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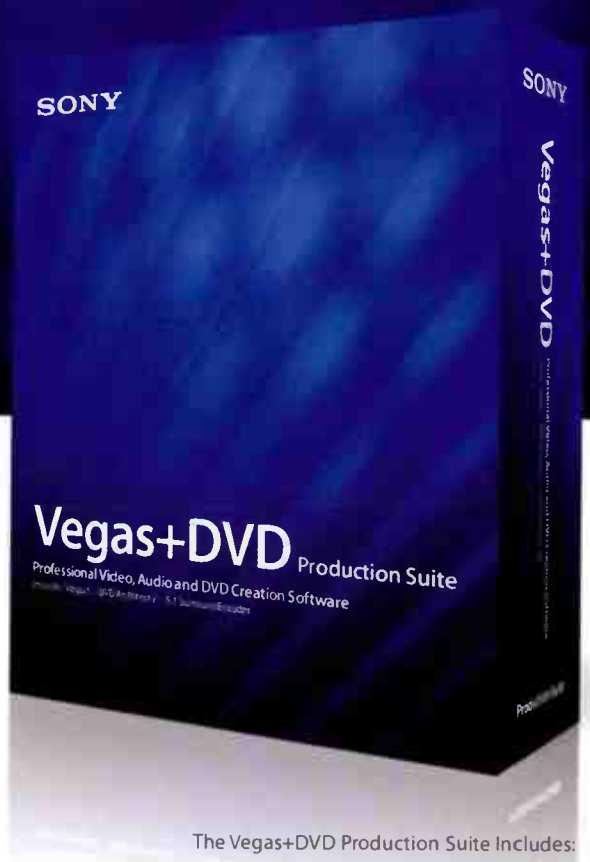

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CONTENTS

OCTOBER 2004

FEATURES

12 **Focusrite Liquid Channel**
Is this the end of the line for analog preamps?

20 **Mark Snow**
Creating Hollywood scores from home

24 **Liven Up Your Electronic Drums**
A few tweaks can make your drum parts really breathe

28 **Summer NAMM 2004**
The hottest new gear, direct from Nashville

42 **How to Silence a Computer**
Get your little silicon friend to quiet down

48 **Acoustics Myths Revealed**
Egg crates? Couches? What really works for acoustic treatment?

THE ART OF RECORDING

54 **Do This, Don't Do That**
Follow these rules, and you'll save time and money in mastering

56 **Understanding Reverb Parameters**
Getting better results from digital reverbs

DEPARTMENTS

4 **Talk Box/Bandstand**

6 **Punch-in**

98 **Coming Attractions**
Steinberg Cubase SX3

100 **Coming Attractions**
Cakewalk Sonar 4

102 **Success Story**
Frank Basile/Live Studio Drums

120 **Room with a VU**
Vincent di Pasquale Studios, Miami, FL

EQ REVIEWS

64 **Ableton Live 4**
Latest version of the loop/audio/MIDI program

70 **Genelec 8040a**
2-way active monitor

76 **Steinberg System|4**
Audio interface and DAW bundle

82 **Ultrasone HFI-550, HFI-650, HFI-2000**
Three sets of studio headphones

88 **Native Instruments Electrik Piano**
Software synthesizer

88 **Universal Audio 2192**
Master audio interface

90 **Edirol UA-25**
USB audio interface

92 **Samson CL7**
Large-diaphragm condenser microphone

Sounds

94 **Sonic Reality Sonik Capsule**

96 **Big Fish Lounge/Chillout**

COLUMNS

104 **Tech Bench**
Sample rate mismatches

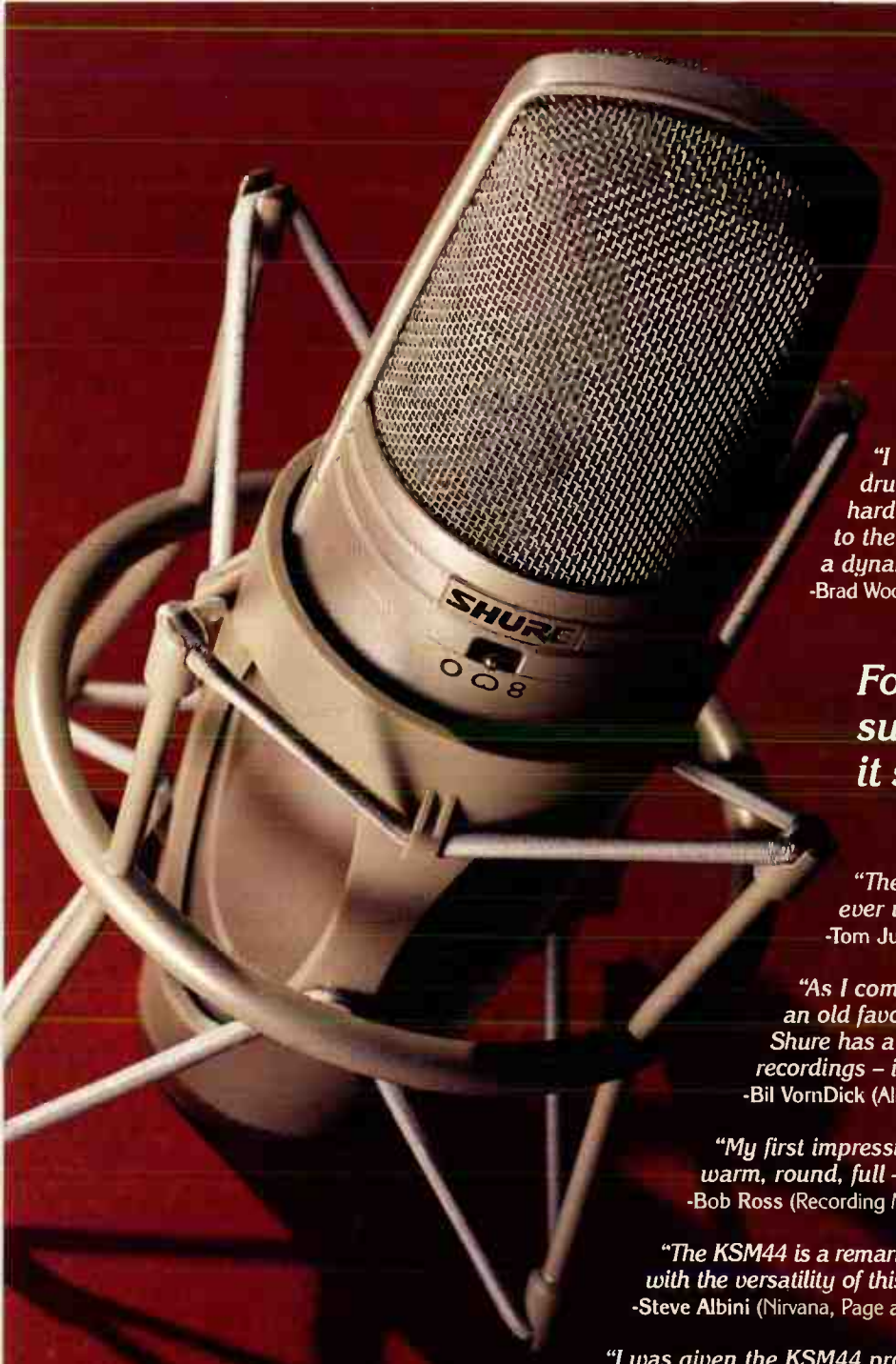
Power App Alley

106 **Emagic Logic**
Channel EQ

108 **Cakewalk Sonar**
Sonitus Multiband as volume maximizer

109 **Digital Performer**
Rendering virtual instruments

World Radio History



"The KSM44 has amazing presence on vocals. It's a great all-around condenser mic."
-Eddie Kramer (Jimi Hendrix, Led Zeppelin, Kiss, the Beatles, ...)

"I found the KSM44 to have an excellent natural quality with good presence and a nice open top end. This mic is so smooth in the midrange, even a banjo sounded good!"
-Joe Chiccarelli (Beck, U2, Elton John, ...)

"I tested the KSM44 on vocals, bass, guitar, and drums, and haven't stopped using it since. It's hard to describe, but there is an immediacy to the KSM44 that is very appealing – sort of like a dynamic mic, but more elegant."
-Brad Wood (Smashing Pumpkins, Liz Phair, Better Than Ezra, ...)

For a mic with such low self-noise, it sure creates a lot of buzz.

"The KSM44 is the quietest microphone I have ever used, and one of the best sounding too."
-Tom Jung (Pro Audio Review, DMP Records, ...)

"As I compared the KSM44 to a mic I consider to be an old favorite, my ear immediately chose the KSM44. Shure has a fantastic studio mic that I can use for critical recordings – it's going to become a standard, very fast."
-Bil VornDick (Alison Krauss, Bela Fleck, Mark O'Connor, ...)

"My first impressions of the KSM44 were warm, round, full – dare I say it? Fat!"
-Bob Ross (Recording Magazine)

"The KSM44 is a remarkable achievement. I am especially impressed with the versatility of this microphone and have yet to find its limits."
-Steve Albini (Nirvana, Page and Plant, PJ Harvey, ...)

"I was given the KSM44 prototype early-on, not knowing its intended purpose - so I tried it on everything. Guess what, it worked on everything!"
-Chuck Ainlay (Trisha Yearwood, Mark Knopfler, George Strait, ...)

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World Radio History

Talk Box

NAKED

Lately I've been working on two projects during my copious free time away from my gig as the Editor of this magazine. (Despite the title of this editorial, neither project involves me disrobing — be thankful.) The first is recording solo classical guitar pieces. The other is recording a Nashville-based singer/songwriter who's sort of in the Tom Waits/Randy Newman camp. In both cases, I'm taking a minimalist approach: mics to preamps to converters to hard disk. In fact, with the classical guitar recordings, I'm bypassing my DAW and going straight to a stand-alone stereo hard disk recorder. The idea is to capture performances without resorting to editing, to use only essential processing (hopefully none), and to avoid employing any "fixing it in the mix."

These efforts at purist recording have brought home four things to me: First, with all the miraculous technology we have available to us, there's still no replacement for a really great performance. Second, computers, software, and technology haven't reduced the need to know what you're doing. Third, no matter how diligently you've practiced your engineering skills, there's always more to learn, always something new to try. Fourth, it's easy to get caught up in the technical stuff and to miss what's truly important: the *music*, and the *sound*.

After I finish these recordings, my goal is to take these four lessons back with me as I resume doing projects that require other approaches (editing, processing, using the DAW as creative tool).

Here's a suggestion: Take a look at your own recordings. Are you using techniques and gear because they're "easy," or is there a better way? Are you editing when the music would be better served by a more musical performance? Are you relying on processing to make up for poor mic positions or engineering skills?

As a teacher of mine used to say, "A house is only as strong as its foundation." Give yourself a test: Peel away all the "protective" layers of technology and habit, and examine your bare, naked tracks. Do your recordings still stand up to critical scrutiny? If not, maybe it's time to get back to basics.

—Mitch Gallagher

The BAND STAND

What's the one piece of gear you've sold that you wish you'd kept?

Mitch Gallagher, Editor
A Peavey Special guitar amp — the original 120-watt version without sweepable mid EQ. I had two, and used them in stereo. I have Mesa-Boogies, Marshalls, and more, but with that amp (either in stereo or mono) and a Nady TO-2 tube overdrive stompbox (which I still own), I got the fattest, crunchiest, roundest, warmest, most singing guitar tones I've ever had.

Craig Anderton, Editor at Large
An MXR Pitch Transposer. I needed the bucks, and the sound quality wasn't near as good as newer units. But it did some outrageous things if you kicked up the feedback and stuck a delay or other processor in the sidechain, then messed with the controls in real time. Fortunately, I sampled a lot of those sounds before I sold it, but that's not the same as realtime control.

John Krogh, Technical Editor
I haven't had the good fortune to amass an enviable amount of what many would consider "vintage" or "classic" outboard gear. What hardware processors I do own, I've had for a while and still put to good use. There is one piece, however, that I do miss from time to time — the Ensoniq DP4. It had some wicked modulation effects and delays that helped create "my sound."

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Reality Check

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"I choose the tools that best help me convert my ideas and imagination into music. That's why I'm using M-Audio's new Studiophile BX8 reference monitors. They sound absolutely brilliant—even after an exhausting 18-hour writing day. And what I hear in my studio comes across exactly as I intended, wherever my mixes go."

Jeff Rona (film composer; "Traffic," "Black Hawk Down")

"I'm surprised and excited by the fidelity of the BX8s. Unlike most speakers I've checked out, they have a nice open middle quality to them—along with the bonus of a smooth low end and one not-too-shiny top. I added M-Audio's subwoofer and was really impressed with what it contributed to the mix."

David Kahne (Grammy-winning producer; Paul McCartney, Sugar Ray)

"I have to go between analog and digital all the time and the BX5s have become my workhorse."

Terry Howard (Grammy-nominated engineer/producer; Ray Charles)

"The M-Audio BX8s are the best sounding powered monitors I've heard among those built on 8" drivers and costing less than $1000 a pair."

Home Recording, April 2003

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Punch-In

Tips & News You Can Use

BY CRAIG ANDERTON & MITCH GALLAGHER

EQ Goes On Walkabout

How many times has this happened to you? You're hanging out in Australia or New Zealand with a few Koala bears and kangaroos, and you're suddenly hit with an irresistable urge to grab a copy of *EQ* and start reading. You search and search, but sad to say, finding your favorite recording magazine on the Aussie newsstands is less than easy.

But don't despair! Next time you're down under and your *EQ* jones gets out of control, grab a copy of *CX* magazine. Through an exclusive international arrangement, *CX* is including "the best of *EQ*" in each issue: reviews, Power App Alley, Tech Bench, and more.

Now you can throw your shrimp on the barbie, have a little vegemite, and still bone up on all the latest and greatest recording tips, techniques, and technology. Pass the Foster's. . . .

CD of the Month

Ringside

***Ringside*, Geffen Records**

Ringside is an unusual combination: Singer/songwriter Scott and beat master Balt. Can you say "White Stripes?" Well, don't, because it's a whole other thing . . . a combination of rock-oriented songwriting and electronics that defies easy categorization, but has a ring of reality missing from so many of the prefab groups being pushed by the majors these days.

Scott lays down the acoustic guitars, keyboards, guitar riffs, and other melodic goodies, while Balt delivers the electronic rhythms. In true *EQ* fashion, Scott and Balt did the demo themselves, even designing the artwork. Once signed by Flawless Records, they then wrote, engineered, and produced their debut CD, recording the project in Scott's garage. Not that it was always easy; while recording "Spanish Faster" (one of the CD's standout cuts), the garage was so cold that Scott recorded the flamenco guitar part while wearing a parka and cut-off gloves. And he wrote the guitar hook and lyrics to "Struggle" while working night shifts as a limo driver.

But the bottom line is the music. When the CD arrived at Punch-In Central, it ended up on the CD player out of curiosity, and has since gone into heavy rotation. It's not for everyone, but it's clearly the product of a couple musicians' souls — not a focus group steered by a marketing committee. www.ringsideband.com

INDIE WORLD:

Jesper Kyd, *Hitman: Contracts*

Many have tried to turn a video game soundtrack into a musical experience. But few have succeeded in creating a coherent, satisfying listening experience as well as Jesper Kyd, who scored the video game *Hitman: Contracts*. He notes that, "I created the score using Cubase VST 5.1, with my main synths being the Yamaha CS80, Alesis Andromeda, Elektron Machine Drum, two E-mu 6400s, Roland V-Synth, Promega 3, and Roland JP8080, as well as lots of soft synths."

As to where he got his galaxy of sounds, Kyd notes, "I sampled lots of sounds from movies, sample CDs, records, and more, and created more than 1,000 sounds. These were combined with the analog synths and dance beats. There are lots of programmed beats that are designed to help give the music a late night, 'after hours club' kind of feel. Yet, the music is not ambient music. It's full of melodies, beats, and intense synth sequences."

And how about some of those lush choir vocals? They're not synthesized. Kyd explains, "The Hungarian Radio Choir performs on two of the tracks; the choir was recorded in Budapest, then mixed in Paris." Additional sound design was recorded at Toni and the score was written, edited, and mastered at Nano Studios in New York City.

To hear samples of the *Hitman: Contracts* score, surf to the official game website at www.hitmancontracts.com *(downloads > soundtrack)*. For more information, check out www.jesperkyd.com.

World Radio History

A DJ of Olympic Proportions

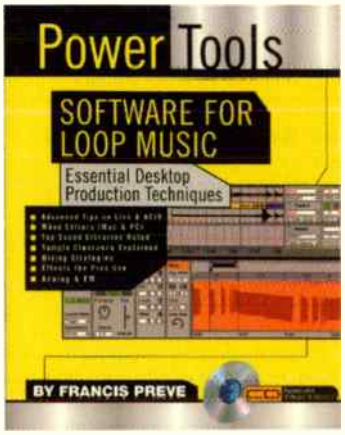
If you were watching the Parade of the Athletes during the Opening Ceremony of the Olympic Games in Athens, you might have noticed a significant departure from the norm: It was accompanied by a 90-minute DJ performance by Tiesto, twice voted the #1 DJ in the world by *DJ* Magazine. Interestingly, far from clashing with the Olympic concept, it fit in pretty well. For more on Tiesto, check out www.nettwerk.com, www.tiesto.com.

TIËSTO

Who's Using What?

On their most recent tour, Audio-Technica endorsers Sevendust and FOH mixer Andy Meyer parsed out their mic cabinet as follows.

Drums (Morgan Rose): Artist Elite AE2500 for kick, ATM25 and ATM23 on the top of the snare, a pair of ATM23s on the vintage Octabon drums, four AT4050 microphones as overheads and one AT4050 on snare bottom, and Artist Elite AE5100s on the hi-hat and ride cymbals. **Guitars (John Connolly** and **Clint Lowery):** AE2500s for each of the mono amplifier cabinets and four AT4047/SVs on the stereo cabinets. **Bass (Vince Hornsby):** ATM25 on the bass amp. **Lead vocals (Lajon Witherspoon)** and **backing vocals (Connolly** and **Lowery):** Handheld AEW-T6100 wireless mic/transmitter, part of an Artist Elite 5000 Series UHF wireless system. **Backing vocals (Rose):** ATM75 headset mic.



Book Beat

Power Tools: Software For Loop Music

By Francis Preve, published by Backbeat Books
www.backbeatbooks.com
166 pages + CD-ROM, $24.95

Full disclosure: *Software For Loop Music* is published by Backbeat Books, the books division of *EQ's* parent company. But that doesn't change the fact that it's a useful resource for those who want to get into producing music using loops.

The book is arranged into seven sections. Three cover the basics: Sampling, Soundware, and Mixing. The remaining four focus on specific applications — ReCycle, ACID, Live, and Soundtrack. In addition to reviews of each application, the book provides tips and tricks for each.

The material is broken down into manageable chunks; you can jump right to what you want to learn about. As a bonus, the included CD-ROM contains demos of Live, DSP-Quattro, ReCycle, and ACID, as well as over 250MB of license- and royalty-free samples and loops from Big Fish Audio and PowerFX to get you started.

If you want a thorough grounding in sampling and working with loops, as well as some of the main loop tools, *Software For Loop Music* can give it to you.

World Radio History

tip

BE GOOD TO YOUR FANS

Not just your audience, but the fans inside your computer. Components that run at high temperatures, like CPUs, depend on properly functioning fans to help them keep their cool. A fan that slows down, or stops altogether, can lead to anything from a shutdown to an expensive repair bill.

How do you know if your fan is shot? Some motherboards detect the CPU, power supply, and/or chassis fans, and return an error message if there's a problem. However, this isn't foolproof, as a fan might rotate but have an issue like worn bearings that slow it down.

Another sign: Your computer may act strangely (well, more strangely than usual). If everything works fine but after a certain period of time you have trouble with instability, screens freezing, or the like, and everything returns to normal if you let the computer cool down, suspect a thermal problem — which means suspecting a fan.

But even before that happens, be aware of the noises your computer makes. A fan whose bearings are starting to go will usually generate noise (and it's not pretty, either). The noise may be particularly bad on power up, then diminish after a while. If your computer starts making a strange noise, stop, turn off power, open it up, then turn on power (be very careful!) and make sure all fans are moving. Sometimes I'm adventurous enough to push down on the fan shaft a bit; looseness indicates a problem (but please, don't get your finger caught in the fan blades).

Finally, use your sense of smell. Overheated components can heat up nearby cables, producing the infamous "warm plastic" smell. Like strange noises, if your computer emanates strange smells, find out why before continuing. If you work on a lot of "mission critical" projects, a spare fan is a wise investment.

Boffo BIAS Bundle

BIAS now sells the Mastering & Restoration Edition of Peak 4.1, which bundles SoundSoap Pro restoration software and the SuperFreq 10-band paragraphic EQ with Peak 4.1, for a combined list of $899. www.bias-inc.com

tip

WHEN GOOD PLUGS GO BAD

If some of your programs freeze or crash as they're opening, and they host plug-ins, the problem may be an incompatible plug-in.

As a program opens, it may scan for plug-ins — the picture shows Traktion scanning as it initializes. You may also be able to scan (or "refresh") the plug-in folder from within the program. If the program freezes, hopefully there will be a status line that shows a plug-in name. 9 times out of 10 that's the one causing the problem.

Check the web for updates to the plug-in or host. If not, try re-installing the plug. If your program still hangs, remove the plug-in, or create a plug-in folder for the program that doesn't include the problem plug.

If there's no status line, temporarily move half the plug-ins from the plug-in folder and see if the program loads. If not, temporarily move half of the remaining plug-ins, and so on until you find the plug-in causing the problem.

Happy Birthday, Digi!

It was 20 years ago today . . . in 1984, Digidesign's founders, Evan Brooks and Peter Gotcher, set out to expand the sounds of their E-mu Drumulator drum machine, and make enough money through the sales of drum sound replacement chips to finance their own recording dreams. But things didn't turn out exactly as planned: That garage operation became Digidesign, the company that forever changed the way that audio was recorded, edited, and mixed. Buoyed by the introduction of the Macintosh, Digidesign's Sound Designer and Sound Tools packages made working with digital audio affordable. Not long thereafter, Pro Tools started the inexorable transition from analog multitrack to digital multitrack recording.

"When Evan and I started the company, we were two musicians who wanted music-making tools that didn't exist, so we decided to tackle the challenge of making them ourselves," says Peter Gotcher, Digidesign co-founder. From that, Digi has grown to over 400 employees, and changed the industry in ways that Gotcher and Brooks never even imagined.

Digidesign will celebrate its 20th anniversary with a number of activities throughout the year. The company will produce special events during AES San Francisco including the biggest DigiWorld ever in their corporate offices in Daly City, California, on Saturday, October 30, 2004. DigiWorld is free and open to the public to enjoy Pro Tools presentations, white paper discussions, third-party developer demos, workshops, and more. www.digidesign.com

Urge to Merge: Avid and Midiman/M-Audio

Digital media software maker Avid Technology Inc. will acquire Midiman, Inc. for $80 million in cash, 2 million Avid shares and the assumption of all Midiman stock options, which will cover about 325,000 added Avid shares. Founded in 1988, the Irwindale, Calif.-based M-Audio has about 200 employees in the United States and Europe. M-Audio's revenues for the fiscal year ended Jan. 31 were about $51.5 million, and are expected to grow more than 30 percent in fiscal 2004.

M-Audio will become a unit of Avid's Digidesign audio division and market its line of computer audio peripherals, PCI sound cards, keyboard controllers and control surfaces, microphones, speakers, and distributed software and sound libraries alongside Digidesign's digital audio workstations for the professional and home/hobbyist markets. www.m-audio.com

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MusicPlayer.com Forum Watch

So where are you supposed to stick your drives in a Windows machine? The SSS Expert Squad offers some useful opinions.

Original question posed by Anderton: My motherboard has the standard two channels for going to hard drives and such. Is it better to set them up like this: (1) C: OS drive, D: CD or DVD drive; (2) E: data drive, F: data drive or like this: (1) C: OS drive, E: data drive; (2) D: CD or DVD drive, F: data drive?

■ **NYC Drew:** Put the optical drives on the same IDE bus (your second proposed configuration).

■ **Jlampson:** For motherboards with SATA connectors, there are inexpensive adapters to convert SATA to IDE so you could put all of your devices on separate channels.

■ **Philip O'Keefe:** I have my hard disks on the primary channel as master/slave, and my optical drives (CD-RW and DVD+/-RW) on the secondary channel as master/slave.

■ **theblue1:** If your motherboard has an older controller, you would probably want to buy a SATA controller and drive for your audio, and put that drive on the new controller.

■ **Jon Doe:** Keep in mind that I'm an IT guy and biased. Ctrlr 1: 160GB HDD, CD burner; Ctrlr 2: 160GB HDD, CD/DVD player. Mirror the 160 Gig drives to each other and configure as a C boot (10GB) drive and a D data drive (150GB). But yes, SATA is the bomb.

■ **philbo_Tangent:** The "CD on the 2nd IDE Channel" was valid back when CD drives were quite a bit slower. To find out if this makes a difference for your Windows setup, with *only* the hard drive connected to the primary channel, look in the device manager for the primary IDE channel properties (Advanced settings tab). It'll say something like "Ultra DMA Mode 5." Do the same for the Secondary IDE channel, with *only* the CD drive connected. If it reads out a lower DMA mode number than the hard drive, leave the CD drive on a separate channel so it won't slow down hard drive access.

■ **Anderton:** Where can I find out more about SATA?

■ **Soundscape Studios:** http://www.serialata.org/

Surfboard

As we peruse the inner recesses, nooks, and crannies of the web, we're constantly flagging sites, news items, and useful tidbits that we feel will be of interest to you. Such as:

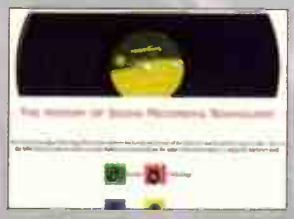
■ **http://www.dorumalaia.com**

If you're a fan of free refills and WAV samples, point your browser here and start downloading. There are about 700MB of samples (33 refills and 11 WAV sample packages). Note that although all the WAV sample packs and refills posted in the page are free, you're not allowed to sell or redistribute any of the samples in any form — but you can use them any way you want in your own compositions.

■ **http://www.generalguitargadgets.com**

Attention, do-it-yourself aficionados: If you want to add some new and different signal processors to your arsenal, stop by and check out a few of these cool processing projects you can build yourself. While they're oriented toward guitar, no law says you can't try them with other signal sources as well. Distortion, tremolo, and all the other standard goodies are here, as well as some more twisted variations.

■ **http://www.recording-history.org/**

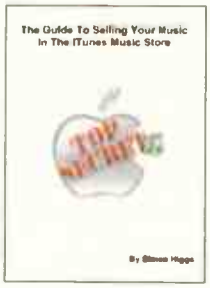


History buffs will have a field day with this site, which is filled with information on the technology that got us to where we are today — including wire recorders, dictation machines, 8-track cartridges, and more. Curious about how tape is made? The history of the answering machine? The basics of manufacturing records? You'll find the answers here.

Book Beat

The Guide To Selling Your Music In The iTunes Music Store

By Simon Higgs, published by Higgs Communications
www.higgs.com
26 pages + bonus reference material, $20



Who'd have thought that getting your music placed for download/sale on Apple's iTunes Music Store could be such an involved process? This comb-bound book guides you through the application process, preparing your files, and uploading them to Apple, and even explains the ISRC (International Standard Recording Code) code, used for identifying sound and music recordings, and how to get one for your recordings.

The book is short, well-written, and an easy read, yet it covers a surprising amount of information. If you're looking to place your music in the iTunes store, this is a good place to start.

World Radio History

Your hard disk or ours?

No matter how you approach digital recording, we can help you sound better.

US-2400 The control surface for serious DAW devotees. Get your hands on twenty-five 100mm motorized faders, real mute and solo buttons, rotary encoders, transport controls and keyboard shortcut buttons. Plug and play set-up with any DAW software that uses the HUI® or Mackie® Control™ protocols.

The Music Trades PRODUCT OF THE YEAR

2488 24-track, 24-bit personal digital studio for under $1500[1]! — Complete with built-in CD-RW burner no less.

Combine a 36-channel mixer, built-in effects, 3-band EQ, enough ¼" TRS and phantom-powered XLR inputs to record 8 tracks at once, 64-voice General MIDI sound module, 40 Gb internal hard disk and USB 2.0 ports for computer connectivity and you have the ultimate Portastudio™.

No other recording solution packs so much into so little space for such a reasonable price.

FW-1884 FireWire audio/MIDI interface and DAW control surface. Compact enough for personal studios...powerful enough that it's becoming the Industry Standard interface among audio professionals.

Includes eight 100mm motorized faders, eight XLR mic inputs with phantom power plus eight ¼" TRS inputs, eight inserts, eight analog outputs (perfect for surround monitoring), 64 MIDI channnels, stereo S/PDIF I/O, 8-channel ADAT® optical I/O and DAW shortcut keys. Among other things.

Plus the FW-1884 is expandable in 8-channel blocks via the FE-8 "side car."

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PORTASTUDIO 25th ANNIVERSARY

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World Radio History

Focusrite Liquid

BY LYNN FUSTON

Never do I recall a product that has simultaneously fostered such great anticipation and trepidation. The product, Focusrite's Liquid Channel ("LC" henceforth), is a single-channel preamp/compressor/EQ with A-D and D-A converters. While the "channel strip" design is familiar, Focusrite's implementation certainly isn't. Their combination of a configurable hardware matrix for the front end along with "dynamic convolution" (impulse modeling) of other hardware devices allows the LC to offer "replicas" of vintage and current analog hardware, both preamps and compressors.

The eagerness for the LC is easy to understand: It will allow studio owners to audition up to 40 preamps and/or compressors that they otherwise might not be able to hear or use. And all that functionality is in one box, so no more repatching to audition different gear. And even though the LC isn't cheap, if you compare it to 40 channels — even 10 channels — of its analog counterparts, it seems a bargain.

Why then the trepidation? From a manufacturing standpoint, digital emulations have been making rapid inroads into the market for analog hardware. Some engineers are selling their infrequently used hardware to replace it with software. Digital may not have completely closed the gap sonically (depending on whom you speak with), but many feel that the time is close at hand.

OVERVIEW

When I pulled the LC out of the box, I was shocked by how heavy it was — it feels more like a power amp than a preamp. Looking inside, a large transformer for the power supply and another for the preamp section constitute most of the weight. It's an impressive unit, with 14 rotary encoders, 26 pushbuttons, and no less than 235 LEDs on the 2U front panel.

A front-panel LED indicates whether the transformer is in or out of the circuit. Another switch controls a unique feature called "Session Saver" that allows the LC to monitor the signal at the input and output. If the input is overloading, the gain is

World Radio History

Channel

End of the line for analog preamps?

automatically reduced at the preamp. If the output is overloading, the makeup gain is lowered. An "activated" LED shows if gain was adjusted. This ingenious feature involves no limiting, just gain attenuation in single-dB increments. It's like having a second engineer watching your levels all the time and keeping you out of trouble.

The large LCD shows lots of information, and has corresponding knobs for many of the preamp and compressor parameters. A nice touch is the 12-segment gain reduction meter, with the first seven segments dedicated to the first 3dB of reduction (very useful). For purity, you can bypass unused processing, leaving only the preamp in the circuit.

On the back are XLRs for mic, line, and AES input, and line and AES output. Word clock in and out (BNC), and the Digital Link Bus (RCA) connections are next to the USB port, which connects the LC to a computer.

QUESTION #1

The first question most people ask (including me) is how a digital box can claim to replicate a variety of vintage preamps, with all the varying impedances of hardware units and different mic/pre interaction characteristics? Through the use of a purpose-designed transformer and complex relay circuitry, and resistors and capacitors, the LC's analog front-end can actually change its impedance characteristics and transformer status for each replica.

JUDGMENT DAY

In order to judge whether Focusrite has achieved their goal of replicating analog hardware, I took several armloads of preamps into Nashville's Classic Recording and set them up next to the LC. The signal source was a female vocal recording fed to a speaker in front of a Neumann U67, which then fed the preamps in the control room. I chose the reproduced vocal instead of a live vocalist to eliminate performance variables.

I calibrated everything to within 0.1dB. In doing so, I discovered that the gain settings from replica to replica aren't consistent. So 33dB of gain on one replica may be the same as 27dB of gain on another replica, making it challenging to do comparisons from one replica to another. Focusrite suggests matching gains and writing the resulting levels to memory, then recalling them for auditioning — a time consuming procedure every time a new source is placed in front of the LC.

I proceeded to compare the replicas with the hardware that was "modeled." (Focusrite will *not* state which replicas came from which hardware though the replica names are extremely suggestive.) I recorded the original and compared it to the LC version, and then did two more passes with the harmonics settings maxed out. Both even and odd harmonics share a single knob, which allows adding even harmonics at values 1-8 and odd harmonics at 9-15. These settings, even maxed, are subtle, with odd being the more pronounced effect; it adds more fuzz and grit to the signal. Adding even harmonics at anything less than max was very difficult to hear.

