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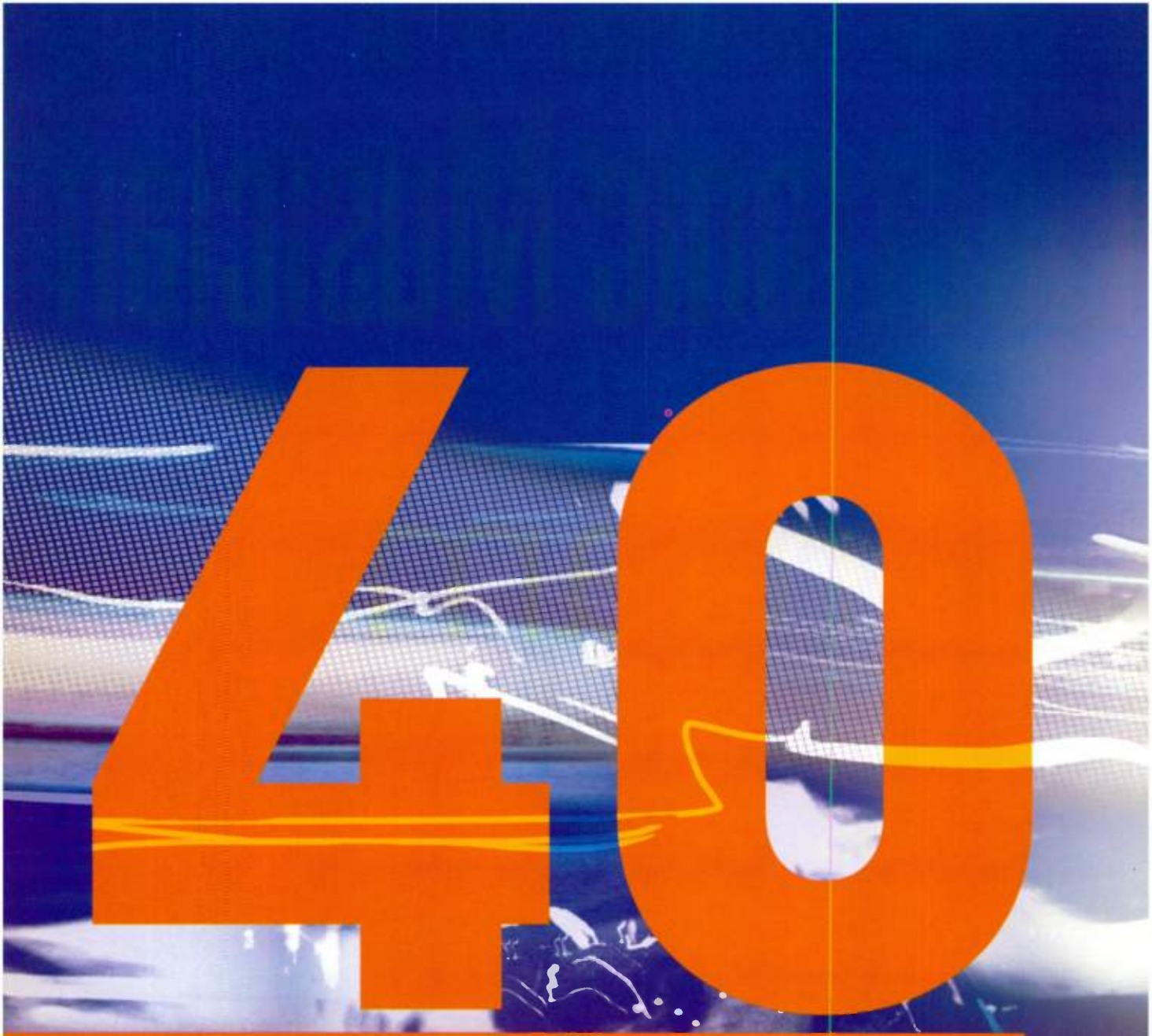

