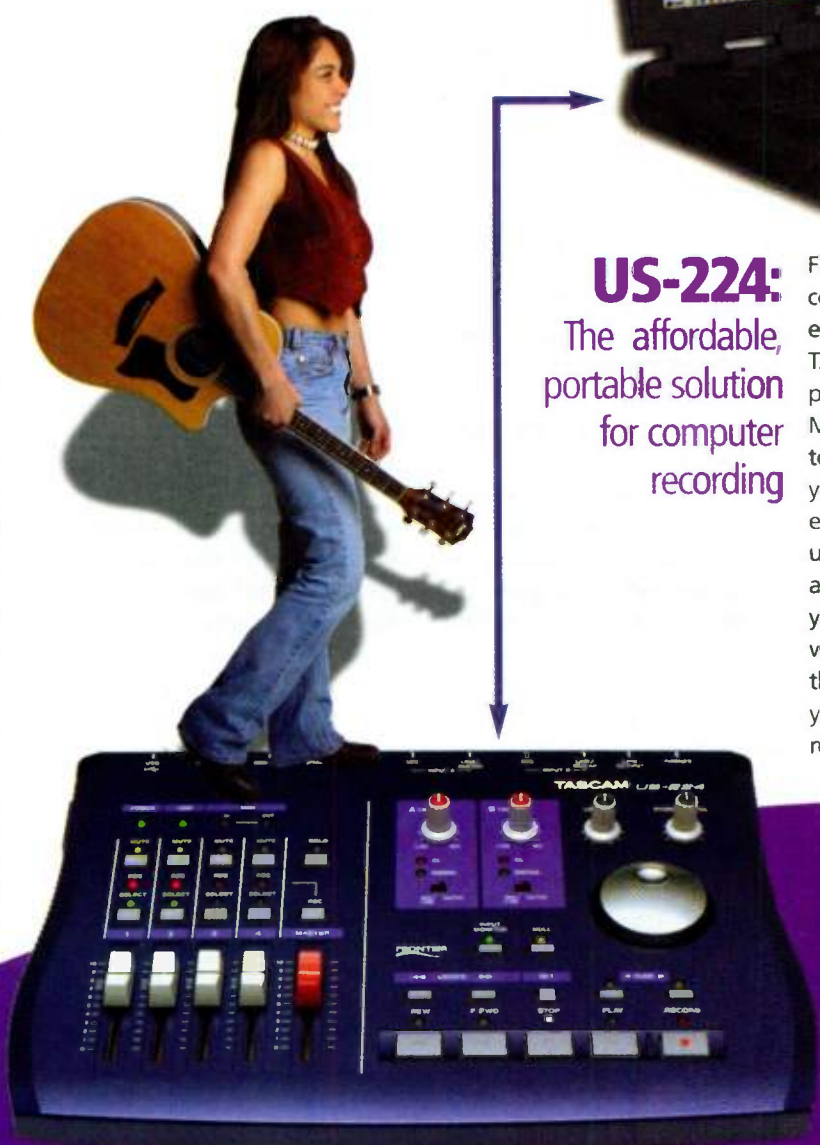
Then play a note on your MIDI controller or send a note from your sequencer to the Kurzweil. As long as that note is on, the processing used by the Program's algorithm will treat any audio received at the Kurzweil's inputs. You can pitch-shift your sound by playing a note above or below middle C (middle C is the so-called unity pitch); harmonize the signal by using multiple Layers in the Program, each pitched to a different note; or combine any number of processing functions to alter your sound. If you plug in a microphone and select Backwards as the Playback mode in the Keymap, you can hear yourself talking backwards. (Okay, there is a fraction of a second delay.) Recording the output as you explore Live Mode is highly recommended, because you might end up with hours of new source material!

—Dennis Miller

For more EM Cool Tips, visit our Web site at www.emusician.com.

The fastest, easiest and smartest way to get into computer audio

US-224 DIGITAL AUDIO WORKSTATION CONTROLLER/USB INTERFACE



US-224:

The affordable, portable solution for computer recording

Feel like everyone in the world is deep into computer recording – except you? There's an easy solution: the **US-224**, co-developed by TASCAM and Frontier Design Group. It's the perfect bridge between your music and your Mac or PC. It connects via USB, so all you have to do is plug in your instrument and plug in your computer. It's USB powered, so you don't even need an outlet to get rockin'. Then start up the included Steinberg Cubasis VST audio/MIDI recording software and boom... you've reached computer recording nirvana, with all of its creative advantages. Plus, with the US-224's faders and knobs, you can control your software's parameters without having to reach for the mouse.

Want a fast, easy and remarkably inexpensive way to take advantage of computer audio? Visit your TASCAM dealer or check out www.tascam.com for all the news on the US-224.

TASCAM US-224 by FRONTIER DESIGN GROUP

TASCAM
a whole world of recording

www.tascam.com

WHAT'S NEW

By Marty Cutler

▲ FONG ELECTRONIC SONICEYE

In the personal studio, it is frequently difficult to locate the weak link in an audio chain. Fong Electronic's SonicEye ($40) makes that procedure easier with a device you can keep on your key chain.

The SonicEye sports an unbalanced ¼-inch plug, a power-indicator LED, and three LEDs that indicate signal level. Plug the device in to the output jack in question and press the power button, and the LED shows you the signal strength when an audio signal is present. The LEDs indicate levels at –32, –22, and –16 dBu, but the manufacturer provides instructions for soldering modifications that enable evaluation of pro-audio-level gear.

The SonicEye runs on the type of miniature 12V battery that is used for powering car-alarm key fobs. According to the manufacturer, the included battery will last for approximately 2,000 operations. Fong Electronic; tel. (208) 898-6442; e-mail info@fongelectronic.com; Web www.fongelectronic.com.

▶ BRAUNER PHANTOM C

Transamerica Audio offers Dirk Brauner's Phantom C ($1,380), his first Field Effect Transistor (FET) mic. The mic is a large-diaphragm condenser with a fixed cardioid polar pattern. Brauner designed the mic for vocals and voice-over use.

The microphone boasts 8 dBa self-noise with 28mV/Pa cardioid sensitivity and 142 dB SPL at 0.5 percent total harmonic distortion. The two-inch gold-sputtered mylar diaphragm is housed in a heavy, professional-grade, hand-machined brass case plated with nickel.

A specially designed shockmount lets you remove the mic easily while also retaining effective isolation from the stand or boom. The shockmount and a carrying case are included with the microphone. Transamerica Audio Group (Drawmer, API, Brauner); tel. (702) 365-5155; e-mail sales@transaudiogroup.com; Web www.transaudiogroup.com.

▼ STEINBERG PLEX

In cooperation with Steinberg, Wolfgang Palm has developed Plex (Mac/Win; $249), a VST software synth. Dubbed a "restructuring synthesizer," Plex creates sounds by combining physical characteristics of different instrument types. The synth is capable of 64-note polyphony but is not multitimbral.

Plex analyzes the original instrument sample, which is encoded in a proprietary format to produce four sound components: lower and higher spectral properties, filter characteristics, and amplitude envelopes. Each element can be swapped with the characteristics of another preanalyzed source to provide natural-sounding hybrid instruments, according to Steinberg. The synth can freely swap any of the four elements of 33 sound sources in real time.

Plex offers three ADSR envelopes with values for rates and levels expressed in milliseconds and decibels, respectively. Three LFOs offer programmable modulation assignments and sync to MIDI Clock, and a global LFO modulates pitch. Filters are based on the unique harmonic characteristics of each source file. The manufacturer describes the filters as being made up of individual spectra that you can play back in sequence, much like a film. Sounds receive additional burnishing with stereo delay and flange effects.

You get 97 preanalyzed sound sources—chosen for their acoustic, synthetic, and filter characteristics—and more than 300 preset patches. Currently, the software does not offer end-user sound-analysis tools. All parameters respond to MIDI Control Change messages.

Plex requires a VST 2.0–compatible host program and, on a PC, a Pentium III/600 MHz processor, 180 MB of RAM, and Windows 2000 or XP. Running Plex on a Mac calls for a Power PC G4/400 MHz machine with 180 MB of RAM and Mac OS 9 or OS X 10.2. Steinberg North America; tel. (818) 678-5100; e-mail info@steinberg.net; Web www.us.steinberg.net or www.cubase.net.

Whole in One

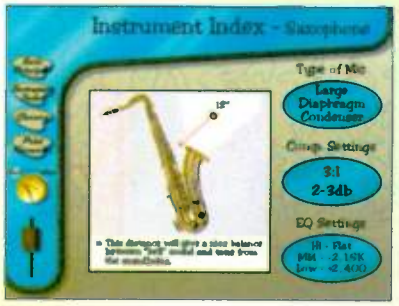
Get in touch with the most comprehensive, versatile Pro Tools® LE workstation ever.

- FireWire® connection
- 24-bit / 96 kHz fidelity
- 8 touch-sensitive, motorized faders, rotary encoders, scribble strips, and metering
- 18 channels of I/O: 8 analog (with 4 mic preamps), 8 ADAT optical, and 2 S/PDIF; integrated MIDI I/O (16 channels in / 32 channels out)
- 32-track Pro Tools LE software with Windows XP and Mac OS support
- Includes bundled plug-ins from Digidesign, IK Multimedia, Native Instruments, and Waves
- Operates as a standalone digital mixer with effects — EQ, dynamics, delay, reverb — and snapshots when not used with Pro Tools

For more information on the new Digi 002, call 1.800.333.2137 or visit www.digidesign.com/002.

digidesign

GET SMART ▲▲▲▲



▲ POMONA PRODUCTIONS, INC.

Pomona Productions' *Interactive Guide to Home Recording* (Mac/Win; $59.95) is a CD-ROM that covers basic recording principles using text, graphics, and audio examples. The topics range from production and session planning to creating an effective mix. The course covers signal flow, mic selection and placement, level setting, dynamics processing and EQ, reverb, and other effects.

A second component of the CD-ROM is the Instrument Index, which covers suitable mics and placement, EQ and compression settings, and other information for the most commonly used instruments. The CD-ROM includes a pop-up glossary, printable track sheets, EQ charts, and more. Pomona Productions; tel. (585) 582-1128; e-mail ighr@pomona1.com; Web www.pomona1.com.

▶ BERKLEE PRESS

Berklee Press's *Arranging in the Digital World* ($19.95) is a guide that introduces arrangers to MIDI and synthesizers. The book integrates music notation, Standard MIDI File (SMF) examples, technical definitions, and tips. MIDI examples arranged for General MIDI instruments accompany the book on floppy disk.

The book starts with a list of definitions and moves quickly to musical styles and instrumentation. The chapter "How to Build an Arrangement" starts with song form, instrumentation, and tempo as it relates to setting up your arrangement in a sequencer.

Chapter 4 deals with instrument families and how to effectively re-create them on synthesizers. You also get brief chapters about MIDI and production techniques, a list of suggested songs for listening, and range charts for various instruments. Berklee Press; tel. (617) 747-2146; Web www.berkleepress.com.

JOHNS HOPKINS UNIVERSITY PRESS

It's easy to forget that making music has always been in part a mechanical process. Contemporary music technology further obscures the dividing line between musician and mechanism. Editor Hans-Joachim Braun presents an eclectic exploration of the relationship between electronics and music in *Music and Technology in the Twentieth Century* ($24.95).

Topics covered range from the player piano to the modern synthesizer, and the development of vibrato technique on the violin to the aesthetics of sampling. An essay written by Trevor Pinch and Frank Trocco contrasts the development of synthesizers by Moog and Buchla and posits that the synthesizer's eventual focus on keyboard technology limits its creative freedom.

Author Rebecca McSwain recounts the evolution of the solid-body electric guitar, the eventual rise of feedback as a part of guitar technique, and the sociological implications of the acceptance of noise as music. In all, the book covers fascinating and unusual ground, invoking artists as diverse as Orpheus and Guitar Slim to Fritz Kreisler, Conlon Nancarrow, and Karlheinz Stockhausen. Johns Hopkins University Press; tel. (800) 537-5487; Web www.jhupbooks.edu.

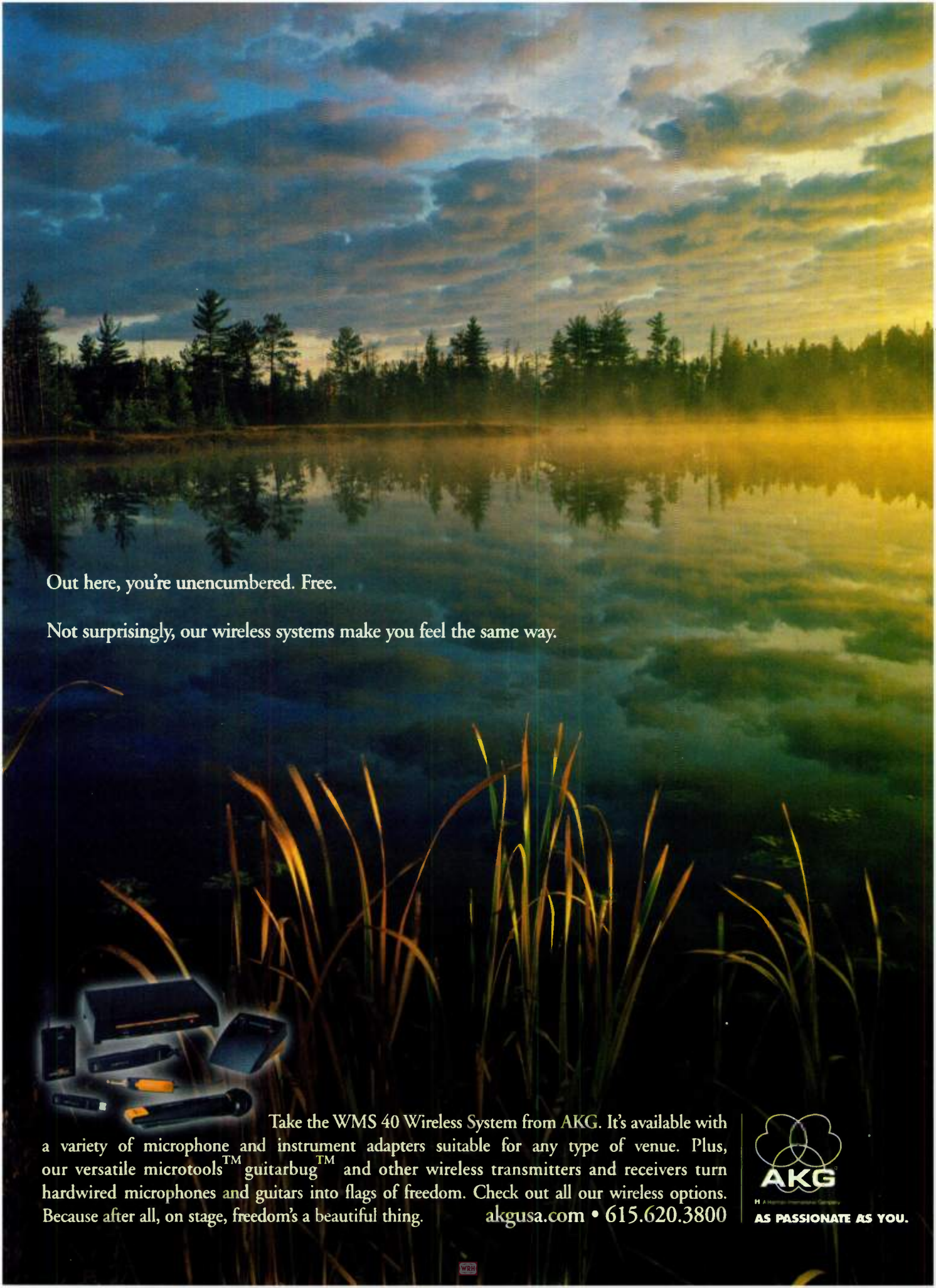
▼ MACAUDIOLAB

From MacAudioLab, *The Complete Digital Performer 3* ($95) offers instruction for MOTU's Digital Performer 3.0. The course covers everything from basic file-management and navigation skills to advanced topics. Each of the five CDs holds well over an hour of tutorials.

The course provides tips and advice on, for example, the use of Markers with film, bouncing tracks to disk, and dithering. Intermediate sections include a DSP primer and coverage of audio transposition, time compression and expansion,

and audio scrubbing. Advanced sections explain song construction using Chunks, the Drum Editor and its tools, and the use of instrument plug-ins such as Propellerhead Reason.

The fifth CD focuses on Digital Performer 3.0's surround capabilities, the use of 5.1 audio files and AC3 encoding, audio and video sync, hardware control surfaces, and third-party plug-in coverage (including Audio Ease Nautilus Bundle and Metric Halo Channel Strip). MacAudioLab; tel. (877) 587-2164; e-mail feedback@macaudiolab.com; Web www.macaudiolab.com.


Out here, you're unencumbered. Free.
Not surprisingly, our wireless systems make you feel the same way.
Take the WMS 40 Wireless System from AKG. It's available with a variety of microphone and instrument adapters suitable for any type of venue. Plus, our versatile microtools™ guitarbug™ and other wireless transmitters and receivers turn hardwired microphones and guitars into flags of freedom. Check out all our wireless options. Because after all, on stage, freedom's a beautiful thing.
akgusa.com • 615.620.3800
AKG
AS PASSIONATE AS YOU.

ROLAND XV-2020

The half-rackspace Roland XV-2020 ($695) has a sample-playback synthesis engine based on earlier XV-series synths. Its four-oscillator-per-patch architecture draws on 64 MB of waveform ROM culled from the XV-5050 and XV-5080 synths. The XV-2020 supports the GM2 specification and includes two card slots that accommodate Roland's SRX-series expansion boards, allowing a total of 192 MB of waveform ROM. You get as many as 64 notes of polyphony, and the unit is 16-part multitimbral.

As with other XV synths, you can configure the four oscillators in a variety of signal paths called structures, which offer routings that include ring- and cross-modulation processing. You get up to four multimode filters per patch. The filter types include lowpass, bandpass, highpass, and a peaking filter. The XV-2020 has four-stage filter and amplitude envelopes.

The XV-2020 includes 40 effects such as overdrive, modulated delay, and enhancer, in addition to eight types of chorus and reverb. Preset memory provides four banks of 128 patches, 256 GM2 sounds, 8 rhythm sets, and 9 GM rhythm sets. Patches are combined in two banks of 64 Performance memories. User memory holds 128 patches, 4 rhythm sets, and 64 Performances. The XV-2020 comes with XV Editor software (Mac/Win), which gives you access to all synth parameters.

A USB jack lets you connect the XV-2020 to your computer. MIDI In, Out, and Thru jacks let you press the unit into service as a basic MIDI interface or connect the unit to a non-USB MIDI system. The synth provides stereo unbalanced RCA outputs and a left and right pair of unbalanced ¼-inch output jacks. Roland Corporation U.S.; tel. (323) 890-3700; Web www.rolandus.com.

MACKIE BABY HUI

Unable to resist a pun, Mackie Designs has dubbed its newest DAW control surface the Baby HUI ($799). The unit retains most of the features of its larger sibling in a smaller footprint. It sports eight channel strips, each with a 60 mm touch-sensitive motorized fader, a multifunction rotary encoder, mute and solo buttons, and a signal LED. The rotary encoders control pan or send levels; pushing the encoder down lets you select and arm channels or engage automation. A shift button allows controls to perform additional tasks. A familiar tape-recorder-style interface handles navigation chores and includes Return-to-Zero and End buttons.

The Baby HUI works with any software that supports Mackie's HUI MIDI Mapping protocol. The current roster of compatible digital audio workstations includes Pro Tools and Digi 001, both from Digidesign; Digital Performer from Mark of the Unicorn; and Steinberg Nuendo, as well as Mackie's Broadcast Professional Soundscape 32 and Mixtreme.

MIDI In and Out connections are provided. The rear panel also contains a jack for the included external power supply. Mackie Designs; tel. (800) 898-3211 or (425) 487-4333; e-mail sales@mackie.com; Web www.mackie.com.

CIRCULAR LOGIC INTIME

Playing along with MIDI tracks is often likened to working with a band that doesn't listen very well; a MIDI sequence will trudge on at an unyielding, inflexible pace despite human variations in timing. Circular Logic believes that its InTime 1.05 (Win; $119) tempo-tracking system can turn the tables on that syndrome and return tempo control to the musician.

With InTime, you can record a sequence with a natural feel. The program follows your tempo and creates a tempo map. Composers can import sequences into notation software for an accurate transcription of the performance and its associated tempo changes. The software provides sensitivity controls that govern how closely it follows tempo changes. You can assign MIDI events to toggle tracking features on and off.

InTime also lets any prerecorded MIDI sequence follow tempo variations in live performance. A tempo-limiting feature sets upper and lower tolerances for tempo fluctuations. Groove Tracking lets you play around a relatively steady tempo and impart subtle changes in tempo and feel.

You can use InTime to sync external clock-driven devices such as hardware sequencers or drum machines. Using MIDI loopback software, InTime can control software sequencer tempos.

InTime requires a Pentium 200 MHz computer with 64 MB of RAM and Windows 98, 2000, ME, or XP. A Mac version should be available by the time you read this. Circular Logic; tel. (561) 302-4320; e-mail info@circular-logic.com; Web www.circular-logic.com.

MASTERLINK™ ML-9600 STEREO MASTERING SYSTEM

Who killed Kenny's DAT?

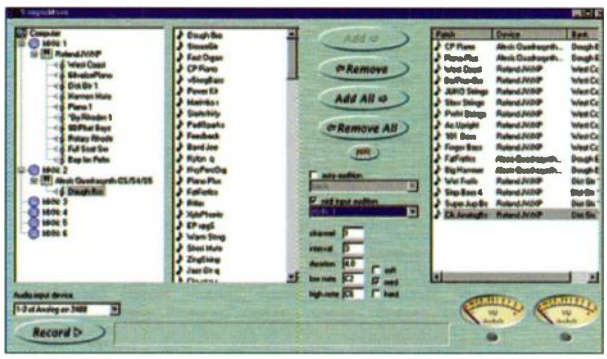
AFTER YEARS OF DEALING WITH EXPENSIVE MEDIA, MANGLED TAPES, AND mind-numbing rewind times, Ken bought a MasterLink. It's a 24/96 stereo hard disk recorder, mastering suite, and CD burner all in one. It comes with a 20 gig drive for almost 30 hours of recording. Non-destructive playlists save not only fades, gain, and start times for each track, but also the compression and parametric EQ that takes you from final mix to perfect master. Then when your tunes sound just right, burn Red Book or CD24™ discs on cheap CD-Rs. So who convinced Kenny to dump his DAT? We'll never tell.

For complete specs and a manual visit
www.alesis.com/masterlink, or call 310-821-5000
for a full-line brochure.

ALESIS
INSPIRE | PLAY | CREATE

▼ WEBSTER AUDIO SAMPLEMOVE

Creating samples of your MIDI synthesizers can be a tiresome and draining process; the problem of capturing multiple samples with precise durations and consistent Velocities is equally daunting. Webster Audio's SampleMove (Win; $129.95) is a utility program that reduces the majority of that task to batch-file processing.

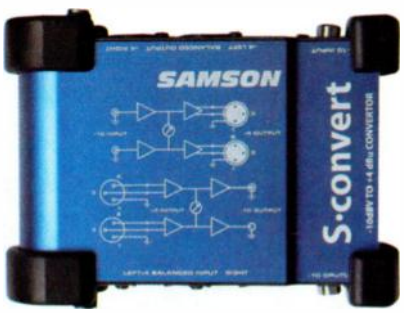


You simply tell SampleMove which devices are connected to your MIDI and digital audio interfaces, select programs, choose sample pitches and durations, choose a drive and folder, and press record. SampleMove dutifully moves through your MIDI system, sends the assigned Note On and Velocity messages, and then records and stores samples as AIFF or WAV files. The software can record multiple synthesizers by transmitting Program Change and Bank Select messages.

SampleMove saves files for each patch in an individual folder that is automatically named after the sound. Samples contain note name and octave information, which makes it easier to map samples to the proper key. Minimum system requirements for SampleMove are a Pentium II/233 MHz computer with Windows 98 and 32 MB of RAM. A Macintosh version is in development. Webster Audio; tel. (510) 533-9959; e-mail ebiz@websteraudio.com; Web www.websteraudio.com.

▼ SAMSON S-CONVERT

Samson Audio refers to its S-convert ($164.99) as a "bump-box" because it provides an interface for matching audio levels between consumer and professional audio gear. Housed in a small stackable case, S-convert provides +4 dBV to –10 dBu audio level converters. The RCA inputs run at –10 dBu; the XLR outputs and inputs run at +4 dBV. Both sets of I/O have a level control. The unit comes with a 12 VAC adapter. Samson Technologies Corporation; tel. (800) 328-2882 or (516) 364-2244; e-mail sales@samsontech.com; Web www.samsontech.com.



▶ MOTU 2408MK3

In conjunction with the included PCI-424 card, MOTU's 2408mk3 ($995) provides up to 24 channels of 24-bit, 96 kHz digital I/O. The unit provides a hefty amount of digital I/O to integrate hardware digital mixers, MDMs, or external A/D/A converters.

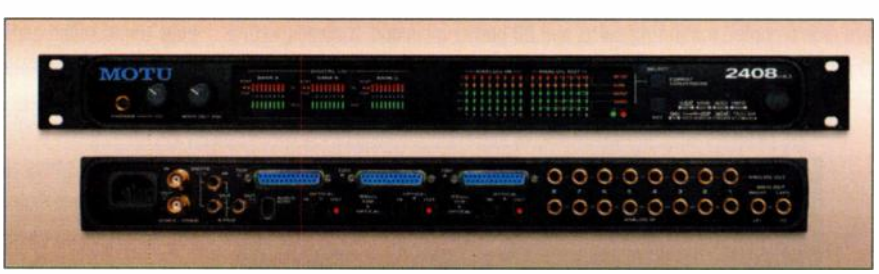
The PCI-424 card lets you link as many as four MOTU audio interfaces and expand to as many as 96 audio channels. Because the unit's onboard CueMix DSP assumes your host computer's audio-buffering, mixing, and monitoring burdens, it provides monitoring latency equivalent to that of a digital mixer. The fact that the DSP engine is built in to the card means any digital audio interface connected to the PCI-424 card shares the low-latency monitoring benefits, including legacy interfaces such as MOTU's 2408, 2408mkII, 1296, 24I, and others.

The 2408mk3 offers built-in SMPTE and video synchronization. You can choose Longitudinal Time Code (LTC), PAL/SECAM, NTSC, or blackburst. The interface includes a dedicated RCA timecode input and output. However, the PCI-424's onboard DSP lets you use any analog input for SMPTE, and timecode can be sent to any digital or analog output.

You can switch analog input stereo pairs to accommodate +4 or –10 dB levels independently. Individual front-panel 5-segment meters let you monitor every analog input and output. You also receive a separate volume knob for headphones and main outs.

MOTU provides AudioDesk recording software (Mac), which relies on the MOTU Audio System (MAS). However, the unit is compatible with other Mac and Windows DAW software. The package includes drivers for ASIO (Mac/Win) and Sound Manager (Mac) as well as GSIF and WDM (Win). You also get CueMix Console (Mac/Win), an onscreen mixer that you can use in conjunction with any recording software.

The rear panel sports seven banks of I/O: one bank of eight balanced ¼-inch jacks, three ADAT optical ports, three Tascam TDIF ports, and coaxial S/PDIF I/O. Other connectors include word clock I/O, ADAT sync input (on the PCI-424 card), a ¼-inch stereo headphone jack, and a pair of balanced ¼-inch monitor outs. Mark of the Unicorn, Inc. (MOTU); tel. (617) 576-2760; e-mail info@motu.com; Web www.motu.com.



IN YOUR FACE

RME

INTELLIGENT AUDIO SOLUTIONS

HAMMERFALL DSP SYSTEM

DIGIFACE

- 3 x ADAT DIGITAL I/O (24 CHANNELS)
- 1 x SPDIF DIGITAL I/O (2 CHANNELS)
- 1 x ADAT SYNC IN (9-PIN D-TYPE)
- 1 x WORD CLOCK I/O (BNC)
- 1 x ANALOG 24/96 STEREO LINE/HEADPHONE OUTPUT
- 2 x MIDI I/O, 32 CHANNELS OF HIGH-SPEED MIDI

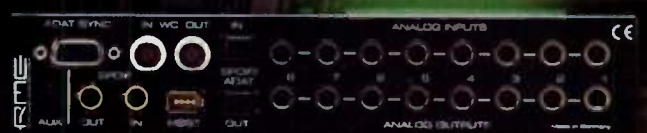
ALL PORTS SIMULTANEOUSLY AVAILABLE!
53 CHANNELS OF AUDIO AND 32 CHANNELS OF MIDI

HDSP METER BRIDGE: FREELY SCALABLE LEVEL METERS, PEAK AND RMS CALCULATION DIRECTLY IN HARDWARE

TOTALMIX: 1456 CHANNEL MIXER WITH 40 BIT INTERNAL RESOLUTION

S/MUX POURED IN HARDWARE: 12 CHANNELS OF 24/96 FOR RECORD/PLAYBACK ON ADAT OPTICAL

MULTIFACE



- 8 x ANALOG 24/96 1/4" TRS LINE I/O (105 DBA)
- 1 x ADAT DIGITAL I/O (8 CHANNELS)
- 1 x SPDIF DIGITAL I/O (2 CHANNELS)
- 1 x ADAT SYNC IN (9-PIN D-TYPE)
- 1 x WORD CLOCK I/O (BNC)
- 1 x ANALOG 24/96 LINE/HEADPHONE OUTPUT
- 1 x MIDI I/O, 16 CHANNELS HIGH-SPEED MIDI

ALL PORTS SIMULTANEOUSLY AVAILABLE!
35 CHANNELS OF AUDIO AND 16 CHANNELS OF MIDI

HDSP METER BRIDGE: FREELY SCALABLE LEVEL METERS, PEAK AND RMS CALCULATION DIRECTLY IN HARDWARE

TOTALMIX: 720 CHANNEL MIXER WITH 40 BIT INTERNAL RESOLUTION

S/MUX POURED IN HARDWARE: 4 CHANNELS OF 24/96 FOR RECORD/PLAYBACK ON ADAT OPTICAL

WIN98/ME/2K/XP: MME, GSIF & ASIO 2.0
MAC: ASIO 2.0

PCI CARD

CARDBUS

THE MOST FLEXIBLE AUDIO INTERFACES EVER!

FIND OUT MORE AT XVISIONAUDIO.COM

XVISION AUDIO

By Scott Wilkinson

Perchance to Dream

Music hath charms to soothe
the savage breast,
To soften rocks, or bend a knotted oak . . .
By magic numbers and persuasive sound.

—William Congreve (1670–1729)
The Mourning Bride, act 1, scene 1

The power of music is well known. In addition to William Congreve's famous peroration, researchers at the University of Toronto (www.utoronto.ca) have found that music can help those who suffer from insomnia, which is estimated to affect 30 to 40 percent of the general population. Led by Dr. Leonid Kayumov, director of the university's Sleep Research Clinic, the multidisciplinary team involved in this research includes computer programmers, music therapists, composers, neurophysiologists, and psychiatrists.

Music from brain waves could help insomniacs drift off.

Most intriguing is their use of computers and synthesizers to create sequences of notes that are customized for each patient, who then listens to the music while trying to sleep. After documenting a patient's subjective complaints and taking objective measurements to determine the exact nature of the problem, an electroencephalograph (EEG) records the electrical activity at several points on the surface of the brain during various states of consciousness, such as alert concentration and deep relaxation. The low-frequency brain waves associated with sleep are called theta (4 to 7 Hz) and high-amplitude delta (0.5 to 2 Hz).

The EEG signals are sent to a computer for Fast Fourier Transform (FFT) analysis, after which a specially designed algorithm generates MIDI note data based on the FFT. This is not a direct conversion from the frequency spectrum of the electrical waveforms from the brain; the music arises from the relationships between the EEG signals, which form a map of the brain's electrical activity in different areas.

The MIDI messages are sent to a synthesizer, and the resulting audio is recorded onto CD-R, which the patient can take home and play according to personalized instructions. Listening to these sounds seems to stimulate the electrical activity associated with the state of consciousness on which they are based; if the sounds are derived from theta and delta waves, those waves are induced in the patient's brain, which helps him or her to sleep.

In a recent double-blind study, Kayumov and his team generated custom "sleep music" for 18 volunteers who had experienced at least two years of anxiety- or stress-related insomnia. The subjects were divided into two groups: the experimental group got CDs of music based on their own theta and delta waves, and the control group got CDs of music based on other people's low-frequency brain waves. After four weeks of use at home, the experimental group showed objective and subjective improvement in the quality of their sleep, while the control group exhibited no objective improvement.

Kayumov's team is also studying the effects of having a human musician compose music while a patient is connected to the EEG machine; this is a variation of biofeedback. The composer plays music while watching an FFT display with the patient in real time. When the composer finds music that consistently affects the FFT in the desired manner (usually increased power in theta and delta activity) for more than two or three minutes, that music is recorded for use by the patient at home. This method was used with one patient in each of the two groups of the aforementioned study, while the rest of the subjects used computer-generated music.

Music-based solutions for insomniacs are clearly much better than drugs, with virtually no side effects or dependency issues. This research is in its infancy, but it holds great promise. Indeed, the tools of electronic music are playing an integral part in helping us to sleep: perchance to dream.

COURTESY UNIVERSITY OF TORONTO

The Brain Sound Compiler software generates MIDI note data based on the FFT of a patient's EEG, creating customized sleep music.

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

LISTEN UP!

- **Accurate: Flat ± 3db over a frequency range of 50Hz - 20kHz**
- **SRS6.5A 100w RMS Biamped (70w low, 30w high)**
- **Shielded for video monitors**
- **Flat/Contour mode for switching between mix down and playback**
- **Front port design for accurate bass in any location**

Pro Audio Review chose the SRS6.5 as one of the top 20 products of 2001

SRS monitors are superbly accurate and extremely flat ±3dB over a frequency range of 50-20k Hz. Studio pros know the importance of a flat frequency response. For the home studio newcomer, this simply means you will hear an exact representation of your recording. There won't be any unwanted coloration to mislead you. You'll hear crisp highs from the ferro fluid cooled, soft dome tweeter and tight, clean bass from the heavy-duty 6.5" woofer. Front ports allow you to place the speaker on a shelf without worrying about low frequencies hitting the rear wall and creating a false bass response. Shielding protects video monitors from the powerful speaker magnets.

SRS6.5 Rear

The active 100w RMS SRS6.5A bi-amped circuits (70w low & 30w high) offer efficient power transfer. Professional balanced XLR inputs with a -12dB pad make connections easy. The 90-250V auto-switching power supply means no unwanted hum and compatibility with worldwide power.

SRS6.5A Rear

The most useful feature of the SRS monitor is the unique "contour" switch. Let's face it, everyone else will not be listening through studio monitors. The contour switch allows you to engage a different crossover circuit giving you a typical frequency response of a home stereo speaker. Experience what others will hear by simply flipping a switch!

Bottom line: These awesome sounding monitors (powered or passive) are simply one of the best near-field monitors available.

SRS6.5A ACTIVE POWERED MONITORS
List $479
$219.99 ea Ship $14.99 ea.
SRS6.5A-2 $439.99 pair

SRS6.5 PASSIVE STUDIO MONITORS
List $295
$149.99 ea Ship $14.99 ea.
SRS6.5-2 $279.99 pair

SRS6.5A ACTIVE POWERED
Active Biamp: Low 70w RMS, High 30w RMS
Amp Response: 20 to 20 k Hz, THD .03%
Enclosure Response: 50 to 20 k Hz, ± 3 dB
Inputs SRS6.5A: Bal. XLR, 12dB attenuation pad, 90-250VAC, 50-60 Hz, LED power indicator
Woofer Enclosure Type: Front Ported Box
Protective Coating: Black Duratex™
SRS6.5A: 9.25"W x 11.75"D x 14.75"H, 23 lbs.

SRS6.5 PASSIVE
Inputs SRS6.5: Gold 5-way binding posts
Enclosure Response: 50 Hz to 20 kHz, ± 3 dB
Sensitivity: 92.5 dB SPL, 1 Watt @ 1 meter
Power Handling: 125w continuous
Recommended Amp: 50 to 150 watts
Nominal Impedance: 8Ω
SRS6.5: 9.25"W x 9"D x 14.75"H, 21 lbs.

carvin.com/SRS

MADE IN USA

STUDIO GEAR

DCM1000 - 1000w List $795 **$369.99**
DCM150 - 150w List $395 **$229.99**

XP4 - 4 engine DSP effects List $595 **$299.99**
AC120 - power conditioner List $295 **$149.99**

CARVIN.COM
800.854.2235
To ORDER, SPECS or for a FREE catalog carvin.com/pro_sound
WORLD'S #1 FACTORY DIRECT MUSIC STORE
Enter carvin.com's weekly FREE GEAR giveaway!

See your local Waves dealer.

(Headquarters) Azrieli Center 1, Tel-Aviv, 67011 Israel, phone: 972-3-608-1648, fax: 972-3-608-1656
(North & South America) 306 W Depot Ave., Suite 100, Knoxville, Tennessee 37917, phone: 865-546-6115, fax: 865-546-8445

See us on tour. Info at:
WWW.WAVES.COM

BRIDGING THE GAP

By Michael Cooper

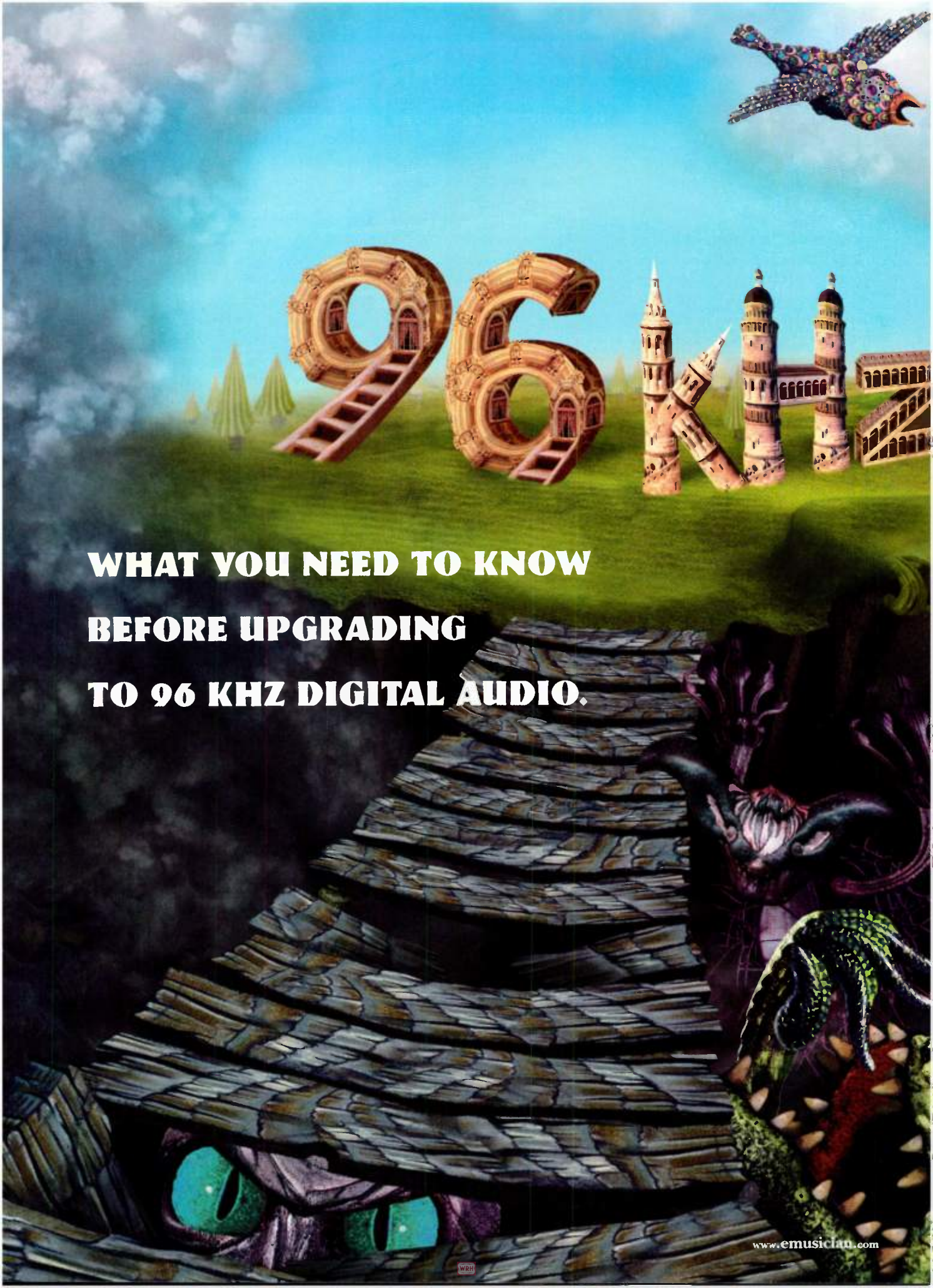
One can't help but notice the increasing number of 24-bit, 96 kHz–capable digital audio devices flooding the pro-audio market these days. The unprecedented sonic performance that high-resolution digital mixers, recorders, converters, and DAW I/O boxes promise has many owners of project studios and small-commercial studios pondering whether they should upgrade their gear to the emerging standard. But before you whip out your credit card, there are some major issues to consider.

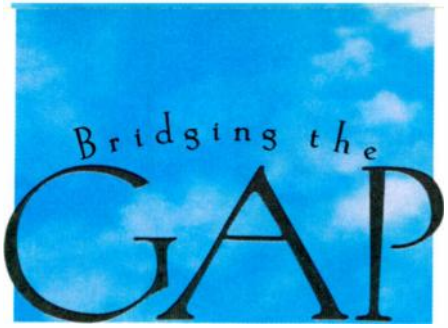
For one thing, just because two pieces of equipment are "24/96" (that is, 24-bit, 96 kHz) capable doesn't mean that they can be used together. They may, in fact, each support a different and therefore incompatible data format, thus preventing them from talking to one another. Many products also demand trade-offs in functionality—for example, a halving of the maximum number of available tracks or channels—in return for working at higher sampling rates. And before you begin production, you'll need to consider which format to use to deliver your high-resolution mixes to the mastering or authoring house.

That, in turn, brings up another question: what end-user/mass-duplication format will your musical masterpiece be released on? If your production is destined for release on CD, will you even hear the sonic benefits of high-resolution recording and mixing once your masters have been downsampled to the CD's 16-bit, 44.1 kHz format? Considering all the hoops you'll need to jump through to produce a 96 kHz recording (not the least of which is monetary), you'll want to be sure that your efforts will result in a superior-sounding end product.

In this article, I'll explore many of the issues that you'll need to resolve in the course of cobbling together a 96 kHz–capable studio and producing a high-resolution master. Most of what I'll discuss applies equally to working at an 88.2 kHz sampling rate, by the way, but for the sake of simplicity I'll refer mostly to 96 kHz digital audio production. (For a discussion about when to use an 88.2 kHz instead of a 96 kHz rate, see the sidebar "Which Sampling Rate Should I Use?")

Illustration by David Ball


96 KHz
WHAT YOU NEED TO KNOW
BEFORE UPGRADING
TO 96 KHZ DIGITAL AUDIO.
www.emusician.com



release. "When using nonlinear processing (such as compression) at a higher sampling rate," says Katz, "distortion in the audible band is reduced by at least 3 dB, even if followed by a sampling-rate conversion back down to the lower rate." In other words, if you're going to use digital dynamics processing, upsampling the material will reduce the amount of audible distortion in the final file.

Despite his love for the sonics produced by 96 kHz sampling, Katz thinks such a high conversion rate might not be necessary if impeccable digital-filter designs were employed in converters. He also notes that upgrading the digital filters in converters would be considerably less expensive than retooling studios for ever-higher sampling rates.

Elen concurs. "There is a point at which multiplying by large numbers, whether it's high sampling rates or high numbers of oversampling, is done to impress people—in terms of selling things—and not for audio quality," Elen says. "But after a certain point, you're not going to be able to hear the difference anymore."

NOT HEARING IS BELIEVING

Though Elen, Katz, and Olsen differ regarding *why* 96 kHz converters sound better than lower-resolution ones, they all agree that the difference is audible. But Paul Lehrman, a composer, educator, and consulting editor for *Mix* magazine, feels that most listeners are unlikely to hear the difference. He contends that "99.999 percent of the people who listen to recordings are not in a position to perceive any difference between a 96 kHz recording and a 44.1 or 48 kHz recording. I think that whatever advantages you get out of 96 kHz are far overshadowed by the limitations of the transducers at both ends of the signal chain."

In defense of his position, Lehrman points out that the frequency responses of most mics and digital musical instruments roll off at around 20 kHz. Thus, anything recorded above 20 kHz at a 96 kHz sampling rate "is probably junk," claims Lehrman. In response to the argument that it's the digital filter in 96 kHz systems, and not the extended frequency response, that's responsible for the improved sonics, Lehrman says that, in A/B tests, he has "never been able to tell, definitively, the difference between a well-constructed 44.1 or 48 kHz oversampling converter and a 96 kHz converter."

Engineer, producer, and **EM** contributing editor Larry the O weighs in somewhere between 96 kHz cheerleaders and naysayers. "There is some extra sparkle at 96 kHz; it does make a difference," he says. "But it's nothing compared to the difference between 24-bit and 16-bit digital audio."

Naturally, you should listen yourself and draw your own conclusions about whether 96 kHz digital audio sounds better than, say, 48 kHz. Assuming you hear enough of a difference to compel you to take the leap, you'll then need to determine which high-resolution digital audio formats are being used by currently available products and what trade-offs, if any, each format requires.

SPLIT DECISION

The various stereo and multichannel digital audio formats that have been in use since the 1980s were not originally designed to pass 24/96 audio. In some cases, such as with AES/EBU, the spec had enough bandwidth that it could be formally rewritten to accommodate higher sampling rates over existing cables without much ado. In other cases, such as with the 8-channel ADAT Lightpipe and TDIF formats, *sample-splitting* schemes had to be developed by manufacturers to allow their equipment's multichannel I/O to pass 24/96 digital audio.

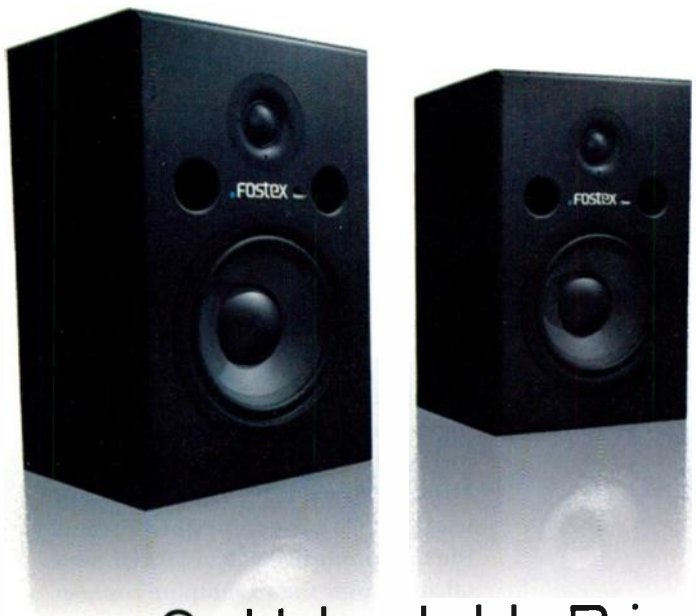
Sample splitting is a process that splits, typically, one 96 kHz digital signal into two 48 kHz signals (or one 88.2 kHz signal into two 44.1 kHz signals), thus allowing the split signal to be sent along two channels rather than one. Because sample splitting uses two channels for transmitting each original channel of 24/96 audio, the number of available channels that the ADAT and TDIF I/O can transmit at 96 kHz is cut in half, to four rather than eight channels. If this seems cumbersome, limiting, or confusing, bear in mind that sample splitting is a transitional strategy meant to enable high-resolution digital audio production using entrenched connectivity technologies. Rather than wait until a better solution is developed, we can employ these interim formats to create multichannel 24/96 productions now.

Similar to sample splitting, *bit* splitting is an encode/decode process that breaks up a 24-bit, low-resolution (44.1 or 48 kHz) digital word into two data streams—one 16-bit, the other 8-bit—and records them onto two tracks of a 16-bit recorder. The two tracks are recombined on playback into one 24-bit stream by a device that decodes the split bit stream. Note, however, that the use of bit-splitting formats is fading as 24-bit devices become the norm.

HELLO, GOOD-BYE

All 24/96 data formats require a chip on the sending and the receiving end of the transmission chain that recognizes what protocol is being used. Without the chip in both pieces of connected gear, the units cannot talk to

FIG. 2: The MOTU 2408mk3 DAW I/O box does real-time format conversion and ships with the new PCI-424 card, which boasts hardware-DSP-driven mixing and monitoring with near-zero latency.



The PM-1

Powered Monitors

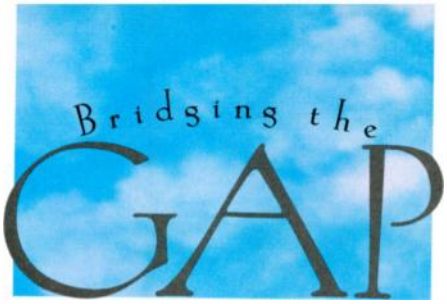
An Unbeatable Price/Performance Value

Listening doesn't need to be expensive. To understand how truly important accurate and clear sound is, you only have to go as far as the new Fostex PM-1 Powered Monitors. With 120 watts of biamped power, a bass response that's full and dynamic, and a high end that sizzles, you'll wonder how you can pay so little for so much. Priced at $499 MSRP, you can now have accurate and clear sound that is affordable as well. The PM-1 Powered Monitors from Fostex: just listen.

FOSTEX®

www.fostex.com

Fostex America, 15431 Blackburn Avenue, Norwalk, CA 90650, Tel: 582-921-1112 Fax: 562-802-1964



one another. Before outfitting your studio with 24/96 gear, make sure all the pieces that you're considering buying can speak the same language. If they can't, you'll hear *nada*.

In many cases, 24/96 operation is available only for some of the supplied I/O on a given piece of equipment. For example, the Mackie MDR24/96 modular hard-disk recorder (M-HDR) can record 96 kHz digital audio by way of its Lightpipe connections, but its AES/EBU connections can handle only 44.1 and 48 kHz sampling rates (at the time of this writing, anyway).

The point is, you can't determine that two pieces of gear will provide interoperable 24/96 capabilities simply by checking to see if they offer the same type of I/O. The best way to determine 24/96 compatibility is to ascertain that both pieces of gear support the same high-resolution data formats. Unfortunately, a comprehensive summary of supported 24/96 data formats is difficult to come by for most currently available products, and usually requires digging beyond promotional literature, spec sheets, and the like. (For a quick-reference guide to some popular 24/96 products and the high-resolution formats that they support, see the table "Resolution Conflicts.")

In addition to checking compatibility of data formats, make sure any products you plan to use together also support the sampling rate(s) you want to work with and can sync to a common word-clock rate. Some recorders must receive 48 kHz word clock (which is doubled internally) to record 96 kHz digital audio. In such a case, you will need a device like the Swissonic AD96 mk2 4-channel A/D converter (see **Fig. 1**) that can output half the word-clock rate (44.1 or 48 kHz) to your recorder's word-clock input when working with 88.2 or 96 kHz audio-data sampling frequencies.

Finally, if you are working on a DAW, make sure you have tons of hard-disk storage available: 24/96 data demands a *lot* of disk space!

Next, let's take a look at the data formats that currently are being offered in 24/96 gear. The following is not meant to be an exhaustive list of 24/96-capable gear; it is offered simply to give you an idea of what's available and what's compatible.

DIVIDE AND CONQUER

S/MUX. S/MUX is a sample-splitting technology developed by Sonorus that splits one channel of 24/96 digital audio into two 24-bit, 48 kHz channels (or splits one channel of 24-bit, 88.2 kHz digital audio into two 24-bit, 44.1 kHz channels) for transmission over ADAT Lightpipe I/O. The new MOTU 2408mk3 DAW I/O box (see **Fig. 2**), the Swissonic AD96 mk2, and the Apogee AD16 and DA16 converters all support the S/MUX format through Lightpipe I/O. Additionally, the Yamaha 02R96 digital mixer, the Alesis ADAT HD24 M-HDR, and Mackie's HDR24/96, MDR24/96, and SDR24/96 M-HDRs all use an S/MUX-compatible format when transmitting 88.2 or 96 kHz digital audio over their Lightpipe connections. (Yamaha, Alesis, and Mackie's high-resolution Lightpipe formats may, in fact, be identical to S/MUX format; exact specifications were not available.) Let's take a closer look at how some of these products implement their own form of S/MUX to record and play back 24/96 audio.

As one would expect from units using a sample-splitting scheme, the above-mentioned Alesis and Mackie hard-disk recorders all have their maximum track counts cut in half when shuttling high-resolution digital audio over Lightpipe I/O—from a maximum of 24 tracks at 44.1 or 48 kHz to 12 tracks maximum at 88.2 or 96 kHz. The new Yamaha 02R96 mixer (see **Fig. 3**), however, distinguishes itself as one of the few products on the market that does not lose any channels when operating at 88.2 or 96 kHz sampling rates over Lightpipe I/O. Each recombined 24/96 track (returning from an M-HDR, for example) shows

FIG. 3: The new Yamaha 02R96 digital mixer is one of the few products on the market that retains its full complement of fader channels when sending and receiving 88.2 and 96 kHz digital audio over Lightpipe connections.

Whether it's your 1st demo tape or your 5th Gold album, the ProVocal delivers.

ProVocal™

Digital Vocal Processor

Whether you're on stage or in the studio, getting your vocals right means everything. And the Pro Vocal delivers. State–of–the-art microphone and pre-amp modeling gives you unparalleled versatility. Beyond our outstanding mic and pre-amp models, there's classic dbx compression, gating, de-essing and parametric EQ to help you tailor your sound. To add breadth and dimension, we've included digital chorus, flanger, delay and reverb. 24-bit S/PDIF and XLR connectors complete the package. It doesn't matter whether you're performing or recording, the ProVocal is the only tool you need to get the job done.

So, head on down to your local dealer, and hear how the ProVocal delivers.

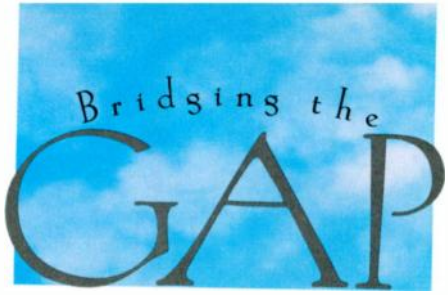
Features

- 18 Microphone Models
- 10 Preamplifier Models
- Classic dbx Compression
- De-Esser, Gate and Parametric EQ
- Digital Reverb, Chorus, Flanger and Delay
- 24-bit S/PDIF Digital Output
- MIDI Control
- Selectable Mic/Line Switch
- 20dB pad, 48Volt Phantom Power
- Front Panel Instrument Input
- Balanced 1/4" or XLR Outputs

dbx
PROFESSIONAL PRODUCTS
The Professional's Choice in Signal Processing

For information call: 1-800-777-1363 • Harman Music Group • 8760 South Sandy Parkway • Sandy, Utah 84070 • www.dbxpro.com

A Harman International Company



up on one 02R96 fader, and the mixer's 56 simultaneous input-channel faders are available no matter what sampling rate you use.