THE BOTTOM LINE

Now we get to the part you've been waiting for: What did the preamp replicas sound like? Honestly, they were far closer to the originals than I ever imagined they could be. I was shocked. Some were almost indistinguishable, while others were very good imitations.

The replicas of tube preamps seemed the farthest from the originals. One of my favorite tube preamps has an impressive, wrap-around quality; a low-end signature in the original that was lacking in the replica. It's not the kind of thing that you could measure on test equipment, but something you just feel, like a warm hug. (I hope you know that feeling.) But on several of the solid-state preamps, whether transformer or transformerless, the two were hard to differentiate. I suspected some digital grit would be the telltale giveaway for the LC, but I noticed none.

Adjusting the harmonics added a nice variety to the replicas and more than once made the replica sound even closer to the original. In the end, I preferred the originals in most cases — with the qualifier that I was listening to a solo voice in a quiet room. In a music track, I'm not sure if I would have been able to tell them apart.

I listened through the remaining 32 preamp replicas (that's a lot of preamps!) and found that, though distinguishably different, there seemed to be a similarity between them — the differences being less pronounced than you would hear between the hardware versions. But the LC's range is far greater when you add the option of the adjustable harmonics, plus many of the

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Focusrite Liquid Channel

The Liquid Channel has a deceptively simple back panel given that it contains the power of 40 microphone preamps, 40 compressors, and a sound-shaping EQ.

originals don't have 80dB of gain on tap.

COMPRESSORS

I was fortunate to have two LCs and was able to audition all the compressor replicas in stereo. Strapping two LCs together is a simple matter of connecting the Digital Link Bus of the master to the slave, identifying the master and slave and turning on stereo link. Once assigned, the slave mirrors everything from the master front panel.

I noticed a difference in update time between master and slave as the settings were changed: When switching the compressor in and out at 192k sampling, the difference was 400ms. At 48k, the difference changed to 301ms. I experimented further and found that when changing a parameter on the master, the slave unit may not "get the memo" that the value is changing until you stop turning the knob. This can result in a slow ramp on one channel and a rapid adjustment on the other. If you're accustomed to reaching over and grabbing a knob while tracking, this could be significant.

Like the preamps, there are 40 replicas of analog compressors. The compressors do sound quite a bit like the corresponding original hardware. Several compressors with which I am very familiar were well represented by the LC. To its credit, the LC replicas that I liked the most were of compressors that I like the most. Some of the comps I am unfamiliar with interested me so much that I have pursued hearing the original hardware versions to see what I think of them. (Not what Focusrite expected, I am sure, for the LC to serve as an expensive auditioning system!)

HEAR FOR YOURSELF

In addition to doing this review of the Focusrite Liquid Channel, Lynn Fuston of 3D Audio, producer of the "3D Mic," "Preamp," and "ADC" comparison CDs, went a step further. He recorded the results of his review tests as 24-bit, 48kHz sound files, resulting in 3D Audio's latest comparison offering *i, replica — the liquid preamps.*

In addition to comparisons with seven analog preamps, there are also samples of all 40 of the preamp "replicas" included in the Liquid Channel. There are 69 WAV files in all, which can be loaded into any DAW for easy A/B comparisons.

The *i, replica* CD is available for $19.95 (+s/h). www.3daudioinc.com/catalog —*Craig Anderton*

EQ

The equalizer offers extreme overlapping frequency bands. The high shelf band sweeps from 20kHz down to 200Hz, and the low shelf band stretches from 10Hz all the way up to 1kHz. The mid band is peaking with switchable Q setting and is sweepable from 100Hz up to 10kHz. The EQ section is switchable to a sidechain, which has a "listen" switch. Boost and cut on each band is ±18dB. The EQ can be routed before or after the compressor. You can choose to show all EQ parameters on the LCD screen.

The manual says it's "loosely based on the classic Focusrite sound of the original ISA 110" and is primarily "designed to allow small amounts of corrective shaping." That sums it up fairly well.

One nice thing: the boost/cut increments for the EQ are in very small steps near 0dB and increase at the extremes. For someone who is frustrated by coarse 1 and 2dB steps in an EQ, this is great. ➤

LIQUID SPECIFICS

Type: channel strip using convolution technology
Price: $3,495
Contact: Focusrite, www.focusrite.com or www.ffliquid.com; distributed by Digidesign, www.digidesign.com

Preamp replicas: 40
Compressor replicas: 40
EQ: 3-band with high/low sweepable shelves and variable-Q mid
Resolution: 24-bit
Sample rate: 44.1 – 192kHz
Frequency response: 20Hz – 20kHz, ±0.05dB, changes depending on replica in use
Signal-to-noise: 120dB
Input gain range: 6 –80dB (mic), ±10dB (line)
Mic preamp noise: –126dB at 80dB gain
Highpass filter: 75 or 120Hz, 12dB/octave
Format: 2U rackmount
Weight: 19 lbs

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24-bit/96kHz Xtended Definition recording

Intelligent "learning" noise reduction

Clean phantom-powered XLR inputs

Cable-free digital routing system

Programmable analog compressors

Guitar amp modeling effects

Sub-mix inputs with EQ

Scrub-style track editing

Beat box with PCM rhythms

4-channel parametric EQ on every track and input

wav file import-friendly

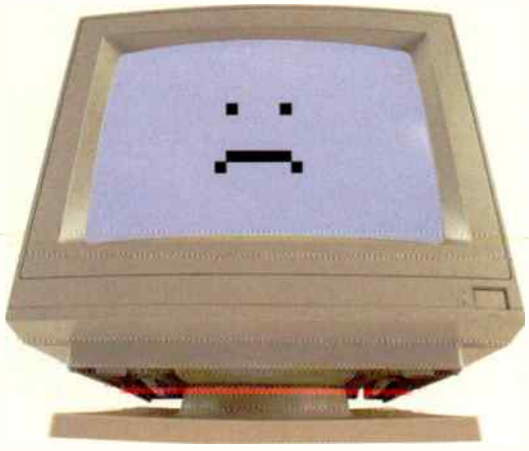
Time compression/expansion

Advanced digital mixer with scene and fader automation

CD-RW burner

Auto-locator with nameable cues

Full complement of programmable master and insert effects



Dream Machine

The D16XD Digital Recording Studio is self-contained, pre-configured, and ready to record, right out of the box. It's everything a computer wishes it could be, but can't. All the advanced recording, editing and mixing features you'd find in a full-blown professional studio are here. Our responsive faders, dedicated knobs and pop-up TouchView interface give you total hands-on control – no keyboard or mouse required. With the D16XD's dedicated operating system, everything works together flawlessly, ensuring reliable, predictable performance. So wake up and start recording in your *own* dream studio.

Now you can track like the masters, capturing the warmth only vacuum tubes can deliver with the new TPB-2 Tube Preamp/Optical Compressor Korg XD Recorder option (shown above). And the rugged, stand-alone TP-2 can be used with any recorder.

The D32XD ups the ante with 32 tracks, over twice the effects, flying faders, a larger hard drive and much more.

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$200 REBATE when you purchase a new D16XD or D32XD between 8/1/04 and 1/31/05. Find out more at www.korg.com/rebate

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CALIBRATION & LATENCY

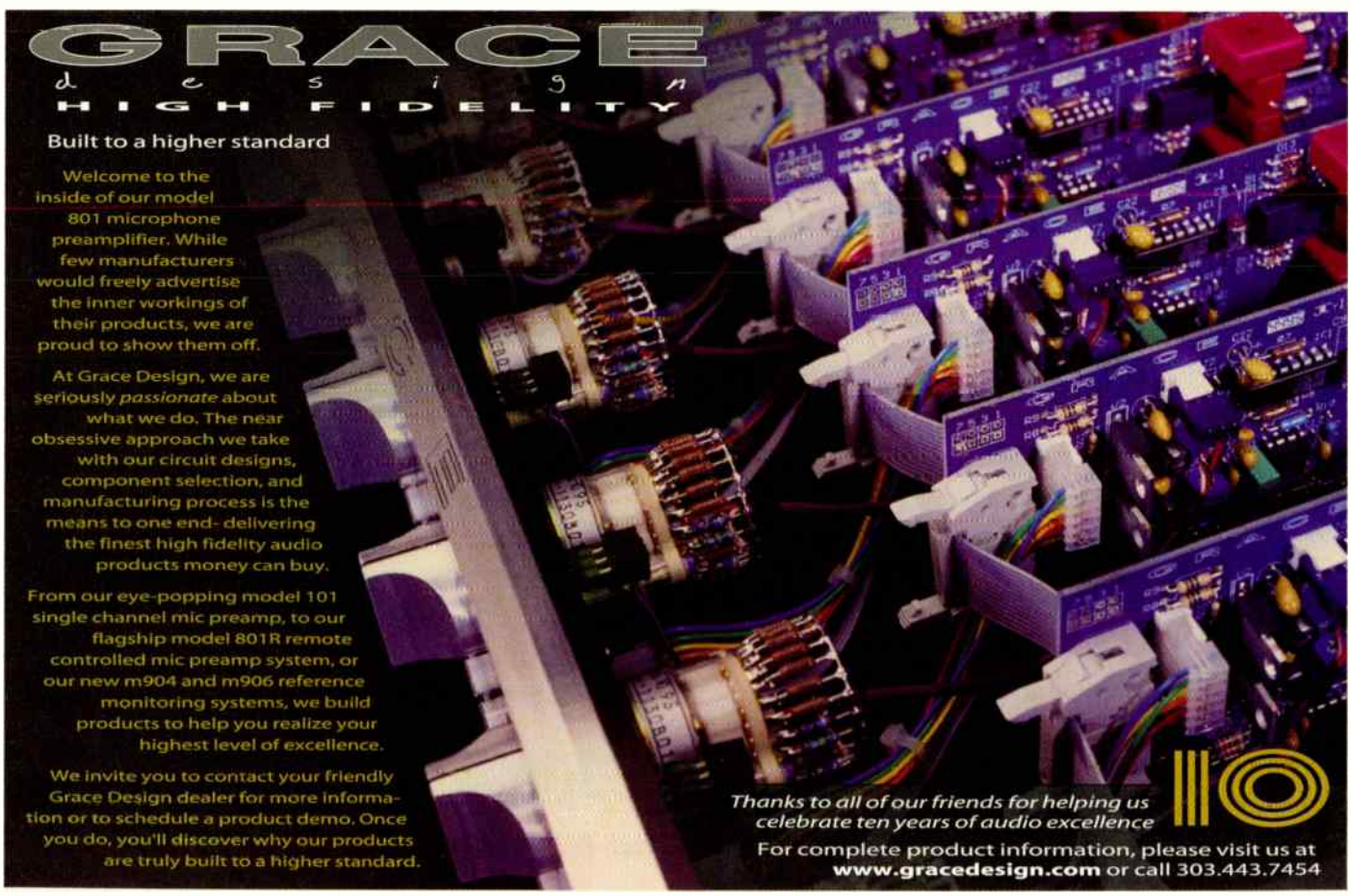
I ran a calibration tone through both review units and immediately noticed something was askew. The output levels from the LCs weren't identical to the input levels. Not only that, but they weren't identical to each other. The master unit output was 0.56dB hotter than the input. The slave unit was 0.73dB hotter than the input. Focusrite designer Rob Jenkins confirmed that the difference was in the transformer windings and there is currently no calibration for it. According to Rob, the gain difference is consistent because the unit uses a relay-switched discrete resistor network. With a single unit, this won't be an issue, but for stereo work it may be noticeable as an image shift.

Then there's that inevitable side effect of digital processing: latency. The LC latency from analog in to analog out is admirably low. (I measured 41 samples at 192k and 179 samples at 48k.) For mono sources, no problem. But in a multimic setup, you may have to compensate to avoid phase cancellations. The engineers that tried the review LC for doing overdubs had no issues with latency at all.

REMOTE CONTROL

For those who like control but don't like reaching for knobs, there's remote control software called LiquidControl that runs on Mac OS X or Windows XP. You can control up to eight different units, backup or restore data, add or remove replicas, and more. Speaking of adding replicas, Focusrite is committed to expanding the library of available replicas and within a month of releasing the LC had uploaded 16 new preamp and five new compressor replicas for free download. ➤

Through the use of complex relay circuitry, the Liquid Channel can change its analog impedance characteristics and transformer in/out status for each replica.



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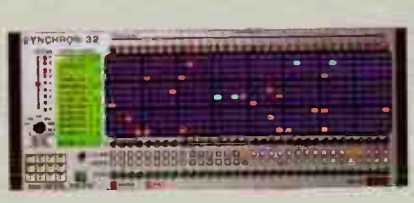
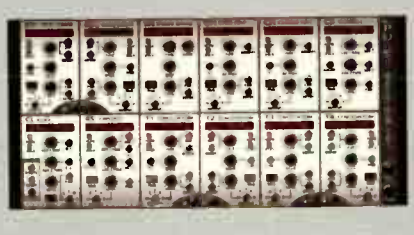
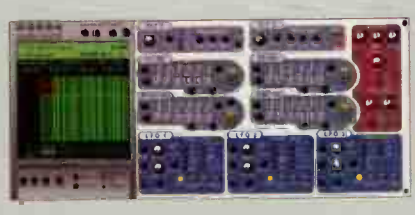
project5

SOFT SYNTH WORKSTATION







"Highly Addictive" – *EQ, June 2003*

Project5 Soft Synth Workstation is the cutting edge tool for the next generation of music production. Project5's dynamic interface combines the best of pattern-based and live-input sequencing, with powerful looping tools– making your compositions come to life faster than ever. Project5 comes loaded with inspiring synths and samplers, creative effects, and professional sample content. Combined with its support for industry-standard effects, synths, and samples* you can take your sound beyond the rack.

"Project5 is meant for those trying to create the in-sounds of now where the groove is king"
– DJ Times, November 2003

"Its instruments and effects are phenomenal"
– Computer Music, May 2003

"There's something about Project5 that just makes music happen"
– Sound on Sound, June 2003

"There's no need to wait any longer, Project5 has arrived"
– Keyboard, June 2003

Experience the addictive qualities of Project5: available at music retailers world wide. Visit **www.project5.com** for more information and to download the demo.

* Supports ReWire™; ACID™-format loops; DirectX & VST™ Effects; DXi & VSTi™ soft synths; and AIF, Akai™, Kurzweil™, LM4™, SF2™, WAV samples

cakewalk

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Focusrite Liquid Channel

THE VERDICT

So is the LC a winner? For those engineers who want lots of options but don't have lots of cash, the LC will fit the bill. For those unfamiliar with the sounds of many hardware units, the LC will help train their ear to hear differences. The sound of the preamp is very good, even without the replicas, and all the functions of the LC are very useable. The build quality and design are first rate. The digital encoder knobs are comfortable and work well. The "LEDs per square inch" ratio is sure to impress artists and clients alike. All in all, I think the LC is a useful and revolutionary box.

THE SURVEY SAYS

To get some alternate opinions, I had several other engineers listen at their own studios; here's the results:

Engineer #1: couldn't tell the originals and replicas apart
Engineer #2: picked the replicas out reliably
Engineer #3: felt that the LC replicas were flat and 2-dimensional
Engineer #4: preferred the sound of the replicas (with full-tilt odd harmonics) to the original hardware every time

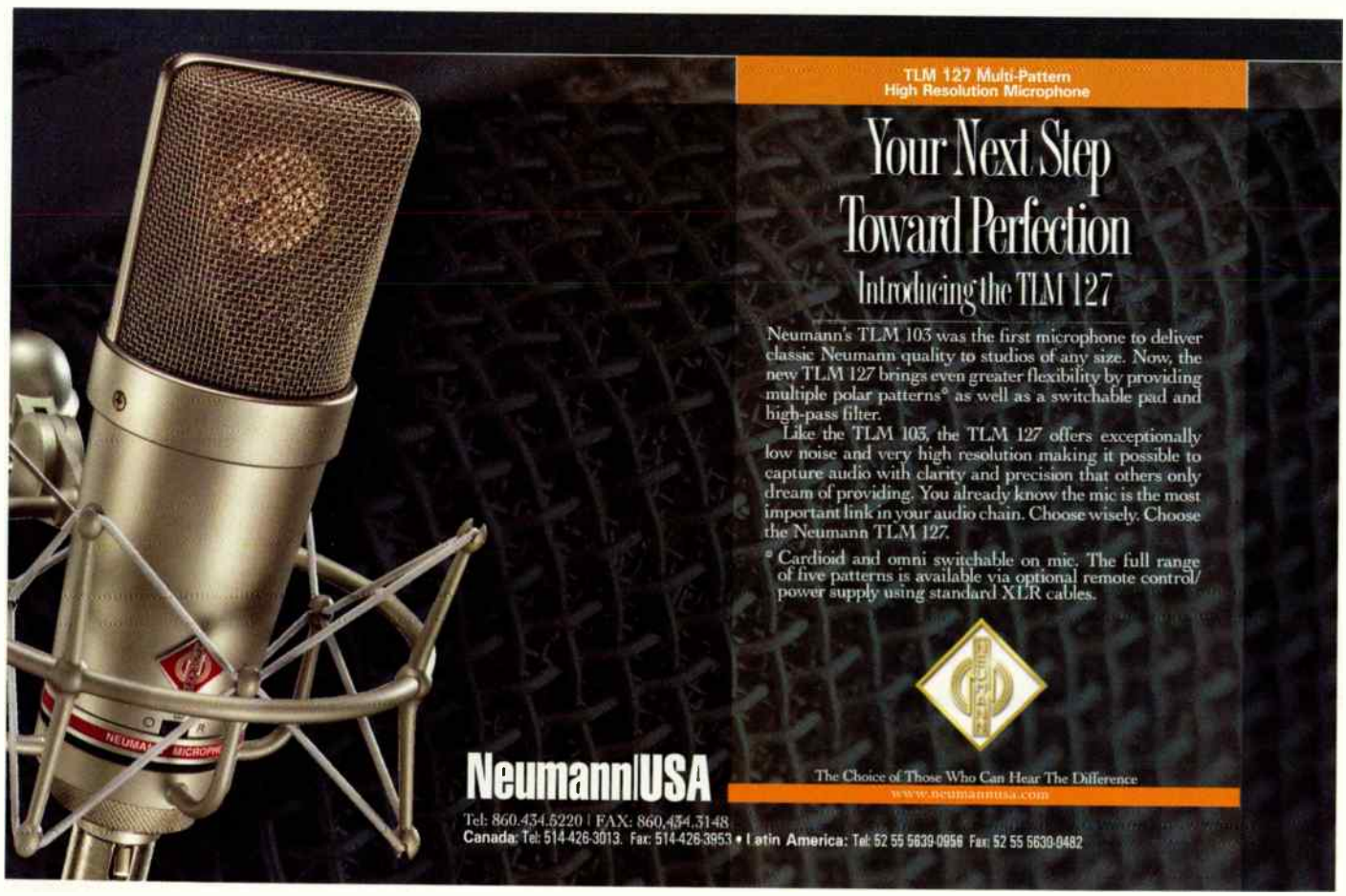
For innovation, I give the Liquid Channel five stars. Nothing like it has been done before and it certainly succeeds where other modeling software has not. Oddly, I don't think that sales of the LC will sacrifice many hardware sales. It will serve as a great starting point for many engineers who will eventually desire more and more of the actual hardware. Ultimately, the LC will be another valuable item in a studio's toolbox and will enable people to experience options they've never heard and variations that have never existed. EQ

Strengths:

- **Preamp replicas range from good to shockingly accurate**
- **Session Saver works well**
- **Complete channel strip with preamp, compressor, and EQ**
- **LiquidControl software**
- **Save and recall all settings**
- **Plenty of gain**
- **Up to eight Liquid Channels can be linked**
- **Growing replica library**

Weaknesses:

- **Gain is inconsistent from replica to replica**
- **Solid-state replicas are more convincing than tube replicas**
- **Small level disparity between units**
- **Control update latency when linking units**



World Radio History

Is Customer Service Dead?

Not if you're smart about where you buy gear

by Adam Cohen

Sweetwater sales engineers take the time to fully explain the gear they sell to their customers — in person or on the phone

Buying musical equipment in 2004 is quite a bit different than it used to be. Music technology is more complex now than at any other time in history, and yet we as consumers have less and less access to knowledgeable people to help us sift through the choices out there or help us get our gear up and running once it's in our studio.

When mom-and-pop music shops ruled the retail landscape, this sort of customer service was commonplace. The folks at your local music store would get to know you and what you did and didn't like, and would help you make decisions about what to buy. If you had questions about how to use something they sold you, chances are they could help you figure it out and, maybe more importantly, were willing to help you figure it out.

THAT WAS THEN, THIS IS NOW...

These days, that level of customer service is largely a thing of the past. While the rise of huge national chain stores has lowered the cost of the average gear purchase, it has also conditioned you to expect the same dismal level of customer support you get at the local discount warehouse. As long as there is a warm body that can point you in the direction of that 5-gallon jug of mustard (or the Guitar Department), you've gotten precisely the level of customer service you expect. The level of "service" one can expect from most mail order or Internet retailers is even less inspiring.

So with music technology becoming more and more complicated, and retailers becoming less and less able to help you figure out what to buy and how to use it, where should you turn? There is one retailer that still believes that customer service is not only important, but the cornerstone on which to build a business, and that retailer is Sweetwater. While others may say they offer great service, Sweetwater actually does it, by hiring only the best to staff their sales department, and backing up their pre-sale advice with post-sale support.

RETAIL DONE RIGHT

You may think that this sort of service would come at a high price, but the reality is that due to their size, Sweetwater is able to offer the same sort of deep discounts as other big retailers AND a level of support that doesn't exist elsewhere. It's as much about their customer service philosophy as anything else — from the receptionist answering the phone to the shipping specialist who packs your order, everyone at Sweetwater is focused on providing the customer with the best experience in music retail.

This fanatical attention to customer service is most evident with Sweetwater's sales staff. Each sales engineer goes through extensive, ongoing product training, augmenting their heavy-duty real-world experience with the latest information about the products they sell.

For Sweetwater, customer service doesn't end once the sale is made. They've invested heavily in staffing and training a technical support and service department with over two dozen music technology experts capable of helping customers use the gear they buy at Sweetwater or repair it if the need arises.

Sweetwater customers have unlimited free access to the technical support department, which supports every brand of gear they carry, making Sweetwater a one-stop tech support shop for complex multi-manufacturer setups. Todd Tatnall, one of Sweetwater's senior support technicians, says "with today's computer-based music systems, it's very easy for end users to find themselves amid a sea of manuals from a half-dozen hardware and software companies, wondering why their virtual synth isn't responding to their MIDI controller, or why they're only getting 6 tracks of playback on a system that's supposed to deliver 32 tracks or more. We handle these sorts of issues all day, six days a week, so we're usually able to get a customer up and running in no time."

So whether you're looking for a retailer with the gear you want in stock at great prices, the willingness and expertise to help you make decisions about what to buy, or someone that will be there to help you get your system up and running once it's in your studio, Sweetwater is the place to call. They can be reached at (800) 222-4700 or visited online at www.sweetwater.com

"Over the years, my friends at Sweetwater have always been able to help me stay on top of the latest developments in Music Technology. They actually use much of the gear they sell, so I'm always able to get great advice about how a given product will work in the real world."

Jon Slote

World Radio History

SNOW STORM

AN X-MAN'S HOME-STUDIO BLISS

by Lisa Roy

The phenomenal success of *The X-Files* and *Millennium* also brought television and film composer Mark Snow to the public's ears. But the composer's haunting themes and scores for the sci-fi/horror series represent only one facet of a wide-ranging and eclectic life in music. He has, in fact, composed for hundreds of television series, movies, and feature films, and in virtually every genre. In the process, he has been nominated for 11 Emmy Awards, and has won nearly two dozen ASCAP Awards, including ASCAP's "Most Performed Background Music on Television" award (seven years running).

Born in Brooklyn — the son of a professional percussionist father and a piano-playing mother — Mark began piano lessons at age 10, before going on to master drums and oboe. From the New York Music and Art School, he went on to the prestigious Juilliard School of Music, where, in 1968, he co-founded the New York Rock and Roll Ensemble with longtime friend and Julliard roommate, composer Michael Kamen. The band signed to Atlantic Records, released five albums, and performed at some of the country's hippest venues with the likes of Sly and the Family Stone and Janis Joplin.

On the advice of his wife, Glynn, the sister of actors Tyne Daly and Tim Daly, the Snows moved to California. Mark was soon at work scoring TV shows and pilots for Aaron Spelling, and managed to score nearly every major hit TV series throughout the '70s and '80s, including *Starsky and Hutch*, *Hart to Hart*, *Dynasty*, *Falcon Crest*, *T.J. Hooker*, and *Cagney and Lacey*.

As the story goes, Glynn was also instrumental in helping bring about the now instantly recognizable *X-Files* theme. Series producer Chris Carter felt the composer was on the right track with a few keyboard arpeggios played through an echo device. But when Mark had his wife whistle the melody — which was then sampled and doubled using an Ensoniq Proteus module—the future international TV sensation had truly found its theme tune.

Most recently, working from his home studio, Mark has scored *Bereft*, a new film from directors Clark Mathis and Tim Daly (which had its world premiere at the Tribeca Film Festival in New York), as well as the CBS telefilm of *Helter Skelter*, based on former prosecutor Vincent Bugliosi's classic book about Charles Manson and his "family."

EQ: How long have you been composing, recording, and mixing in your home studio?

MARK SNOW: Since 1985.

So you're one of the originals!

Yeah.

Tell me about your current studio.

It's in my home in Santa Monica, California. It's a one-man garage band situation. The main device I use is a Synclavier. When

MARK SNOW'S HOT NUMBERS

1968
The New York Rock and Roll Ensemble, *The New York Rock and Roll Ensemble*

1972
Freedomburger (film soundtrack)

1986
Jake Speed (film soundtrack)

1996
Songs in the Key of X: Music From and Inspired by The X-Files (*X-Files* theme)
The X-Files: The Truth and the Light

1997
20,000 Leagues Under the Sea (TV score)

1998
Disturbing Behavior (film soundtrack)
Sci-Fi's Greatest Hits Vol.2: Dark Side ("Nowhere Man" and *X-Files* theme)

1999
Crazy in Alabama (film soundtrack)
Mark Snow, The Snow Files: The Film Music of Mark Snow

Photo: Andrew Papastephanou

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I got the Synclavier, I didn't know a thing about it. But, for some reason, I thought, "Gee, what's cool about it is you get *one* keyboard." At that time, everybody had racks of keyboards and wires coming out — like Frankenstein's laboratory or something. However, it did take me a couple of years to get the sounds where they sounded musical instead of just electronic.

A lot of people think the Synclavier's sequencer is not so great — and some of it *is* old-fashioned — but the sound is really still amazing. There are a few guys who still have them, and I'm lucky enough to know some people who service the thing. I have a few Synclaviers, and I use them in conjunction with two TASCAM GigaStudios.

In addition, I often depend on Native Instruments Absynth, which is a synth/computer virtual thing with tons of cool analog and digital synth sounds. Then there's Spectrasonics Atmosphere, which is a similar kind of program, but with a lot of ambient sound design-type things, and Yellow Tools Culture, which offers different types of virtual computer synth percussion.

I have a Mackie D8B mixing console, and I also have these Tannoy Gold speakers — they don't make them anymore, but they sound amazing. I was first introduced to them by Mick Guzauski, who mixes on them. My mixer, Larold Rebhun, has exactly the same stuff I do. He's so brilliant! He can make that Mackie board — which is pretty modest — sound amazing, and he knows how sounds translate to TV.

How do you and Larold typically work together?

Everything is saved in the Synclavier, as well as on my Mac G5. So I have all these individual pieces, and I just e-mail the stuff to Larold, who lives about 80 miles away in Canyon County, CA. He does a Pro Tools session, sends it to the mixing the stage, and away we go.

How much of your work is done at home?

I would say 99 percent is done here in my home studio. I don't do a ton of live recording at my place — typically just two or three people playing live violin or guitar or woodwind. I did a game for Sony where I had a 100-piece orchestra up at Skywalker Ranch — and Larold was right there with me — which was great, but the week-to-week stuff is mostly all home grown.

If you had to play devil's advocate, are there any *disadvantages* to doing 99 percent of your work at home?

Well, just that you're sort of a white-collar prisoner in a way. You come downstairs to your workspace, and that's it. When you're doing a show like *The X-Files* or *Smallville*, there's a ton of music to do. That's a lot of days — and, sometimes, a lot of weeks — and you're trapped in your studio doing it. It's a little creepy being alone.

Part of your process is wearing multiple hats as composer, musician, and arranger. Is it fair to add producer and engineer, as well?

Well, I'm definitely *not* an engineer! Every time I record something that I think sounds good, the music editor will call back

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and say, "Man, what are these clicks and pops? What the hell are you doing?" And I have to ask, "I didn't hear that. Where are they?" [*Laughs.*] So I said, "Okay, Larold — that's it. I'm not doing any engineering!"

What can you tell us about working on director Tim Daly's new film?

He's my brother-in-law, and I was thinking, "Oh no, this guy's a director now, and he's going to come over and talk to me like I seriously work for him!" But he was cool. He was able to say, "I'm not crazy about this part," and I was able to say, "Okay," and it worked out really well. He wasn't creepy, we were both collaborative, and it was really fun. I'm really, really proud of some of that music.

After that, I did this recent CBS remake of *Helter Skelter*, where the music was all sort of industrial, dark, and depressing. I used a solo female vocalist for moments of redemption or moments of hope or possibility, but most of it was dark and rhythmic — almost like machines breathing. Plus, I did a remake of the song "Helter Skelter" with genius Larold at Glenwood Place Recording [Glendale, CA]. He got some guys who were real Beatles nuts, and they just made it sound amazing. For that session, everything was recorded and mixed at Glenwood.

There are a couple of other things cooking, as well. ABC is talking to me about a miniseries about gladiators called *Empire*.

What do you consider yourself, first and foremost?

A composer first, and then a player. My first instrument was the oboe, and I was also a drummer. I'm not a brilliant performing keyboard player, but I'm certainly good enough to do all the stuff I need to do. EQ

LAROLD REBHUN ON SNOW'S GEAR

"The key ingredients include a Synclavier PSMT, two TASCAM GigaStudios, E-mu Proteus 2/Orchestral and 2000, four Roland S760 Samplers, a Korg Wavestation SR, and a Kurzweil MicroPiano," says Rebhun. "Software tools include Emagic Logic Pro, Digidesign Pro Tools LE, Native Instruments Absynth 2, Yellow Tools Culture, Korg Legacy, and Spectrasonics Atmosphere.

"The audio devices include a Mackie D8B console, a Digi 002, an Emagic AMT8, a Summit Audio Dual Program Equalizer and a DCL-200 Compressor/Limiter, and a Funk Logic AP-302 Algorhythmic Prosecutor. I monitor on Yamaha NS10s and Mark uses Tannoy 12 Golds. We use a Neumann TLM-170 for the odd 'real' instrument, and we record to a Sony PCM 800. Effects include an Alesis Quadraverb 2, Lexicon PCM70, and a Sony DPS-D7 delay and Sony DPS-R7 reverb.

"The basic process is that Mark e-mails his music files to me, and I mix everything at my place, where I have the identical setup as Mark. I record the tracks right in Pro Tools, mix through a Manley Vari-Mu and a Summit Dual Program EQ, and burn a CD on an Alesis Masterlink, an Otari CDR-18, or some other drive. Clock is from an Apogee Big Ben. I check mixes on a set of Genelec 1031As, and I generally do a simple two-track mix. If some elements need to be split out on separate tracks, I'll do that, but everything usually goes down to stereo. Then, someone picks it up from my doorstep, and, like magic, it's on the air in a few days.