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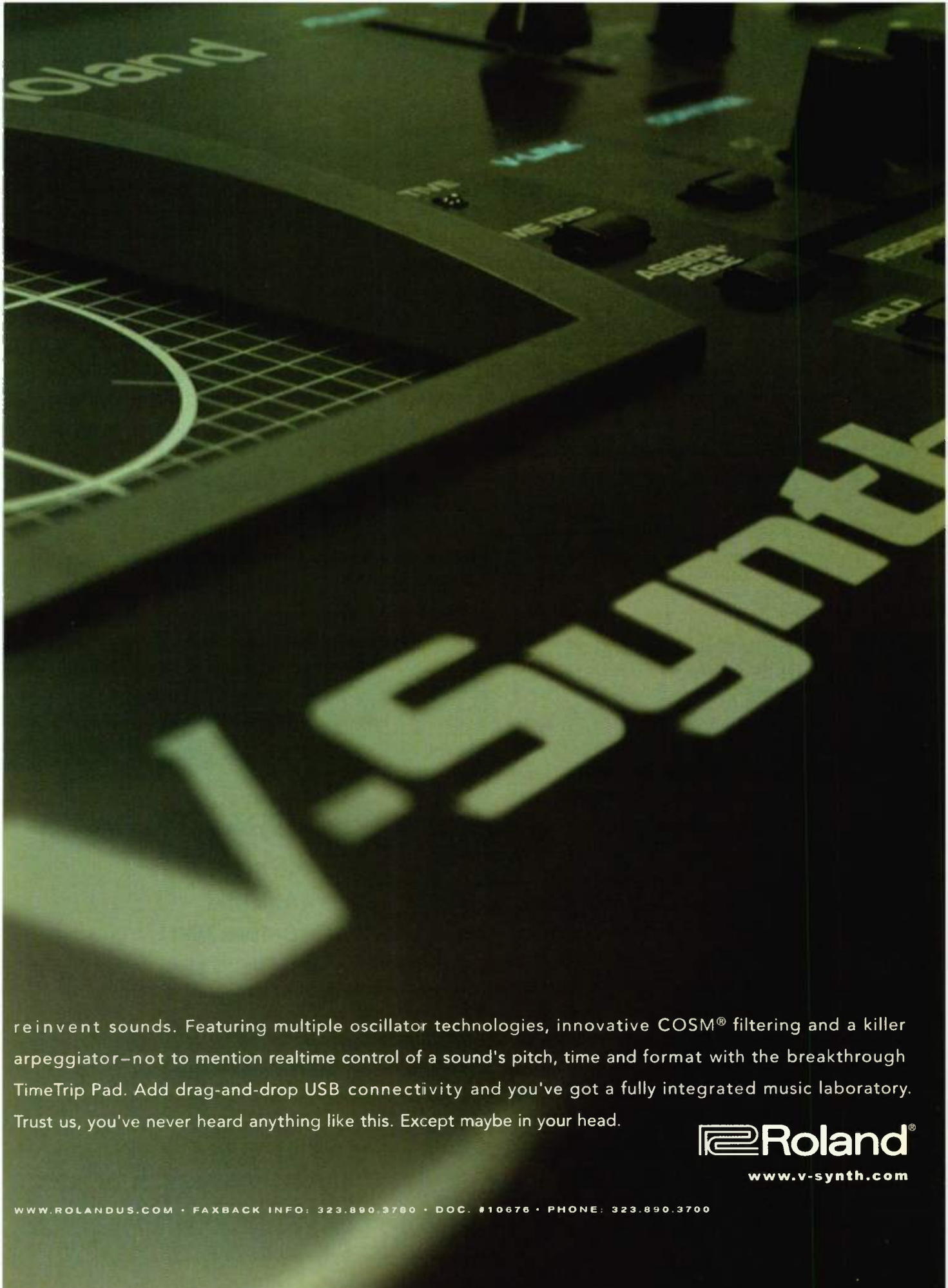

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I N S I

FEATURES

37 IN SEARCH OF . . . THE ULTIMATE BRASS LIBRARY

EM's quest for the best sample libraries continues. In this issue, our discerning expert seeks out top-notch solo and ensemble brass samples for a wide range of musical styles: classical, pop, rock, jazz, funk, and more. We round up a dozen outstanding choices for your consideration.

By Rob Shrock

46 COVER STORY: VIRTUAL WORKSTATIONS

Software-synth workstations combine sound generators, pattern sequencers, and song sequencers, letting you quickly and easily generate and manipulate patterns and loops. We checked out the six leading software-synth workstations for Mac and Windows—Arturia Storm, Image-Line Fruityloops, Propellerhead ReBirth and Reason, Synapse Orion, and VirSyn TERA—and found a lot to like in each of them.