MOTU's 2408mk3 also loses half its maximum number of available channels on each digital bank when using sample-splitting schemes such as S/MUX and 96 kHz TDIF. (I'll discuss TDIF in a moment.) So, for instance, each bank of Lightpipe I/O can transmit only four channels of 24/96 audio in S/MUX mode. Thankfully, though, the 2408mk3 records each 24/96 (or 24/88.2) channel of S/MUX- or TDIF-format audio to *one* track in Digital Performer (DP). (All MOTU I/O boxes are compatible with Mac and PC DAWs and will also work with other applications besides Digital Performer.) On playback, each DP track becomes just one 96 kHz stream that can be sent out one analog output, in any supported format you wish, on the 2408mk3. That keeps operations simple and user-friendly. Moreover, the 2408mk3 can perform *real-time* format conversion between its inputs and outputs.

For some readers, it's important to note that the Alesis HD24 can only sync to its Lightpipe inputs when recording digitally at an 88.2 or 96 kHz sampling rate. That is, the HD24 cannot sync to its BNC word-clock input when receiving 88.2 or 96 kHz digital audio over its fiber-optic lines, but must instead sync to the clock embedded in the audio bit stream. Lightpipe has a reputation for being jittery, and finicky engineers may wish to evaluate whether the benefits of recording high-resolution digital audio over Lightpipe justifies the assumed trade-off in jitter performance. Fortunately, Alesis also offers an optional analog I/O board for the HD24 that can record at 88.2 or 96 kHz while synced to the unit's internal clock. All three of Mackie's hard-disk recorders (mentioned above) can sync to their respective word-clock inputs when recording through their Lightpipe I/O at any sampling rate, including 96 kHz.

TDIF. As is the case with S/MUX for lightpipe-equipped devices, recording 96 kHz digital audio over TDIF lines usually requires two channels of storage for every 24/96 channel transmitted. For M-HDRs, that also results in a track count reduced by half. Most mixers that support 24/96 operation over TDIF I/O, such as the Tascam DM-24, also lose access to half their faders when operating in this mode (but, thankfully, each 24/96 channel shows up on only one DM-24 fader).

Things are a bit less cumbersome when using TDIF in DAW land: the MOTU 2408mk3 I/O box records each 24/96 digital audio channel received over its TDIF lines to one track in Digital Performer. Note that although the Apogee AD16, Rosetta 96, and PSX-100 converters are 24/96-capable and include TDIF connections, they cannot handle 24/96 operation over TDIF lines.

Apogee ABS96. A proprietary format developed by Apogee Electronics, Apogee ABS96 combines bit-splitting and sample-splitting techniques to allow you to record two channels of 24/96 digital audio on an 8-channel, 16-bit recorder. The Apogee Rosetta 96 A/D and PSX-100 A/D/A converters both offer ABS96 mode. You'll need the latter unit to decode any tracks that have been encoded in ABS96 format.

2-CHANNEL FORMATS

Double-wire AES. Also known as double-wide AES, double-wire AES mode sends one channel of 88.2 or 96 kHz digital audio down each AES/EBU cable. Thus, two connectors are required for a stereo signal, whereas only one connector is needed to send two channels of 24-bit, 44.1 or 48 kHz audio. Use of the double-wire AES format is not very common anymore, because an AES/EBU spec was formalized for "single-wire/double-speed" (88.2 or 96 kHz) transmission of two channels down one AES/EBU cable. That said, Tascam's DM-24 mixer, DA-98HR 8-track recorder, and MX-2424 SE hard-disk recorder; Benchmark's AD2402-96 A/D converter; Prism Sound's Dream AD-2 A/D converter; and Apogee's Rosetta 96 and PSX-100 converters all support double-wire AES mode in addition to the now-standard single-wire/double-speed AES mode. (The Tascam MX-2424 SE requires an option card to enable double-wire AES operation.)

Single-wire/double-speed AES. Like the regular AES/EBU format that we've always used, the single-wire/double-speed mode sends two channels of 24/96 audio down one connector, but at

The Digidesign 192 I/O can operate at up to 192 kHz sampling rate (using double-wire AES mode) and provides switchable, real-time sampling-rate conversion by way of its digital inputs.

The Apogee PSX-100 converter performs real-time format conversion in addition to A/D and D/A conversion.

SONAR MAKES ME INVINCIBLE

> SHAWN CLEMENT

Shawn Clement is one of the most prolific composers for film, television and video games on this planet. Always ready to take on the toughest assignments and the tightest deadlines. His secret weapon? SONAR, the award-winning, digital multitrack recording system from Cakewalk.

For his most recent battle, Shawn used SONAR to produce the soundtrack for the best-selling *Batman Vengeance* video game. With seamless audio and MIDI recording, automatable DirectX effects, powerful audio looping tools, and high-performance DXi soft synths, SONAR is the utility belt of music production. It's everything you need to record, edit, mix and deliver your next project on time and under budget.

SONAR. It gives you super powers.

JOIN THE AXIS OF AUDIO

Cakewalk, Native Instruments and Waves unite for a tour of over 90 U.S. music stores this fall. Visit www.cakewalk.com/axis for details.

2.0

SONAR™

New for 2.0

- Cyclone DXi Groove Sampler
- Support for Reason, ReBirth, and other ReWire synths
- Global control surface support, with presets for MotorMix, Tascam US-428 and others
- Multi-port drum editor
- ACID file export
- More

SONAR is available at music retailers worldwide.
Find out more at www.cakewalk.com/SONAR or call 888.CAKEWALK (617.423.9004 outside U.S.).

cakewalk®

twice the usual sampling rate. Products that support single-wire/double-speed AES mode include the Yamaha 02R96 and Tascam MX-2424 SE digital mixers; MOTU's 896 and 1296 DAW I/O boxes; Digidesign's 192 Digital I/O, 192 I/O, and 96 I/O boxes; Lucid's AD9624, Swissonic's AD96 mk2, Benchmark's AD2402-96, dB Technologies' AD122-96 MK.II, Sek'd's ADDA 2496 S, Prism Sound's Dream AD-2, and Sonifex's Redbox converters; and Apogee's Rosetta 96, PSX-100, Trak2, Mini-Me, and AD16 (with optional card) converters.

Double-speed S/PDIF. Double-speed S/PDIF is an unbalanced version of the single-wire/double-speed AES format, except that the S/PDIF flavor also uses a different voltage and impedance than AES/EBU. Products that support the double-speed S/PDIF format include the Yamaha 02R96; the Tascam MX-2424 SE; the MOTU 2408mk3;

RESOLUTION CONFLICTS

This table shows a sampling of currently available high-resolution digital audio products and the 24/96 data formats they support (indicated by a √ mark). As long as they offer compatible sampling frequencies and word-clock rates, any two products that support the same format should be able to work together in 24/96 operation (with the possible exception of products that sport FireWire or USB ports, which are included here only as a handy reference to show which DAW I/O boxes support 24/96 computer connectivity).

The I/O that a product provides is implicit in its supported formats. For example, a product that supports S/MUX format will provide ADAT Lightpipe I/O. Some products may require an option card to enable a particular format that is noted here as being supported.

	S/MUX or compatible format	96 kHz TDIF	Apogee ABS96	Double-wire AES	Single-wire/ Double-speed AES	Double-speed S/PDIF	FireWire	USB
Alesis ADAT HD24	√							
Apogee AD16	√				√			
Apogee DA16	√							
Apogee Mini-Me					√	√		
Apogee PSX-100			√	√	√	√		
Apogee Rosetta 96			√	√	√	√		
Apogee Trak2					√	√		
Benchmark AD2402-96				√	√	√		
dB Technologies AD122-96 MK.II					√			
Digidesign 192 Digital I/O					√	√		
Digidesign 192 I/O					√	√		
Digidesign 96 I/O					√	√		
Digidesign Digi 002						√	√	
Edirol UA-5						√		√
Edirol UA-700						√		√
Lucid AD9624					√			
M-Audio Duo						√		√
M-Audio Quattro								√
Mackie HDR24/96	√							
Mackie MDR24/96	√							
Mackie SDR24/96	√							
MOTU 1296					√			
MOTU 2408mk3	√	√				√		
MOTU 896					√		√	
Prism Sound Dream AD-2				√	√	√		
Sek'd ADDA 2496 S					√	√		
Sonifex Redbox					√	√		
Swissonic AD96 mk2	√				√	√		
Tascam DA-98HR				√	√			
Tascam DM-24		√		√	√			
Tascam MX-2424 SE				√	√	√		
Yamaha 02R96	√				√	√		

From mic-pre to CD...

DPS24 DIGITAL PERSONAL STUDIO

The DPS24 is the only affordable integrated hardware digital workstation that offers 24 tracks of recording without data compression. Most types of data compression throw out portions of your audio during recording, and use a mathematical algorithm to approximate the original audio upon playback.

Data compression can adversely affect your audio quality and stereo imaging, especially with multiple generations of track bouncing.

Kind of sounds like your old cassette multi-track, doesn't it?

It's important to know what you're getting when you invest in any recording solution. The DPS24 was designed from its inception as a professional production tool and not simply a scaled-up portable studio.

We combined a 24bit/96kHz linear 24-track hard-disk recorder, a 46-input moving-fader automated digital mixer, a sample-accurate multi-track graphic waveform editor, 4 stereo multi-effects processors, ak.Sys TrackView and VST plug-in platform software, and a CD mastering and archiving suite, without creating the performance or user interface compromises found in many integrated workstations.

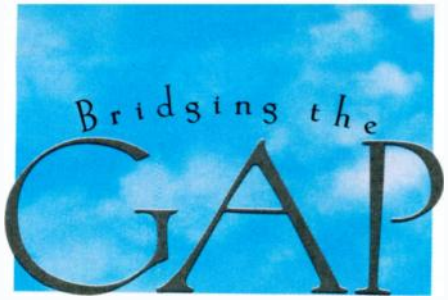
Utilizing our Q-Link navigation design, the DPS24 offers access to any major function with one button press. The Q-Channel strip of automated LED rotary controls enables instant access to any channel strip on the mixer.

Features like two banks of inputs to eliminate re-patching, balanced channel inserts which enable external mic preamps to bypass the on-board preamps, multi-function Q-Knobs for realtime effects control, and up to 24 channels of ADAT I/O offer professional production capabilities that give you the real-world advantages you need to bring your artistic vision to its full potential.

AMC ph: 817-491-9208 fax: 817-222-1490
In Canada: ph: 905-405-1229 fax: 905-405-1885

akaipro.com

In stores now AKAI professional



Digidesign's 192 Digital I/O, 192 I/O, 96 I/O, and Digi 002; the M-Audio Duo USB mic preamp; and the Prism Sound Dream AD-2, the Swissonic AD96 mk2, the Sek'd ADDA 2496 S, the Benchmark AD2402-96, the Sonifex Redbox, and Apogee's Rosetta 96, PSX-100, Trak2, and Mini-Me converters. The Edirol UA-5 and UA-700 DAW I/O boxes also both support 96 kHz, but not 88.2 kHz, I/O over S/PDIF lines.

COMPUTER CONNECTIVITY

IEEE 1394. Also known as FireWire, IEEE 1394 is an industry-standard specification developed by the Institute of Electrical and Electronics Engineers (IEEE) for connecting consumer audio and video devices to each other and to computers. However, companies such as MOTU and Digidesign also use IEEE 1394 for connecting their professional I/O boxes to DAWs. The FireWire interface on the Power Macintosh G3 and G4 uses Apple's implementation of IEEE 1394. The original FireWire protocol, IEEE 1394a, provides 100 to 400 Mb per second (Mbps) bandwidth. A new implementation of FireWire, dubbed IEEE 1394b, is just around the corner and will provide up to 3.2 Gb per second bandwidth.

The MOTU 896 and Digidesign Digi 002 both use IEEE 1394a/FireWire for bidirectional 24/96 digital audio connectivity with a computer-based DAW.

USB. USB is another type of bus used to get digital audio (and MIDI) data in and out of a computer. All of the USB-based digital audio devices that I'm aware of use the original USB spec, which provides 12 Mbps bandwidth. By the time you read this, however, devices using the new Hi-Speed USB 2.0 protocol should be out. USB 2.0 provides 480 Mbps throughput, which should dramatically increase track counts as compared with current USB capability.

The M-Audio Duo and Quattro and the Edirol UA-5 and UA-700 are examples of I/O boxes that offer 24/96 audio transmission over USB to and from computers. Due to USB's bandwidth limitations, each of these four products can deliver only two simultaneous tracks at 96 kHz sampling rate, and none of them can record and play back tracks simultaneously. Although the USB-based Apogee Mini-Me can output 24/96 audio by way of its AES/EBU and S/PDIF jacks, the unit's USB port can dish out only 44.1 and 48 kHz rates.

From the above discussion of formats (and referring to the table "Resolution Conflicts"), we can see that the Yamaha 02R96 mixer and Tascam DA-98HR recorder cannot work together in 24/96 mode. Neither the Mackie HDRs nor the MOTU 896 and 1296 I/O boxes can communicate with the Tascam DM-24 mixer in 24/96 operation. And neither the DA-98HR nor the DM-24 can receive 24/96 digital audio from the dB Technologies AD122-96 MK.II, the Lucid AD9624, the Sek'd ADDA 2496 S, the Sonifex Redbox, the Swissonic AD96 mk2, or the Apogee AD16, Trak2, or Mini-Me converters. Clearly, it pays to confirm interoperability of all 24/96 gear that

MANUFACTURERS

Alesis
tel. (401) 295-9000
e-mail info@alesis.com
Web www.alesis.com

Apogee Electronics Corporation
tel. (310) 915-1000
e-mail info@apogeedigital.com
Web www.apogeedigital.com

Benchmark Media Systems, Inc./ Sonic Sense, Inc. (distributor)
tel. (800) 262-4675 or (315) 437-6300
e-mail sales@benchmarkmedia.com
Web www.benchmarkmedia.com

dB Technologies/Lavry Engineering, Inc. (distributor)
tel. (206) 381-5891
e-mail jeff@lavryengineering.com
Web www.dbtechno.com

Digidesign
tel. (800) 333-2137 or (650) 731-6300
e-mail prodinfo@digidesign.com
Web www.digidesign.com

Edirol Corporation North America/ Roland Corporation U.S. (distributor)
tel. (323) 890-3700
e-mail edirol@edirol.com
Web www.edirol.com

Lucid
tel. (425) 742-1518
e-mail info@lucidaudio.com
Web www.lucidaudio.com

M-Audio
tel. (626) 445-2842 or (800) 969-6434
e-mail info@midiman.net
Web www.m-audio.com

Mackie Designs
tel. (800) 258-6883 or (425) 487-4333
e-mail productinfo@mackie.com
Web www.mackie.com

Mark of the Unicorn, Inc. (MOTU)
tel. (617) 576-2760
e-mail info@motu.com
Web www.motu.com

Prism Sound/Prism Media Products Ltd. (distributor)
tel. (973) 983-9577
e-mail sales@prismsound.com
Web www.prismsound.com

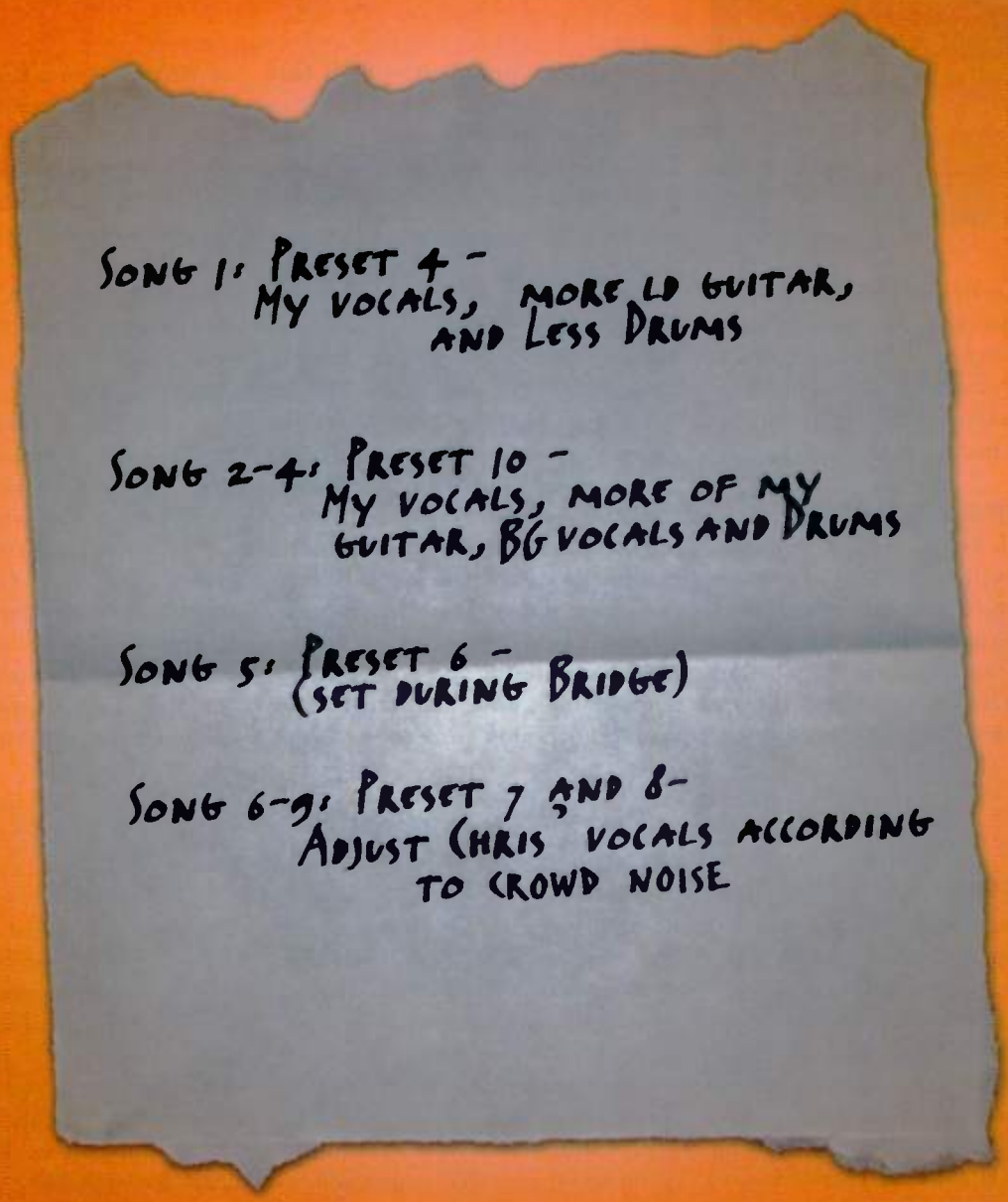
Sek'd/plus24 (distributor)
tel. (800) 330-7753 or (323) 845-1171
e-mail info@sekd.com
Web www.sekd.com

Sonifex Ltd./Independent Audio (distributor)
tel. (207) 773-2424
e-mail sales@sonifex.co.uk
Web www.sonifex.co.uk

Swissonic/plus24 (distributor)
tel. (800) 330-7753 or (323) 845-1171
e-mail info@swissonic.com
Web www.swissonic.com

Tascam
tel. (323) 726-0303
Web www.tascam.com

Yamaha Corporation of America
tel. (714) 522-9011
e-mail info@yamaha.com
Web www.yamaha.com



(Your personal mix. In your monitor. At the touch of a button. Simple.)

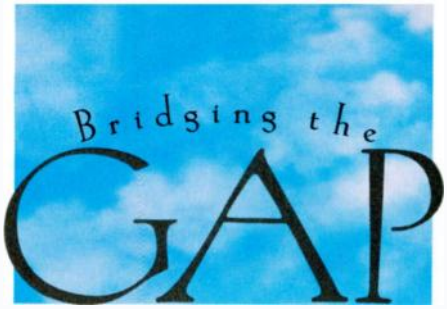
How cool would it be if each player in the band could easily adjust their own monitor mix? Or recall individual preset mixes for a whole gig? Or even tweak a mix during a song? Well now you can. Designed by musicians and recording engineers to solve a problem that all performers and studio musicians face, each digital A-16 Personal Monitor Mixer™ offers a unique output mix that can be adjusted in real time. It's simple to set up, simple to use, and fits nicely on a mike stand. Want to know more? Check out our website today. And take control of your monitor.

AVIOM INC. | 1157 Phoenixville Pike | Suite 201 | West Chester, PA 19380
610.738.9005 | www.avominc.com

A-16 Stereo Mixer
(Shown Above)
10.75 x 5.6 x 2.25"

A-16T Transmitter
(Not Shown)
1-U Rackmount

AVIOM™
TO EACH HIS OWN.



you're interested in before you buy.

Now that you have a handle on the formats currently available for 24/96 digital audio production, let's examine what you need to know about high-resolution delivery formats for your masters.

PREPARING YOUR MASTER

If you decide to dive in to 24/96 digital audio production, you'll need to know what delivery formats mastering houses and authoring facilities can accept. Many DVD-mastering and -production facilities prefer that you send them a copy of your mixes on a hard drive. Roger Talkov, president of DVD Labs (a DVD-Audio and DVD-Video production house located in Cambridge, Massachusetts), notes that delivering your project on a hard drive "precludes the need to restore [from the masters you provided] and back up. We also get Retrospect backups on Quantum DLTs." DLT (digital linear tape) can hold up to 80 GB of data on a single cartridge.

DVD Labs can also accept AIFF or WAV files on CD-ROM, DVD-ROM, or Alesis Masterlink discs. For surround-sound projects, which contain multiple tracks for each mix, Talkov emphasizes the importance of making sure that all of your files are saved on your DAW timeline so that they play together in sync.

Lance Clark, multimedia engineer at Gateway Mastering and DVD (in Portland, Maine), notes that most of the masters he receives arrive as 24/96 AIFF or WAV files on a hard drive. He also gets a lot of masters delivered on Tascam HR tape (the format used by Tascam's high-resolution, tape-based MDMs). Clark also notes that Gateway can also accept CD-ROMs, but the company does not receive many CD-Rs in Masterlink format. Although Gateway also masters projects for SACD (a competing high-resolution format to DVD-Audio), Clark observes that such work is currently "slim." He says that the number of projects that Gateway masters for SACD release are perhaps only 1 in every 10 or 12 projects it receives.

Digital Domain's Katz says that he often receives 24/96 and 24/88.2 files, even though he masters for 16-bit, 44.1 kHz CD release. He occasionally receives mixes on hard disks in Pro Tools format, "but 99 out of 100 projects that come to me have been on CD-R." Katz notes that

WHICH SAMPLING RATE SHOULD I USE?

Most people who currently work with high-resolution digital audio prefer using the 96 kHz sampling rate and 24-bit word lengths for their productions. Roger Talkov of DVD Labs cites this as the most common format for both stereo and surround-sound DVD-A (DVD-Audio) discs. That's mostly because 96 kHz is a little easier to work with if your project will also include video content. Read on to learn why this is so.

Despite all the concerns a couple of years ago about whether DVD-A discs would play in early-model DVD-Video players, the DVD disc has turned out to be fairly universal. (Of course, a DVD disc won't play in a CD player.) DVD discs can play in either DVD-Audio or DVD-Video players because audio content is stored in a different format compatible with each type of player and on separate portions of the disc. Many DVD-Video discs use the Dolby AC-3 compression format for encoding their audio content, and the Dolby digital encoder wants to "see" a 48 kHz sampling rate to do this work. Converting a 96 kHz sampling rate to AC-3 is a little easier than converting a rate of 88.2 kHz because 96 is an integer multiple of 48 ($2 \times 48 = 96$). That simpler processor "math" should theoretically result in a more pristine conversion. That's why you're better off using a 96 kHz sampling rate if your DVD project will include video content.

Although the DVD-A spec also includes support for 176.4 and 192 kHz sampling rates, and all DVD-Audio players are capable of playing audio at those rates, they have very rarely been used to date.

In some cases, a studio might be planning to release a project on both DVD and CD. If only one mix will be produced for both release formats, the engineer might choose to mix at the 88.2 kHz sampling rate. Because 88.2 kHz is an integer multiple of the CD-format's 44.1 kHz rate, downsampling an 88.2 kHz mix for CD release should theoretically cause less degradation than downsampling a non-integer-multiple 96 kHz mix. Accordingly, Talkov sometimes receives 88.2 kHz masters for DVD authoring. Gateway Mastering and DVD, on the other hand, reports that it rarely receives 88.2 kHz DVD-A files to accommodate conversion to Red Book CD format. "In fact," Gateway's Lance Clark says, "I think we've done only one DVD-A disk at 88.2 kHz."

Downsampling theory notwithstanding, Talkov says that "there are excellent sampling-rate converters that will take 96 kHz to 44.1 kHz okay." Bob Katz of Digital Domain, however, takes a stronger stance on this subject. He asserts that, considering the pristine performance of the best sampling-rate converters available today, there is no practical reason ever to use the lower 88.2 kHz sampling rate in lieu of 96 kHz. "We're talking one flea's worth of audible difference" between 88.2 and 96 kHz files, Katz says. "Still, I've been pushing for 96 kHz. It seems to be a touch warmer, but only because the filter is just a little bit farther out." Preferences aside, Katz also regularly accepts 88.2 kHz files for CD mastering.

an entire album's worth of 24/96 stereo mixes will typically fit onto three or four CD-Rs. He calls Masterlink a "fantastic delivery format" for this purpose, but he is also comfortable using any CD-ROM containing AIFF or BWF-type WAV interleaved files. (Broadcast WAV Format, or BWF, adds time-stamping to regular WAV files.) Because he has encountered incompatibilities among various DVD writers and readers, Katz does not recommend putting your files on DVD-R at this time.

BIT (OF) RESOLUTION

As this article has made clear, many currently available 24/96-capable products suffer substantial trade-offs in functionality in return for promised higher fidelity. If you've had the chance to audition 24/96 audio gear and you like what you hear, the only question that remains (besides affordability) is whether you can accomplish your goals with it.

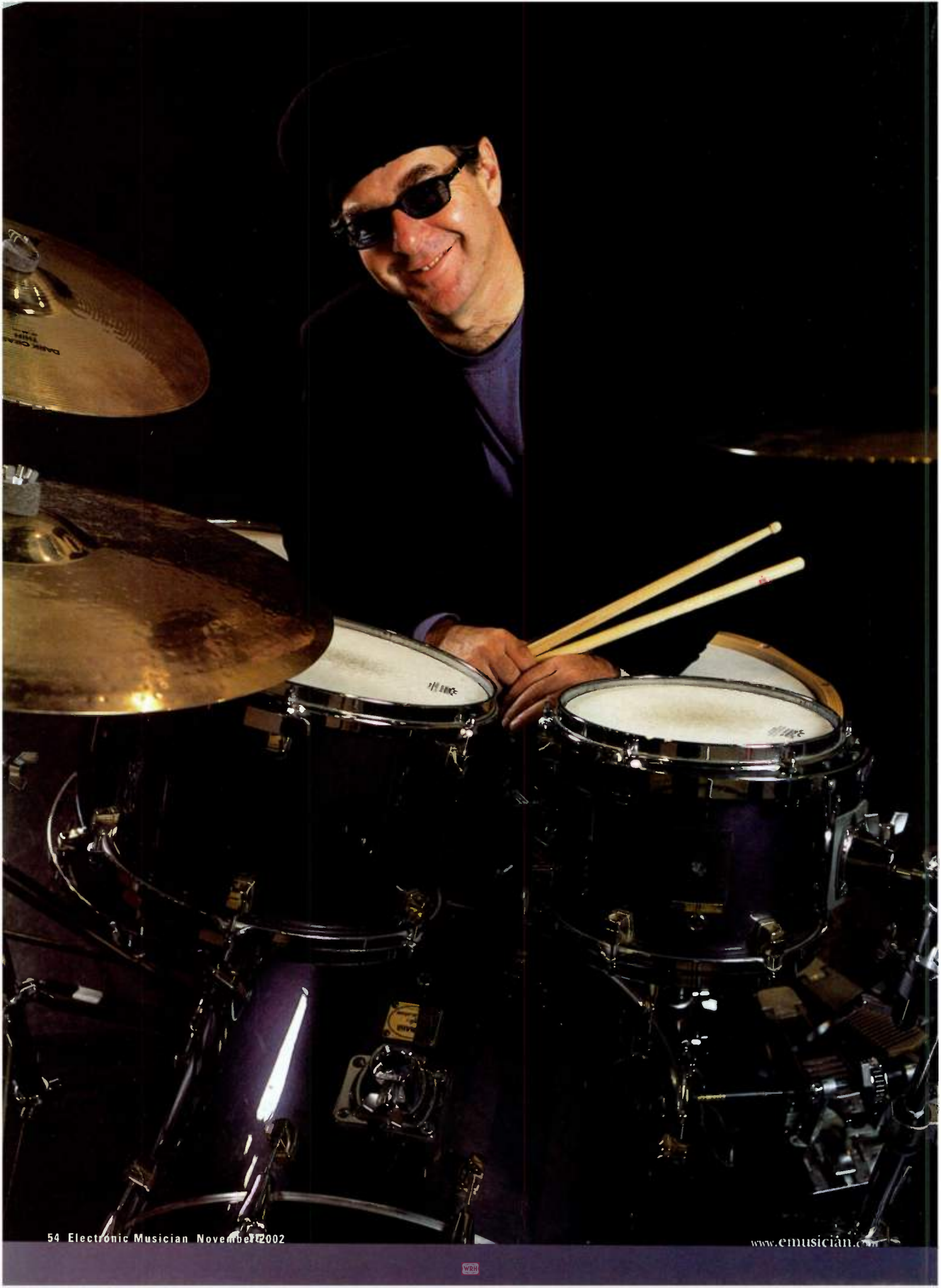
As Larry the O says, "with most of the 96 kHz devices in the **EM** readership's price range, all of your facilities are halved as soon as you go to 96 kHz. In the case of mixers, you no longer have enough channels to do a mix of any level of complexity. Just doing bass and multimiked drums will use up most of your available channels at 96 kHz, leaving no room for guitar, vocals, or whatever. If you're doing a small ensemble like a jazz trio where you're only using one or two mics on the drums, then you might be able to do 96 kHz." Of course, as more products such as the Yamaha 02R96 (which retains its full complement of channel faders in 88.2 and 96 kHz modes) become available, the O's concerns will become moot. Looking even further into the future, TDIF and Lightpipe protocols could easily fade away as more people migrate to DAWs equipped with FireWire.

"Doing bit-splitting techniques and doubling up on things," Elen says, "you end up with a lot of real estate being taken up by connectors. Today you have one little connector [FireWire] that will handle 400 mbps." And with the imminent arrival of 1394b, one can't help but wonder how long it will be before *all* the digital audio devices in our studio will be connected by FireWire into one large peer-to-peer network.

Make no mistake: our industry is in the midst of a radical transition. Only you can decide when is the right time—if ever—to dive in. If and when you do, hopefully this article will have armed you with the information necessary to make informed decisions in this brave new world of 24/96 digital audio.

Michael Cooper *is an* **EM** *contributing editor and owner of Michael Cooper Recording, located in beautiful Sisters, Oregon.*

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.



Opening photo by Dave King

figMENTS Become Reality

Anton Fig, longtime drummer on David Letterman's *Late Show*, emerges from behind the kit as an artist-producer.

By Matt Gallagher

For 16 years, Anton Fig has held the drummer's chair in Paul Shaffer's world-class TV-studio bands—first at NBC and then at CBS where he currently anchors Shaffer's CBS Orchestra on the *Late Show with David Letterman*. In addition to his music duties, Fig is always ready to punctuate Letterman's comedy with a well-placed snare roll and cymbal crash, serving as "part circus drummer," in Fig's words. By virtue of appearing on the show five nights a week, Fig is certainly one of the most visible musicians in all of show business.

During his years with Letterman, Fig has backed up musical guests such as Miles Davis, James Brown, Aretha Franklin, Al Green, Paul Simon, and Bruce Springsteen, to name just a few. The CBS Orchestra is also the official house band of the Rock 'n' Roll Hall of Fame and was chosen for The Concert for New York City at Madison Square Garden in October 2001, backing up Paul McCartney, Eric Clapton, James Taylor, and other all-star performers.

Born and raised in Cape Town, South Africa, Fig had difficulty gaining access to the American and British popular music of the 1960s that fired his imagination. In 1970, at age 18, he left South Africa for the United States, enrolling at the New England Conservatory of Music in Boston. Fig studied both jazz and classical music and in 1975 earned a bachelor's degree with honors in classical music. He moved to New York City in 1976, where he built a career as a live performer and session musician, appearing on more than 100 albums. In the past 25 years, Fig has recorded with the likes of Joan Armatrading, Booker T and the MGs, Paul Butterfield, Joe Cocker, Bob Dylan, Ace Frehley, Kiss, Mick Jagger, Cyndi Lauper, Madonna, and Warren Zevon.

In April 2002, Fig released *Figments*—his debut album as a solo artist and producer—on his own label, Planula Records. Fig plays drums, percussion, keyboards, rhythm guitar, and bass on the album. He also enlisted a number of guest artists, calling on the talents of Sebastian Bach, Randy Brecker, Blondie Chaplin, Donald "Duck" Dunn, Ace Frehley, Richie Havens, Adam Holzman, Ivan Neville, Brian Wilson, and a host of others. Paul Shaffer and CBS Orchestra members Alan Chez, Felicia Collins, Will Lee, and Sid McGinnis also guest. The album features 13 eclectic tracks of Fig's original music, including several songwriting collaborations.

Figments (which is available only at www.antonfig.com) is the result of several years' worth of Fig's songwriting and demos as well as three and a half years' worth of recording. Although he is a veteran of commercial-studio sessions, Fig has maintained a personal studio since the late '70s and chose to record *Figments* in his home. Pro-audio consultant David Frangioni helped build a Digidesign Pro Tools system specifically for recording, editing, and mixing *Figments* in Fig's Manhattan apartment.

Fig recorded most tracks in his apartment, but he kept his neighbors happy by recording his foundational acoustic drum tracks in two commercial studios. He then wove succeeding parts on top of the drums, meticulously editing live performances in Pro Tools.

I spoke with Fig about his personal studio, the challenges of piecing together *Figments*, and his enviable job on the *Late Show*.

PRODUCTION VALUES

figMENTS Become Reality

The Letterman gig is perhaps the greatest day job that a drummer could ever wish to have.

Oh yeah, it's incredible. It's steady, you get visibility, and you get to play with great people.

You certainly have the right background for the job.

I knew a lot of the songs that Paul [Shaffer] knew. That was a big plus. I was a studio musician with a rock sensibility. A lot of studio musicians came from a more jazzy place. I always said that I was not a studio musician; I was a rock guy who could also do sessions. I considered myself a rock drummer who studied jazz and classical music to make myself a better musician.

That approach has served you well on the Letterman show, which requires that you play a variety of musical styles convincingly.

I've always felt that what makes the styles different are the nuances: just go for the groove and take the trouble to study a few of the nuances. You may not be able to play like someone who's immersed himself in that style forever, but you'll be able to create a nice groove so that the music will still sound and feel good. The drummer is often like the shepherd who's corralling everyone into the same time space.

What is your weekly schedule like?

We work Monday to Thursday, doing two shows on Thursday. We get our schedules fairly well in advance, so within that, I try and arrange the other stuff that I want to do. The show has to take precedence, but I'm able to play in the clubs at night and do a bunch of recording as long as people are prepared to work within the confines of the Letterman schedule. I was doing the record pretty much from around 12:00 to 3:30 p.m. every day. I live a 17-minute walk from the show, so I worked right up until the last minute and just walked over to the show.

What was it like growing up in Cape Town, and how did it affect your music?

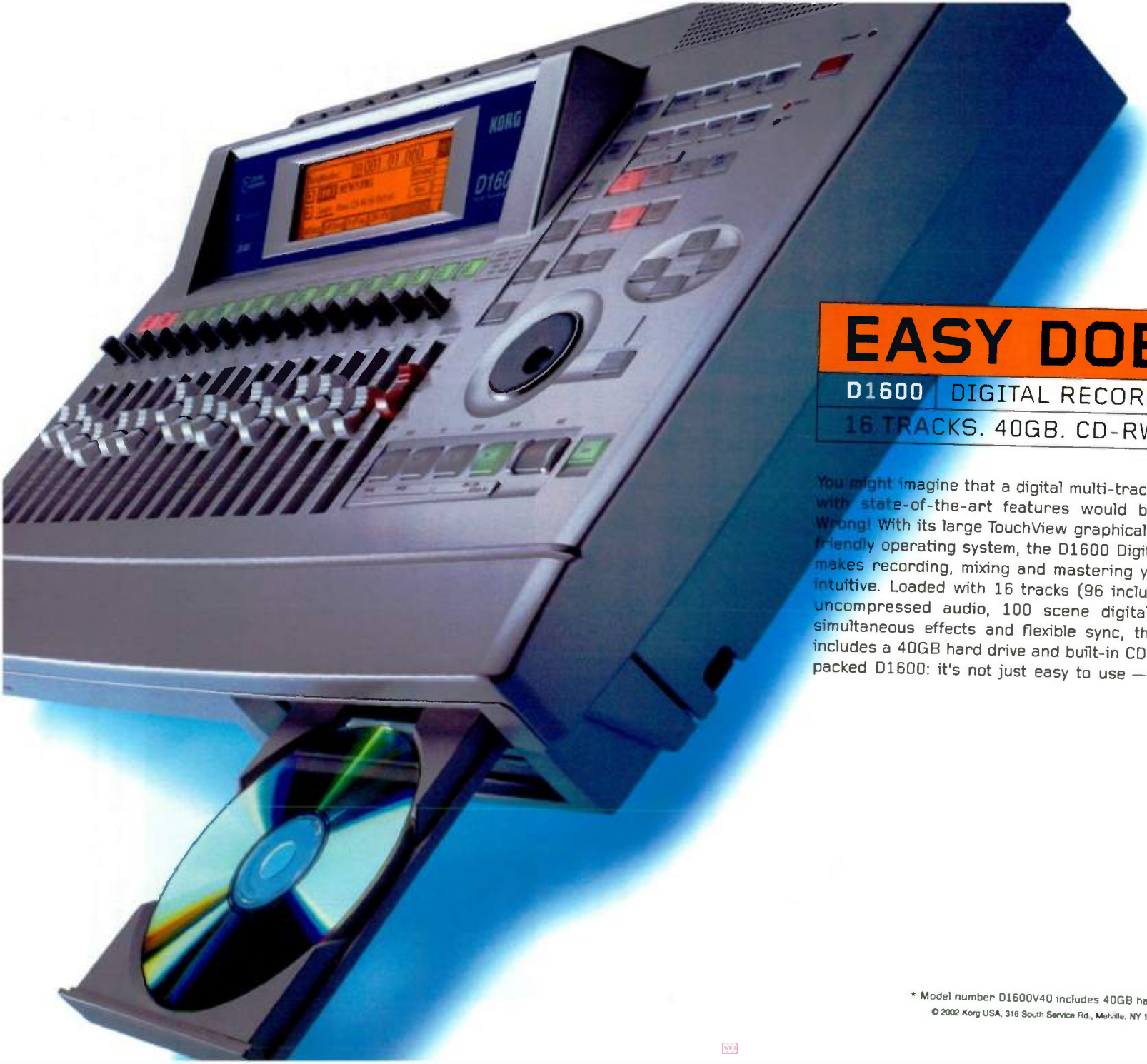
Very few touring acts came down. What we did have was African music on the radio. There were short-wave radio stations in a place called Lorenzo Marques—which is now Mozambique—that rebroadcast American stations, so we got to hear songs through garbled short-wave radio. The movie *Woodstock* came down, and we saw that. I went overseas one time on a trip with my parents and bought records while I was in London. I brought them back to South Africa, and then we kind of caught up, but it was relative. A person in Cape Town could become a celebrity on the basis that they saw a Led Zeppelin concert overseas. That's how isolated we were. But the good thing about that is we were forced to develop our own ways of doing and playing things, because there was so much in our imagination. We never saw anything.

My folks were very supportive. I was playing in bands from about age eight on. When I was 18, I started to get into jazz, and I wanted to hear the musicians firsthand and absorb all the musical influences over here. My folks said that I could go overseas provided that I got a degree, and so they facilitated that.

You later moved from Boston to New York to pursue your professional music career.

The CBS Orchestra in action on the *Late Show with David Letterman*. Pictured are (clockwise from drums) Anton Fig, Tom "Bones" Malone, Alan Chez, Bruce Kapler, musical director Paul Shaffer, Felicia Collins, Will Lee, and *Late Show* music coordinator Chris Schukei. Guitarist Sid McGinnis is not pictured.

JOHN FILO/CBS



EASY DOES IT.

D1600 DIGITAL RECORDING STUDIO

16 TRACKS. 40GB. CD-RW. GET READY.

You might imagine that a digital multi-track recorder brimming with state-of-the-art features would be hard to operate. Wrong! With its large TouchView graphical interface and user-friendly operating system, the D1600 Digital Recording Studio makes recording, mixing and mastering your music easy and intuitive. Loaded with 16 tracks (96 including virtual tracks), uncompressed audio, 100 scene digital mixing, up to 11 simultaneous effects and flexible sync, the D1600 now even includes a 40GB hard drive and built-in CD burner.* The power packed D1600: it's not just easy to use — it's easy to master.

KORG

* Model number D1600V40 includes 40GB hard drive and built-in CD-RW.

figMENTS Become Reality

I got to New York [in 1976] and tried to fit in doing a few jazz gigs, but people were talking about getting back to their roots. I thought, "My roots are in Africa, but they're also in rock music." I tried going back into rock music, and all sorts of doors opened. I suddenly got a lot of good jobs freelancing around the city. In the late '70s, I formed a band called Spider with some friends of mine who were from South Africa.

How did you get started with home recording?

[Spider's record] label was very song oriented, so it got us those original 4-track [Tascam] Portastudios and encouraged us to put down demos. The Portastudios had just come out back then. I had one in the apartment, and I would try and write songs. I found myself doing creative things on the side with synths and sounds—little abstracts—and I enjoyed being able to work late at night and do whatever I wanted to do on those things. The Portastudio evolved into an 8-track Tascam with an [Akai] MPC60 and some synthesizers. In the beginning the MPC60 kept the sequences together. When I got the new equipment, I transferred all that [MPC60] stuff over to the Akai S3000.

What inspired you to do your album?

It came from enjoying working on the Portastudio many years earlier. I don't consider myself a prolific writer, but I do enjoy putting pieces of music together and collaborating with other people. Over the years, I kept up the writing and amassed a small body of work that I always wanted to record properly.

At some point I said to myself, "If they ever offer digital recording for the home, I'm going to make a record of all these songs." Then Pro Tools came out and it became possible to record that way. I felt as though it would change the nature of the record business because people wouldn't be dependent on a record company giving them a large sum of money to make their record. Digital recording in the home isn't cheap, but it's not that expensive compared with what the budget for making a record used to be. I'm not saying that it has to be Pro Tools—there are alternatives—but that way of recording is pretty prevalent these days.

I never approached anybody about making this record. I just told myself from day one that I was going to do it the way that I wanted it to be. So I got a bank loan—I was very lucky that I had the steady Letterman paycheck—and assembled a little system in my house. David Frangioni helped advise me about the gear and the routing of the studio [see the sidebar "Planning Planula Studios"]. We had lots of phone conversations.

The album was 70 to 80 percent written before I started producing it. I was a little concerned because the songs weren't all exactly in the same vein. I didn't want the album to sound like a hodgepodge of different things, but I figured that since I was producing and playing drums on the whole thing and starting each song from scratch and seeing it through, that somehow the album would take on a particular sound.

How do you compose songs?

I write most of the stuff on the keyboard. I usually end up at a completely different place from where I started. I'll get either a drumbeat or a loop going, or I'll just mess around with the chords and sing melodies and some words.

Basically, I had these songs in MIDI form, and then I started to add live instruments and take the MIDI stuff away. In some cases I kept the MIDI stuff, and in other cases I didn't. The recording process was the same, though.

I would record the drums first. I'd play them to the MIDI stuff, or whatever click I generated. The drums were done in a [commercial] studio. I would record them on [2-inch] analog tape, convert that to ADAT, and bring the ADATs back into my studio. I would do a couple of songs on the 2-inch tape, put that into the computer, and then use that 2-inch tape again. Toward the end, we just went straight to Pro Tools.

Where did you record the acoustic drums and the percussion tracks?

At Avatar, which is the old Power Station, and at Dangerous Music, which is like someone's living room, but they have a Neve-Studer combination.

DAVE KING

Anton Fig's Pro Tools–based rig resides in a tiny, 9 × 10-foot room within his Manhattan apartment, which proved to be a difficult mixing environment.

ENGINEERING FIGMENTS

Anton Fig hired Weld, a New York City musician and freelance engineer, to engineer *Figments* and to help manage Fig's studio. Weld says his role in the *Figments* project "was basically to help the whole process run smoother. The studio that Anton built presented a big learning curve for both of us. We started with the 16-voice Pro Tools system and one [DSP] Farm card—not the original system, but one of the early ones—and a 4-gig drive. From there, we kept updating and expanding to the current Mix Core system with three Mix Farm cards." According to Weld, his assistance allowed Fig to "focus more on the music and the production. I would deal with the day-to-day issues."

Weld prepared 8-track submixes on ADAT tapes to send to musicians in remote studios. "When we received the tape back, I would be responsible for getting the performance back into the computer onto the hard drive and keeping everything in sync," he says. "When a musician would come by to record, my job was to set up the headphone mix and the mics, and to get the performance to binary as transparently as possible." He also helped Fig adapt to his difficult monitoring environment. "You have to bring in reference material, listen to it, and see just how different the room is from larger studios. Once you get used to how it sounds, it works well. After a while, you intuitively know what frequencies to listen for."

At the core of Fig's studio is a "beefed up" Power Mac 9500. "I think it had a 132 MHz processor, but we upgraded it to a 300 MHz G3 processor," Weld says. "We added an ATI video card and the Adaptec 2940 Ultra SCSI accelerator card. A lot of this technology is now a bit dated. We used [Dantz Development] Retrospect Backup, an archiving program for backing up data to DDS-3 DAT backup tape. We have three or four Glyph [storage] drives and the Yamaha CD burner. The Yamaha 02R was used as an analog input for the outboard synths and for dialing in a little compression or EQ for a Pro Tools submix." He adds that "the [Mark of the Unicorn] MTP-AV is the master clock for the whole studio."

Because *Figments* sessions regularly took place outside of Fig's studio, transferring audio files was critical. "When we were doing submixes to ADAT, we would use MIDI Machine Control with Pro Tools as the transport control," Weld says. "The MTP-AV remained the time base. The great thing about the 02R is that its digital inputs are assignable. The 02R has the AES/EBU interfaces and the ADAT optical interface, so all the data could be routed digitally from Pro Tools to the ADAT or vice versa. On a couple of songs, we easily adapted this method to the [Tascam] DA-88 DAT machine, as well. This allowed the other studios to use as many slave tapes as they desired. As long as our tape was the positional reference for them, any additional tapes would come back locked with our session.

"We tried to take advantage of the big studios," he continues, "so we recorded 12 tracks of drums and did three or four takes of each song. When we got the files back into Pro Tools, we were looking at 46 to 48 tracks of drums. We would group tracks for each take and then create another set of empty tracks that would become the edited drums. Anton would decide what he liked and paste them into the new composite tracks. When he finished editing drums, any unused files were cleared and the remaining files were truncated using Pro Tools' Compact function—after we made safeties of all the initial takes."

When bringing your Pro Tools files to another studio for recording or overdubs, Weld advises that you first find out whether your system is compatible with theirs. "We always call ahead to find out the version number of the system that they're using at the studio, just to make sure that there are no compatibility issues," he says. "You don't want to show up at the studio and find out that your session won't open all because they have an older version than you do."

Weld confirms that he and Fig processed most tracks within Pro Tools, including vocals, which they recorded flat through a Focusrite Voicebox. "That's when we had our fun," he says, adding that they used Waves, Bomb Factory, Line 6, and native Pro Tools plug-ins. "We didn't use much EQ going into Pro Tools. I remember once we added a little bit of top end on the vocals, but that was just 2 or 3 decibels."

As he mixed individual tracks, Weld would focus on the song at hand rather than worrying about how one track sounded against another, even if the tracks had a time-span difference of more than three years. "We didn't zero the board and mix from scratch when the recording was complete," he says. "It's Anton's album, so his spirit is going to be there. It's a part of who you are, and that comes across in the music and provides the essential thread. The mastering engineer, Leon Zervos, also did a great job of uniting the sounds of all the songs. I just try to do what I think is right for the song at the time and help Anton get his feeling across. With a current song, I wouldn't go back and listen to a mix that was done a year ago and make sure that the hi-hat was at the same level relative to the vocal or snare. It wasn't that technical, and I like to keep evolving as an engineer."

BACKGROUND PHOTO BY DAVE KING

figMENTS Become Reality

Did you record any of the percussion tracks at home?

Yeah, I would play brushes on boxes, or play bongos and try to do funny things to the sounds and change them around. Some MIDI percussion existed from the original demo tracks.

How do you like to mic your drums?

I left that up to the engineers who were recording the drums. I didn't get into that. I just hit my drums and got a good sound. I wanted mics on the toms, and overheads, room mics, and distant room mics. I think that gives you a lot of flexibility. We recorded the drums flat onto tape.

I would either edit the drums or not, depending on how they came out. When I had the drums and the MIDI stuff, I would then get some kind of vocal on as soon as possible, whether it was the real vocal or a guide vocal. Once the drums were on, almost everything else was done at home. I recorded each musician individually, and then edited each musician's part and got it how I wanted it before I put the next person on. Basically, the next person had to play to whatever sound was created by the people that had preceded him. I had to leave gaps for what I thought might happen in the future. It's very easy to fill up all the spaces right away.

So each guest artist had to react to prerecorded tracks.

Everything was done one by one, but I was very conscious of trying to make it sound as spontaneous as possible. Sometimes you choose to leave mistakes in. I certainly didn't go around quantizing everything and making it all correct. I would leave rough edges and little things that they did—stuff that they may have played or said before the song started. I found ways to put that in the track to keep it interesting. I always had to make choices between what someone had played and where I wanted the song to go. But I always tried to get the best performance, even if it came from a few different takes.

I kept a running balance in my mind of what I thought I had and didn't have. I covered all the bases and therefore knew that I would be able to assemble it. I spent a great deal of time editing things together. I loved doing that because it felt like I was making a collage.

Did you ever use a digital audio sequencer on the project?

I started off in [Opcode's] Vision because Pro Tools had no MIDI [features]. Then I used [Emagic's] Logic in the background along with Pro Tools in the foreground, and then eventually Pro Tools added a MIDI sequencer. The album took so long to make that when I started it, Pro Tools 3.0 was the most current version of the program; by the time I had finished the album, the most current version was 5.1. Certain songs had to be reimported as we went along. The MIDI tracks were either left behind or recorded as audio files so that we could have a big audio session.

As we continued to update the Pro Tools [software], the hardware didn't change much at all. [See the sidebar "Fig's Studio Rig."] I have a good patch bay, an ADAT, the [Digidesign] 888s, and a Yamaha 02R. I had MIDI coming through one bank of 16 channels and the audio coming through the other bank.

Weld was the engineer on *Figments*. Can you tell me about his role in the project?

Weld helped engineer the whole project with me [see the sidebar "Engineering *Figments*"]. When I had a musician here, I didn't want to be trying to get a microphone to work, so he took care of that. He had a good knowledge of the studio and took charge of the mixing. It's difficult to produce a session unless you can work your studio really well, which I couldn't do in the beginning. It's nice to just concentrate on the music without also having to worry about routing and sounds. Weld worked the board while I conducted musicians through their songs and made decisions regarding their parts. Once people were done recording, Weld would refine the sounds and then I would edit the parts.

How do you use the space in your apartment for recording? Your control room is remarkably small.

It's 9 feet by 10 feet. Next to that room is my living room. We had no master plan; we just improvised as we went along. I've got one hallway, and we tried putting the guitar amp there. We used the bedroom because it seemed to sound good and people could look out the window and have a nice view at night of all the lights. If I was running a session by myself, it was easier to use the living room because I could just put my head around the corner; I didn't have to run from room to room.

I understand that you own only one microphone and that you rented microphones in certain instances.

We used my Neumann [TLM 193] for just about everything. I like to say that I made the record with three reels of 2-inch tape and one microphone. Well, that's not strictly true.

Why did you rent microphones?

Weld suggested that I get a particular microphone for Richie Havens's voice [an AKG C12 tube condenser mic], so we ordered one. We rented mics and maybe a certain guitar, or whatever.

***Figments* is the culmination of several years' worth of songwriting and recording efforts and presents 45 guest artists.**

Just What You Need

The S90 has just what you need–and nothing you don't. It's perfect for those who simply want all the award-winning MOTIF high quality sounds and one of the world's most expressive three-layer piano sounds all in an affordable, portable 88-note weighted synthesizer.

Stunning Sounds

The S90 contains the best sounds of Yamaha's flagship MOTIF synthesizer–plus a new, three-velocity layer grand piano sample!

System Expansion

Yamaha's Modular Synthesis Plug-in System expandability lets you add more polyphony (up to 190 notes), more effects, and even different technologies to your S90 System.

Suberb Action

Thanks to Yamaha's Balanced Hammer Effect keyboard, the S90 feels as great as it sounds.

Simple Operation

The S90's large LCD screen and intuitive hands-on user interface make it remarkably easy to use.

YAMAHA

figMENTS Become Reality

How were you able to work around noise limitations?

We recorded in the daytime and edited and mixed at night. I could get enough of a sound by doing it in a limited way. I didn't have to have a big room and Marshall amps—which undoubtedly would have sounded great, but I didn't need that for what I was doing.

Did you face issues with the acoustics of your apartment?

I thought I was going to have some. In the chorus of "When the Good Die Young," for example, I had this bass drum. I played the mix in a car, and the bass drum was so loud I thought I was going to blow the windows out. Yet when I had played it in my studio, I hadn't heard it in the room at all. I thought, "This is never going to work." But we got used to the room. I made the surface a little more uneven. I could always take a mix out into my living room and listen to it there. We'd refer to other CDs. Weld was pretty vigilant about keeping the sound contained. My biggest fear was getting uncontrollable bass [frequencies], but

PLANNING PLANULA STUDIOS

When Anton Fig decided to record his solo album, he turned to David Frangioni for guidance on redesigning and upgrading his existing personal studio so that it could handle that task. Frangioni is the founder and president of Audio One (www.audio-one.com), a consulting firm with offices in Miami, Boston, and Nashville, that designs personal and commercial recording studios, home-theater systems, and home-automation systems. Audio One's clientele includes Ricky Martin, Olivia Newton-John, Ringo Starr, and Steven Tyler, and the firm offers its services to anyone who is interested.

"I've been consulting on recording studios, primarily at the high end, since 1985," Frangioni says. "Anton called and we really hit it off. For more than a year, we talked about and conceived Anton's studio. Anton is an avid reader. He researches things very thoroughly and asks questions. To his credit, he had a clear vision from day one about wanting to use his studio to do his record. He already had a home studio, something that he had put together. I listened to what he had done there, and it was amazing. Anton will take what he has and go as far as he possibly can with it."