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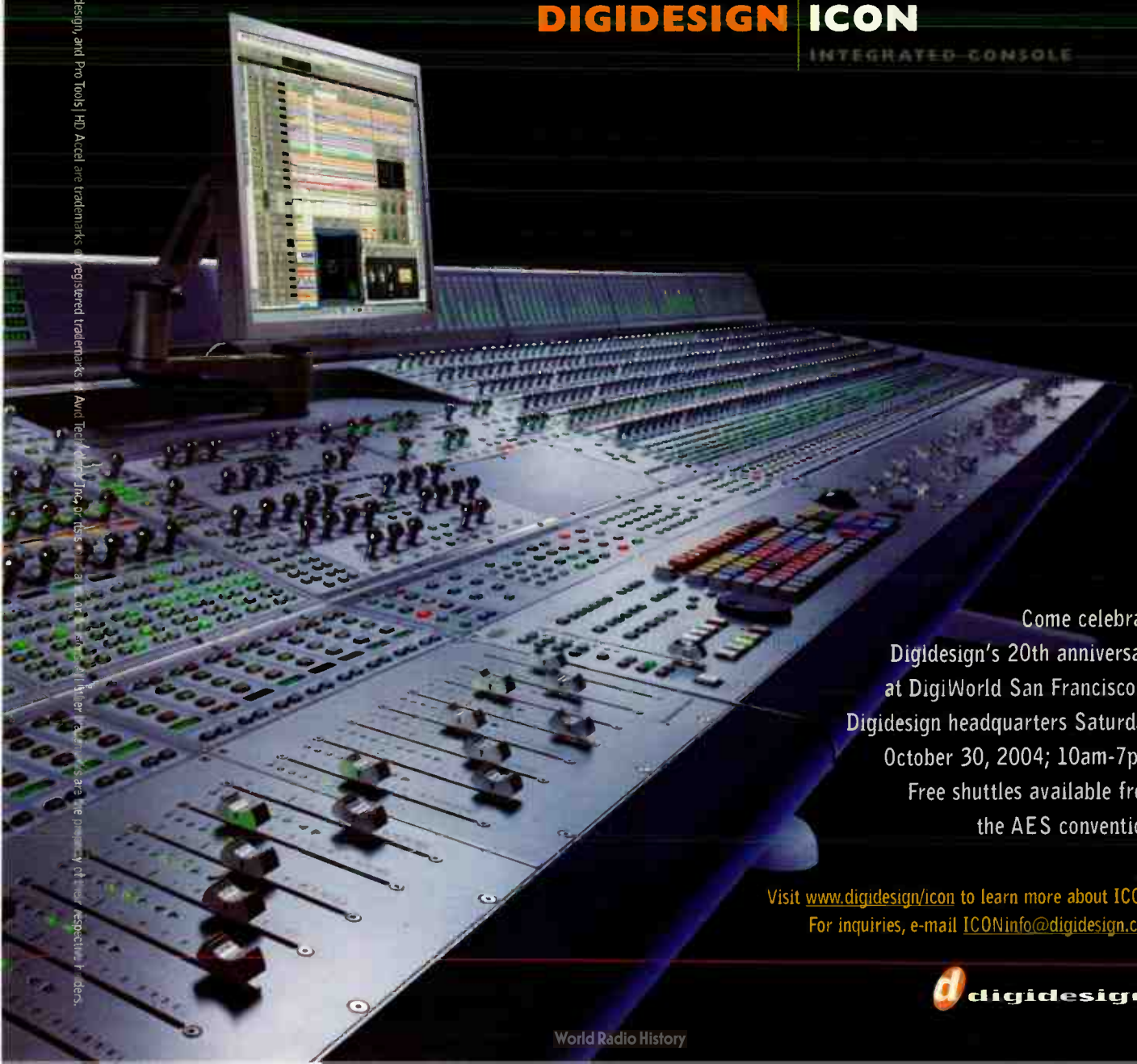

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LIVEN UP YOUR ELECTRONIC DRUMS

A FEW TWEAKS CAN MAKE YOUR DRUM PARTS REALLY BREATHE

In today's rhythm-based music, there's nothing worse than a dull drum pattern that doesn't do what it's supposed to do: Get people moving! Even if you come up with a good part, though, what about your sounds? Real drums have complex timbre changes that add excitement; if you want electronic drums to have the same kind of excitement, you need to create those timbral variations yourself.

Fortunately, today's soft synths, samplers, and groove boxes have rich editing options. By tweaking a few parameters, you can create more expressive, powerful, and personalized sounds. Here are some of my favorite drum tweaks.

PITCH SHIFTING

Pitch control parameters are very useful. You can:

- Accommodate different musical styles. Some house music pitches drums lower, whereas drum 'n' bass often pitches them up. You may not need a new set of samples — try retuning the ones you have.
- Create multiple drum sounds from one. Want to play a 2-hand shaker part, but you have only one shaker sample? Copy it, then detune the copy by a semitone or so to provide a slight sonic variation. Detuning can also create a family of toms out of one tom sample.
- Tune drums to the song's key, particularly with toms and resonant kick drums (such as the famously overused TR-808 "hum drum"). If the kick is out of tune with the bass, the sound can be muddy, and weaken the entire rhythm section. If fine-tuning isn't available as a control (sometimes you can change tuning only in semitones), you may be able to feed in a constant amount of pitch bend instead.
- Use radical transpositions to create new sounds. Most drum boxes don't have a gong sound, but here's how to create one. First, take your longest cymbal sound and detune it by 12 to 20 semitones. Create another version of the cymbal and detune it by about 3 semitones. Layer the two together; the slightly detuned cymbal gives a convincing attack, while the extremely detuned version provides the necessary sustain.
- If your drum sound source can assign velocity to pitch modulation, you can increase dynamics by programming high velocity levels to add a very slight upward pitch shift. This works best if you apply velocity to the pitch envelope amount, then modulate the drum's pitch from the envelope. This way, after attacking at a higher pitch, the drum will fall back to the normal pitch. A small increase emulates a drum's skin being stretched, hence pitched higher, when it's first hit.

CHANGING THE SAMPLE START POINT

Altering a sample's start point under velocity control can add convincing dynamics (see Figure 1). Most drum machines won't do this, but many synths and samplers will. Generally, you set the initial sample start point several tens, or even hundreds, of milliseconds "late" into the sample so it's past where the attack occurs. Now assign *negative* velocity to modulate the sample start point. At low velocities, you don't hear the signal's initial attack; higher velocities kick the sample point further toward the beginning, until at maximum velocity you hear the entire attack.

If you already have a good MIDI drum part but it lacks dynamics, you can add sample start modulation after recording. Overdub a controller track using a mod wheel or MIDI fader, and assign the controller to sample start time.

FILTER MODULATION

For additional dynamic control, assign velocity to filter cutoff so that hitting the drum harder produces a slightly brighter sound. This gives extra emphasis to the hardest hits, making the drums feel more "alive." Soft taps will sound a bit muted.

HI-HAT AMPLITUDE ENVELOPE DECAY MODULATION

One of the most annoying "features" of electronic drums is the hi-hat. A real drummer is constantly working the hi-hat, opening and closing it with the pedal, but the electronic version is an unchanging snapshot. Sure, you can program a combination of open, half-closed, and closed hi-hat notes, and assign them to a mute group (see below) so each will cut off the others, but programming a rhythm with three hat sounds is boring, and doesn't always sound that realistic.

A more expressive option is to use a MIDI controller, such as mod wheel, to

Fig. 1: The highlighted section of the virtual front panel for Native Instrument's Battery drum plug-in shows the controls for modulating, setting, and monitoring the sample start point. (Note: I've modified the front panel graphic to focus attention on the sample start point elements.) On the waveform display, the red line indicates the initial sample start point, as set by the Start control. In the Modulation section, velocity is modulating Sample Start by –92, so higher velocities cause more of the attack transient to be heard.

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vary an open hi-hat sound's envelope decay time. Close the decay for a closed hi-hat; as you increase the decay, the hi-hat opens gradually. I usually play the hi-hat note with my right hand and move the mod wheel with my left, but this is also an operation that lends itself well to "post-processing" — record the part, then overdub the controller changes necessary to create a more expressive track.

OVERDRIVE

Most drums have a quick initial attack, followed by an abrupt decay. Adding a little bit of overdrive distortion will "crunch" the attack's first few milliseconds, while leaving the decay untouched. You can do this with an overdrive or distortion plug-in, or modify the sample itself using a digital audio editor (Figure 2), then load it into the drum module. This affects the sound in three important ways:

- You can raise the overall average level of the drum for a louder perceived sound, because the overdrive effect will limit the percussive attack. This is like using a dynamic range limiter.
- It creates a short period of time where the sound is at its maximum level, thus contributing a feeling of "punch."
- It increases the attack's harmonic content, producing a brighter attack.

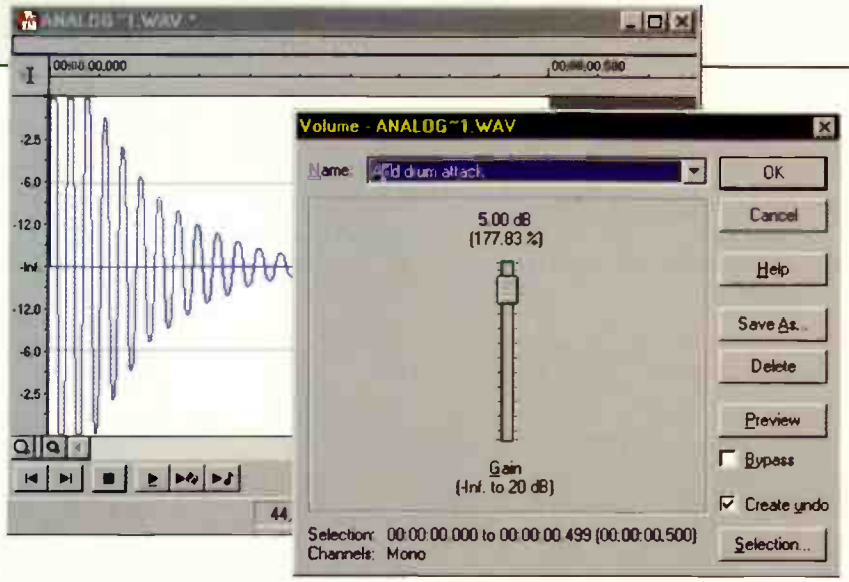

Fig. 2: Increasing gain in a digital audio editor will "crunch" the initial transient.

MUTE GROUPS

When drums are assigned to a mute group, hitting a drum that's part of the

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group will cut off any other drum from the group that's still sounding. This is mostly intended for hi-hats, so that playing a closed hi-hat sound will shut off an open hi-hat. But there are other uses for mute groups:

■ Assign toms with long decays to the same mute group. Too many simultaneous tom decays can muddy up a track. When you assign them to the same mute group, not only do tom rolls sound cleaner, but you conserve polyphony.

■ If you have some rhythmic loops loaded into your sampler along with individual drum sounds, make the loops part of a mute group (assuming, of course, you don't plan to layer them). This is particularly important if you're playing live. Suppose you have a bunch of four-measure loops, but you're hitting a build and you want to switch quickly between the first measure, or first two measures, of various loops. Assigning loops to the same mute group means you can start them whenever you like, knowing that the other ones will shut up when you do.

SINGLE-CYCLE LOOPING

This sampling-oriented trick can turn a quick hit into one with a looooooooong decay, particularly with toms and kicks.

Loop a single cycle in the drum's decay tail so it repeats indefinitely. Then, apply an amplitude envelope to give the decay the desired length. Try different individual cycles for looping; they may appear almost identical in the waveform display, but some will usually loop better than others, and the harmonic content may differ as well. Also try adding some pitch shift to the decay so it goes lower in pitch as it decays.

CLICK LAYERING

Sometimes modulating an existing sample just isn't enough to create serious dynamics. This is where a click sample or sound can come in handy.

For samplers, create a click sample. I made mine by simply drawing some spikes in a digital audio editor for about 35ms, and saved that as a file. With synthesized drums, you can make a good click by applying maximum, extremely short pitch modulation to a white noise source or buzzy oscillator, then impose a very quick amplitude decay.

The goal is to layer the click with another sound, such as kick. But choose a velocity curve where the click is very quiet at lower velocity levels, so that the click appears only in the upper dynamic range of the sound with which it is layered. As you play harder, the click will become more audible, adding punch to the drum sound. A little lowpass filtering on the click will help blend the two sounds to taste.

Remember, machines don't make dull music — people do. If you want your drum parts to really grab your listeners, use some of these tricks to help your sounds come alive. EQ

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(Okay. That's a lie. We totally did.)

When you pay thousands of dollars for a "boutique" studio microphone preamp, you should expect a tight, focused high end, superior ambience retrieval, detailed lower bass octaves, and a highly articulated midrange. In short, it should give you the most from any mic you plug into it.

Not coincidentally, that's also what you get with Mackie's new Onyx 800R 8-Channel Premium Microphone Preamp — at a decidedly less boutique price. The no-compromise Onyx 800R features new high-performance analog circuitry developed specifically for 192kHz audio, coupled with the finest A/D converters on the market, giving you impressive specs like 123dB dynamic range and an amazing 0.0007% THD. The 800R also gives you tweaky features like a Mid-Side Decoder and Variable Mic Impedence control, which lets you "tune" the preamp to any connected microphone.

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SUMMER NAMM 2004

By Craig Anderton

I just can't be blasé about trade shows. I still get my kicks checking out gear, accompanied by the din of what sounds like a thousand radios playing simultaneously — all tuned to different stations.

But 2004 was the last **NAMM in Nashville** (it's Indianapolis for 2005 and Austin for 2006), so there was a certain inescapable lame duck quality. Officially, NAMM said they were running out of space; but the Gaylord Entertainment Center arena, normally the home to lighting, pro audio, and DJ gear, was closed this year. And with the on-again/off-again economy, a lot of companies decided to forego the trip and spend their bucks elsewhere.

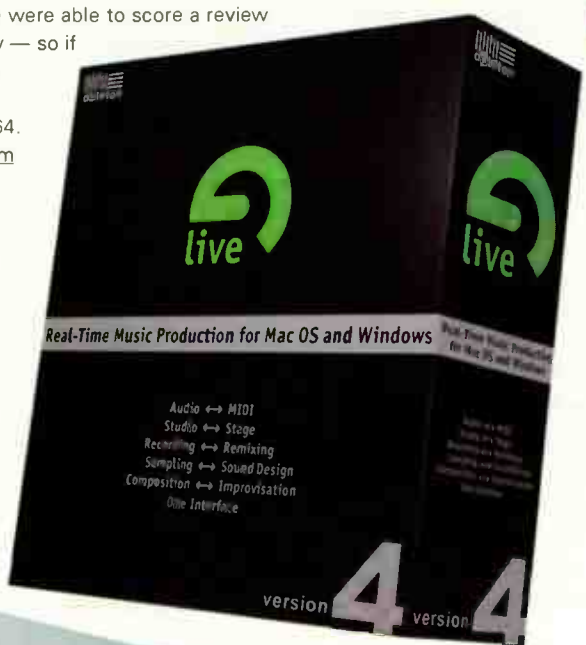
Yet despite all that, the bright spot was that for those with new products, the signal-to-noise ratio was very high. Case in point: At Winter NAMM, Ableton's update to Live 4 would have been filed under "okay, another update." But with the sparse software presence, this brilliant program got the attention it deserved. And the booths of high-tech companies that did attend, such as Yamaha, TASCAM, E-mu, Korg, M-Audio, Roland, Sony, Native Instruments, IK Multimedia, etc. were always packed.

So all in all, it wasn't the trade show to end all trade shows . . . just the trade show to end Nashville Summer NAMM. Let's look at what made the headlines.

THE SOFTWARE STAR OF THE SHOW: **ABLETON LIVE 4.0**

Either you "get" **Ableton Live**, or you don't. It started life as a live performance tool for those who thought like DJs, but over the years, has added linear recording, new types of audio editing, and support for protocols such as ReWire. In the process, it's gone from obscurity to amassing a large and devoted following. When sequencer manufacturers look over their shoulders, this is the program they see.

Best of all, we were able to score a review copy at the show — so if you want the full story, go to the review on page 64. www.ableton.com



SPEAKING OF VIDEO . . .

Korg's PAL/NTSC-compatible **krossfour** 4-channel video mixer/switcher (**$900**) is designed for VJs, but it'll probably end up doing duty for a lot of music videos as well. The krossfour can assign any of up to four video sources to either of two mixer channels; each channel also has a hold button for freezing images, and can produce solid color backgrounds for transitions and mix effects. A DJ-style crossfader (with four crossfader curves) blends these two channels. The krossfour also features both composite and S-video main outputs, as well as Luma-key and Chroma-key (blue screen) compositing effects. www.korg.com

Auralex TruTraps

The TruTraps Broadband Absorption System sits off the wall, creating an airspace between the passive absorber and the wall that increases low-frequency effectiveness. www.auralex.com

- Available in charcoal, burgundy, and purple colors
- Includes panels sufficient for covering 120 square feet, spacers, and liquid adhesive
- Highly cost-effective, especially at frequencies below 250Hz.

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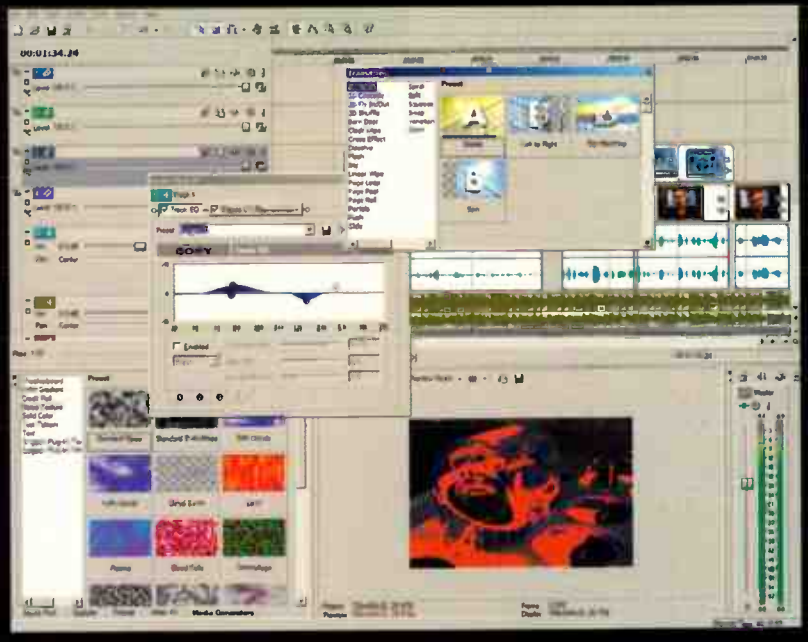
Sennheiser EH-Series Headphones

The EH150 ($59.95) and EH250 ($99.95) are sealed-design headphones, while the EH350 ($139.95) has an open-air design. www.sennheiserusa.com

- Efficient design allows use with low-level, –10dBV unbalanced output signals
- 10-foot oxygen-free copper cables
- The EH150 and EH250 offer drastically reduced outside noise interference

STAR-MAKER SOFTWARE OF THE SHOW: SONY VEGAS+DVD PRODUCTION SUITE

Sony set up a room where rock videos were being made with their **Vegas+DVD Production Suite** ($999), which includes Vegas 5 Audio/Video editing software, DVD Architect 2, and a Dolby Digital AC-3 encoder. Their point was clear: Get the suite, and go beyond making music to making music videos — then burn the whole thing to DVD. I'd bet many showgoers didn't realize how simple this process really can be, until they saw the fluidity and ease of use that has always been a Vegas hallmark. www.sony.com



Peavey PV Series Mixers

Cost-effective mixers include 3-band EQ and both XLR and 1/4" inputs on every channel. www.peavey.com

- **PV 6:** Four channels, 48V phantom power, two mono/two stereo ins, TRS/RCA outs, **$109.99**
- **PV 8:** Six channels, 48V phantom power, four mono/two stereo ins, TRS/RCA outs, inserts on mic channels, **$155.99**
- **PV 10:** Eight channels, 48V phantom power, six mono/two stereo ins, XLR/TRS/RCA outs, built-in digital FX, inserts on all channels, **$299.99**
- **PV 14:** Twelve channels, 48V phantom power, ten mono/two stereo ins, XLR/TRS/RCA outs, built-in digital FX, inserts on all channels, **$369.99**

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Peavey Dual DeltaFex

1U rackmount effects box has two "engines" configurable as stereo, dual mono, series, parallel, or sum mono effects operation. www.peavey.com

- Reverbs, delays, phase shifter, compressor, pitch shifter, chorus, flanger, phaser, tremolo, rotary speaker, distortion, exciter, vocal eliminator
- Sum mono works like dual mono but combines the two effects into a single stereo out
- All effects are programmable via two individual parameters and wet/dry mix

Yamaha MY16-mLAN Expansion Card

This Mini-YGDAI card provides the interface hardware and connections required to link Yamaha 02R96 or 01V96 digital mixers to an mLAN network. www.yamaha.com/proaudio

- 24-bit/96kHz compatible
- Provides up to 16 channels of audio I/O.
- Bundled mLAN Patchbay application software provides audio and MIDI signal routing on Mac/Windows XP systems, eliminating the need for extra PCI cards or interface hardware

SURPRISE! COMPUTERS AT NASHVILLE?

Considering Nashville NAMM's rep as a guitar show, it was surprising to see not one, but two computer companies with truly high-power offerings designed specifically for music applications.

Alienware showcased their **Ozma** line of digital audio workstation hardware, which now includes an extremely cool-looking (and powerful) laptop. The desktop systems feature 24/7 tech support, front-accessible USB ports, quick-release hard drive cages, upgradeable chassis architecture, and careful attention to thermal management. The basic computer is fully configurable, and supports single or dual processors (Intel or AMD) and up to 2GB of system memory. Watch for a review of their laptop in an upcoming issue of *EQ*. www.alienware.com

In the next booth over, Digital Audio Wave debuted their **DAWin G5000** line of digital audio workstations based on Intel's 925X Express Chipset and Intel Pentium-4 HT (Hyper Threading) processor model LGA 775. Designed for minimum noise, this desktop system also features hot plug capability (swap hard drives while your PC is running), 800MHz front side bus, eight USB 2.0 ports, two FireWire ports, and Intel HD Audio technology's eight independent DMA audio engines.

Digital Audio Wave also showed the **DAWin64M**, a laptop based on AMD's 64-bit Athlon Mobile Processor that can deliver more than three hours of run time on a single battery charge. It includes a 128-bit integrated DDR memory controller, and the largest available on-die cache memory (1.152MB) for laptop PCs. www.digitalaudiowave.com

SE ELECTRONICS RAISES U.S. PROFILE

The maker of these Chinese mid-priced mics has now set up wider U.S. distribution. New offerings include the **Gemini** cardioid-pattern mic (**$1,499**), which uses a two-tube design (one 12AX7, one 12AU7) and features a 1.07" gold-sputtered diaphragm and transformerless balanced active output. It comes in a flight case with power supply, cables, and shock mount. Another new model, the **Z3300a** (**$599**), is a Class A multi-pattern (cardioid, omni, and figure 8) studio condenser mic with a 1" gold-sputtered diaphragm, 100Hz filter, and 10dB pad. The package includes an aluminum flight case and shock mount. www.sonic-distribution.com

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CONTROL YOUR SOFT SYNTHS

The Alesis **Photon X25** USB/MIDI two-octave keyboard controller includes an X/Y joystick, 10 high-resolution 360-degree knobs, 10 buttons, an "AirFX"-type controller dome, velocity-sensitive keyboard, 24-bit/44.1/48kHz audio interfacing, pitch bend and mod wheels, LCD screen, and battery/USB/external adapter power. It also allows for user customizable, front-panel templates when controlling devices such as soft synths or virtual mixers. www.alesis.com

Korg Legacy Collection Updates

Several enhancements have been made to the Korg Legacy collection of soft synths (free update to registered users at www.korguser.net).

- Edit multiple steps of a Wavestation wavesequence simultaneously
- A "snap" function sets the duration of steps in a wavesequence to a note value (1/4, 1/8, 1/16, etc.), as determined by MIDI clock
- The MS-20's list of available external modulation Patch Point parameters has been expanded

IK Multimedia AmpliTube Live for Windows

Stand-alone guitar amp emulator ($99) for Windows was previously available only for Mac OS X. www.ikmultimedia.com

- Package also includes the AmpliTube LE plug-in (VST, AU, DX and RTAS)
- Three preamp models (and related EQs), three cabinet simulations
- Four effects (spring reverb, wah, delay, and overdrive) and built-in tuner
- 64 factory, 64 user presets

GLEAMING THE TUBE

Korg's Dual Tube Preamp with Optical Compression and Digital Output (which also has a mercifully short nickname, TP-2) provides a standalone version of their Valve Force technology (featuring two 12AX7 tubes) to add tube character. There's also an optical compressor, and cool-looking vintage-style VU meters. Each channel has independent phantom power, pad, phase, low cut and Hi-Z switches, balanced XLR and 1/4" TRS I/O, and coaxial and optical digital outs (44.1/48/96kHz). A version *sans* digital outs is available as a user-installable option for Korg's D32XD and D16XD recorders. www.korg.com

HONEY, I SHRUNK THE STUDIO

I first thought this was a scale model of a real product, but no. The Zoom MRS-8 records eight tracks of uncompressed files to SD Media cards, and also includes multieffects, a digital mixer, drum and bass generator with touch-sensitive pads, over 500 pre-programmed rhythm patterns, a built-in condenser mic, high-Z input for guitar, and XLR mic input. It even comes with a 128MB SD card, and apparently they shrunk the price too — **$349**. www.zoomfx.com

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E-MU HARDWARE-ACCELERATED VST FX

E-Mu's new **PowerFX** hardware-accelerated VST effects allow all E-Mu Digital Audio Systems and Emulator X owners to run E-Mu's hardware-accelerated E-DSP effects as VST plug-ins. This free download also adds a new reverb and seven new delay algorithms to E-Mu's effects palette.

PowerFX works like any other VST plug-in — instantiate effects in a host VST insert or aux send, then drag in the desired effect (or group of effects) from the Effects Palette field. All parameters for the selected effect can be viewed and edited in the Effects window, and you can automate and save all parameter settings within the VST environment. PowerFX also compensates automatically for system latencies, thus ensuring proper audio sync throughout the VST chain. www.emu.com

PreSonus BlueTube DP

Dual Path technology two-channel preamplifier.
www.presonus.com

- Switch tube stage in or out and use the preamp as a solid-state or tube preamp
- +48V phantom power, pad, and phase switches
- 80Hz lowpass filter
- Vintage style analog meters

WAVES SAYS "GIMME FIVE"

The Waves product line has been upgraded to Version 5, which provides HDTM support for all plug-ins, Pro Tools 6.4 support, host tempo sync, 360° Surround Tools Bundle compatibility with Windows XP TDM, Mac GUI acceleration, and 96kHz support on Accel DSP cards. Also, MIDI instrument control allows Morphoder to be used live as a virtual instrument. Furthermore, the Musician's Bundle has been updated to the Musicians II Bundle; its plug-in roster consists of the Renaissance Compressor, Renaissance EQ, SuperTap delay, Doubler, and Renaissance Vox compressor/expander for vocals. www.waves.com

Yamaha 01V96 Digital Mixer V2 Software

Free, downloadable upgrade includes nearly 50 new features, and comes with new 01V96 mixers.
www.yamaha.com/proaudio

- Studio Manager V2 provides improved editing, librarian, and remote-control functions while retaining the ability to manage all console parameters from a computer via GUI
- Expanded DAW control
- Additional application-specific functions
- Runs Yamaha's "Add-On Effects" packages

World Radio History

M-AUDIO GETS SAMPLE CRAZY

The **Best of ProSessions — Vol. 1** in Apple Loops format (**$99.95**; for Apple's GarageBand, Logic, SoundTrack and Final Cut software) incorporates highlights of several dozen volumes of M-Audio's ProSessions Sound and Loop libraries. Genres distilled into the Apple Loops version include rock, pop, hip-hop, rap, drum & bass, electronica, techno, Latin, dance, and more. **The Best of ProSessions — Vol. 2: Liquid Cinema** adapts the Liquid Cinema series by film composer Jeff Rona to the Apple Loops format as well. In addition, 10 new **ProSessions** sound and loop libraries (**$49.95 each**) cover rock, techno, hip-hop, and more. Titles include *Dope Beatz, Scratch'n Elements: Disc 1 — Drums, da Jointz, Dance Static, Tension Theory, Field of Visions, Abstract World Fusion II, Turbulent Filth Monsters, Electro Groove,* and *Spooky Ghost*.

Also new: **ProSessions Premium Instruments** (**$99.95**) provide 16- and 24-bit versions of instruments for Reason's NN-XT sampler. The initial release includes 11 volumes: *Grand C7, Acoustic Guitar, Cathedral Organ, String Ensembles, Solo Strings, Brass, Woodwinds, Choirs, Orchestral Percussion, Drum Kits,* and *Rhodes*. www.m-audio.com

Roland Juno-D

ROMpler that focuses on ease of use; includes multieffects, realtime performance controllers, and tools for groove creation and composition. www.rolandus.com

- Mac/PC editor included
- Phrase/arpeggio generator and Multi Chord memory function
- 61-note, velocity-sensitive keyboard
- D Beam controller

Alesis CD Twin

Inexpensive, standalone one-to-one audio and data CD duplicator. www.alesis.com

- 52X burn mechanism
- USB and software for fast backup from Windows and Mac OS computers
- Can use CD-R/-RW media and back up audio, data, video, and photo CDs

Roland MV-8000 Workstation Updates

MV8-VGA user-installable expander option and Version 2 software expands the MV-8000 into a DAW with mouse and VGA monitor control. www.rolandus.com

- View and edit MV-8000 track and sample data on a VGA monitor
- Now imports Akai MPC2000/XL program files and Akai S1000/3000 program and sample files

THEY'RE COMING TO TAKE ME AWAY

Portable interfaces have come a long way, and Edirol's **UA-25** (Mac and Windows) has the usual — combo (XLR and 1/4") jacks, coax S/PDIF I/O, MIDI in/out, and 1/4" output jacks. But it also does 96kHz, and has a "Why-didn't-I-think-of-that" feature: a built-in peak limiter. (If you've ever done live recording with a portable interface, you know exactly why that's cool.) It's all USB-powered — even the +48V phantom power — and although I was too polite to throw it across the hall as a test, it seemed pretty rugged. www.edirol.com

World Radio History

Mastering Tools for PowerCore

From the legendary System 6000

System 6000 is an industry milestone, and the most research intensive audio processor ever created. Processing once exclusive to the System 6000 is now available for Mac and PC via the PowerCore platform. PowerCore users can now take advantage of the top-level processing and precision limiting of the MD3 Multiband Dynamics and BrickWall Limiter algorithms in the MD3 Stereo Mastering package.

For stereo and single sources, this package brings professional production and mastering possibilities to the realm of DAWs, and integrates smoothly with serious music and film editing applications. Please visit www.tcelectronic.com for more info on the MD3 Stereo Mastering package and the PowerCore platform.

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WWW.TCELECTRONIC.COM

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Yamaha MG Series Mixers

Two new mixers complete the MG series.
www.yamaha.com/proaudio

- The eight-channel **MG8/2FX** features four mono channels with 3-band EQ, a maximum of three stereo inputs with 3-band EQ, and a stereo out bus structure with single aux/effect send/return. Mono channel inputs contain mic level XLR-type connectors and line-level unbalanced TRS phone jacks; stereo input channels have both unbalanced phone and RCA phono jacks.
- The 12-channel **MG12/4FX** features six mono inputs with 3-band EQ, and a maximum of four stereo ins with 3-band EQ. It also has a four stereo and group output bus structure, and built-in stereo SPX-type effect.