By Len Sasso

69 MASTER CLASS: SWEET FRUIT, STRANGE FRUIT

Image-Line Software's Fruityloops loop generator and sequencer has rapidly become one of the most popular music-production tools for the PC. We give you tips on how to get the most out of this powerful program, along with downloadable examples for further study.

By Jim Aikin

Cover by Dmitry Panich

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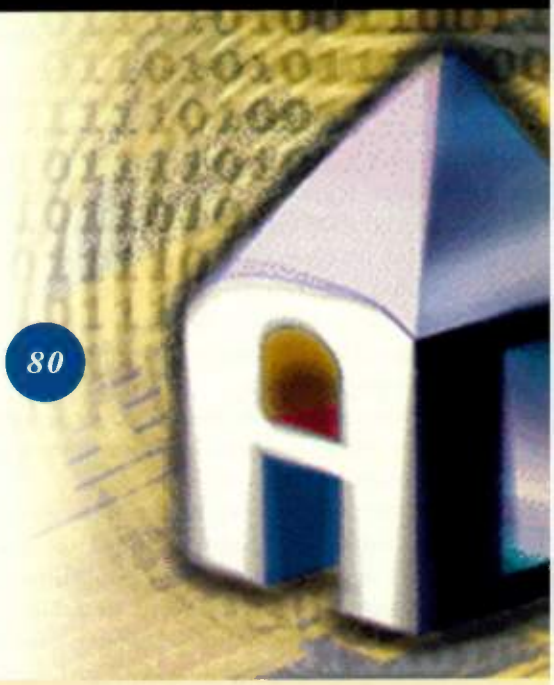

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All In A Day's Work

DAN PHILLIPS

Every job has own its challenges and problems. As editor of **EM**, my job includes not only conceiving, writing, and editing stories but supervising staff, budgeting, and dealing with corporate and industry politics. If a manufacturer hates our coverage, if a story doesn't turn out as planned, if an editorial staff member messes up, if we are over budget, it's up to me to find a solution. That's fine; it's what I expected when I signed on as editor in chief. Most corporate department managers have comparable challenges, although not usually in such a public forum.

Of course, nobody likes to get personally threatened, sued, or screamed at. I suspect that my photo is on more than one dartboard. And yet, I never lose sleep over it. Why not?

The secret is to keep things in perspective. Some of the things I experienced when touring and playing sessions full-time for 15 years were far worse than anything I've experienced in the publishing business.

For instance, you know you are really in trouble when:

• Your guitarist/singer announces that he is engaged to marry a hooker. She is a high-class call girl, and you know she will dump him soon after breaking up the band.

• The sheriff comes looking for your lead guitarist with an outstanding arrest warrant. The guitarist is the one person in the band that you could rely on, and you have gigs booked.

• A surprise blizzard hits while you're northbound on a lonely South Dakota road. Your pickup truck breaks down, so you're having to tow it with the band's other vehicle, a heavily loaded van. Icy water is rising on the side of the road, and one person has to constantly run alongside the van in snow boots, pushing on the side panel to keep the whole rig from sliding sideways into a ditch. The next town is 90 miles away, mostly uphill.

• An agent books your country-rock outfit into a club in southeastern New Mexico and assures you that it's the perfect venue. You open the set, and the crowd starts chanting for AC/DC tunes. The band doesn't know any, and your guitarist couldn't get that sound if his life depended on it—which it might.

• You're a bandleader playing at a club in a national park. You just finished the last set on opening night and look up to see that the 6-foot, 4-inch bass player has some diminutive employee up against a post, with cocked fist. The park rangers have been called, and the bass player disappears. You suspect he went back to the dressing room to get stoned. The ranger is going after him and will check the room first. You cannot afford to lose this gig.

These are true stories from my road days, and any long-time road warrior can tell more of the same. Compared to that, magazine publishing is a breeze, come what may. Bring it on!