According to Frangioni, Fig contacted him because he "wasn't sure about what the final technology choices would be and how it would all be integrated; that was up to me. We originally designed that studio before the advent of Pro Tools. During the course of the record, Pro Tools and other technologies were evolving; Pro Tools became a standard in the middle of the record. Nowadays people keep everything in Pro Tools; they don't even transfer to tape."

Fig's studio room presented a particular challenge. "We designed it around a room that holds the record as the smallest recording studio I have ever put together—acoustics were virtually impossible to deal with," Frangioni says. "The ceilings are fairly high, but it's a practically square room. I brought in an acoustician to try to do something with the room, but there wasn't a whole lot he could do. We just figured we'd make it primarily a near-field-monitoring environment and hope that the room wouldn't introduce problems.

"In a room that has constraints acoustically, you have to do a lot of listening," Frangioni continues. "You have to make CDs and cassettes, leave the environment, and see how it translates. When you play a reference CD in a new room, you have to go with your first impression and you can't convince yourself it's something that it's not. If you hear it sounding awkward in certain frequencies, you have to address that. So there's more work to be done than there would be if you have the budget and the space to build a studio from scratch where you can address the physical side of the studio, which most of us can't. We're dealing with home environments."

In personal studios, Frangioni says, people "sometimes use headphones for certain aspects of the monitoring and should be very careful about their near-field monitors. Hopefully, they'll be open minded about doing some acoustic trapping and diffusion if space allows. If a room sounds natural, you can work in it and get things sounding pretty close."

KEN NELSON

David Frangioni

Frangioni also states that the degree to which you treat your studio room acoustically should depend on your end goals for your studio. "Mixing only becomes critical with a final big-budget record where there's a standard," he says. "Every record has a certain sound quality, and if you're too far away from that, you're not going to be able to compete. Most people are not mixing for a final record release, and if they are, then they have to go through that extra work that we talked about. Anton did; he really worked his studio."

BACKGROUND PHOTO BY JOHN FILO/CBS

Musician's Friend

APPLY TODAY! YOUR CHOICE SAME AS CASH!

3 MONTHS Minimum Purchase $199 | 6 MONTHS Minimum Purchase $499

KORG

D1200 Digital Recorder (Shown with optional CDR)
702242‡ List $1,250.00
$899.99

MACKIE.

Baby HUI™ Control Surface
00342
List $799.00
$599.99

RED

Now Shipping!

DarkStar XP2
709009 List $399.00
$299.99

steinberg
Creativity First

Cubase SX 1.0 Multitrack Software
707840
List $799.99
$579.99

E-MU

XK-6 Extreme Keys Synthesizer
706267‡ List $1,299.00
~~$899.99~~
Save $300! $599.99

sonicfoundry
media solutions

Loops for ACID

Acid 2.0 Latin Remix Software
707264 List $49.00
$9.99

40X Silver CDR 50 Piece Spindle
955400
List $39.99
$12.99

FREE CATALOG!
One-Year Subscription!

call or Click!

WEEKLY WEB GIVEAWAY!
FREE GEAR
Worth Up To $1000!

800-436-6976 musiciansfriend.com

Four Easy Ways To Order!

1. Call: 800-436-6976
2. Click: www.musiciansfriend.com
3. Fax: 541-776-1370
4. Write: P.O. Box 4520 Medford, OR 97501

45-Day Double Guarantee!

- Money-Back Satisfaction Guarantee
- Best Price Guarantee

Rapid Delivery!

- Most orders shipped same day!*

Limited to stock on hand; prices subject to change; standard catalog shipping rates apply.
*On orders received by 5PM ET Mon.-Fri. ‡Additional 2-day shipping charge.

To get your FREE Catalog subscription, fill out this handy coupon and mail to: Musician's Friend, Dept. CR, P.O. Box 4520, Medford, OR 97501

Name _____

Address _____

City _____ State _____ Zip Code _____

E-mail address _____

Area(s) of interest: ☐Guitar ☐Bass ☐Keyboard ☐Drums ☐Studio (recording) ☐Stage (PA, lights, etc.) ☐DJ

SOURCE CODE: EMBL

figMENTS Become Reality

we were able to avoid that. We were very careful to find what we thought was the sweet spot in the room and stay there.

I'd run off a cassette of what I was working on and listen on headphones on a cassette machine while walking to and from the [Letterman] show every day. I made a lot of mix suggestions just from walking around with my cassette machine. That may not have been the truest way to do it, but it seemed to work.

I took my mixes [early on] to Leon Zervos at Masterdisk, who mastered the record. I said, "Tell me if I'll actually be able to mix in my studio." He put them through the mastering equipment and said, "This sounds fine. I'll definitely be able to master this." That gave us the last bit of confidence we needed.

FIG'S STUDIO RIG

Anton Fig's current personal studio took shape during the tracking of *Figments* from the late 1990s into 2001. Fig retained certain favored devices from earlier incarnations of his studio while acquiring Pro Tools hardware and software and newer sound modules specifically for the album. Following is a list of his current setup. More information is available on Fig's Web site at www.antonfig.com.

Computer
Apple Power Mac 9500 with G3/300 MHz upgrade

Digital Audio Workstation
Digidesign Pro Tools TDM 5.1 with 888-24 I/O audio interfaces (2)

Effects Processors
Anthony DeMaria Labs (ADL) Stereo Tube C/L 1500 stereo compressor
Focusrite Green 3 Voicebox mic preamp/equalizer/dynamics processor
Tech 21 SansAmp PSA-1 analog tube-amplifier emulator
Yamaha GEP50 guitar-effects processor
Yamaha SPX90 digital multi-effects processor

Microphone
Neumann TLM 193 large-diaphragm condenser mic

MIDI Interfaces
MOTU MIDI Timepiece AV MIDI interface
Opcode Studio 4 MIDI interface

Mixer
Yamaha 02R digital mixer

Monitors
KRK V6 active near-field monitors

Recorders
Alesis XT20 ADAT
Panasonic SV-3800 DAT recorder
Tascam 112 mkII Portastudio 8-track cassette recorder

Samplers, Sound Modules, and Synthesizers
Akai S3000 sampler
Alesis DM Pro drum module
E-mu E4X sampler
E-mu Proteus 2000 sound module
Korg M1 synthesizer
Oberheim Matrix-1000 rackmount analog synthesizer
Roland D-550 sound module
Roland JV-1080 synth module
Yamaha CS1x synthesizer

BACKGROUND PHOTO BY JOHN FILO/CBS

Are there any other instances in which you traveled to other studios?

On "Hand on My Shoulder," Brian Wilson did the background vocals. I flew to California and we did the vocals at Mark Linett's studio, where they remixed [the Beach Boys'] *Pet Sounds*. We did it on Pro Tools. I also recorded Chris Botti [for the track "Tears"] in California. I went to his home studio, where he had a Tascam system. With Sebastian Bach, we went into Dubway Studios because his vocals were really screaming. "January/February/March" has a group of people singing, and that was also at Dubway. Randy Brecker recorded his [flugelhorn] solo [for "Inside Out"] that same night. With Paul Shaffer, Al Kooper, and Ivan Neville, we went into Avatar. There were times when I needed access to their microphones. Everything else was done at home.

Even the choir on "When the Good Die Young?"

Yeah, that was done in my living room.

The snare drums in "When the Good Die Young" remind me a lot of Scottish drums.

I had an orchestral snare drum. I played it in the bathroom to get a little echo, and then I doubled it. I didn't try to make it perfect because it sounded like a few different people playing, but not quite the same. That was totally intentional.

Which of the other tracks stand out in your mind?

"Utopia" is a very simple song, but it took quite a bit of work. The drumbeat in the chorus is actually a slowed-down two-bar sample of the fade of "When the Good Die Young." A drum machine was in the original song, and then I played real drums in the verse. I tried to play real drums on the whole song, but it just didn't feel right. So then we had to mix the sample and the real drums, and bring it in and out. Then there's another drum part that's just a sample of real drums—bass drum and snare. There are actually four drum kits in that song, but it obviously doesn't sound like that. We had 12 tracks of drums per kit, so it was a very unwieldy session until we managed to pare it down.

The ending of "Home" didn't exist. The song ended at least a minute and a half before it actually does on the record. That whole ending was recreated once everyone had gone home. I probably played the drums all the way to the end, but the vocals and guitars were done; I just went in and made a whole new ending.

What future plans do you have for your studio?

At the moment, I'm leaving it the way it is. I'm building up another set of song ideas. Right now, I'm just trying to get my record out there. The record is available only on the Web site [www.antonfig.com]. It isn't in the stores. Because it's such a homegrown project, I almost don't mind that some corporation hasn't gotten hold of it. I'm not saying that wouldn't happen, but for the most part, it's coming directly out of my house to anybody who wants to listen to it.

How do you feel about taking on the role of a producer?

A lot of the producing involved my getting the right person for the right part. You hire them for what they can do, and then you make up something from what they've given you; but I'm really quite comfortable being in that position. If I were to produce someone else, it would be just as big a responsibility but a different kind of mind-set. That's something that I would be interested in doing, if I found the right person.

This was my first big production. As a drummer, you get used to going into the studio and playing the basic tracks, and then leaving. In creating the whole thing myself, I had to follow everything through. If I didn't work on it, nothing happened. When the project's over three years long, you have to stick with it. You have to be prepared to slug away all the time to get the thing completed. It was an incredibly rewarding experience.

Matt Gallagher *is a drummer and an assistant editor at* **EM** *and* Onstage.

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

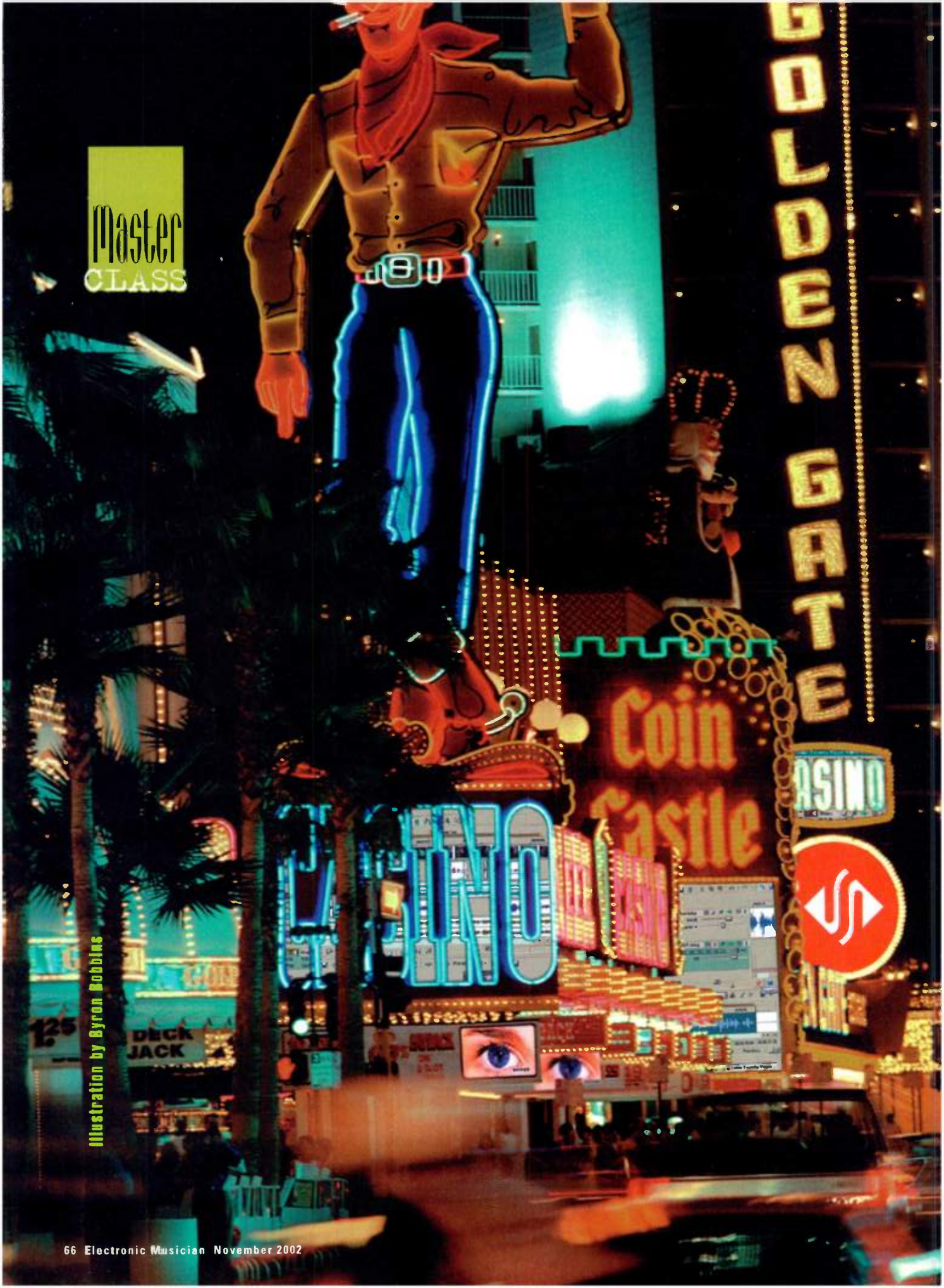


Illustration by Byron Robbins

Viva Vegas Video

The creation of Sonic Foundry's Vegas Video 3.0 is a major leap forward for desktop media production. The program combines feature-rich, broadcast-quality nonlinear video editing with a complete, powerful multitrack audio engine. Combine an A/V-equipped PC with Vegas Video and a digital-video (DV) camcorder, and you can start offering audio-for-video post-production services.

This article will show you how to use Vegas Video for audio post-production (*audio post* for short), from getting the video into your computer and adding sounds to picture to manipulating and mixing those sounds to create an outstanding video soundtrack. (If you're new to audio post, have a look at the sidebar "Sound Meets Picture.") And although I'll focus on Vegas Video and sound for picture, many of these tips and tricks also apply if you use the program for multitrack audio only.

By Jeffrey P. Fisher

FLYBY

Vegas Video 3.0 is an ideal environment within which to sweeten soundtracks for indie films, documentaries, music videos, commercial spots, and corporate productions destined for DVDs, CD-ROMs, Web sites, and broadcast. The program lets you record and edit narration, on-camera dialog, sound effects, and background sounds, and it even lets you compose and record original music. It offers an unlimited number of audio and video tracks (until your computer complains), and its nondestructive editing means your original files are never altered—Vegas stores all your edit data and applies it in real time.

You don't need any external hardware to keep your audio and video in sync. Instead, you import digital video and add audio to it. By showing you the video and audio together, Vegas makes editing and synchronizing sounds and music effortless. When you're done, you can export your finished work, complete with its new aural soundscape, to a variety of formats including DV, Real Media, MPEG-1 and -2, Windows Media, and QuickTime. Or, if you prefer, you can render just your audio files.

Audio post-production on your desktop.

it's better than squinting at the small Video Preview window in Vegas.

MOUSING AROUND

various Vegas parameters can seem cumbersome at first. An easy way to fine-tune a slider's value, however, is to click and hold both the left and right

fat. You can also make a time selection, press S, and split both edges simultaneously. Either approach is useful for removing unwanted noises, deleting dialog breaks, and isolating the sounds you need.

Splitting long dialog or narration segments into short Events can give you greater control over a project's pacing. For example, amateurs tend to either leave too little or too much space between phrases. If everything is slammed together, you can slice the audio apart and move the sections around until it sounds right (music can fill in the gaps). For a slow section, use crossfades to tighten things up. Split the slow-paced Event into smaller segments and overlap and crossfade them slightly so they blend better. To change how sounds crossfade, right-click the overlapping area, choose Fade Type, and then select from the graphical list. Using only Vegas's Split and Crossfade tools (and no pitch or time shifting), I reduced a 19-second narration section to 12 seconds.

To time-stretch or pitch-shift Events, first right-click on the Event, choose Properties, and indicate whether to preserve the pitch and change the length (the default) or preserve the length and change the pitch when stretching. Then Control-drag either Event edge to the desired length.

When editing voice tracks, watch out for room tone—the general background "sound" of a recording. If you're combining separate Events, the sudden dropout and return of room tone can make even the most careful edit stand out. Vegas provides a few ways to deal with this pesky problem. Use a quick, smooth crossfade between edits to cover up the room tone stops and starts. Use the Track FX noise gate to eliminate room tone altogether during silent passages. If that doesn't work, find a piece of room tone from the existing recording, isolate it with splits, copy the room tone Event, and paste it on another track to mask the edits. Music and backgrounds can cover these edits, too.

INSIDE VIDEO

But how do you get to the point at which you can start editing the sound? Before you can begin working on the audio portion, you need your video in a format Vegas can read. Unless you are editing the video, you'll get a completed, or nearly completed, video from your client. The video may come in any of a variety of formats; CD, analog tape, and digital video are the most common. You want the edited video in the highest-quality format available, preferably DV. That way, you can import the video into Vegas, add your audio contribution, rerender the video with new audio, and then lay back the finished video to DV, CD, DVD, and other formats.

To capture video, connect your camcorder or other DV device to your computer's 1394 input and then launch Vegas. Choose the Capture Video item in the File menu to display the Video Capture dialog. If your device is connected correctly, you should be able to control it from this screen, using the transport controls to record the video as you require. The video's audio track will be captured at the same time. Capturing the original video and subsequently saving your final project using Sonic Foundry's DV codec results in the highest-quality video possible with no generation loss.

Always work at the highest resolution you can, paying careful attention to the video's frame size and rate. Work at high resolution (digital video's resolution is 29.97 frames per second, or fps)

BURNING TIMECODE INTO YOUR VIDEO

One video filter that's useful for audio post is Vegas's Timecode filter. From the Video FX tab, scroll down to find the Timecode filter. Then choose a preset from the available list (for example, SMPTE Drop 29.97 fps) and drag-and-drop it onto your video track in the Track List. This "burns in" a timecode window (see **Fig. A**). Reference the timecode numbers when spotting sounds, and then refer to your notes when editing your audio. To remove the filter, select the Track FX button on the video track and remove the plug-in.

FIG. A: You can use the Timecode filter to burn a timecode window into your video.

Viva Vegas Video

The creation of Sonic Foundry's Vegas Video 3.0 is a major leap forward for desktop media production. The program combines feature-rich, broadcast-quality nonlinear video editing with a complete, powerful multitrack audio engine. Combine an A/V-equipped PC with Vegas Video and a digital-video (DV) camcorder, and you can start offering audio-for-video post-production services.

This article will show you how to use Vegas Video for audio post-production (*audio post* for short), from getting the video into your computer and adding sounds to picture to manipulating and mixing those sounds to create an outstanding video soundtrack. (If you're new to audio post, have a look at the sidebar "Sound Meets Picture.") And although I'll focus on Vegas Video and sound for picture, many of these tips and tricks also apply if you use the program for multitrack audio only.

By Jeffrey P. Fisher

FLYBY

Vegas Video 3.0 is an ideal environment within which to sweeten soundtracks for indie films, documentaries, music videos, commercial spots, and corporate productions destined for DVDs, CD-ROMs, Web sites, and broadcast. The program lets you record and edit narration, on-camera dialog, sound effects, and background sounds, and it even lets you compose and record original music. It offers an unlimited number of audio and video tracks (until your computer complains), and its nondestructive editing means your original files are never altered—Vegas stores all your edit data and applies it in real time.

You don't need any external hardware to keep your audio and video in sync. Instead, you import digital video and add audio to it. By showing you the video and audio together, Vegas makes editing and synchronizing sounds and music effortless. When you're done, you can export your finished work, complete with its new aural soundscape, to a variety of formats including DV, Real Media, MPEG-1 and -2, Windows Media, and QuickTime. Or, if you prefer, you can render just your audio files.

Audio post-production on your desktop.

SETTING UP

Vegas is highly customizable. You can change the toolbar; resize, float, dock, and hide windows; and make the program mirror your working style. I usually undock the Video Preview window and let it float over the desktop, keeping the other functions in place (see **Fig. 1**).

To free up more space on your screen, you can press F11 to quickly hide the Window Docking area and Shift + F11 to hide the Track list. I prefer sliding the Track list to the left until only the Track FX, Mute, and Solo icons show. Forget what's on a track? Let your cursor hover over the Track number to display the hidden scribble strip.

If you have an OHCI-compliant IEEE 1394 (FireWire) card installed, you can send the video to an external monitor. I connect my 1394 card's output to my DV camcorder's digital-in port, then send the camera's analog output to a separate video monitor. You may experience some latency and stuttering, but it's better than squinting at the small Video Preview window in Vegas.

MOUSING AROUND

Vegas and a scroll-wheel-equipped mouse are a potent combination. By default, scrolling on the Timeline zooms in or out. Holding down the Shift button while scrolling duplicates the horizontal scrollbar functions; holding the Control button duplicates the vertical scrollbar. Scrolling while holding both Control and Shift moves the current position indicator around the Timeline. Allow the cursor to hover over the Scrub tool, and the mouse wheel controls the scrub speed either forward or in reverse.

You can also scrub directly on the Timeline by letting the cursor hover over the current position indicator, pressing Control, and dragging your mouse in either direction. If you want to scrub with key commands, pressing J scrubs in reverse, K pauses, and L scrubs forward. Holding K while pressing J or L gives you greater control over the scrub speed.

Right-clicking allows you to access several functions available in pop-up menus. Unfortunately, using your mouse to make precise adjustments to various Vegas parameters can seem cumbersome at first. An easy way to fine-tune a slider's value, however, is to click and hold both the left and right mouse buttons and drag the slider.

To reduce mousing and save time, it's a good idea to learn the keyboard shortcuts for common commands. For example, the Spacebar toggles start and stop, and Enter pauses. The tilde (~) key lets you quickly minimize all tracks. Page Up and Page Down move the cursor to the next grid line. Specify grid spacing using the Grid Spacing function listed in the Options menu. To jump to a particular position in your project, press Control + G and type in a value.

CURRENT EVENTS

One of Vegas's greatest strengths is the ease with which it allows you to work with audio Events. Instead of having to edit and fine-tune your audio in a separate editor, you can massage audio tracks with speed and ease right inside Vegas. You can zero in on your audio and trim, cut, and rearrange it in numerous ways. For one project, I reduced a two-hour interview to one hour, making 172 separate edits all in Vegas—it took me less than four hours to do the job.

You can edit Events directly on the Timeline or use the Trimmer. Right-click on any Event and choose Open in Trimmer. There you can select portions of a file and drag them to any spot on the Timeline. The Trimmer has its own transport controls, zoom buttons, time-region selector, and ruler. There is also a hotlink button (or use Control + E) to open the selected Event in another sound editor, such as Sound Forge. To trim an Event, just drag its edges. Turn on Enable Snapping (this feature can apply to a variety of points including grid, marker, region, and Event edge) to quickly align Events, or turn off snapping for minute adjustments.

Much like its older sibling Acid, Vegas lets you easily slice and dice parts of your audio Events. You can position the cursor where you need to edit, press S to split the Event, and trim away the

FIG. 1: In this figure, the Video Preview window has been moved from its default position at the bottom of the screen.

Creativity Connectors

Audio Capture

If your computer supports USB, Edirol makes it easy to creatively connect....anywhere, since your computer supplies the power.

The UA-1A is a simple and small way to get 16-bit, 44.1kHz audio into your computer from analog sources through RCA jacks. This is the affordable way to bypass the built-in audio device of your laptop and home computer with quiet, quality sound.

The UA-1D interfaces totally digital transfer of audio between your computer and external digital components through its optical or coaxial S/P DIF ins and out. Its cable configuration and Native OS driver compatibility make it the perfect, portable upgrade of your computer's built-in audio.

MIDI Interface

If MIDI is your mode of expression, Edirol offers two ultimate value interfaces designed for a variety of setups.

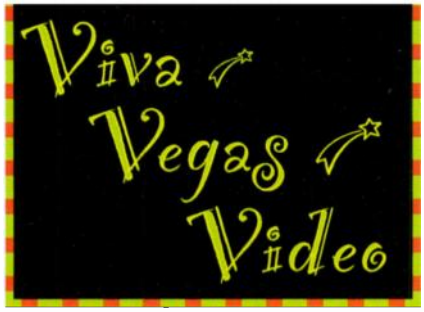
The UM-1 1x1 MIDI interface comes fitted with a USB cable on one end and MIDI In & Out leads on the other. Its true Plug and Play compatibility makes it easy to connect any MIDI instrument to your PC or Mac for 16 channels of control.

The UM-1S 1x1 MIDI interface is flexible to your unique setup: you select the length on the MIDI In & Out cables you connect UM-1S female MIDI connectors. Control up to 16 channels of MIDI with the affordable, portable Plug and Play UM-1S. Includes driver CD-ROM.

EDIROL
Just Add Imagination

available at participating Dealers or call:

1-800-380-2580 www.edirol.com



fat. You can also make a time selection, press S, and split both edges simultaneously. Either approach is useful for removing unwanted noises, deleting dialog breaks, and isolating the sounds you need.

Splitting long dialog or narration segments into short Events can give you greater control over a project's pacing. For example, amateurs tend to either leave too little or too much space between phrases. If everything is slammed together, you can slice the audio apart and move the sections around until it sounds right (music can fill in the gaps). For a slow section, use crossfades to tighten things up. Split the slow-paced Event into smaller segments and overlap and crossfade them slightly so they blend better. To change how sounds crossfade, right-click the overlapping area, choose Fade Type, and then select from the graphical list. Using only Vegas's Split and Crossfade tools (and no pitch or time shifting), I reduced a 19-second narration section to 12 seconds.

To time-stretch or pitch-shift Events, first right-click on the Event, choose Properties, and indicate whether to preserve the pitch and change the length (the default) or preserve the length and change the pitch when stretching. Then Control-drag either Event edge to the desired length.

When editing voice tracks, watch out for room tone—the general background "sound" of a recording. If you're combining separate Events, the sudden dropout and return of room tone can make even the most careful edit stand out. Vegas provides a few ways to deal with this pesky problem. Use a quick, smooth crossfade between edits to cover up the room tone stops and starts. Use the Track FX noise gate to eliminate room tone altogether during silent passages. If that doesn't work, find a piece of room tone from the existing recording, isolate it with splits, copy the room tone Event, and paste it on another track to mask the edits. Music and backgrounds can cover these edits, too.

INSIDE VIDEO

But how do you get to the point at which you can start editing the sound? Before you can begin working on the audio portion, you need your video in a format Vegas can read. Unless you are editing the video, you'll get a completed, or nearly completed, video from your client. The video may come in any of a variety of formats; CD, analog tape, and digital video are the most common. You want the edited video in the highest-quality format available, preferably DV. That way, you can import the video into Vegas, add your audio contribution, rerender the video with new audio, and then lay back the finished video to DV, CD, DVD, and other formats.

To capture video, connect your camcorder or other DV device to your computer's 1394 input and then launch Vegas. Choose the Capture Video item in the File menu to display the Video Capture dialog. If your device is connected correctly, you should be able to control it from this screen, using the transport controls to record the video as you require. The video's audio track will be captured at the same time. Capturing the original video and subsequently saving your final project using Sonic Foundry's DV codec results in the highest-quality video possible with no generation loss.

Always work at the highest resolution you can, paying careful attention to the video's frame size and rate. Work at high resolution (digital video's resolution is 29.97 frames per second, or fps)

BURNING TIMECODE INTO YOUR VIDEO

One video filter that's useful for audio post is Vegas's Timecode filter. From the Video FX tab, scroll down to find the Timecode filter. Then choose a preset from the available list (for example, SMPTE Drop 29.97 fps) and drag-and-drop it onto your video track in the Track List. This "burns in" a timecode window (see **Fig. A**). Reference the timecode numbers when spotting sounds, and then refer to your notes when editing your audio. To remove the filter, select the Track FX button on the video track and remove the plug-in.

FIG. A: You can use the Timecode filter to burn a timecode window into your video.

An incredibly powerful audio editor. Also included: 24-track hard disk recorder.

Introducing the new MX-View Editor for the MX-2424

Multiple Independent Clipboards:

Allows you to store four separate edits, each in their own clipboard. Convenient for copy/paste creation of song arrangements.

Breakpoint Volume Automation:

Adds automation of track levels without using a mixer.

Edit Groups:

Allows you to easily perform edits on groups of individual tracks (such as drums).

Pencil Tool:

Lets you "draw" clicks and pops out of your audio tracks.

Virtual Tracks:

For performing multiple takes on a single track.

With TASCAM's MX-View, owners of the MX-2424 hard disk recorder now get an incredibly powerful, no-cost solution for sophisticated audio editing on their Mac or PC, directly connected via 100Mb Ethernet. If you're already deep into DAWs like Pro Tools®, Cubase SX™, Logic™ and Nuendo™, the MX-2424 offers the time-stamped audio file compatibility you need to get the job done right. Need more info? It's all available at **www.mx2424.com**.

PRO TOOLS | Cubase SX | Logic 5 | NUENDO

TASCAM
a whole world of recording

and then render the video at a lower resolution if needed for streaming formats such as Real Media. If you're unsure of a video's properties, start a new project and then use the Properties option in the File menu to access the Match Media setting (the file folder with an arrow above it). Now choose the video file provided to you (or that you captured), and Vegas will automatically match your project properties to that file. If you render your project to the same format, your final version should match the original's quality.

If the video provided to you already has sound, consider isolating the existing soundtrack elements on separate tracks. When you open a captured video in Vegas, its audio track appears as one long file below the video portion. Right-click on the audio-track icon and choose Duplicate Track; that places a copy of the audio track directly under the original captured audio. Mute the original track, Split the duplicate audio Event, separate it into component chunks (dialog, narration, and so forth), and move each component to a separate track. If necessary, apply quick fade-ins and -outs and use EQ on the separate Events to help disguise your edits.

To make sure that Events you've moved are in sync, you could look at the waveform display while comparing the copy to the muted original. Another way to check would be to unmute the original audio track and play it along with the copy. If your sync is off, you'll hear slapback doubling on the copied track. If you're right on, the dialog should sound twice as loud (3 dB louder). Don't forget to either mute or delete the original audio track when you've finished your work.

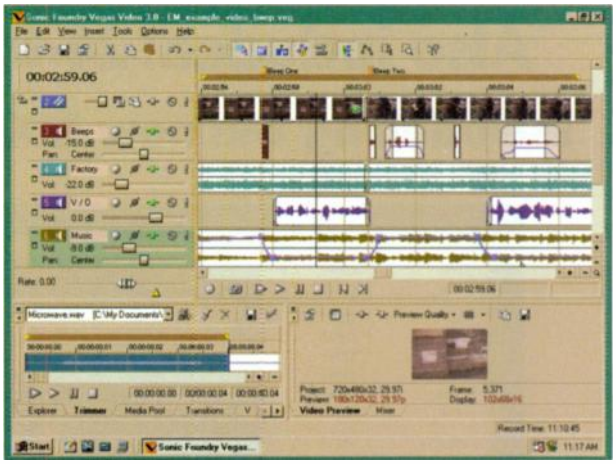


FIG. 3: By using Vegas's graphic Volume envelopes, you can easily raise or lower the levels of small segments of audio. That method can be useful when you need to duck the music behind a narration track.

INSIDE AUDIO

Referring to your notes, begin gathering the audio material you need by recording, finding, and creating new sounds.

Dialog. If your video has on-camera sync dialog, you may need to fix or even replace the production audio with a new recording. This is called Automatic Dialog Replacement (ADR), or *looping* in the trade. The term looping came from the process of rerecording dialog by splicing a tape loop of the original, playing it back for the talent, and recording while they repeated their lines.

Vegas can easily loop dialog and record new takes. First, get the talent into your studio and use the same mic and preamp that were used in the field, if possible. If identical equipment isn't obtainable, choose similar equipment and experiment with mic positioning, EQ, and reverb to match the new recordings to the field tracks.

Then, in Vegas, find the dialog you need to replace on the Timeline (see **Fig. 2**), choosing short segments of not more than a sentence or two to work with. Split the Event just before and just after the offending segment. Insert a new audio track below the bad track and solo the two tracks. Next, turn on Loop Playback, wrap a time region around the Event to be fixed, put the new track into record ready, and start recording. The talent will hear the old dialog and can then talk along with it until they get it right—Vegas will record take after take in the new track. To switch between takes, you can select the Event and press T, or you can right-click on the take for other options. Make sure that you check the dialog sync before the talent leaves. Play the project at 29.97 fps on a larger monitor, focus on the lips, and listen critically.

It may help if the talent can see themselves as they replace their on-camera dialog, so you should pipe the video to them through an external monitor if possible. It's also useful to insert a countdown tone to help them know when to start speaking. To do that, create another track and place three beeps on it spaced a half-second apart. Line up the new track with the existing audio so that the dialog to be replaced starts where the fourth beep would sound. Make sure the countdown tones

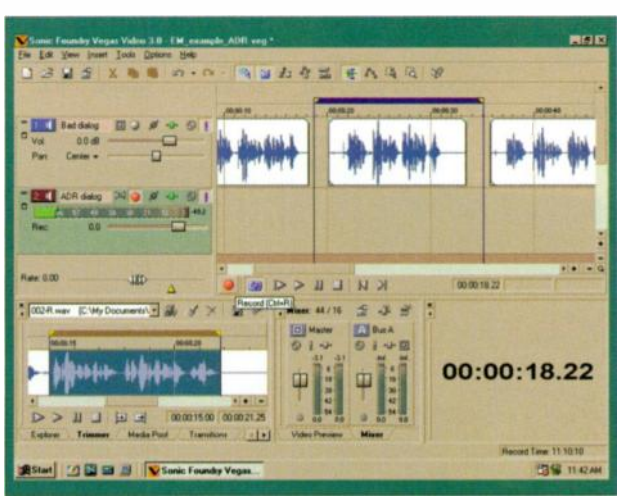


FIG. 2: Vegas can be used for Automatic Dialog Replacement. By dividing the dialog track into discrete Events, you can replace only the sections you need.

SAY NO TO NOISE

The New **RØDE NT1-A** is one of the world's quietest microphones.

Why is that important?
Light and dark, hot and cold, loud and quiet! These are examples of the contrasts found in nature. A low noise recording will give your work it's dynamics. It will give you the impact you dream of. Adding noise from any device, especially at the source, only degrades your performance.

The New **RØDE NT1-A** has a self-noise of **only 5dBA!**

No other studio microphone in its class, or indeed costing many times more can claim this!

Low Noise is only half the story.

1) **Multi award winning, and the world's biggest selling studio microphone,** the NT1 is now a legend. The New **NT1-A** continues this tradition while improving specifications and tonal qualities.

2) **Using cutting edge technology** for the electronics, RØDE has implemented a computer controlled manufacturing line. Unlike many 'leading brands' all electronic boards are made without 'human hands' assuring high specifications, tight tolerances and unsurpassed consistency.

3) **Built to last** with a new computer controlled machining process. The body is then satin nickel-plated. The NT1-A is designed to last you a lifetime.

4) **No PAD or Filters.** Some microphone manufacturers include these in their budget products, but at what cost?
The NT1-A can be used with very high sound pressure levels without perceptible distortion. Most people never use a high pass filter on their microphones. Why pay for features you don't want or need at the cost of what is really important, true performance!

5) **Complete solution:** The NT1-A comes complete with a dedicated shock mount and zip pouch. No optional extras to buy.

The new NT1-A, a clear winner.

RØDE MICROPHONES

35 years

RØDE MICROPHONES USA - Ph: 310 328 7456 INTERNATIONAL - Ph: 61 2 8765 9333 info@rodemic.com www.rodemic.com

are within the loop region. The talent will hear the beep rhythm and know when to start talking. Delete the tones after the recording session ends.

To punch in or out on an Event, select it, wrap a time selection around the punch area, and give yourself some preroll and postroll to make doing the punch easier. If you need to replace only a portion of the Event, split it to isolate the punch area. Enable Loop Playback mode to record multiple takes. Arm the track and start recording. Vegas will loop the time selection but record only into the Event you selected.

Narration. You have several options when it comes to narration. One is to record the narration in advance and supply it to your client to use when cutting the video. Another possibility is that your client will use narration obtained from another facility or directly from voice-over talent. In that case, the video provided to you will have this narration in place, and you can add further audio sweetening (such as effects, music, and mixing). You might also need to replace the narration or record an entirely new one in sync with the video.

Ideally, you can follow the techniques of the ADR method and have your voice-over talent record his or her contribution, piece by piece, to fit a finished video. Unfortunately, you might have to record or use an existing "wild" (unsynced) narration track and make it fit with the video. If so, splitting and arranging smaller chunks, crossfading, and time-stretching will come in handy.

Sound effects. Sound effects fall into three main categories: hard effects, which are synced to some onscreen action (a door closing, for example); soft effects, which are not synced to any action but reinforce a scene's reality (such as a bird call during an outdoor scene); and ambient effects, which provide a general, overall soundscape (for example, traffic sounds in a city segment).

Sources for sound effects include online and CD-based sound-effects libraries, your own creations, and the original video production audio (see the sidebar "Sound Effects Sources" for additional candidates). Many professionals use library sound effects as starting points, although the sounds may require editing to get them just right. When you can't find the right sounds, you must create them yourself. Roam the world with a portable recorder to capture audio. Bring sound-producing material into your project studio and record there or create new sounds from scratch using your sound gear (synths and samplers) or through *Foley*. (Foley is the process of recording sounds in the studio to match onscreen action. Sound effects suitable for Foley include footsteps, clothes rustling, and other actions that are easy to mimic. A Foley session is similar to ADR: the Foley artist watches the video and re-creates the sounds using various props, and the results are recorded.)

Another source for sounds, particularly backgrounds, is from the raw production audio that is captured during videotaping. If possible, go back to the field video to lift sounds. Capture the footage, open it in Vegas, delete the video portion, and save only the audio as a WAV file. When choosing a general background sound, be aware that when lowered in the mix, it just may sound like low-end rumble or white noise. To overcome that problem, feature distinct sound effects along with a general ambient background. Also, use EQ or other effects to make background sounds more prominent.

On a project that I recently completed, I was able to combine the original background noise with a distinct sound effect to achieve excellent results. The production audio contained a needed sound—a bar-code-scanner beep. Unfortunately, the factory noise where it was recorded interfered. I recorded a new beep (my microwave!) and synced it with the original. Using Vegas's Scrub tool, I rocked back and forth until I found the original beep on the factory track. Next, I inserted a new audio track for my clean beep Event. I repeated that procedure with several other sounds. The outcome: a low-level general factory background with up-front hard effects to match the video action.

When looping backgrounds, the loop point might sound obvious. To keep it from standing out, split the Event before the loop point and trim it slightly. Trim the next iteration slightly and then overlap the Events. Experiment with the fade type to help make the loop point less noticeable. A similar technique can work with music loops. Overlap two Events a beat before the loop point and experiment with fade types. To find the beats easily, play the music and press the M key in time with the music, placing markers on the beats. The waveform itself can supply a visual cue, too.

Once you have suitable sounds, place them on your hard drive and audition them in Vegas Explorer. Try rough syncing them with the video to hear how they work in context. You may discover that you need to find other sounds. If

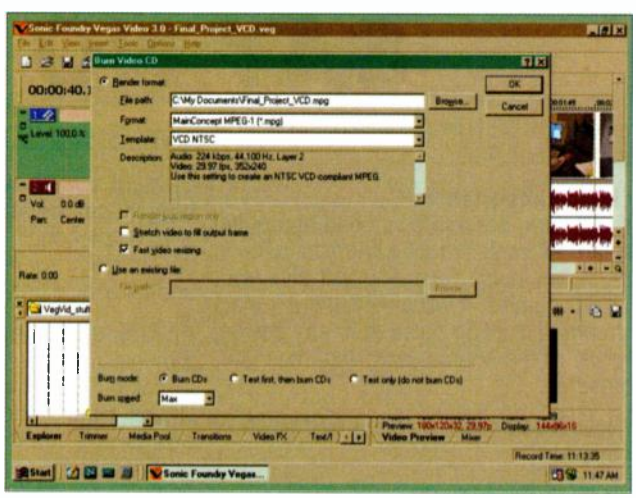


FIG. 4: Vegas includes CD-burning capabilities that can be used for creating Red Book audio, video CDs, or multimedia CDs, which combine audio and video in various formats.

Attention Computer Geeks:

We're introducing a new mixer with features you'll appreciate.

Don't take it the wrong way—we have more than our share of computer nerds here at Samson. That's why the new MDR 8 is more than just a great-sounding 8-channel mixer. For one, it features our exclusive Hard Disk Mode. HDM is an independent monitoring bus that eliminates latency when tracking to a PC. You'll find it nowhere else. You will also find transparent sound, high quality mic preamps and 24-Bit DSP effects that sound so real, you'll actually want to use them. At just $229*, the MDR 8 mixer costs less than most peripherals. And the geek thing? Take it from us. You'll get used to it.

SAMSON
AUDIO

For more info on MDR Series mixers save your work, close your DAW window and checkout
www.samsontech.com

*Estimated Street Price

you're lucky, you'll have everything you need, and you'll be able to start putting the sound effects in place.

Music. There are two kinds of music to use on a video: source and underscore. Source music comes from action onscreen, such as a band or radio playing. Underscore music provides the general mood for the video. Underscore can be dramatic, evocative of a historical period or exotic setting, or just a neutral background filler. Music can also eliminate the need for ambient backgrounds.

You can buy library or production music just as you would sound effects. Such a purchase will be classified as either *needle-drop* or *buyout*. With needle-drop, you pay a fee every time you use a cut from the library. A buyout lets you pay one fee and then use the music whenever you want. You can add original music to the video, too. Either record your music separately and drop the completed piece into the video, or compose and record your musical parts directly within Vegas while watching the video.

If you want to use another application for music composition, Vegas includes the Sonic Foundry Virtual MIDI Router (VMR) so you can either control Vegas from another MIDI application or let Vegas control it. In Vegas, select Preferences in the Options menu and navigate to the Sync tab. Under Generate MIDI Timecode, select the Sonic Foundry MIDI router and choose the correct frame rate for your project. Save the settings, return to the Options menu, select Timecode, and then use the Generate MIDI Timecode command there to send Timecode to the other program.

To control Acid, for example, select Preferences in the Options menu and then click on the Sync tab. Under Trigger from MIDI Timecode, select the Sonic Foundry MIDI router and choose the frame rate that matches your Vegas project. Next, select Trigger from MIDI Timecode under Timecode in the Options menu. Press Play in Vegas, and the programs will run in sync. You can then create your music using Acid, render the final WAV file, and add it to your Vegas project. You could also edit your narration, effects, Foley, ADR, and other elements in Vegas, then render the project as an AVI file and import it into Acid to score the music.

BUILDING YOUR MIX

With all your sounds collected or recorded, begin editing. Dropping Events into your project in Vegas and moving them around in sync with the picture is straightforward, because what you see and hear is what you get. When

SOUND MEETS PICTURE

Never added sound to a video before? Take these preliminary steps before you begin working your audio magic.

Meet with the director and producer to discuss their particular audio needs. On-camera dialog and even narration may already be in place, and only sound effects and music might be needed. Go through the video with your client and take notes about the soundtrack. Listen carefully to the existing soundtrack (if there is one). Ask these questions: What's missing? What's needed? Burn a timecode window and watch the video on a larger monitor, then discuss it together. Use the timecode numbers to note where certain sounds should go (see the sidebar "Burning Timecode into Your Video").

Typically, you'll need to be concerned with one or more of the following elements:

Dialog, including replacing existing onscreen voices.

Narration, including replacing existing narration, recording new narration in sync with the picture, syncing existing narration to the picture, or providing narration up front (which the client uses to edit the video).

Sound effects, including hard effects matched specifically to screen action.

Soft effects not synced to action and general ambient sounds to complement the video.

Music, including choosing preexisting library music, editing music produced by another composer, and composing and recording your own original score.

After your initial spotting session and before you begin working, always make sure that you and your client are on the same page. Agree on all the specific sound elements for the soundtrack, including placement, feel, quality, style, instrumentation, musical genre, mix levels, and so forth. They may say "throw in some music here"—you don't want to pick rock and find out later that they meant light jazz. When a client is undecided or seems apathetic, take the initiative. Put together test sequences and get the client to sign off on them. You'll save yourself some frustration and lost time by clearing everything first.

A good video soundtrack captures viewers' attention and directs them to what's important. Soundtracks work when they present an authentic, realistic environment that supports the visual material. Establish a sense of sonic harmony by limiting yourself to a specific sound palette. Always include background ambient sounds and hard effects that synchronize with onscreen action. If essential sounds are missing, the production will seem unreal to viewers. Finally, like all audio work, your soundtrack must be balanced, clear, and distinct, with good separation among all the individual elements.

Electribe • A
Analog Modeling Synthesizer

AND THE BEAT GOES ON AND ON AND ON...

Electribe • R
Rhythm Synthesizer

check out the demos at www.korg.com/electribe

Electribe • S
Rhythm Production Sampler

Electribe • M
Music Production Station

Korg's four different and distinctive ELECTRIBES cross the spectrum of beats and genres. Used alone, together, with your favorite MIDI gear or even with turntables, they provide everything it takes to throw down hot tracks. High-velocity rhythm patterns, cutting-edge sounds, creative sampling/resampling, and massive groove capabilities guarantee that the beat will never stop, never pause and never die.

Experience the tribe for yourself at www.korg.com/electribe then sign up for our monthly

SWEEPSTAKES TO WIN A FREE TONEWORKS PXR4 DIGITAL RECORDER. PLAY TO WIN.

NO PURCHASE NECESSARY. Sweepstakes open to all legal residents of the 50 United States and the District of Columbia, 18 years of age and older. Void in Puerto Rico and where prohibited or restricted by law. All federal, state and local laws and regulations apply. This month's sweepstakes starts November 1, 2002 at 12:01 a.m. Eastern Standard Time ("ET") and ends November 30, 2002 at 11:59:59 p.m. ET. For Official Rules, go to www.korg.com/electribe. To obtain a copy of the official rules or to enter by mail, send a 3 x 5 card with your name, address and phone number to Korg USA, Attn: Electribe Sweepstakes, 316 S. Service Road, Melville, NY 11747. Please include a self-addressed, stamped envelope. ©2002 Korg USA.

ELECTRIBE. PLAY TO WIN.

ELECTRIBE | KORG

KEYBOARD KB AWARD KEYBUY

WRH

Viva Vegas Video

syncing music and hard effects, play the video and use the M key to insert markers at hit points. Scrub to find more precise placement. Hold down the Alt key and use the left and right arrow keys to move frame by frame. F8 toggles snapping on and off. Vegas even remembers your five most recent time selections; use the Backspace key to cycle through them.

Work on vocal material first, followed by hard effects, soft effects, general backgrounds, and finally music. Go back and edit until everything starts working together. Sweeten the tracks with effects and use the Vegas Level and Pan features to carefully balance and automate your final mix. Stay under digital 0 dB, compress the mix slightly, and check for mono compatibility. I mix using computer speakers, Event 20/20s, and the lousy single speaker in my 13-inch TV monitor.

While each track's volume fader controls the overall track volume, every Event also has its own Attack, Sustain, and Release (ASR) envelope. Place the cursor near the top left or right Event edge and click-and-drag inward to create an Event fade-in or fade-out. Place the cursor above the top of an Event (the cursor will change to the pointing-hand envelope cursor) and click-and-drag down to reduce an Event's level. Vegas provides a visual representation of Event waveform-amplitude changes when you use this tool. Reserve volume envelopes for other level automation and use the ASR to tame quick peaks. In one project I worked on, a dialog track contained one word that stood out like a sore thumb. Though I could have used a compressor or a volume envelope to even out the track, it was faster to split the offending section from the surrounding audio and lower its sustain level to tame the peak.

If you don't want to crossfade Events on the same track, position two tracks one below the other and use the ASR envelope to fade out the top track's Event and fade in the second track's Event. Choose appropriate fade types for the Events; that way you can use separate EQ or other effects and still get the benefits of crossfading sounds.

Because any Vegas track can hold multiple Events even if they have different formats, bit rates, or sample rates, I prefer keeping similar sounds together on a couple of tracks: hard sound effects on a track or two, narration on one, music on another. Using fewer tracks with more Events in them can sometimes work better than multiple tracks comprising a single Event each. If you prefer to use multiple tracks, bus them to a single fader at the mixer and adjust

their overall volume and Bus FX there. Route on-camera voice to Bus A, narration to Bus B, hard effects to Bus C, and so on. That approach gives you control of the levels of individual Events (ASR), level and pan automation through envelopes, Track level and FX, and the buses, as well as another hit of overall level and effects. Nice!

Voice is often the most important mix element, so keep music and sound effects from overwhelming your key narration and dialog segments. Use the Track FX EQ, select Band, and set the frequency to 3,500, gain between 2 and 4 dB, and bandwidth to 2 on the voice tracks. Use the same frequency and bandwidth settings on the music track, and make the gain setting 2 to 4 dB lower. That can help make the dialog more intelligible.

Another trick is to reduce the level, or *duck*, sounds out of the way when voice is dominant. Position the music track directly below the voice track and add a volume envelope to it. Add points that fade the music down quickly under the voice, stay low, and then fade up slowly as the voice part ends (see **Fig. 3**).

FINAL RENDERING

If you wish to keep your project file and media together, create a project folder and use the Save As option in the File menu. Check the box next to Copy and Trim Media with Project to copy all the files to the same location as the project file. You get the option of copying the source files in their entirety or just copying the trimmed (edited) versions. In either case, make sure you clean the Media pool or you'll copy unneeded media during this procedure. Back up this project folder regularly and especially when your work is done.

SOUND EFFECTS SOURCES

Vegas includes a CD with 1,001 sound effects and assorted music beds that you can use in your productions. Sonic Foundry also sells dozens of loops for Acid, some of which contain a variety of individual effects. Here is a list of some other useful resources for adding sounds or library music to your projects.

Firstcom Music
www.firstcom.com

The Hollywood Edge
www.hollywoodedge.com

Killer Tracks
www.killertracks.com

The Music Bakery
www.musicbakery.com

Omnimusic
www.omnimusic.com

Sonomic
www.sonomic.com

SoundDogs.com
www.sounddogs.com

Sound Effects Library.com
www.sound-effects-library.com

Sound Ideas
www.soundideas.com

VideoHelper
www.videohelper.com

DESKTOP MUSICIAN

The Sound of Silence

Keeping computer noise out of the mix.

By Brian Smithers

As I sit at my desk writing this article, I can hear a minor tornado blowing a few inches from my left ankle. It's the sound of no fewer than three fans spinning inside of my computer. Periodically, the noise is punctuated by the crunching of my hard drive as it reads and writes. Together, those sounds almost succeed in drowning out the high-pitched whine of my video monitors; it's the sonic equivalent of momentarily forgetting your headache because you stub your toe.

In my studio, as in many others, two trends are colliding head-on: first, the computer continues to play an ever-more-central role in music production, and second, more production is taking place in single-room facilities where writing, tracking, and mixing share the same physical space. The ankle-high storm that's merely an annoyance when doing something such as writing a "Desktop Musician" column becomes a real problem when I plug in a microphone or put on my mixing ears.

There are many ways to deal with a noisy computer, from the simple to the elaborate. As with most aspects of your studio's design, you have the choice of spending either money or time solving a problem, and you'll need to do a cost-benefit analysis of how much quiet you can afford. All of the following solutions apply equally to Macs and PCs, although some product examples may be platform specific. (See the sidebar "Quiet Companies" for a list of helpful Web sites.)

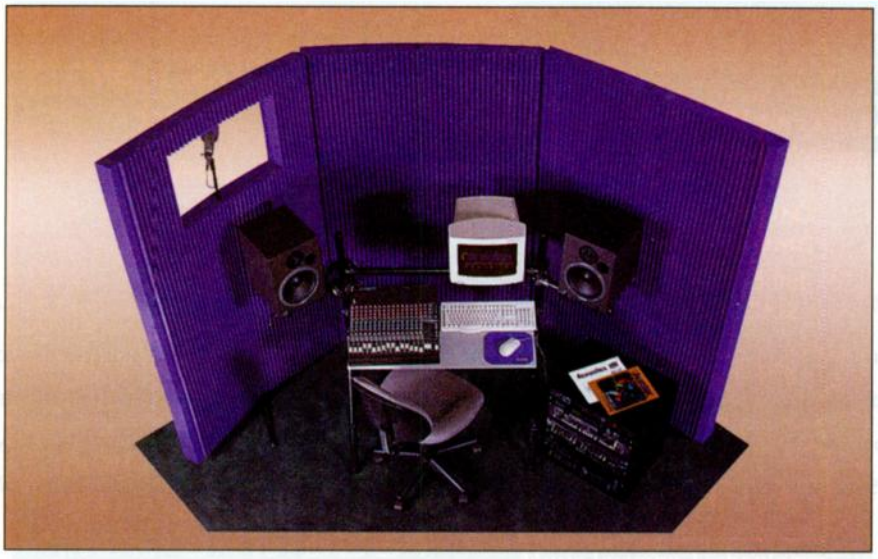


FIG. 1: The MAX-Wall from Auralex Acoustics provides a configurable baffle to shield your microphone from computer noise.

ART OF NOISE

Ideally, we all want a perfectly silent recording and monitoring environment, but such conditions are rarely available. After all, even if you have

Professional Lightpipe AD/DA

www.frontierdesign.com/tango24

TM-D4000

001 Montana 2408 828 328

TM-D24 Digital 8•Bus

WaveCenter/PCI

ADAT XT Dakota MX-2424

03D Layla24 01V 02R

take what you've got, and make it better

Need more analog I/O for your computer interface or digital mixer? Then get a Tango24. It converts 8 analog inputs to an ADAT optical output, and takes an ADAT optical input and converts it to 8 analog outputs. Perfect for getting more in and out of your Digi 001 or your Frontier Dakota or your MOTU 828 or your Yamaha 01V or...well, the list goes on and on.

And you'll love Tango24's price ($699) as much as you will love its clean sound!

features

- **Pristine 24-bit, low-noise conversion**
- **Balanced TRS I/O at +4dBu or -10dBV**
- **Word clock In and Out**
- **Flexible clock selection**
- **ADAT Optical In, Out, and Thru**

8 analog ins, 8 analog outs, word clock, lightpipe...it's just that simple

FRONTIER DESIGN GROUP

Welcome to the Family.

Crank the creative dial way up with these mighty, cross-platform* Pro Tools LE-based home and project studio workstations.

Mbox

Ideal for on-the-go recording, collaboration, editing, and mixing.

- Stereo analog I/O
- 2 Focusrite® preamps
- 24-bit/48 kHz sound quality
- 100% USB-powered
- Stereo S/PDIF I/O
- 48V phantom power
- Zero-latency monitoring
- 2 TRS (1/4") inserts
- 24-track Pro Tools LE software

Digi 001

From recording bands to radio programming, all-in-one proven excellence.

- 18 simultaneous I/O channels
- 2 preamps
- 24-bit/48 kHz sound quality
- 48V phantom power
- PCI connection
- 32-track Pro Tools LE software**
- MIDI IN/OUT
- Rackmountable

* *Mbox is Mac only; Windows support coming soon.*
** *Windows only; beta version for Mac available online.*

digidesign

Digi 002

Finger-friendly dual personality system, perfect for the 24-hour musician.