Rude Audio Tube Twins

This tube condenser mic ($1,799.95) is built specifically to serve as part of a stereo pair.
www.rude-audio.com

- Difference in sensitivity, frequency response, and noise is less than 1dB
- Cardioid polar pattern
- Output impedance under 200 ohms

KEYS TO GO

If your idea of portability leans more toward MIDI keyboards, try this: The **PCR-M1** two-octave keyboard has eight assignable knobs, pitch bend and modulation controls, editing software, V-Link for all you video fans out there, and it must be on the Atkins diet — it's just over an inch thick, and weighs 2 lbs. 11 oz. www.edirol.com

IK Multimedia Expansion Tank Sound Modules

Designed for SampleTank2 LE or SampleTank full version, this series currently includes 20 modules ($99 each, three for $249) covering a variety of musical styles. www.ikmultimedia.com

- Hip-hop, ethnic, pop/rock drum loops, Euro dance loops, brass multisamples, and various instrument multisamples (guitar, piano, strings, bass, etc.)
- Each Expansion Tank includes SampleTank 2 LE player
- Multiple sample engines, loop sync to host BPM
- 32 built-in effects

NEW MICS FOR NEW TIMES

Audio-Technica's line of Pro Series mics (MSRPs range from $59 to $239) comprises 11 models designed mostly for stage use, including cardioid and hypercardioid dynamic vocal mics, cardioid and hypercardioid dynamic instrument mics, and cardioid condenser clip-on instrument mics. But of particular interest to *EQ* readers is the Pro 24 Stereo Condenser Mic, which is designed for stereo recording and field use. A pair of cardioid elements in X-Y configuration provides the spatiality of a live sound field; in addition, the lightweight design works well for camera-mount use. Another new mic, the Pro 37 Small-Diaphragm Cardioid Condenser Microphone, is designed for capturing acoustic guitar, overheads, piano, and group vocals. The cardioid condenser capsule reduces pickup of off-axis sounds, and features a low-mass element for maximum transient response. www.audio-technica.com

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"MiniTraps really made a difference in my studio. I previously had foam corner bass traps but they really seemed to have no effect. It wasn't until after I added the MiniTraps that my low end evened out." –Charles Dye
(Ricky Martin, Jon Bon Jovi, Shakira, Lauryn Hill, Gloria Estefan)

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34 Cedar Vale Drive, New Milford, CT 06776

MOOG MODULAR, PART DEUX

Version 2 of the **Moog Modular V** includes several GUI changes (you can now see all the different sections simultaneously in a scrollable view), opens the filter to external inputs, and adds several cool new modules including the 1630 Bode Frequency Shifter, 928 Sample and Hold, 912 Envelope Follower, and 12-stage Moog phaser. Two new modules, a Formant Filter and Ring Modulator, were designed by Arturia to complement the existing Moog modules. www.arturia.com

Waves Y96K DSP Card

Add Waves signal processors running at up to 96kHz to the Yamaha DM2000, 02R96, DM1000, 01V96, PMD5, and more, with backward compatibility to the AW4416 and AS2816 (limited to 48kHz operation). www.waves.com

- Plugs into a Mini-YGDAI slot
- Uses dual DSP56K devices
- 8-channel ADAT I/O, with support for routable processing to and from external equipment
- Comes with the Waves Renaissance Compressor and EQ, TrueVerb Reverb, L1 UltraMaximizer, SuperTap Delay, and DeEsser; more processors are scheduled for release

Roland DS-8/-7/-5 Active Reference Series Monitors

The DS monitor line provides an all-digital signal path to the internal power amp. www.rolandus.com

- 24-bit audio path (up to 192kHz)
- Each monitor has digital (AES/EBU, coax, and optical) and analog (Neutrik 1/4"/XLR) inputs
- Magnetic shielding

Boss DR-880 Drum Machine

Standalone rhythm programmer includes drum, percussion, and bass sounds along with simplified pattern generation options. www.rolandus.com

- Independent compressors and EQs for kick and snare
- Compressor and amp models for bass
- Guitar/bass input jack with amp models and multieffects
- S/PDIF digital out and USB port for MIDI interfacing/SMF data import

Disc Makers MacElite Duplicator

This line of Mac OS X-compatible CD and DVD duplicating systems (prices start at $2,990) connects directly to Mac G4/G5 computers (no PC required). www.discmakers.com

- Plextor drives — 52X CD-R or 8X DVD±R/CD-R drive
- 4800 dpi Autograph6 color on-disc printer
- Input and output bins hold up to 125 discs
- Includes Charismac Discribe duplication software and Discus label design software

Peavey CM1 Condenser Mic

Handheld, back-electret condenser microphone ($199.99) with cardioid polar response. www.peavey.com

- Pressure gradient element, transformer FET circuit
- Sensitivity: –43dBV/Pa (7.1mV/Pa)
- Maximum SPL: 136dB at 1kHz (THD < 1%)
- XLR connector

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Hands-free recorder makes capturing your musical ideas quick and easy.

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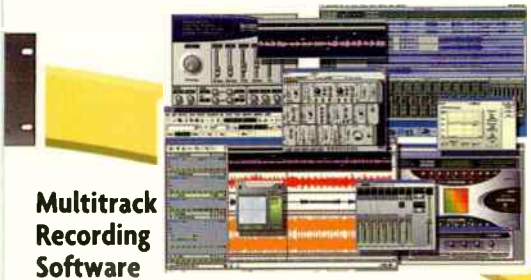
Guitar Workstation™?



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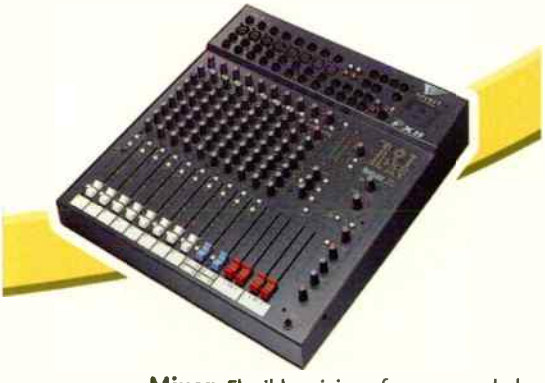

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How to Silence a Computer

GET YOUR LITTLE SILICON FRIEND TO QUIET DOWN

by Michael Farnsworth

CPUs, hard drives, power supplies, video cards, RAM – they all generate heat, so your computer needs cooling. Some cases have five or more cooling fans, which creates a lot of noise. Drastic options for reducing noise include placing your computer in a "machine room" and using mouse/keyboard/monitor extender cables, or buying a special rack enclosure designed to house, quiet, and cool PCs. However, you can often reduce noise levels sufficiently at the computer itself.

A silent computer requires minimizing heat build-up, choosing the quietest cooling methods possible, then using appropriate acoustical treatment.

Although I've recommended a few specific products, there are so many options it's impossible to cover everything. Therefore, this article describes noise reduction basics so you can make informed decisions. See the Resources sidebar on where to find more information on products and silencing techniques.

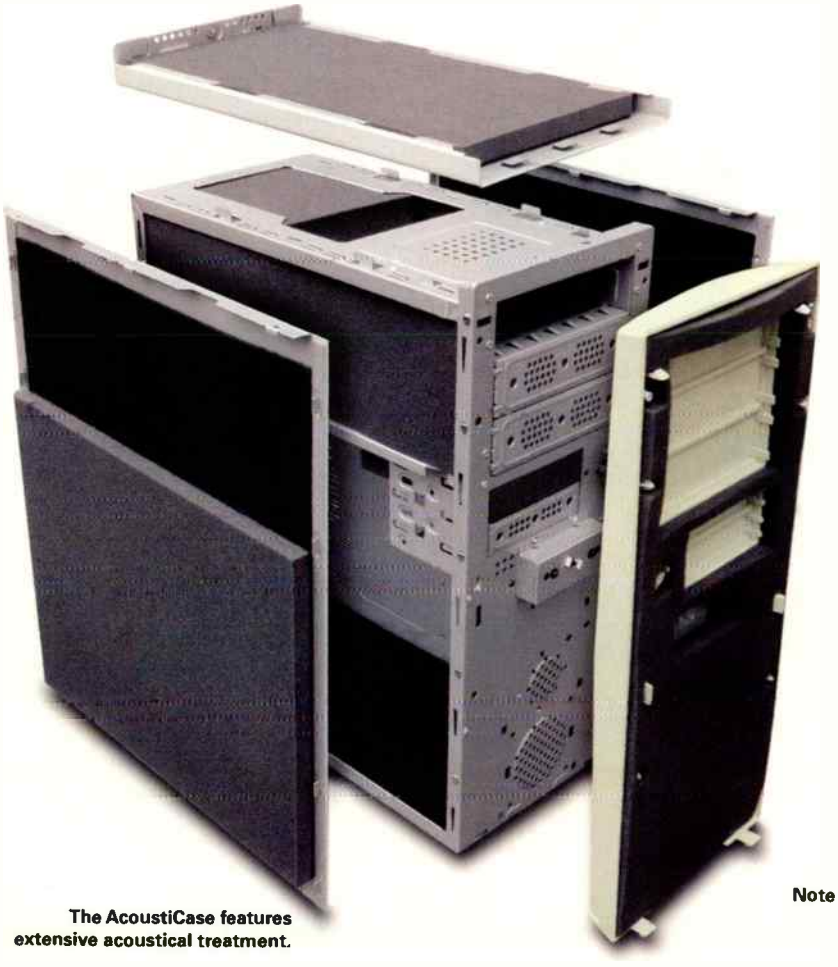
POWER SUPPLIES AND FANS

A poorly designed power supply is a major noise generator. Budget fans may have poorly designed blades that cause the air to oscillate at audible frequencies as it's pulled through the fan housing, as well as inexpensive, noisy bearings. Better fans have improved ball bearings or noiseless sleeve bearings designed to rotate at high RPM with little friction, and a more efficient blade design. Unfortunately, with power supplies it's hard for sleeve-bearing fans to move enough air, so ball bearing-based units are preferred. A "bonus" of ball bearing fans is that they often get noisier just before failing, whereas sleeve-bearing fans can seize up without your knowing it.

Audible oscillation of air can be caused as the fan pulls air past internal components, adding more noise. And, the chassis holes in the power supply's case often cause an audible "siren effect" as air is forced through the openings.

Unlike older single-speed power supply fans, better power supplies include temperature-sensing circuits and variable speed control so the fan rotates only as quickly as needed for proper cooling. This is good for audio applications, but check out any power supply under full load; a unit that's quiet when idling can get noisy when the fan's higher speeds kick in. There are now off-the-shelf power supplies that produce in excess of 350W yet are virtually inaudible.

A quiet fan is a worthwhile upgrade, but requires a qualified technician for installation. Power supply capacitors can retain a lethal shock, even when unplugged. Also, the connector may be non-standard, requiring a direct solder connection to the board. ➤



The AcoustiCase features extensive acoustical treatment.

Note the oversize fan in this 350W supply from QTechnology.

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LET GO AND FLOW

SONAR Producer Edition has earned a reputation for delivering powerful production tools in a streamlined interface. Now in version 4, the new recording, editing, comping, and navigation tools give today's professionals like you the freedom to flow. They're so fast, you just have to see it to appreciate it. And the ride doesn't stop there; version 4 adds innovative surround and AV capabilities, along with precise engineering tools—seamlessly combined together to make SONAR 4 Producer Edition the definitive audio production environment on the Windows Platform.

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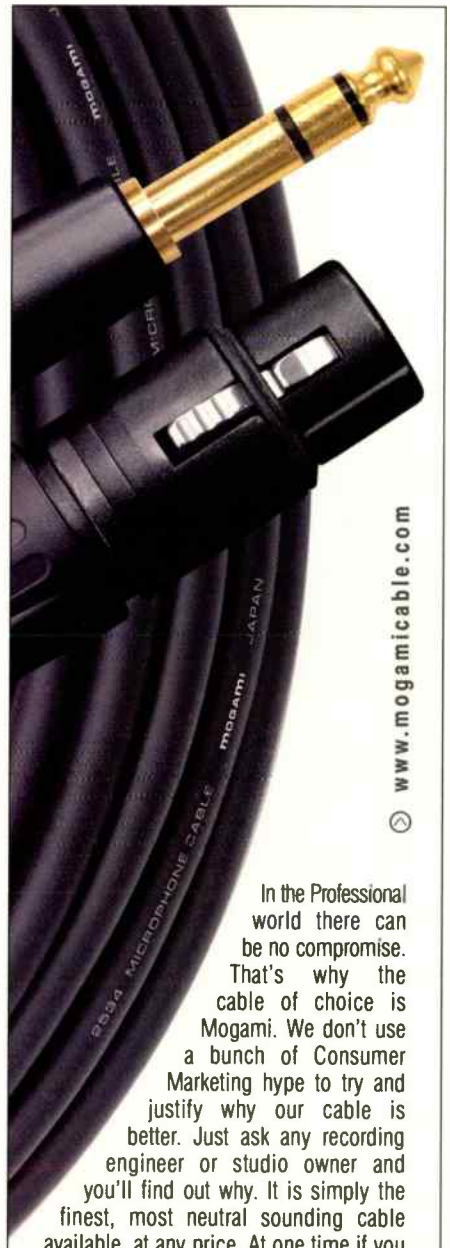
Watch the video at WWW.SONAR4.COM



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How to Silence a Computer

120mm fans move more air with less noise compared to smaller fans. Note the heat sensor (circled) that can be placed in a heat pocket, the silicon mounting grommets to reduce vibration, and a speed-reducing resistor.

Some fan-less power supplies exist, but as the main source of venting for internal case heat build-up is the power supply fan, you may have to install an extra case fan anyway to exhaust the internal case heat. Also, a fan-less power supply may not need a fan because it doesn't produce a very high output, so you may not be able to expand your computer without pushing it over the edge. There are more elaborate silencing methods, such as water or oil cooling, but these options are generally impractical in the typical sound production/playback environment.

When selecting a power supply, look for "sheathed" cables that supply 5V and 12V power on the ATX connector (as well as the serial ATA connectors if so equipped) to the PC's various components. These improve airflow and don't have gaps that can generate noise as air goes through them. I've had excellent results with the QTechnology line of power supplies; they're quiet, efficient, and have sheathed cables.

Some power supplies mount the exhaust fan on the power supply's bottom. This directs fan noise inside the case rather than out the back, where there's a more direct path to your ear. However, as the area at the top of the case behind the power supply gets less air flow, mount hard drives toward the bottom of the case to avoid "heat pockets."

CPU COOLERS

Older CPU coolers used heat sinks with a relatively small surface area, coupled with a fixed RPM high-speed fan to move air over the small surface area. Newer CPU cooling systems may use copper instead of aluminum for better heat transfer, and elaborate heat sink designs that dissipate more heat into the air. If you couple these with a large fan, the fan can rotate more slowly, further reducing noise.

Some heat sink/fan designs, as used in products pioneered by Zalman, don't couple the two components directly; the fan may be much larger than traditional designs, and suspended over the CPU heat sink by a special frame that connects to the PC chassis. This reduces noise dramatically due to using a larger fan, and minimizing noise-causing air flow effects.

Some newer CPUs also have an improved physical architecture and generate far less heat. VIA even has a "fan-less" CPU, but the math processing capabilities — which are crucial for audio — are less powerful than the better-known CPUs. It's fine for general office duty, however. ➤

World Radio History

CPU fan upgrade kits usually include thermal "grease," a paste that maximizes thermal conductivity between the heat sink and the CPU. But it's worth spending a little more for something like Arctic Silver 5, which has a special formulation incorporating a high-density filling of micronized silver and thermally conductive ceramic particles.

HARD DRIVES

One of the most painful experiences I ever had in an audio career that spans 20+ years was editing on my first digital audio workstation, which had a Seagate Barracuda II SCSI hard drive. The whine was almost intolerable. Seagate figured out this was a problem, and their newer Barracuda drives are almost silent right out of the box, largely due to a new bearing design. These drives are now common in audio workstations.

If you have a noisy drive, you can mount it in a special audio baffle unit that fits in a spare 5-1/4" drive bay [*QuietPC sells one called the SilentDrive – Ed.*], or build a baffle around the area where the drive is mounted with special sheets of acoustic materials designed for this purpose.

Note that heat builds up quickly in an enclosed space. Using an enclosure is generally applicable only for 5,400 RPM drives, and most (but not all) 7,200 RPM drives. Inexpensive, stick-on thermal monitors can indicate the drive temperature, which you can check against the manufacturer's temperature ratings to make sure you're not cooking the drive.

10,000+ RPM drives are much more difficult to silence. Be realistic about what kind if track counts you need; a slower drive might create a more pleasant working environment.

CASE FANS

Case fans, CPU fans, motherboard, and video card cooling fans share the same design considerations described under "Power Supplies," and you pretty much get what you pay for. You can also decrease case fan noise with vibration isolation. Even rubber grommets placed over the mounting bolts, between the fan frame and the surface to which the fan mounts will help reduce the transfer of vibrations to areas of the case that can resonate sympathetically and acoustically amplify the noise. You could also cut your own gaskets out of sound dampening materials and place them between the fan and mounting area. Recently, Acousti Products has introduced some fairly inexpensive, yet effective, silicone gel fan mounting grommets and similar fan gaskets.

Acoustic absorbing materials (available from companies that sell components for quieting PCs) can be placed around the airflow path inside the case to absorb noise. Just be careful not to impede the airflow itself.

Standard 80mm case fans usually come in one or two wiring configurations, and each has its own type of connector. A four-pin Molex connector (like the type that supplies power to a hard disk drive) delivers 12V DC. It doesn't inherently accommodate speed control. The "three-wire" type of fan allows feedback from the fan so the user can see the fan speed, and/or an alarm can sound if the fan fails.

If your three-pin fan speed isn't controlled by the motherboard, inexpensive fan speed controls let you limit the fan speed to a lower RPM. This can drop unwanted noise levels quite a bit, but make sure there's still enough airflow to dissipate heat.

FAN SPECS

A fan's spec sheet will specify air throughput in "CFM," or cubic-feet-per-minute. As a general rule, bigger is better; a 120mm fan rotating at a low speed will usually move more air than a smaller fan running at a higher RPM. I've had the best results so far with the AcoustiFan 120mm fans from Acousti Products, which are literally inaudible.

CASES

Many people feel that aluminum cases are better at dissipating internal heat buildup

RESOURCES

www.acoustiproducts.com
This manufacturer's site offers independent reviews of their products, general and product-specific FAQs, and links to articles about reducing noise in PCs.

www.quietpc.com
This site hosts the author's original version of this article on quieting a PC. It's a huge resource for FAQs, parts, and kits (including items like the SilentDrive enclosure).

www.siliconacoustics.com
Although this is a retailer's site, there are several useful FAQs and as expected, parts and kits designed to produce a quieter PC.

www.endpcnoise.com
Another retailer's site, this offers components but also has some articles concerning PC cooling techniques and components.

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How to Silence a Computer

than steel, however, a thick steel case reduces mechanical transmission and sympathetic resonance, while providing a barrier mass to stop internal sound from getting out of the case. Well-fitted case parts can help reduce noise that escapes through cracks (e.g., where the side panels meet the front bezel).

Some people leave the side of their PC off, thinking it provides more ventilation. However, many cases need to be fully assembled for the air flow design to work effectively.

When evaluating PC cases, consider getting a full-sized tower instead of a smaller tower even if you don't need the extra space. A larger internal space means that less air needs to go through the system per minute. Always think "efficient air flow" and "convection is good" when installing internal components. If you can leave some air space between multiple hard drives, do so.

ACOUSTIC TREATMENT

There are several user-installable sound dampening/absorbing aftermarket kits. These are usually a better buy than purchasing a case with the materials pre-installed, because you can customize the installation to your specific hardware. The best kits contain at least one type of foam to absorb noise acoustically, along with sound dampening material to inhibit sympathetic vibrations.

Kits with a good barrier mass component are ideal; they reduce unwanted resonance and block sound energy. Watch out with cheaper kits — one product I was fire testing burst into flames in just a few seconds when I held a match to it, and burned profusely while emitting toxic fumes. I have achieved the best results by far with AcoustiPack kits from Acousti Products. These incorporate properly designed, fire resistant open-celled acoustic foam sheets plus a thick rubbery barrier mass.

ACCESSORIES FOR HEAT CONTROL

Motherboard heat sinks, video card heat sinks, memory heat sink spreaders, and round cables (as opposed to ribbon types) are good. Additional heat sinks can help pull concentrated heat out to areas where the heat buildup can be more efficiently dealt with by the fans. Also, new "heat pipe" technologies (e.g., from Zalman) seem very promising for improving heat dissipation.

INSTALLATION CONSIDERATIONS

If a computer is not in a rack, place it on a carpet or some other soft surface to avoid mechanical sound transfer into the floor or other surface on which it sits. Place it as far as possible from reflective surfaces, and put soft carpet or acoustic energy absorbing material on surrounding surfaces to minimize sound reflections. There are a few special "case feet" on the market that reduce or eliminate mechanical transfer of noise to hard surfaces. I've had good results with QuietFeet from Quiet PC.

FINAL COMMENTS

Some kits contain a mix of various bits of hardware such as a quiet power supply, CPU cooler, and case fan. Fortron makes some excellent kits for folks on tight budgets. Regarding video cards, you don't need a gaming card with a loud fan for most audio work. Less video card memory also means less heat.

Many new hard drives and CD-R/DVD components have a smart onboard BIOS that some "thermally intelligent" motherboards (e.g., Fujitsu Siemens "Green" motherboards such as the D 1627 G2 and the newer D 1627 C) can directly control. A few motherboards, like the ones just mentioned, have on-board thermal sensors, along with connectors for additional sensors that can be placed inside the case, for advanced thermal control. The fans connected to the motherboard will be speed-controlled accordingly.

Also, don't trust all of the dB specs you read for computer components, sadly, many are fabrications. You can generally trust established companies with large product lines and a long production history.

The final and surest way to silence a PC is simply to turn it off. A recommended follow-up procedure is to go outside into an area filled with nature's serene beauty, or if it's nighttime, possibly a friendly tavern that serves up a good pint, but only if it has good music . . . or better yet, silence!

Michael Farnsworth has designed and built PC based DAWs for theatres, recording studios, and universities. He spent many years as a professional musician, recording and live audio engineer with hundreds of live audio mix credits including Billy Bragg, Jane Siberry, and Ronnie Hawkins, plus dozens of live theatre production sound design credits.

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Jack Renner, 6 time Grammy winner, Telarc International

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Acoustics Myths Revealed

Egg crates? Couches? What *really* works for acoustic treatment?

by Lynn Fuston

Our industry is rife with misconceptions, false notions, incorrect assumptions — the audio equivalents of the "real" world's urban legends. These myths propagate in various ways: through word of mouth, in carefully "spun" advertisements, by pseudo-experts on internet discussion forums, through poorly researched, verified, and presented articles, books, seminars, and classes, and many other ways.

Because we believe that the truth should come out — that fact-based knowledge can only improve the quality of the audio recordings we create — EQ is launching this new series of truth-seeking articles. Each month we'll choose an audio myth or misconception, then assemble a panel of industry experts to present the hard facts behind the truth. Those experts will include scientists, engineers, educators, manufacturers, designers, end users, and others knowledgeable about the topic at hand. The truth will come out!

For our first installment, we've selected two extremely pervasive acoustical misconceptions. Read on to learn the hard facts. —Mitch Gallagher

In the music recording and performance profession, there is one issue that comes up time and again: sound control/containment. As much as we'd like to change it, this paraphrase of an old adage seems to remain true: "One man's music is another man's noise."

So how do you deal with your "music" being interpreted as noise by friends, wives/husbands, and neighbors? Better yet, how do you keep unintended recipients from hearing and complaining about your "music/noise?" We asked leading industry professionals just that question, with the intent of exposing at least a few myths surrounding acoustics and sound isolation. As you will read in the responses below, there are two distinct properties of sound control that are often confused. Using the wrong solution can result in making the problem worse.

A second issue is the use of common — and inexpensive — household or other items as acoustical control solutions inside a studio or control room. Can an egg crate or a beat-up old sofa really improve the acoustics in your studio? Our cast of experts has the answer!

Myth-busters and Truth-seekers

Our cast of experts for this installment of "Myths Revealed" includes:

Jeff D. Szymanski, PE
Chief Acoustical Engineer
Auralex Acoustics
www.auralex.com

Richard Schrag
Principal
Russ Berger Design Group
www.rbdg.com

Eric Desart
DESART acoustics
Antwerp/Belgium
www.acoustics-noise.com

Scott R. Foster
Home recording studio/small room acoustics enthusiast
http://forum.studiotips.com

Jim Dugger
www.poorhouse productions.com

MYTH #1: If your neighbors are calling the police during a band rehearsal or recording session, you need a lot of acoustical foam on your walls.

Jeff Szymanski, PE, Chief Acoustical Engineer of Auralex (www.auralex.com) responds:

■"I get asked this question almost every day! Construction is the key to sound isolation. Acoustical absorbers are typically porous, like fiber and foam. They are designed to tame the sound in the room. The opposite of porous material is needed to stop sound from entering/leaving the room. Dense materials such as gypsum board and concrete are key to stopping sound. Other helpful materials and techniques include insulation between studs and joists, dead air spaces between double walls ("room within a room" construction), sealing any air leaks, and using different layers of materials to finish out the walls.

"If construction simply is not an option, then some sort of negotiation needs to take place. Or a new rehearsal space away from neighbors would help. (Renting a moving van can sometimes be cheaper than isolating a garage!)

"There's a wonderful quote attributed to the late Ted Schultz of Bolt, Beranek and Newman (the world famous acoustic consulting firm founded in 1947): 'Mistaking sound absorption for sound isolation is like mistaking a diaper for an umbrella.'"

Richard Schrag of Russ Berger Design Group (www.rbdg.com) comments:

■"It's easy to confuse sound absorption (one of the ways we can control acoustics inside a room) with sound isolation (controlling the transmission of sound between spaces).

"Even with foam on the walls, the sound that the band generates still strikes those surfaces. How much of it goes through depends on how the wall is constructed — the mass of the materials, the number of layers and the air cavities that separate them, and how the materials are coupled to each other (through the studs, for example). Damping and absorption within the wall cavities play a relatively minor role in sound isolation. Materials that you apply to the face of the walls inside the room do little to change how much sound (known as noise once it leaves the rehearsal garage, regardless of what the band thinks) can be heard next door.

"Here's a test: Hold the foam up to cover your ears. Can you still hear the band? That's roughly how effective it will be in keeping your neighbor from hearing it."

Eric Desart of DESART Acoustics in Belgium (www.acoustics-noise.com) adds:

■"Using absorption to solve insulation will often not help, but may make the problem worse. A band, as a non-constant source of level, will adjust their level to the environment. Since low frequencies are less absorbed than mids and highs by foam, the overall content of the resulting spectrum shifts toward the lower frequencies where absorption insulation toward neighbors is worst." ➤

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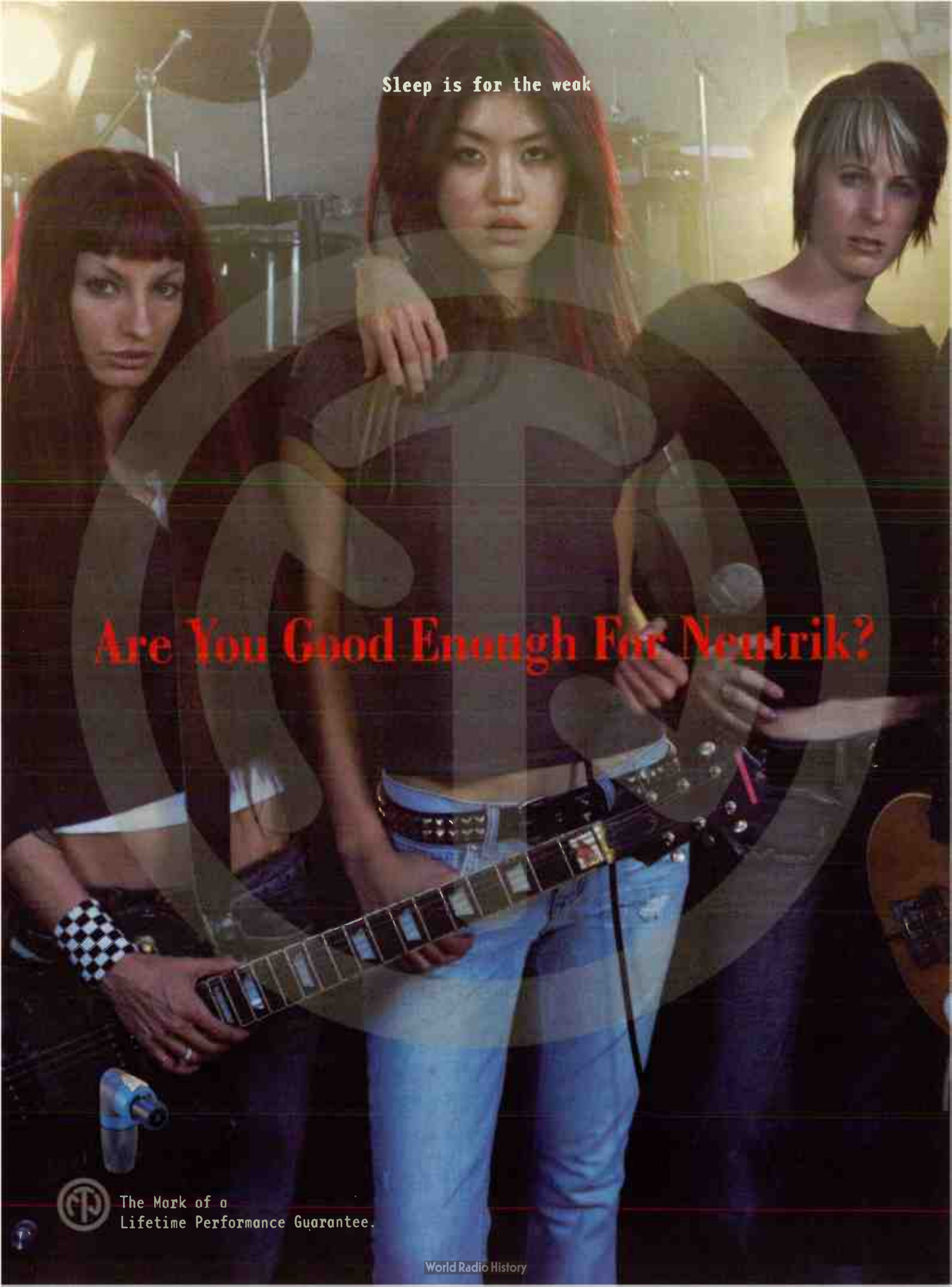

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According to Scott Foster, moderator of the Acoustics forum at studiotips.com (forum.studiotips.com):

■"If you find yourself saying things like: 'Gee, Officer Wellman, I thought you said you didn't want to come back out here tonight' every time you and your mates get together to do that thing you been trying to do . . . then you have a Transmission Loss (TL) problem. In other words, the boundaries (walls, floor, ceiling windows, doors, etc.) of your rehearsal space are not adequately isolating your 'music' from the rest of the world. Enhancing the TL across typical room boundaries is not a trivial task, and certainly not one for a group that does not have a significant construction budget *and* the right to make alterations to the building.

"Your best bet is to do what is probably the last thing you want to do . . . namely, get to know the person filing the complaint and try to work things out on a personal level. Offer to take practical steps to reduce the complaint at the source such as adjusting your schedule around their schedule, or if at all possible, lower the volume. (Electronic drums and headphones anyone?) If the human approach is hopeless — and you just gotta have more cowbell — you probably need to move to a more remote/less residential setting.

"If circumstances dictate that the acoustic TL of the room's boundaries must be beefed up, then drywall will almost certainly come into play. The barebones low-down bottom-line bang for your buck path to increasing joy for the man in search of a higher TL for a building partition is mass, and in most circumstances there's no cheaper way to add mass to a partition than drywall. Layers of drywall. Foam, on the other hand, is a material used for acoustic absorption — and a spiffy one at that. Foam will help tame the resonances inside the room (reverb), but it won't keep loud noises from escaping the building, and thus it won't keep Officer Wellman away."

Jim Dugger, who built his home studio in Dallas, Texas with enough isolation to achieve a 29dB noise floor (www.poorhouse-productions.com) tells us:

■"First, I think it's important to separate the tasks of acoustic isolation and acoustic treatment. The solutions for each have surprisingly little to do with each other, despite popularly held conventions.

"When one is trying to isolate a room, either for containing sound or for preventing noise pollution, there are two main concerns: mass and decoupling. Bass frequencies are especially effective at transmission through almost any material unless:

A) The material is especially massive.

B) The particular material requires the problem vibration to make several transmissions between mediums such as air and solid material.

"A four-piece rock band in a small room will easily produce 120dB sound levels, and much of it, bass guitar and kick drum in particular, involves low frequency information. Even 8-inch thick masonry construction will only cut this sort of sound pressure down to the level of a shouting conversation in the lower octaves, so clearly lightweight foam is a practically useless attempt to soundproof.

"As a room treatment, foam does an excellent job as a basic treatment for slap echo, but that's about where its usefulness stops. The big problem with foam is the lack of performance in the lower octaves. An overly foam-treated room not only sounds muffled, it will actually make recordings boomy and muddy as an unbalanced quantity of lower frequency information continues to reverberate around the room unabsorbed. In addition, most musicians, especially those playing acoustic instruments, take tuning and sound cues from the reflections within a room. Take this away and the confidence in the playing suffers and the recording can become lifeless.

"True isolation is achieved exclusively through the use of very massive building materials and careful construction techniques. So while foam and fiberglass products are excellent at absorbing high frequencies, they are almost completely ineffective at frequencies below 200Hz and, unless several feet (in some cases, several yards) thick, will do very little for isolating a room or absorbing low frequency information. Argue all you want — foam does *not* isolate and does *not* soundproof."

THE FACTS:

1. Mistaking sound absorption with sound containment is like confusing a diaper with a dam. One absorbs, the other contains.

2. If you know your local police officer by name, and he attends rehearsals and sessions as often as you do, you've got a serious noise isolation problem.

3. Acoustical foam will help tame the resonances and reflections inside the room, but it won't keep loud noises from escaping the building

4. Adding absorption (such as acoustical foam) to the inside of a rehearsal space may cause the band to play even louder than before, thereby increasing the noise problem with the neighbors.

5. True isolation is achieved exclusively through the use of very massive building materials and careful construction techniques.

6. Renting a moving van can sometimes be cheaper than isolating a rehearsal space or a recording studio!

MYTH #2: Egg crates on your walls and couches in your room are sufficient to control sound; even at low frequencies.

Jeff Szymanski hears this frequently:

■"Ah, the egg crates. I often bring this up in training sessions. Egg crates were designed for one thing: To hold eggs. Using them as acoustical devices is like using chewing gum to plug the leaking dam. In other words, they'll help, but not anywhere near as much as they need to in order to get the job done. The job, in this case, is controlling sound in the studio room. This is best done with devices — commercial or DIY — specifically designed to control sound. There are lots of companies that provide these sorts of materials and they are all much more appropriate for the application than egg crates!