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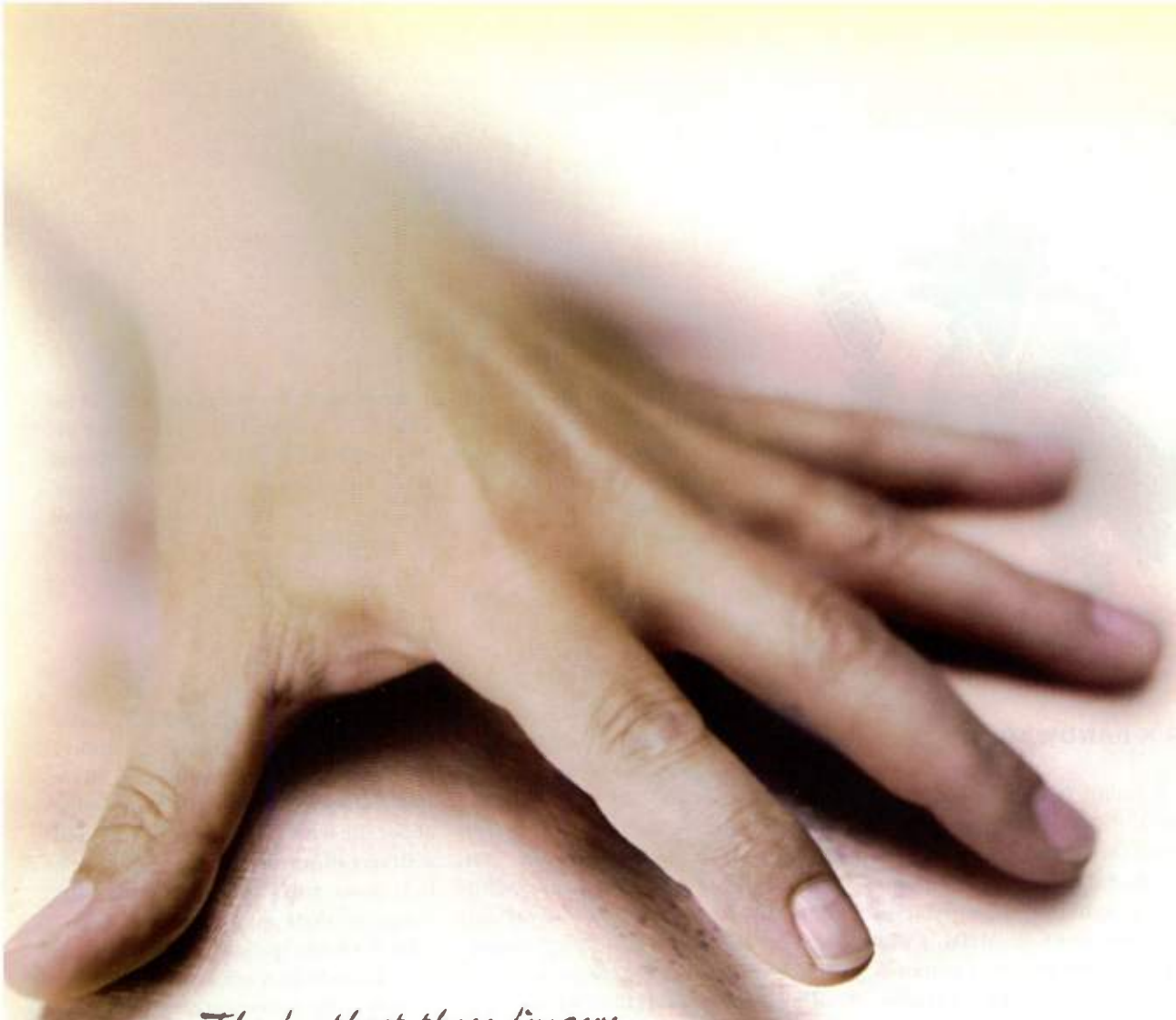

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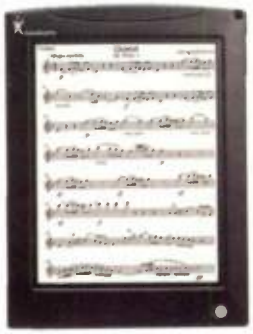

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MAE LAROBIS

THE OS X BANDWAGON

I found Daniel Keller's article on OS X ("Desktop Musician: Has OS X Joined the Band?" January 2003) lacking in useful content. Hoping for some more insight into the intricacies of Core Audio and CoreMIDI, I was disappointed to merely see a tentative list of OS X supported apps. I realize this may be due in part to the information that was available at the time the article was published, but I have contacted many third-party VST manufacturers directly and received much more information regarding development and release dates than was published.