- 18 simultaneous I/O channels
- 4 preamps with 48V phantom power
- Integrated control surface
- 24-bit/96 kHz sound quality
- FireWire® connection
- Powerful Digi 002pack plug-in bundle included
- 32-track Pro Tools LE software
- 8x4x2 digital mixer (in Standalone mode)

Digi 002pack

Powerful, professional plug-ins come bundled FREE with your Digi 002.

- **Amplitube** *by IK Multimedia*
  (Guitar amp and stompbox emulator)
- **D-Fi** *by Digidesign*
  (Retro sound design tools)
- **D-fx** *by Digidesign*
  (Chorus, Flanger, and other effects)
- **Maxim** *by Digidesign*
  (Peak limiting and sound level maximizing)
- **PRO-52** *by Native Instruments*
  (Vintage synthesizer emulation)
- **Renaissance Collection** *by Waves*
  (Vintage EQ, dynamics, and reverb)
- **SampleTank LE** *by IK Multimedia*
  (Expandable sound module plug-in)

FREE

Over $2,250 Value!

Plug-Ins

Remember: All Pro Tools LE projects are fully compatible with any Pro Tools system all the way up to Pro Tools|HD on Mac or PC. For more information about Pro Tools upgrades, hard drives, computers and plug-ins, call (800) 222-4700 or visit www.sweetwater.com.

OF THE PRO TOOLS LE FAMILY TODAY.

(800) 222-4700 • (260) 432-8176
5335 Bass Road • Ft. Wayne, Indiana 46808
sales@sweetwater.com • www.sweetwater.com

rented a well-insulated studio, you may still have to keep the instruments from bleeding into each other's microphones by using baffling and fixing instrument positions, mic positions, and mic patterns to keep things separated. You'll need to apply those same skills to mitigate computer noise.

Admittedly, my computer is pretty noisy, but under most circumstances I can record saxophone parts in the same room with no noticeable noise. The saxophone is loud enough that my mic gain doesn't have to be cranked up, leaving any computer bleed at a comparatively low level. By using my mic's cardioid pattern with the null facing the computer and placing the mic in the farthest corner of the room, I can further reduce the impact of those fans. When Sony finally comes to its senses and offers me a record deal, I might reevaluate whether this arrangement is "quiet enough," but at that point I'll probably reevaluate a lot of my studio's limitations. In the meantime, by applying basic engineering skills and zero money (my mantra), I have devised a perfectly viable solution to the computer-noise problem.

The computer noise becomes more of an issue, however, when I pick up the flute and boost the mic's gain. A bit of baffling solves that potential problem nicely, whether I use a sheet of plywood or wallboard mounted on a base of 2×4s, or something fancier like Auralex Acoustics' MAX-Wall (see **Fig. 1**). A few decibels of additional shelter from the CPU is sufficient for recording all but the most extreme pianissimos. If you take the DIY route, consider draping the baffle with absorptive (or diffusive) material such as a blanket to minimize reflections off the plywood.

FIG. 2: Moving your computer outside of the studio into a closet or machine room requires the use of a keyboard, video, and monitor (KVM) extender such as the Ex-tend-it series from Gefen.

A KIND OF HUSH

If you want to tackle the issue head-on and you have a little do-it-yourselfer in you, you can modify your computer in several ways to reduce its din. At the top of your hit list should be either your cooling fans or your hard drives. On the PC in my studio, the fans are much noisier than the hard drives, even when I'm recording multiple tracks. That is not the case for some other computers I use regularly, though, such as the one in my classroom whose brand-name external drive makes a rather impressive racket. Whatever symptom your computer exhibits, there are ways to silence it.

A number of types of fans that run quietly are available from a variety of sources. Such fans run from $10 to $25 and feature high-quality bearings that minimize mechanical noise. They also have specially designed blades that can move a lot of air without creating excessive turbulence. Some are equipped with variable-speed controls so that the fan won't run any faster than is necessary.

Keep in mind that fans are not optional with modern processors; G4s, Athlons, and Pentium 4s by their very nature create an enormous amount of heat. Inadequate cooling of the CPU can lead to heat-related data errors, CPU failure, and even melting or burning of the CPU. Having your DAW burst into flames in the middle of a session is a drag. To help ensure that you're getting adequate cooling with your quieter fans, you might want to invest in a custom heat sink for your CPU. By using very large surface areas and materials that transfer heat efficiently, such heat sinks can make the fans' job much easier.

You'll most likely find one fan cooling your CPU, another attached to your case to pull hot air out, and another in your power supply. Some high-performance video cards have fans to cool the graphics coprocessor as well. The easiest kind to replace is the case fan, and the most difficult is the power-supply fan. Rather than

FIG. 3: If you want your computer within arm's reach but can't stand the racket, the Isobox Studio from Sound Construction and Supply keeps the noise in while quietly blowing the hot air out.

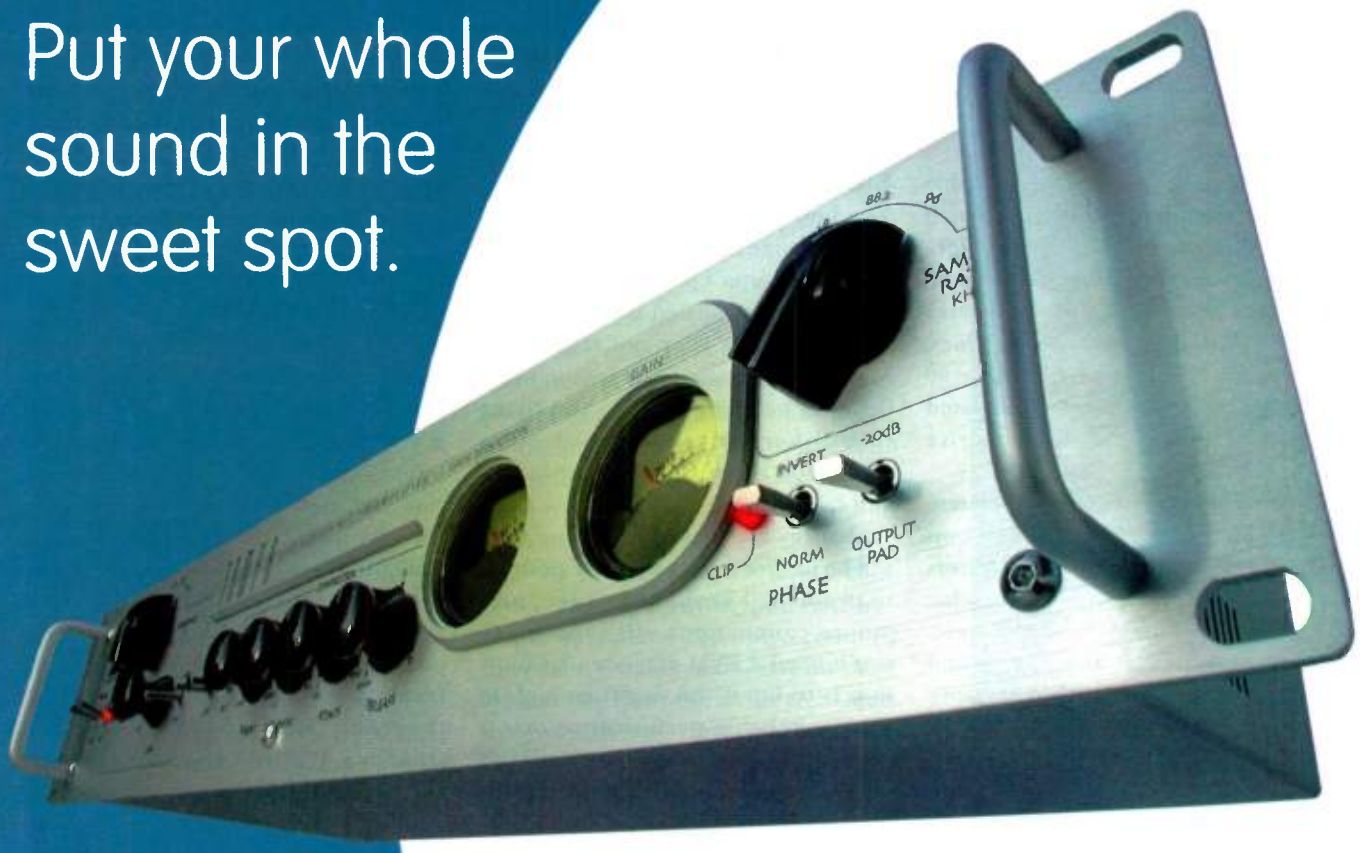
open up your power supply, you might want to simply replace it. A new quiet-running 400W power supply will set you back between $80 and $150, but in addition to obtaining a quieter system, you will gain a power supply that is more appropriate to the high-performance professional machine that you're running.

IN A SILENT WAY

Depending on just how much ruckus your hard drives are creating, there are three silencing strategies worth pursuing. If the source of the noise is hard-drive vibration (inducing rattles and such in the case), you can pull the hard drive out of the drive bay and remount it using rubber washers to dampen the vibration. A more elaborate but still affordable solution to vibration noise is the No Vibes III hard-drive mounting bracket ($29.99) from NoiseControl. Essentially a shockmount for your hard drive, it uses rubber O-rings to suspend the drive and insulate its vibrations from your case.

If your drive's noise is mechanical in origin, you need something like Silent Systems' SilentDrive ($32) to keep the noise from getting out. Essentially an

Put your whole sound in the sweet spot.



TAMPA-The Professional Mic Preamplifier and Compressor with Temporal Harmonic Alignment™

TAMPA is a professional microphone/instrument preamp unlike any other. That's because our design team set out to discover just why expensive tube technology sounds so good, and devise a way to land that sound at affordable solid state prices. The result is far beyond tube modeling. It's a whole new technology called Temporal Harmonic Alignment™. TAMPA even comes with direct digital output and world-class dual optical servo compressor built-in.

Unlike most solid state electronics, tube-based devices strike the ear as having such a "warm" sound because the added mid-range harmonics have the same temporal relationship as natural mechanisms like strings, drumheads and vocal chords. This results in a sweet spot that makes vocals, guitars and other midrange-rich content sound especially pleasing. TAMPA's revolutionary new Temporal Harmonic Alignment technology produces that same phase relationship found in both tubes and nature. And unlike tubes, TAMPA's sweet spot spans the full spectrum of your sound from bass to cymbal.

- >> Class A circuitry throughout
- >> Built-in dual optical servo compressor/limiter
- >> Variable impedance optimizes vintage mic performance
- >> Available 66dB system gain
- >> S/PDIF and AES/EBU output to digital recording gear

M-AUDIO
Redefining the Studio™

See the M-AUDIO dealer near you or visit us online: **www.m-audio.com/tampa05**

vice president of KABA, a CD and multimedia production facility in northern California, told me, "KABA and companies like ours can turn around a project in a very short period of time, if necessary. However, for the independent artist—especially one doing it the first time—I would first take the date on which you need delivery and move it back a week, simply for a 'mental cushion.' Ideally, you would initially place your order six weeks from your mental-cushion date to factor in shipping, mistake time, changes in design, the back-and-forth process of graphic proof approval, and circumstances out of your control. I highly recommend formulating some elements of your packaging while you're recording your project. Bring a manila folder to the studio and start filling it with photos, lyrics, credits, and graphic ideas. That way, you will be well prepared by the time you see your printing professional and not rushing the visuals associated with your project."

Be clear about your costs. Even though printing and photocopying costs can be fairly competitive, be sure to talk to a printer who can explain what you are getting for the budget you have to work with. Price quotes vary widely when an artist makes nonstandard requests, especially with CD manufacturing.

Use several proofreaders. Much the way that listening to the same mix repeatedly can tire your ears, having one person proofread printed materials multiple times can easily lead to errors slipping through. A simple word-processing spell check doesn't suffice when it comes to final drafts of printed materials, especially with credits that include names. Have a few people whose objective opinions you trust go over your materials so you can avoid typos or awkward wording on the final product.

Don't be fooled by the Web. The required resolution for photos and artwork for printed materials is higher than that required for Internet posting, so be sure to discuss technical requirements such as exact layout measurements, resolution for scanning, and color limitations with your printing professional.

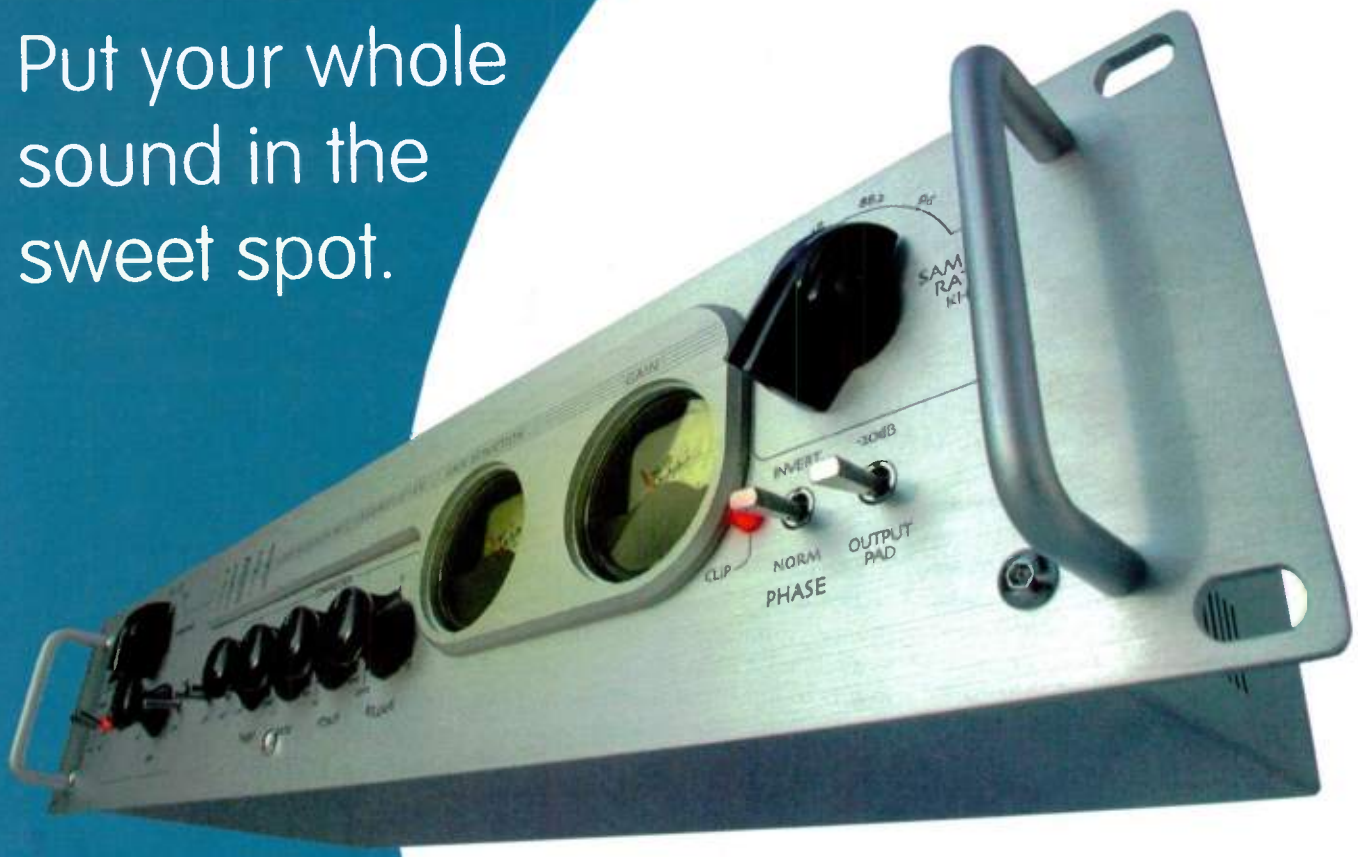
Keep your materials consistent. A well-planned approach that allows you to reuse elements for your printed materials creates an association between the graphics and your music and can also cut down on costs.

By carefully dotting your i's and crossing your t's, you can create product packaging that is artistically, technically, and legally solid. Above all, remember that the printed medium supports your musical artistry. Try to do your music justice by presenting it in the best way possible.

After all these years, **EM** *contributor* **Michael A. Aczon** *still can't get over how great the packaging is for* Sgt. Pepper's Lonely Hearts Club Band.

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

Put your whole sound in the sweet spot.



TAMPA-The Professional Mic Preamplifier and Compressor with Temporal Harmonic Alignment™

TAMPA is a professional microphone/instrument preamp unlike any other. That's because our design team set out to discover just why expensive tube technology sounds so good, and devise a way to land that sound at affordable solid state prices. The result is far beyond tube modeling. It's a whole new technology called Temporal Harmonic Alignment™. TAMPA even comes with direct digital output and world-class dual optical servo compressor built-in.

Unlike most solid state electronics, tube-based devices strike the ear as having such a "warm" sound because the added mid-range harmonics have the same temporal relationship as natural mechanisms like strings, drumheads and vocal chords. This results in a sweet spot that makes vocals, guitars and other midrange-rich content sound especially pleasing. TAMPA's revolutionary new Temporal Harmonic Alignment technology produces that same phase relationship found in both tubes and nature. And unlike tubes, TAMPA's sweet spot spans the full spectrum of your sound from bass to cymbal.

- >> Class A circuitry throughout
- >> Built-in dual optical servo compressor/limiter
- >> Variable impedance optimizes vintage mic performance
- >> Available 66dB system gain
- >> S/PDIF and AES/EBU output to digital recording gear

M-AUDIO
Redefining the Studio™

See the M-AUDIO dealer near you or visit us online: **www.m-audio.com/tampa05**

isolation booth for your hard drive, SilentDrive mounts your hard drive in a sound-dampening sleeve that fits in a normal drive bay. Its design is capable of dissipating up to 5W of heat, which may not be adequate for some high-performance drives. Check your manufacturer's specs before you risk cooking your drive. Along similar lines, Digidesign's new DigiDrive FireWire 80 ($575) is built in to a sound-insulated case that is claimed to reduce drive noise by 20 dB.

If you're putting together a system or are going to upgrade, plan on buying a quiet hard drive. Manufacturers are increasingly aware of the effect that noise can have on a work environment, so they are building quieter drives and making noise ratings part of their spec sheets. Seagate's Barracuda ATA IV drive features a SoftSonic Fluid Dynamic Bearing motor along with internal dampers and other technologies to deliver what the company claims is "virtually silent" performance. Similarly, Samsung uses a technology it calls NoiseGuard to quiet things down. In addition to poring over manufacturers' specs and querying your colleagues about which drives are quietest, you should check out StorageReview.com, which regularly reports on drive noise along with more traditional performance criteria.

FIG. 4: Carillon Audio Systems' AC-1 computer system is especially designed for studio use. Its heavy-duty rackmount enclosure and extraquiet fans and drives keep the noise level well below that of a typical desktop computer.

SILENT RUNNING

The best solution to computer noise may be to remove your CPU from your studio. You won't hear a peep out of it once you've relocated it to a closet or the living room. (I'm not responsible for any noise caused by a spouse who's upset at having a CPU in the living room!) Keep in mind that adequate ventilation is critical for performance and safety reasons.

Chances are that your remote CPU will be farther from your work position than normal keyboard, video, and mouse connections will support, so you'll need a KVM extender. Its function is to boost the signal enough to achieve reliable performance over a longer-than-usual cable run. Belkin's OmniView CAT5 KVM Extender ($319) supports relocating your CPU up to 500 feet away from the controls and display using standard CAT5 cabling.

Using multiple, ADC, or DVI monitors or running multiple computers from one console requires more elaborate KVM solutions. Gefen's Ex-tend-it series includes extenders and converters for just about any combination you can dream up (see **Fig. 2**).

Speaking of monitors, you should definitely consider upgrading to a flat-panel monitor for your DAW. Not only will you lose that high-pitched whine that some CRTs generate, your work area will become several degrees cooler, your desk space much larger, and your eyes less strained.

Having removed your noisiest components a safe distance away, you may now notice that your mouse and keyboard also generate quite a bit of clatter. Some people find the clacking of mouse and keyboard to be a reassuring sort of feedback as they type and point; if you aren't one of those people, however, rest assured that you can find models that are devoid of any such noises.

Remember that you probably already have 50 feet of remote control built into your system. Most DAWs support some type of MIDI remote control, allowing you to trigger anything from basic transport and recording functions to editing operations and undo commands from a keyboard, control surface, or a handy little remote gizmo such as the MIR from C-Mexx.

SILENCE IS GOLDEN

One drawback of relocating your CPU is that it makes the CD-ROM and floppy drives difficult to get to, which is a big pain when you're installing software or if you have plug-ins that require periodic CD insertion to verify authorization. Similarly, burning CDs or hitting the ever-popular reset button is more difficult when your computer is in the next room.

One solution to that problem is to put your computer in its own isolation booth, so it doesn't have to move out of the room. (Hey, it's good enough for singers.) The 16-inch wide Isomac ($1,135) and the 24-inch wide Isobox Studio ($1,395; see **Fig. 3**) from Sound Construction and Supply are good examples; they enclose the computer in a custom isolation booth about the size of a two-drawer filing cabinet. I've recorded sessions using a Pro Tools rig in an Isomac in the same room with an acoustic grand piano miked with some very sensitive mics, and computer noise was not an issue. The Isobox Studio boasts even greater noise reduction and also provides rackspaces for studio gear.

The Isomac and Isobox Studio are built from medium-density fiberboard to minimize transmission of the computer's racket to the outside air. The front door of both products is made of ½-inch-thick insulated glass to afford a good view of the computer and related components while reducing the noise; a back door provides easy access to rear-panel connections. The ventilation system in both cabinets is specially designed to keep the noise inside, and a thermometer is easily visible from the front, so you can see at a glance if there's cause for concern. Other noise-reduction cabinets that are worth considering (especially for computers with rackmount peripherals) include the AcoustiLock from Noren Products (www.acoustilock.com) and the IsoRaxx from Raxxess (www.raxxess.com).

If you decide to take the DIY route and build your own custom isolation box, be sure to keep ventilation in mind. A simple plywood box with some acoustic foam on the inside can provide significant noise reduction if you're careful to make tight-fitting seams and caulk them to prevent any leakage. Use weather stripping to ensure a tight fit on the doors, and put intake and exhaust fans on the back of the unit. You can even make your computer's case into an isolation box by lining the inside with absorptive foam and sealing any gaps. Remember, you'll need to leave at least one hole for air intake and another for exhaust.

If you're shopping for a new computer, consider buying one that's already optimized for noise-reduced operation. Carillon Audio Systems' AC-1 systems (see **Fig. 4**) use all the techniques discussed here—vibration damping, hard-drive enclosures, quiet drives and fans—along with a custom-designed noise-reducing rackmount case to keep the decibels down. Carillon claims noise levels below 25 dB SPL, even during heavy read/write cycles.

QUIET COMPANIES

Auralex Acoustics
www.auralex.com
MAX-Wall and other acoustic-treatment products

Belkin
www.belkin.com
KVM extenders and other computer accessories

Carillon Audio Systems
www.carillonusa.com
Turnkey DAW systems

C-Mexx
www.mircontrol.com
MIR MIDI Interactive Remote

Digidesign
www.digidesign.com
DigiDrive FireWire 80 external drive

Gefen, Inc.
www.gefen.com
KVM extenders and other computer accessories

NoiseControl
www.noisecontrol.de
No Vibes III hard-drive insulation cage and other quiet-computer accessories

QuietPC
www.quietpc.com
Distributor of acoustically friendly computer components, including quiet fans and power supplies

Samsung
www.samsung.com
Hard drives featuring NoiseGuard technology

Seagate Technology LLC
www.seagate.com
Barracuda hard drives featuring SoftSonic technology

Silent Systems
www.molex.com
SilentDrive

Sound Construction and Supply, Inc.
www.custom-consoles.com
Isomac and Isobox Studio

ENJOY THE SILENCE

It's impossible to list all of the products available to help you quiet your computer, but these ideas will give you a good head start in your search. Whether you tackle one noisy component at a time or jump in with both feet and a big checkbook is up to you. But if you use your common sense and your ears to plan your attack, you'll be able to make some significant reductions in the roar of technology.

Quieting a Mac is the same as quieting a PC, with one exception: you'll need to overcome the "closed system" mystique associated with Apple products. Be brave and open the box! Respect the danger of static discharge and your computer's need for proper cooling, and you'll do fine. Just be warned that once you've silenced your computer, you'll start to realize just how loud your squeaky chair really is.

Brian Smithers *is Course Director of Audio Workstations at Full Sail Real World Education in Winter Park, Florida.*

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

WORKING MUSICIAN

Stop the Presses

Avoid packaging pitfalls before going to print.

By Michael A. Aczon

Even though audio is the currency of the music industry, musicians depend heavily on print to sell their music. Savvy musicians acknowledge that they have only one opportunity to make a good first impression, and they therefore work hard to ensure that the quality of the visual and written materials that accompany their music is high. You too should be aware of some of the legal and practical challenges that you will face when preparing the packaging for your recording project.

KEEP IT LEGAL

You will need to secure three sets of legal rights before finalizing the packaging for your project: common law and constitutional rights, intellectual property rights, and contractual rights. Let's look at each set, one at a time.

Private lives. Every person has a constitutional right to privacy. Therefore, when finalizing the packaging for your project you must secure an individual's permission before using his or her name, performance, photograph, likeness, or other biographical material. One way to do that is to have everyone involved in your project sign a release form. Lawyers familiar with multimedia and entertainment law should be able to draft a release for a relatively small fee. You should have a stack of release forms available with blanks for filling in the name of the artist involved; the circumstances under which you obtained the person's likeness, photograph, or biographical material (for example, as a session musician, as a model on your CD artwork, and so on); and a broad description of how you intend to use their likeness.

Intellectual property. The two primary intellectual property rights that you

JACK DESROCHER

"I Landed a Record Deal in a Week Because I Joined TAXI"

Brian Allan – TAXI Member

I know it sounds almost too good to be true, but I really did land a record deal about a week after arriving in America on my first visit. That's me signing my contract with 2K Sounds/EMI President Michael Blakey on the left, and V.P. of A&R, Laura Becker on the right.

My name is Brian Allan, and I'm from Scotland. I thought landing a deal with a U.S. label was just a pipe dream, but I was really determined. I figured all I needed was a "vehicle" to get my music heard by American labels.

The vehicle I chose was TAXI. And let me tell you why I'm so incredibly happy I did.

I found out about TAXI on the Internet, and it looked like just what I needed. So, I decided to take a shot and sign up right away.

Before I'd even taken advantage of TAXI's phenomenal industry connections, I heard about their annual convention, The Road Rally. I decided to fly out to Los Angeles and give it a try.

I was amazed by what I saw. Nearly two thousand songwriters and artists were there. Plus more high-level music industry executives than I had ever seen in one place. The panels were brilliant, but what happened next was a dream come true.

A fellow TAXI member heard my music, and introduced me to an A&R person who was a panelist at the convention. She liked my music so much that she asked me to extend my stay in the States. Needless to say, I was more than happy to oblige.

The next thing you know, I was auditioning for the president of the label right in his office. I guess I passed the audition, because I got signed a few days later.

The ironic part is that I got my record deal so quickly, I never got to pitch my music to the hundreds of companies that use TAXI to find songs, bands, artists, and tracks for film and TV projects.

Will your TAXI membership get you a record, publishing, or Film & TV deal? That all depends on your music. As my friends in Scotland always say, "You can't win the lottery if you don't buy a ticket."

But TAXI offers a lot more than a great way to get your music heard by key people in the music industry. Their monthly newsletter, personal feedback, and private convention are worth much more than the price of investing in a TAXI membership.

If you are a songwriter, artist, composer or band, then I highly recommend that you make the call to TAXI right now. I did, and it changed my life!

TAXI®

The Independent A&R Leader

1-800-458-2111

need to secure before going to print are copyrights and trademarks. Copyrights cover all of the music and artwork used on a project; trademarks identify the various "brand names"—such as your band name or the name of a production company, a studio, or a product endorser—associated with your project.

Because a copyright holder owns and controls the exclusive right to make copies of a work, it is crucial that you clear all rights to use copyrighted material, particularly with regard to CD packaging. You must obtain a mechanical license from the publisher of a song before including it on a CD. The license will probably require that the songwriter and publisher receive the proper credit on all printed materials. If you plan to include lyrics on the packaging, let the music publisher know that when you obtain your mechanical license; the right to publish lyrics is a separate right that is usually granted free of charge. When the right to use samples is negotiated, the owners of the original songs that were sampled usually require that very specific credit be printed on all copies of the new recording (see "Working Musician: In the Clear" in the March 2002 issue).

Artwork, photographs, and liner notes are subject to copyright ownership laws, and you will need to get permission to use such works from the artists who created them. Each artist should sign a license or a use agreement that clearly states how you are using the copyrighted material, what fees are being paid for the use, any restrictions on your use (for example, you may be able to use a photograph on a CD booklet and for posting on Web sites but not on T-shirts or advertisements), and other terms in connection with the artwork.

If you want to own and have full use of any visual materials for your packaging, consider having artists provide their services on a "work for hire" basis. With work-for-hire arrangements, you commission an artist to deliver your artistic vision, be it in a drawn, written, or photographed form. In exchange for their fee, artists will often transfer their right of ownership and copyright in the resulting work to you. Have your graphic artists sign a written work-for-hire agreement for their services.

Trademarks, which identify the source of goods in the marketplace, are some of the most important and protected rights in print media. If you don't learn about them before going to print with the packaging for your record, you might well have some problems. Be careful, for example, if a band with the same band name as yours has already taken the necessary legal steps to use that name exclusively in the entertainment industry. If they catch wind of your upcoming release and send you a "cease and desist" letter, you will not only have to rename your band, but you will need to reprint all of your artwork with your new band name—a costly proposition.

Using another company's trademark or even something closely resembling its trademark (such as a name or logo) in your packaging may imply a business association that the original trademark owner won't allow. Companies with strong trademarks—especially those that do a lot of merchandising with their trademarks—vigorously protect them through legal channels. I once represented a punk band that used the same name as a character on a network television show. The full legal force of a major television production studio descended on the band with hundreds of pages of proof that they owned the rights to use any names associated with the show in all forms of entertainment, causing the band to eventually change its name.

Before using a trademark that you do not own, be sure to get the permission of the legal owner. Your printed materials may have to include statements of who the owners of various trademarks are, whether you have permission to use the trademark, whether you have an affiliation with the trademark owner, and what the extent of your affiliation with the trademark owner is. An extreme example of a trademark notice was when the group Aqua sold millions of copies of its song "Barbie Girl." After a much publicized legal battle with Mattel, copies of "Barbie Girl" had to have stickers put on them with a statement of trademark ownership and a note that the band had no association with the owners of the "Barbie" trademark.

Everything is negotiable. The last set of legal rights that affect your packaging are contract rights, or rights that are negotiated. At the top of the list here are negotiated credits, including musician, production, management, and other common music-business credits. "Courtesy credits" to other record labels for allowing their exclusive artists to appear on another project are a result of contractual obligations. Less obvious are the logos, artwork, and carefully drafted statements in printed materials that are the result of band partnership agreements, settlement agreements, and other contractual obligations of an act. Endorsement deals usually require that an act include a phrase stating on all product packaging or promotional materials that an act exclusively uses a certain product. Likewise, you might be required to include multiple label or production-company logos on CDs if an artist's exclusive recording services are being "shared" by more than one company.

PRACTICAL TIPS

In addition to the various legal factors you must consider when putting together your packaging are the nuts-and-bolts issues. Here are some key practical pointers that I have culled from CD manufacturers and graphic designers.

Give yourself enough time. Remember that the printing process is different from the speed of photocopying, and it is important to allow enough time to prepare your materials, calculating backwards from the deadlines given to you from your printing and manufacturing professional. Lauraine Bacon,

vice president of KABA, a CD and multimedia production facility in northern California, told me, "KABA and companies like ours can turn around a project in a very short period of time, if necessary. However, for the independent artist—especially one doing it the first time—I would first take the date on which you need delivery and move it back a week, simply for a 'mental cushion.' Ideally, you would initially place your order six weeks from your mental-cushion date to factor in shipping, mistake time, changes in design, the back-and-forth process of graphic proof approval, and circumstances out of your control. I highly recommend formulating some elements of your packaging while you're recording your project. Bring a manila folder to the studio and start filling it with photos, lyrics, credits, and graphic ideas. That way, you will be well prepared by the time you see your printing professional and not rushing the visuals associated with your project."

Be clear about your costs. Even though printing and photocopying costs can be fairly competitive, be sure to talk to a printer who can explain what you are getting for the budget you have to work with. Price quotes vary widely when an artist makes nonstandard requests, especially with CD manufacturing.

Use several proofreaders. Much the way that listening to the same mix repeatedly can tire your ears, having one person proofread printed materials multiple times can easily lead to errors slipping through. A simple word-processing spell check doesn't suffice when it comes to final drafts of printed materials, especially with credits that include names. Have a few people whose objective opinions you trust go over your materials so you can avoid typos or awkward wording on the final product.

Don't be fooled by the Web. The required resolution for photos and artwork for printed materials is higher than that required for Internet posting, so be sure to discuss technical requirements such as exact layout measurements, resolution for scanning, and color limitations with your printing professional.

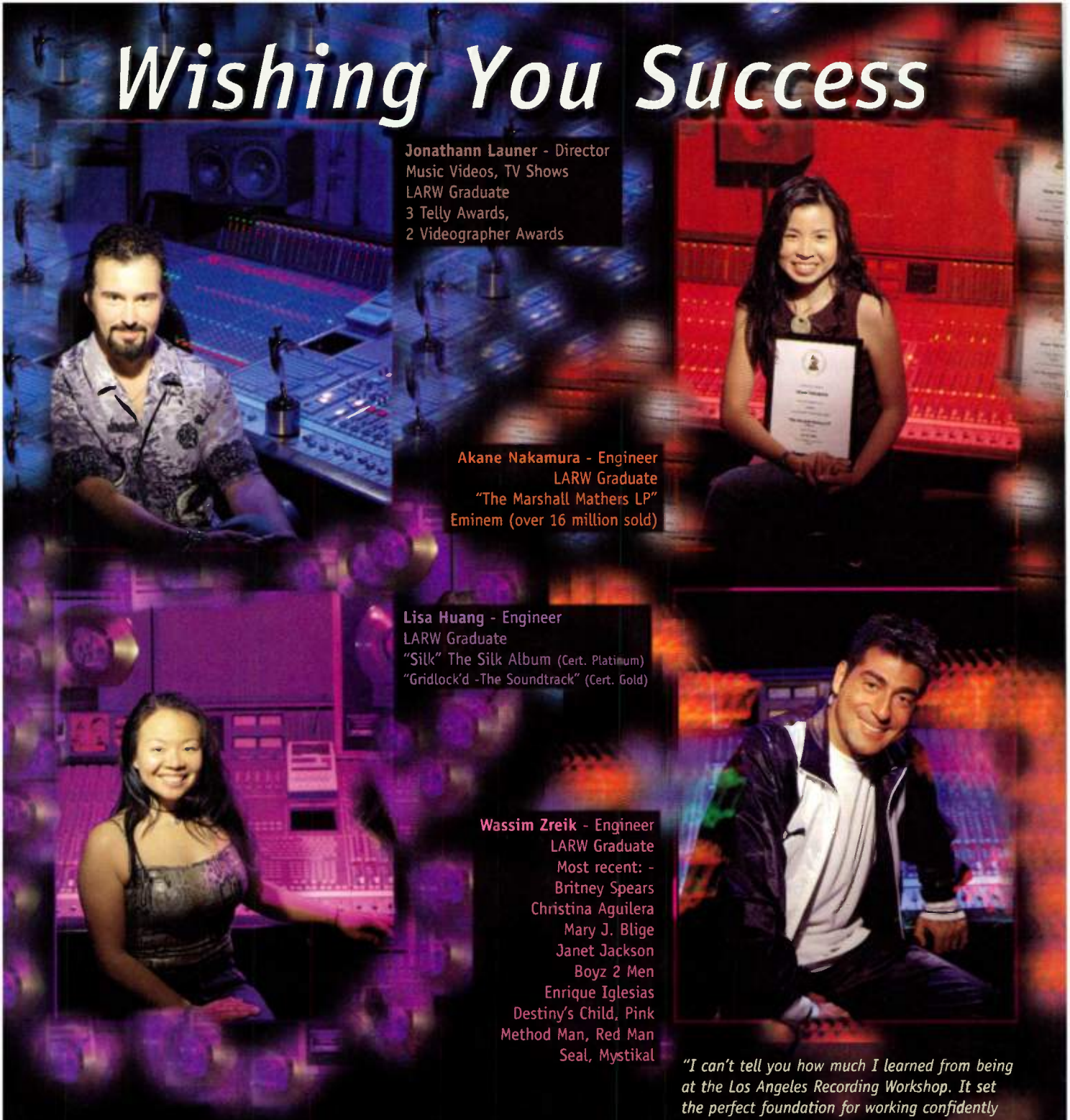
Keep your materials consistent. A well-planned approach that allows you to reuse elements for your printed materials creates an association between the graphics and your music and can also cut down on costs.

By carefully dotting your i's and crossing your t's, you can create product packaging that is artistically, technically, and legally solid. Above all, remember that the printed medium supports your musical artistry. Try to do your music justice by presenting it in the best way possible.

After all these years, **EM** *contributor* **Michael A. Aczon** *still can't get over how great the packaging is for* Sgt. Pepper's Lonely Hearts Club Band.

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

Wishing You Success



Jonathann Launer - Director
Music Videos, TV Shows
LARW Graduate
3 Telly Awards,
2 Videographer Awards

Akane Nakamura - Engineer
LARW Graduate
"The Marshall Mathers LP"
Eminem (over 16 million sold)

Lisa Huang - Engineer
LARW Graduate
"Silk" The Silk Album (Cert. Platinum)
"Gridlock'd -The Soundtrack" (Cert. Gold)

Wassim Zreik - Engineer
LARW Graduate
Most recent: -
Britney Spears
Christina Aguilera
Mary J. Blige
Janet Jackson
Boyz 2 Men
Enrique Iglesias
Destiny's Child, Pink
Method Man, Red Man
Seal, Mystikal

"I can't tell you how much I learned from being at the Los Angeles Recording Workshop. It set the perfect foundation for working confidently with the biggest and most demanding stars. If you seriously want a recording career, LARW is the place to go". Wassim Zreik

Los Angeles Recording Workshop is one of the best-equipped recording engineer schools on the planet. If you are interested in training for a professional career in Audio we're sure you'll be knocked out by our training facilities, our extensive equipment, our curriculum and our outstanding staff and faculty. Just ask our graduates!

818-763-7400

recordingcareer.com

LOS ANGELES RECORDING WORKSHOP
Center for the Recording Arts

with plastic endcaps, it's almost nine pounds—nearly triple the Oxygen's weight. A more interesting comparison is with the all-plastic BassStation, Novation's first two-octave synth. I've owned a BassStation since 1995, so it was illuminating to set it up side by side with the K, especially because the BassStation has true analog oscillators and filters.

I'll compare their sounds in a moment, but Novation has made great strides in industrial design. The K-Station feels far sturdier than its flyweight predecessor does. Its knobs are easy to grasp and intelligently spaced, and they turn with just the right amount of resistance (see **Fig. 1**). Its pitch-bend and mod wheels are hard rubber with horizontal grooves for good traction. The keyboard, though not the crispest in the world, feels solid. Buttons with status LEDs have replaced the BassStation's touchy slide switches. A bright, 16-character LCD makes it surprisingly easy to navigate the K-Station's inner workings. The display alone is reason enough to pick the K-Station over the rackmount A-Station, which is sonically identical but offers just a two-digit LED.

Astonishingly, though, the K-Station doesn't display patch names—only numbers. With 400 memory locations (inexplicably numbered 100 to 499), that scheme makes it much harder than necessary to locate the sound you want. Although the factory presets are generally organized by tens—you'll find basses in slots 100, 210, and 260, for example—slots 108, 208, and 268 contain an organ, a clicky arpeggio, and a telephone ring, respectively. I had a hard time remembering where I'd stored my own sounds (slots 300 through 499 are empty), especially when I'd modified an existing sound and wanted to save it to a new location. According to Novation, patch naming was omitted to make the K-Station totally compatible with the A-Station, but I sincerely hope it can be added in a software update.

When you twist a knob, the K-Station's display changes to show the parameter name and value. Some knobs go from –64 to +63, and others go from 0 to 127, but the markings around them don't indicate that. Fortunately, a helpful little animated graphic shows each knob's position relative to its stored value (see **Fig. 2**). All knobs and sliders transmit MIDI Control Changes, so you can capture and play back your performance in a sequencer. The buttons send MIDI data as well.

The K-Station's two-octave keyboard generates Velocity but not Aftertouch, which would have been welcome in a performance synth. I was pleased that the mod wheel can control a number of simultaneous parameters, including filter cutoff, volume, pitch (over four octaves!), and the send level for each individual effect, which greatly increases the expressive possibilities. The values sent by the wheel can be either positive or negative, so you could make

a lead sound bright and distorted when the wheel is down, then gradually more mellow and echoey as you push it up. (I programmed that example in less than 60 seconds—that's how simple it is to operate the K-Station.)

For more expression, a dedicated button lets you quickly configure how a patch will respond to incoming Aftertouch and Breath Controller (CC 2) data. I connected a Yamaha BC3 breath controller with a MIDI Solutions Breathalyzer interface, mapped CC 2 to pitch, and was able to play some stratospheric glissandos on a brass patch.

K IN, K OUT

Revealing the K-Station's primary role as a monotimbral lead synthesizer, the sparse back panel contains only stereo analog outputs, MIDI ports, a headphone jack, and an unexpected bonus—an audio input (see **Fig. 3**). Because the K-Station bristles with MIDI-belching knobs, a built-in USB MIDI interface would have been convenient, turning the synth into a compact software control surface like the Oxygen 8. Of course, adding USB would have driven up the price, and for laptop-computer use, you could always get a pocket-size USB MIDI interface such as the Edirol UM-1, the M-Audio USB Midisport Uno, or the Yamaha UX96.

Notably missing from the K-Station's back panel is a sustain-pedal jack. Although a pedal isn't always essential to my playing technique, I missed having one, especially when using the K-Station to control external sound modules and software synths. Most players will probably want to control sustain with another MIDI instrument's pedal, but that doesn't help if the K-Station is the only keyboard that's available.

SHIVER ME TIMBRES

On the surface, the K-Station's synthesis engine appears to be a standard oscillator-to-VCF-to-VCA model with two LFOs and two envelope generators, but several hidden goodies make it more powerful. Each voice can use three oscillators plus a noise source, and the external input can be fed through the filter and amplifier as well for an effective five sound sources per voice. Not fat enough? You can detune the three main oscillators with themselves for a sound that'd take eight sources on a conventional synth. Add the unison mode, which stacks from two to all eight of the K-Station's voices, and things really pork up.

The oscillators produce only four basic waveforms—the venerable sine, triangle, sawtooth, and pulse—but you can adjust the pulse width with a knob, LFO, or envelope to create square waves or a variety of warm or nasal tones. Modulating the "pulse width" of a sine, triangle, or sawtooth wave actually offsets the phase of a copy of the waveform. Modulating that phase offset with a slow LFO creates the detuning effect I mentioned previously.

External audio can be sent straight to the effects, or first routed through the synthesis engine or vocoder. The order in which the effects are connected isn't documented in the manual, but from listening, it appears to be panning; then distortion; then delay, reverb, and chorus in parallel; and then EQ.

To adjust the settings, simply press the Up and Down Select buttons until the LED corresponding to the effect you want lights up, and then twist the Level knob to set the send level. In the case of EQ, the knob will boost lows and cut highs when turned left and do the opposite when turned right. For pan, the knob acts as a simple left-right control. When the vocoder is selected, the knob controls the balance between the carrier and modulator signals (the K-Station's oscillators and the external input, respectively). For more detailed tweaks, punch up the effects menu, where you can perform tasks such as assigning an LFO to control panning or to vary the EQ's center point.

The effects sound very good, although the delay is not an interpolating type, so you will hear clicking if you change the tempo (using either the arpeggiator's Tempo knob or MIDI) while audio is passing through it. You can make the chorus approximate a flanger at some settings. I've never been keen on digital distortion, but this one complements the sound well, particularly because you can use the wheel to vary the amount during performance. The vocoder is a blast, and it comes with enough controls to produce intelligible speech. That's quite a bonus on such a small, inexpensive synth.

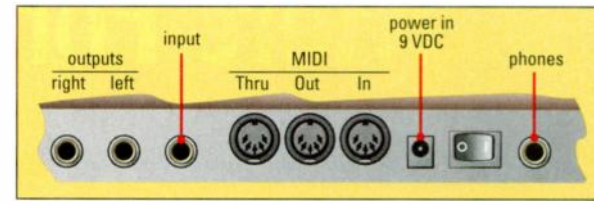


FIG. 3: Although it lacks a sustain-pedal jack, the K-Station wins points for its external audio input.

K-Station Specifications

Audio Inputs	(1) unbalanced ¼" mic/line TS
Audio Outputs	(2) unbalanced ¼" TS; (1) ¼" stereo headphone
Keyboard	25-note unweighted; Velocity-sensitive
Sound Engine	analog synthesis modeling
Polyphony	(8) notes
Multitimbral Parts	1
Patch Memory	(400) RAM locations (200 are blank)
Sound Sources	(3) oscillators with hard-sync, FM, ring modulation; noise; external audio input
Oscillator Waveforms	sine, triangle, sawtooth (all with doubling effect); variable pulse
Filters	resonant lowpass; switchable 2- and 4-pole
Envelopes	(1) amplitude ADSR; (1) modulation ADSR (controls filter cutoff, pulse width, and pitch); (1) FM AD
LFOs	(2): LFO 1 controls pitch; LFO 2 controls filter and pulse width. Both offer tempo sync; delay; triangle, saw, square, and sample-and-hold shapes
Effects	delay, reverb (6 types), chorus/phaser, distortion, shelving EQ, pan, vocoder; all available simultaneously
Arpeggiator	(6) patterns; 64–191 bpm or external sync
Controllers	(25) knobs; (4) sliders; (1) pitch wheel; (1) mod wheel
MIDI	In, Out, Thru
Dimensions	20.7" (W) × 3.7" (H) × 11.6" (D)

ARPEGG-U-LATER

Given the number of interesting parameters that can be synced to internal or MIDI clock (LFO speed, delay taps, phaser speed, panning, and EQ sweep speed), I was disappointed that the K-Station's arpeggiator is such an underachiever. It provides only six patterns: up, down, up-and-down, up-and-down with high and low notes repeated, order played, and random. Although you can change the subdivision from 32nd-note triplets to whole notes, every beat is played; there are no rests or rhythmic variations. Nor is there any variation in Velocity; each note (and its octaves, if enabled) plays at the same Velocity you entered.

That said, one of my favorite patches combines the arpeggiator with synchronized effects and a filter sweep set to different time divisions. I set the arpeggiator to 16th notes, the delay to dotted eighths, the filter LFO to three bars, and the phaser to free-running mode for a sound that evolved endlessly. For more variety, you can also change the arpeggiator pattern and other sound parameters (such as attack time) during playback. Still, if there's any room left in the ROM, adding more arpeggiator patterns is high on my wish list for a future OS update.

I was initially baffled by the update process, which is supposed to require simply playing a MIDI SysEx file into the K-Station. Because the keyboard shows a truncated readout of the OS version on power-up (1.0), I tried for days to update the OS, not realizing it already had version 1.0.09 installed. Each time, the display would slowly increment to "99%," then complain, "Packet Error." To see the full six characters of the OS version, you need to power up the K-Station while holding down the number 5 button.

HAVE A NICE K

Sometimes a piece of gear looks so cool that you stretch to devise with a justification to buy it. Happily, the K-Station is both attractive and practical, even doubling as an effects processor. It's smaller and less expensive than the Korg MS2000 and Waldorf MicroQ, its main competitors in the compact analog-modeling keyboard realm. The K-Station has double the polyphony and more effects than the MS2000, though it lacks the Korg's multimode filter and Mod Sequencer.

The feature gap between the K-Station and Waldorf—notably in multitimbrality and modulation options—is far greater. With the Waldorf's recent price drop, the K-Station's main advantages could be its smaller size, larger number of knobs, and straightforward user interface. On the other hand, the Waldorf's three-octave, Pressure-sensitive keyboard might be preferable to compactness in some setups. As always, the most important criterion is the sound, so I recommend auditioning all three.

Even disregarding its cost advantage, I'm very impressed with the K-Station. With its high-class sound and effects, boatload of knobs, and straightforward, two-tiered editing system, it could easily enhance a variety of music setups. Beginners should find the manual's background on synthesis and MIDI helpful, whereas more-experienced players will be able to dive in and get expressive sounds right away. The instrument's potential as a software control surface is also a big plus.

The K-Station has a few shortcomings, but I found work-arounds for several of them. I'm dismayed that the K-Station doesn't support patch naming. I'd also like to see more arpeggiator patterns, including a few with syncopation, Velocity variation, and perhaps chords. Velocity modulation of envelope attack time would be very welcome. Considering that the K-Station is a two-octave instrument, it's inconvenient that it has no semitone-transpose feature. Still, none of these gripes is a showstopper, and I'll bet that at least one of them will be addressed in a software update. (Although you should never buy gear based on what it might do in the future, Novation's track record of offering updates is good.)

For several years, I hated returning my tray table to its upright and locked position, because that meant I had to stop playing my Novation BassStation. The two-octave, analog BassStation has great sound and is easy to customize, and it makes me really appreciate the virtues of portability. With the K-Station, Novation has taken that concept into the digital realm, and the results are excellent. Now if it only ran on batteries . . .

David Battino *(www.batmosphere.com) has come to know the seven patches in his Novation BassStation very, very well.*

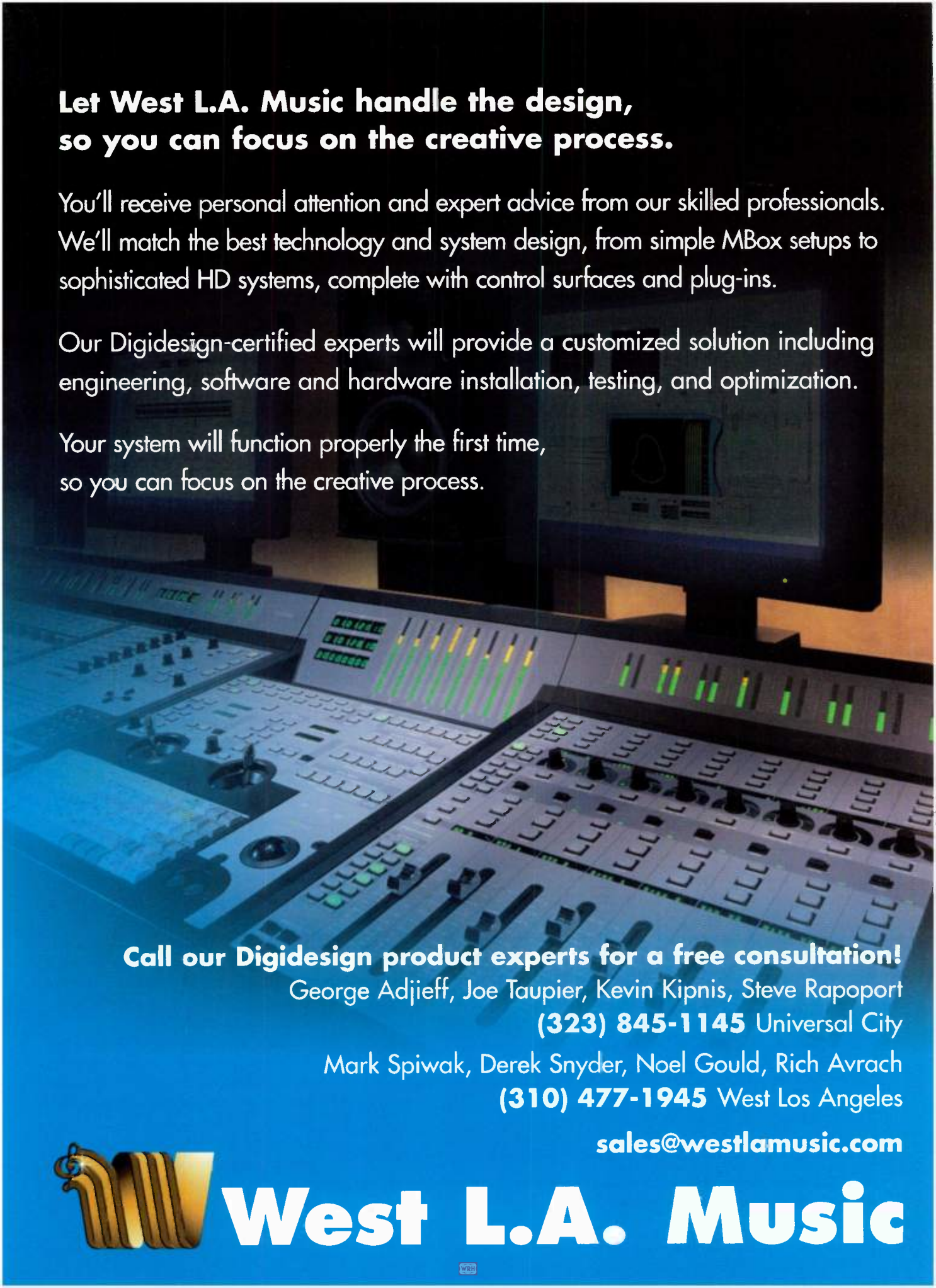
West L.A. Music...
Your Pro Tools Headquarters!

Pro Tools is the industry standard recording and editing system for musicians and post production professionals. The majority of recordings, feature film audio, and television audio is produced using Pro Tools.

Digidesign and West L.A. Music can bring you up to date with the latest digital recording technology, and Pro Tools can make your audio productions sound better than you ever imagined.

The world's top recording studios, broadcast companies, record companies and artists rely on West L.A. Music for their Pro Tools needs. West L.A. Music has designed and installed more recording systems than anyone!

Visit www.westlamusic.com for photos and a complete list of our world famous clients.


Let West L.A. Music handle the design,
so you can focus on the creative process.
You'll receive personal attention and expert advice from our skilled professionals. We'll match the best technology and system design, from simple MBox setups to sophisticated HD systems, complete with control surfaces and plug-ins.
Our Digidesign-certified experts will provide a customized solution including engineering, software and hardware installation, testing, and optimization.
Your system will function properly the first time,
so you can focus on the creative process.
Call our Digidesign product experts for a free consultation!
George Adjieff, Joe Taupier, Kevin Kipnis, Steve Rapoport
(323) 845-1145 Universal City
Mark Spiwak, Derek Snyder, Noel Gould, Rich Avrach
(310) 477-1945 West Los Angeles
sales@westlamusic.com
West L.A. Music

STEINBERG

WAVELAB 4.0 (WIN)

Still setting the standard for multitrack audio editors.

By Daniel Keller

WaveLab has been at the forefront of the dedicated Windows audio-editor scene for several years, and Steinberg has taken great pains to keep it there, breaking new ground with each version. CD burning arrived early with version 1.5, and the program's 2.0 update added sampler support and some high-end audio-analysis tools—all cutting-edge features for their time.