"As for couches, I have seen some things written and have studied this myself. While the presence of couches does help control a little bit of low frequency sound, again, they are not nearly as effective as devices that are specifically design to serve this purpose. There are a variety of approaches to control low-end: tuned devices, panel devices, membrane devices."

Richard Schrag comments:

■"You will often hear claims that something in a room is good at absorbing sound or diffusing it. The question is: At what frequencies? To create a room that acoustically behaves the way you want it to, you have to maintain the right balance across the audible

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spectrum of sound, and throughout the spatial area where you will have listeners. Egg crates (or carpet or even 1" thick acoustical panels) do absorb sound, but they are much more effective at high frequencies than at low frequencies, and they're not as effective as other materials that cover a broader range of frequencies. The couch in the corner may help control some low-frequency modes, but only the ones that involve that corner, and it can't fix problems that involve the room's basic dimensions.

"There's no one magic bullet in creating good room acoustics. If it's going to work right, you have to start with the right volume of space and good geometry (ratios of primary dimensions and room shape), then deal with specific reflection paths and low-frequency behavior, and only then address the overall balance of absorption, diffusion, and reflection. The best solution may include that couch and the egg crates (well, maybe not the egg crates) but using those items certainly doesn't guarantee good results."

Suggested Resources

Read more on building high TL partitions here:
http://forum.studiotips.com/viewtopic.php?t=48

Read more on broadband absorption materials here:
http://forum.studiotips.com/viewforum.php?f=9

Jim Dugger's scrapbook about building his studio:
www.poorhouse-productions.com/Construction/newstudio.html
The acoustic properties of egg crate foam:
www.acousticsfirst.com/docs/egg.pdf

Auralex offers an acoustics primer and guidelines on construction at:
www.acoustics101.com or
www.auralex.com/acoustics-introduction/acoustics-introduction

Scott Foster:

■"You're kidding right? "Just look at a piece of egg crate — hold it in your hands — then pick up a material that actually will achieve absorption all the way across the frequency band — like say an Auralex MegaLENRD or a 6" thick piece of compressed fiberglass or rockwool insulation board, such as Owens Corning 703.

"A good broadband absorber isn't what you would call heavy, but it has some heft to it . . . it has an appreciable depth dimension . . . and it has thousands of holes (gaps — interstices) per square foot of surface. These materials work by allowing the air pressurized by sound waves to enter into the material where the sound energy is trapped — turned into heat. Now look at that convolved piece of cardboard that is the humble egg crate. You *were* kidding . . . right?

"Now a couch on the other hand ain't a bad start. We used to rehearse in a buddy's used furniture store; basically a 60' x 80' room full of couches and mattresses. It worked out pretty well. Based on that experience, for a 14' x 20' room, I'd suggest you try a dozen used couches and maybe a dozen or so used queen-sized mattresses. Or you could plan a more compact treatment using acoustic foam or mineral wool. (It probably would smell better, too!) In any event, leave the egg crates for the chicken lady — they won't help." ➤

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THE FACTS:

1. Egg crates were designed for one thing: To hold eggs.

2. Sofas were designed for one thing: To support the posteriors and backs of humans.

3. While sofas may help control some low-frequency sound, they're not nearly as effective as devices that are specifically designed to serve this purpose.

4. A good broadband absorber has thousands of holes per square foot of surface that trap sound energy and turn it into heat. Egg crates may absorb a very tiny bit of sound, but they are much more effective at high frequencies than at low frequencies.

5. There's no magic bullet in creating good room acoustics. It's a combination of the right room volume and geometry, and an overall balance of absorption, diffusion, and reflection.

Jeff Szymanski adds a final note for those lost in a sea of acoustical confusion:

■ "There is help available. You can get professional help from studio designers, as well as help from many of the device manufacturers. Acoustics is a physical science. I may be stereotyping, but I doubt most studio owners and musicians have day jobs as physicists. This isn't a bad thing. But it is important to solicit help from folks that understand the physical aspect of room acoustics. Just as important is that those same people that understand the physics also understand the musical goals of a studio owner and its musician clients. We've all heard the phrase: Acoustics is science and art. It is also worth pointing out that music is art and science!"

Which brings us to the end of this truth-seeking mission. If you find yourself lost in the world of acoustics and sonic physics, there are design professionals who will consult (without travel) for minimal fees in the $200-$300 range. Depending on your needs, this could be money well spent, as you could easily spend that much experimenting blindly while accomplishing none of your intended objectives — by proceeding in such a way you could even make your room sound worse.

There is also an abundance of online resources available for those looking for acoustical truth. You can find online resources by entering keywords such as "soundproofing," "studio," "acoustics," and "isolation" into any decent search engine.

Lynn Fuston took a crash course in studio isolation at Hard Knocks U after building two studios on the eighth floor of a high-rise office building. Then someone installed another studio on the ninth floor.

Audio Urban Legends

If you have questions about other audio myths that you would like addressed by leading industry professionals, please email them to Lynn Fuston at go3daudio@aol.com.

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The Art of Recording:

Do This, Don't Do That

Follow these rules, and you'll save time and money in mastering

by Mitch Gallagher

You've finished your project. All those hours of work and sweat have finally come to an end. One step left before the CDs are pressed: mastering. You don't want to make costly or time-consuming mistakes at this point, or even worse, jeopardize the quality of your final release by committing a fatal error. We went to one of the busiest mastering/duplication houses around, Disc Makers, and cornered the Director of the SoundLab, Paul Elliot, for a list of things to do and not to do as you're getting ready to send your project off for mastering.

DO have a safety copy. You'd be surprised how many engineers think that having a project saved on their hard drive is backup enough. One or more copies or backups on different hard drives/media are essential, especially if you're not hand-delivering it directly to the CD plant.

DON'T assume anything. Communication regarding what you're looking for in mastering is key to achieving the results you want. Jot down your thoughts and ideas on what you feel needs to be addressed. If possible discuss it with the engineer to make sure you both are on the same page. Don't assume that mastering engineers/duplicators are aware that you want some things changed or removed and others left alone. Provide complete documentation for everything you submit, and for what you want done.

DO avoid the volume wars. If you're going to send your project off to a mastering house, don't compress or limit the final output. It can handcuff your mastering engineer. The first inclination is to try to undo what you've done. Of course, we can't do that so we're stuck trying to work around it rather than just trying to bring out the best in the music.

DON'T overprocess. Some tools in some situations are most effective when they're left in the toolbox. Just because you have the option doesn't mean you should use it. I've heard many projects that had one simple song that sounded really nice followed by a more involved production — you wonder if the same engineer did both of them. Use as little processing as you can to create what you're looking for.

DON'T use paper labels on CD-Rs. Yes, paper labels allow you to create an attractive looking master with logos and extra info. However, stick-on labels aren't optimal for use with a production master. You run the risk of altering the rotation of the disc and causing glitches and skips. With a project you've worked so hard on, why take the risk?

DO use the right media. The media type (CD-R brand) used with your burner can affect your master. Whenever possible use media that's recommended by the manufacturer of your burner and write at speeds that will produce the lowest error rates. Some media is optimized at low writing speeds. Try these for your final master burn. Also, use 74-minute media when possible. It tends to perform better than 80-minute media.

DON'T add too much bass. The low-end content in many mixes these days is massive. It's an important part of the sound we're creating. However, excessive bass can affect the perceived level of your disc. You need room for everything else in the frequency spectrum and sometimes the energy from the low end doesn't allow for an adequate amount of the other frequencies.

DON'T play your production master. This is what your safety copies are for. Why risk the delay and headache of finding out that the duplication plant or the mastering house has issues and high error rates because your disc was damaged when it was being handled? Listen to the safety copy many times. Familiarize yourself with it. But keep the precious production copy safe and untouched to send to the mastering/duplication house. EQ

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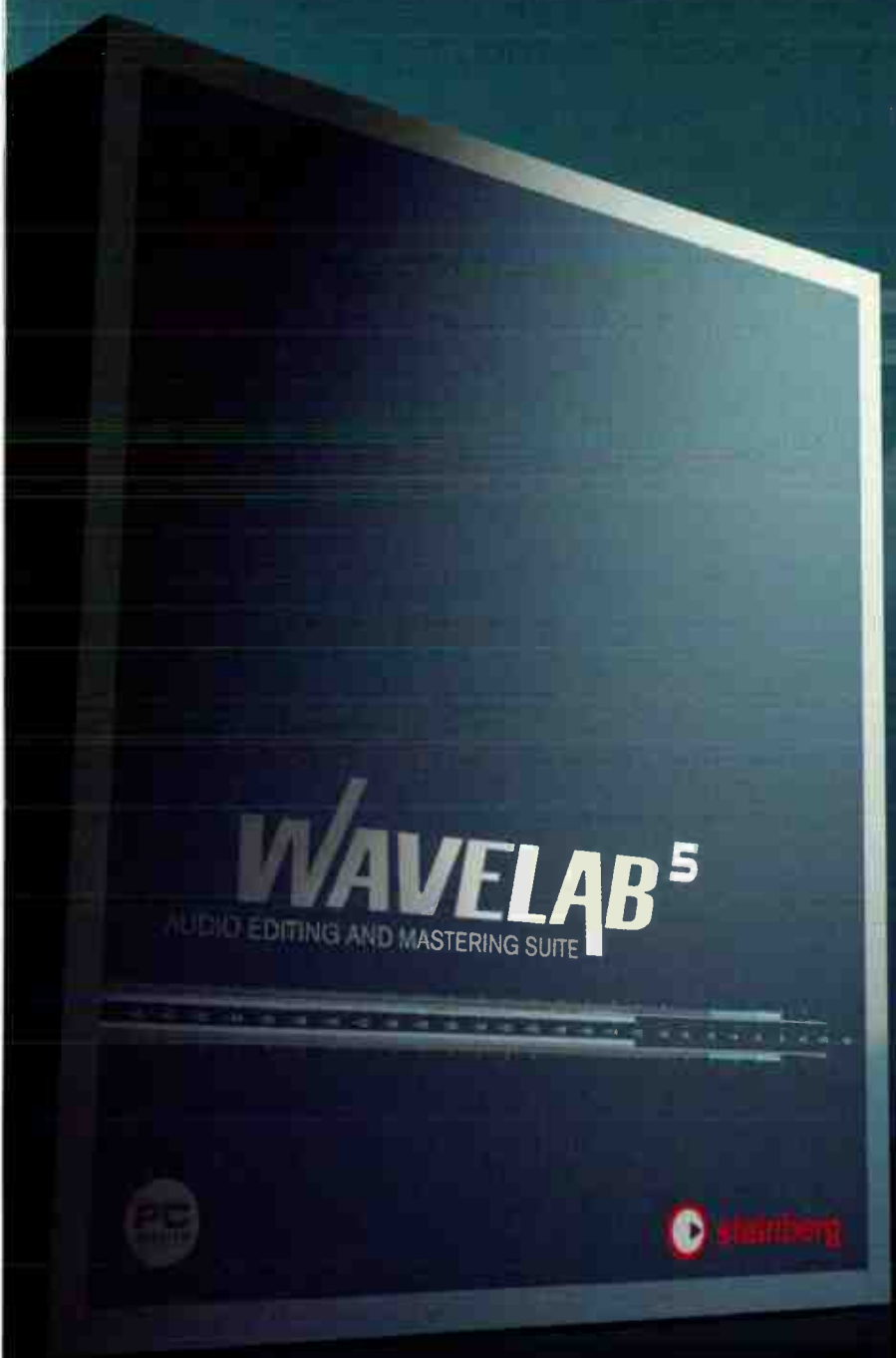

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The Art of Recording:

Understanding Reverb Parameters

Optimize your reverb for the best possible sound

You think you have it tough: Digital reverb has to approximate the sound of a seemingly infinite number of waves bouncing around a reverberant space, and make all these complex calculations in real time. And if you don't believe this is a truly difficult task, walk into a cathedral sometime and do a single handclap — then tell me *any* reverb, regardless of price, that can duplicate that effect exactly.

by Craig Anderton

But most of us don't have the space for a concrete room, or a convenient elevator shaft, or a nearby cathedral. So for ambience, digital reverb is the way to go. Yet digital reverb also has some powerful advantages compared to an acoustic space. First, an acoustic space has one preset; a digital reverb offers several. Second, digital reverb is highly customizable. Not only can you use this ability to create a more realistic ambience, you can create some unrealistic — but provocative — ambiences as well.

However, the only way to unlock the true power of reverb is to understand how its parameters affect the sound. Sure, you can just call up a preset and hope for the best. But if you want world-class reverb, you need to tweak it for the best possible match to the source material.

REVERB PARAMETERS

The reverb effect has two main elements (see Figure 1):

- The *early reflections* (also called initial reflections) consist of the first group of echoes that occurs when sound waves hit walls, ceilings, etc. These tend to be more defined and sound more like "echo" than "reverb."
- The *decay*, which is the sound created by these waves as they continue to bounce around a space. This "wash" of sound is what most people associate with reverb.

Following are the types of parameters you'll find on higher-end reverbs. Lower-cost models will likely have a subset of these.

Room size. This affects whether the paths the waves take while bouncing around in the virtual room are long or short. If the reverb sound has *flutter* (a periodic warbling effect that sounds very unrealistic), vary this parameter in conjunction with decay time (described next) for the smoothest sound.

Decay time. This determines how long it takes for the reflections to run out of energy. Remember that long reverb times may sound impressive on instruments when soloed, but rarely work in an ensemble context (unless the arrangement is very sparse).

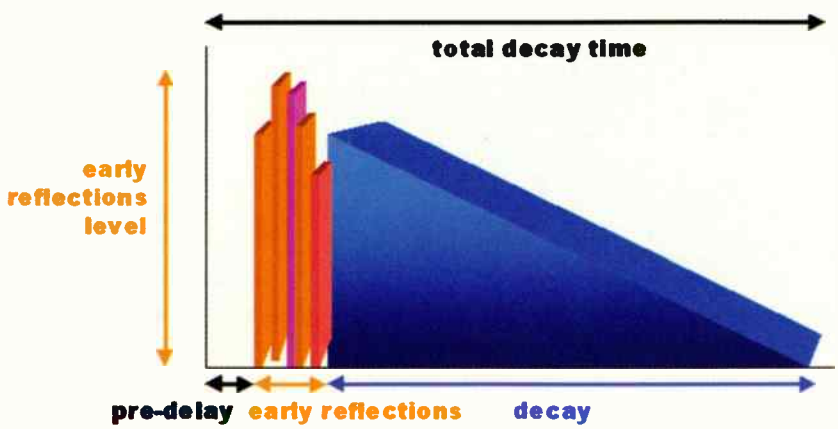
Decay time and room size tend to have certain "magic" settings that work well together. Preset reverbs lock in these settings so you can't make a mistake. For example, it can sound "wrong" to have a large room size and short decay time, or vice-versa. Having said that, though, sometimes those "wrong" settings (remember, "rong is gud!") can produce some cool effects, particularly with synthetic music where the goal isn't necessarily to create the most realistic sound.

Damping. If sounds bounce around in a hall with hard surfaces, the reverb's decay tails will be bright and more defined. With softer surfaces (*e.g.*, wood instead of concrete, or a hall packed with people), the reverb tails will lose high frequencies as they bounce around, producing a warmer sound with less "edge." A processor has a tougher time making accurate calculations for high-frequency sounds, so if your reverb produces an artificial-sounding high end, just concede that fact and introduce some damping to create a warmer sound.

High- and low-frequency attenuation. These parameters restrict the frequencies going into the reverb. If your reverb sounds metallic, try reducing the highs starting at 4–8kHz. Remember, many of the great-sounding plate reverbs didn't have much response over 5kHz, so don't fret too much about a reverb that can't do great high-frequency sizzle.

Having too many lows going through the reverb can produce a muddy, indistinct sound that takes focus away from the kick and bass. Try attenuating from 100–200Hz on down for a tighter low end.

Early reflections diffusion (sometimes just called diffusion). This is one of the most critical reverb controls for creating an effect that properly matches the source material. Increasing diffusion pushes the early reflections closer together, which thickens the sound. Reducing diffusion produces a sound that tends more toward individual echoes. For percussive instruments, you generally want lots of diffusion to avoid the "marbles bouncing on a steel



The two main elements of reverb are the initial reflections and decay.

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plate" effect caused by too many discrete echoes. However, for vocals and other sustained sounds, reduced diffusion can give a beautiful reverberant effect that doesn't overpower the source. With too much diffusion, the voice will lose clarity.

Note that there may be a second diffusion control for the reverb decay. With less versatile reverbs, both diffusion parameters may be combined into a single control.

Early reflections pre-delay. It takes a few milliseconds before sounds hit the room surfaces and start to produce reflections. This parameter, usually variable from 0 to 100ms or so, simulates this effect. Increase the parameter's duration to give the feeling of a bigger space; for example, if you've dialed in a large room size, you'll probably want to employ a reasonable amount of pre-delay.

Reverb density. Lower densities give more space between the reverb's first reflections and subsequent reflections. Higher densities place these closer together. Generally, as with diffusion, I prefer higher densities on percussive content, and lower densities for vocals and sustained sounds.

> Use higher densities on percussive content, and lower densities for vocals.

Early reflections level. This sets the early reflections level compared to the overall reverb decay. The object here is to balance them so that the early reflections are neither obvious, discrete echoes, nor masked by the decay. Lowering the early reflections level also places the listener further back in the room, and more toward the middle.

High-frequency decay and low-frequency decay. Some reverbs have separate decay times for high and low frequencies. These frequencies may be fixed, or there may be an additional crossover parameter that sets the dividing line between the lows and highs.

These controls have a huge effect on the overall reverb character. Increasing the low-frequency decay creates a bigger, more "massive" sound. Increasing high-frequency decay gives a more "ethereal" type of effect. An extended high-frequency decay, which is generally not found in nature, can sound great on vocals as it adds more reverb to sibilants and fricatives, while minimizing reverb on plosives and lower vocal ranges. This avoids a "muddy"

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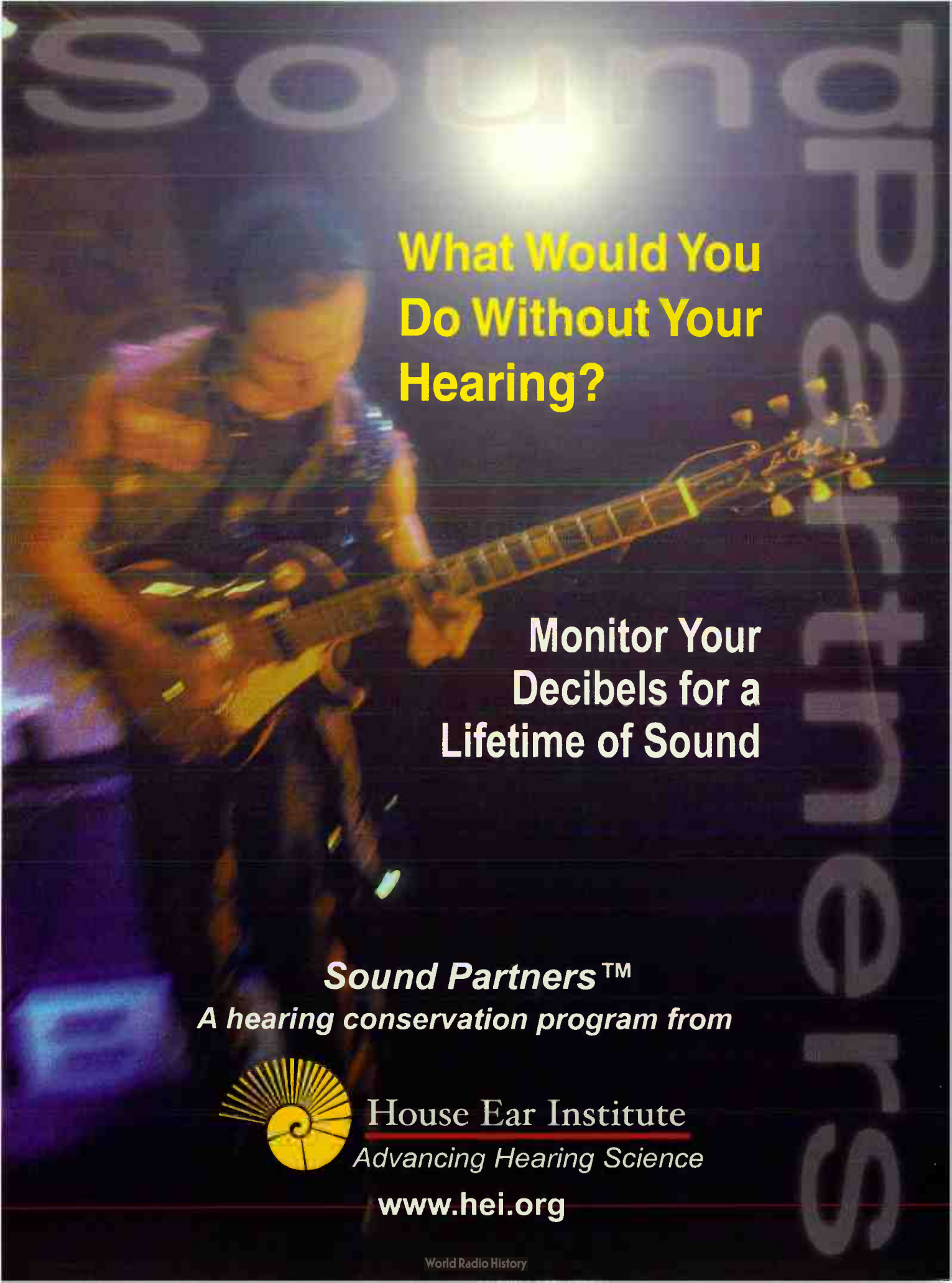

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reverberant effect, and doesn't compete with the vocals.

ONE REVERB OR MANY?

I tend not to use a lot of reverb, and when I do, it's to simulate an acoustic space. Although some producers like putting different reverbs on different tracks, I prefer to insert reverb in an aux bus, and use different send amounts to place the sound source in the reverberant space (more send places the sound further back; less send places it more up front). For this type of "program material" application, I'll use fairly high diffusion coupled with a decent amount of high-frequency damping.

The only exceptions to this are when I want an "effect" on drums, like gated reverb, or need a separate reverb for the voice. Voices often benefit from a bright, plate-like effect with less diffusion and damping. In general I'll send some vocal into the room reverb and some into the "plate," then balance the two so that the vocal reverb blends well with the room sound.

Voices often benefit from a bright, plate-like effect with less diffusion and damping.

REALITY CHECK

The most difficult task for a digital reverb is to create realistic first reflections. If you have a nearby space with hard surfaces like a tile bathroom, basement with hard concrete surfaces, or even just a room with a tiled floor, place a speaker in the room and feed it with an aux bus output. Then add a mic in the space to pick up the reflections. Blend in the real first reflections with the decay from a digital reverb, and the result often sounds a lot more like a real reverb chamber.

DOUBLE YOUR (REVERB) PLEASURE

I've yet to find a way to make a bad reverb plug-in sound good, but you can make a good reverb plug-in sound even better: "Double up" two instances of reverb (each on their own aux bus), set the parameters slightly differently to create a more "enveloping" stereo image instead of a point source, then pan one reverb somewhat more to the left and the other more to the right. You can even do this with two different reverbs. The difference may be subtle, but it can improve the sound . . . check out the audio example posted at www.eqmag.com and you'll hear what I mean. EQ

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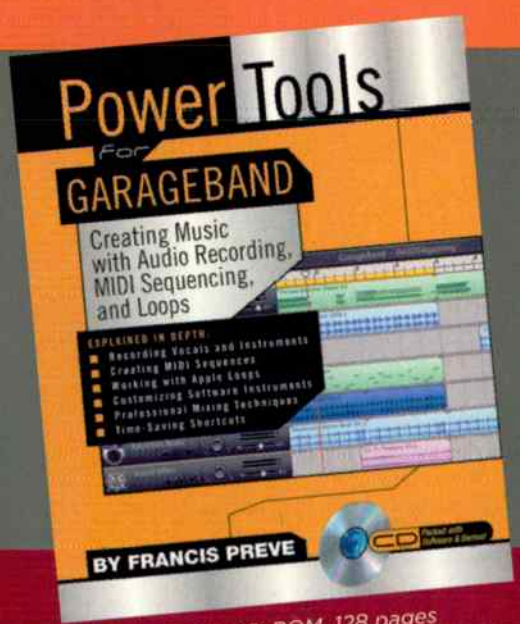

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Ableton Live 4.0

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by Craig Anderton

Type: Sequencing, arranging, looping, and live performance software
Platform: Mac, Windows
Price: $499 (upgrade from full versions of Live 1, 2, or 3: download $119, boxed $149. Recent purchasers may get further discounts; see web site). Boxed version includes 603MB of samples by Big Fish Audio. Demo version available.
Contact: www.ableton.com

Minimum system requirements: Mac: G3, 256MB RAM, Mac OS 9.2 or later, Mac OS X 10.1.5 or later. PC: 600MHz CPU, 256MB RAM, Windows 98/2000/XP
Copy protection: Enter serial number, unlock with code from company
Version reviewed: 4.0.1
Internal resolution: 16-, 24-bit
Internal sample rates: 32/44.1/48/96/192kHz
Driver support: SoundManager, CoreAudio, DirectX, MME, ASIO
ReWire modes: Client or host
Audio plug-in support: VST, AU
Virtual instrument plug-in support: VSTi, AU
Audio import formats: WAV, AIFF
Audio export formats: WAV, AIFF at 22.05/32/44.1/48/88.2/96/176.4/192kHz
Sync: Receive MIDI clock, MTC; send MIDI clock

Let's get a few things out of the way. First, I use Live for live performance and in the studio, so yes, I like it . . . and Live 4 trumps Live 3. Second, you can download a demo that does everything but save, render, and resample, so in some ways, a review is redundant.

Or is it? Live is actually a somewhat controversial program, with some pretty far-out claims being made both for and against the program by partisans and detractors. So rather than just cover the nuts and bolts, let's address the new features, then zoom out and consider what Live is all about.

BACKGROUND

If you joined the party late, Live is a digital audio (and now MIDI) program that has two main views: Session and Arrangement. The loop-oriented Session view is optimized for live playing and improvisation, and is laid out as a matrix. Columns are like tracks, and Rows are called "scenes." Each intersection is a "slot." You drag clips (audio or MIDI)

LIVE'S SESSION VIEW IS A BLEND OF A FAMILIAR MIXER-TYPE INTERFACE AND A MATRIX OF SLOTS THAT CONTAIN CLIPS, WHICH CAN BE TRIGGERED IN MULTIPLE WAYS.

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THE TRACK VIEW SELECTOR SHOWS THE HIGHLIGHTED TRACK'S DEVICE CHAIN. THIS MIDI TRACK HAS A RANDOMIZING MIDI EFFECT, THE IMPULSE DRUM BOX, A LIVE PLUG-IN, AND NATIVE INSTRUMENT'S GUITAR RIG VST PLUG-IN.

into a slot. Once there, you can trigger, loop, mute, and modify the clip in many ways.

Only one clip can play at a time from a track, but Live's Hugely Powerful Feature is that selecting a scene simultaneously triggers *all* the track clips in that row, with start times quantized to whatever rhythm you desire.

For example, suppose Track 1 has DrumLoop1 in the top slot (which would be row 1) and DrumLoop2 in the slot below (row 2). Track 2 has nothing in the first row, but BassLoop1 in the second row. If you trigger the scene representing the first row, DrumLoop1 will start playing, and continue playing if you've looped it. If you trigger scene 2, DrumLoop1 will play to the end of the loop (or to the end of whatever rhythmic quantization interval you've set), then DrumLoop2 and BassLoop1 will start playing.

For live performance, this is awesome: Set up combinations of loops that work well together, and trigger them as desired by calling up a scene. You can still trigger additional loops individually while a scene is playing, and do real-time manipulation like altering the track levels, pans, effects, etc. Furthermore, Live's audio engine is virtually gapless. You almost have to crash the computer before the audio will hiccup.

Better yet, if you hit Record prior to doing a performance, all your moves (well, almost all — more later) will be remembered. Press Play and hear a replica of your performance, and/or render it as audio to disk.

And where were these moves remembered? In the Arrangement view, which looks like most DAWs — you see tracks, automation curves, fader levels, etc. This makes it easy to touch up your Session view performance, but some Live users start from scratch with the Arrangement view and treat it more like a DAW. The Arrangement view has been beefed up over time, making it better suited for those who live mostly in a more traditional working environment.

Other Live high points are the clean and unified interface, "elastic audio" that allows pegging any audio file to a tempo (*e.g.*, I brought in a file that wasn't played to click, defined measure markers in Live, and was able to accompany it with loops), a solid complement of processors and the ability to host VST plugs, a great help facility, and super-easy remote control setup.

Live also has lots of key equivalents, short cuts, and other "power user" techniques that are worth learning (it's called "read the manual"). So while on the surface Live is easy to navigate, as you get more proficient you can do correspondingly more amazing things.

AND THEN THERE WAS FOUR

Much has been made of Live 4 adding MIDI capabilities, as if it's now positioned against programs like Performer, Logic, Sonar, Cubase, etc. Yet Live always handled ReWire well, so you could use Reason, Project5, or other MIDI-intensive programs as adjuncts. My take is that there are two important aspects about how Live has added MIDI:

- Miraculously, Ableton managed to do this without making the program more bloated, or the interface significantly more complex. Live 4 does *not* have a "creeping featuritis" vibe.
- MIDI has taken Live further down the path it was already going; it's made Live a better program that remains consistent with its design goals. MIDI doesn't feel "tacked on" so marketing types could say "now we compete with big sequencers."

I feel the Live interface has always been very *simple*, but not necessarily *intuitive* — there is a difference. Because its roots are different from standard sequencers, if you apply standard sequencer thinking, you may not get the desired result. So you look at the manual, and instead find there's some simple, obvious procedure to do what you want.

For example, you can drag MIDI files into a track or a clip slot to create a track. So I opened up a folder on the desktop, and tried to drag a file in. Wrong: You drag from Live's Browser, which is 100% consistent with the way you pretty much drag *anything* into Live. (As a bonus, the Browser shows each track in the file, which can be dragged in individually.) That's what I mean by not intuitive, but simple. Everything related to MIDI works almost identically to how things work with audio.

Adding a soft synth is equally simple; just drag it in as you would an audio effect. To add a signal processor to the instrument, drag it to the right of the instrument (*i.e.*, at the output). How about a MIDI effect? Drag it to the instrument's left (the input). If you drag the MIDI effect onto the instrument itself or where audio processors are supposed to go, you get a message that says "Insert MIDI Effects Before Instruments" and the display shows a red line where you're supposed to drag it. But get this: It then goes ahead and puts the effect in the right place anyway, even if you dragged it to the wrong place! I love programs that just go ahead and do what you wanted anyway, even if you did it wrong.

THE MIDI EXPERIENCE

In Session view where you would normally see an audio waveform, with MIDI tracks you see a piano roll editor. There are four "panels" for working with MIDI: Clip (set time signature, swing, clip color, name), Launch (determines how the clip will be triggered and quantized, among other things), Notes (choose banks and programs, do note editing, set loop characteristics), and Envelopes, which work like envelopes for audio except they're MIDI controllers. You can show/hide these

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Ableton Live 4.0

panels to allow less/more room respectively for editing.

In addition to this type of Clip Overview, there's also a MIDI Track Selector. Like audio tracks, this is where you process the virtual instrument (VSTi or the ones included with Live) driven by MIDI. This also shows the virtual instrument parameters, and any MIDI or audio effects.

And that's pretty much it for MIDI — what you need in a compact interface. In Arrangement view, MIDI tracks look as they would in most any digital audio+MIDI host sequencer.

There are two bundled instruments: The Impulse 8-pad drum module (with a decent library of hits), and a sample playback module called Simpler — drag in a sample (again, several are included with the package) and adjust envelope, filtering, etc. It won't put MachFive *et al* out of a job, but it's handy.

Other MIDI goodies include Standard MIDI File import/export, the ability to generate MIDI notes from your QWERTY keyboard (attention laptop fans), some MIDI effects (love the randomizing one), and an overdub-oriented "drum machine" mode for creating patterns.

OTHER NEW STUFF

Other major and minor improvements include AU support on the Mac, groove settings for audio and MIDI clips, the ability to copy warp markers across multiple tracks (good if you've imported several tracks for a remix — if the tracks are the same length you only have to warp one), storable tempos with individual scenes (yes!), and more. Rather than kill more trees just to describe features, surf to the Ableton web site for details.

Last but not least is better busing, including more sends and returns (now up to 12 per Live set), and more flexible track routing and monitoring — great for "re-sampling" processed tracks, or recording MIDI tracks as audio.

AUDIO QUALITY

I've seen some online discussion about the audio engine's sound quality. "It's much better than my main sequencer!" "It's not as good as my main sequencer!" Well, they're *both* right — it depends on the source material and skill of the user.