Perhaps the most glaring omission from the article is the new Audio Units (AU) standard that Apple is trying to push, beginning with its newly acquired Logic line from Emagic. This is significant news in the world of plug-ins, and could conceivably complicate things on the development end dramatically (and has actually begun to do so).

Keller's chronology of OS X also failed to mention the significant changes to Core Audio and CoreMIDI in the release of Jaguar, which is directly tied in to the timeline of third-party VST development. In fact, Keller didn't even mention Jaguar—odd, since that OS is the one many of us audio types have been watching for some time.

In short, the article seemed to be miserably outdated and speculative in its relevance to the world of audio and OS X that is changing rapidly.

Greg Paxton
via e-mail

*Author Daniel Keller replies: Greg—thanks for your feedback; sorry the article didn't address your specific concerns regarding Mac OS X audio. While you raise a number of valid issues, in all fairness many of them are outside the scope of this piece. The article's premise was not to address the intricacies of Core Audio and CoreMIDI but rather to analyze the reasons behind the slow arrival of audio support for Mac OS X in general. (***EM** *first looked into OS X's audio and MIDI architecture—and its potential benefits and problems—in the October 2001 "Desktop Musician: Mac OS X for Musicians.")*

While the piece doesn't delve into details of Audio Units or Jaguar's Core Audio and CoreMIDI implementation, those topics are covered insofar as their effect on audio-related development in OS X is concerned.

As you mentioned, things move rapidly in our world. When I undertook this piece, I interviewed a number of key players at Apple and at major Mac-based audio companies. That was several months ago, and as I mentioned in my article, Jaguar had just begun shipping. Admittedly, if I were to speak to those same people today, I'd receive more and different information, as well.

A few months later, the Mac-audio landscape is quite a bit different. MIDI and multitrack audio under OS X is far more of a reality. I agree that more in-depth coverage of Mac OS X's audio functionality is a great idea, but that's another article.

CHEERS . . .

Your interview of Emily Lazar ("Production Values: Ears, Passion, and Patience," January 2003) was refreshing in her focus on musical results, not on sampling rates and bit depth. I'll bet it's easier to feel that way when one has access to the best gear, but she sure seems to have her head on straight.

Tim Canon
via e-mail

. . . AND JEERS

Your article on Emily Lazar was the most uninformative article I have ever read in your magazine. I have to admit that I have little knowledge about the mastering process compared with recording and mixing, and I think that most musicians who read your magazine share my experience.

Most of the questions asked by author Myles Boisen are good, but unfortunately, the answers are useless. Most answers are vague and too far off the point, just like when PR people give PR material to magazines and newspapers: "The Lodge was designed to give the listener as many monitoring choices as possible," and, "Mastering is an unbelievably advantageous way to elevate the quality of your album."

The Lodge gets free publicity this time. Please, if you need something that fits the page, I prefer reading ads rather than PR material.

Notre Ramos
via e-mail

CYBERJAM

I thoroughly enjoyed Gary S. Hall's "Bands Without Borders" article (October 2002). It eloquently articulates my current musical activity. One point I'd like to mention is the "talent pool" available on the Internet. I've formed relationships with world-class players and vocalists and can make

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NetStudio is an online recording-studio center where musicians can collaborate on recording projects over the Internet—regardless of their geographical locations!

them a part of my "virtual" band. If I had to rely on the talent solely available in my town, I know I could not get the quality I'm getting now.

Glen D. Giles
via e-mail

SAY WHAT?

It was with a real sense of irony that I read your "First Take" column concerning **EM**'s product reviews ("First Take: Do You Hear What I Hear," December 2002). I say this because when I first received that issue I went right to the review of Syntrillium Cool Edit Pro 2.0. This is my recording software of choice, and I was very interested in reading what **EM** had to say about the new version before I buy.

Unfortunately, it offered neither good nor bad opinions; virtually no opinion is expressed at all! Instead, the review consists of a features list in paragraph form. I can get this information from Syntrillium's Web site. As you said in your column, **EM** is read in large part for the product reviews. Please don't let your reviews slide into the type of vapid discussion exhibited in the Cool Edit Pro review. Thanks.