Version 3.0 significantly raised the bar, with support for a wider array of file formats and higher sampling rates. It also introduced the Audio Montage window, a powerful multitrack environment for nondestructive editing. The Montage is central to WaveLab's operational premise; it's a sophisticated tool for assembling individual files into a final project master. (For a more detailed look at the Audio Montage, see the review of WaveLab 3.0 in the February 2001 issue of **EM.**)

WaveLab 4.0 doesn't introduce anything quite as groundbreaking as the Audio Montage, but it does add more than enough noteworthy features to once again keep it well ahead of the competition. The user interface is nicely redesigned for a more streamlined work flow, performance is significantly improved, and a host of new features and analysis tools firmly establish WaveLab as a true all-in-one mastering suite.

MORE THAN SKIN DEEP

Although version 4.0's graphical interface is definitely a modernization of the previous version's, the changes are minimal enough for users already familiar with the program to maintain their comfort level. Once you poke around beyond the basics, however, it becomes clear just how much thought has gone into this face-lift.

FIG. 1: The addition of several right-click call-out menus in WaveLab's Audio Montage window makes it an effective mastering environment.

Minimum System Requirements

WaveLab

Pentium II/200 (Pentium III/500 recommended); 128 MB RAM (256 MB recommended); Windows 98/2000/ME/XP; 60 MB free hard-disk space

WaveLab now provides a good deal more control over the environment, offering the ability to collapse and redock control panels, customize and save window layouts, and create key-command lists. A number of menu functions have also been added, many with new icons for fast identification. The addition of right-click submenu options and marker functions in the Montage window (see **Fig. 1**) makes it quick and easy to create and save an entire CD master file with track markers, crossfades, and level information intact. All this contributes to a considerably improved work flow.

FEATURED EFFECTS

WaveLab's Effects pane has also been updated (see **Fig. 2**). In addition to providing for eight plug-ins (up from six), you can now reorder the effects chain by simply dragging and dropping them into the various slots. That's really handy for playing around with routing combinations.

WaveLab has always boasted a useful package of DSP effects, as well as support for third-party VST and DirectX processors. This update also adds some valuable plug-ins that were previously sold separately, including Spectralizer, Phase Scope, Spectrograph, MultiBand Compressor, Denoizer, and Declicker. In addition, the program provides a good-sounding 4-band mastering EQ and a new 192 kHz resampler plug-in. Those are all great tools.

One minor annoyance is Steinberg's long-time standard user-interface design for most of its effects. You change the value of a plug-in's virtual-data knob, as you would on a Mac, by clicking on the (virtual) data wheel and moving the mouse up or down. No problem, except that the effects always appear by default at the top of the screen, leaving

little room for an upward mouse stroke until you drag the effect downward.

Each new instance of a VST effect opens that plug-in's panel at the top of the screen once again, even after you've saved a screen layout. The system of moving the mouse up and down also offers less control than the concentric-circle method used by Steinberg's other VST plug-ins, where moving the mouse in wider circles offers finer resolution. (Oddly, Q—the included mastering EQ—works that way.) I'd like this to be a user-selectable setting; at the very least it should be possible to save a screen layout with the effects open at midscreen.

I also found two notable omissions in an otherwise excellent DSP rack: a de-esser and a professional-level reverb. Reverb-quality assessment is highly subjective, and WaveLab's reverb can easily be replaced with any number of good third-party offerings if necessary. The lack of any de-esser, however, is harder to justify in a mastering program, particularly when a de-noiser and de-clicker are included. Steinberg offers a VST plug-in version of SPL's De-esser as an option, but it seems odd that this one item is missing from an otherwise comprehensive processing rack.

PERFORMANCE FACTORS

Updates in performance are never as glamorous and enticing as graphics overhauls, new features, and other "wow-factor" updates. It's just not as easy to get people excited about under-the-hood improvements, and performance is particularly subjective and hard to quantify because of the large number of system variables involved. Nevertheless, performance is important to every user, especially in a mastering program.

FIG. 3: WaveLab 4.0 comes packed with useful and sometimes exotic meter and analysis tools.

Steinberg has definitely put some energy into revving the performance of WaveLab's audio engine, and the results are quite noticeable. Screens zoom in and out and redraw with an immediacy and responsiveness that was impressive even on the modest Pentium II/450 MHz laptop that I used for testing. Cutting, pasting, and other mundane editing tasks run faster and more efficiently, with less disruption of the active playback. In earlier versions of the program, clicking some common requests like opening or saving files left you with nothing for company but an hourglass and the slow eastward creep of a progress meter. Those are now thankfully relegated to the background where they belong, allowing you to continue working.

Intelligent batch processing further automates a number of DSP and archiving functions, using some pretty clever shared-information techniques to reduce CPU demands. Entire projects can be processed and archived to disk or CD in the background, and they can even be compressed on the fly as ZIP files.

Alternatively, you can use another new feature, WaveLab's OSQ (Original Sound Quality) lossless encoding. OSQ seems to live up to its name: in my (admittedly less-than-critical) tests, it was difficult to distinguish between an original 44.7 MB WAV file and the same file as a 28.4 MB OSQ version.

WaveLab now supports most major audio formats, including Sound Designer II, AIFF, WAV, Javasound, WMA (export only), and MP3. It's interesting, though, that while it supports some relatively exotic protocols such as US and EU telephony formats, it doesn't support the RealAudio format.

Another welcome performance improvement is the inclusion of ASIO driver support and the updating of MME to include WDM support. Because WaveLab isn't a multiple-output application, the program was previously optimized only for MME drivers. Although that's not a problem in itself, for some audio hardware, the ASIO drivers are preferable to the MME drivers.

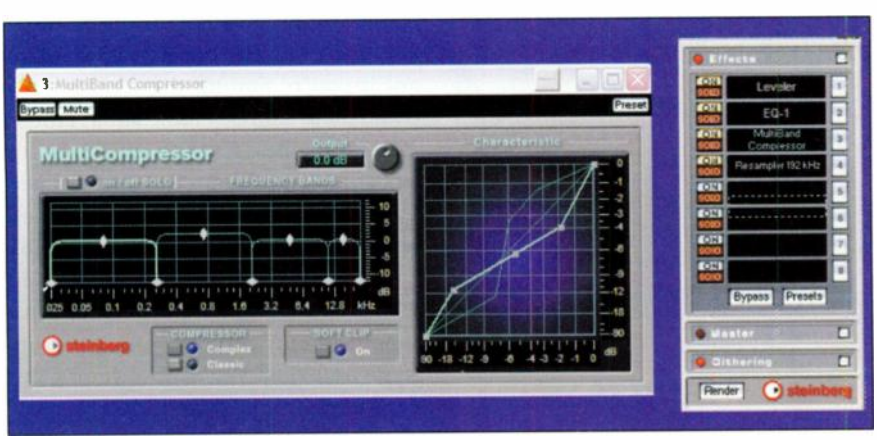


FIG. 2: WaveLab's DSP effects chains can be reordered by dragging and dropping the effects in the Effects pane. The MultiBand Compressor with its well-designed user interface is one of several plug-ins now included.

LOOK, DITHER, AND BURN

WaveLab has always offered some handy analysis tools, and this update adds a few new items to the menu (see Fig. 3). The program now has a selection of real-time metering functions, including standard fare such as level/pan and spectrum analysis (60-band

bar graph and FFT versions), as well as more exotic phase and wave scopes and bit meters. This last item is an exceptionally useful tool in determining the actual word depth of a file, alerting you to potentially underused headroom, which can add noise.

Once you're ready to finalize your project, you'll be very pleased with WaveLab's new version of Apogee's UV22 dithering algorithm. The previous version of the UV22 (which is also still provided in WaveLab 4.0) dithers to only 16 bits, but the new UV22 HR supports dithering to 8-, 16-, 20-, and 24-bit resolution.

WaveLab 4.0 supports an increased range of CD burners for creating Red Book audio CDs. It can also burn mixed-mode and data-backup CDs and has a CD-copy feature that can copy directly between two drives or write to the hard disk first. The program even includes a basic but very usable Label Editor window for designing disc labels, tray inserts, and covers.

PRODUCT SUMMARY

Steinberg
WaveLab 4.0 (Win)
multitrack audio editor
$599.99

FEATURES	4.5
EASE OF USE	4.0
AUDIO QUALITY	4.5
VALUE	4.0

RATING PRODUCTS FROM 1 TO 5

PROS: Improved user interface. Enhanced performance. Additional plug-in processors and analysis tools. Improved dithering algorithm. Tight integration with HALion software sampler. Good hardware sampler support. Handy CD-label editor.

CONS: No de-esser plug-in. Virtual sampler support limited to HALion. Some VST effects still have awkward user interface.

Manufacturer
Steinberg North America
tel. (818) 678-5100
e-mail info@steinberg.net
Web www.us.steinberg.net

SMART SAMPLING

WaveLab's interface with samplers has always been excellent, with direct support for most popular hardware units and generic sample-dump support for other sources. MIDI and SCSI communication are covered, and the program's smart looping features, crossfade options, and processing power make it a great alternative to the limited interfaces in most hardware samplers.

For owners of Steinberg's HALion, WaveLab now offers a direct interface. You can even drag loops directly from WaveLab into HALion's Keyzone page. It would be great to see support extended to Tascam GigaStudio and other software samplers as well.

Another new feature, Auto Split, allows some interesting file-manipulation tricks. Aside from automatically splitting files at designated markers or specific time intervals, Auto Split can identify and split at user-specified regions of silence or at beat points. Functionally, that's somewhat akin to Propellerhead's Recycle, though according to Steinberg it is a different technology, based on space, whereas Recycle is amplitude based. In any case, it makes quick work of reordering and rearranging grooves and loops, and it further enhances WaveLab's sampler interface.

NEWER IS BETTER

If you're a Windows-based musician and you're shopping for a high-end audio-editing program, WaveLab 4.0 deserves some serious consideration. If you already own an earlier version of WaveLab, is the upgrade worth it? Perhaps not if you're among the few who see WaveLab as simply a basic audio editor; some of the new features might seem a bit extraneous. But for the other 90 percent of WaveLab users, this overhaul is a very comprehensive one. The combination of new features, streamlined work flow, and significant performance enhancements certainly justify the upgrade and keep WaveLab several giant steps ahead of its competition.

Daniel Keller *is a pro-audio curmudgeon who, when he was your age, had to walk 20 miles in the snow to splice wax cylinders.*

Breaks sound (and price) barriers.

Introducing the (affordable) new C01 Studio Condenser Mic from Samson.

Who doesn't want a great sounding condenser mic in their project studio? Like mics costing hundreds of dollars more, the C01 picks up all the warmth and richness of vocals and acoustic instruments with incredible accuracy. And at just $69* you can afford one. The C01 from Samson. A price that breaks new ground, and performance that is nothing short of supersonic.

SP01 spider-style shock mount also available

SAMSON®

For more info on the C01 Condenser Mic and other great Samson products, put down that old dynamic mic and checkout www.samsontech.com

*MSRP $149, $69 estimated street price.

TASCAM

US-224

A portable and affordable interface and controller.

By David Miles Huber

If you're familiar with the US-428, you probably know that it's a flexible, reasonably priced USB controller that integrates well with a wide range of audio software. The US-224 closely resembles the US-428, except that it is smaller and lighter, sports five 45 mm sliders instead of nine, and has no EQ or auxiliary send controls (see **Fig. 1**).

The US-224 combines the functionality of a software control surface, MIDI interface, and audio interface in a single device. Housed in a cool-looking metallic purple-blue box, the US-224 takes its power solely from the USB port.

I/O ENGINEERING

The number 224 indicates that the US-224 can simultaneously pass two audio channels to and from a computer while providing mix and operational control over four channels at a time. Like the US-428, the audio interface is designed to work at sampling rates of 44.1 or 48 kHz and resolutions of 16 or 24 bits.

You can independently assign the US-224's two audio inputs to accept either an XLR mic or a ¼-inch line-level connection that you can switch to high impedance for electric guitars (see **Fig. 2**). A gain trim, a signal LED, and an overload LED are on each input. The outputs include two RCA line-level jacks and a ¼-inch stereo headphone jack, each with a level control. A pair of S/PDIF ports passes digital audio to and from audio applications, while MIDI In and Out ports send MIDI data (including MIDI Time Code) to and from your computer.

Like the US-428, the US-224 has no provision for phantom power. When I asked why it didn't, Tascam told me that phantom power might bog down the USB port and that "the basic US-224 user will probably use dynamic mics anyway."

A SURFACE WITH PURPOSE

The controller section, located on the US-224's far-left side, contains four channel strips and a master output fader. Above the input faders are Select buttons that assign mix and effects parameters to their respective channels when you press them. Simultaneously pressing the Rec button and a channel's Select button arms its assigned track for recording at the current cursor position. Above the Select buttons, Mute buttons can be toggled for use as solo buttons.

As it is on the 428, the transport section is located on the lower right. It features the usual transport controls, marker location buttons, bank selectors (which switch between channel banks), and a chrome jog wheel. The jog wheel conveniently doubles as a pan control when you press a channel Select button. When used with Steinberg Cubasis VST, Cubase VST, or Nuendo, the US-224's marker location buttons let you set and locate two marker points (Left and Right) within a project.

Although the US-224's faders are not motorized, you can match fader levels to the onscreen mix's current fader positions by pressing the Null button and moving each fader (without changing the mix level) until both the green Select and red Rec LEDs light up. Once the faders are in position, simply press the Null button again and you're ready to roll.

The US-224's control panel is very simple and straightforward. It allows you to switch between analog or digital inputs, enable 428 Emulation mode,

PRODUCT SUMMARY

Tascam
US-224
USB control surface and audio interface
$375

FEATURES	3.0
EASE OF USE	4.0
AUDIO QUALITY	3.5
VALUE	3.5

RATING PRODUCTS FROM * TO 5

PROS: Small and lightweight. Powered by USB. Great converters. Rock-solid functionality.

CONS: No phantom power. Very little software support (except in 428 Emulation mode).

Manufacturer
Tascam
tel. (323) 726-0303
Web www.tascam.com

FIG. 1: The US-224 is a control surface, a 16-channel MIDI interface, and a stereo audio interface rolled into one. Bundled with a custom version of Steinberg Cubasis, the US-224 is designed to look and function like a Tascam Portastudio.

Who Says Size Matters?

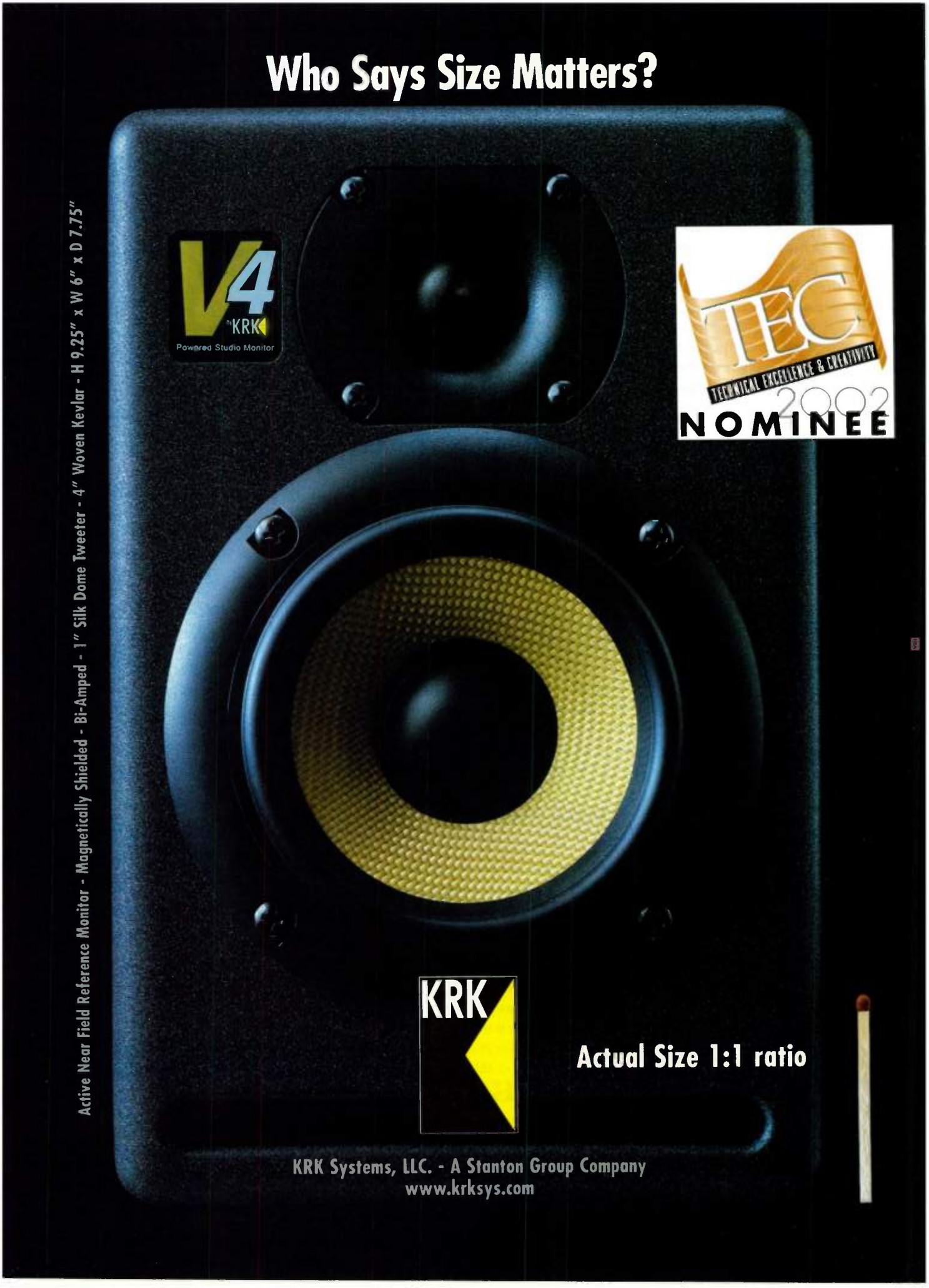


IMAGE-LINE

FRUITYLOOPS 3.5 (WIN)

A loop generator that's as simple or complex as you make it.

By Len Sasso

FruityLoops is one of the oldest contenders in the growing field of loop-oriented, all-in-one studio software. Unlike programs such as Sonic Foundry Acid, Ableton Live, and Bit-Headz Phrazer (designed primarily for playing and manipulating audio loops), FruityLoops and its soul mates Sonic Syndicate Orion, Propellerhead Reason, Arturia Storm, and VirSyn TERA contain a variety of sound generators tied together by a step sequencer. FruityLoops has had a relatively long time to get it right, and its feature set puts it near the head of the pack.

FruityLoops 3.5 runs as standalone software and as a VST Instrument (VSTi) plug-in. It comes with a full complement of proprietary plug-in instruments ranging from standard-fare drum machines, samplers, and analog-style synths to off-the-wall entrants such as BeepMap (for turning images into sound) and Granulizer (for independent pitch and time shifting). FruityLoops also includes a robust array of effects processors.

If you can't find what you're looking for among those offerings, you can try one of FruityLoops' five additional, reasonably priced synth plug-ins (demos included), and you can use your favorite instrument and effects plug-ins in VSTi, VST, DXi, and DirectX formats.

FruityLoops comes in two versions: Pro and Full. The Full version adds controller automation and a piano-roll-style step-sequencer editor. Both versions provide ASIO support for low latency. (I used the Full version for this review.) Customers who buy the boxed retail Full version can purchase upgrades for life for $29. The boxed version also includes the DreamStation DXi software synth and 3,000 royalty-free loop samples.

Not surprisingly for software that offers an unlimited number of audio channels and sequencer tracks, FruityLoops can take a big bite out of your CPU. Nevertheless, my 700 MHz Pentium III laptop running Windows 98SE was easily able to handle ten or more tracks playing simultaneously. I used an Emagic EMI 2|6 USB interface with the latest ASIO drivers for audio, and I was able to get latency down to several milliseconds without audio breakup. When you do run out of gas, you can bounce some parts to a WAV file, which you can then import as a single FruityLoops track.

Minimum System Requirements

FruityLoops
Pentium/200; 32 MB RAM;
Windows 95/98/2000/ME/XP

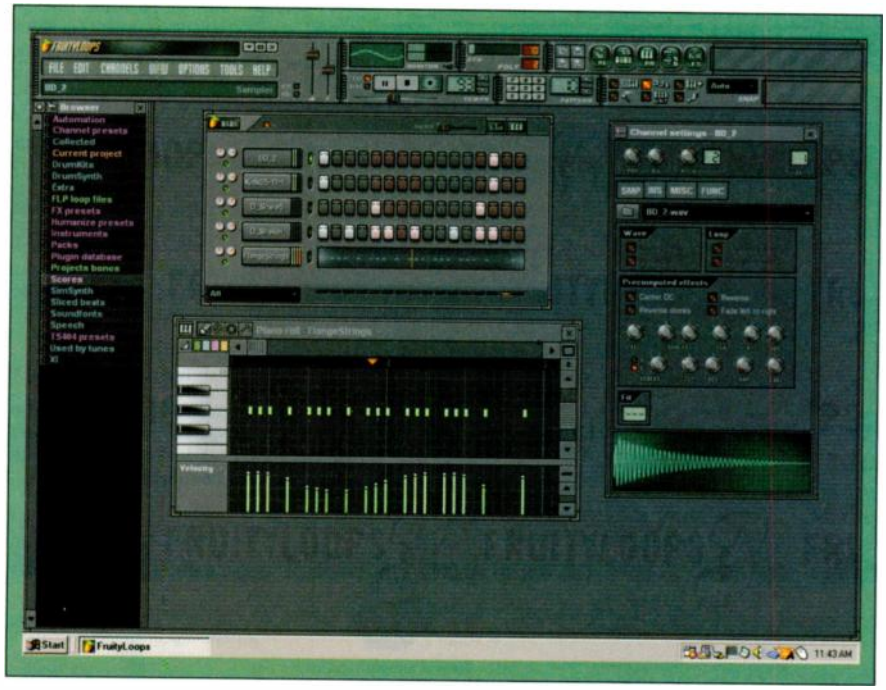


FIG. 1: FruityLoops' main window provides global tools along the top and a file browser on the left. The Step-Sequencer and associated Piano-Roll Editor are shown in the middle. The Channel Settings panel on the right has several tabs for editing sound and effects parameters.

THE SAME, ONLY DIFFERENT

Although the implementation varies, all loop-oriented, all-in-one studio software programs contain the same basic components: one or more step sequencers for generating sequences of notes, sound generators for playing those sequences, a song sequencer for building songs from those sequences, and effects processors for manipulating the audio output. In some programs (including Orion and Storm), individual step sequencers are built in to the sound generators, whereas in others (such as TERA and FruityLoops), sound generators are assigned to the tracks of a single multitrack step sequencer. (Reason uses a combination of those approaches.)

The FruityLoops application window presents its global controls (menus, transport, pattern selector, display toggles, and MIDI recorder) across the top; its file browser along the left side; and its Step-Sequencer, Piano-Roll Editor, and Channel Settings windows in the center section (see Fig. 1). Everything in FruityLoops revolves around the Step Sequencer.

Each row in the Step Sequencer represents an audio channel with its own step sequence (which is called a Pattern). There is only one Step Sequencer

Audio Monitors That Promise *More* Than Just Accuracy.

Introducing ProDesk™ Reference monitors that render traditional two-way monitors obsolete and make most large (and costly) three-way systems look, and sound, a little silly.

With the same design as the revolutionary Sky System One,™ they're the ultimate in powered speakers. A true 2.1 system with integrated sub-woofer and two satellites (five in 5.1 Surround). They deliver full range audio for music, film and video- replete with the essential low frequencies that are missing in old designs. And like all Blue Sky products, these sealed, compact boxes contain more high technology than is visible from the outside.

So while other monitors promise mere accuracy, Blue Sky delivers something that is somehow more...**exciting.** To find out more about why Blue Sky monitors can do what they do see your Blue Sky dealer or visit www.abluesky.com.

blue sky ...*because we can*

Sky System One™ available in 2.1 ($1595 MSRP) and 5.1 surround, including remote Bass Management Controller ($3795 MSRP). 2.1 system easily upgradeable to 5.1.

ProDesk™ Available in 2.1 ($1195 MSRP) and 5.1 surround, including BMC ($3020 MSRP). Optional hand-held Functional Volume Control available for 2.1 systems. 2.1 system easily upgradeable to 5.1.

THX 21 51

Audio Technica AT4040

audio-technica

Audio Technica's large-diaphragm condenser mics have proven to be very popular here at Sweetwater, and now the AT4040 adds its name to that illustrious line. An excellent mic for all kinds of studio applications, the low-priced AT4040 offers a hotter output and lower self-noise than similar mics in its class. You can record directly to your computer-based digital audio workstation via the FireStation's analog inputs without losing the AT4040's smooth, natural sonic characteristics.

Korg Triton Studio

Korg's flagship synthesizer is simply one of the most powerful instruments available. A comprehensive synthesizer workstation, the TRITON offers everything you need to create, mix, and master your music: powerful recording and editing, professional effects and fantastic sounds, mixing... it's all here. The TRITON's mLAN option means you can easily hook it up to your computer-based production studio for a whole new level of power!

PreSonus Audio Electronics

Presonus FIREstation

Presonus' 8-channel FIREstation interface is designed to be the heart of your digital recording studio. Any mLAN compatible keyboard such as the Yamaha Motif or Korg Triton Studio can be seamlessly patched into the FireWire ports of the FIREstation to send audio and MIDI information to your computer. You can plug microphones, instruments and external preamps into the analog inputs while monitoring them in realtime without latency. Need more inputs? Just daisy-chain multiple FIREstations for up to 40 channels of I/O. There's even a built-in 1x1 MIDI port for interfacing with MIDI devices.

Yamaha Motif

Yamaha's MOTIF master synthesizer sets a new standard for sonic performance and creative freedom. It offers a whopping 85MB of Yamaha's finest sounds and the revolutionary Integrated Sampling Sequencer, a 16-track sequencer that lets you easily add vocals, guitars and drum loops to MIDI sequences.

While these workstation powerhouses can stand alone as complete music production systems, imagine the creative potential when combined with other devices in an integrated intelligent FIREstation/mLAN studio.

5335 Bass Road, Fort Wayne, IN 46808
(260) 432-8176 • FAX (260) 432-1758

(800) 222-4700

GET FIRED UP

Join the FIREstation studio revolution

Presonus' FIREstation interface, with state-of-the-art mLAN technology, is destined to become the most essential piece of gear in your digital studio. Just as AES/EBU and MIDI have set the standard for the way music technology communicates, so mLAN or FireWire technology promises to bring that level of integration to the recording and audio set-ups of the future. But unlike USB, an mLAN FireWire solution uses separate data streams for different types of data in a single wire. There's no need for a card or large cable. Video and other FireWire devices can be run on the same FireWire cable without affecting the timing of the mLAN musical data. And because mLAN is non-proprietary, any mLAN-equipped product will work with any other mLAN-equipped product.

Yamaha O2R96

YAMAHA

Along with a feature set more advanced than any other digital mixer in its class, the 02R96 offers multiple channels of pristine 24-bit, 96 kHz audio, surround sound capabilities, DAW compatibility, and much more! Connect your 02R96 via the FireStation to a standalone recorder or to a computer-based system like ProTools or Nuendo for powerful and flexible audio production.

- **2 Dual-Servo Preamplifiers with Switchable Tube Circuit**
- **2 1/4" Instrument Preamps**
- **MIDI I/O**
- **Eight Channels of Analog I/O**
- **Eight Channels of ADAT I/O**
- **S/PDIF I/O**
- **External Recording Punch Input**
- **Word Clock Input/Output via BNC Connectors**

Apple iMac

You can drive your whole mLAN system with a top-of-the-line iMac. Thanks to mLAN, the latest iMacs are as adept at providing pro-level audio/MIDI communication as the expensive PCI-based desktops of the past. The new iMacs feature an 800 Mhz PowerPC G4 with Velocity Engine, the ferociously fast NVIDIA GeForce4 MX graphics processing unit, and the Super Drive — a combination DVD-R/CD-RW — that lets you burn your own CDs and DVDs. The striking 17-inch flat panel widescreen LCD display gives you more space for viewing all your windows and toolbars.

Authorized Reseller

Call Sweetwater today! Your Sales Engineer can help you find the best components for your FIREstation production studio.

www.sweetwater.com
sales@sweetwater.com

Sweetwater®
music technology direct™

in a FruityLoops Song, and it can have as many channels as you like, up to the limits of your RAM and CPU. Sound Generators are assigned to the individual channels as they are created, but they can later be changed. Because every sound (every program for every Sound Generator) is represented by its own channel strip, the number of channels can multiply rapidly. Image-Line has conveniently implemented display groups, and the menu at the lower left of the Step Sequencer is used to select which group is currently displayed.

Each channel strip contains knobs for pan and volume, an LED-button for mute and solo, a large rectangular button for opening the controls of the assigned Sound Generator and performing other context-menu functions, a channel activity display, and buttons (called Dots) for playing notes at 16th-note intervals. The Step Sequencer in Fig. 1 is configured for 16 16th notes grouped as 4 16th notes to the beat (indicated by a change in Dot color). The time signature can be reconfigured for as many as 64 16th notes per bar with any beat grouping. You can also change the resolution (96 ppqn by default) in a range from 24 to 768 ppqn.

In version 3.0, FruityLoops outgrew the limitations of step sequencing by introducing the Piano-Roll Editor, shown just below the Step Sequencer in Fig. 1. The Piano-Roll Editor can be applied to any Step-Sequencer row, and if you've already entered steps with the Dots, you can start by transferring them to the Piano-Roll Editor. You can enter notes with the mouse or by recording MIDI input in real time or step time. Once entered, notes can be moved, lengthened, quantized, and humanized as needed. One of the Piano-Roll Editor's slickest after-the-fact features is called Chop, which, as its name implies, allows you to chop the notes in a sequence according to the rhythmic template of another sequence.

FIG. 3: The Channel Settings window includes all the Sound Generator controls for each channel. The window has multiple tabs that vary depending on the Sound Generator. The four tabs for the Sampler Generator are shown here.

In addition to allowing for longer sequences that are not forced to 16th-note quantization, the Piano-Roll Editor provides for chords, supports loading and saving of Standard MIDI Files as well as Fruity-format Score files, and offers a very clever scheme for creating pitch Slides between notes—even within chords. Both sequence formats also feature note-by-note control of pan, Velocity, filter cutoff, filter resonance, pitch shifting, and time shifting. As you can imagine, you can do quite a bit of damage to a rhythm loop with those controls. For an audio example, check out the MP3 file "SteadyEddie."

Once you've created some Patterns (you can have as many as 999 of them), you need a way to put them together. That's where the Playlist comes in (see **Fig. 2**). The Playlist is an array of Cells whose rows correspond to Patterns and whose columns correspond to measures in the current Song's meter. Left-clicking on a Cell toggles the corresponding Pattern on at that point in the Song, and right-clicking toggles it off. (If you find that inconvenient, as I did, you can change FruityLoops' Preferences so that left-clicking toggles Cells on and off.) There's not much more to the Playlist than that. The one tricky point is that Patterns (automation and Piano-Roll sequences, for example) can be longer than a single Playlist Cell, in which case you turn the Cell on where you want the Pattern to start, then leave empty Cells for the duration of the Pattern.

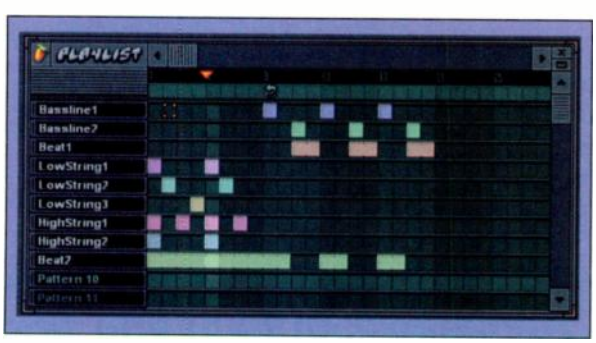


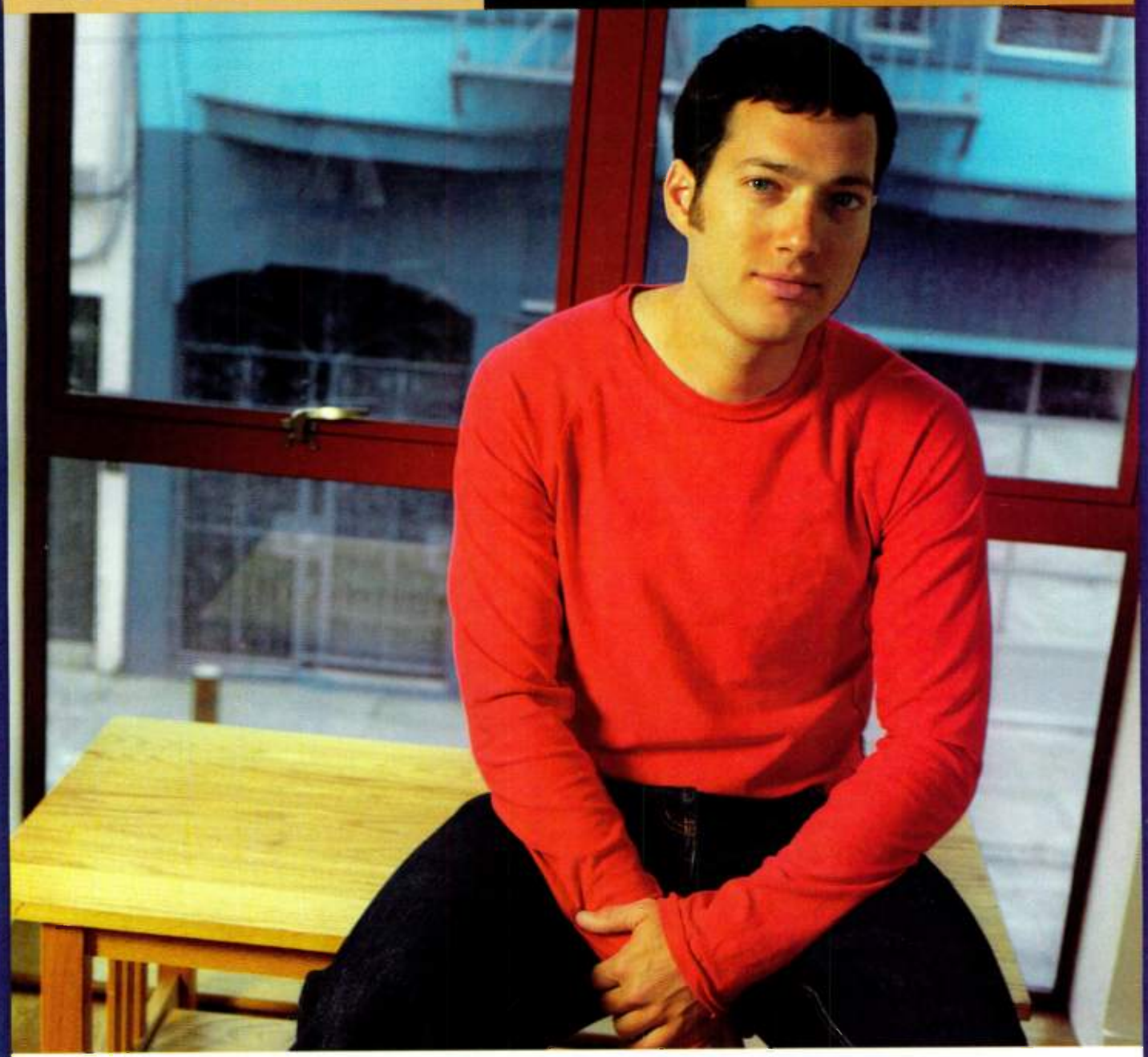
FIG. 2: The Playlist is for arranging Step-Sequencer Patterns for playback. Each row in the Playlist corresponds to a Pattern; each column corresponds to a measure of the Song. Cells that are turned on (colored squares) cause Patterns to trigger at that point in the Song.

Songs automatically loop, and the rightmost Playlist column that has a Cell turned on determines their lengths. You can move the loop start-point to allow for an introduction, but you can't change the end-point, which means you can't loop a small section of the song for editing. You can drag-select segments of the Song and rearrange them by cutting, copying, and pasting, but you can't actually drag them around. You can resize the Playlist, but you can't change its zoom level. You can click the Playlist label (or hit Backspace) to center the Playlist at the current Song playback position, but you can't set it to scroll automatically. In short, the Playlist has the features necessary to get the job done, but it is not the ripest fruit on the vine. Image-Line plans to revise the Playlist with the style and features of the Piano-Roll Editor in a future upgrade.

SOUNDS ABOUND

FruityLoops comes with a basic collection of built-in Sound Generators, and Image-Line offers several more as inexpensive add-ons. In addition, you can use anything in your kit of DXi and VSTi plug-in instruments. The same applies to effects; a good

A6 ANDROMEDA REAL ANALOG SYNTH



Alex speaks Analog....

IN FACT IT'S PRACTICALLY A LIFESTYLE — A PASSION THAT BROUGHT HIM TO THE A6 Andromeda. Why? It has 16 real analog voices, each with two oscillators, two sub-oscillators, 2-pole multimode and 4-pole lowpass filters. An arpeggiator, a step sequencer, a ribbon controller, and an incredibly flexible modulation engine. Plus smart background tuning, CV inputs, and superb effects. In short, Andromeda is the most powerful analog synth ever made, so it's no surprise that Alex connects with its deep control and uncompromising, true-blue sound. Anything else is like, well . . . a whole other language.

For complete specs and a manual visit www.alesis.com/andromeda, or call 310-821-5000 for a product line brochure.

ALESIS
INSPIRE | PLAY | CREATE

collection of built-in effects is provided, and DirectX 8 and VST2 plug-ins are supported.

Each Step-Sequencer channel includes a Generator and all of its settings. Most of the Generators produce sounds; two that don't are Layer (for layering multiple Generators) and MIDI Out (for sending MIDI to external objects such as the Windows built-in GM synth). All Generator settings are made in the Channel Settings window, which is opened by clicking the oblong Channel button in the Step Sequencer. The Channel Settings window has several tabs, the content of which varies with the Generator (see **Fig. 3**).

The Sampler (actually a sample player), a three-oscillator synth named 3xOsc, a kick-drum Generator named Fruity Kick, and the TS-404 bass-line synth (styled after the Roland TB-303) are FruityLoops' workhorse Generators. Four additional specialized Generators round out the set of free built-ins. BeepMap converts BMP format pictures to sounds and Granulizer performs granular sample resynthesis. Plucked (my personal favorite) uses the Karplus-Strong physical model of a plucked string and allows you to use any sample for the impulse driving the model. Slicer plays sliced-up beat loops produced by Image-Line's add-on BeatSlicer (see the sidebar "By the Slice").

Two of the Channel Settings window tabs significantly expand the capabilities of the Step Sequencer. The INS tab (second from the left in Fig. 3) provides AHDSR envelopes and LFOs for controlling volume, pan, pitch, and the cutoff and resonance of an extra multimode filter. The FUNC tab (rightmost in Fig. 3) offers a tempo-synced panning delay and a versatile arpeggiator with built-in chord generator.

PUTTING IT ALL TOGETHER

Once you've set up the Generators and Patterns, you'll undoubtedly want to add automation, set up MIDI control, include some effects processing, and save it all as audio. FruityLoops provides full-featured tools for each of those jobs.

You can record automation of almost any control (even tempo) as part of a Pattern. The recommended procedure is to devote a Pattern strictly to automation and toggle it on at the beginning of the Playlist. You can record

BY THE SLICE

You probably won't get very far into loop sequencing before you'll find yourself wanting to do some beat slicing. Image-Line offers its BeatSlicer ($35) as a separate product, and FruityLoops contains a matching player, Slicer, for playing the proprietary BeatSlicer files. A BeatSlicer demo comes with FruityLoops, but instances of the Slicer Generator that use slices created with the demo are deleted when you save your Song. That almost makes BeatSlicer a must-buy when you buy FruityLoops.

Beat slicing is the process of identifying individual events or "hits" in an audio file (typically a beat loop). For example, if you have a kick-drum loop, each kick would be a hit. The purpose of beat slicing is twofold: it allows you to play the slices back individually to achieve a different tempo or order, and it allows you to process (pitch-shift or EQ, for example) each slice independently. Beat slicers do their magic by identifying transients in the sound file that, hopefully, correspond to the desired hits. They then allow you to delete, add, and move the slice points manually. Finally, they export the results in one of two ways: as a proprietary-format slice file that requires a matching player, or as individual audio files (one for each slice) with an accompanying MIDI file that corresponds to the timing of the slices. BeatSlicer utilizes the first method, and the matching player in FruityLoops is called Slicer.

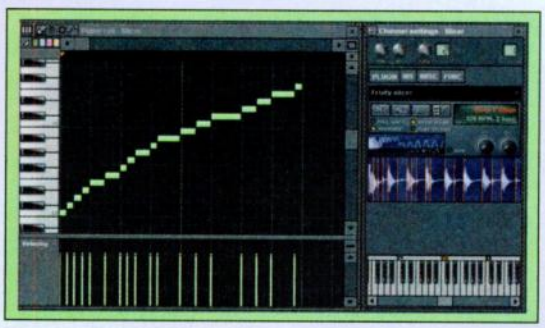


FIG. A: The Slice Generator (right) plays beat-sliced audio files generated by the separate BeatSlicer program. The Piano-Roll score (left) is generated automatically by BeatSlicer to match the timing of the slices.

In **Fig. A**, Slicer is shown with a BeatSliced file (on the right) and the automatically generated Piano-Roll file to play it. When the Piano-Roll sequence is included in a Pattern, the slices are triggered at the Song tempo. Moving a note horizontally in the Piano-Roll Editor changes the time at which the corresponding slice is triggered. Moving it vertically changes the slice that is triggered. All note-based FruityLoops controls (such as the controller lanes) can be applied as well.

Beat slicing is useful for more than just beat loops; any segmented audio material—speech, for example—is fair game. FruityLoops 3.5 contains a new Integrated Speech Engine that generates computerized speech files in a variety of voice types (from Giant Male to Munchkin) and styles (from singing to whispering). You type in the words, and FruityLoops synthesizes the speech. Speech files can be played in the Sampler, but when they are dragged to the Slicer they are automatically sliced into words by BeatSlicer. That technique was used for the speech in the MP3 file "SteadyEddie."

em links

Yeah...we do DAWs

TASCAM DM-24 v2.0: Now with HUI™ emulation and much more.

With its new version 2.0 software, TASCAM's DM-24 becomes more than just an incredibly powerful digital mixing console. It adds control surface capabilities for software DAWs like Pro Tools®, Digital Performer™ and Nuendo® via HUI emulation, with external control of levels, mutes, pans, track arming and aux sends, in addition to standard MIDI control of DAWs like Cubase®, Logic™ and Sonar™.

But that's just the beginning. DM-24 v2.0 is a great front-end for your DAW, with 16 high-quality mic pres, 24-bit converters, 4-band parameteric EQ, dynamics processing and more. Plus, with standard interfacing like 24 channels of TDIF and 8 channels of ADAT, it's a perfect companion to DAW interfaces like Digidesign's 001™ and MOTU's 2408™.

Version 2.0 adds over 20 exciting new features to the DM-24, including 60 inputs at mixdown, new 5.1 surround panning, nearly unlimited signal routing, and much more. For all the info on the world's most powerful small-format console, visit your TASCAM dealer or www.tascam.com.

*MU-24 Meter Bridge optional

TASCAM
a whole world of recording

www.tascam.com

automation using the mouse or incoming MIDI, and you can edit it after the fact in a dedicated Automation Event editor, which even includes an LFO for generating tempo-synced LFO-style automation. The one shortcoming of FruityLoops automation recording is that when you record new automation, any existing automation for the same controller is erased all the way to the end of the Pattern—ouch!

You can assign MIDI continuous controllers to most controls. There is an auto-learn function, but you can also set it up manually. The same MIDI continuous controller can be assigned to multiple FruityLoops controls, and you can easily map incoming values to control the amount and direction of the effect. That, for example, allows you to set up a MIDI controller to raise a filter's cutoff while lowering volume.

In the effects department, FruityLoops has a Master effects bus that applies to all Channels, as well as 16 individual FX buses that can be fed by individual Channels. Four Send buses are fed by a mix of all the FX buses. (Each FX bus has four Send controls.) Each of those 21 effects buses can hold up to four effects in series. FruityLoops has 33 built-in effects mostly devoted to filtering, compression, and delay. As I mentioned, you can also use your full kit of VST and DirectX 8 plug-in effects.

FruityLoops lets you render Songs and individual Patterns in WAV or MP3 format. WAV files can be Acidized for use in programs that support that format. FruityLoops 3.5 adds the handy ability to save all effects buses as separate files.

A couple of useful data-export options are also provided. Project Bones saves all Channel Settings (FST) and Score files (FSC), and Project Data saves all samples, waveshapes, and plug-in data in a separate folder. Finally, FruityLoops will compress your Song, with all relevant data, into a ZIP-format file.

IS IT FOR YOU?

FruityLoops is the deepest loop-generating step sequencer I've seen. If you're into loops and step sequencing, that alone is worth the price of admission. The included Generators sound good and provide plenty of material for basic loop construction. Some of the add-ons available from Image-Line, though reasonably priced, don't extend the sound palette as much as I'd like. If you plan to use FruityLoops as a primary tool, you will undoubtedly want to use some of the VSTi or DXi plug-ins in your kit. Aside from some automation limitations, all the plug-ins I tried worked without problems.

For total song creation, FruityLoops is adequate, but you'll probably want to move your FruityLoops loops to a digital audio sequencer at some point. FruityLoops' export options and its availability as a VSTi plug-in make that process fairly simple for whatever sequencer you choose. Given that Image-Line seems to add and refine features at a steady rate, FruityLoops looks like an unbeatable deal.

PRODUCT SUMMARY

Image-Line
FruityLoops 3.5
loop generator/sequencer
$49 Pro Edition (download)
$99 Full Edition (download)
$149 Full Edition (boxed retail version)

FEATURES	4.5
EASE OF USE	3.5
AUDIO QUALITY	4.0
VALUE	4.5

RATING PRODUCTS FROM 1 TO 5

PROS: Easy to learn and use on a basic level. Very deep feature set. Convenient file-export options.

CONS: Playlist lacks user-friendly features and some functionality. Automation recording is destructive. Documentation is sparse for some features.

Manufacturer
Image-Line Software/Cakewalk (distributor)
tel. (888) CAKEWALK or (617) 423-9004
e-mail sales@cakewalk.com or info@image-line.com
Web www.fruityloops.com or www.cakewalk.com

Len Sasso *can be contacted through his Web site at www.swiftkick.com.*

Don't Let a Second-Rate Cable Hiss on Your Parade

Planet Waves cables are simply designed for superior sound and are built to last.

We use double-molded connectors to afford ultimate protection and unmatched strain relief. The cable itself is double-insulated & double-shielded to provide the cleanest signal available by eliminating hum and triboelectric noise.

Our goal was to create a truly transparent cable to reproduce your signal without unneccesary filtering or equalization. All Planet Waves cables come with a lifetime warranty.

These are the last cables you will ever have to buy.

PLANET WAVES

J.D'Addario PO Box 290 • Farmingdale, NY 11735 • www.planet-waves.com

K O R G

TRITON STUDIO

Taking the workstation concept to new heights.

By Jim Aikin

Korg had a phenomenal hit back in the mid-1980s with one of the first keyboard workstations, the M1. In the years since, Korg has worked hard to keep its edge in the workstation market. Each generation of flagship workstations—the O1/W, the Trinity, and now the Triton—has been a great leap forward.

In a sense, the Triton Studio is the ultimate keyboard workstation (see **Fig. 1**). One of its most significant features is that the ability to burn CDs has been grafted onto the original Triton's powerful synthesis and sampling engine. The Triton Studio is the first keyboard in which you can take your production from a MIDI sketch all the way through to the final CD master without the need to power up another piece of gear.

EM's review of the original Triton (see the January 2000 issue) covered its voice architecture and other features in depth. This time around, I'll take a look at the features that are unique to the Triton Studio: a 16 MB grand piano multisample; the ability to sample or resample from any mode (even while sequencing); the ability to resample to the internal hard drive; seven PCM expansion slots rather than two; and twice as much polyphony as the original. Additional enhancements include six times the processing power and S/PDIF I/O. Before I explore those new capabilities, though, I'll recap the story so far, for the benefit of those who came in late.

SIRENS OF TRITON

The best thing about the Triton Studio is its sound. Or rather, sounds. The Triton Studio has room for 1,536 Programs and 1,536 Combis in RAM. As if that weren't enough, it has 256 General MIDI 2 (GM2) programs in ROM. If you have the MOSS board installed, there are locations for another 128 RAM Programs (see the sidebar "Climb on a Board"). The total number of sounds depends on how many expansion boards you have installed. The Studio ships with 512 Combis, 768 Programs, and 29 Drum Kits in memory, leaving plenty of room for new sounds.

I got lost for hours checking out the Combis—spectacularly big, speaker-filling productions. Many use the dual arpeggiators to produce inspiring hip-hop, dance, and ethnic grooves. Spacious pads are also in plentiful supply. If you're in the soundtrack business, you could rough out an underscore with one of these babies in no time flat. You practically wouldn't need to add anything; the Combis sound complete as they are.

Among the internal Programs, I found the choirs and new-age pads especially tasty. The drums are very punchy and solid, quite the antithesis of new age. The cheerful arpeggios of ProgressivTrance put me in an '80s electropop mood, and Chord Trigger addresses the same style from a darker space. The synth-lead department offers plenty of variety. Although the Studio is a little short on physical drawbars, the Studio's many Hammond imitations would go down very well at a club gig.

The new 16 MB acoustic piano multisample (a Bösendorfer) lives on the main board alongside the remaining 32 MB of waveform ROM. Compared with the original Triton piano, the new one has longer, smoother loops in the bass register. Its two-way Velocity cross-switching is so smooth and effective that I had to listen closely to hear it, and that's a very good thing. You can tinker with the cross-switch point in the oscillator page, but Korg got it just right in the Programs that use those samples. The Studio's programming capabilities also let you tailor the sound to suit your needs or preferences.

The original piano sound has a fatter bass response, but that's partly due to the 7 dB of bass boost in program A001. There's very little EQ in the basic Bösendorfer preset (C001). In Euro Grand (D001), a boost in the bass takes advantage of the keyboard being tuned an octave lower, giving the Triton all the presence of a nine-foot grand. The Bösendorfer has more presence in the upper midrange, but that's not to say it's lacking in the bass. It just sounds rich and full, the way a piano should. Although I might not want to use it on a classical recording, I would have no trouble laying it into a pop ballad mix.

Korg also deserves praise for the great effects section, which includes five insert effects for each Program, Combi, or Song, as well as two master effects and a 3-band stereo EQ. Whether you're into lush new-age beds or grinding grunge, the Triton Studio will deliver.

The Triton's filters are less powerful, offering either a resonant lowpass or a nonresonant lowpass/highpass pair that operates as a bandpass filter with adjustable width. There's no notch filter, no choice of rolloff slope, and no filter overdrive. To my ears, the resonant lowpass is satisfactory for shaping complex sampled waveforms, but less than ideal for analog simulations. If

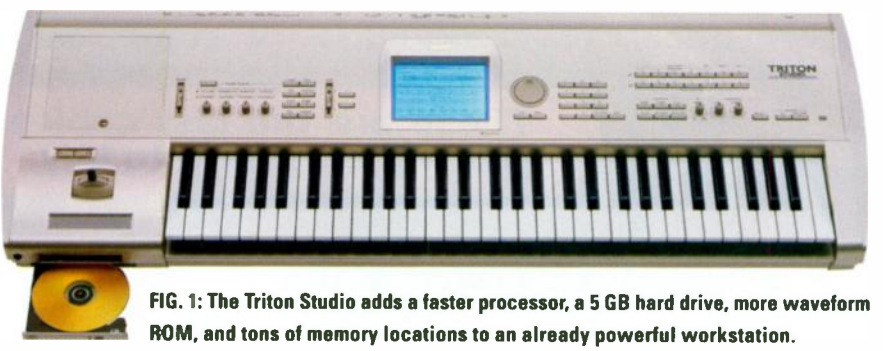


FIG. 1: The Triton Studio adds a faster processor, a 5 GB hard drive, more waveform ROM, and tons of memory locations to an already powerful workstation.

you crave a Triton and need something resembling authentic analog, I'd recommend adding the MOSS board.

FIG. 2: Among other things, the Triton Studio's rear panel includes MIDI ports, an LCD contrast knob, optical S/PDIF ports, a SCSI port, and analog audio inputs with a mic/line switch. On the unit pictured here, the EXB-DI ADAT output and EXB-mLan options are also installed.

FACE TIME

I like the Studio's 61-note keyboard action a lot; it's light and snappy, but it feels solid. The ribbon controller and four programmable knobs are also very handy for performance. I'd be happy to take the unit on a gig.

The Studio uses Korg's futuristic touchscreen, and although I appreciate having a large, well-organized display, I found it difficult to use. Perhaps fiddling with its calibration would have helped, but the touchscreen didn't always sense my fingernail on the first try. Besides, curling your finger under so you can tap with your fingernail is not a natural hand position. I found that tapping the screen with a makeshift stylus was more reliable and more comfortable. Other users might like the touchscreen, but I would have preferred a standard cursor diamond.

Most of my other user-interface complaints are minor. The disk operating system allows only eight-character, DOS-style file names. That led to some confusion when I tried loading WAV files from third-party CD-ROMs, because the Triton was unable to display the correct file names. (The Studio never found the WAV files on eLab's *Abstract HipHop* CD, although my computer had no trouble seeing them. Korg says that the latest OS should correct the problem.)

After creating and saving a multisample, I made a few edits and tried to resave it, but I got an error message saying, "File already exists." So where's the Overwrite Existing File button? For that file type, astonishingly, there isn't one, though other types of disk files can be overwritten.

Another small gripe is that in the Sample Edit page, when you make changes to the sample loop as you hold a key, you can't hear the loop change as it plays. Several other samplers (even my old Kurzweil K2500) and sampling programs provide that capability, and it's unbelievably convenient. Korg would do well to revise the Triton's loop editor.

FREQUENT SEQUENCER MILES

Although a workstation's sequencer is unlikely to surpass the capabilities of a digital audio workstation, the Triton Studio's sequencer has some useful features. It can record incoming audio (such as a vocal) into a RAM track, for example, and loop individual tracks. If you're planning to take the Triton onstage, you'll certainly appreciate the sequencer's cue list, which can spool out an entire set's worth of songs.