Live does not interpret acidization markers or REX slices, but has a flexible stretching engine with different algorithms. Matching the source material to the right algorithm produces the best quality; I suspect the people who don't do this are most vocal about Live's supposed "shortcomings." However, the "beats" algorithm — probably the most used one — has fixed rhythmic markers, which is a more rigid process than acidization's ability to position markers at specific transients.

For example, assume an eighth-note rock drum pattern but at one point, an open hi-hat sustains for one beat while nothing else plays. With acidization, you would place a marker at the beginning of that beat, and another at the next beat when another drum hits. With Live, you

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Program directly with LCD interface, or graphically with PC software

- Eight emulations of popular speaker models
- Link monitors to adjust DSP from one interface
- Adjust from sweet spot with included software
- Up to 16 discreet channels of control—perfect for surround
- Apply EQ to compensate for room resonances
- Eight editable user presets

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Ableton Live 4.0

would specify eighth-note markers, but this means a marker would end up in the middle of the open hi-hat. This can produce a small, but noticeable, discontinuity.

Granted, all looping methods — acidization, REX files, and Live — have strengths and weaknesses. What's good about Live is not that there are situations when it doesn't work perfectly, but rather, that it works well for most program material. When truly acidized files are essential, I ReWire Live into Sonar. Of course, if you repitch with resampling or don't stretch, artifacts aren't an issue. As to whether digital summing, level changes, panning, etc. affect the sound, that's a controversy that relates to all digital audio hosts — so let's not go there.

CAN IT REPLACE MY DAW?

This is another topic of online comments, and again, the answer is yes and no. If you need a video window, REX/Acid file support, or surround, Live won't qualify. On the other hand if the Session view fits your style of working, no DAW will cut it for you. There are other issues: Metering in Live is rudimentary, as there's no numeric indication of how much a signal peak is above or below clipping. And for those who *must* have a hardware mixer-type look (not me, though), you won't find it here.

My only real beef when using Live for loop-based live performance is that you can't record solo button moves as part of the automation. Ableton is aware of this issue and will address it, but haven't said when.

What Live *does* offer is something unique, and I think comparing it to DAWs misses the point. Live may be optimized for creating loop-based music, but even the most dedicated loop fans feel the need to add linear tracks of audio or MIDI instruments — just as those who record mostly linear tracks are discovering the value of throwing some loops into the equation. Live 4 provides both facilities with the same ease, grace, and simplicity with which it does everything else.

No, I'm not getting rid of my DAW. But I'm using Live instead of it more than ever, because just as DAWs are ideal for certain applications, Live is the program of choice for others. And when you ReWire Live together with a DAW, you can pretty much control the universe as we know it.

If you're a Live fan, Live 4 will make you jump for joy. And if you're not, Live 4 may be the rev that turns you into a convert. EQ

Strengths:

- MIDI adds much to the core strengths
- Retains its elegance despite adding features
- Accepts VST/AU instruments
- Supports automation, ReWire, multiple formats
- Vastly improved routing and monitoring
- Storable scene tempos
- Excellent help, with built-in lessons and tutorials

Limitations:

- No surround support
- Limited metering
- With Windows, Browser doesn't recognize files on the desktop
- Solo button moves not automated

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Genelec 8040A

Groundbreaking active monitors undergo a new-millennium makeover

by Mitch Gallagher

Type: Active monitor system
Price: $1,150 each
Contact: Genelec, www.genelec.com

Format: 2-way, rear ported
Low-frequency driver: 6-1/2"
High-frequency driver: 3/4" metal dome
Low-frequency amplifier: 90 watts
High-frequency amplifier: 90 watts
Crossover frequency: 3kHz
Frequency response: 48Hz – 20kHz, ±2dB
Max peak SPL: >115dB @ 1m (pair)
Self-generated noise: <10dB @ 1m, free-field, A-weighted
Input connectors: XLR
CONTROLS
Input level: ±6dB
Treble Tilt: mute or –4, –2, 0, +2dB @ 15kHz
Bass Roll-off: –6, –4, –2, 0dB @ 45Hz
Bass Tilt: mute or –6, –4, –2, 0dB @ 100Hz
Desktop: –4dB @ 160Hz
Magnetic shielding: yes
Dimensions: 13-13/16" x 14-3/8" x 8-13/16" (H x W x D)
Weight: 18.9 lbs

Finland's Genelec was one of the original proponents of active high-end studio-quality monitors. Founded in 1978, the company's speakers have earned an enviable reputation, and are in constant use in countless studios around the world. So when they re-design — essentially re-create — some of their most popular models, it's big news.

The company's new 8000-series monitors replace the highly regarded 1029a, 1030a, and 1031a two-way active monitors. The new models sport a unique rounded cabinet design, a redesigned bass reflex port, and an integrated Directivity Control Waveguide.

The unusual cabinets have more than just rounded corners; the cabinet sides, bottom, and top are all gently rounded. According to the company, this cuts down on the effects of diffraction from the enclosure. It also means that the speakers won't stand up on their own, so an Iso-Pod stand was developed that attaches to the bottom or side of the enclosure. In addition to allowing the speaker to stand upright, the Iso-Pod provides isolation from whatever surface the speaker is resting on. It can be slid forward and back, which lets you adjust the forward/back angle of the speaker. Very nice. The new cabinets also have integrated stand-mounting hardware for bolting to floor stands or wall or ceiling mounts.

The back of the cabinet has the new bass reflex port, which has a large cross-section and a wide flare. (The port has the added bonus of serving as a carrying handle — these things are solid and heavy.) As with any speaker, placement in front of a wall or other surface can cause problems. But like their

THE 8000-SERIES MONITORS FROM GENELEC (THE 6.5" 8040A IS SHOWN AND REVIEWED HERE) OFFER A COMPLETELY NEW CABINET DESIGN, AND EVEN BETTER SONIC QUALITY THAN THEIR PREDECESSORS.

THE 8000 SERIES MAKEOVER INVOLVED MORE THAN JUST A CABINET REDESIGN. THE ELECTRONICS AND DRIVERS ARE NEW, TOO.

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Genelec 8040A

predecessors, the 8000 series have plenty of room-tailoring control built-in. There's Treble Tilt, which can provide 2dB boost or up to 4dB cut above 15kHz (in 2dB steps). Bass Tilt does the same thing below 100Hz. The "Tilt" switches also allow you to mute the bass or treble driver. According to the frequency response graphs in the manual, the slope of both filters is fairly gentle, so their effects extend beyond the cutoff frequency (up to around 500Hz with Bass Tilt, down to around 3kHz with Treble Tilt).

Two other controls address low-frequency issues. Bass Roll-off attenuates up to 6dB (in 2dB steps) with a cutoff frequency of 45Hz. The Desktop Control is a 4dB notch filter at 160Hz. It's designed to compensate for placing the speaker on a table, meter bridge, or other reflective surface.

Compared to the older 1030a, the new 8040a is, as you'd expect, similar in tonality and response. However, there are differences.

The only other control (besides the power switch, of course) is input sensitivity, which ranges ±6dB. All controls are on the rear panel; they're set into a "shelf" in the body of the enclosure, so you shouldn't have to worry about them being inadvertently adjusted. Input sensitivity requires a screwdriver for adjustment.

The speakers are all symmetrical and identical, so each can serve as left or right (or center or left/right rears in a surround rig) monitors. They can be positioned vertically or horizontally. Genelec recommends vertical placement for best results.

ON THE BACK PANEL OF THE 8040A YOU'LL FIND POWERFUL SOUND-SHAPING CONTROLS. THERE'S A TREBLE FILTER AND TWO BASS FILTERS. NEW FOR THE 8000 SERIES IS THE "DESKTOP" CONTROL, WHICH NOTCHES THE RESPONSE AT 160HZ TO COMPENSATE FOR PLACEMENT ON A METER BRIDGE OR TABLE.

LET'S LISTEN

I received a pair of 8040a monitors for this review. Until recently I had 1030a monitors in my studio; the 8040a is a direct replacement for that model. While I couldn't do an A/B comparison with the two models, after 10 years my memory of the 1030s is pretty good.

The 8040a has a 6.5" woofer, and 3/4" metal-dome tweeter. The low- and high-frequency amplifiers each provide 90 watts of power. The speakers were positioned on stands placed 3' from the front wall, 7' from the sidewalls, and in a 4' equilateral triangle with the mix position. The mix position in my studio is an RFZ (reflection-free zone) design.

I settled in with my favorite reference material, a new project I'm working on with a Nashville singer/songwriter, and some recent minimalist/direct-to-Masterlink classical guitar recordings.

Compared to the older 1030a, the new 8040a is, as you'd expect, similar in tonality and response. However, there are differences. The 8040a's low end is bigger,

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Genelec 8040A

but at the same time tighter than the older model. The highs seem more open. The midrange also has an open quality, with excellent depth, and no boxy quality or harshness.

The speakers have plenty of power for nearfield applications. They can even hold their own compared to 8" models from other manufacturers, both from an output and a low-end standpoint.

Like the 1030a before it, the 8040a has a smooth, but detailed, sound. It's easy to listen to for long periods of time. You won't find yourself straining to hear "into" your mixes or to balance ambience and reverb. Once you've dialed your ears in, you'll also find them easy to set EQ on, with plenty of depth for adjusting the balances in complex mixes.

SHOULD YOU?

If you're a long-time Genelec user, and your old speakers are getting a bit long in the tooth (as my 1030s were after many years of continuous use), you'll definitely want to look at updating to the new models. They'll sound familiar to you, but with noticeable improvements. I felt the lows were tighter and more extended, and that the top end detail was even better than my trusty old standbys.

If you're looking to replace other monitors or searching for your first higher-end active speaker, give the Genelec 8000-series a good look. They provide a balanced, smooth sound that's easy to listen to for extended sessions. Even with the 6.5" woofer in the 8040a, the low end is solid and surprisingly powerful. There are plenty of tonal adjustments for matching the speakers to even the most problematic room. They're not cheap, but you'll get many years of service from them.

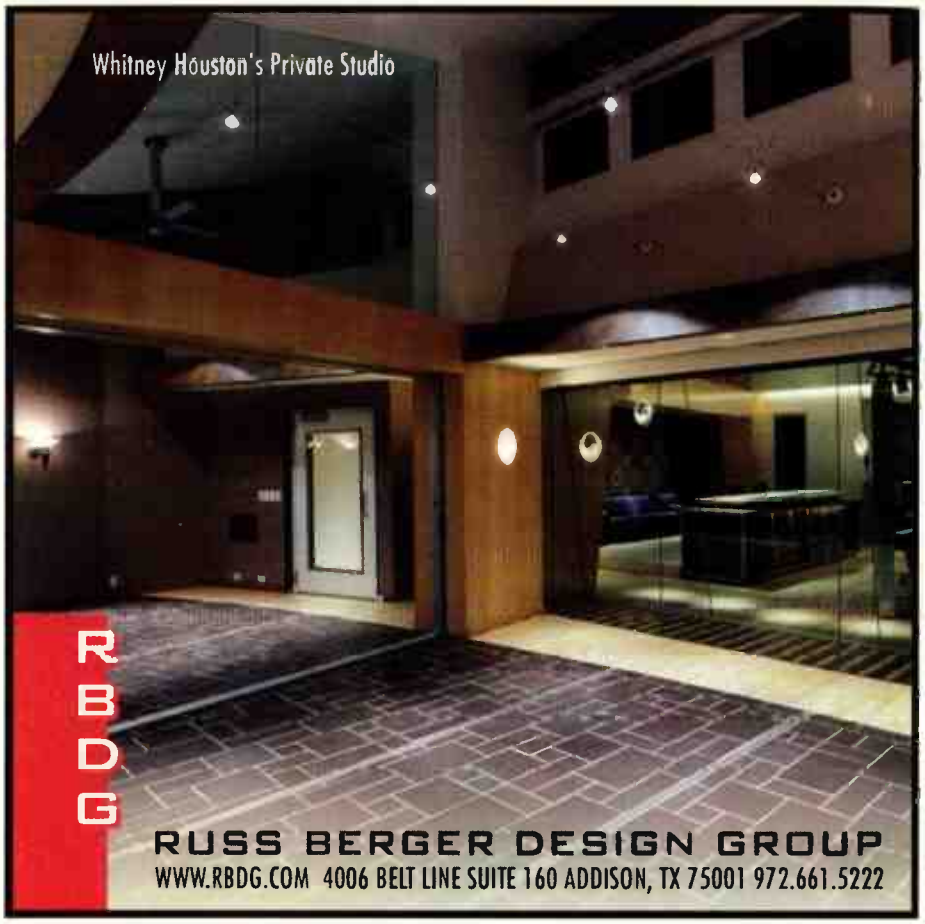
Naturally the only way to decide on monitors is to sit down and critically listen to them in your own room. If you do this with the 8000-series, you'll be glad you did. EQ

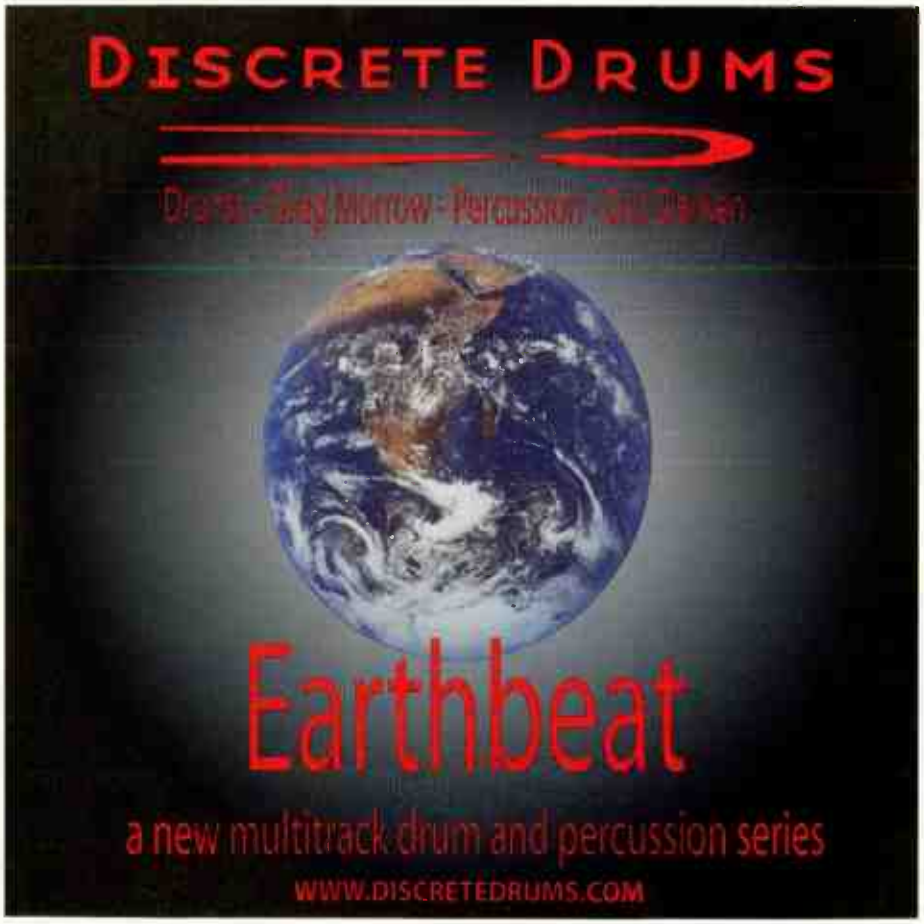
Strengths:

- Excellent Genelec audio quality
- Good dynamics
- Flexible and powerful sound-shaping control
- Plenty of power

Limitations:

- None to speak of





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Differentiating itself from standard computer I/O boxes which are typically based on a patch-bay paradigm, the Omega 8x4x2 USB I/O mixer is based an a mixer paradigm and includes input, output and mixing functions that support a variety of tracking/monitoring applications while requiring no additional mixing hardware. The I/O mixer is packed with professional features such as ultra-transparent, high resolution A/D converters, extremely low-noise mic preamps with 48-volt phantom power and active balanced line level inputs. MIDI and S/PDIF ports allow connection to a variety of digital equipment.

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Steinberg System|4

This mid-level bundle also works for upscale entry-level setups.

by Phil O'Keefe

Type: Audio/MIDI interface with DAW software bundle
Price: $899
Contact: www.steinberg.net

Platforms: Windows 2000/XP, Mac OS X 10.2.5 or higher
Minimum system requirements: 384 MB RAM, USB 1.1 port, 1024 x 768 display; (Windows) Pentium/Athlon 800MHz; (Mac) G4 867MHz
Computer interface: USB 1.1
Analog ins: Channels 1/2: XLR mic ins with 48V phantom power, 50dB gain, balanced TRS 1/4" line ins with up to 70dB gain. 1/4" unbalanced TRS send/return inserts. Channel 1 also has a front-panel 1/4" TRS Hi-Z in (50dB gain). Channels 3/4: unbalanced 1/4" TS line ins with 20dB of gain, adjustable in four steps.
Analog outs: 1/4" TRS balanced +4dBv L/R main outputs, 1/4" stereo headphone out
A/D - D/A converters: 24-bit linear
Resolution: 16/24-bit @ 44.1/48/88.2/96kHz
Digital I/O: S/PDIF up to 96kHz
Bundled sequencer: Cubase SL
Plug-in formats: VST, DX with included wrapper
Drivers: ASIO, MME, CoreAudio
Copy protection: Integrated into MI4 interface.
Tested with: Athlon XP 2400, 512 MB RAM, Cubase SL, Sound Forge 5, Sonar 3, Windows Media Player

There's a wide range of people who are interested in recording, with a correspondingly wide range of needs, so a significant market exists for products that cater to people who are relatively new to the art of making their own music. What they want is an easy to use, yet reasonably powerful system that allows them to record their music without the hassles of cobbling together different elements from a variety of sources. Steinberg's Cubase System|4 (with the MI4 USB audio/MIDI interface and Cubase SL software) is designed to address the needs of users who are no longer beginners but aren't quite ready to go for a full-blown pro system; let's see if Steinberg succeeded in that goal. ➤

CUBASE SL, A DIGITAL AUDIO+MIDI SEQUENCER, IS BUNDLED WITH SYSTEM|4. WHILE THE FEATURE SET ISN'T QUITE AS COMPLETE AS CUBASE SX, SL OFFERS MOST OF THE SAME FEATURES AND INCLUDES SEVERAL PLUG-INS. NOTE THE 4-BAND EQ AVAILABLE FOR EACH CHANNEL.

THE MI4 INTERFACE IS CRAMMED WITH I/O AND SOLIDLY BUILT. IT'S SELF-POWERED, AND THEREFORE SUITABLE FOR REMOTE RECORDING APPLICATIONS WITH A LAPTOP.

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Steinberg System|4

HARDWARE AND INSTALLATION

The MI4 interface (4-in/4-out audio, MIDI in and out) is a solidly built, half-rackspace metal box that's crammed with I/O (see the specs sidebar). It's USB-powered, making it well suited to mobile applications. I particularly appreciate the pair of insert jacks for patching outboard processors into inputs 1 and 2. The S/PDIF I/O runs up to 96kHz; the output can "mirror" the main output jacks, or be used separately to connect outboard digital effects or as a secondary output pair.

I was impressed by the front-panel controls and metering: 4-segment multicolored LED meters and gain knobs for inputs 1/2, a 48V phantom power LED indicator, peak and signal present LEDs for inputs 3/4, a headphone jack, two separate volume knobs for headphone and main output level control, MIDI I/O indicator LEDs, and a power LED. Nice. A Direct Signal monitor knob blends the balance of playback and inputs for zero latency monitoring while tracking, but unfortunately you can monitor only inputs 1/2 or 3/4 with this feature; at 96kHz, you're limited to monitoring only input 2 (inputs 1 and 2 are currently "swapped" at the highest sample rates, a bug that Steinberg promises to fix). When I connected an outboard converter to the S/PDIF in, I found it doesn't work with direct monitoring — bummer. While the front panel is packed, nothing feels cramped or difficult to adjust.

> While the front panel is packed, nothing feels cramped or difficult to adjust.

Driver installation (ASIO/WDM for Windows, CoreAudio on the Mac) is easy — just follow the onscreen instructions. Regarding copy protection, the MI4 acts as the dongle for Cubase SL. You can add a more sophisticated interface, but you'll need to leave the MI4 connected. Incidentally, the MI4 worked fine with various ASIO programs, and played Windows system sounds with the WDM drivers. A control panel applet is where you configure the MI4's direct monitoring, mic in 20dB pads, line in gain trims, and control phantom power on/off (there's no hardware switch).

While the MI4 supports up to 24-bit/96kHz resolution, the USB 1.1 interface bandwidth is a bottleneck. For example, 16-bit/48kHz operation allows four audio ins and outs; 24/44.1 limits I/O to four ins/two outs, or two ins/four outs. 24/96 provides either two active ins with no outs (*e.g.*, for high sample rate remote/live recordings), one in and one out, or two outs and no ins.

To be fair, bandwidth is an issue with all USB 1.1 interfaces. FireWire or mLAN offers far more bandwidth, but either is more expensive to implement. Bottom line: If you're serious about 96kHz, you should probably look elsewhere.

For me, 96kHz wasn't worth the extra hassles, and besides, any differences in sound quality were negligible — the unit sounds fine for a product in this class, even at lower rates. The mic pres were quiet and useful, while the headphone out has plenty of gain. No complaints here — it sounds good!

THE SOFTWARE BUNDLE

Cubase SL shares many Cubase SX features, and has a similar "look and feel." Space doesn't allow listing all the program's features (see the Cubase SX2 review in the Jan. '04 *EQ*), but there's a PDF comparison chart of the differences between SX and SL at www.steinberg.net. For now, we'll hit the high points.

Audio loop recording *rocks*. It's simple to do multiple passes until you nail that perfect take. The maximum amount of tracks depends on your computer and project complexity, but the program itself doesn't limit track count. Each audio track features a 4-band parametric EQ — another nice feature (of course, you can always "plug in" other EQs). SL has five insert slots per track, which is plenty for all but the most demanding situations. Furthermore, it's stable, and didn't crash once. Outstanding!

You get 16 virtual instrument (VSTi) slots, and three bundled soft synths — I really liked the Waldorf A1 virtual analog

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BUYING MONITORS?

When it comes to studio monitoring, more Sweetwater customers rely on Mackie monitors than any other. Why? Because the Mackie family of studio monitors deliver incredible performance at an astoundingly affordable price, with enough models to hit the sweet spot for music-makers and professionals alike.

HR624 This award-winning bi-amplified two way studio reference monitor features a 6.7" woofer and 1" tweeter w/ a metal dome waveguide for a wide stereo spread. It's the perfect professional active monitor for smaller studios.

$449.97
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HR626 This popular bi-amplified studio reference monitor features a custom D'Appolito driver design for enhanced bass without boominess. A favorite in post-production facilities.

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HR824 As the most acclaimed active nearfield monitor of the last decade, the legendary HR824 brings esoteric, high-end studio monitoring to a price within reach of the working professional. Features an 8" woofer and 1" tweeter with metal dome waveguide for wide sweet spot.

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HRS120 and **HRS150** These high-precision powered system subwoofers feature 12" and 15" drivers, respectively, as well as THX PM3 certification. They're the perfect complement to Mackie nearfields, providing ultra-accurate, very detailed bass.

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MSRP $1499

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MSRP $2499

TAPCO brings Mackie-quality monitors to more musicians.

The **S•5** is a Mackie-designed studio monitor with a 5.25" woofer for punchy bass output, plus an extremelydetailed midrange and ultra-wide sweet spot. It's Mackie studio monitor quality at a great price!

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The TAPCO **S•8** takes the great Mackie-engineered sound of the popular S•5 and kicks it up a notch with an 8" woofer for bigger bass output. Perfect for modern music production where accuracy is a must.

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synth's fat sound. The LM7 drum module and VB1 bass synth are useful additions, although I would have liked a GM sound module. Latency at the fastest setting was just under 9ms, which is typical for USB 1.1. This is usable, but noticeable, and stresses the CPU; a session that used 80% CPU power used only 40% at the next fastest setting (about 13ms latency). Fortunately you can "freeze" tracks with VST plug ins, thus reducing the CPU load.

Enough VST audio and MIDI plug-ins are included to get you going. The delay compensation for plug-ins was transparent; it was great to bus over to a VST effect and not hear delays between the original and processed signal.

MIDI in Cubase is a joy to use. Inserting the LM7, pulling up a drum grid, and throwing a groove down took only a bit more time than typing this sentence. Sweet. The MIDI notation display is also welcome.

FINAL THOUGHTS

System|4 is a great fit for someone who wants a capable, inexpensive home recording setup or does basic mobile recording. Compared to Digi's Mbox, System|4's increased audio track count, vastly superior handling of MIDI, and increased hardware capabilities are major plusses, although I prefer the Pro Tools LE mixer — Cubase SL's seems somewhat cluttered and less intuitive. However, it is highly configurable, so with a little bit of effort you can streamline the look to whatever extent you desire.

As usual, the choice comes down to your personal needs. If you require extensive MIDI features, Cubase SL is a great choice, especially if you need only a few simultaneous inputs. With its good sound and capable software, it's definitely a winner. EQ

Strengths:

- Extensive MIDI features
- Unlimited track count
- Bus powered hardware
- Excellent metering and hardware control layout
- Solid, stable software
- Good sound and value for the price

Limitations:

- USB bandwidth limits I/O at high sample rates
- Mixer somewhat cluttered
- Even if you upgrade the audio interface, the MI4 must remain connected to your system.

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World Radio History

Ultrasone Headphones

Studio cans for the new millennium

by Frank Wells

Type: Dynamic headphones
Price: HFI-550, $189 (PROline with greater EMF protection, $249); HFI-650, $249 (PROline, $299); HFI-2000, $249 (PROline, $299)
Contact: Ultrasone, www.ultrasone.com

HFI-550
Design: Foldable, closed-back
Frequency response: 10Hz to 22kHz
Impedance: 64 ohms
Sound pressure level: 103dB
Cable: 3-meter, straight, gold-plated 1/4"/1/8" connector
Weight: 265g (without cable)
Accessories: Travel bag

HFI-650
Design: Foldable, closed-back
Frequency response: 10Hz to 25kHz
Impedance: 75 ohms
Sound pressure level: 94dB
Cable: 3-meter, straight, gold-plated 1/4"/1/8" connector
Weight: 265g (without cable)
Accessories: Travel bag

HFI-2000
Design: Circum-aural, semi-open back
Frequency response: 15Hz to 25kHz
Impedance: 75 ohms
Sound pressure level: 90dB
Cable: 3-meter, straight, gold-plated 1/4"/1/8" connector
Weight: 230g (without cable)
Accessories: —

German headphone manufacturer Ultrasone uses a proprietary design approach ("S-Logic") with a decentralized driver placement that works with the physics of the ear to produce a "natural surround sound." Instead of forcing sound directly into the inner ear, Ultrasone headphones are designed to reflect sound off the surface of the outer ear. Since the outer ear is used to determine the direction and distance of a sound, Ultrasone says this results in a "natural 3-dimensional" sound. According to the company, S-Logic also raises the perceived volume level, allowing you to reduce the actual sound pressure level by 3–4dB, but still think that you are hearing the same loudness. This is said to cut down on hearing strain and fatigue, and to reduce the risk of hearing damage. (While 3–4dB may not seem like a lot, Ultrasone says it's a 40% reduction in pressure at the eardrum.)

Ultrasone's PROline headphone designs also feature a reduction in electromagnetic force (EMF) leakage. The company states that normal headphones have a field emission level of four times the recommended maximum levels — in some cases up to 10 times the recommended max — and that their patented use of MU-metal shielding in the PROline can reduce magnetic field emissions by 98%.

For pro use, these headphones come with a straight 3-meter (about 10') cord. The 1/4" plug unscrews to reveal a 1/8" plug. The HFI-550 and HFI-650 fold up neatly. The earpads on the Ultrasone phones are easily replaced and the headbands are serviceable, but unless I missed a trick, the wiring and transducers don't seem to be easily replaced in the field.

I had the chance to put three Ultrasone PROline models to the test, using the excellent HPA-2 headphone amp circuitry in Benchmark's DAC-1 converter as my primary test driver.

HFI-550

First up, the HFI-550, the lowest priced member of the line-up. Designed for tracking, these cans should delight your drummer friends. The fit is tight, but not uncomfortable. Rejection of outside sound is excellent. The HFI-550 has the lowest impedance rating of the Ultrasone models tested (64 ohms to the others' 75 ohms), which is part of what makes them the most sensitive of the group — in other words, it's the loudest with a given input). They also have the loudest output rating, cited without drive reference at 103dB SPL.

Specs aside, these phones can get very loud, without distortion. As with any headphone, they can be overdriven, but they take more abuse than any other headphone I'm aware of, while still giving solid sonics. The HFI-550 beat most of their competition in sonics — the fine detail and the smoothness of the high frequencies being

ULTRASONE'S HFI-550 IS THE LEAST EXPENSIVE MODEL IN THE LINE. IT'S A CLOSED DESIGN AIMED AT TRACKING.

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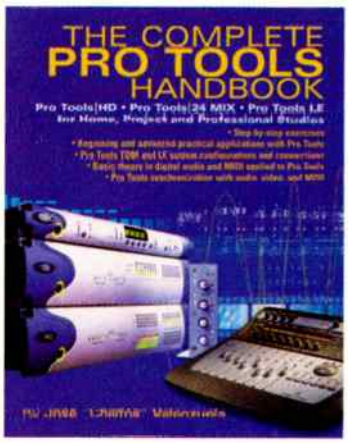

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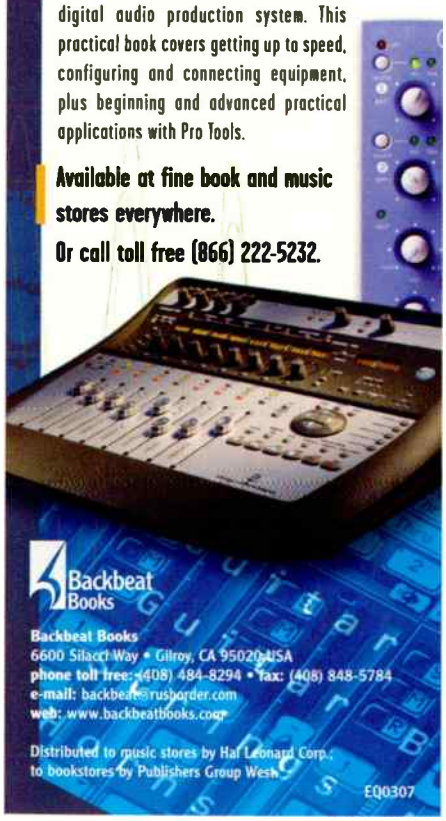

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EQ0307

Ultrasone Headphones

THE HFI-650 HAS THE WIDEST FREQUENCY RESPONSE OF ALL THE ULTRASONE HEADPHONES.

WITH ITS SEMI-OPEN DESIGN, THE HFI-2000 ISN'T DESIGNED FOR TRACKING. BUT IT OFFERS AUDIOPHILE SOUND QUALITY FOR MIXING AND MASTERING.

only subtly below the performance of the other Ultrasone models tested here. Where they undoubtedly beat all the competition is with low-end performance — solid, well defined, and specified as reaching down to a very low 10Hz.

HFI-650

My favorite of the Ultrasone models I tested is the HFI-650. These fit like the HFI-550, and like the HFI-550, offer a closed-ear design with great rejection of outside noise. Though snug fitting, they can be easily worn for long stretches with decent comfort. Their impedance rating matches the HFI-2000 (see below) at 75 ohms, though they are more sensitive with an output rating of 94dB SPL. They also have the broadest frequency response rating at 10Hz to 25kHz. Detail, punch, and spaciousness are all excellent.

HFI-2000

Rounding out the high end of the Ultrasone PROline spectrum is the HFI-2000, the most sonically pure of the three models tested. It provides the most detail, the most definition between instruments, the broadest sense of space, and the

World Radio History

WHAT IS IT THAT MAKES sE MICS THE PROFESSIONALS CHOICE?

Rob Kelly

'We have used the SE Gemini on various sessions at Strongroom Studios, and they stand up to the best valve mics in our collection. They are clear, full and detailed sounding. We bought two for Strongroom, and several of our clients who got to use them have put orders in for their own mics without hesitation.'

Strongroom Studios

Geoff Dugmore

'The coolest grooves the hardest beats the funkiest vibe only come together when I'm using the meanest mics. GET THEM OR GET OUT OF THE STUDIO.'

Robbie Williams, Tina Turner, Dido, Bruce Springsteen, Jeff Beck, Rod Stewart

Sidh Solanki

'... in the studio we usually have the pick of the crop when it comes to microphones but I keep coming back to my Gemini - I use it for almost everything from recording bass cabs and kick drums to acoustic guitar and vocals - knockout detail and luscious warmth - plus the two valves glowing in the back... simply beautiful.'