David Summer
via e-mail

BACK TO SCHOOL

I missed the article on audio schools ("Making the Grade," October 2002), but S. Jason Lynch offered a good comparison between trade-school and university recording curriculums ("Letters: Schools of Thought," December 2002). However, there's a third educational alternative: the community college.

I work at a junior college where sound recording and commercial music has been taught since 1980. We have more than 20 full-time faculty and are equipped with analog and digital studios. We offer an analog Sony MXP 3000, the digital DMX R100 and Mackie D8Bs, ADATs, Mackie hard-disk recorders, and more. The program isn't as thorough as a four-year school's—our sound-technology students have to focus more on engineering than musical training because they only have two years—but students can transfer to another university within the state if they wish, and our tuition prices are junior-college rates.

The major publications tend to overlook the community college, and it's a shame because there are some great values in recording education out there.

Jerry Stoddard
Instructor, Sound Technology
South Plains College
Levelland, Texas

TO SLEEP . . .

I enjoyed the "Perchance to Dream" article ("Tech Page," November 2002) that talked of "customized sleep music." You may wish to also mention Dr. Jeffrey Thompson's acoustic-vibration research, which is being done at the Brain/Mind Research Institute in Encinitas, California. Dr. Thompson's music is not as "customized," but it does offer some great options for those wanting to try sound-frequency patterns encoded in music for deep relaxation. I have been enjoying several of his tapes and CDs for years, and he has been conducting sound-therapy research for at least 21 years.

I enjoy reading about the advanced design concepts mentioned in "Tech Page." Because so many advancements are being made in music and sound technology, it would be nice to expand that column—perhaps start a "Future Tech" series to inform us of new innovations that may affect the music studios of tomorrow.

M. Silcox
Sonic Arts & Startled Cat Productions

GOING OFFLINE

I found it fascinating and a little sad that two out of three online music sites that you featured in an article from your March 2001 issue ("Working Musician: Getting It Online"), inoiz.com and musicblitz.com, are no longer in existence. Those sites made thousands of tracks available for licensing or purchasing through downloads.

Are other sites becoming successful? If not, why hasn't the concept worked?

Rob Hellmann
via e-mail

WE WELCOME YOUR FEEDBACK.
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FRONT PANEL

Download of the Month

By Len Sasso

VSTi Host 3.0 (Mac, $35), from Defective Records, is a standalone application for using VST Instrument and effects plug-ins. It allows you to use plug-ins for performance as well as for processing live or recorded audio without launching your sequencer or other host application. VSTi Host was created in Cycling '74's Max/MSP but is self-contained; you don't need Max/MSP to run it. You can download a demo from Defective Records' Web site (www.defectiverecords.com). The demo quits after ten minutes and inserts a periodic squawk into the audio stream.

VSTi Host is easy to use and nearly self-explanatory. It stacks five VST insert slots: the top one is for a VST Instrument and the remaining four are for VST effects plug-ins. Send sliders allow you to send any mix of two audio sources—the VST Instrument and live or recorded audio—to each of the VST effects. Balance sliders crossfade the output of each effect between the input to the next effect and the final mix. The output is a mix of the two sound sources and the effects output bus.

VSTi Host's mixing network lets you create quite complex signal paths. For example, you can apply completely separate processing to an audio-file player and a VST Instrument, and you can route the plug-in outputs in parallel or series.

A number of features have been added in version 3.0 (upgrade for version 2.0 users, $10). The program provides an onscreen keyboard for occasions when you don't have a MIDI controller available. You can record the output directly to disk in AIFF format. ASIO support has been added, so you're not limited to Sound Manager and Mac AV-quality audio. At present, OS X is not supported. ReWire and DirectConnect support has been announced for a future update. For quick testing of VST plug-ins and fast setup recording, VSTi Host is well worth a look.

TIPS

Cool Tip of the Month

Fatten Up Your Horns

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

If you ever mix a recording with a brass section in it, and you feel you need to beef up the hits, stabs, falls, screams, or funky honks, this month's tip might come in handy. With today's editing capabilities, you can really tighten up horn parts if you need to. Instead of editing, however, I want to discuss dynamics control and range expansion.