Compared with previous Tritons, the Studio features an improved method of

Triton Studio Specifications

Analog Audio Outputs	(2) unbalanced ¼" TS main; (4) unbalanced ¼" TS assignable; (1) ¼" TRS stereo headphone
Analog Audio Inputs	(2) unbalanced ¼" TS mic/line
Digital Audio I/O	(1) optical S/PDIF; 24-bit; 48 kHz
Control I/O	MIDI In, Out, Thru; (1) SCSI (50-pin half-pitch); (1) ¼" damper pedal; (1) ¼" assignable switch/pedal
Sound Engine	PCM playback; sampling
Keyboard	(61), (76), or (88) keys; transmits Velocity and Key Pressure
Polyphony	(120) notes (mono); (60) notes (stereo)
Multitimbral Parts	16
Program Memory	(1,536) RAM (512 preloaded); 256 GM2 ROM
Combi Memory	(1,536) RAM (512 preloaded)
Drum Kits	(144) RAM (20 preloaded); (9) GM2 ROM
Waveform ROM	48 MB, expandable to 112 MB; (429) multisamples, (417) drum samples
Sample RAM	16 MB; expandable to 96 MB
Sampling Rate	16-bit, 48 kHz
Sample Import Formats	AIFF, Akai S1000/S3000, WAV
Filters	(1) 24 dB/octave resonant lowpass; (1) 12 dB/octave lowpass/highpass
Effects	(5) insert (stereo in/out); (2) master (mono in/stereo out); (1) master 3-band stereo EQ (all simultaneous); (102) insert effects types; (89) master effects types
Arpeggiators	(2) polyphonic; (5) preset patterns; (507) user patterns (367 preloaded)
Sequencer	(16) channel tracks; (1) master track; 192 ppqn; (200,000) notes; (200) songs; (20) cue lists; (150) preset patterns; (100) user patterns for each song; RPPR
Left-Hand Controllers	(1) joystick; (1) ribbon; (2) switches
Disk Drives	(1) 5 GB hard drive; (1) 3.5" floppy drive; (1) optional CDRW-1×8
Expansion Slots	(7) EXB-PCM; (1) EXB-MOSS; (3) 72-pin SIMM
Display	TouchView 320 × 240-pixel backlit LCD
Dimensions (61-key model)	43.46" (W) × 5.08" (H) × 15.04" (D)
Weight (61-key model)	37.92 lb.

THE NEWEST TECHNOLOGY!
THE HOTTEST DEALS IN THE U.S.A.!

ZOOM MRS-1044CD
$999.99
List: $1999.00

NEW!

NEW!

ZOOM MRS-4
$249.99
List: $499.00

Korg D1600-V40
$1599.99
List: $2000.00

NOW WITH BUILT-IN 2X8X CDRW BURNER AND 40GB HD!

Roland VS-2480CD
CALL
For Lowest Price!

NEW!

Mackie DFX-12
$379.99
List: $479.00

Yamaha AW-2816CD
$1999.99
List: $2399.00

NEW!

NEW!

Korg PXR4
$399.99 List: $495.00

Boss BR1180
$745.99 List: $895.00

Fostex VF-160
$999.99
List: $1799.99

BOSS BR-532 $395.99
List: $495.00

Soundcraft Spirit M12
$699.99
List: $999.00

NEW!

Tascam DM24 CALL
For Lowest Price!

Now Shipping!

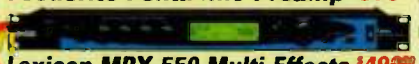
Alesis HD24
$1999.99
List: $2499.00

NEW!

TC Electronic M300 Multi-Effects $249.99

VT-747-SP Call!

Focusrite Penta Mic Preamp $379.99



NEW!

Lexicon MPX-550 Multi-Effects $499.99

S-Phone $169.99

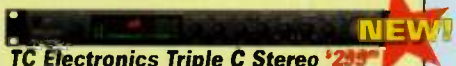
S-Com Plus $179.99

MPX-110 $199.99

Mark of the Unicorn 828 $699.99

NEW!

Mind Print Dual Tube Pre Amp $1599.99



NEW!

TC Electronics Triple C Stereo $299.99

DBX 166XL $249.99

DBX Pro Vocal $299.99

DIGITAL RECORDING
SIGNAL PROCESSING, GROOVE BOXES

Samson Resolve Monitors
$199.99 A Pair

Tannoy Reveal Active
$779.99 A Pair

Be sure to enter our on-line contest to win great gear!

Mackie HR824
CALL!

Event PS-5
$469.99 A Pair

Tannoy System 600
$1199.99 A Pair
Powered!

Roland DS50A
$499.99 A Pair

Genelec 1030 AMP
CALL!
Powered!

NEW!

Steinberg HALion Sampling Software MAC/PC $299.99
IK Multimedia Amplitude • MAC/PC • $299.99
Steinberg The Grand VST Piano Plug-in MAC/PC • $229.99

ZOOM · lexicon · PreSonus · AVALON DESIGN · Soundcraft · TANNOY · DENON · MACKIE · TASCAM · audio-technica · steinberg · Fostex · YAMAHA · ALESIS · SONY · HHB · Roland · SHURE · KORG · ALESIS · SAMSON · AKAI · E-MU · GENELEC · ART · t.c. electronic · RØDE · AKG · dbx

SYNTHS, DIGITAL PIANOS, SAMPLERS, CD RECORDERS

Roland RD-700 Expandable keyboard $1795.00

NEW!

Korg SP-500 $1449.99

Yamaha Motif 8-88 $2599.99

Korg Triton LE 76 CALL!

Korg Triton Studio 61 CALL!

Roland AX-7 MIDI Controller $395.99 List: $495.00

NEW!

NEW!

AKAI MPC-4000 Music Production Center $3199.99 List: $3999.00

NEW!

E-mu Proteus 2500 $999.99 List: $1329.00

SPECIAL PURCHASE!

Korg D12 $699.99 List: $1150.00

ART Tube MP Studio V3 $119.99

Roland CDX-1 DiscLab $899.99 List: $1495.00

NEW!

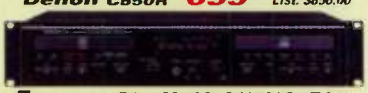
Roland SH32 $495.99 List: $595.00

Korg Triton Rack $1549.99 List: $2500.00

Zoom ZRT-123 $169.99 List: $299.00

HHB CDR-830 $499.99 List: $795.00

Denon C550R $699.99 List: $850.00



Tascam CD-1X4CD DUPLICATOR $1999.99 List: $2499.00

Alesis CCLX-440 Compressor Limiter $349.99 List: $399.99

Tascam Pocketstudio 5 $499.99 List: $599.95

MIDIMAN Oxygen 8 Controller $139.99 List: $179.95

NEW!

Roland XV5050 $795.99

NEW!

WOW!

Zoom RFX-300 Multi-effect Processor $69.99 List: $174.99

Neumann TLM-103 CALL! For Lowest Price!

Neumann U87 CALL! For Lowest Price!

AKG C-1000S $199.99 List: $288.99

AKG C-2000B $249.99 List: $378.00

Audio Technica AT4047 $499.99 List: $695.00

Rode NT-K $499.99 List: $999.00

AKG Solid Tube Mic $679.99 List: $1398.00

Rode NT-1000 $299.99 List: $599.99

AKG C414.ULS $799.99 List: $1258.00

Samson C01 Condensor Mic $69.99 List: $149.99

Sennhelser MD421 $299.99 List: $485.00

Marshall Electronics MXLV67B $119.99 List: $299.00

NEW!

Shure KSM27/SL $299.99 List: $575.00

MCA SP Condense Mi $59.99 List: $99.

Shure KSM44SL $699.99 List: $1393.60

RED HOT DEAL!

NO PAYMENTS! INTEREST! FOR 6 MONTHS! ON ANY ON-LINE PURCHASE!*

want a FREE catalog? Call 1-800-4-SAMASH or log on to www.samash.com

We Will Beat Any Price! LOWEST PRICE GUARANTEED! 50 STATES / 60 DAYS

OPEN 24 hours 7 days

Visit our website for the best deals in Guitars ¥ Drums ¥ Live Sound ¥ Books & Video

samash.com

The on-line musical instrument megastore!

1·800·4·SAMASH • www.samash.com

Mention Code EM15DP When Ordering!

Samash.com is part of the Sam Ash family of companies, including 30 musical instrument megastores nationwide.

*On your Sam Ash credit card, subject to credit approval. Certain rules apply to the allocation of payments and finance charges on your promotional purchase if you make more than one purchase on your store credit card. Call 1-888-367-4310, or review your cardholder agreement for information.If balance on these purchases is paid in full before the expiration of the 6 months promotional period and your Account is kept current, accrued Finance Charges will not be imposed on these purchases. If balance on these purchases is not paid in full, Finance Charges will be assessed from the purchase date at the Standard Rate of 20.96% APR. For Accounts not kept current, the Default Rate of 24.96% APR will be applied to all balances on your Account. Minimum Finance Charge $1.00. See our website, www.samash.com, for complete details. Offer expires 11/29/2002. Sam Ash is not responsible for any typographical errors or incorrect images.

importing Combis into its sequencer. Thanks to some sophisticated OS capabilities, the Combi's arpeggiator, effects, and MIDI channel settings are modified in such a way that when you find a Combi you like, you can start transforming it into a song without much muss or fuss. A minor limitation is that you can import the Combi only into tracks 1 through 8 or 9 through 16.

Transferring a single Program into the sequencer is more difficult than transferring a Combi. After pounding out a catchy two-finger beat with a factory drum kit, I decided I wanted to start a new song. When I dialed up the identical drum-kit Program in the sequencer, none of the effects or EQ settings were imported. By the time I had copied the necessary insert and master effects and then assigned the effects-send settings to the track, my inspiration had evaporated. To remedy the problem, Korg expects to implement a Copy Prog to Seq command in a future OS update. (I reviewed OS 1.0.1.)

My greatest disappointment was that the sequencer doesn't do swing/shuffle quantization—only straight duplets and triplets. Fortunately, Korg says that swing/shuffle quantization is expected in an OS update soon, and it has recently been implemented in the original Triton's OS. In a market dominated by dance and hip-hop, such an update is sorely needed. I was also bothered

CLIMB ON A BOARD

The unit I received for review was packed with expansion boards: *Orchestral Collection*, *Dance Extreme*, *Future Loop Construction*, *Studio Essentials*, *Vintage Archives*, and MOSS.

The multisamples for the 32 MB *Orchestral Collection* ($480) are taken from Peter Siedlaczek's well-known sample library. It's a versatile set, with lots of strings (including tremolando and pizzicato samples and some solo instruments as well as sections), winds, orchestral percussion, and harp. A few performance flourishes (harp glissandi, violin runs, and so on) are included. *Orchestral Collection* comes with two additional banks of Programs and Combis.

The *Dance Extreme* board ($240) features tons of individual drum hits—good ones. I'd happily use the Program called Raw RnB Kit as the foundation of a radio track. Room-filling synth basses are also in plentiful supply. The rest of the ROM is filled with a grab bag of guitar chords, chord hits, and "gospel" vocal phrases. There's no documentation on what key the singers were singing in (if any), and their intonation is pretty spotty.

If you crave fresh percussion tracks, *Future Loop Construction* ($240) would be an even better choice. I have to give Korg full points for innovation. Rather than providing sampled loops that are set in stone, Korg split the loops up using Propellerhead ReCycle 2.0 (yes, they're stereo) and loaded the ReCycle MIDI phrases into the Triton's RPPR section. As a result, you can change the tempo of any loop without changing its pitch.

The loops sound great over a wide range of tempos, with no stuttering or glitching. You can replace any drum hit with any other sound from the kit and event-edit the rhythms, so you can totally customize the loops. There's no need, however, because these grooves are totally happening right out of the box. Styles covered include hip-hop, rock/pop, Latin, drum 'n' bass, house, and R&B. Several variations are available for each groove, and there's a scattering of fills. Whether you're a songwriter or a project-studio owner whose clients demand great grooves on a tight deadline, *Future Loop Construction* will be a must-have.

The 16 MB *Studio Essentials* board ($240) supplies rich choirs and alternate string, brass, and woodwind samples. If you get a lot of calls to add sweetening to rock and country tracks, you might appreciate having some extra colors. "Essentials" might not be the right description, though the string and brass ensembles are in stereo, unlike the mono ensembles in ROM. The board features a couple of solid basses as well, but the Harpsikord and Electric Sitar Programs were worse than disappointing.

I liked the *Vintage Archives* board ($240) a lot better. It has a broad assortment of short waveforms sampled from old analog gear. The basses and leads sound quite cool, and many Programs gave me flashbacks to the '80s. The distortion and tremolo in Vintage EP200 are especially tasty, turning a square wave into a reasonable Wurlie imitation.

The EXB-MOSS board ($600) is a cool piece of hardware. Its synthesis architecture is completely different from the rest of the Triton. It has both analog-style oscillators and physical models—electric piano, brass, plucked string, and so on. If you've never heard a physical model of a trumpet before, you're in for a treat: when you use the Pitch Bend, you'll hear the player's embouchure "break" in a way that a sample playback synth simply can't duplicate. The richness of the plucked string and electric piano models is also sweet. And the shimmering glitter of the Acid Rain Program, which uses a comb filter, is quite striking.

The MOSS board has been around for a few years (as far as I can tell, it hasn't been updated since it debuted in the Korg Z1), and its six-note polyphony isn't exactly a cutting-edge spec. To layer a MOSS sound with a standard sound in a Combi, you have to tell the Combi how many MOSS voices to make available. That makes sense, but I was stumped for a few minutes because the MOSS board didn't seem to work in Combi mode; then I discovered that the default setting is zero voices.

I'M BIASED

David Torn aka splattercell
Guitarist/Texturalist/Producer

Collaborators include: david bowie • ryuichi sakamoto • carter burwell • kd lang • david sylvian • cliff martinez • me'shell ndegéocello • chute • page hamilton • b.l.u.e.

Soundtrack work includes: traffic • a knight's tale • three kings • heist • the velvet goldmine • simone

Photographed by Karjean Ng at the studio of film composer Carter Burwell, New York City

David Torn is a genuine musician's musician — one of the most respected of our time.

Whether working with David Bowie on his latest album, or creating trademark textural soundscapes for *Traffic* and other blockbuster movies, or crafting a new splattercell CD, David's aesthetic for raw sonic exploration goes far beyond a conventional approach to music, let alone guitar. And to help him make his discoveries, David turns to BIAS software.

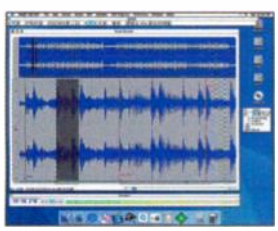
As he puts it, "I'm not much interested in what's been done before, especially when it comes to my own work. I need to keep uncovering new ground — and I love how BIAS products help me do that so intuitively, with critical speed & stability. Like my guitar, they feel like they were built just for me, letting me create a vocabulary for the language of my music."

It only makes sense that BIAS software is an integral part of David's creative process. After all, we share a common focus: the intersection of technology and art, where creativity flows on a path of least resistance. And it's from this place we create tools to help *you* define your own unique vocabulary.

Ambitious? Idealistic? Perhaps. Unless, of course, like David, you also happen to be biased.

www.bias-inc.com • 1 [800] 775-BIAS

The BIAS family of professional audio tools:



Peak™ 3.1

The fastest, most powerful, & most popular editing/processing app for the Mac — now for OS X & OS 9. Extensive plug-in support including VST & Vbox • Features LoopSurfer™ & other legendary tools • 32-bit processing • Sound Manager & CoreAudio support with performance beyond 24-bit/96kHz • Versions start at just $99 [including valuable extra software]

Deck™ 3.5

The best value in a multitrack audio workstation – native for Mac OS 9 and OS X. OMF import • 999 virtual tracks • 64 simultaneous tracks • Realtime automated mixing – including 5.1 surround • VST plug-ins • CoreAudio & ASIO • Advanced timecode & QuickTime sync • Perfect audio-post solution for video editing/DVD authoring • Versions start at just $99 [including valuable extra software]

Vbox™ 1.1

The ultimate multi-effects control environment – for Windows, Mac OS 9 & OS X. Combine up to hundreds of VST plug-ins per channel • Millions of sonic combinations • Hot swap plug-ins • Instantly mute, solo, mix, & edit parameters • Perfect for music, DJ'ing, audio-post, sound design & radio • Just $129 [Vbox SE free with Peak VST/TDM & Deck]

BIAS Studio™

BIAS Studio bundles bring you the combined power of BIAS solutions – for recording, mixing, editing, and processing – at huge savings.

Two options are available: the remarkably affordable BIAS Studio LE, and the amazingly powerful BIAS Studio – both of which let you combine the BIAS products you need for a fraction of the price they would cost separately. BIAS Studio bundles start at just $179.

bias

sound creative™

WRH

that you can't start playback while you're editing the event list; you have to leave Edit mode to listen to your edits.

On the other hand, I was pleased to discover 16 factory-programmed Song Templates that provide sounds, effects settings, and drum patterns, which you can use to jump-start the song-recording process. You can also store 16 Templates of your own. For use in live performance, Korg's RPPR (Realtime Pattern Play/Recording) phrase player lets you assign 150 drum patterns to individual keys.

Even without a dedicated front-panel button, it's easy to switch back and forth between arpeggios in performance: just pop into Edit mode and type in the arpeggio numbers on the fly. The Triton will segue flawlessly from one arpeggio to another. You can even do that as you record tracks into the sequencer. It's a great time-saving feature, and inspirational too. Some of the drum patterns have an exotic flavor when you use them on the "wrong" kit.

BIG AUDIO FUN

The Triton Studio isn't just a synthesizer; it speaks digital audio too. It comes standard with S/PDIF I/O, and the optional EXB-DI board ($200) provides six channels of ADAT Lightpipe out and word clock in (see **Fig. 2**).

If straight sampling doesn't suit your needs, you can record incoming audio to a sequencer RAM track, as I mentioned. Internal resampling to either RAM or hard disk is supported. You can transfer an entire sequenced song, complete with RAM tracks of acoustic instruments, onto the internal hard drive to create a stereo WAV file. When you're ready to share your creation with your bandmates or listen to the mix in the car, just burn an audio CD using the optional CDRW-1×8 drive ($199) or an external SCSI CD-R.

For setting up multisamples, the Triton will import a bunch of WAV files all at once by using wildcards in the file name. Even slicker is the Time Slice command, which chops a beat loop into individual drum hits, ReCycle-style, and creates a sequence track that triggers the slices one by one. In theory, you can slow down or speed up the sequencer and change the tempo of the loop. I could introduce a modest amount of time-stretching with drum-only loops, but just as with ReCycle, loops with bass or other pitched elements tended to get choppy when I slowed down the sequencer tempo. If you want to isolate certain drum hits to do fills or stuttering effects, though, time slicing will do the job nicely.

Although the Korg Trinity played back as many as four audio tracks from its hard drive, that feature was bafflingly omitted from the Triton Studio. The stock Studio comes with 16 MB of RAM, which is plenty to get you going, but the unit tops out at 96 MB, which is less than many dedicated samplers. The RAM is segmented into 16 MB blocks, and no single mono sample can exceed that size. That's a reasonable limitation, though, when you consider that 16 MB is enough RAM to record the

entire vocal for a three-minute song.

When I was ready to burn a CD, I was surprised that the Triton Studio wouldn't let me specify the length of time between tracks. Two seconds of silence are automatically inserted at the end of each track, and you can't change that amount. Unless you export the track to a computer, you can't add or trim silence after a song is recorded. Depending on your needs, then, you still might need a computer when it's time to do your duplication master.

TRUE TONE

The Triton Studio is a powerful instrument with great sounds and an impressive list of features. True, it's on the pricey side, but you get a generous voice and effects count: even the basic model is packed with great sounds. If you need more, I'd recommend the *Vintage Archives* expansion card for analog-style tones or *Future Loop Construction* for percussion tracks.

It's been a long time since I was so seriously tempted to buy a synth, but I can't help wishing the OS and user interface were as good as the sounds. As much as I like Korg's ribbon controller and arpeggiator, the touchscreen is just not my cup of tea. If Korg built an instrument with the Triton's synth and arpeggiator in a box by themselves, complete with all the insert effects and expansion boards but with no other bells or whistles, it would jump to the top of my shopping list. For many musicians, though, the Triton Studio might be the ideal one-box-does-it-all solution.

Jim Aikin *has been writing about synthesizers and music technology in a variety of magazines for more than 25 years. For fun, he writes interactive software and plays classical piano.*

PRODUCT SUMMARY

Korg
Triton Studio
keyboard workstation
61-key $3,400
76-key $3,800
88-key $4,200

FEATURES	3.5
EASE OF USE	3.5
QUALITY OF SOUNDS	4.5
VALUE	3.5

RATING PRODUCTS FROM 1 TO 5

PROS: Huge set of high-quality sounds. Built-in hard drive. Resampling. Excellent multi-effects. Plenty of insert effects per sound. Effects can be used in real time with external sources. Versatile arpeggiator with tons of pattern memory. CD burning with optional CD-RW drive.

CONS: Can't play audio tracks from hard drive. No swing/shuffle quantization. Can't control amount of silence between tracks when burning audio CDs. Can't adjust loop point while auditioning sample. Can't audition sequence edits while in event edit page.

Manufacturer
Korg U.S.A., Inc.
tel. (516) 333-9100
Web www.korg.com

staller CD-ROM that I received had

• UAD-1 POWERED PLUG-INS

Nigel was first introduced in version 2.1 of the UAD-1 bundle. It contains six effects modules: gate and compression (GateComp), modulation filter (ModFilter), phaser (Phasor), an amp simulator (Preflex), tremolo (TremFade), and modulation delay and echo (which are combined with the Tremolo module to form the TremModeEcho plug-in). GateComp provides very basic dynamics control, but it gets the job done with a minimum of CPU power. The ModFilter, Phasor, TremFade, and TremModeEcho are wonderful for creating anything from thick and twisted effects to subtle flanges and echoes. You can do a lot with these four plug-ins, although I wish there were a way to sync the effects to a sequence's tempo. (Mackie reports that that feature is in the works.) Preflex sounds really good, from big and distorted effects to smooth and warm tones. There are a variety of amp and cabinet types to work with, and the cabinets even include different mic positions.

SOLID STOCK PLUG-INS

The following plug-ins ship with version 2.2.2. Some of the plug-ins are single effects, while others are collections. Each of the components of the multi-effects plug-ins can also be used as single effects.

Single Effects
1176LN vintage compressor
LA2A vintage compressor
Pultec EQP-1A EQ
RealVerb Pro reverb

Multi-effects
CS-1 channel strip
- DM-1 delay modulator (short)
- DM-1L delay modulator (long)
- EX-1 EQ/compressor (stereo)
- EX-1M EQ/compressor (mono)
- RS-1 room-ambience modeler

Nigel guitar-effects processor
- GateComp gate and compression
- ModFilter modulation filter
- Phasor phaser
- Preflex amp simulator
- TremFade tremolo
- TremModeEcho tremolo/modulation delay/echo

Utility
DelayComp delay compensation

Bill Putnam's 1176LN solid-state limiting amplifier was first conceived in 1966. It went through several modifications over the years to improve its sound. The 1176LN (the LN stands for Low Noise) plug-in is based on the culmination of those modifications. It faithfully reproduces the sound of the original hardware units, imparting a distinctly high-end, solid-state flavor to tracks.

The LA2A plug-in is modeled after the Teletronix LA-2A Leveling Amplifier, first built in the mid-1960s, and it looks, acts, and sounds like the original. I was not disappointed by Mackie's UAD-1 version. It provides the ultimate in clean, clear dynamics processing with a minimum of controls.

The Pultec EQP-1A program equalizer has long been praised for its ability to dramatically boost or attenuate specific frequencies without sounding harsh. The Pultec plug-in looks like the original hardware unit and sounds equally as sweet, even adding a subtle analog flavor to tracks in its passive state.

The UAD-1 main reverb offering is RealVerb Pro. With the exception of the 5.1 parameters, it's practically identical to the much-revered RealVerb 5.1 TDM version. All the same great parameters for customizing reverbs are available, including the ability to choose an environment's composition (such as wood, glass windows, grass, fiberglass, or a combination of two different materials), precise control over the listener's position within the space, and morphing between presets. The fact that RealVerb Pro is part of the bundle is almost worth the price of the entire package alone.

HANDLING THE POWER

Keep in mind that only plug-ins written specifically for the Powered Plug-Ins format work with the UAD-1—you can't run a normal VST plug-in using the UAD-1's processing power. The system doesn't actually give you more native processing power because the UAD-1's DSP isn't dynamically shared with your computer's DSP power. However, any channel's inserts can have a mix of Powered Plug-Ins and traditional VST plug-ins, so adding a UAD-1 card to your computer will net much more processing power overall. Moreover, the system's plug-ins are all useful and sound terrific.

Some digital audio sequencers don't automatically compensate for the delay caused by the Powered Plug-Ins effects processing. In those cases, you'll need to use the included DelayComp plug-in to manually adjust the tracks that are playing early in relation to the processed tracks.

To use DelayComp, first determine what the maximum number of Powered Plug-ins being used by any track in the project is, then subtract from

PRODUCT SUMMARY

Mackie Designs
UAD-1 Powered Plug-Ins 2.2.2 (Mac/Win)
DSP card/plug-in bundle
$995

FEATURES	4.0
EASE OF USE	4.0
AUDIO QUALITY	4.5
VALUE	4.0

RATING PRODUCTS FROM 1 TO 5

PROS: Great-sounding plug-ins. Includes the LA2A and 1176LN vintage compressors and Kind of Loud's RealVerb Pro reverb. Very good bang for the buck. Full automation and 24-bit, 96 kHz sessions supported. Works with VST-compatible host applications and MOTU's Digital Performer. The utility plug-in for compensating for processing delay is easy to understand.

CONS: Works only with its own plug-in format. Effects don't sync with the host sequencer's tempo. No virtual-instrument plug-ins.

Manufacturer
Mackie Designs, Inc.
tel. (800) 258-6883
e-mail info@mackie.com
Web www.mackie.com or
www.uaudio.com/PPI/home.html

entire vocal for a three-minute song.

When I was ready to burn a CD, I was surprised that the Triton Studio wouldn't let me specify the length of time between tracks. Two seconds of silence are automatically inserted at the end of each track, and you can't change that amount. Unless you export the track to a computer, you can't add or trim silence after a song is recorded. Depending on your needs, then, you still might need a computer when it's time to do your duplication master.

TRUE TONE

The Triton Studio is a powerful instrument with great sounds and an impressive list of features. True, it's on the pricey side, but you get a generous voice and effects count: even the basic model is packed with great sounds. If you need more, I'd recommend the *Vintage Archives* expansion card for analog-style tones or *Future Loop Construction* for percussion tracks.

It's been a long time since I was so seriously tempted to buy a synth, but I can't help wishing the OS and user interface were as good as the sounds. As much as I like Korg's ribbon controller and arpeggiator, the touchscreen is just not my cup of tea. If Korg built an instrument with the Triton's synth and arpeggiator in a box by themselves, complete with all the insert effects and expansion boards but with no other bells or whistles, it would jump to the top of my shopping list. For many musicians, though, the Triton Studio might be the ideal one-box-does-it-all solution.

Jim Aikin *has been writing about synthesizers and music technology in a variety of magazines for more than 25 years. For fun, he writes interactive software and plays classical piano.*

PRODUCT SUMMARY

Korg
Triton Studio
keyboard workstation
61-key $3,400
76-key $3,800
88-key $4,200

FEATURES	3.5
EASE OF USE	3.5
QUALITY OF SOUNDS	4.5
VALUE	3.5

RATING PRODUCTS FROM 1 TO 5

PROS: Huge set of high-quality sounds. Built-in hard drive. Resampling. Excellent multi-effects. Plenty of insert effects per sound. Effects can be used in real time with external sources. Versatile arpeggiator with tons of pattern memory. CD burning with optional CD-RW drive.

CONS: Can't play audio tracks from hard drive. No swing/shuffle quantization. Can't control amount of silence between tracks when burning audio CDs. Can't adjust loop point while auditioning sample. Can't audition sequence edits while in event edit page.

Manufacturer
Korg U.S.A., Inc.
tel. (516) 333-9100
Web www.korg.com

MACKIE DESIGNS

UAD-1 POWERED PLUG-INS 2.2.2 (MAC/WIN)

Pop in this PCI card and expand your DSP horizons.

By Erik Hawkins

Going head-to-head with TC Works' PowerCore system (reviewed in the April 2002 **EM**), Mackie has introduced the UAD-1 Powered Plug-Ins bundle, another option for getting more signal-processing power into your computer. The system, developed by Universal Audio, is based on the UAD-1 PCI card that, according to Mackie, features a single "groundbreaking super-DSP chip" for running extremely sophisticated plug-in algorithms. Eighteen stock plug-ins ship with the bundle, including Universal Audio's LA2A and 1176LN vintage compressors. Not surprisingly, Kind of Loud's much-admired RealVerb Pro is also included. (UA is Kind of Loud's parent company; see the sidebar "Solid Stock Plug-ins" for a complete list of plug-ins.)

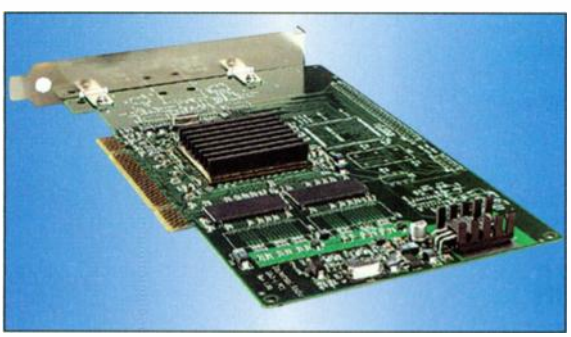
PARKING THE CARD

The installation instructions advise you to first install the Powered Plug-Ins software and then the UAD-1. The installer CD-ROM that I received had version 1.1 software, which I knew to be outdated; I therefore got online and downloaded the current software, version 2.2.2. At just under 23 MB, that is time-consuming to do over a standard phone line. Nonetheless, it's worthwhile to download the latest software, because it includes bug fixes and two new plug-ins (the Pultec EQP-1A program equalizer and the Nigel guitar-effects processor).

The UAD-1 system requires a VST-compatible host and runs on either a Mac or a PC (MAS support was announced just as I was finishing this review). I installed and reviewed the system using an AMD Athlon XP 1.6 GHz computer running Windows 2000 and packing 262 MB of RAM. The host application was Cubase VST/32, version 5.1. With the UAD-1 software installed and the UAD-1 properly seated in a PCI slot, Windows' New Hardware Wizard found and installed all the necessary drivers with no hitches.

The system's plug-ins are placed in your VST Plug-ins folder, in a subfolder called Powered Plug-ins. You access the plug-ins from your host application, and they start up and function just like standard VST plug-ins. A program called UAD-1 DSP Performance Meter—a floating meter bar that can run in the background—lets you keep an eye on the card's DSP load (see **Fig. 1**). The meter shows usage as a percentage of the card's CPU and memory. (The UAD-1 has 4 MB of onboard RAM that is used for delay lines.) I positioned the UAD-1 meter next to Cubase's VST Performance meter for easy monitoring of both systems at a glance.

I was also curious to see if the system would work in a Magma single-slot expansion chassis (the CB1H) connected to my Titanium PowerBook G4 using its PC Card slot. It worked like a charm, offering a really great way of adding extra DSP to your laptop.



Mackie's UAD-1 Powered Plug-Ins bundle, developed by Universal Audio, includes a single-slot PCI card and a set of effects plug-ins. The card handles all processing required by the plug-ins, which takes the load off the host CPU.

Minimum System Requirements

UAD-1 Powered Plug-Ins

MAC: G3/233; 128 MB RAM; OS 9.0; compatible VST or MAS host application

PC: Pentium II/400; 128 MB RAM; Windows 98/2000/ME/XP; compatible VST host application

PLUG-IN LOWDOWN

The plug-ins come in two flavors: either single, dedicated processors or multi-effects. The single-processor plug-ins provide one specific effect (such as reverb or compression); the multi-effects are a group of complementary effects modules (such as amp simulator, gate, and compressor). There are two main multi-effects plug-ins: the CS-1 channel strip and the Nigel guitar-effects processor. All of the effects contained in these two groups are also available individually. The 1176LN, LA2A, Pultec, and RealVerb Pro are not included in either of the multi-effects plug-ins and only run alone. Most of the plug-ins have presets that sound decent and offer a good starting point for creating your own effects.

The CS-1 has a cool vintage look that is reminiscent of an old Neve console. It has almost all the processing capability you need for a channel in a single plug-in. In order, there are five bands of parametric EQ, a compressor (EX-1), a delay-modulation section (DM-1), and a room simulator (RS-1) that UA calls a "reflection engine." If you don't need all of the CS-1's processing modules, you can defeat them to conserve CPU power or you can simply use the component plug-ins separately, which is also handy for inserting the plug-ins in a different order. The EX-1 plug-in is available in stereo or mono (the EX-1M), and the DM-1 plug-in comes in short and long (the DM-1L) delay versions.

The EX-1 and DM-1 plug-ins are useful and they sound good. I found the RS-1 a bit harder to fit into my mixes because it is more of a room-ambience effect than an actual reverb, but there are certainly times when such an effect fits the bill.

Proteus® Keys

Delivers More for Less

$599*

"The (Proteus® Keys) PK-6 may just have the best factory presets of any Proteus yet... An enthusiastic thumbs up!..."
— Keyboard Magazine

Musicians have had to spend at least a thousand dollars to get a keyboard with pro features and sounds – until now. We at E-MU® have discovered that we can build quality keyboards like our Proteus® Keys and still sell them at a fair and affordable price. Proteus® Keys features one of the most powerful synth engines in the industry – the same found in E-MU®'s industry-standard Proteus® 2000 sound module – at a fraction of the cost of its competitors without cutting corners. Why pay more for a competitor's keyboard that delivers less? Play Proteus® Keys at your local E-MU® Dealer and see and hear for yourself what E-MU® can deliver for $599.

Keyboard Head-to-Head Comparison

	E-MU® PK-6	Yamaha® S30	Roland® RS-5
Max. ROM Expansion	128MB	40MB	32MB
Real-time Controllers	16	9	6
Outputs	4	2	2
Arpeggiators	16	1	1
Arpeggiator Types	300	128	45
Aftertouch?	Yes	Yes	No
Polyphony	64	64	64
Effects?	Yes	Yes	Yes
Street Price	$599*	$799*	$695*

* Based on on-line advertised price September 2002

Hard Rock Cafe

E-MU

Nigel was first introduced in version 2.1 of the UAD-1 bundle. It contains six effects modules: gate and compression (GateComp), modulation filter (ModFilter), phaser (Phasor), an amp simulator (Preflex), tremolo (TremFade), and modulation delay and echo (which are combined with the Tremolo module to form the TremModeEcho plug-in). GateComp provides very basic dynamics control, but it gets the job done with a minimum of CPU power. The ModFilter, Phasor, TremFade, and TremModeEcho are wonderful for creating anything from thick and twisted effects to subtle flanges and echoes. You can do a lot with these four plug-ins, although I wish there were a way to sync the effects to a sequence's tempo. (Mackie reports that that feature is in the works.) Preflex sounds really good, from big and distorted effects to smooth and warm tones. There are a variety of amp and cabinet types to work with, and the cabinets even include different mic positions.

Bill Putnam's 1176LN solid-state limiting amplifier was first conceived in 1966. It went through several modifications over the years to improve its sound. The 1176LN (the LN stands for Low Noise) plug-in is based on the culmination of those modifications. It faithfully reproduces the sound of the original hardware units, imparting a distinctly high-end, solid-state flavor to tracks.

The LA2A plug-in is modeled after the Teletronix LA-2A Leveling Amplifier, first built in the mid-1960s, and it looks, acts, and sounds like the original. I was not disappointed by Mackie's UAD-1 version. It provides the ultimate in clean, clear dynamics processing with a minimum of controls.

The Pultec EQP-1A program equalizer has long been praised for its ability to dramatically boost or attenuate specific frequencies without sounding harsh. The Pultec plug-in looks like the original hardware unit and sounds equally as sweet, even adding a subtle analog flavor to tracks in its passive state.

The UAD-1 main reverb offering is RealVerb Pro. With the exception of the 5.1 parameters, it's practically identical to the much-revered RealVerb 5.1 TDM version. All the same great parameters for customizing reverbs are available, including the ability to choose an environment's composition (such as wood, glass windows, grass, fiberglass, or a combination of two different materials), precise control over the listener's position within the space, and morphing between presets. The fact that RealVerb Pro is part of the bundle is almost worth the price of the entire package alone.

HANDLING THE POWER

Keep in mind that only plug-ins written specifically for the Powered Plug-Ins format work with the UAD-1—you can't run a normal VST plug-in using the UAD-1's processing power. The system doesn't actually give you more native processing power because the UAD-1's DSP isn't dynamically shared with your computer's DSP power. However, any channel's inserts can have a mix of Powered Plug-Ins and traditional VST plug-ins, so adding a UAD-1 card to your computer will net much more processing power overall. Moreover, the system's plug-ins are all useful and sound terrific.

Some digital audio sequencers don't automatically compensate for the delay caused by the Powered Plug-Ins effects processing. In those cases, you'll need to use the included DelayComp plug-in to manually adjust the tracks that are playing early in relation to the processed tracks.

To use DelayComp, first determine what the maximum number of Powered Plug-ins being used by any track in the project is, then subtract from

SOLID STOCK PLUG-INS

The following plug-ins ship with version 2.2.2. Some of the plug-ins are single effects, while others are collections. Each of the components of the multi-effects plug-ins can also be used as single effects.

Single Effects
1176LN vintage compressor
LA2A vintage compressor
Pultec EQP-1A EQ
RealVerb Pro reverb

Multi-effects
CS-1 channel strip
- DM-1 delay modulator (short)
- DM-1L delay modulator (long)
- EX-1 EQ/compressor (stereo)
- EX-1M EQ/compressor (mono)
- RS-1 room-ambience modeler

Nigel guitar-effects processor
- GateComp gate and compression
- ModFIlter modulation filter
- Phasor phaser
- Preflex amp simulator
- TremFade tremolo
- TremModeEcho tremolo/modulation delay/echo

Utility
DelayComp delay compensation

PRODUCT SUMMARY

Mackie Designs
UAD-1 Powered Plug-Ins 2.2.2 (Mac/Win)
DSP card/plug-in bundle
$995

FEATURES	4.0
EASE OF USE	4.0
AUDIO QUALITY	4.5
VALUE	4.0

RATING PRODUCTS FROM 1 TO 5

PROS: Great-sounding plug-ins. Includes the LA2A and 1176LN vintage compressors and Kind of Loud's RealVerb Pro reverb. Very good bang for the buck. Full automation and 24-bit, 96 kHz sessions supported. Works with VST-compatible host applications and MOTU's Digital Performer. The utility plug-in for compensating for processing delay is easy to understand.

CONS: Works only with its own plug-in format. Effects don't sync with the host sequencer's tempo. No virtual-instrument plug-ins.

Manufacturer
Mackie Designs, Inc.
tel. (800) 258-6883
e-mail info@mackie.com
Web www.mackie.com or
www.uaudio.com/PPI/home.html

that maximum number the existing number of Powered Plug-ins that any other audio track on the project has. Next, use that difference as the DelayComp setting. For example, if the maximum number of Powered Plug-ins being used on any track is three and another track has only one Powered Plug-in, you would assign a value of 2 (3 – 1) to DelayComp for the latter track. By the same token, if a track in the same project has no Powered Plug-ins, it would require a setting of 3 (3 – 0) to equal the maximum number of plug-ins being used.

Remembering to compensate for processing delays is an annoying speed bump in the road of one's creative flow. But without the DelayComp plug-in, the system would be unusable with some digital audio sequencers. For example, Cubase VST/32 automatically compensates for the delay on its audio tracks but not its virtual-instrument tracks. Logic Audio and Cubase SX

FIG. 1: The UAD-1 Powered Plug-ins can be mixed freely with native VST plug-ins in a VST host application. Here, the CS-1 channel-strip plug-in is shown running under Cubase VST/32. Performance is measured in real time using the Powered Plug-ins meter bar, shown at lower right.

reportedly automatically compensate for Powered Plug-Ins delay on audio and virtual-instrument tracks. However, I tried opening a Cubase VST/32 session in Cubase SX and there was still processing delay on the virtual instruments.

Keeping up with delay adjustments while you insert Powered Plug-Ins on audio and virtual-instrument tracks at the same time can get tricky. Thankfully, because delay values are given as the number of Powered Plug-Ins used, DelayComp is easy to understand. To be sure that you're always prepared to deal with delay times, I suggest creating a mixer template with DelayComp inserted on every channel.

All of the Powered Plug-Ins' parameters can be automated just the way standard VST–plug-in parameters can be. Mackie says that the plug-ins have a smoothing algorithm that makes digital zippering noise during automation obsolete, and indeed, I didn't hear any zippering.

PLUG-IN HAVEN

Between the computer's 2 GHz Athlon processor and the UAD-1 card, I was never in serious need of processing power. In a 16-bit, 44.1 kHz session I was able to run half a dozen LA2As, a couple of Pultecs, and two RealVerb Pros. (Of course, the number of plug-ins you can run will be lower for sessions with higher sample rates.) Some plug-ins, such as the Nigel and the 1176LN, did eat up a lot more processing power than others. My solution, especially with the Nigel, was to bounce the effect to disk to free up the UAD-1's processing power. Either way, the ability to run your reverbs and so many other cool plug-ins on the UAD-1 leaves your computer's CPU available for running still more native effects plug-ins and virtual instruments. Mackie also says that multiple UAD-1 cards, installed in the same computer, will soon be able to share processing power dynamically.

The fact that only those plug-ins written specifically for the Powered Plug-Ins format work with the UAD-1 card may present a problem for some users. Whether third-party plug-in developers will write versions of their plug-ins for this new format remains to be seen. Regardless, the included plug-ins are more than adequate, and combined with an arsenal of native plug-ins, you should have plenty of effects to work with.

My wish list includes Powered Plug-Ins that sync to your sequencer's tempo and some UAD-1-compatible virtual instruments. Otherwise, I have very few gripes about the bundle: it works well and comes with some great-sounding effects. Even the manual (PDF only) is well written. If you need more DSP power to augment your native processing power and have also been considering the Kind of Loud plug-ins, check out the UAD-1 Powered Plug-Ins bundle.

Visit **Erik Hawkins**'s *fledgling indie label at www.muzicali.com to hear music made with today's hottest studio gizmos. Also check out his new virtual-studio recording book,* Studio-in-a-Box *(ArtistPro/Hal Leonard).*

MannysMusic.com
The Original Music Superstore

THE MUSIC TECHNOLOGY EXPERTS!

Aardvark Pro Q10
Direct Pro Q10 is a computer based digital multi track recording solution from Aardvark. Powerful DSP-based virtual mixing software eliminates the need for an external out-board mixer.

Aardvark

Zoom MRS-1044CD Digital Multitrack
The MRS-1044 is a digital multi track workstation, featuring 10 audio tracks, a programmable stereo drum track and a programmable bass track and built-in CD burner.

ZOOM

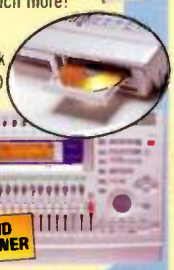
Roland VS2480CD 24 Track
The VS-2480 is the first self-contained recording workstation to offer 24-track/24-bit digital recording with 64-channel digital mixing, onboard effects processing, CD burner & 80 gig drive.

Roland

AKAI MPC-4000 Music Production Center
The most powerful MPC ever takes its rightful position in our Akai Professional product line. Using the new Z-96 sampling engine the MPC4000 boasts the first full feature sampler ever in an MPC product. Built-in CD Recorder for master archiving or Sample Loading. And Much, Much more!

AKAI

Korg D1600 V40
The Korg D1600/V40 is a 16-track digital recorder with a 2x8 CD burner and 40GB HD, that packs recording, mixing, and final CD mastering into a professional quality all-in-one unit.



KORG WITH 40 GB HD & 2X8X CD BURNER

Alesis Hard Disk Recorder
The HD24 from Alesis delivers 24 tracks of Hard Disk recording at an unbelievable price, and offering incredible performance and stability, thanks to Alesis' unique method of writing to the hard drive designed and built exclusively for recording music.

ALESIS

Korg Triton Studio Pro X 88-Key Workstation
The TRITON STUDIO Pro X features Korg's HI (Hyper Integrated) synthesis system and best PCM sounds. Its high-capacity 48 Mbyte PCM ROM, with 429 multisamples and 417 drum samples, covers every need imaginable!

KORG

Korg Triton LE Synthesizer
The TRITON LE Music Workstation distills all the best features of its namesake into a streamlined, cost-effective package. Available in 61 & 76 keys.

Millennia Media STT-1 Origin
Millennia's new STT-1 Origin is like having a large rack of vintage and modern outboard recording equipment with over 130 product combinations!

T.C. Electronic Voice Prism
VoicePrism offers revolutionary detailed craft & creative control over vocals!

t.c. electronic

Mackie MDR24/96 Digital Multi Track
Mackie's new MDR24/96 is the perfect price-busting commitment to non-linear hard disk recording for the first time recordist or those replacing aging gear!

MACKIE.

Avalon VT-747SP
AVALON DESIGN

The Avalon VT-747SP combines a creative STEREO tube-discrete Class A spectral-opto-compressor with a musical six band program equalizer, L-R output level and gain reduction metering and internal regulated power supplies in a 2U space.

Presonus Digimax 8 Channel Microphone Preamp
PreSonus

The Digimax combines 8 channels of pristine mic preamplification with 24 simultaneous digital and analog outputs.

Mind Print DTC Preamp
MindPrint DTC 2-Channel Dual Tube Preamp w/48 volts phantom power and more.

Mark of the Unicorn 896
Mark of the Unicorn, Inc

The 896 is a two rack-space 96 kHz FireWire audio interface for Macintosh and Windows computers.

Tannoy System 800A
180 watts with 8" bass transducer.

TANNOY

Dynaudio BM6A Active Studio Monitor
Applications for the BM6A cover every aspect of sound engineering and reproduction, including post production, recording studios and playback rooms.

Genelec 1030A
Bi-amplified Powered Studio Monitors ideal for nearfield monitoring, broadcast monitoring, video post production or where space is very limited.

GENELEC

Sonar 2XL Audio/Sequencing Software (PC)
SONAR 2XL offers fully integrated multitrack recording, editing, mixing, and delivery of audio and MIDI.

Steinberg Nuendo
Nuendo is compatible with virtually every format available today, allowing sources from many different places to be easily integrated into your project.

Steinberg

AKG Solid Tube
AKG has combined the benefits of tube and solid state technologies so you get the much sought after warm sound provided by tube microphones with the reliability of state-of-the-art circuitry.

AKG

Manny's Music
The Original Music Superstore

156 West 48th Street
(Between 6th & 7th Aves) NYC NY 10036
Monday-Friday: 10am-7pm
Sat: 10am-7pm • Sundays: 12-6pm

Or call 24/7 @ 1-866-PROMANNY

MENTION CODE MEM10

www.mannysmusic.com

Manny's Music is not responsible for any typographical errors or incorrect images.

ELEKTRON

MACHINEDRUM SPS-1

This unnatural wonder is truly a different drummer.

By David Battino

Lately, it seems as though anything you can slap, scrape, or smack with a stick has been sampled and fossilized on CD-ROM. The number of ready-to-beat drum sounds is staggering, but arranging them into usable grooves can feel more like trawling a flea market than making music. Ironically, it's quite possible that the sample you finally choose is simultaneously appearing in 15 other songs by other artists.

Fortunately, a small Swedish company called Elektron has bucked the sample-scavenging trend by releasing the Machinedrum SPS-1, a true rhythm synthesizer (see **Fig. 1**). The Machinedrum provides 49 basic percussive *machines* (synthesis algorithms) and a wealth of knob-driven parameters to sculpt new sounds from them. Within minutes you can whip up patterns in which every note is subtly or wildly different. Thanks to the Machinedrum's horde of LFOs, the sounds can continuously evolve each time the patterns loop.

The Machinedrum's powerful synthesizer engine gives it a big edge over typical drum machines. Its real advantage, however, is the way the synthesizer is integrated with its pattern recorder. SPS stands for Synthetic Percussion Sequencer, and it's an apt name. Like beloved Roland, Linn, and E-mu drum machines of the past (which it easily emulates), the Machinedrum succeeds not because its sounds are realistic but because of their expressive character and the ease with which you can arrange them. Indeed, as you'd expect from the company that developed the wacky SidStation (see the March 2000 issue for a review), the Machinedrum has more in common with a singing robot than a wooden drum.

The Machinedrum is decidedly not for everyone. It's manufactured in small batches and sold only through Elektron's Web site, and it comes with a ten-day, money-back guarantee. It's pricey for a groove box, though not for a synth or a high-end drum machine. The price includes express shipping and a one-year warranty, though according to Elektron, about half its U.S. customers have been charged an additional $30 to $60 in customs fees. Nonetheless, if you've been searching for a unique, infectious sound to drive your tracks that is packed in a box that's compact and easy to use in live performance, the Machinedrum could very well be the answer.

FIG. 1: Unlike drum machines that simply regurgitate samples, the Machinedrum lets you sculpt every note with its infinite-rotation knobs.

SWEDISH MESSAGE

Like a Volvo, the Machinedrum initially comes off as solid, square, and homely. After a few minutes, though, you'll discover innovations reminiscent of another Swedish import, Propellerhead ReBirth. The Machinedrum is smaller and heavier than you might expect. (If you spread this magazine flat, the Machinedrum would fit over it with one-third of the page's height to spare.) The housing is massive steel with a thick aluminum faceplate. On my review unit, the edge of the faceplate was so sharp that I sliced my thumb; according to Elektron, newer units have been smoothed. Optional rack ears ($35) let you mount the Machinedrum in a standard 19-inch rack; depending on the audio cables you use, you'll need four or five rackspaces to accommodate it.

Audio jacks (all unbalanced ¼-inch) are bolted to the case. Four individual outputs supplement the main left and right outputs (see **Fig. 2**). Some people on the Elektron Users group site (see the sidebar "Web Resources") complained about cross-talk noise in the individual outputs, but I heard only a faint version of the adjacent jack's signal on my review unit. The overall sound is clean, though you can easily rough up individual drums with the twist of a knob.

Two input jacks let you apply the Machinedrum's offbeat signal processing to external audio. The inputs also accept standard drum triggers. The only connector I missed was a footswitch jack for remote start and stop, but you can use MIDI for that. Such an expensive box should have a built-in power supply (or at least a cord lock); during one session, I accidentally dislodged the wall-wart cable twice.

WELCOME TO MY PAD

Sixteen drum pads with associated LEDs span the Machinedrum's front

SonicImplants® serious instruments.

*"Live and in the studio, Sonic Implants are with me. The sounds **breathe** and have the quality and feel I need to get right to the music."*

-Roger Joseph Manning Jr.

Credits Include:

AIR
BECK
SHERYL CROW
MELISSA ETHERIDGE
ZIGGY MARLEY
GREEN DAY
BLINK 182
JOHNNY CASH
JAMIROQUAI
SUEDE
LADYTRON
SAVE FERRIS
NEIL FINN
JELLYFISH
SCAPEGOAT WAX
FANTASTIC PLASTIC MACHINE
EELS
FELIX DA HOUSECAT
IMPERIAL DRAG
RINGO STARR
THE INCREDIBLE MOSES LEROY
THE VINES
ARLING & CAMERON
THE MOOG COOKBOOK

GIGASAMPLER
AKAI
KURZWEIL
SOUNDFONT

NEW!

WWW.SONICIMPLANTS.COM

For demos and info please visit the site or call 888.769.3788

panel. In Live mode, the pads and LEDs correspond to the 16 sounds in the current kit. In Grid mode, they denote the steps on which the selected sound will play in the current pattern. Patterns can have as many as 32 steps; an additional button toggles the pads to access steps 17 through 32. Depending on the Scale setting (1× or 2×), each step corresponds to a 16th or 32nd note.

Half an inch square and somewhat clicky, the pads feel dependable; their vertical travel is about an eighth of an inch. Disappointingly, though, they are not Velocity-sensitive—a surprising omission in a kilobuck drum machine. The drum sounds do respond to Velocity over MIDI, but the onboard sequencer doesn't record that information. Because it's so easy to tweak individual hits and automate level and tone on the fly, the lack of Velocity response was less of a drawback than I expected, but I still missed it.

Above the pads is a group of four buttons for selecting the 128 patterns. They access the A through D or E through H banks, depending on the state of the Bank Group button. To call up pattern H3, for example, press Bank Group (if necessary), hold the H button, and then press drum pad 3. Thus, with only two or three keystrokes, you can call up any pattern. If a pattern is already playing, the next pattern you select will be queued. If you hold down a bank button and one pad and then press additional pads, all corresponding patterns will be chained in that order—a useful feature for live performance—and the chain will loop indefinitely.

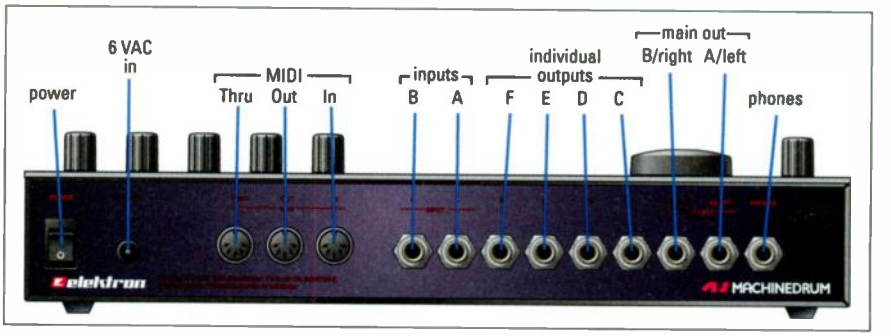


FIG. 2: Although the Machinedrum provides four individual outputs, you might not need them, because you can route each drum sound (and the two inputs) through five or more simultaneous onboard effects.

You can also switch patterns by sending MIDI Note On commands to the Machinedrum. When you do, the pattern will switch immediately, allowing you to create complex turnarounds and breakbeats. The pattern you select will loop for as long as you hold the MIDI note; then it will play to its end and stop.

Surprisingly, the big data wheel above the bank buttons is underutilized. Its primary function is to select which sound to edit, but it's much faster to do that by holding the Function key and hitting the appropriate drum pad, because you don't have to scroll through all 16 drums. You can also use the wheel to adjust tempo, but because a full rotation adds or subtracts just 12 bpm, you might do a lot of spinning. Again, the Function key comes to the rescue: when you hold it, your next four taps on the Tempo button will be averaged to set the tempo. (Tempo range is from 30 to 300 bpm with 0.1 bpm resolution.)

The 128-by-64-pixel display is backlit in dark red, which initially looks exotic but makes the text harder to read than a brighter color would. Another challenge is that most parameter names are truncated to four characters or fewer in a font that's only 3 by 5 pixels. However, the way the display interacts with the Machinedrum's smaller knobs is brilliant. Each knob is continuous; twisting it moves an animated knob in the display, simultaneously revealing the numeric value (see **Fig. 3**). Pushing

Machinedrum SPS-1 Specifications

Audio Inputs	(2) unbalanced ¼" line-level
Audio Outputs	(2) unbalanced ¼" main; (4) unbalanced ¼"
Software Version Reviewed	1.11
Polyphony	(16) notes
Patch Memory	(64) user-programmable kits, each with (16) sounds max.
Synthesis Types	TRX (analog drum-machine modeling), EFM (enhanced feedback modulation), P-I (acoustic-drum modeling), E12 (sampled), GND (sine/noise/pulse)
Effects Processing (per track/drum sound)	amplitude modulation, 1-band EQ, resonant lowpass/bandpass/highpass filter, sampling-rate reduction, distortion
Effects Processing (global)	rhythm delay, shelving EQ, parametric EQ, gated reverb, compressor
Sequencer	(16) tracks; (128) user patterns; (32) user songs; (254) song steps; 32nd-note max. resolution with variable swing individual; (1) ¼" stereo headphone
A/D/A Converters	24-bit
MIDI	In, Out, Thru; (384) controllable parameters
Dimensions	13.38" (W) × 3.00" (H) × 6.94" (D)
Weight	6.19 lb. (excluding adapter)

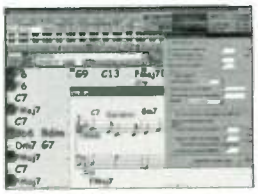
HOT SOFTWARE PROGRAMS FROM PG MUSIC!