Outkast

Steve Levine

'The Gemini studio tube microphone is a very unusual microphone as it combines both the traditional warmth, expected of a high quality studio tube condenser microphone along with an exceptional transparent high end, normally only available with solid state designs.'

Culture Club, The Creatures, The Beach Boys, Westworld

Paul Borg

'The Z5600 is a great all rounder. I have found it to be a great work horse using it on vocals, acoustic guitar and even bass amps. It has plenty of depth and handles low frequencies well whilst delivering real clarity on the high end with vocals and acoustic instruments.'

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Ultrasone Headphones

best localization. This is a semi-open, circum-aural design, so they're not suited for most tracking applications or for noisy environments. The earpieces are very comfortable, but the headband isn't as well suited for someone with a large head. They also don't get quite as loud as the other Ultrasone models I tested, having a rating at 90dB SPL, and the frequency response doesn't go quite as low (15Hz — still below what most cans are able to deliver). Having said that, for mixing or mastering chores and for the golden ears among us, the HFI-2000 is an excellent choice.

PHONES IN 3-D

The 3-dimensionality of the image and bass response are the features most frequently praised by Ultrasone advocates. The S-Logic design didn't totally make me forget I was listening to headphones, but the image was indeed well defined. Center-panned instruments and voices pull forward and other imaging exceeds the expectations of headphones. These headphones have become popular for movie watching, giving a sense of surround from two channels and excellent discrimination between sounds that was lost with other phones used for comparison. To be properly appreciated, the bass and imaging performance of these headphones must be heard. Ultrasone headphones are subjectively louder than the competition. Though I can't empirically quantify this with measurement, I heard more at lower volumes, which also could reduce listener fatigue.

TIME FOR A CHANGE?

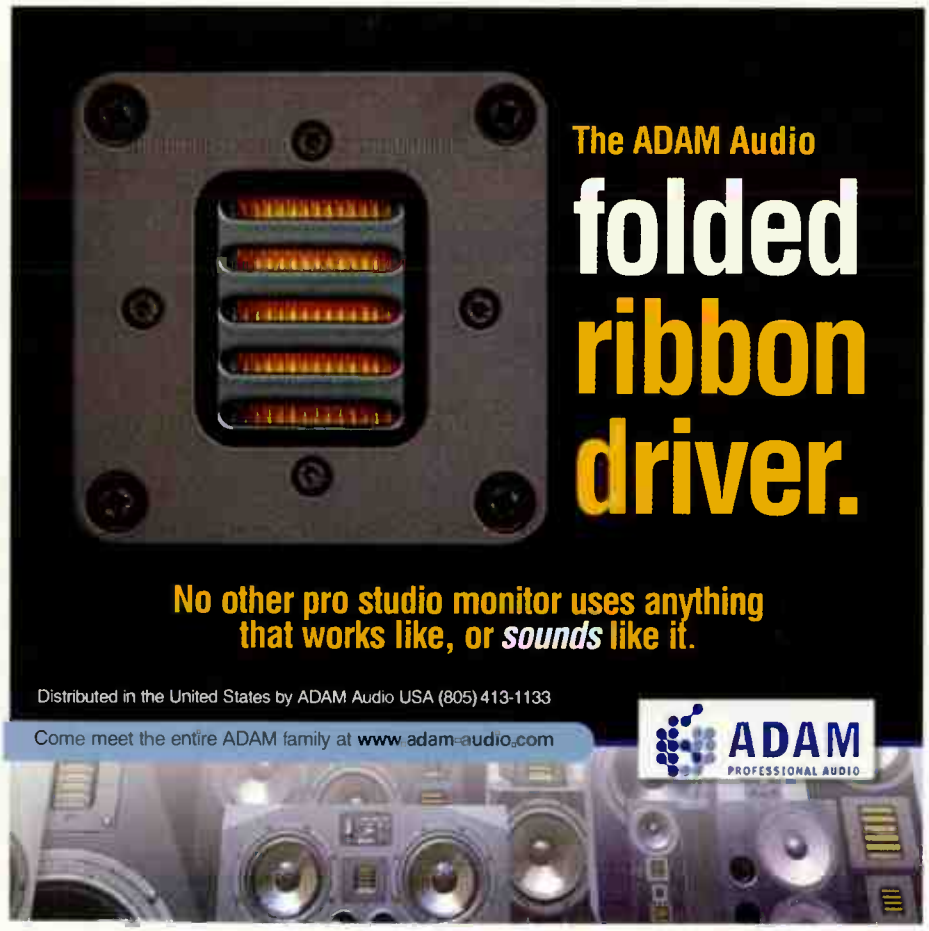
Headphone design has come a long way over the last two decades, and if you're still using a model you purchased more than a year or two ago, chances are you'd change your choice if you auditioned modern headphones. If Ultrasone headphones are part of such a test, odds are your final choice will carry their logo. EQ

Strengths:

- Excellent imaging
- Great bass response
- Folding design (HFI-550, HFI-650)
- Seem louder for a given volume setting

Limitations:

- None to speak of



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World Radio History

Native Instruments Elektrik Piano

by John Krogh

Price: $229
Contact: Native Instruments, www.native-instruments.com

Strengths:
- Cross-platform
- Low-, medium-, and high-memory presets included
- Samples can be streamed from hard disk or loaded completely into RAM
- Presets can be recalled via QWERTY function keys

Limitations:
- None to speak of

Elektrik Piano is a multisampled collection of four electro/mechanical keyboards: Rhodes (mark I and II models), Clavinet E7, and the Wurlitzer A200. Multiple velocity levels were recorded, along with release (key-up) samples; the end result is a playable, convincing batch of instruments that does an admirable job of recalling the vibe and sound of "classic" keyboard tones. This is subjective, of course. Die-hard retro keyboard players may object to the clean, pristine quality of the samples. Personally, I found the Rhodes perfectly usable for smooth jazz and pop styles, but generally lacking in bark in the middle register of the keyboard. The Wurly sounded more like an FM approximation. Clavs, however, are full of character, with just the right amount of squawk on the key release.

Effects are built in to the sampler engine, not recorded as part of the samples, so you can dial in the desired amount of chorus, delay, phaser, and so on. There are a total of four effect knobs, whose functions vary depending on the selected preset. With the "3-band EQ" Rhodes preset, for example, the knobs are mapped to low-, mid-, high-frequency gain, and mid-frequency selection. On the whole, the effects add a lot to Elektrik's palette, but I do wish there was more programmability. For starters, I'd like control over the Auto Filter's response.

So the big question remains: Does Elektrik outpace its competition? Feature-wise, I'd say yes. It can operate as a plug-in or as a stand-alone module, it offers handy features such as the ability to load multiple presets and quickly switch among them via QWERTY function keys (great for live use), and the multisamples can be loaded into Kontakt for further manipulation (allowing you to add more effects, etc.). Sonically, I wasn't as impressed, but I tend to like grittier Rhodes and Wurlys. Putting its cleaned-up sound aside, Elektrik is a solid contender for producers and songwriters looking to add quality electro/mechanical keyboards to their list of soft samplor options. EQ

Universal Audio 2192

by Mitch Gallagher

Price: $2,795
Contact: Universal Audio, www.uaudio.com

Strengths:
- Luscious sound quality
- Easy to use — no menus
- A/D and D/A in one box

Limitations:
- Meters could have more low-level resolution

Universal Audio has a long heritage of creating top-notch analog gear. Now with the 2192 Master Audio Interface, the company has brought that analog expertise to the digital world. The 2192 is a 2-channel analog-to-digital/digital-to-analog converter. It utilizes discrete class A analog electronics and an advanced low-jitter internal clock.

But the 2192 is more than just an A/D/A converter. It can also be used for routing — any of the digital inputs as well as the analog input can be sent to the analog outs. The selected input feeds all digital outputs simultaneously. It can convert among digital formats, and it has two word clock inputs and four word clock outputs for distributing clock around your studio. The A/D and D/A stages can work completely independently.

The unit has analog (XLR), AES (XLR), S/PDIF (coaxial), and ADAT optical I/O. Sample rates from 44.1 – 192kHz are supported, with 24-bit resolution. High sample rates are handled by S-MUX on ADAT optical, on S/PDIF, or via single- or dual-wire AES. Rear-panel trim pots allow you to calibrate analog levels exactly where you want them.

The 2192 is a joy to use — no menus! There are four rotary knobs on the front panel for selecting clock source, sample rate, D/A source, and A/D source. Two buttons select AES or S/PDIF and single- or dual-wire AES. Ten-segment LED meters show input and output levels. The meters don't quite have enough resolution for low-level or very dynamic signals; –27dB is the lowest level indicated.

In use, the 2192 is a joy. It's easy to operate, plays well with other digital equipment, and sounds awesome. I compared it to five other converters (some built into equipment, some stand-alone) and found that it shone in every situation. The sound is (I hate to use the word) warm, rich, and natural. The top end is open and detailed, without harshness. In addition to multitracking with it in Pro Tools Accel, I used it for recording classical guitar direct to an Alesis Masterlink at 96kHz. The results were simply stunning.

Combining UA's analog expertise with cutting edge digital technology was a masterful stroke . . . and the results are outstanding. The 2192 wins on versatility, features, ease of use, and exemplary sound quality. EQ

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Photography: Ed Freeman

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EQ EXCEPTIONAL QUALITY AWARD

It's just a USB stereo audio/MIDI interface — but given the feature set, low latency, and sound quality, it's a best in show.

Edirol UA-25

by Craig Anderton

Price: $295
Contact: Edirol, www.edirol.com

Strengths:
- Impressively low latency
- Limiter switch
- Handles 24-bit/96kHz
- Hi-Z input
- MIDI I/O
- Solidly built

Limitations:
- At 96kHz, can record or play back stereo, but not both
- Some USB plugging/unplugging required

Okay, I'll admit it: I started this review by dropping the UA-25 from a height of 6 feet on to a tile floor. After all, it's designed for mobile recording, and I figured *EQ* readers needed to know if it would stand up to life on the road.

Well, it passed that test with flying colors, so next came installation — and it passed that test, too. The well-written manual includes *40 pages* on installation details (for Windows 98SE/ME/2000/XP, Mac OS X, and Mac OS 9 — both OMS and FreeMIDI). There's ASIO/WDM for Windows and ASIO/CoreAudio for Mac. Basically, I get the impression that some engineer would be fired if the UA-25 didn't work with *everything*. If so, he still has his job. He may have even gotten a raise.

Once the UA-25 was up and running on my XP machine, it was audio/MIDI testing time. I was surprised by the latency: 3.0ms using WDM and 3.2ms with ASIO at 44.1 or 96kHz. For USB 1.1, that's extraordinary. Another surprise was the sound quality. The line outs (1/4" TRS and RCA phono) sounded great, but I also used headphones to see if I could hear any little noises or glitches (there weren't any), and the headphone amp is top shelf.

The limiter is indeed useful. I pushed it hard, but you have to *smash* it before ugliness sets in. I can easily see this saving a remote recording session. Other features are ASIO direct monitoring, mono switch, dual gain controls, +48V phantom power, high-impedance switch for one of the inputs, and S/PDIF optical I/O.

It's necessary to disconnect and reconnect USB under various circumstances, which is a tad annoying but no huge deal. I did have trouble getting MIDI recognized under the original Windows XP; it worked fine with XP and Service Pack 1, which seems the case with many USB MIDI devices. Incidentally, Edirol is adamant about using the USB cable supplied with the unit, but others I used worked fine.

This is a well-engineered interface (both hardware and software) at a very fair price. Add extremely low latency, and it's time for an EQ Award.

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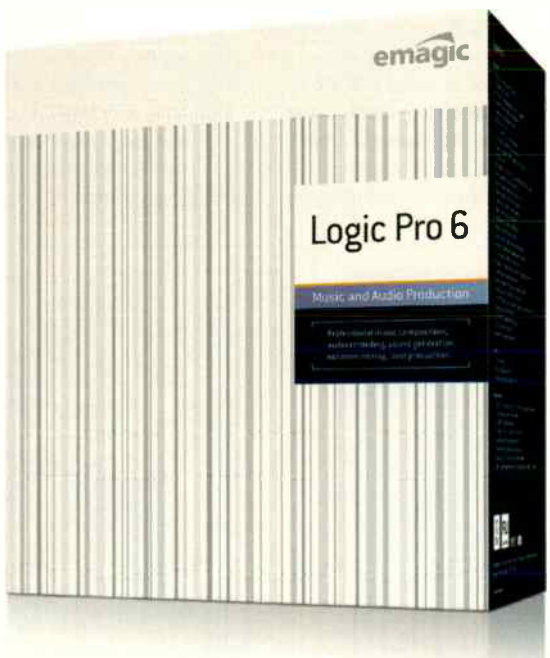

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www.emagic.de or www.apple.com/software/pro

World Radio History

Samson CL7

by Phil O'Keefe

Price: $474.99
Contact: Samson Technology, www.samsontech.com

Strengths:
- Good transient response
- Balanced, detailed sound
- Works well on a variety of sound sources
- Storage case included

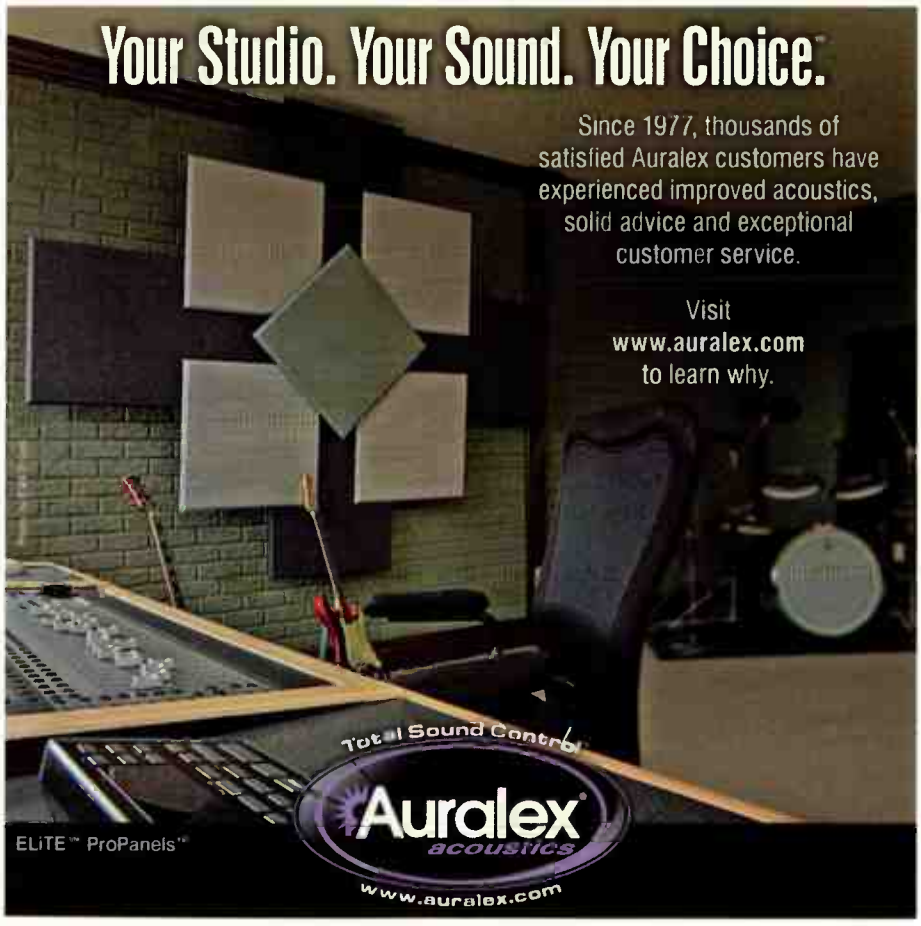
Limitations:
- Capsule on review unit was misaligned

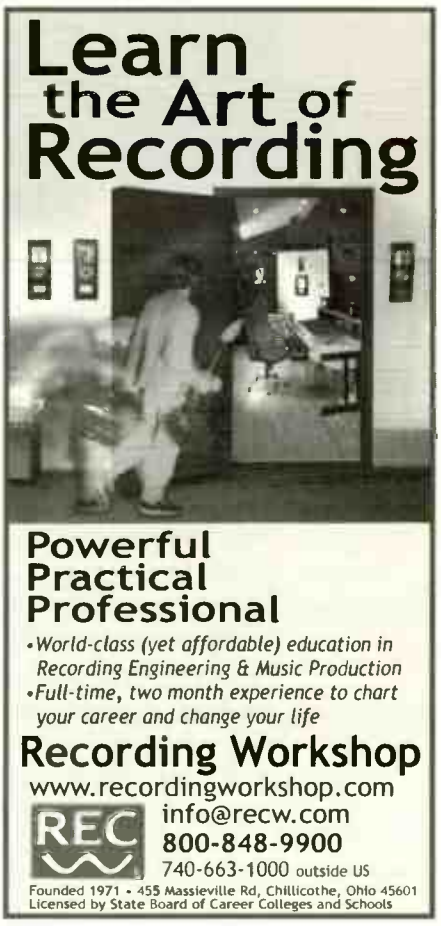
Being a bit of a mic fiend, and having been impressed with my Samson C-Control, I was eager to give the company's new CL7 large diaphragm condenser a workout. The CL7 comes in a foam-lined plastic case. Its die-cast body has an attractive matte silver-grey finish, which is fairly fingerprint resistant. I immediately noticed that the mic capsule, which is visible through the heavy-duty black grille, was slightly off-center. The CL7 comes with a stock stand mount, which threads onto the base of the mic. The stand mount was easy to adjust and the mic stayed in position well, without drooping during sessions. I also used the CL7 mounted in Samson's optional SP01 spider-style shockmount, where it was equally adjustable and stable. The SP01 proved effective at reducing stand-borne vibration and noise.

The solid feeling –10dB pad switch worked as expected, and with it engaged, the mic handles a respectable 147dB maximum SPL. Loud sources such as guitar amps and drums presented no problems.

The CL7 had a neutral tonality with less high-frequency hype than some low-cost condenser mics. On acoustic guitar and hand percussion, the mic had good transient response. It's not the quietest mic around, but self-noise wasn't an issue. While the mic has good detail, it lacks a bit of thickness and richness on some singers. Moving it closer and taking advantage of proximity effect helped. The 100Hz, –12dB/octave highpass filter worked great — I was actually able to get a good sound with the mic directly in front of the soundhole of my Taylor acoustic with the filter engaged. With it bypassed, the tone was as muddy and boomy as you'd expect from that mic position.

I found the sound of the CL7 very acceptable on pretty much everything I tried it on. At its price point, and with its neutral sound and versatility, the CL7 would definitely be worthy of consideration for someone who was looking for their first large diaphram condenser mic or for a "utility player" to add to an existing mic collection. EQ





World Radio History

Get Real

What the critics say:

"Sonically the M930 delivers. The mics are small and light enough to be positioned anywhere and the mounting hardware allows you to exactly set the angles. Brilliant! I really liked the M930s on every source I tried and in every case they came through with fine imaging and open sound. Give them a try. You'll be convinced. I was; I bought them."

~ Mitch Gallagher
EQ Magazine

"Honey they shrunk my M49! Compared to my $10,000 reference, both had that big bold Neumann sound, yet the M930 seemed to have a deeper low end and was definitely quieter. Wow was I impressed! Despite its diminutive size, the M930 contains a full 1" diaphragm and amazingly hip electronics. The tiny form factor makes various stereo arrangements easy to accomplish and the M930 is the quietest mic I have ever used. I liked them so much, I bought them.

~ Dr. Fred Bashour
Pro Audio Review

"The compact size of the M930 is very useful when trying to get a mic into a tight space. It is smaller, lighter and has greater headroom than others. It acquitted itself very well indeed in all cases, including all forms of human voice, capturing lots of detail, but in a fairly neutral way. The M930 matches or exceeds the performance of alternatives costing substantially more."

~ Hugh Robjohns
Sound on Sound

"In all of the applications, the M930's small size was an asset. I found myself writing the word superb over and over. The M930 gave me lovely, unblemished signals, that were easy to mix and required little or no EQ. The M930 is a rare critter. In short, a superb professional microphone, among the best I've used. I bought them."

~ Paul Stamler
Recording

M930 matched stereo pair with SH93 X/Y bracket

Real History

Since 1928, Gefell has led the world in microphone technology starting with the world's first condenser. In 1935 the remarkable M7 capsule was introduced that led to the legendary sound of the U47, the U49 and in 1957, the UM57 – the first ever multi-pattern microphone. Today, Gefell continues the tradition under the direction of Mr. Kühnast Jr. with the original M7 capsule featured in the UM75 and UM92.1S tube microphones.

Georg Neumann with Chief Engineer Mr. Kühnast Sr. – circa 1933

Real Quality

Quality comes with the desire to do it right. For over 75 years Gefell has built microphones by hand in order to achieve the highest standards possible. From precision machining raw metal stock to hand stretching the diaphragms and individually testing each microphone in an anechoic chamber, Gefell sets a standard that is simply higher than *any* other.

2004 – Hand drilling an M930 back plate

Real Innovation

Introducing the M930 – the most advanced condenser microphone made today. Compact for easy placement, the M930 features a full-size 1" diaphragm mounted on a triangulated pedestal to diffract body reflections away from the capsule and minimize acoustic field disturbance. Inside, the M930's optical power isolation lowers self-noise to a mere 7dB while providing 80 Volts to the capsule for an unprecedented 142dB signal handling. The results are stunning: that 'big bold German sound' without compromising sensitivity, articulation or tonal structure. No other microphone comes close.

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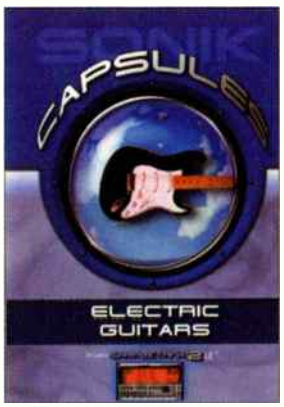
Sonik Capsules:
Guitar 3-Pack

Contact: Sonic Reality, distributed by IK Multimedia, www.sonikcapsules.com
Format: 2 CD-ROMs (Sonik Capsule and SampleTank 2 LE)
Price: $249, individual Capsules $99

The "sample library meets playback instrument" concept isn't new, but the Sonik Capsules series (for Windows ME/2K/XP or Mac OS X 10.2.8) adds serious universality. When installing the samples, the UFO (Universal Format Outputter) utility program regenerates the basic AIF samples into any one or all of several formats: SampleTank 2.0.7, SampleTank 2 LE 2.0.7 (included with the package),



Reason NN-XT, Kontakt 1.5.1, HALion 2, Battery 1.3, and EXS24 Mk II.

Interestingly, as the UFO is a fairly small file, a downloadable rev could be created with additional translation capabilities, then used to translate an older Sonik Capsule sound library into another format. (Although the company has not made any official announcements, MachFive support is expected soon.)

However, while UFO can map samples, convert filtering, and replicate envelopes, it can't translate effects. For example, the SampleTank 2 programs take good advantage of ST2's effects, but the patches don't sound the same on other samplers. This is true even with Kontakt, which has a full complement of effects.

The Guitar 3-Pack includes 477MB of Acoustic Guitars, Electric Guitars (453MB), and Bass Guitars (310MB). Each is also available individually. Acoustic Guitars includes a variety of samples — fingered, picked, harmonics, and "Performance" programs that include elements like scrapes, knocks, harmonics, slides, etc. The sampling avoids over-consistency. For example, a high-velocity sample on one note might "snap" more than a sample on an adjacent note — just like a real guitar.

The Electric Guitars are mostly clean or slightly gritty, so they work well through overall distortion. Again, there's good variety. The Bass Guitars meet the same high standards.

So the bottom line is faithfully recorded samples, good value for money, a "cream of the crop" approach rather than gigabytes of samples, and compatibility with multiple samplers in their native formats. It's a cool concept, and it works.

—CRAIG ANDERTON

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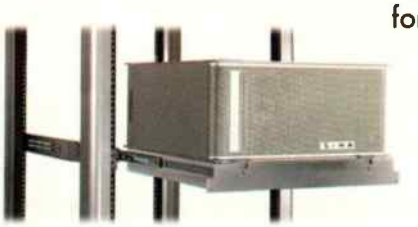

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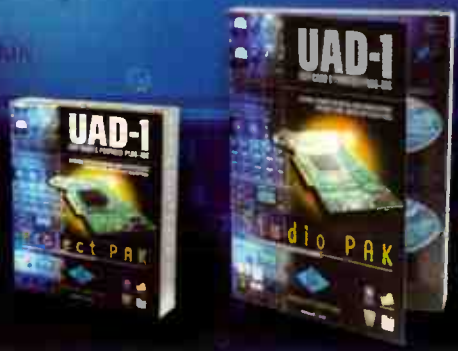

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Sounds

LOOPMASTERS
Lounge/Chillout

Contact: Loopmasters, U.S. dist. by Big Fish Audio, www.bigfishaudio.com
Format: 1 CD (WAV, REX2, Reason NN-XT sampler patches)
Price: $69.95

Lounge/Chillout promises to be your 1-stop shop for loops, 1-shots, and multisampled patches in the style of Morcheeba, Zero-7, Aim, and Kruder & Dorfmeister. For the uninitiated, we're talking about down- and mid-tempo "lounge" music that incorporates live playing and sampled riffs. Indeed, this title is packed with lots of tightly recorded and expertly played percussion and drum loops ranging from 70–120 bpm.

There's no shortage of style-appropriate synth pads and arpeggios complete with filter sweeps and bpm-synced delays, '60s-sounding electric guitar, phased Rhodes riffs, and ambient effects — all REX'd and ready to be looped. The synth material is mostly "static" (*i.e.*, stays on one harmonic center), so I was able to rework many of these loops in a number of ways. But I found many of the keyboard licks and effects too generic and derivative to be of much use; others may disagree.

This library is larger (566+MB) than most Reason-oriented collections, and offers the material in both REX2 and WAV formats. This is a good thing because it opens up *Lounge/Chillout* to non-Reason users.

I found a lot of "holes" in the lineup, however, and rather than duplicating the same material in multiple formats, I wish the producers would have used their disc space more wisely. In the electric bass category, for example, there are typically only six loops at a given tempo, and all of them have a "samey" quality (melodically and tonally speaking). There are only ten drum kits, none of which seem to adhere to any sort of concept. One kit might have a kick and ride cymbal combined as one hit, but not isolated, a few other kits have no cymbals whatsoever, and some have crashes. You may or may not find toms, depending on what you load. What's more, none of the sampler patches are looped. In short, it all feels like it could have been better planned. —JOHN KROGH

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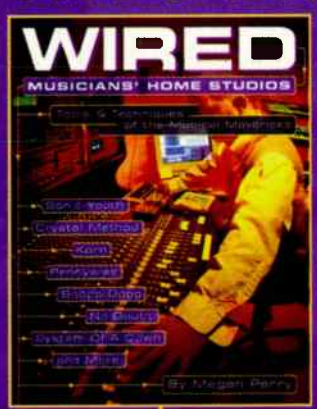

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EQ IS RECORDING

The newest addition to EQ's roster of monthly features is THE ART OF RECORDING

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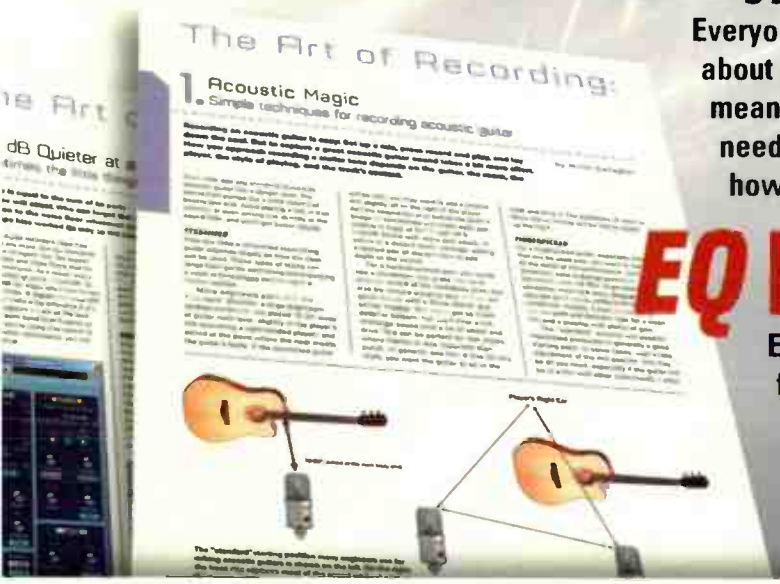

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"Coming Attractions" are previews of new products that haven't arrived in the marketplace. These aren't product reviews, but are designed to bring you up-to-the-minute information on the next generation of cool recording tools.

COMING ATTRACTIONS

Steinberg Cubase SX3

Time warping and hardware integration are just a few highlights

by Craig Anderton

What is it? The latest version of Cubase SX, which is clearly not resting on its laurels.

Who needs it? Cubase owners who want more flexible operation within the sequencer and integration with their studio hardware, as well as those who covet a deep feature set.

Why is it a big deal? Not only has Cubase SX3 included features to keep up with other hosts, it has added some significant new functions.

Shipping: 3rd Q 2004

Price: $799.99

Contact: www.steinberg.net

Cubase SX3 isn't just about updates to Steinberg's flagship sequencer, but about increased studio hardware integration. For starters, the program now supports Acid-format files and can stretch loops to fit tempo in real time. But it also builds on its previous Time Warping technology to allow the global tempo map to fit audio files, or warp a "free time" audio file to fit tempo (like Ableton Live's "elastic audio"). Audio files can now be quantized and groove quantized; off-line time stretch algorithms provide high-quality "permanent" transposition and tempo matching. Hitpoint operation and detection has been improved too, with the option to convert hitpoints to warp tabs.

A huge feature, Play Order Track, lets you treat a composition as multiple sections that can be rearranged on the fly. This makes it easy to test out alternate song versions, which can then be converted back into a linear form for mixdown and mastering.

There are also significant MIDI enhancements, as well as the return of some Cubase VST MIDI features. The Inplace Editor function (see screen shot) allows for direct MIDI event editing from within the project page, rather than having to jump over to a separate window. This simplifies editing MIDI events in context with audio (and video) tracks. And MixerMaps are back, but better: MIDI Device Maps/Panels support direct access to external MIDI hardware with user-definable graphic editing panels. You can import VST Mixer Maps or create editing panels, even for the Track Inspector or the mixer's channel strip. Furthermore, quantizing MIDI events can now move associated controller events.

Hardware fans will love the External FX Plug-ins feature, which integrates external hardware effects processors into the VST audio mixer as send or insert effects (with delay compensation). Furthermore, a dummy plug-in feature now loads a "placemarker" if the project is transferred to a system that lacks the plug-in. Yet the file retains information about the original plug-in, so if the project is saved and reloaded back into the original system, the plug-in set returns to its original configuration.

It's now possible to "freeze" instruments with or without insert effects, so you can save RAM by freezing the instrument, yet still tweak effects during mixdown. Audio track effects and inserts can also be frozen and un-frozen.

A small but useful change, Volume Envelopes, allows altering level without having to resort to automation tracks. These envelopes can "travel" with events as well. And there have been some ergonomic tweaks, such as color-coding of tracks and VST mixer channels to allow for quicker differentiation, and "workspace" layouts that define window setups for different steps of the production process.

Not surprisingly, SX3 also sees the debut of the Studio Connections technology introduced jointly with Yamaha at the 2004 Musik Messe, where opening a project can recall an entire studio setup.

And yes, Cubase SX3 continues to be cross-platform (Windows 2000/XP, Mac OS X) but is also compatible with Windows XP 64-bit Edition so it can access 4GB of RAM. All in all, SX3 is an impressive upgrade for a sequencer that refuses to remain stagnant.

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KEYBOARD

January 2005 marks the beginning of the 30th anniversary year for *Keyboard* magazine. To recognize this landmark, the editors of *Keyboard* will take their readers on a journey from the earliest days of synths and MIDI to the future of music technology, all in a special music-packed special issue!

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Materials Due Deadline: November 16
On Sale Date: January 4, 2005
Distribution: To the entire current *Keyboard* readership. Polybagged with all January subscriber copies, and full newstand distribution for three months. Estimated press run: 80,000.

30th Anniversary

THIRTY...

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COMING ATTRACTIONS

Cakewalk Sonar 4

Surround, new editing tools, and more

by Mitch Gallagher

What is it? The latest version of Cakewalk's high-powered SONAR digital audio sequencer.

Who needs it? Sonar users and those looking for a powerful Windows-based audio/MIDI environment.

Why is it a big deal? Sonar 4 introduces new features such as surround support, video thumbnail track, and Navigator View, as well as powerful workflow enhancements such as new comping, editing, and loop features, and editable frozen tracks.

Shipping: September 28, 2004

Retail Price: Sonar 4 Producer Edition, $959; Sonar 4 Studio Edition, $479.