Depending upon the size and chops of the horn section, using a high-quality pitch shifter to add upper and lower octaves can really help the horns pop in the mix. You can use most professional digital audio workstation programs in combination with pitch-shifter plug-ins such as Waves UltraPitch, Wave Mechanics PurePitch, or Digidesign DPP-1 to accomplish that goal. In this example, the brass section consists of two trumpets, an alto sax, and one trombone, all recorded on separate mono tracks. I'm using Pro Tools with Digidesign's DPP-1.

1. First, place EQ and compressor plug-ins on each horn source track. Set the compressor to a ratio of, say, 4:1 and adjust the EQ to taste.

World Radio History

Band on the Web

By Geary Yelton

Some bands find their beginnings in the desire to "make it big," to become popular enough to gain fame and fortune, and incidentally, to make satisfying music along the way. Other bands are born of irrepressible artistic expression, the need to release the music inside its creators. Atlanta's 3d5spd (pronounced "three-dee five-speed") fits into the latter category. Its solid core of Chris Hoke (lead vocals, guitar), Sean Moore (drums, electronic textures), Joie Williams (keyboards, vocals), and Justin Gray (bass) works to maintain a balance of their respective aspirations and influences. Though the group is perplexed by frequent comparisons to prog-rock mainstay Yes, associations with the Flaming Lips, Perry Farrell, U2, King Crimson, and David Bowie aren't unusual. Still, 3d5spd's passionate, intelligent, somewhat adventurous sound is all its own.

Fever in the Ice Age is 3d5spd's fourth CD release and the first on indie label Two Sheds Music (www.2sheds.com). Producer Karl Egsieker, who recorded all the band's previous efforts and whose recent work includes engineering albums by Bruce Springsteen and Papa Roach, mixed *Fever in the Ice Age* at Southern Tracks (www.southerntracks.com), one of Atlanta's premier recording studios.

The group's Web site (www.3d5spd.com) covers all the bases. The site was designed by Hoke and is written and maintained by Moore, whose duties include updating the concert calendar and answering e-mails as well as revising the home page at least monthly. The band's humor, attitude, and originality are evident on every page. They subtly poke fun at record promotion as they persuade you to order their CDs. Hoke is currently redesigning the site, which should soon feature Flash graphics by Geoey Cook (www.geowebdesign.com) and MP3s of live 3d5spd appearances.

Two Sheds maintains a separate page dedicated to 3d5spd, and you can find additional pages at MP3.com, the Internet Underground Music Archive (IUMA), and CD Baby. Online album sales are through Two Sheds and CD Baby (www.cdbaby.com), who have received orders from such far-flung places as Italy, Germany, and Israel. "Our Web site reaches people beyond our boundaries," says Moore.

Key Changes

By Marty Cutler

Having decided to orient its development efforts toward new products, Clavia (www.clavia.se) has officially discontinued further upgrades of Nord Modular and Micro Modular software. Final versions of the Nord Modular and Micro Modular software are version 3.03; they include software editors for Mac OS and Windows . . . **BitHeadz** (www.bitheadz.com) will add support for OS X Audio Units to future software releases. The company's Audio Units support will debut with the Unity 3.1 update in the first quarter of 2003 and will be a free download for all current Unity Session, Unity DS-1, and Unity AS-1 3.0 users . . . **Pinnacle Systems, Inc.** (www.pinnaclesys.com) has entered into an agreement to acquire Steinberg Media Technologies AG, which is based in Hamburg, Germany. At closing, Pinnacle Systems will acquire all of Steinberg's products, software, and intellectual property rights . . . **Ableton AG** (www.ableton.com) is bundling a Sonomic Library Card with the release of Live 2.0. The bundled card will enable Live users to search, audition, and download ten samples or five sound effects from Sonomic's online library . . . **M-Audio** (www.maudio.com) is including the Maximum Audio Tools package with the purchase of any of the company's sound cards and keyboards. The package includes special versions of Ableton Live, Dsound RT Express VST host with WAV player, ArKaos VJ VMP visual performance software, IK Multimedia SampleTank SE VST sample player, and 125 MB of WAV- and REX-format samples from M-Audio's ProSession series.

2. Insert a pitch shifter on each trumpet track and on the trombone track. Set the pitch shift of both trumpet tracks to +12 semitones (one octave up) and the trombone to –12 semitones (one octave down). Start by setting the wet/dry mix percent parameter to 50 percent. Experiment with lower percentages for a more subtle effect.