BAND-IN-A-BOX *(for Windows® & Macintosh®)*

INTELLIGENT MUSIC SOFTWARE FOR YOUR PC OR MAC* IS HERE!

Version 11 for Windows® is here—Automatic Accompaniment has arrived!

** NOTE: Band-in-a-Box for Macintosh® is currently available at version 8.0*



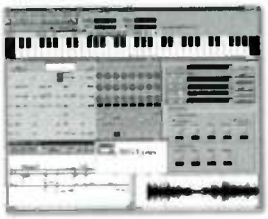
The award-winning Band-in-a-Box is so easy to use! Just type in the chords for any song using standard chord symbols (like C, Fm7 or C13b9), choose the style you'd like, and Band-in-a-Box does the rest... automatically generating a complete professional quality five instrument arrangement of piano, bass, drums, guitar and strings in a wide variety of popular styles.

"One of the few music products that sits in the 'must-have' category."
Sound On Sound, July 2000

Band-in-a-Box Pro Version 11...$88
Includes Version 11, Styles Sets 1-3, Harmonies Set 1, Soloist Set 1, Melodist Set 1 & bonus software SlowBlast! (Windows® version only)

Band-in-a-Box MegaPAK version 11...$249
The MegaPAK contains "the works" – version 11 PLUS Styles Sets (1-29), all Soloist Sets (1-9), Melodists (1, 2), The MIDI Fakebook, PowerGuide Instructional CD-ROM, & bonus software SlowBlast! (Windows® version only)

NEW! PowerTracks Pro Audio 8.0 $49



PowerTracks Pro Audio's new 32-bit engine ensures smooth operation in the latest Windows operating systems. There's an amazing new Chord Wizard, real time DirectX audio effects, "handwritten" Jazz notation font, a new Chords Window and lots more new features for fun and convenience. The amazing built-in **Chord Wizard** automatically interprets the chords of any MIDI file or PowerTracks MIDI sequence and writes the chord symbols to the notation and to the new **Chords Window**. Chord symbols are an essential component of playing by ear, so most musicians who play by ear should find this new feature indispensable! The Chords Window displays the chords in a selectable font and size, and is fully editable. It also has Band-in-a-Box compatible part markers to easily mark any section of the song. **PowerTracks Pro Audio 8 supports real time DirectX effects and plug-in groups**. Up to four chained plug-ins can be used simultaneously. These effects groups can be saved and loaded along with their settings. **It's like having a 48 track recording studio on your computer!**

- **PowerTracks Pro Audio 8.0**... $49
  Contains PowerTracks Pro Audio 8.0 + PowerGuide CD-ROM video training; 2 CD-ROMs.
- **PowerTracks Pro Audio 8.0 PowerPAK**... $69
  PowerTracks Pro Audio 8.0, PowerGuide CD-ROM video training, and MultiTracks Volume 1; 5 CD-ROMs.
- **PowerTracks Pro Audio 8.0 PowerPAK Plus**... $79
  PowerTracks Pro Audio 8.0, PowerGuide CD-ROM video training; MultiTracks Vols. 1 & 2; Bonus software SlowBlast!, 8 CD-ROMs.

"Solid sequencing at an unbelievable price"
Electronic Musician

DIGITAL AUDIO

MORE HOT PRODUCTS...

OSCAR PETERSON MULTIMEDIA CD-ROM *(for Windows®)*... **$79.95**
Multimedia Performances, Transcriptions, Autobiography, Photo Gallery, Discography & More!

Jazz piano legend **Oscar Peterson** brings an exciting new level of artistry to the Multimedia experience in this signature CD-ROM. This rich treasury integrates interactive audio/visual performances with on-screen piano display and notation. You can see and study exactly what the master is playing! Join Oscar for a musical journey through his life and career. There's also a comprehensive Multimedia autobiography loaded with audio and video clips **PLUS** exclusive photographs from Oscar Peterson's private collection.

OSCAR PETERSON
NOTE FOR NOTE
***(Companion book/audio)* $39.95**

Transcriptions of Classic Recordings: Over 200 pages of music PLUS performances on audio CD!

Masterclass & Guitar Solos SRP $49 per volume

Jazz Piano MasterClass CD-ROM: Vols. 1 & 2... $49
Master jazz pianist **Miles Black** is your teacher in a multimedia software program designed to illustrate basic skills to the beginning pianist while enhancing the skills of more advanced pianists. You'll study over 60 topics such as Roots and Shells, Block Chords, Stride Piano, Playing the Blues, Scales, Common Progressions, Improvisation and more. All lessons are accompanied by practice exercises, backing tracks, further illustrated with 11 tunes included in the program. Interactive audio lessons with on screen piano display and notation let you see and hear exactly what Miles Black is playing.

Jazz Guitar MasterClass CD-ROM: Vols. 1 & 2... $49
Master jazz guitarist **Oliver Gannon** is your teacher in this software program designed to illustrate basic skills to beginning guitarists while enhancing skills of more advanced guitarists. Study over 60 topics such as Chord Voicings, Inversions, Right Hand Techniques, Comping, Scales, Modes, Arpeggios, Common Progressions, Improvisation and more. All lessons are accompanied by practice exercises, backing tracks, further illustrated with the included 10 tunes. Interactive audio lessons with on screen guitar display and notation let you see and hear exactly what Oliver Gannon is playing.

Master Jazz Guitar Solos PAK Volumes 1, 2 & 3... $99
This interactive program is designed to help you learn to solo like a professional Jazz guitarist. Musicians studying improvisation frequently learn by copying other soloists' performances. Since guitar is a "visual instrument", it is often easier to learn to play by watching the fretboard than by reading the music from a staff. The on-screen guitar fretboard in **The Master Jazz Guitar Solos PAK** shows you exactly which notes and chords are being played, in real time as you hear the music. We've even included "guide notes" for common fretboard positions that are displayed on the on-screen guitar fretboard to help you learn the note names, string and fret positions. **The Master Jazz Guitar Solos PAK** contains over 150 songs designed to illustrate basic skills to the beginning guitarist while enhancing the skills of more advanced guitarists

Master Jazz Guitar Solos Volume 1... $49
Full featured program includes over 50 tunes with jazz guitar solos in the style of the great Jazz Guitarists (Joe Pass, Pat Metheny, John Scofield and others). What a great way to learn jazz guitar soloing! Let a master show you solos in the styles of the greats. All tunes are done in MIDI format with a complete band arrangement (drums, piano, bass, guitar). Watch and learn the tunes as they play on the guitar fretboard, notation and tablature. Slow the music to the tempo you want, or step through the solo note by note.

Master Flatpick Guitar Solos Volume 1... $49
Full featured program including 50 tunes with guitar flatpick solos in styles similar to Doc Watson, Jerry Reed and others. Since guitar is such a visual instrument, it is easiest to learn by watching the on-screen guitar as a flatpick master plays these great solos. Slow the music to the tempo you want, or step through the solo note by note. View or print out the material in notation and tablature.

Pianist Performance Series

The Blues Pianist Volume 1 & 2... $49 per volume
Volume 1: 50 selections, older styles
Volume 2: 50 selections, newer styles
We've recorded great down-home blues piano stylings by top professionals. 100 selections in all. A wide variety of blues piano styles are included – Boogie Woogie, Slow/fast boogies, New Orleans style, Chicago blues and more.

The Latin Pianist... $49
The Latin Pianist is a music software program containing over 50 Latin and Salsa pieces recorded live-to-MIDI by popular Latin pianist Rebeca Mauleón-Santana (editor of Sher Music's Latin Real Book) in a wide variety of Latin Piano styles. The Latin Pianist includes authentic piano songs and styles.

The Modern Jazz Pianist... $49
The Modern Jazz Pianist is the software that makes it too easy to learn how to be a great Jazz pianist. Top studio musicians Renee Rosnes, Miles Black, Ron Johnston, and Brad Turner perform over 50 tunes in a wide variety of modern Jazz styles.

The New Age Pianist... $49
This program includes over 70 "New Age" and "New Age-Jazz" style piano pieces, performed by top New Age Artists. This is a beautiful collection of solo piano compositions inspired by the natural world. Learn all about New Age piano music, where it came from, and how it's played.

Multimedia Performance Series CD-ROMS *(for Windows®)* $49 per volume

THE ROCK SAXOPHONIST
Multimedia Instrumental Program
Fully featured professional music program containing studio recordings of great Rock 'n' Roll saxophone music. Hot session players perform great sounding Rock music, while you learn the riffs and tricks! Seamlessly integrated MultiTrack audio, MIDI, chord symbols, and music notation and chord progressions.

THE JAZZ SAXOPHONIST
Multimedia Instrumental Program
Listen to hot session players perform great sounding Jazz music, while you learn the riffs and tricks! This interactive program has great "chops" – nearly an hour of hot Jazz plus tips and techniques. Seamlessly integrated MultiTrack audio, MIDI, chord symbols, and music notation for your sound card equipped PC.

THE BLUES GUITARIST
Multimedia Guitar Program
Professional fully featured music program containing studio recordings of great electric Blues guitar music. Listen to hot session players perform great sounding Blues music, while you learn the riffs, licks and tricks! This interactive program has great "chops"– nearly an hour of hot Blues plus tips and techniques..

THE BACH CHORALES
Volumes 1 & 2
Multimedia Vocal Program
Inspiring performances of J.S. Bach's famous four-part Chorales by a professional choral ensemble, complete with a detailed multimedia history of the composer's life and times. On-screen notation, lyrics and chord progressions in perfect time with the singers.

THE ROCK GUITARIST
Multimedia Guitar Program
Listen to hot session players perform great sounding Rock music while you learn the riffs, licks and tricks! Multimedia features give you the ability to mute or solo any audio track independently and study or play the part yourself. On-screen notation, tablature and chord progressions scrolls by with the band.

THE BARBERSHOP QUARTET
Volumes 1 & 2
Multimedia Vocal Program
All-time favorite Barbershop songs and an interactive multimedia history of barbershop singing in America. Made with the assistance of **SPEBSQSA** (Society for the Preservation and Encouragement of Barbershop Quartet Singing in America).

THE SOR STUDIES FOR CLASSICAL GUITAR
Multimedia Guitar Program
Superb professional classical guitar performances of all 121 of Fernando Sor's celebrated studies for guitar (Opus 6, 29, 31, 35, 44, and 60 complete). This interactive program contains hours of music on 3 CD-ROMs **PLUS** complete Sor biography, historical timeline, and more powerful multimedia features.

DOWNLOAD IT NOW !!!

PG MUSIC INC.

29 Cadillac Avenue, Victoria, BC V8Z 1T3 CANADA
Phone (250) 475-2874 • (800) 268-6272
(888) PG MUSIC
www.pgmusic.com • sales@pgmusic.com
Fax (250) 475-2937 • (888) 475-1444

down on a knob while twisting it changes the values more rapidly (it's too bad that the tempo knob doesn't work that way). The parameter assigned to each knob depends on the current drum algorithm and on a nearby button that switches between Synthesis, Effects, Routing, and LFO screens. Eight knobs and four screens provide quick access to more than 90 sound parameters. I just wish that the knobs were a bit farther apart.

The best part is that when you hold down a pad and twist a knob in Grid mode, the new value is applied to the currently selected drum for only that step, a feature that Elektron calls Parameter Lock. Using Parameter Lock, you can subtly alter the decay of a cymbal throughout a bar, add a blast of reverb to every other snare hit, or create bass lines by varying a note's pitch, for example. By invoking the Slide function, you can make the values change smoothly rather than jumping, which is handy for the ever-popular panning Vibra-Slap effect. You can also record Parameter Locks in Live mode; each change is applied to the next drum hit.

PERCUSSION SYNTHESIS

There are several types of synthesis on the Machinedrum, each with algorithms (machines) tailored for at least kick, snare, cymbals, and percussion. TRX is analog drum-machine modeling. It's inspired by the sounds of classics such as Roland's TR series but offers more sound-shaping parameters. The resulting drums are as crisp or heavy as a low rider could hope.

EFM (enhanced feedback modulation, which sounds like FM to me) can produce aggressive, noisy sounds as well as clear, bell-like tones. Because turning a single knob can morph a sound from a tiny plink to a wall of grit, it's hard to describe the algorithms precisely. Visit www.emusician.com to hear some audio examples.

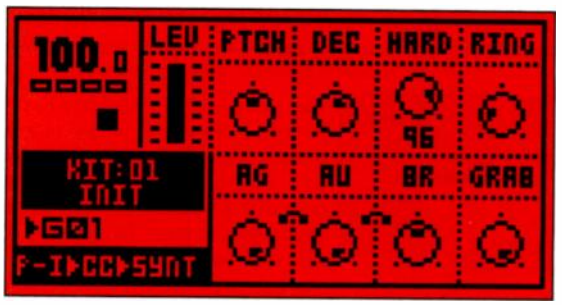


FIG. 3: This screen shows how the Machinedrum's knobs are mapped to synthesis parameters for the current sound, a physically modeled cymbal. You can access the effects, routing, and LFO screens—more than 95 parameters in all—by simply pressing a button.

P-I (physically informed) synthesis is designed to model acoustic drums. With the maracas algorithm, for example, you can adjust the number and hardness of the grains in the virtual shaker. I particularly liked the tom algorithm, but each offers a variety of realistic (and otherworldly) possibilities.

E12, presumably an homage to the E-mu SP-12, is a sample-playback synth. The samples are quite brief, but parameters such as start time and pitch envelope expand the palette. An adjustable retrigger parameter lets you create convincing flams and stick bounces or metallic buzzes if you crank the timing into the audio range.

A fifth synthesis method, called GND, supplies basic sine, pulse, and noise algorithms, perfect for building thin, toy-like drum sounds. Finally, INP, the input synth, lets you create a "drum" that applies a gate, an envelope filter, or an amplitude envelope (with optional lowpass filter) to either of the two audio inputs. I plugged in a wimpy old FM synth, set a syncopated 16th-note pattern to trigger an amplitude envelope, and dialed in some effects, and the Machinedrum transformed the chords I played into a pulsating groove.

Version 1.1 of the operating system adds the MID machine, which can play as many as three notes over MIDI when each pad is triggered. You can specify Velocity, Program Change, six Control Changes, and more. All those values are set not by digging through menus but by turning the knobs. Using the Parameter Lock feature, it was simple to automate the chord changes that I had been playing live. Although I appreciated the irony of replacing a keyboardist with a drum machine, the Machinedrum won't replace your sequencer, because each of its 16 tracks (drum parts) records monophonically. On the other hand, the ability to trigger an external sampler could be all you need for styles that rely heavily on sampled loops and sound bites.

The Machinedrum's 64 drum kits can contain a mixture of sounds made with different synthesis methods—a TRX kick and a P-I snare, for example, or even multiple copies of the same machine. One owner turned his Machinedrum into a telephone dialer by detuning ten copies of an EFM rim shot. All synthesis-, routing-, and effects-parameter settings are stored in kits, not in individual patterns (unless you specify them with Parameter

Web Resources

Site	URL	What's There
Elektron Users	http://groups.yahoo.com/group/elektron-users	Active discussion group with files and links.
Erekutro	www.erekutro.com/md	User site with downloadable kits, patterns, songs, and software.
Machinedrum.com	www.machinedrum.com	Official site with MP3s, photos, PDF manuals, OS updates, ordering, support, and links.
Shifty's SPS-1 Info	www.gweep.net/~shifty/machinedrum	Drum kit that generates Touch-Tone telephone signals.

BAYVIEW PRO AUDIO

Here's the Real Deal!

"Professional Quality Microphones at the Right Price"

Receive a FREE CASCADE M-20 w/ CASCADE MX-56 or M-55

BAYVIEW PRO AUDIO

New CASCADE MX-56

1.07" multi-pattern vacuum tube condenser

Sale: $569.00

MX-56 includes: shockmount, 20' XLR cable, 20' 7-pin cable, pop-filter and case.

Specifications

- Frequency Response: 20Hz to 20kHz
- Polar Pattern: Omnidirectional, cardioid, figure 8 and 6, intremediate stages, all selectable on AC powering unit.
- Diaphragm: 1.07" 24K gold-sputtered
- Sensitivity: 12m V/Pa or -38.5 (±2 dB)
- Tube Type: 6072A/12AY7
- Output Impendance: <200 ohm
- Output Noise: <16 dB (A weighted)
- THD: <0.5% at 130 dB SPL
- Power Requirement: Dedicated Power Supply with Polar Pattern Selection, includes switchable 115V to 220V

New CASCADE M-55

1" vacuum tube condenser

Sale: $381.00

Specifications

- Frequency Response: 20Hz to 20kHz
- Polar Pattern: Cardioid
- Diaphragm: 1" 24K gold-sputtered
- Sensitivity: >14m V/Pa
- Tube Type: 6072A/12AY7
- Output Impendance: <200 ohm
- Output Noise: <17 dB (A weighted)
- THD: <0.5% at 125 dB SPL
- Power Requirement: Dedicated Power Supply, inludes switchable 115V to 220V

M-55 includes: shockmount, 20' XLR cable, 20' 7-pin cable, pop-filter and case.

FREE WITH EACH PURCHASE

CASCADE M-20

Plus: 20' XLR cable ($35.00) and pop-filter ($35.00)

That's a total of $469.00 of free product.

($399.00 retail value)

CASCADE M-20

Specifications

- Type: 1" condenser
- Frequency Response: 25Hz to 20kHz
- Polar Pattern: Cardioid
- Diaphragm: 1" 24K gold-sputtered
- Sensitivity: >16m V/Pa
- Output Impendance: <200 ohm
- Output Noise: <17 dB (A weighted)
- THD: <0.5% at 120 dB SPL
- Power Requirement: +48V

CASCADE Microphones – *a division of Bayview Pro Audio, Inc.*

Limited Time Offer!

Receive 2 FREE CASCADE M-20 microphones w/ Digidesign 002 or Jay Turser JT-137

NEW Digidesign 002

Includes over $2250.00 of FREE Plug-Ins

Digidesign 002 8 touch-sensitive motorized faders

Features: 8x4x2 digital mixer complete with EQ, dynamics, delay and reverb with snapshots. Pro Tools LE software, real-time plug-in support, Firewire, 4 mic pre-amps, 32 tracks of record & playback, 8 x analog I/O, 8 channels of Adat optical I/O, S/PDIF, Midi I/O, compatible with M-box, Pro Tools HD, Mac OS 9, Windows XP systems & ships with a powerful bundle of RTAS plugins.

Sale: $2195.00

Jay Turser JT-137

- Flame maple top
- Mahogany set neck
- Rosewood fingerboard
- Body & neck binding
- Bound and inlaid headstock
- Gold hardware
- Gold Grover machines

Sale: $370.00

TWO CASCADE M-20 MIC'S FREE WITH PURCHASE

That's a total of $798.00 of free product.

($798.00 retail value)

Toll Free 888.718.0300

http://bayviewproaudio.com

International Orders Welcome

We will beat any advertised price from any US authorized dealer!

RGCAUDIO

PENTAGON I 1.21 (WIN)

A full-featured software synthesizer that won't put a hole in your budget.

By Len Sasso

RgcAudio's Pentagon I is an analog-style software synthesizer available in standalone as well as VSTi and DXi plug-in formats. It features four multiwaveform oscillators, a pair of multimode filters that can work in series or parallel, and a full complement of effects, including a frequency-response simulator for modeling various speaker and amp configurations. The software also provides a Formant Filter for creating vocal effects and a Voice Modulator that turns it into a 24-band vocoder. Pentagon I is one cool synth that's inexpensive and easy to use and has enough features to keep you busy for a long time.

For this review, I used Cubase VST/32 as a VSTi host running on a Pentium III/700 MHz laptop with an Emagic EMI 2|6 USB audio interface. Under those conditions, Pentagon I sounded great. With many of its patches, I easily got ten-note polyphony without pushing the CPU meter over 20 percent. (More complex patches can quickly run the CPU up into the red zone, however.)

I also tried the DXi version of Pentagon I (which is version 1.22) with Cakewalk Sonar 2.0 XL and got similar results. By the time you read this, the DXi version should support DirectX 8 automation. You can download a demo version (on which the volume drops every few seconds) in either plug-in format from the rgcAudio Web site (www.rgcaudio.com). While you're there, pick up Triangle II, a free monophonic software synth that offers some of the same features as Pentagon I.

THE SOUND AND THE FURY

Pentagon I's front panel belies the ease with which you can navigate its controls (see **Fig. 1**). It has 114 knobs (26 of which have two functions), but many of them are repeats. For example, each of the four oscillators has the same six knobs, and having them all up front rather than in subpanels actually speeds things up. If you've programmed a synth before, a quick look at the labels will give you a good basic picture of how Pentagon I works. Skimming the manual, which is short and well written, will introduce you to the idiosyncrasies that make Pentagon I more than just an average synth.

Minimum System Requirements

Pentagon I

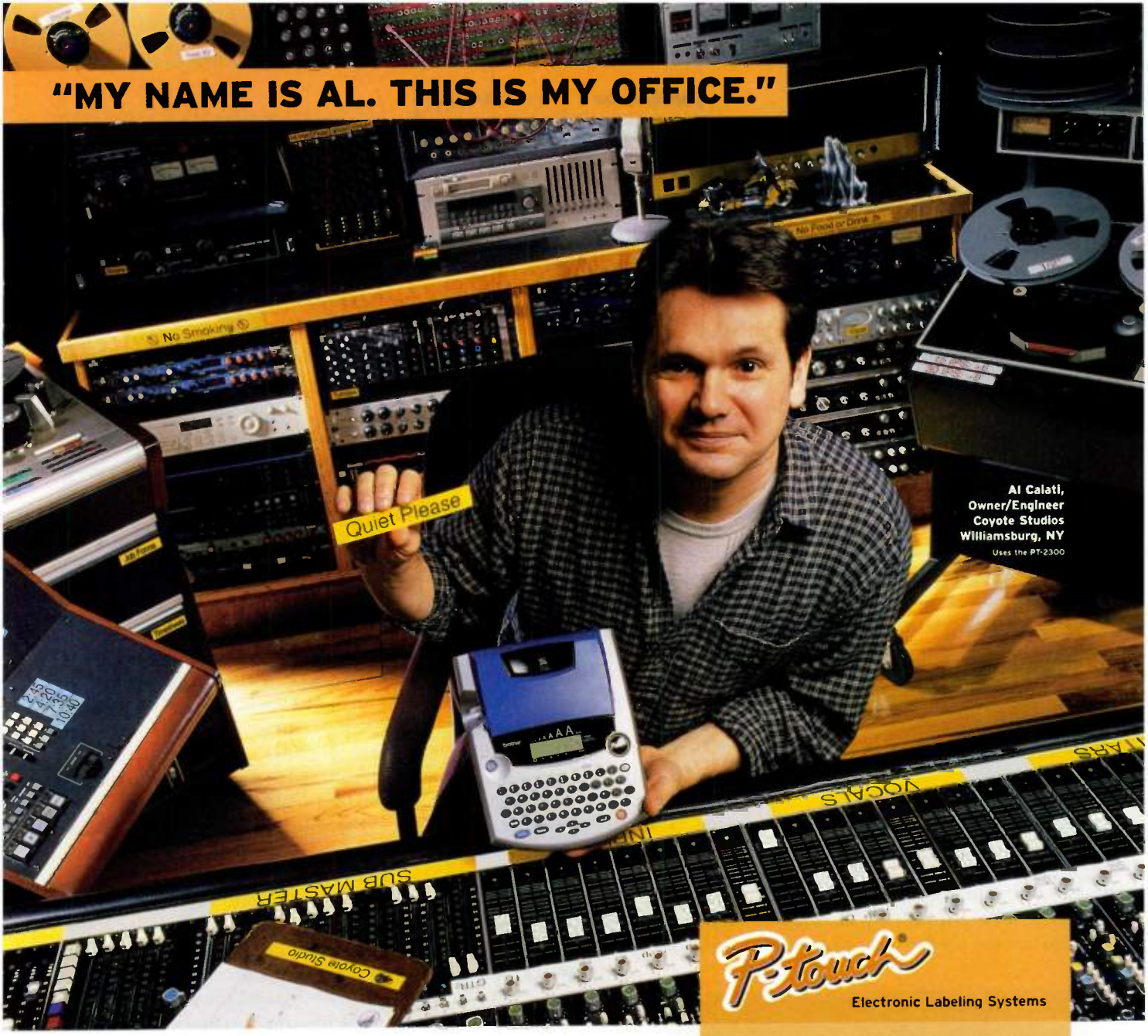
Pentium II/300; 64 MB RAM; Windows 95/98/2000/ME/NT/XP

Pentagon I's sound engine is a multiwaveform oscillator with 13 waveforms as well as white noise. The usual shapes are included along with some harmonically unusual waveforms. For example, some waveforms contain only multiples of the third, fourth, or fifth harmonic. Pentagon I also offers four slots for importing user-defined wavetables, which come in two varieties: full wavetable and single cycle. You can easily generate your own single-cycle wavetables in most sample editors (such as Syntrillium Cool Edit and Sonic Foundry Sound Forge). Full wavetables contain a separate waveform for each MIDI note (yielding 128 single-cycle waveforms) and are a little more complicated to build. You can download 50 of them from the rgcAudio Web site, and you can request a Cool Edit plug-in for creating your own.

The oscillators offer several unusual options. You can use the Key Sync feature to synchronize the start position within the waveform (the phase) with the onset of notes. That allows you to create reproducible new waveforms by combining two oscillators with different tuning, waveshapes, or phases. (If the oscillators were free running, which is another option, you would not get the same waveform each time you played a note.) As the control panel indicates, the oscillators come in pairs; the top oscillator in each pair can modulate the bottom one using ring modulation, FM, or hard synchronization. (Hard synchronization forces the bottom oscillator's waveform to restart

FIG. 1: Pentagon I's control panel features 114 knobs, but many perform similar functions, making the program much easier to use than it appears.

"MY NAME IS AL. THIS IS MY OFFICE."



Al Calati,
Owner/Engineer
Coyote Studios
Williamsburg, NY
Uses the PT-2300

In my office, a simple mistake can cost me plenty – in both time and money. With all the equipment I've got, I can't waste time searching for the right cable or the last master tape.

That's why I use the P-Touch PT-2300 to keep me on track.

It's compact enough to fit in a drawer, and because the labels come in lots of colors and sizes, it's versatile enough to identify everything – like my sound board, master tapes, cables, reels, even schedules and invoices. I can even connect it to a PC for fonts and graphics.

And since P-Touch labels are laminated, they'll stand up to almost anything: late night coffee spills, scratches, hot amps – and all the other stuff that I call business as usual.

So now, instead of spending time tracking down dead mics, I can focus on what's really important – a great mix.

P-Touch systems – the perfect office labels, wherever your office may be. Enter the P-Touch People Contest and tell us how your P-Touch helps you organize your office. We want to know.

www.ptouchpeople.com

P-Touch® Electronic Labeling Systems

P-Touch® Electronic Labeling Systems create industrial strength and standard adhesive-backed, laminated labels to organize virtually anything.

- **Laminated tapes:** Water, abrasion and heat-resistant to resist stains, scratches, scuffs and radiant heat from equipment
- **Industrial adhesive tapes:** Adhere up to two times stronger than standard laminated tapes
- **"Fluorescent" tapes:** Eye catching, bright labels for easy color-coding and visibility
- **Security tape:** Leaves evidence of tampering if the label is removed

At your side.

brother

Available at Staples, OfficeMax, Office Depot and other fine retailers.

www.brother.com 1-877-4PTOUCH

every time the top one's does.) Finally, the top oscillator in each pair has a Multi mode, in which the oscillator actually becomes eight oscillators whose detuning is set by the Phase knob (see Fig. 2). That produces the fat sounds usually associated with unison mode on classic synths; with Pentagon I, however, it also works polyphonically.

Pentagon I offers a number of pitch-modulation options; among them are a dedicated LFO, a dedicated ADSR generator, a Random knob for detuning the oscillators, and flexible pitch-bend and portamento schemes. For example, portamento can be normal (always applied) or fingered (applied only to legato notes) and variable or fixed time (time does or does not depend on pitch difference). Pitch bend can be asymmetric (with unequal ascending and descending amounts), applied to only the highest or lowest notes of a chord, or restricted to notes being held down by the user (not applied to sustained or released notes). Obviously, someone at rgcAudio is a guitar player.

A FILTER BY ANY OTHER NAME

Filters pop up everywhere in Pentagon. The main Filter section contains two resonant multimode filters that can be arranged in series or parallel. (You can also use just one filter or turn them both off.) Each filter has its own bipolar ADSR envelope with Velocity tracking. Separate controls set the amount of cutoff modulation by MIDI note number (aka key tracking), Aftertouch, Breath Controller, and Mod Wheel.

A dedicated filter LFO offers the usual waveshapes as well as user-defined (imported) waveforms. All of Pentagon I's LFOs can be synchronized to tempo and have separate offset, delay, and fade-in controls. They also have separate settings for MIDI Aftertouch, Breath Controller, and Mod Wheel control of modulation amount. The filter LFO's only drawback is that it has only one modulation-amount control for both filters. Being able to apply different amounts and polarities to parallel or series filters would be a welcome addition.

Pentagon I's Simulator offers a selection of 19 complex filters that model the frequency response of various environments (see Fig. 3). Simulations include guitar speakers and amps, radio speakers, artificial environments, EQ curves, and sample-rate limiters. The Simulator offers one of the easiest yet most effective tweaks you can make to a program. It's especially effective when you're doubling a part using two instances of Pentagon I with the same program.

FIG. 2: Dual-function knobs such as those indicated with the red rectangles give access to more parameters without making the control panel even more crowded.

Pentagon I's other special filters are the Formant Filter and the Voice Modulator. You can turn both of them on and off using the context menu that appears when you click in the status display at the top center of the control panel (see Fig. 4). The Formant Filter simulates the filtering effect of the mouth when vowels are spoken. When the Formant Filter is turned on, the Drive knob selects the vowel sound. You can assign any MIDI Control Change (CC) message to the Drive knob, but you can also use the filter LFO to modulate the Formant Filter. In that case, the filter's V-MOD knob (the alternate state of the MOD knob) sets the LFO amount.

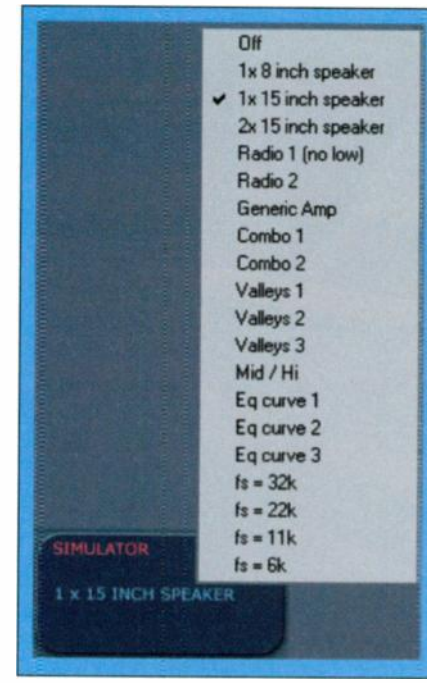
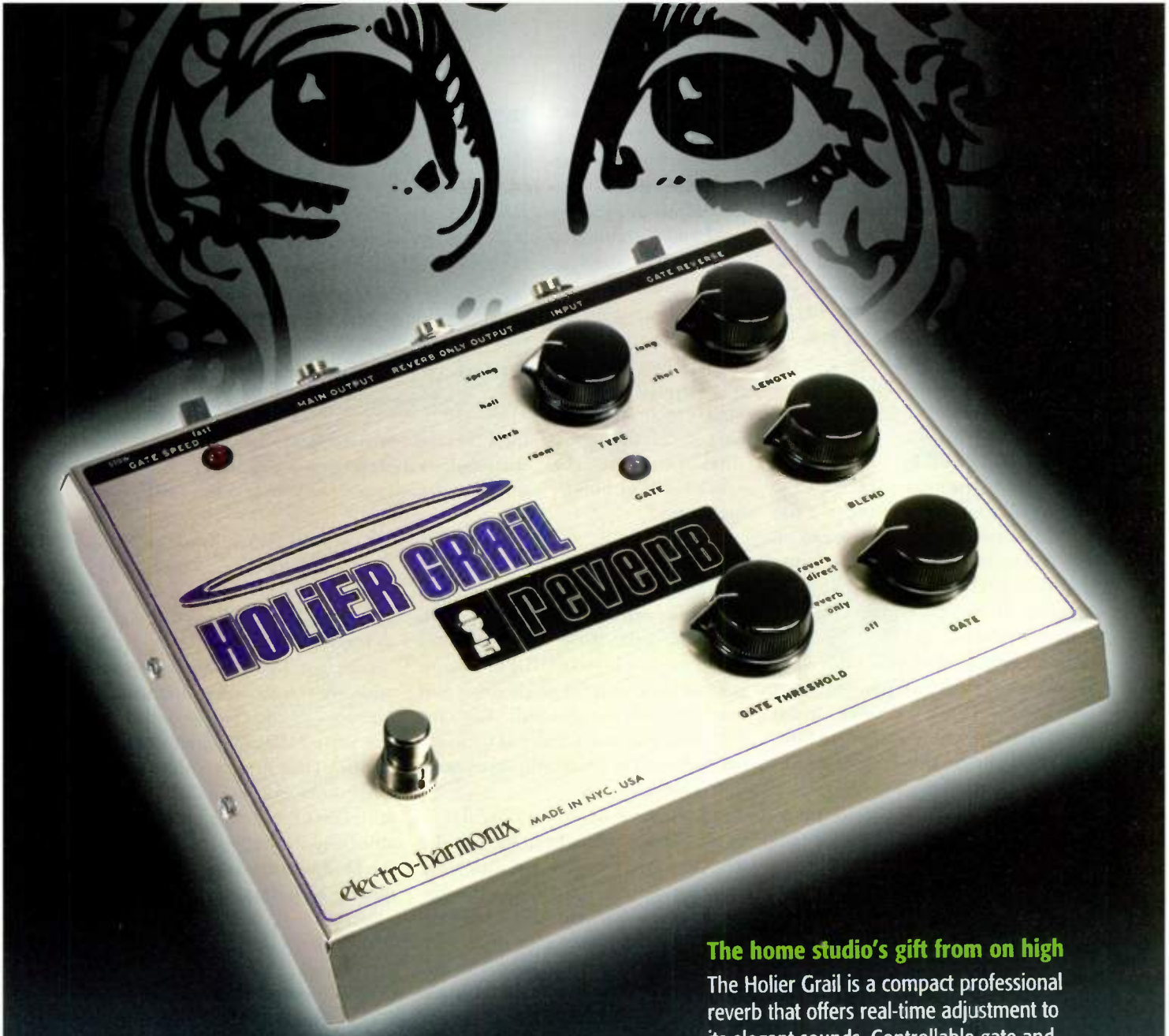


FIG. 3: Pentagon I's Simulator effect offers 19 environment models including various speakers and amps, EQ curves, and down-samplings.

The Voice Modulator is actually a 24-band vocoder. It requires that you use the Pentagon I effect plug-in as an audio-track insert. The audio on the audio track (or live audio input to the corresponding audio channel) then becomes the modulator (which is typically speech), and the selected Pentagon I program becomes the carrier. Your host program must be able to send MIDI note messages to effects plug-ins in order to use Pentagon I as a vocoder. Although the Voice Modulator doesn't have all the bells and whistles of a full-featured vocoder (such as band-shifting and the ability to handle fricatives), it will produce recognizable speech and is very effective with other types of program material such as percussion loops.

The MP3 file "PentaVox" at www.emusician.com illustrates both the Formant Filter and the Voice Modulator. The clip is in four segments. The first is a straight Pentagon I pad program. The second adds a randomly low-frequency-oscillated Formant Filter.



The home studio's gift from on high

The Holier Grail is a compact professional reverb that offers real-time adjustment to its elegant sounds. Controllable gate and reverse gate allow squelching of reverb via controllable trigger levels... great for drum tracks and creative editing. From its realistic spring reverb and unique flerb to its lush hall and room possibilities, the Holier Grail solves your quest for the perfect space.

A reverb guitar pedal with angelic 'verbs. Thou shalt not covet thy neighbor's reverb tank any longer.

electro-harmonix

tel: 718.937.8300 fax: 718.937.9111 email: info@ehx.com

mp3 demos on: www.ehx.com

The third uses a drum loop to vocode the straight pad sound. The last segment vocodes the formant-filtered pad.

The other filters Pentagon I offers are a 2-band quasi-parametric EQ and tone controls built in to its Drive and Delay effects. The EQ offers as much as 15 dB cut or boost for adjustable low (30 to 230 Hz) and high (3 to 9 kHz) bands. The filter in the Drive effect is high-cut as you would expect, and the filter in the Delay can be either low- or highpass.

JUST FOR EFFECT

In addition to the quasi-parametric EQ already mentioned, Pentagon I has Drive, Chorus, Delay, and Spread effects modules as well as a dedicated Amplifier LFO for tremolo and autopanning. Drive is a typical clipping overdrive circuit.

The Chorus module offers three levels of both chorus and phasing: Normal, Stereo, and Four-Voice. In all modes, you can set the delay time from 0 to 30 ms (adjustable in 0.01 ms increments), and the sweep LFO has a range of 0.01 to 5 Hz. The effects range from very subtle chorus to extreme phasing.

The Delay module has stereo (separate delays for each channel), Ping-Pong, and LRC (left-right-center) modes. You can adjust delay times in 0.5 ms increments from 0 to 1 second, or a maximum of 4 seconds in Sync mode. At the range's low end, you get interesting resonator effects with high feedback settings. Larger delay-time settings result in the usual kinds of bouncing around.

FIG. 4: The context menu that opens when you click on Pentagon I's status display is where you manage program banks, select knob and envelope modes, and activate the Voice Modulator and Formant Filter.

GUESS WHO'S IN CHARGE?

Pentagon I's interface has a number of user-friendly features. The gray strip at the bottom of the control panel functions as a keyless MIDI keyboard; you can click on it for single notes and drag across it for glissandi. The current voice count (as many as 64 notes per instance) is always displayed at its right end.

You can move knobs with circular or linear mouse motion. In circular mode, they have inertia; click a position far from the current setting, and the distance the knob moves will depend on how long you hold (you can disable inertia from the Options menu). You can set a default mode for all knobs, then temporarily toggle to the other mode using the Alt key. If you prefer linear motion, as I do, but also want inertial clicking, that is a great feature. Control-clicking on a knob will reset it to its default value, and Shift-clicking allows fine adjustment (in linear mode only).

As mentioned, many controls have two functions, as indicated by a blue label. Clicking on the label toggles the function as well as the label text. Passing the mouse over any knob shows both its function and setting (in meaningful units such as percent, milliseconds, or decibels) in a status display at the control panel's top-center.

Pentagon really shines when it comes to MIDI control. You can assign Aftertouch, Pitch Bend, and any MIDI CC message to any knob by Shift-right-clicking the knob and selecting MIDI Learn from a pop-up menu. Once MIDI has been assigned, you can use the same menu to restrict the knob's range and to reverse its polarity.

Pentagon I goes way over the top by allowing you to assign multiple MIDI messages to any knob as well as assign the same MIDI message to multiple knobs. That means you can set up extremely complex MIDI control schemes; for example, to create a variable-bandwidth filter, you could assign the Mod Wheel to the filter-cutoff frequency of both filters with opposite polarity.

The MIDI configuration is not saved directly within Pentagon I programs (although it would be nice). In the DXi version, however, it is saved within the song file. Pentagon I can also store as many as ten MIDI configurations and allows you to copy and paste among them.

TOURS STARTING NOW

It's hard to find anything to fault about Pentagon I. Analog-style software synthesis is in an increasingly crowded field, but Pentagon I offers several unique twists. Among them are complex MIDI control, custom waveforms, dual filters, numerous modulation options, and unique effects such as the Simulator and Formant Filter. It isn't free, but you get a lot for your 99 bucks. If you're on a Windows machine, you should certainly give Pentagon I a test-drive. ●

PRODUCT SUMMARY

rgcAudio
Pentagon I 1.21 (Win)
software synthesizer
$99

FEATURES	4.0
EASE OF USE	4.0
AUDIO QUALITY	4.5
VALUE	4.5

RATING PRODUCTS FROM 1 TO 5

PROS: Great sound. Extensive MIDI control. Good selection of filters and effects.

CONS: Requires a fast CPU. MIDI control setups not saved with patches. Filter LFO applies same amount to both filters.

Manufacturer
rgcAudio
e-mail info@rgcaudio.com
Web www.rgcaudio.com

TASCAM
a whole world of recording

FULL COMPASS
Great Deals. All The Time.
www.fullcompass.com

YOU DON'T OWN THESE?

CDD 1X4
Professional CD Duplicator

SX-1
Digital Audio
Production Environment

US224
USB Audio Interface/Mixer

DSM7.1 Digital Surround
Monitoring Controller

Pocket Studio 5
Compact Flash 4-Track Recorder

YOU SHOULD - SO CALL TODAY!

FULL COMPASS
800-356-5844
9am-5:30pm M-F CST

COMPASS XPRESS
Not a 9-5 shopper?
Call us at 800-476-9886
8am to 10pm M-F CST 10am to 6pm Sat CST

We are a Tascam Factory Authorized Parts & Service Center!

LINE 6

GUITARPORT

Line 6 brings "edutainment" to the desktop.

By Richard Alan Salz

With the GuitarPort, Line 6 has invented a whole new category of product, one that combines a dedicated computer peripheral with a software engine (adapted from the company's Pod series) and an optional subscription-based service. The GuitarPort is a small, USB-based peripheral that lets Windows-based PC users plug in their guitars and record directly into a DAW while accessing various Line 6 amplifier and effects models. The algorithms use 32-bit floating-point processing, which means the sounds are actually higher resolution than what you get from Amp Farm and the Pod.

But what's really innovative is the jam-along playback feature. For $7.99 per month, GuitarPort owners can access the GuitarPort Web site, which provides a range of content including new amp models, loops, downloadable songs, and lessons taught by some pretty big guns of the guitar world, such as Scott Henderson and Steve Lukather. The songs include not only general tracks such as 12-bar blues, but you can also jam along with classic cuts from bands such as Led Zeppelin, Jimi Hendrix Experience, and Stevie Ray Vaughan and Double Trouble. Many of the songs were remixed from the original masters—sometimes by the original mix engineer—specifically for the GuitarPort project; others were recorded and mixed anew to sound like the originals. The lessons vary from song to song, but they typically include tablature and may also provide information about the guitar, amp, and effects used to record the original track, as well as tips about the player's style, specific techniques, and so forth.

The Line 6 GuitarPort is an innovative device that allows guitarists plug-and-play DAW recording (Windows only) using Line 6 guitar models and effects, as well as instructional jam-along, looping, and other capabilities using the included software audio player. An optional monthly subscription grants access to GuitarPort Online, an ongoing "edutainment" service.

Minimum System Requirements

GuitarPort

Pentium II/400 MHz; 128 MB RAM; Windows 98SE/2000/ME/XP; 40 MB hard-disk space; USB port; Direct Sound/MME-compatible recording software (for recording only)

PORT OF ENTRY

About the size of a PC trackball, the GuitarPort is made of high-impact plastic cast in Line 6's characteristic deep red. The bottom of the unit is covered in a nice, sticky rubber that keeps it from working its way across your computer desk.

The GuitarPort's control interface is very simple. There is a rotary, chicken-head-type knob that controls volume. That's it. Well, there's also an LED, which changes color to indicate that the unit is connected and to indicate that an input signal is present.

The unit has a single ¼-inch guitar input on its front surface. The back panel sports the USB interface, left and right unbalanced RCA outputs, an ⅛-inch stereo output (for headphones), and an ⅛-inch stereo input that goes to the computer's sound-card output (see **Fig. 1**). One thing to keep in mind is that this is a Windows-only application—and only certain flavors of Windows are supported, at that; Macintosh users are out of luck.

I had some initial problems getting the GuitarPort working on my aging Pentium II system. With the help of Line 6's excellent tech support, I was able to narrow the problem down to a faulty video card. I also learned that, on my computer, the GuitarPort was much more stable running under Windows 2000 Professional than Windows 98. (According to Line 6, the XP version is also now supported.) Once I ironed out the problems with my PC, I am happy to report that the GuitarPort software (and Web site) worked bug- and crash-free.

UNDER THE HATCH

The GuitarPort features 80 factory presets, which comprise amp models, cabinet models, and effects settings. The amp-modeling section includes ten amplifier simulations ranging from vintage to modern. Effects include compression, delay, chorus, flanger, tremolo, rotary speaker, and two kinds of reverb. Amp parameters vary, but typically you get drive, bass, middle, treble, presence, and overall volume. Some models also have a boost control, with a nifty onscreen patch cable that simulates the effect of jumpering two inputs at the same time (a common trick with certain vintage amps).

The amp models comprise three Fender-influenced models (1953 Wide Panel Deluxe, 1959 Tweed Bassman Classic, and 1964 Black Panel Deluxe Reverb), one Vox-a-like (1967 Brit Class A-30 Top Boost), two faux Marshalls

Having trouble deciding which active studio monitors to buy?

Let Samson help you *Resolv*™ it.

Also available: Resolv 65 passive monitors, and the Resolv Sub 120a powered subwoofer.

Introducing the new Resolv 65a active near-field monitors from Samson.

Incredibly full, fast and open. Snare and percussion are tight. Reverb trails are discrete and smooth. And with our new four-position midrange control, it's like having four different sets of near-field monitors in your studio. There are a lot of studio monitors out there, but none so perfectly combine performance, features and versatility. Consider your monitor dilemma resolved.

SAMSON
AUDIO

For more info on the Resolv Studio Monitor Series, check out www.samsontech.com

FIG. 1: The GuitarPort's rear panel provides left and right outputs on unbalanced RCA jacks, an ⅛-inch stereo sound-card input, an ⅛-inch stereo headphone jack, and a USB port.

(1968 Brit 50W Plexi and 1983 Brit 100W J-800), a pseudo–Roland Jazz Chorus (1987 Jazz 120), a Mesa/Boogie tribute (1994 California Rectified), a model by the name of Classic Fuzz, and an original model called the Line 6 Insane.

There are numerous cabinet models, any of which can be mixed and matched with any of the amplifier models. The cabinet models include three faux Fender models (1953 Wide Panel Deluxe, 1964 Black Panel Deluxe Reverb, and 1959 Tweed Bassman Classic), two faux Marshalls (1968 Brit Basketweave and 1978 Brit G-75), a Mesa/Boogie-influenced model (1996 Brit V-30S), a Vox-a-like (1967 Brit Class A-30 Top Boost), two Line 6 custom models, and a "no-speaker" model.

Effects include a compressor with five preset ratios; a delay with up to 3 seconds of delay (with delay-time, feedback, and level controls); a modulation section, which offers four types of modulation effects—chorus, flanger, tremolo, and rotary speaker (with up to 1 second of predelay, as well as speed, depth, and feedback controls); and a reverb section offering two kinds of reverb: spring reverb, which has level and dwell controls; and room reverb, which offers diffusion, density, tone, decay, and level controls.

The GuitarPort software has a neat onscreen tuner, which features a cool, vintage-looking analog meter to show pitch. It offers eight reference tunings for A, including, of course, A 440.

Another cool feature of the GuitarPort is an interactive "hum reducer," which appears to sample the hum components of the particular guitar setup that you are using and cancel out the hum components. This worked so well that I found myself wishing it were available as a separate hardware box—it would sure come in handy.

The GuitarPort software is also capable of playing back audio tracks from a CD, a hard drive, or Line 6's GuitarPort Web

GuitarPort Specifications

Preset Effects/Filter Patches	80
Amp Models	10
Effect Types	8 (compression, delay, chorus, flanger, rotary speaker, tremolo, spring reverb, hall reverb)
Analog Inputs	(1) unbalanced ¼" mono; (1) ⅛" stereo (sound card)
Analog Outputs	(2) unbalanced RCA L/R; (1) ⅛" headphone
Other I/O	USB port
Sampling Rate	44.1, 48 kHz (automatically selected)
Bit Rate	16, 24 (automatically selected)
Frequency Response	20 Hz–20 kHz (±1 dB)
Signal-to-Noise Ratio	103 dB
Included Software	GuitarPort application, support documents, DirectX 8, Internet Explorer 6
Dimensions	5.5" (W) × 5.5" (L) × 1.0" (D)
Weight	1.44 lb.

WIN $100,000 Gear for Life! GIVEAWAY

Our first 100,000 happy customers have given us 100,000 reasons to create this $100,000 gear for life giveaway! **THIS PRIZE WILL BE GIVEN AWAY BY ZZOUNDS.COM! DON'T MISS THE ENTRY DEADLINE - SIGN UP TODAY!**

To register go to

www.zZounds.com

Top 10 reasons to buy your gear at zZounds.com

1. **The best gear at the best prices.**
2. **30-day hassle-free money-back satisfaction guarantee.**
3. **Free shipping on orders over $200.** And regardless of your order size we show your shipping costs up front - no last minute surprises.
4. **Get the product - NOW!** Best on time delivery in the business with 50,000+items in stock. Real time inventory display so you know what's in stock before you order.
5. Thousands of unedited, unbiased **user ratings**, gear reviews, **product manuals**, and **sound samples** online.
6. **Ask our experts anything** - by phone, email, or live chat.
7. Based on over 1 million customer surveys, BizRate.com declared zZounds one of the best 70 places to shop on the web for any product - a **"BizRate.com Gold Honoree."**
8. Your **privacy** is your business - we won't sell your name to **ANYONE**, especially not to a thousand other highest bidders who will spam you.
9. When you order your gear from zZounds by phone or web, you'll never have to hear a sales person play "Stairway to Heaven" again.
10. **Because over 100,000 customers think zZounds.com is the best place to buy gear anywhere.**

Call toll-free

800)zZounds

800)996-8637

Be sure to mention ZEM when you call

See site for details. http://www.zzounds.com/rules100.htm

zZounds.com

Gear for Life!

site. Users can loop sections of tracks for jamming along and slow down sections to half speed (without changing the pitch) to help learn tough riffs.

TONE AND FEEL

I tested the GuitarPort using a Tom Anderson Stratocaster and a Renaissance Instruments five-string bass. I monitored on my Apple Design active speakers—a setup I imagine many users may have. I also listened using Sony Walkman-type headphones. For more critical listening, I patched the GuitarPort in to my Neotek IIIc console and monitored using either Fostex NF-1s or Urei 809s.

I found the amplifier models to be reasonably accurate in terms of overall tone, but not quite as good when it came to the "feel" factor. Of course, this phenomenon is by no means unique to the GuitarPort—many, if not most, modeling devices suffer from this problem to some degree.

Latency is one culprit that can give guitar-modeling devices a feel that's less than realistic. Fortunately, latency is not a big problem with the GuitarPort, thanks to the GuitarPort driver, which includes a control panel that allows you to control the amount of latency in the system. The objective is to arrive at the setting that offers the best trade-off between low latency and stable operation of the software (freedom from audio glitches and pops).

No, the real culprit appears to be something more subtle. The more I hear digital amp, microphone, and preamp simulations, the more I am convinced there are other, intangible elements the engineers have not yet learned to model. That said, the GuitarPort is certainly capable of producing some pleasing tones—and some that are nasty as heck, too—as long as you are not expecting the world of it. I especially liked the '64 Black Panel 'Lux Reverb, which felt the most like a real amplifier. The '83 Brit 100 J-800, in contrast, was quite a bit more restrained than the real thing (I should know—there's one sitting in my tracking room as I write this).

The chorus is very nice sounding, with a good sense of width. The spring reverb sounds a bit strange, mainly because it seems to lack the organic quality of a real spring. On the other hand, the room reverb can be massaged to sound great. The effects as a group are pretty good, though I have to wonder why there aren't more available—for example, an octave-divider, auto-wah, envelope filter, and so on. After all, more code is all that's required.

The presets are a strong point of the GuitarPort. They offer the user a wide palette of sounds to choose from and cover an impressive range of musical styles.

COMMUNITY PLANNING

Perhaps the greatest appeal of the GuitarPort product is the optional online community (GuitarPort Online), which offers a wealth of music, lessons, and information to download. The file format is MP3, which makes for fast downloads, but of course means less-than-CD quality. For jamming along, though—the main purpose of the GuitarPort—the sound is more than adequate.

PRODUCT SUMMARY

Line 6
GuitarPort
guitar amp and effects modeler/instructional device
$229.99

FEATURES	3.5
EASE OF USE	4.0
AUDIO QUALITY	3.0
VALUE	4.0

RATING PRODUCTS FROM 1 TO 5

PROS: Entertaining. Educational. Inexpensive way to get Line 6 amp models for use in DAW recording. Good for learning specific songs, riffs, and solos. Integrated guitar tuner. Integrated digital looper with a half-speed playback option.

CONS: Somewhat disappointing reverbs. Limited number of effects models. No Macintosh support. Monthly fee for online access to GuitarPort Online.

Manufacturer
Line 6
tel. (818) 575-3600
e-mail info@line 6.com
Web www.line6.com

The lessons differ from song to song. Jimi Hendrix's "Crosstown Traffic," for example, offers some interesting tidbits of information about the song, and there is an option to select a GuitarPort preset (that is a part of the downloaded file) to get one a little closer to the correct tone for the song. Though some of the GuitarPort Online downloadable tracks include tablature, that particular example does not. Almost all of the downloadable tracks are available in different versions, typically with and without guitar tracks. You have to download each version you want to use—there are no solo and mute controls, which would have been nice (though it probably would have required unwieldy file sizes). The sans-guitar versions provide a space that you can fill in with your own noodling, which is another nice feature.

The Web site provides many different styles of downloadable tracks. "Inna Di Murrows" was a reggae loop I downloaded. On the whole, it nailed the electronic-reggae sound, albeit slightly stiffly.

One of the cooler clips I came across was called "Lukather will KICK YOUR ASS!" No kidding. It was just one superfast guitar riff that came complete with both standard notation and tablature. That was one occasion when the half-speed playback came in very handy!

Another convenient feature of GuitarPort Online is file preview, which allows you to preview a low-bandwidth file while downloading another (full-bandwidth) file. That should come in especially handy for dial-up connection users.

STARBOARD SIDE

The GuitarPort is not only the least expensive way to get your hands on some Line 6 amp and effects models, but it also offers a fun, educational, and sometimes quite challenging experience for students of electric guitar seeking to extend their chops by learning specific songs, riffs, and solos—that is, as long as you don't mind shelling out $7.99 a month for the optional GuitarPort Online subscription. Sonically, the models are equal to or better than what the company's Pod offers, and though the downloadable files online aren't quite CD quality, they're certainly good enough for jamming along with.