Contact: www.cakewalk.com

Recently *EQ* Editor-at-Large Craig Anderton and myself had an opportunity to hang out at Cakewalk HQ (one of those cool, exposed-brick, wrought-iron spiral staircase sort of urban loft spaces) in Boston for an afternoon. The reason for our visit? A sneak preview of the latest version of the company's flagship DAW software, Sonar 4. Craig, who did our last review of Sonar, was understandably excited to see the new features. I freely admit to being a Mac guy, although lately I've been spending more and more time in front of my studio's Windows PC. So while I was certainly impressed by the new features, I feel that Sonar 4 is going to be a major release for another reason: The workflow enhancements.

Multichannel fans will be happy to see that the new Sonar includes surround sound mixing and editing support, as well as a new Lexicon Pantheon Surround Reverb and Sonitus Surround Compressor. The program also has a unique SurroundBridge feature that allows you to use your existing stereo plug-ins as multichannel processors. For video work, there's a new Video Thumbnail track.

There are new Track Folders with the ability to edit the Folder's Composite Clip. You can display track layers. Other enhancements include improved Key Bindings, support for six pan laws, support for Quicktime and Windows Media Audio Pro, and full control over file export parameters. POW-r dithering and MPEX time stretching are also included.

Among the workflow enhancements are wonderful comping and editing features, with the ability to mute portions of clips, isolate overlapping clips, multi-clip slip edits, and more — all this adds up to what appears to be one of the best track comping environments out there.

For those into loops, you now have slice-based envelope control over gain, pitch, and pan.

Sonar has long been able to render (freeze) effects and synths to audio tracks, but v4 takes things a step further: you can edit and arrange frozen tracks without unfreezing them, as well as convert frozen data to groove clips.

A scalable Navigator View shows an overview of your entire project, and allows you to easily locate to the position you want — even if you're zoomed way in on tracks.

Sonar 4 has lots more on tap — we'll look forward to digging much deeper when we do an actual review of the product (look for it soon). But based on our proview, it looks like Cakewalk has again hit the nail on the head with Sonar 4.

For your own preview of Sonar 4, watch for Cakewalk's Studio Precision & Power Tour, featuring an up-close look at the new version. The tour will be coming in October and November to select music and sound retailers around the world. Visit www.sonar4.com/tour to register, or call 888-CAKEWALK (617-423-9004 outside the U.S.).

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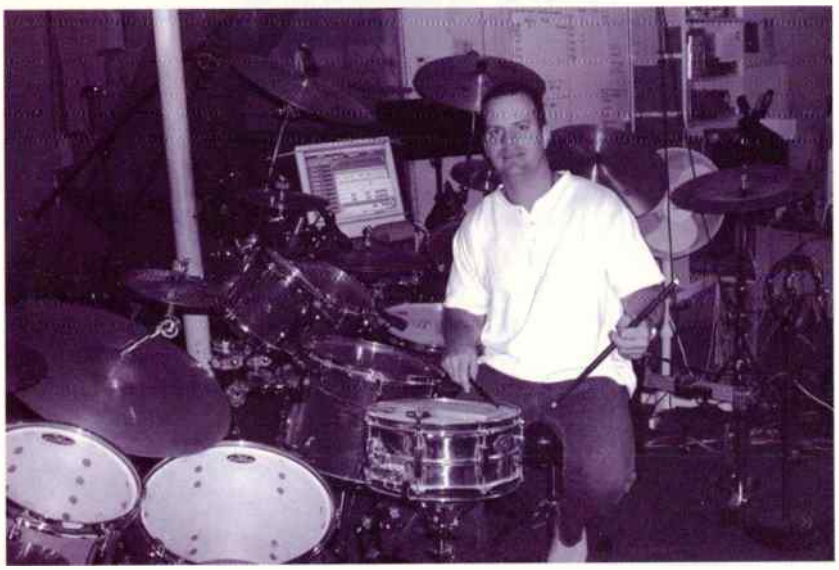
Success Story

COMPANY: Live Studio Drums
CONTACT: www.livestudiodrums.com
LOCATION: Boston, MA
KEY CREW: Frank Basile

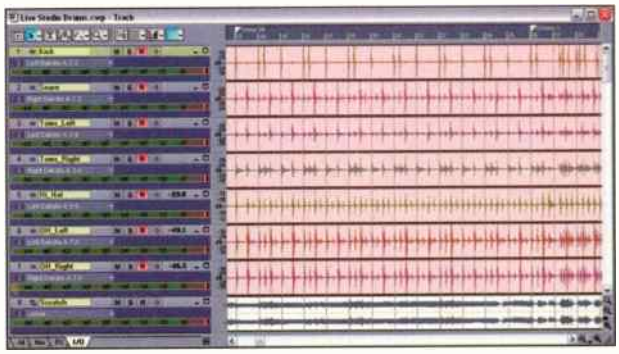


by Mitch Gallagher

Every day that we spend in this industry, we're more and more impressed with the creativity, drive, and ingenuity of the people that work in it, and with the successes that they achieve. The latest and greatest from the big-name (and not-so-big-name) manufacturers, studios, producers, and engineers are featured in these pages each month. But what about the home or project studio that's found a unique niche, a need, an opportunity to become a success in the music business?

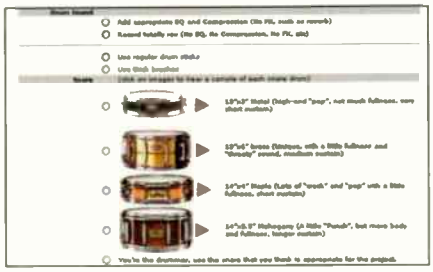
That's what "Success Story" is all about. And this month's debut installment says it all: Frank Basile, the purveyor of Live Studio Drums (LSD) saw an opportunity and he jumped at it. According to Frank, "LSD started as a way to generate more revenue from my drum loop company (Smart Loops, www.smartloops.com), and as a way to fill a need in the industry. Although, to tell you the truth, it really came about because I'm always looking for an excuse to play my drums all day (and sometimes all night)."

As a drum loop programmer, Basile recognized what many of his clients wanted, but were unable to record in their own studios: real drum tracks. "I watch people struggle to create realistic drum tracks using MIDI, drum machines, and software drum samplers. They have to use those methods because they can't afford to hire a drummer, an engineer, and a studio. It doesn't seem fair that home recordists can't get the same quality drum tracks as the big-budget projects. There are some great songs being produced in home studios these days, but if the drum tracks aren't great, the whole project starts on the wrong foot." LSD was born, with Basile providing real, multitracked, custom-recorded drums for each project. The price? A low $69 per song; $25 if you want a second take. You can specify exactly how you want the parts to sound, and even which drums are used for your tracks. (Basile is a Pearl drums endorsee.)



"What made LSD a viable business is online communication. Instead of saying 'Hey, email me if you want some tracks,' we put together an online tool that allows clients to tell us what they're looking for in their drum tracks, upload their scratch and reference tracks, listen to drum previews, and see the status of their project throughout the entire process. This allows us to keep the lines of communication wide open, so it's really the next best thing to being in the studio with the drummer. Of course, we can also set up a phone meeting. All transactions are handled through our secure online store. We even have an option that allows people working on time-sensitive projects to download their tracks within 24-hours!"

While LSD has been successful for Basile, the rewards have been more than monetary. "Nothing has been more satisfying than giving people drum tracks with real feel, and to give their songs a legitimate chance at competing with the big-budget productions." EQ



Are You a Success Story?

Listen up EQ readers: Have you found a unique way to turn your home or project studio into a profitable business? If so, we want to feature you as a Success Story. Send an email letting us know why you should appear to mgallagher@musicplayer.com.

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SOURCE CODE: EQDK

World Radio History

by Todd G. Tatnall

Sample Rate Mismatch

DAW users often report this problem, "My song sounded fine when I tracked and mixed down. But when I burned an audio CD and played it back, the music was pitched down about a half-step and sounded slow. What happened?"

THE SETUP

Let's start by looking at how this happens. We'll use Digidesign Pro Tools/Digi002 and the Presonus DigiMax for this example; however the problem can occur with just about any software and digital hardware if the conditions are correct.

The problem begins when a digital connection is made to the audio recording hardware. The DigiMax's eight mic preamps are sent digitally via ADAT lightpipe optical to the optical input on the Digi002. In order for the Digi002 to receive the digital audio signal properly, we need to set its "clock source" to "ADAT." This is necessary because each device has its own internal clock, which determines at what sample rate it should operate: 44.1, 48, 96kHz, and/or whatever. Just like two wristwatches almost never "tick" at the same instant, and often tick at slightly different speeds, digital audio sample clocks are seldom precisely the same. By setting the clock source of the Digi002 to ADAT, we are asking it to synchronize to the speed of the DigiMax internal clock through the optical ADAT cable. If we don't do this, we may experience noise, audio spikes, or lack of audio signal.

> Always make sure that any devices connected to one another digitally (and the software that uses them) have the same sample rates.

THIS IS IT

Because the Digi002 is now setting its clock speed by following the DigiMax, it's essential to make sure both items are set to the same sample rate. Here's where the problem occurs. Let's say the Digi002 and the Pro Tools session are set to operate at 44.1kHz while the DigiMax is operating at 48kHz. The Digi002 is synchronized to operate at the speed of the DigiMax clock; however, the Pro Tools software still thinks it's recording at 44.1k. Like most DAWs, Pro Tools records audio by creating individual audio files for each track. In addition to the audio data, the file contains information about how it was created, including the sample rate at which it was recorded. The result in this case is that files that were recorded at 48k are "labeled" as 44.1k files.

Anyone remember records? Vinyl? Near the end of their era, records operated at either 33 or 45 rpm. Suppose a record that was meant to operate at 45 rpm accidentally got a label that said it was 33 rpm. If you set your turntable to 33rpm and played the record, the music would be very slow and low-pitched. This is essentially what's happening in our sample rate mismatch scenario. The file was recorded at one sample rate, but improperly labeled with another.

Back in our digital recording world, the problem continues during mixdown. The engineer uses "Bounce to Disk" in Pro Tools to create a stereo mix of the audio tracks, keeping the Pro Tools sample rate at 44.1kHz for the bounce in order to comply with the Red Book audio CD standard. You can play this "mislabeled" stereo file back in Pro Tools (which is still using the Digimax 48k sample rate), and it sounds fine. (Remember that Pro Tools and the Digi002 think that they're operating at 44.1k while in reality the DigiMax is setting the speed of the Digi002 to 48k, making the file sound correct.)

But when the file has been burned to an audio CD, the slow, "pitched down" sound will be heard. When you play the disc back in a CD player, it's now playing at 44.1 kHz — *slower* than it was originally recorded.

WHAT TO DO, WHAT TO DO?

So are our tracks ruined permanently? Fear not, there are some things you can do. In our example, we can fix this right inside Pro Tools. Start by setting Pro Tools' clock source to "internal." Create a new 44.1k session and import the problem file. Select the Time Compression-Expansion AudioSuite plug-in, and set the Ratio field to 0.919:1 (the ratio of 44.1 to 48). By shortening the file, we make it play faster — as fast as it was originally recorded. Then using the AudioSuite Pitch plug-in, set the Ratio to 1.088:1. This raises the pitch of our selection by a half-step to its original state.

If you're not using Pro Tools, most DAWs/audio editors have similar tools for time compression/expansion and pitch shift. Unfortunately, these types of processes aren't always completely "clean" — you may hear some artifacts from the processing. But at least you're back at the right speed and pitch, and you've saved the files.

PREVENTION IS THE BEST CURE

Of course, the best way to fix sample rate mismatches is prevention. Always make sure that any devices connected to one another digitally (and the software that uses them) have the same sample rates. In our example, the Digi002 has sample rate lights on the hardware that indicate the current sample rate. If the Digi002 detects a large enough difference between the speed of its internal clock and the external clock (say 44.1 versus 48k), the sample rate light will blink. Watch for this sort of indication any time you set your clock source to external. EQ

Todd G. Tatnall is the Senior Tech in Sweetwater's Technical Support department.

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Cakewalk	888-CAKEWALK	www.sonar4.com	43, 45
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World Radio History

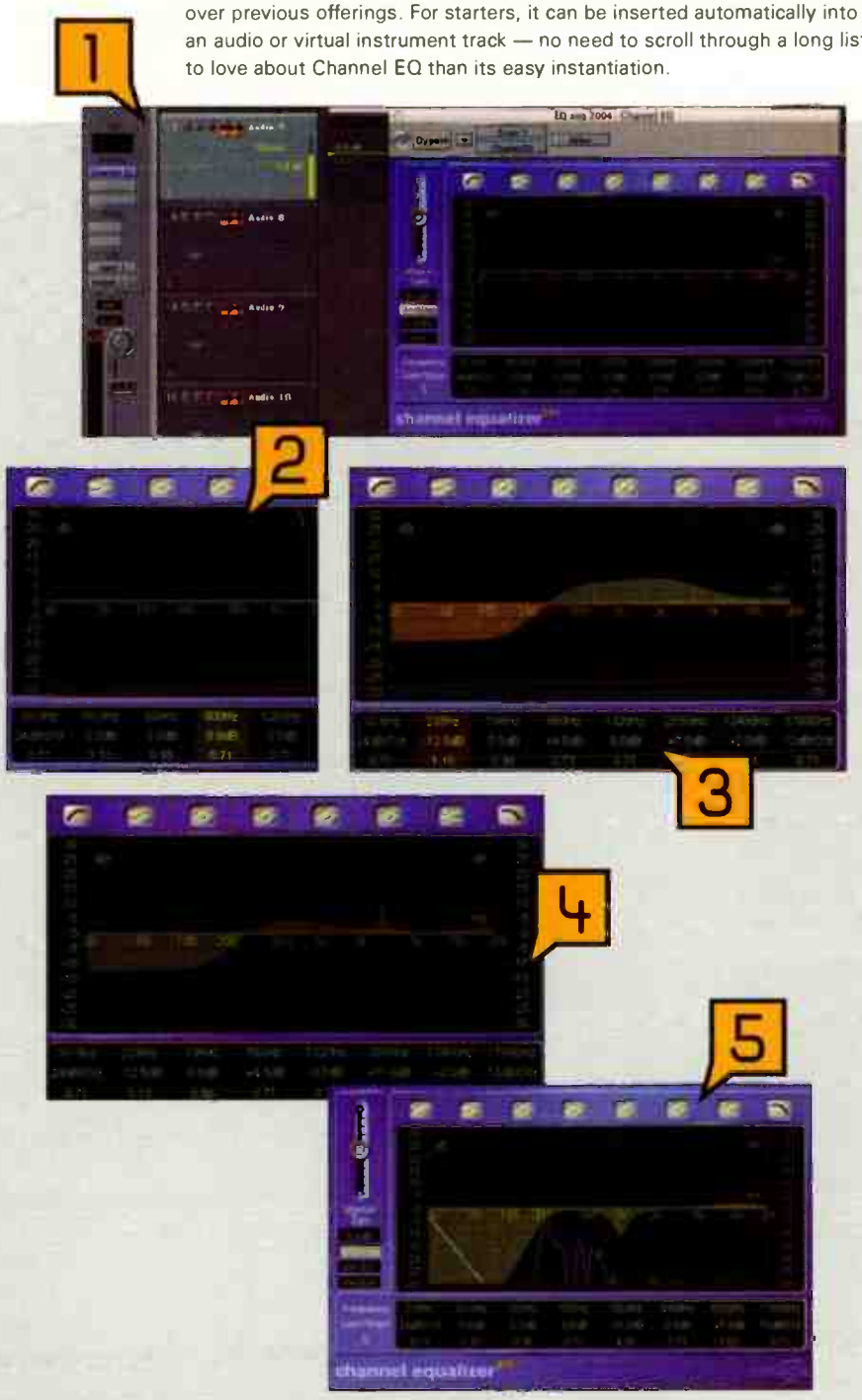
by John Krogh

Emagic Logic

Maximizing the Channel EQ

Objective: Introduced in version 6 of Logic, the 8-band parametric Channel EQ has some advanced features that make it easier to use and more intuitive than the older Track EQ plug-in.

Background: Feature-wise and sonically speaking, Logic's Channel EQ is a noticeable improvement over previous offerings. For starters, it can be inserted automatically into the first available insert slot for an audio or virtual instrument track — no need to scroll through a long list of plug-ins. But there's more to love about Channel EQ than its easy instantiation.



1 **First, insert Channel EQ on a track from within the Arrange window by selecting an audio channel, then double-clicking its EQ area.**

2 **The Channel EQ plug-in should automatically be inserted and appear onscreen. Notice that the EQ area now shows a thumbnail view of the EQ curve. Drag along the horizontal frequency line — as the cursor moves, the nearest frequency band will become highlighted in yellow.**

3 **To change the gain of a band, simply click and hold on the display background and drag up or down.**

4 **To change a band's Q (width), click-hold on the desired band's "pivot point" (which looks like a small dot) and drag up to increase or down to decrease.**

5 **Now click on the Analyzer button to turn it on. Channel EQ's analyzer shows the levels of all frequency content of a signal, which means you're able to see which frequencies are too loud or soft. This can be helpful when trying to zero in on a track's offending frequencies. It's possible to switch the analyzer between pre- and post-EQ displays. Here I've selected a vocal track with too much low-frequency information — with pre-EQ mode enabled, you can see the low-frequency energy.**

tips

- Option-click in the display area to remove any EQ curve changes.
- To get a sense of a track's overall EQ curve, loop a section of the song and then watch the analyzer (pre-EQ mode) as it plays. Note the peaks and valleys, then switch to post-EQ mode and adjust accordingly.
- The analyzer requires considerable CPU resources to do its "thing" in real time. Disable the analyzer to reduce processor load.

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World Radio History

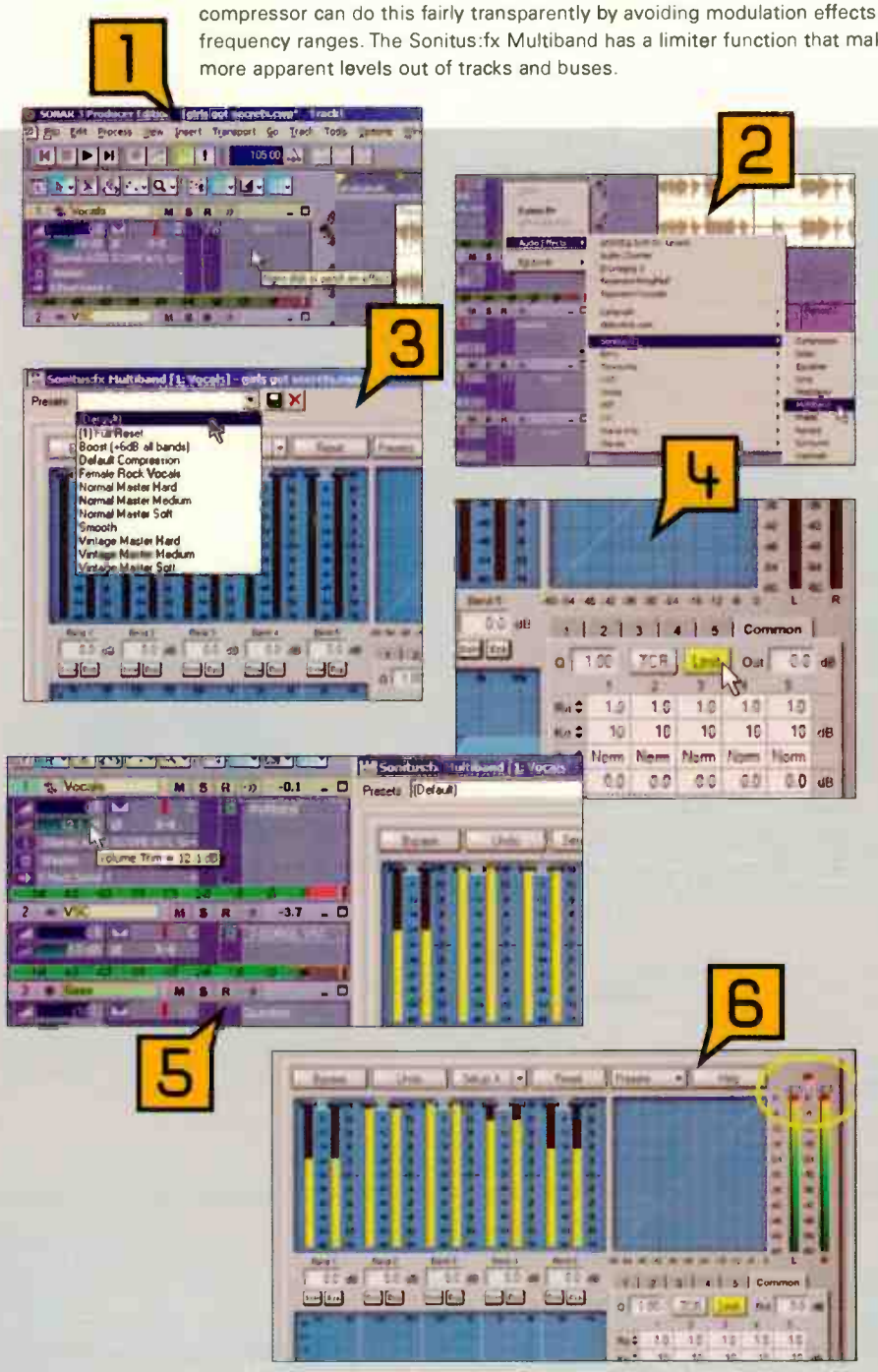
by Craig Anderton

Cakewalk Sonar (Producer Edition)

Use the Sonitus:fx Multiband as a loudness maximizer

Objective: Increase the apparent loudness of tracks without the "squashed" sound of standard compression.

Background: "Loudness maximization" increases a track's average level, and a multiband compressor can do this fairly transparently by avoiding modulation effects among different frequency ranges. The Sonitus:fx Multiband has a limiter function that makes it easy to get more apparent levels out of tracks and buses.



1. **Right-click in the track or bus FX slot (track or console view).**
2. **Navigate to Audio Effects > Sonitus:fx > Multiband to load the Multiband Compressor into the FX slot.**
3. **When the Multiband window appears, load the Multiband's Default preset. This ensures that the threshold for each track is at maximum.**
4. **Go to the Multiband's Common tab. If the Limit button is glowing yellow, you're good to go. Otherwise, click on it to enable Limit mode.**
5. **Add the desired amount of maximization by increasing the associated track's Trim control (which precedes the Multiband effect) rather than Volume, which follows the effect. Volume should be at 0.0 or lower.**
6. **When in limit mode, the overload LED serves as a "limiting active" indicator. Whenever it glows, limiting is taking place.**

tips

- Increasing the Trim amount pushes more level into the Multiband, which forces it into limiting. The higher the Trim level, the greater the amount of maximization.
- As with all dynamics processing, there is a point of diminishing returns. For the most natural sound, move the Trim control back and forth; you'll notice a range between "no obvious effect" and "that sounds really bad." Find the sweet spot where there is still a good sense of dynamics, but the overall sound is louder and stronger.

World Radio History

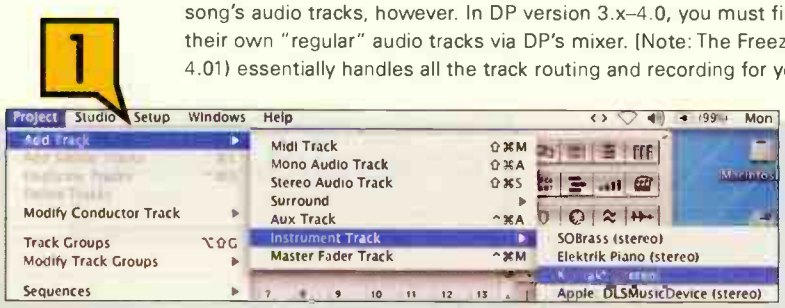
by John Krogh

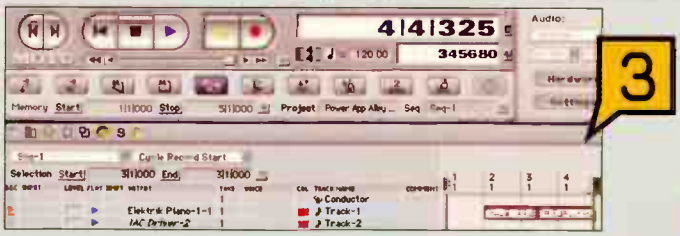
MOTU Digital Performer

Rendering Virtual Instrument Tracks

Objective: Render the output from virtual instruments as audio tracks within Digital Performer.

Background: Unlike some programs, rendering or "bouncing" multiple audio tracks down to a stereo or mono audio file in DP is an off-line process that happens faster than real time (*i.e.*, less time than the actual length of your song). Virtual instrument (VI) tracks aren't automatically included along with a song's audio tracks, however. In DP version 3.x–4.0, you must first record the output signals from VIs to their own "regular" audio tracks via DP's mixer. [Note: The Freeze Tracks command (added in version 4.01) essentially handles all the track routing and recording for you.]





1 **Start by adding an instrument track from the Project menu's Track submenu. An audio track with the software instrument you chose will be created and the plug-in will automatically be opened.**

2 **From the Tracks window, assign a MIDI track's output to whatever instrument you've instantiated. In order to play or trigger the instrument, record-enable its MIDI track.**

3 **Feel free to record some MIDI data. You should be able to hear your performance when you play back the sequence. (If not, check to make sure the audio instrument track's output is set properly.)**

4 **Next, assign the VI's audio output to a stereo bus — this will be the internal mixer path that we'll use to feed a "regular" audio track.**

5 **Route this bus to a stereo audio track's audio input, then record-enable the audio track.**

6 **Press the Transport's Record button. The VI's output will be recorded onto the audio track. At this point, you can mute or disable the VI, and then bounce the newly recorded audio track, along with the rest of the tracks in your session, to a stereo file.**

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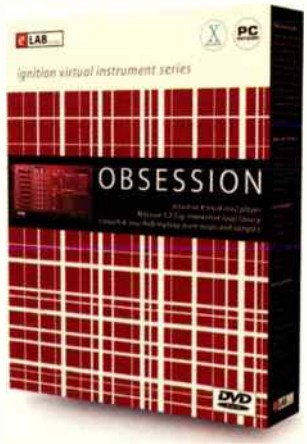

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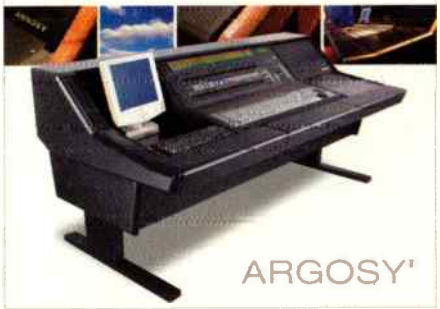
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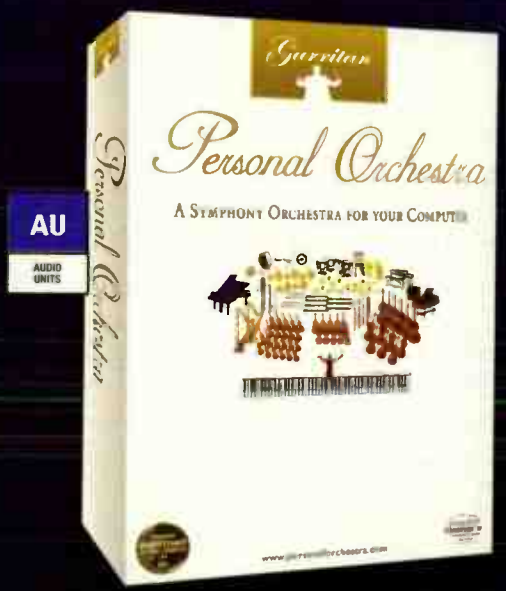

Native Instruments Guitar Rig

The Be All, End All guitar tone and effects rack for Digital Performer. This monster package (look at that effects rack to the left!) even comes with its own foot controller, which doubles as a Direct Input box for feeding your guitar signal into your MOTU audio interface — too cool! Guitar Rig is your one-stop solution for guitar effects, amp and cabinet emulations, and mic modeling.

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Monster Power Pro AVS 2000

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Monster PowerCenter Pro 7000

Equally important, power conditioning is another must. The current that comes from most AC outlets is inherently unbalanced, causing high-frequency oscillations that get picked up by your gear in the form of performance-robbing hum, buzz and static. Only a power center with perfectly balanced power can fully remove this type of interference. The Pro 7000 is the answer, with 12 AC outlets and Tri-Mode™ 3145 joule rated surge protection. It's the perfect compliment to the AVS 2000 Pro. Get both units to deliver the world class power that the gear in your MOTU studio deserves.

Yamaha 01x Digital Mixer

For mixing "inside the box" or "outside the box" with Digital Performer, the Yamaha 01x gives you the best of both worlds. In fact, the 01x can serve triple duty in a MOTU-based studio as a mixer, control surface and audio interface. First and foremost, the 01x is a world-class 24-channel moving-fader digital mixer with 8 mic preamps, 24/96 A/D converters and total recall. Built on world-renowned 96kHz DSP technologies found in Yamaha's flagship DM2000, 02R96 and 01V96 professional digital mixers, the 01x has massive power under the hood, at an amazingly affordable price. If you choose to mix in Digital Performer instead, the 01x serves as a comprehensive control surface for Digital Performer's mixing environment, complete with motorized faders. And Finally, the 01x can serve as a multi-channel audio interface and multi-port MIDI interface via mLAN FireWire.

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Presonus Central Station

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

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Room with a VU

by Mitch Gallagher

STUDIO NAME: Vincent di Pasquale Studios
CONTACT: www.vincentdipasquale.com
LOCATION: Miami, FL
KEY CREW: Vincent di Pasquale (owner/producer/engineer), Ean Sugarman (producer/engineer)
CONSOLE/MIXERS: TASCAM M3700 32x8, Emagic Logic Control, Rane MP2016, Rane XP2016
RECORDERS/PLAYERS: Philips CDR-765, Numark CDN-25, Technics 1200 (2), Denon cassette, Sony D7 Dat, Alesis ADAT XT (2), BRC
MONITORS: Mackie HR824, SRM450; Yamaha NS-10, Rolls RA 2100b
OUTBOARD: CIM DBM-500, Behringer Powerplay Pro, AudioSource EQ100
EFFECTS: Lexicon MPX-500, TC Electronic M-One, Yamaha R-100
MICROPHONES: Rode NT1000, Shure SM 58
MICROPHONE PREAMPS: ART-Studio V3 Tube MP
COMPUTERS/DAW: Apple G5 dual 2.5Mhz, 2GB RAM, 20" Cinema Display (2), G4 Powerbook, 17" iMac 800Mhz, Airport Extreme network; 1.4 Ghz PC, 1GB RAM
DAW: MOTU 828 (2), Digidesign M-box, Universal Audio UAD-1 Studio Pack
SOFTWARE: Emagic Logic 6 Pro, Digidesign Pro Tools LE, BIAS Peak 3.0, Steinberg Cubase VST, Sonic Foundry Sound Forge, plug-ins by Emagic, Spectrasonics, Bomb Factory, Waves, Focusrite, Native Instruments, IK Multimedia, Arboretum Systems, Ohm Boys, Ultrafunk, TC Electronic, GRM, DUY
KEYBOARDS/MIDI/SOFT-SYNTHS: Korg Triton, Nord, Access, Roland, AKAI, Boss, Native Instruments, Arturia, Spectrasonics, MOTU MIDI Express XT

STUDIO NOTES: According to Vincent di Pasquale, "The studio has evolved over the past 10 years. At one point, it seemed like I was re-arranging the studio every few weeks. As the gear added up, so did the ways to have everything arranged. Working in some of the best rooms and in artists' private studios, I learned it's a delicate balance between the best gear you can afford, the best treatments you can afford, and a personal flare that breeds creativity. Over the past year I really feel I've arrived at a point where we can work efficiently. I attribute that to experimenting and finding what works.

"I built all the acoustic treatments and tuned the room myself. Due to the narrow width of the room, I chose to build three styles of thin resonators each targeting certain frequencies. I also built a wall behind the console that houses more treatment as well as the large monitors.

"I work with some clients who prefer to run everything through the board, and others who want to keep it all in the digital domain. The studio is set up to easily accommodate either approach and the two monitors allow you to be front and center whether editing, mixing, or both.

"I always spend extra time on sound design when working with synth patches. That really gives the sounds added integrity and personality. When programming drums, I like to do it differently on each project. Sometimes I just use Battery, sometimes Emagic EXS24, and sometimes it's a loop that kickstarts everything and then I fly everything else in by hand. For me this helps spark creativity and leads to different feels that might not come up if I were using the same method every time."

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Digital Performer in the Movies

The Lord of the Rings Motion Picture Trilogy (New Line Cinema)

Howard Shore
Composer

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Lord of the Rings: The Two Towers "01 5F" Digital Performer project courtesy of Howard Shore / Prince in New York Music and New Line Cinema

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