My biggest reservation about GuitarPort Online is that when you discontinue your subscription, you no longer have access to the material you have already downloaded. But according to Line 6, this approach was necessary due to licensing requirements from the music publishers—evidently, it wouldn't be fair to the artists if you could access the files in perpetuity.

Richard Alan Salz *is a producer, engineer, and composer living in Southern Vermont.*

Quick Picks

SUMMIT AUDIO

TLA-50 Tube Leveler

By Myles Boisen

For more than 15 years, Summit Audio has been a leading U.S.-based maker of high-end tube gear. The company's latest offering, the TLA-50 Tube Leveler ($695), breaks new ground by packing Summit's acclaimed compression technology into a compact frame. Furthermore, in keeping with its "less is more" design philosophy, Summit has kept the price of the TLA-50 accessible to all levels of the studio market—without sacrificing pro quality.

In many ways, the TLA-50 is like a little brother to the venerable Summit TLA-100A. Like its elder sibling, the TLA-50's selling points include smooth soft-knee compression, classic two-knob simplicity, transformerless circuitry, and a chunky vacuum-tube vibe. The TLA-50 and TLA-100A also share nearly identical front-panel features. Separate three-position switches (fast, medium, and slow) govern attack and release parameters, as well as stereo link/in/bypass status for the unit. In Bypass mode, the tube is still in the signal path. Switches for AC power and meter status (output and gain reduction) are also found on the brushed-aluminum front panel, flanking large output gain and gain-reduction knobs. A retro-looking cylindrical (also known as edgewise) VU indicator, backlit in orange, incorporates overload lights that bathe the meter in a red wash when levels hit 6 dB before clipping (+20 dBm).

Inside the unit's sturdy metal chassis, a 12AX7A/ECC83 vacuum tube imparts a glow to the Tube Leveler's signal path; the output amplifier stage, however, is solid-state. Unlike pricier Summit gear, the TLA-50 does not employ a custom 990 op-amp stage.

Rear-panel connections are comprehensive, with a +4 dBu balanced XLR/–10 dBV unbalanced ¼-inch combo input jack, and separate +4 dBu balanced XLR and –10 dBV unbalanced ¼-inch outputs. A ¼-inch insert jack allows sidechain and send/return functions, and another ¼-inch link jack facilitates the use of two Tube Levelers on, say, a stereo mix. A standard IEC power-cord connector and fuse are also rear mounted. The compact TLA-50 is one rack unit in height and half a rackspace wide, and it can be mounted on standard rack trays.

Listen Up

The TLA-50 performed well during commercial sessions at Guerrilla Recording studio, and my overall impression is that this little compressor definitely has a big tube attitude. In tracking duties, the unit excelled on bass, baritone sax, and other sources that typically benefit from a slow, smooth attack, long release time, and hefty low-end response.

The Tube Leveler also worked well on some male vocals. I did, however, opt for another compressor when the Summit contributed a grainy high-end characteristic to one particular male vocalist singing into a Lawson tube mic.

On full-frequency mixes while running signal through the unit with the bypass switch on (tube in circuit), the audio quality was clean and uncolored. Switching the compression circuit on (unity gain, no gain reduction) dulled the high end slightly and added a significant increase in punchy bass response.

Dialing in 2 to 3 dB of compression on program material produced a thickening of the bass and midrange and some attenuation of airy upper frequencies. Though I try to avoid such words, I have to admit that the Summit TLA-50 delivered an unquestionably "fat" sound here. However, some mixes treated in this fashion became murky in the 200 to 300 Hz range. At 5 to 7 dB of compression, the Tube Leveler was still smooth and musical and evidenced no bass pumping. At this extreme setting, midrange boosting and high-end attenuation were more noticeable.

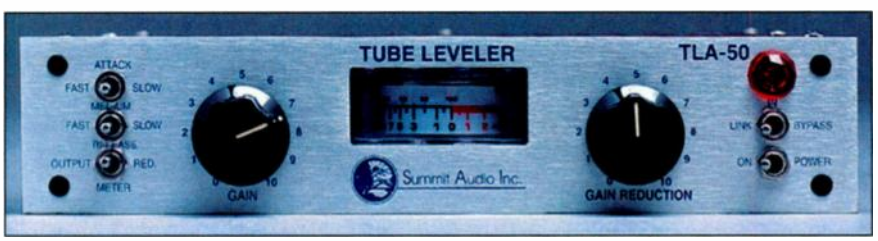
Summit Audio mentioned to me that the TLA-50 does some high-end boosting of its own as gain-reduction increases. I found this to be true with the aforementioned vocalist, but to my ears this characteristic was largely program dependent. I also determined that the two TLA-50s I reviewed had internal wiring anomalies that reversed the polarity of signals routed through the XLR connections. According to Summit Audio, though, this problem has not been found in any of its other TLA-50s.

Contender

If you're looking for flat and transparent compression, Summit Audio's TLA-50 Tube Leveler may not be your ideal tool. But for convenience and a vigorous tube vibe at an affordable price, I have yet to see a comparably priced contender that can stay in the ring with Summit's little giant.

Overall EM Rating (1 through 5): 4

Summit Audio, Inc.; tel. (831) 728-1302;
e-mail sound@summitaudio.com;
Web www.summitaudio.com



The Summit Audio TLA-50 Tube Leveler brings the company's smooth, soft-knee tube compression within reach of the personal studio.

VALVOTRONICS

Tube Amplified Direct Box

By Michael Cooper

The Valvotronics Tube Amplified Direct Box ($400) offers some interesting features that should appeal to electric-bass guitarists. A "bass tilt" switch provides a 6 dB-per-octave lowpass filter with a corner frequency at 500 Hz—excellent for producing pillowy electric-bass tracks devoid of high frequencies (think reggae music). Also provided is a continuously

The Professional's Source

The Professional's SOURCE for all your

PRO-AUDIO and RECORDING needs

- Built To Order Computer Based Turnkey Systems for Macintosh or Windows
- Expert Advice from Working Professionals!
- World's Largest In-Stock Inventory!

B&H

PHOTO - VIDEO - PRO AUDIO

www.bhphotovideo.com

When in New York City Be Sure To Visit Our SuperStore

420 Ninth Ave.

Between 33rd & 34th Streets,

New York, N.Y. 10001

For Information Call:

800-947-5509 • 212-444-6679

or Fax (24 Hours):

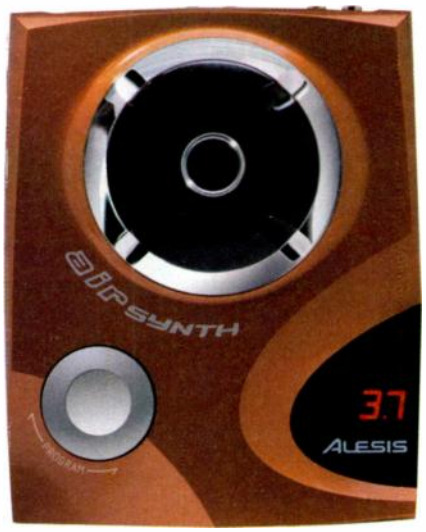
800-947-7008 • 212-239-7770

Store and Mail Order Hours:

Sun. 10-5, Mon. thru Thurs. 9-7

Fri. 9-1, Sat. Closed

WE SHIP WORLDWIDE



The Alesis airSynth is an easy-to-use instrument that's great for adding electronic color and visual flair to your music.

to sustain it, tap the program knob. Tap the knob again to disengage Hold. That's all you need to know to play this instrument.

The airSynth has a pair of RCA inputs and outputs and is powered by a wall wart. The inputs allow you to send an audio source through the device, although none of the programs process the sound and there is no onboard control for balancing the mix of internal and external sounds. The airSynth can be attached to a mic stand and includes four rubber feet for skid-free use on a tabletop.

A 38-page manual and a printed Program chart are included. Thoughtfully, the list of the Programs, how to load them, and an explanation of Hold mode are printed on the bottom of the device.

Music from the Æther

The sounds are categorized as Tone, Percussion, SFX, High Five, or Rhythm. The Tone group offers a selection of pitched sounds, some of which are theremin-like. Generally, these have a range of an octave or two and require some practice if you want to play them melodically with precision. The Percussion and SFX categories are self-explanatory, and High Five holds five programs that could easily fit under one of the other headings.

Within the first four categories, my favorite Programs are the Phonemeanon, which offers voicelike timbres; Whispering Wind, which sounds like formant-shaped noise; and the weird distorted sounds of Sabre Tooth. A handful of the sounds are a bit corny for my taste, so I ran the airSynth through a ring modulator and tape-delay simulator to spice them up.

The Rhythm category is a collection of simple loop builders: five "sequencers" and four "auto-melody generators." These allow you to set up a repeating percussion track, bass line, or melody line. Once you set up a loop, you can mute individual instruments by touching different parts of the dome. Although getting the exact notes you want is a bit tricky, the looping Programs are some of the finest and most satisfying features of the airSynth.

There is no MIDI or digital I/O, so you can't automatically sync the airSynth with an external device. You can set the tempo using the Global Tempo Program. The airSynth remembers this tempo until you change it or power down.

Handsome

The airSynth is the epitome of a plug-and-play instrument. It's especially nice if you want an easy-to-use instrument that provides electronic color. At a recent gig, I combined it with the Alesis airFX, which proved to be a formidable combination, both sonically *and* visually.

If you like simple but quirky gadgets, try your hand at the airSynth. You'll be surprised at how inspiring it can be.

Overall EM Rating (1 through 5): 4

Alesis; tel. (401) 295-9000; e-mail info@alesis.com; Web www.alesis.com

VINTAUDIO

Giga Clean Electric Guitars (Giga)

By Ray Legnini

Soundware newcomer Vintaudio has just released its first offering, *Giga Clean Electric Guitars* ($134.95 including shipping). The four-CD set includes samples of a 1959 Gibson Les Paul Custom, a 1958 Fender Stratocaster, and a Godin Artisan.

Vintaudio's collection includes four presets: the bridge and neck pickups on the Les Paul and the bridge pickup alone on the Strat and Artisan. The samples were recorded chromatically at three Velocity levels and extend for the full sustain of each note without loops. The decays sound very natural and even include an occasional fret buzz—a nice touch. All the samples were recorded dry, so you can process them as needed. The basic tones are excellent, though I wish other pickups from the Strat were offered.

The Note Spread

All three guitars were sampled at different positions on the neck: open, middle, and high. The samples include sustained picked notes, muted notes, hammer-ons, and slides. (The hammer-ons and slides are all whole steps.) Curiously, the slides layer is referred to as "swells" in the documentation.

Eight key switches are used to select the various articulations and neck positions in real time. That adds a nice expressive element to your sound palette. It's easy to get the sound of chords being played at the fifth fret area as opposed to open position, for example. All eight key switches are mapped to the lowest octave of a full-size keyboard, a range that isn't accessible if you play on a 61-note synth keyboard. In that case, you can transpose your keyboard down an octave to gain access to the key switches, or you can remap the key assignments with the GigaStudio Instrument Editor.

Tracks and Bumps

To find out if a sampled instrument really works, you must use it in a musical context. So, starting with the Strat, I added some

Vintaudio's *Giga Clean Electric Guitars* sample library includes samples of a 1959 Gibson Les Paul Custom, a 1958 Fender Stratocaster, and a Godin Artisan.

ORDER 24/7 FROM OUR SECURED WEB SITE

Ordering from BSW's pro audio experts doesn't cost a penny more.

When you call Broadcast Supply Worldwide, you're gonna talk to a pro audio veteran, not an ex-used car salesman. In fact, a lot of our staff are genuine audio engineers.

With folks like that (and the added overhead of all those pocket protectors), you'd think we'd have to charge more.

But we don't.

We're price competitive with all those companies who complicate their lives with guitars, drums, video cameras and other stuff we don't sell.

It's another reason BSW is the Secret Source that radio and television stations, recording studios and post production houses rely on for rock-bottom prices on top-name pro audio products.

Give us a try and you'll never call one of those hard-sell places again.

Call for a free 112-pg. catalog!

Collect 'em! Trade 'em with your friends!

BSW EXCLUSIVE MONEY-SAVING 5-PACK DEALS!

Buy in bulk...save in bulk! Awesome prices on gear you never have too much of.

XM2000S 5-pack **99.95**

BEHRINGER • XM2000S Dynamic Mic 5-pack • cases incl

MS200PKG **89.95**

Mic Stand 5-pack

89.95 TD61 5-pack

KOSS • TD61 Full Enclosure Dynamic Headphone 5-pack

M25PKG **49.95**

PROCO • 25' mic cable 5-pack

HA4600 **99.95** $129.99 list

BEHRINGER • HA4600 • 4-Channel Headphone Amp • Each with stereo aux input, mono/stereo and left/right mute switches • 2-band EQ • 8-digit LED output level meter

SLA1 **199.95** $279.00 list

ART • SLA1 Studio Power Amplifier • 100w/ch. 8Ω, 130w/ch. 4Ω, 260w mono 8Ω

AT3035 **199.95** $349.00 list

AUDIO TECHNICA • AT3035 Cardioid Condenser Mic

B2031 • list $499.99 / pair **399.95 /pair**

BEHRINGER • B2031 Active 8.72" Monitors 75w & 150w amps, 25mm tweeter, video shielded

MIA • $249.00 list **199.95**

ECHO • MIA 24-bit/96 kHz Digital Audio Card • 8 "virtual" outputs

BLUEMAX **149.95** $199.95 list

PRESONUS • Bluemax • Compressor/Limiter • 15 studio presets + manual mode

GUARANTEED LOWEST PRICES!

www.bswusa.com • 1.800.426.5750

ORDER 24/7 FROM OUR FAST-LOADING WEB SITE • RING US UP 6AM-6PM PACIFIC TIME

BSW

World's Best Source for Pro Audio Products

guitar parts to several tracks that I was working on. If you play chords that emulate guitar voicings, you can definitely get realistic-sounding parts from the Strat samples. One thing I noticed with the Velocity switches in the Low Neck samples was a drop in volume when switching from the medium Velocity layer to the highest Velocity layer. It's more apparent as you play higher up the virtual neck. That doesn't happen with the other neck positions of the Strat (or with the other instruments).

I also discovered that several of the notes are not quite in tune (a common problem in guitar sample libraries). The tuning discrepancies appeared occasionally among the sample layers of a single note as well as with notes in relation to other notes. You can fix the problems in the Instrument Editor and save the results as a new preset, but that's a lot of work.

The Les Paul sounds nice and fat, especially if you run it out to an amp or a Line 6 Pod Pro for some "attitude" adjustment. The Godin Artisan is a nice addition to the set. Its tone sits somewhere between the Les Paul and the Strat. Both guitars exhibit some of the same tuning problems as the Strat. (According to Vintaudio, the samples were all carefully tuned and any discrepancies are inherent to the instruments.)

The hammer-ons and slides work well in many contexts but are tempo dependent to some degree. All four instruments have a bit too much release in the amplitude envelope for my taste. They work fine when you're playing chords, but the notes may overlap a bit too much when you play melodies, especially when playing fast.

Affordable Axes

All in all, the *Giga Clean Electric Guitars* library is a useful set of nice-sounding instruments. The printed documentation is minimal; a short Read Me file on the CD offers a little more information and a keyswitch map. The minor tuning flaws could be fixed with a bit of effort, making this set even better, and the modest price tag is especially appealing.

Overall EM Rating (1 through 5): 3

Vintaudio Productions; tel. (450) 638-9295;
e-mail info@vintaudio.com;
Web www.vintaudio.com

We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

GET SERIOUS ABOUT COMPUTER MUSIC PRODUCTION!

Pick up the exclusive guide to computer music gear for the recording musician! Master the tricks of the trade with the *Computer Music Product Guide*, brought to you by the desktop-music-production authorities!

Electronic Musician

introduces the

COMPUTER MUSIC PRODUCT GUIDE

Coming in January 2003

CMPG is packed with:

- The industry's most comprehensive product charts in over 20 categories
- Specs on all the computer software and hardware for producing music in the personal studio
- Bonus editorial and how-to articles on:
  - Creative Use of Plug-Ins
  - Synchronization
  - Debunking Digital-Audio Myths
  - Web Markup Languages for Musicians
  - Sound-Design Tips
  - Shortcuts to Success

Categories:

Algorithmic composition software
Audio editors
Auxiliary software
CD-writing software
Computer-assisted music-education software
Computer music systems
DAW control surfaces
DAWs
Digital audio sequencers
DSP plug-ins
Editor/librarian software
Interactive music-composition/ auto-accompaniment software
Loop sequencers
MIDI interfaces/patch bays/processors
Noise-reduction software
Notation software
Performance software
Signal-processing software
Software synths, samplers, and drum machines
Sound-design software/workstations
Studio-management software

Subscribe to EM and receive your copy of the *Computer Music Product Guide*!
Call 1-800-245-2737 or log onto emusician.com.

ADVERTISER INDEX

ADVERTISER	INTERNET	PAGE
Akai	www.akaipro.com	49
AKG	www.akgusa.com	27
Alesis (Andromeda)	www.alesis.com	119
Alesis (Masterlink)	www.alesis.com	29
Antares	www.antarestech.com	9
Aviom Inc	www.aviominc.com	51
B&H Photo-Video	www.bhphotovideo.com	159
Bayview Pro Audio	www.bayviewproaudio.com	143
Berklee Press	www.berkleepress.com	10
BIAS	www.bias-inc.com	129
Blue Iris Studios	www.blueirisstudios.com	89
Blue Sky	www.abluesky.com	115
Broadjam	www.broadjam.com	168
Brother	www.brother.com	147
BSW	www.bswusa.com	163
Cakewalk	www.cakewalk.com	47
Carillon	www.carillonusa.com	187
Carvin	www.carvin.com	35
Celemony Software GmbH	www.celemony.com	79
Conservatory of Rec. Arts & Sciences	www.audiorecordingschool.com	154
Cool Breeze	www.coolbreezesys.com	156
dbx Professional Products	www.dbxpro.com	45
Digidesign	www.digidesign.com	25
Disc Makers	www.discmakers.com	136
Discrete Drums	www.discretedrums.com	164
Edirol	www.edirol.com	69
Electro-Harmonix	www.ehx.com	149
emagic	www.emagic.de	15
E-mu Systems	www.emu.com	133
Focusrite	www.focusrite.com	103
Fostex	www.fostex.com	43
Frontier Design Group	www.frontierdesign.com	83
Fruity Loops	www.fruityloops.com	64
Fruity Loops	www.fruityloops.com	65
Full Compass Systems	www.fullcompass.com	151
Full Sail	www.fullsail.com	93
Garritan Orchestral Strings (GigaStrings)	www.garritan.com	157
Grace Design	www.gracedesign.com	92
IK Multimedia	www.amplitube.com	78
Interstate Music	www.interstatemusic.com	108
Korg (D1600)	www.korg.com	57
Korg (Electribe)	www.korg.com	77
Korg (Karma)	www.korg.com	41
Korg (Triton Le)	www.korg.com	20
Korg (Triton Studio)	www.korg.com	18–19
KRK Systems	www.krksys.com	111
Kurzweil	www.kurzweilmusicsystems.com	97
Lexicon	www.lexicon.com	98–99
Los Angeles Recording Workshop	www.recordingcareer.com	95
Mackie	www.mackie.com	2–3
Mackie (Baby HUI)	www.mackie.com	161
Manny's Music	www.mannysmusic.com	137
Mark of the Unicorn	www.motu.com	188
M-Audio (Ableton Live)	www.m-audio.com	113
M-Audio (Tampa)	www.m-audio.com	87
Musician's Atlas	www.musiciansatlas.com	122
Musician's Friend	www.musiciansfriend.com	63
MusicTech College	www.musictech.com	108
Musitek	www.musitek.com	80
Muska & Lipman	www.muskalipman.com	130
Neumann/USA	www.neumannusa.com	131
PG Music	www.pgmusic.com	141
Planet Waves	www.planet-waves.com	123
Primedia Business New Media	www.primediabusiness.com	181
QCA	www.go-qca.com	154
Rode Microphones	www.rodemicrophones.com	73
Sam Ash	www.samash.com	126–127
Samson Audio (Resolv)	www.samsontech.com	153
Samson Technology (C01 Condenser)	www.samsontech.com	109
Samson Technology (MDR)	www.samsontech.com	75
Sonic Foundry, Inc	www.sonicfoundry.com	53
Sonic Implants	www.sonicimplants.com	139
SPL Electronics	www.spl-usa.com	10
Steinberg	www.us.steinberg.net	13
Studio Projects	www.studioprojectsusa.com	94
Sweetwater Sound #1	www.sweetwater.com	33
Sweetwater Sound #2	www.sweetwater.com	84–85
Sweetwater Sound #3	www.sweetwater.com	116–117
Sweetwater Sound #4	www.sweetwater.com	182–183
Sweetwater Sound #5	www.sweetwater.com	184–185
Syntrillium Software Corp	www.syntrillium.com	81
Tascam (DM-24)	www.tascam.com	121
Tascam (MX-2424)	www.tascam.com	71
Tascam (US-224)	www.tascam.com	23
Taxi	www.taxi.com	91
TC Works	www.tcworks.de	4–5
Tonos	www.tonos.com	145
Waves	www.waves.com	37
West LA Music	www.westlamusic.com	104–105
X-Vision Audio	www.xvisionaudio.com	31
Yamaha (AW16G)	www.yamaha.com	11
Yamaha (PLG)	www.motifator.com	101
Yamaha (S90)	www.sninety.com	61
Zaolla	www.zaolla.com	135
zZounds	www.zzounds.com	155

ELECTRONIC MUSICIAN MARKETPLACE ADS

American Duplication Supply	www.superdups.com	170
Auralex	www.auralex.com	171
CD Labs	www.cdlabs.com	172
Crystal Clear Sound	www.crystalclearcds.com	173
Dupco	www.dupco.com	174
ELS Productions	www.elsproductions.com	169
Gefen Inc	www.gefen.com	174
Griffin Technology	www.griffintechnology.com	172
Lonely Records	www.lonelyrecords.com	170
Mac Solutions	www.macsolutions.com	172
Media Services	www.mediaomaha.com	171
MiBac Music Software	www.mibac.com	173
Neato	www.neato.com	171
New Song Media	www.newsongmedia.com	171
Nu Graphics etc.	www.nugraphics.com	169
Omnirax	www.omnirax.com	170
pcaudiolabs.com	www.pcaudiolabs.com	173
Play-It Productions	www.play-itproductions.com	173
Rascal Loops	www.rascalloops.com	169
Recording Workshop	www.recordingworkshop.com	173
Shreve Audio	www.shreveaudio.com	174
The Gate	www.gatemedia.com	174
Triple Disc	www.tripledisc.com	169
Vancouver Film School	www.vfs.com	170
Voyager Sound	www.voyagersound.com	173
Wacom	www.cintiqlcd.com	169

FOR FREE INFORMATION FROM OUR ADVERTISERS, VISIT

EM's Online Reader Service is the quick and easy way to contact advertisers to receive **FREE** product information. Simply go to **www.emusician.com/rs**. From our Online Reader Service page you can then select the issues and the advertisers you are interested in. It's that simple. Your request is immediately e-mailed to the advertiser.
Also, while you're there, take a moment to complete our RATE THE ARTICLES survey in each issue. We want to know what works for you!

IMPORTANT NOTICE TO READERS:
Reader service inquiries are sent directly to the advertiser, who is solely responsible for sending product information. *Electronic Musician* can not guarantee a response from all advertisers.

www.emusician.com/rs

Electronic Musician's Advertiser Sales Regions and Representatives

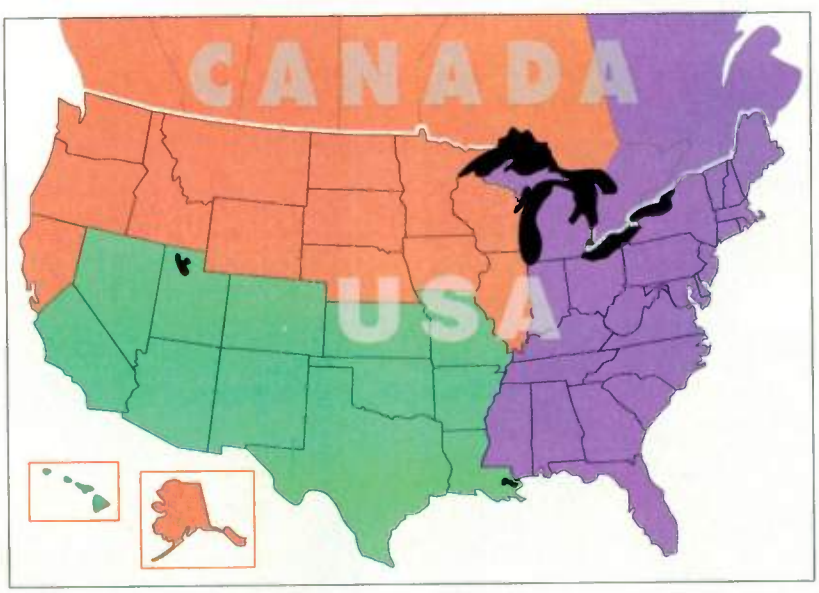
Advertising Director
Joe Perry (770) 343-9978
jperry@primediabusiness.com

Northwest
Stacey Moran (323) 782-2016
smoran@primediabusiness.com

Southwest
Mari Deetz (323) 782-2011
mdeetz@primediabusiness.com

East Coast/Europe
Jeff Donnenwerth (770) 618-0160
jdonnenwerth@primediabusiness.com

Classifieds
Kevin Blackford (West Coast)
Jason Smith (East Coast)
(800) 544-5530 or (510) 653-3307
emclass@primediabusiness.com



broadjam

Broadjam Artist • **Bob Dee** • Genre: Rock

highest ranked broadjam artists: **7.2002**

Artist: Keith Grooves **Song:** Sweet Urban Funk
Genre: Soul - R&B

Artist: OneDogWoof Music **Song:** Any Dream Will Do
Genre: Pop

Artist: Chris Bayne **Song:** Detour
Genre: Jazz/Swing

Artist: Liz Miller **Song:** Standing Still
Genre: Easy Listening

Artist: Festival Choir of Madison **Song:** Gypsy's Warning
Genre: Classical

www.broadjam.com

Broadjam Corporation
1101 State Highway 69, #8 | New Glarus, Wisconsin 53574
608 527 3633

unleash
your music

Get it up
Don't want to deal with the hassle of encoding and uploading your music? Send it to Broadjam, and we'll do it.

Get it out
We'll get it up on our site and then get it out to all the best Internet music sites.

Get it back
Oh you'll get feedback all right. From fans, peers, industry pros, professional guest reviewers and even a moron or two.

Get a homepage
A well-designed world-class page that you'll be proud to call home.

Get it on
Whatever you do, get it online and give your music a chance. And give us a chance to do it for you. If you want to talk to a human and ask questions, call us toll free at 877-527-3651. If you prefer email, we can deal with that as well.

customerservice@broadjam.com

EM MARKETPLACE

EM CLASSIFIEDS

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

BUSINESS OPPORTUNITIES

"Auralex continues to grow every year and a part of that growth is directly attributed to the response from the Classified & Marketplace readers of *Electronic Musician*. When we plan our advertising budget, this magazine is always part of our core buy."

—The staff of Auralex

COMPUTER SYSTEMS

EM CLASSIFIEDS

EMPLOYMENT

Sony Computer Entertainment America, (SCEA), is the manufacturer and distributor of the number one selling video game console in North America.

SENIOR SOUND DESIGNER
San Diego, California

SCEA is looking for a talented, highly motivated Sound Designer to join our award winning audio team in San Diego. We are looking for applicants with 2-3 years of Film / TV post production and mixing experience with a proven record of creating unique soundscapes.

The position will involve spotting and mixing music and sound effects as well as developing sounds for in-game use on the Playstation®2. Interested candidates should apply directly to:

PlayStation.2

Sony Computer Entertainment America
Attention: HR - Sound Designer
919 E. Hillsdale Boulevard, 2nd Floor
Foster City, CA 94404
E-mail to: garry_hill@playstation.sony.com
EEO/AA

SONY COMPUTER ENTERTAINMENT

COPY EDITOR

Experienced copy editor with audio expertise wanted to join Creative Services team at Dolby Laboratories in San Francisco. Please see full job description at *www.dolby.com/career.*

Dolby

For rates and deadlines on placing a classified ad
Call EM Classifieds at (800) 544-5530

EQUIPMENT FOR SALE

The Case Specialists

Flight cases for guitars, pedalboards, mixers, drums, rackmount equipment, keyboards, DJ equipment, etc.

Call for quotes and FREE catalog

Discount Distributors
800 346-4638
In New York: 631 563-8326
www.discount-distributors.com

What do you need a great price on today?

DigitalProAudio.com

1-800-240-4079

Synthesizers..... made of TUBES??
(....WHY NOT?)
METASONIX
WWW.METASONIX.COM
PMB 109, 881 11th St
Lakeport CA 95453 USA

SINGERS! REMOVE VOCALS
Unlimited Free Backgrounds from ***Original Standard*** Recordings!
Thompson Vocal Eliminator™ VE-4 Free Brochure & Demo
24 Hour Demo/Info Line
(770) 482-2485 - Ext 16
LT Sound Dept EM-1 7980 LT Parkway Lithonia, GA 30058
Internet www.LTSound.com
Better Than Karaoke for Over 25 Years!

FURNITURE

INSTRUCTION

Indie Music CDs For Sale

INSTRUMENTS

MISCELLANEOUS

EM CLASSIFIEDS

MUSIC MASTERING

PARTS & ACCESSORIES

PUBLICATIONS & BOOKS

RECORDS, TAPES & CDS

See our ad in Marketplace

See our ad in Marketplace

See our ad in Marketplace

See our ad in Marketplace

EM CLASSIFIEDS

RECORDS, TAPES & CDS

RETAILERS

SOFTWARE, SEQUENCES & SOUNDS

Power beyond the printed word.

Our ability to help you solve business problems extends beyond the great editorial in this publication.

E-Mail Newsletters. Get the news you need, as it happens. Sign up for a subscription to one of our e-mail newsletters. Go to PrimediaBusiness.com and click on "I want to subscribe to a newsletter." Or, sponsor one of our targeted newsletters to reach buyers in your market. Contact Rob Shore (rshore@primediabusiness.com or 212-204-2622).

Amplified coverage. Every Primedia Business publication has a Web site with relevant news and additional resources. Go to PrimediaBusiness.com and click through to the publications you're interested in.

Supplier Directory. Find a product or service in our multi-industry Supplier Directory. Go to PrimediaBusiness.com and click on the Supplier Directory link.

Custom online "special reports."
Our editorial content and your sponsorship can help you increase your sales. Contact Trish Conheeney (pconheeney@primediabusiness.com or 212-204-1455).

Banners. Properly created and targeted Web banners can actually be incredibly effective. Target by audience or content. Contact Rob Shore (rshore@primediabusiness.com or 212-204-2622).

Industry news, delivered. Get the latest industry-specific news automatically delivered fresh to your corporate Web site, intranet or extranet. Go to PrimediaBusiness.com and check out Primedia Insight newswire.

We can connect you with the exact buyers you're looking for or bring you the information you need to win in today's markets. Click or call today to tap into the power of Primedia Business.

PRIMEDIA
Business Magazines & Media

PrimediaBusiness.com

GO MOTU NATIVE

The MOTU 2408mk3 recording system with DSP-driven mixing and monitoring opens a world of new possibilities for your MOTU native desktop recording studio.

The New Power Mac G4

Dual-processor heaven for Digital Performer. All models.
1 or 2MB of DDR Level3 Cache per processor.
System bus speeds up to 167MHz.
Don't make Digital Performer sing.
Make it scream.

MOTU Digital Performer 3.1

Unlimited undo that remembers everything you've ever done to a project, since the moment you first created it. Customized track grouping that lets you choose what to group. REX file import and Acid-style loop building. Audio workstation technology at its finest.

The New MOTU 2408mk3

Expandable to 96 channels of 24-bit 96kHz recording. DSP-driven mixing and monitoring with the same near-zero latency performance as today's latest digital mixers — and no processor drain on the host computer. Connect all your synths, sound modules, drum machines and effects processors and mix it all from your computer desktop. The latest breakthrough in native audio recording.

Radikal SAC 2.2

Completely redesigned. Smoother faders. Higher resolution encoders. Dozens of enhancements made specifically for DP3. The Radikal Technologies Software Assignable Controller gives you automated, touch-sensitive mixing. The ultimate hands-on experience for Digital Performer.

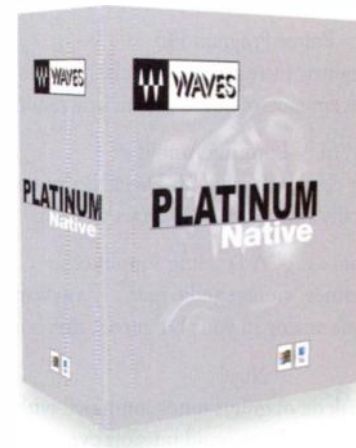
GO MOTU NATIVE CALL SWEETWATER

Antares kantos 1.0

The company that gave you AutoTune, the holy grail of pitch correction, now brings you kantos: the world's first audio controlled synthesizer. Use your voice (or any other monophonic source) to play, shape, warp, bend, convolve or otherwise control the powerful kantos synthesis engine in ways you never thought possible. Or feed it rhythmic loops for truly mind-bending results. And you can play kantos directly into Digital Performer. This changes everything.

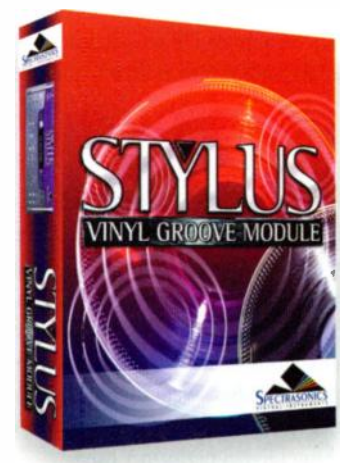
Waves Native 3.5

Waves, the most sought-after plug-ins for Digital Performer, have just undergone the most sweeping performance enhancements ever in Version 3.5. Enjoy support for DP3's fully symmetric multiprocessing, sample-accurate automation, 96kHz operation, and optimizations that allow you to run dozens more Waves plug-ins simultaneously. Available in various-sized bundles at numerous price points, including the Platinum Native bundle (shown). With 25 plug-ins, it's an amazing value and covers the full spectrum of audio tools. Waves 3.5 is native processing in full glory.



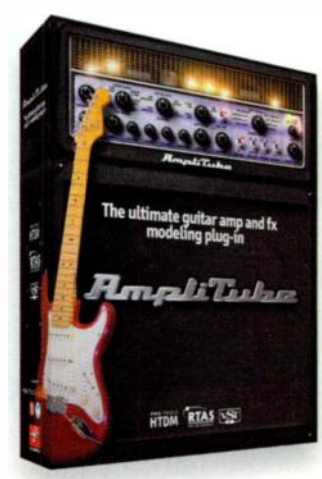
Spectrasonics Stylus

Stylus™ is a breakthrough native virtual plug-in instrument for Digital Performer from renowned developer Spectrasonics that integrates a massive 3GB arsenal of incredible Groove Control™ activated loops and unique drum sounds, with a powerful user interface for shaping and creating your own grooves. Features all NEW sounds, over 1,000 new remix grooves by acclaimed producer Eric Persing, elastic Tempo, Pitch, Pattern and Feel with Groove Control, killer live percussion loops, thousands of cutting-edge drum samples and real-time jamming with Groove Menus.



IK Multimedia Amplitube

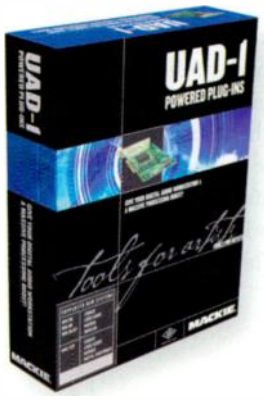
Amplitube is simply the best guitar amp and FX modeling plug-in ever made. 1,260 possible combinations, mic emulation, 200 presets and 10 different stomp, amp and rack effects. Amplitube sounds superb on guitar — and just about everything. Amplitube delivers the largest arsenal of guitar tones ever to your Digital Performer mix. Play it live or use it post. Now just plug in your inspiration...



THE MOTU 2408mk3 NATIVE STUDIO...

Mackie UAD-1 Powered Plug-ins

UAD-1 is a PCI card that allows you to run dozens of sophisticated effects plug-ins inside Digital Performer without bringing your Mac to its knees. What's the secret? A custom-built, monster DSP. It's like adding an extra $20,000 worth of effects gear to the dozens of native plug-ins included with DP. UAD-1 ships with this growing list of powered plug-ins:



Real Verb Pro
The most flexible, natural sounding reverb available. Design your own rooms, down to the smallest detail.

Pultec Program EQ
Stunningly realistic recreation of this classic analog EQ. Dangerous amounts of boost with musical results.

1176LN Limiting Amplifier
Another analog classic reborn inside Digital Performer. Apply liberally with host CPU cycles to burn.

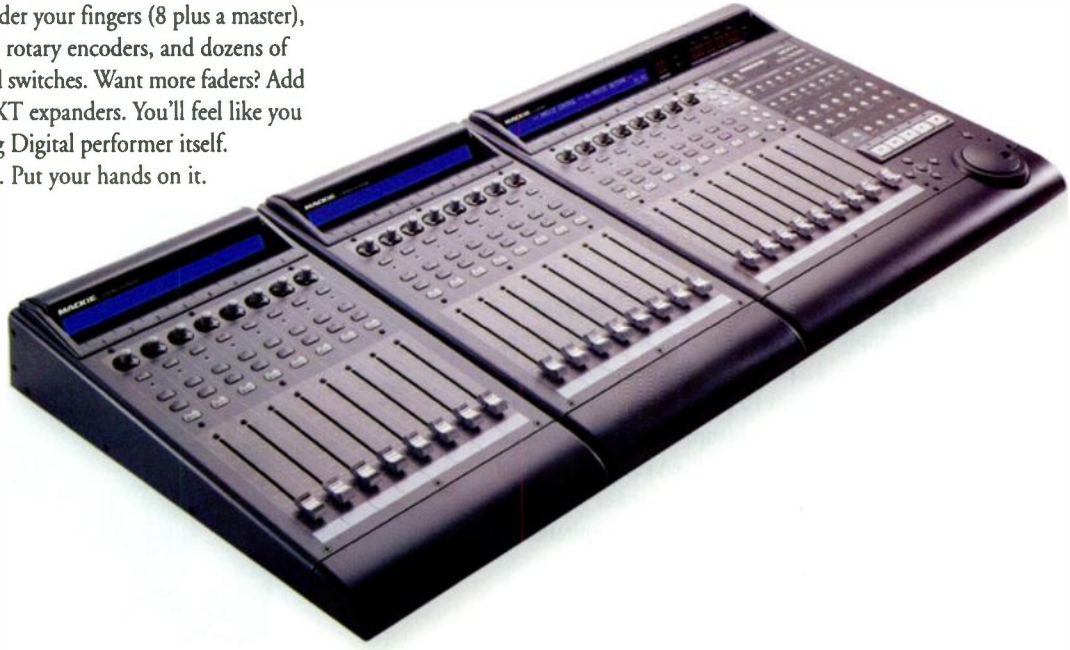
Teletronix LA-2A Leveling Amplifier
This beauty defines "vintage audio gear". If you want warm, authentic analog in your DP mixes, this is it.

Nigel
A complete palette of guitar tones combined with every effect a guitar player could possibly ever need.

CS-1 Channel Strip
Whopping punch on a single DP plug-in insert: EQ, compression, delay and reverb all in one plug-in.

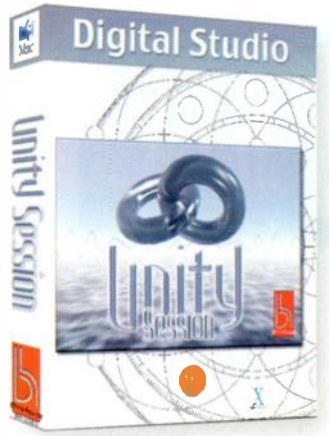
Mackie Control for DP3

Designed in direct collaboration between Mackie and MOTU, the new Mackie Control automated control surface puts nine touch-sensitive Penny & Giles automated faders under your fingers (8 plus a master), 8 motion-sensitive rotary encoders, and dozens of custom-programmed switches. Want more faders? Add 8-channel Control XT expanders. You'll feel like you are touching Digital performer itself.
Go ahead. Put your hands on it.



BitHeadz Unity Session

First in a new generation of virtual instrument technology. Even more tightly integrated with Digital Performer. PowerPC G4- and Velocity Engine-optimized to deliver way more sounds per CPU cycle. One integrated environment with sampling, analog synth emulation, physical modeling, and Gigasampler file streaming. A complete rack of synths for DP3 in a box.



BIAS Peak 3

Burn Redbook CD's. Read and write MP3, Dolby AAC™, 24 bit WAVE and more. Batch process hundreds or even thousands of files. Ultra-fast waveform editing. Run standalone or launch directly from DP3. Unlimited undo/redo with graphic edit histories. View multiple audio documents simultaneously. Unique DSP and looping tools like Convolve, Repair Clicks, Loop Tuner™, Loop Surfer™, Guess Tempo™, Duplicate, and more. Hot swap real-time effects in series, parallel, or hybrid using Peak's Vbox™ SE VST matrix. Native for Mac OS 8.6 thru Mac OS X - including version 10.2 Jaguar. Optimized for Apple's G4 Velocity Engine. The ultimate editing, processing and mastering companion for Digital Performer.

Cool School Interactus

From Cool Breeze Systems, the leader in pro audio interactive training. CSi vol. 6 provides dedicated training for DP3 and CSi-QuickStart Plug-ins covers concepts, operation and production techniques for featured MOTU and third-party plug-ins. The CSi interactive environment includes click-state simulations, a huge DAW glossary, and hours of enlightening movie tutorials.

Bomb Factory MAS bundles

Three bundles. Three incredible opportunities. Available only from Sweetwater. Bomb Factory is known for its meticulously crafted, exquisitely authentic vintage effects plug-ins, from the Fairchild Model 660 (shown) to the JOEMEEK VC5 "meequalizer". You've just gotta' have 'em.

The MOTU Studio Experts

www.sweetwater.com

5335 Bass Road • Fort Wayne, IN 46808
Voice: (260) 432-8176 • Fax: (260) 432-1758

800-222-4700

Sweetwater
music technology direct

Authorized Reseller

SWEETWATER NOW 800-222-4700 GO MOTU NATIVE

800-222-4700 GO MOTU NATIVE CALL

By Larry the O

I've Got It Good (and That Ain't Bad)

My friends call me a snob. Not about everything, mind you; mostly about food. I love my coffee but prefer water over Yuban, and I'll have a Gigante Frappukeroseno at the Evil S only when it's the only choice within miles. I don't turn up my nose at AmeriCorporate Beer; I turn away altogether. Even tostada salads must pass muster.

I don't mind the reputation; in fact, it pleases me. The way I see it, I'm simply differentiating between good and bad food, and if that constitutes snobbery, then I'm snob No. 1.

The difference between good and bad is a dangerous topic because someone will always disagree with your valuation. It's even difficult to get people to agree on a basis for judging good and bad. And yet, being willing to make that judgment is crucial to the creative act.

Knowing the difference in your own mind between good and bad creates the context within which a great work can be fashioned, while failure to recognize the difference leads to—well, are there any TV listings nearby?

We all know that deciding between good and bad can be very complicated. There are many shades of "good" and of "bad": a vocal take might be good, but is it good enough? I've often seen this question arise in sessions and open the door to rampaging perfectionism that thrashes a track until all perspective is lost and the best take is gone with it.

On the flip side, have you ever seen a movie so bad, it was good? Or gone to a concert that was "not bad"?

For me, this usually comes down to Mr. Right Brain leaping forward with an intuitive assertion of good or bad and Mr. Left Brain following behind, closely analyzing the ground for corroborating or disproving evidence. Mr. Left Brain's inquiry is almost always centered around *why* I find the thing in question good or bad.

For instance, I think Jerry Garcia's singing was good. His tone was thin and reedy, his pitch, um, less than reliable, and he forgot lyrics. What in the world makes me think he sang well? In my opinion, Garcia's greatest strength in all musical areas was his expressiveness, and through that, the thin tone became plaintive, the wobbly pitch was the sound of years of hard life experience, and the loss of words was, um, strong drugs. (Okay, two out of three were strengths.)

Of course, there are plenty of people who didn't hear it that way. That's because they were using different criteria to judge good and bad, which is what gives the world variety.

Mr. Right Brain, as good as his leaping record is, has been known to receive an education from time to time. On more than one occasion, friends have insisted some music was good that I thought was bad. Because I respect my friends' opinions, I engaged them in discussion about it and was won over to their way of thinking. A new door opened for me.

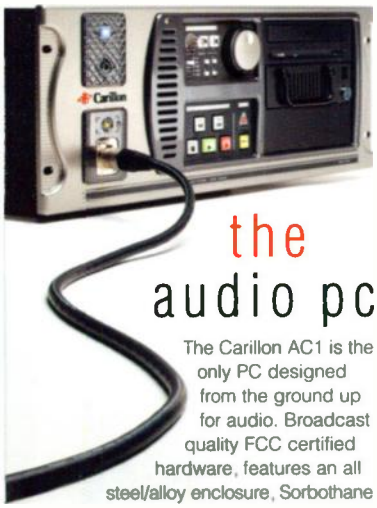
In the end, knowing the difference between good and bad is not the hardest part for me. The hardest part is deciding when to stick to my guns when all around me disagree, persisting with my vision until I bring it to fruition in spite of all criticism, and when to keep an open mind and allow myself to be swayed.

It's all very easy when it's a question of coffee and beer, because bad food just makes me feel lousy. But music and creative activity can really keep me on my toes. Some things can even be bad in spite of being good, like perfectly executed and entirely soulless "music," a syndrome I refer to as "CBU": Competent but Uninspired.

I'm not bothered by the challenge of figuring out what's good and bad or when to be persuaded and when to be bullheaded. I find it invigorating in much the same way as the creative act itself, keeping my brain and heart in a lively dance whose objective is the pursuit of truth and beauty. And that ain't bad. ❀

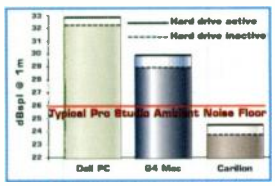
We welcome your feedback. E-mail us at emeditorial@primediabusiness.com.

STEVE CURL



the audio pc

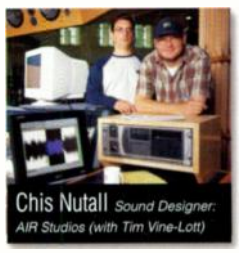
The Carillon AC1 is the only PC designed from the ground up for audio. Broadcast quality FCC certified hardware, features an all steel/alloy enclosure, Sorbothane vibration damping & the very best components including our own Ultramute PSU. Ultra low noise performance & a host of audio specific features, like front panel patching and inexpensive 'real controllers', have earned praise from journalists & name professionals alike.



NOISE LEVEL HEAD TO HEAD
Anechoic chamber test (Southampton University's Institute of Sound & Vibrational Research)

"The Carillon AC-1 is silent, robust and portable. I can keep it switched on in the control room without even thinking about fan noise."

Mike Hedges *Producer: U2, Phil Collins, Manics, Travis etc.*



"The AC-1 is really fast and it doesn't crash It's also extremely quiet. I'm now using it for all my DSP work"

Chis Nutall *Sound Designer: AIR Studios (with Tim Vine-Lott)*

"The Carillon computer rocks! The hardware is beautifully designed and barely audible. It's also really well optimized - Nuendo runs like a dream".

Chuck Ainley *Producer: Mark Knopfler, Lyle Lovett etc.*

Carillon

866-4CARILLON

(866-422-7455) email info@carillonusa.com

To order online and for full details on all of our systems, features and Pro Users visit us at

www.carillonusa.com

- SONAR XL professional studio recording software
- Integrated multitrack recording, editing, mixing, and delivery of audio and MIDI.
- Sounds - built in DXi software synths
- Loop Construction Toolkit with beat matching and time stretching
- 24bit recording with twin mic preamps, guitar inputs and two headphone sockets
- Inserts on inputs for use with hardware compressor
- FX sends for use with hardware effects processors
- Session Drummer for instant drum patterns
- Mixing and effects to produce a finished track ready for burning to CD

SONAR PRO STUDIO

System shown with optional monitor

The Pro Studio package has all the facilities, features and versatility demanded by the serious musician. SONAR operates like a multitrack recording studio, with all the facilities and tools you need to produce professionally recorded music. You have a large range of FX like reverb, delay, and dynamics like compression and EQ to get the best out of your music. You even have a built in guitar tuner!

You get a great selection of sounds, like the Virtual Sound Canvas with 256 instruments, plus 9 drum kits to use with SONAR's Session Drummer to call up instant drum patterns. Or you can create beats using loops from Carillon's Loopstation and then bend them to your own rhythms with the Loop Construction Toolkit. You can record from a MIDI keyboard or write notes directly onto a staff. The 2-port MIDI interface can connect 2 external synths to the computer.

You can then record your voice, or guitar, or any real instrument. The M-Audio Omni Studio works like a mixer, connected directly to a 24bit PCI card. You have 4 inputs, two of which can be mic inputs with 48V, or direct inputs for guitar. Each input has an insert so you can patch in a hardware compressor. You have 4 FX sends to route through external FX processors. 2 headphone amps make it easy to collaborate with other people. To complete the hardware versatility you have 4 aux inputs so you can route your synths back though the Omni for monitoring and recording.

This awesome studio system would satisfy the most demanding musicians and Pro songwriters.

LIMITED OFFER PRICE

$2219

Lease packages from $83

Just a few of the many systems available, call us or visit us online for further details:

Sonar Foundation	FROM $1849	**Core Systems**	FROM $1399
Sonar Studio	FROM $1959	**Configure custom systems online with** Carillon system builder	
Sonar Pro Recordist	FROM $2699		
Sonar Pro Digital	FROM $2549	**Please visit www.carillonusa.com for full specifications**	

Standard with all these systems:

how System specific set-up, manuals, tutorials & help

fix Our own one-stop online remote control tech support

Loopstation sound source & search engine with over 5000 pro samples

Custom set of Software specific, short-cut command key caps.

Cakewalk Pyro MP3 conversion and audio CD burning software.

TOTAL SYSTEM INTEGRATION

SONAR M-AUDIO Carillon

SONAR 2.0 XL is the leading digital multi-track recording system for Windows. It provides you with a complete audio and MIDI production environment.

Designed and optimized by Cakewalk exclusively for the Windows platform, SONAR 2.0 ensures that you get the best performance and stability from your workstation. Includes DXi soft synths, real-time DirectX effects processing, audio loop construction tools, support for hardware control surfaces, OMFI and Broadcast Wave file support, extensive MIDI and audio editing tools, and many other essential features. The XL edition of SONAR 2.0 includes Sonic Timeworks EQ and Compressor X effects, and the award-winning FXpansion Audio DR-008 DXi drum sampler/synthesizer.

M-Audio (formerly Midiman) is a leading provider of digital audio and MIDI solutions for today's electronic musicians and audio professionals.

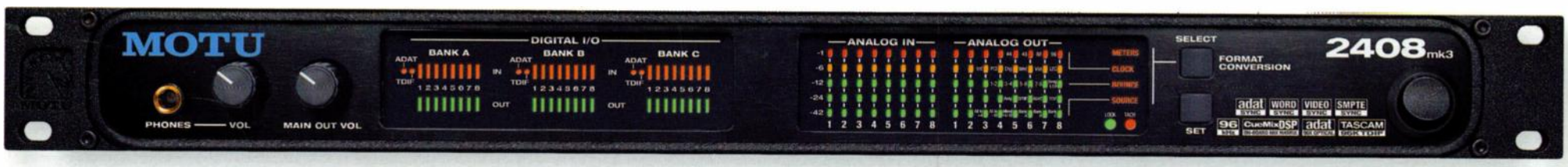
M-Audio's mission of "Redefining the Studio" delivers new levels of control, virtualization and mobility that transform the way computer-centric musicians compose, perform and live their creative lives. In addition to manufacturing its own product lines like the popular Delta audio cards, Studiophile reference monitors and USB Keystation MIDI controllers, M-Audio also distributes best-of-class products such as Propellerhead's Reason, Ableton's Live and Groove Tubes microphones.

Carillon have become renowned in the music industry for their dedication to creating the ultimate in computer based studio systems. Designed expressly for the purpose of music production and creation, Carillon's systems are the pinnacle of performance, stability and sheer beauty, and we've done everything to ensure that our systems are a dream to use.

Each of our true "turnkey" systems include manuals, tutorials & help written for each system as an entity. Expertly optimized and configured, they're ready to run so you can focus on making music.

Introducing the 2408mk3

**24-bit/96k. DSP-driven mixing and monitoring. Up to 96 inputs/outputs.
On-board SMPTE and video sync. Legacy I/O support.
Same amazing price.**



mk3 feature highlights

- **PCI-424 card** — connect up to four interfaces. Capable of delivering 96 channels of input and output at 96kHz.
- **CueMix DSP™** — a new DSP-driven digital mixing and monitoring matrix with the same near-zero latency performance as today's latest digital mixers. Connect all your gear, including live synths and outboard effects processors, and then monitor and mix everything with your 2408 system—and do it all without a mixer in your studio. Located on the PCI-424 card, CueMix DSP works across all connected MOTU interfaces with no drain on your computer.

- **Legacy I/O support** — connect any MOTU PCI interface, including the 2408, 2408mkII, 1296, 1224, 24i and 308. Mix and match as you please.
- **Video sync** — resolves directly to video with fast lock-up and sub-frame accuracy (no sync box needed).
- **SMPTE sync/generator** — resolve your entire system to SMPTE time code with fast lock-up and sub-frame accuracy (no SMPTE synchronizer needed).
- **Software-switchable input levels** — choose +4dB or -10dB operation separately for each analog input pair.
- **Support for 96kHz ADAT optical** digital I/O (S/MUX) and 96kHz Tascam TDIF digital I/O.

Basic features

- **Expandable 24-bit 96kHz audio interface** for Macintosh and Windows with 24 channels of simultaneous input and output.
- **8 TRS +4dB analog outputs** — perfect for surround.
- **8 TRS analog inputs** with switchable input levels.
- **Separate TRS main outs** and front-panel headphone jack, each with independent volume control.
- **24 channels of 24-bit ADAT optical** input/output (three banks) with sample-accurate ADAT SYNC. Supports up to 12 channels of 96kHz optical.
- **24 channels of 24-bit Tascam TDIF** digital I/O (three banks). Supports 12 channels of 96kHz TDIF.
- **24-bit S/PDIF** digital input/output up to 96 kHz.
- **Word clock** in and out; SMPTE (LTC) in and out; video sync input; sample-accurate ADAT sync input.
- **Compatibility** with virtually all audio software on Macintosh and Windows 98SE/Me/2K/XP.
- **Includes AudioDesk®** sample-accurate workstation software for MacOS with 24-bit recording/editing and 32-bit automated mixing/processing/mastering.

MacOS 98 Me 2K XP

MOTU
www.motu.com