3. Add an Aux Input track and label it "Horn Reverb." Insert a reverb plug-in and assign its input to a stereo bus (5–6). Create sends from the horn tracks to the stereo bus (5–6) corresponding to the input selection of the Horn Reverb Aux Input track.

4. Assign all horn track outs and the Horn Reverb track to a new stereo bus pair (7–8).

5. Create an Aux Input track and label it "HornSubmix." Set its input to monitor bus 7–8 and insert a stereo compressor. If you have a gain-optimization plug-in (such as Waves L1 or L2), try inserting it after the compressor for added control.

Note: Adding additional routing and plug-ins can delay the source signals and affect the timing of the tune. Depending on your rig, you might need to compensate by shifting tracks in time.

This technique doesn't work in all situations, but it might be just what's needed!

—Steve Albanese

Be sure to check out the streaming movie tutorial of this tip to view this procedure in action. Log on to www.emusician.com/cooltip to take part in this online adventure. Also, if you dare, take the quiz to review what you've learned!

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Rev Up

By Marty Cutler

Magix Entertainment

Version 7.0 of Samplitude Professional (Win, $999; upgrade, $399; crossgrade, $599) is a major upgrade with an extensive list of new features, including direct recording of 24-bit WAV, AIFF, and Ogg Vorbis files and support for VST effects and VST Instruments (VSTi).

Recording features offer significant enhancements. Samplitude now provides an option to save every take to a new file. New menu commands include Playback While Record and Record Without Playback. The Record button in the transport control and toolbar flashes before a punch, and you can now set markers for punches.

The program has updated driver support, including ASIO and multichannel MME Support. Multichannel WDM devices automatically appear as several stereo devices for playback and recording. The software provides a new switch for audio monitoring. Depending on the audio card used, ASIO drivers allow selection between software monitoring with or without effects or hardware monitoring. Every activated recording track input is routed to the corresponding output. For software monitoring, all volume changes are applied, including gain, pan, volume fader, aux sends, aux and submix buses, master volume, and the track-record settings (left, right, and mono).

Samplitude 7 adds new effects, including a new vocoder insert effect and an assortment of amp-simulation models that reproduce several types of tube amplifiers and speakers. The Room Simulation plug-in now offers a real-time preview function. All insert effects, including dynamics processors, are available in tracks and buses.

Other features include an option for bouncing several tracks into different files with or without effects. Samplitude 7 now licenses Psychoacoustically Optimized Word-length Reduction (POW-r) dithering from the POW-r Consortium LLC. It also provides batch processing for common editing and conversion procedures.

Samplitude Professional requires a 1.8 GHz Pentium 4 with 512 MB of RAM and Windows XP. X-Vision Audio U.S. Ltd. (distributor); tel. (330) 747-3857; e-mail info@magix.net; Web www.samplitude.com.

Celemony Software

Melodyne 1.5 (Mac/Win) is a free upgrade and is available as a download from Celemony's Web site. With the release of the new version, the program provides new synthesis and playback algorithms, better handling

TIPS

Learning the Old-Fashioned Way

When people ask me what's the best way they can improve their recording and mixing chops, I have a one-word answer: mimesis. (The word "mimesis" means the same as "imitation" or "mimicry," but I intentionally don't use those words because they have connotations I don't want to confer.) The notion of mimesis (and the word itself) comes from the ancient Greeks, who felt that the best way to master an art was to mimic masters of that art—but again, *mimic* in a different sense than the one in which we tend to use that word. Even though we have the saying "Imitation is the sincerest form of flattery," our culture does not generally value imitations, at least not commercially.

What I mean by mimesis is very specific: pick a recorded song you like and rerecord and mix it to sound exactly like the original. It's generally best to start with a classic—early Elvis, Beatles, and Rolling Stones records are excellent choices for this exercise—because the productions are less sophisticated and the arrangements and performances less demanding. First, of course, you need to analyze the song from every angle. Do some research to discover where and when the song was recorded, what equipment and how many tracks the engineers used, what instruments the musicians played (including amps and types of drums and cymbals), how the song was put together, and so on. You don't have to have the same exact gear, of course—but knowing what it was can help considerably in recreating the sound. Naturally, you also have to come up with the musicians to play the different parts (this is a great exercise for them as well).

After recording all the tracks as identically as you are able, it's time for mixdown. Pay close attention

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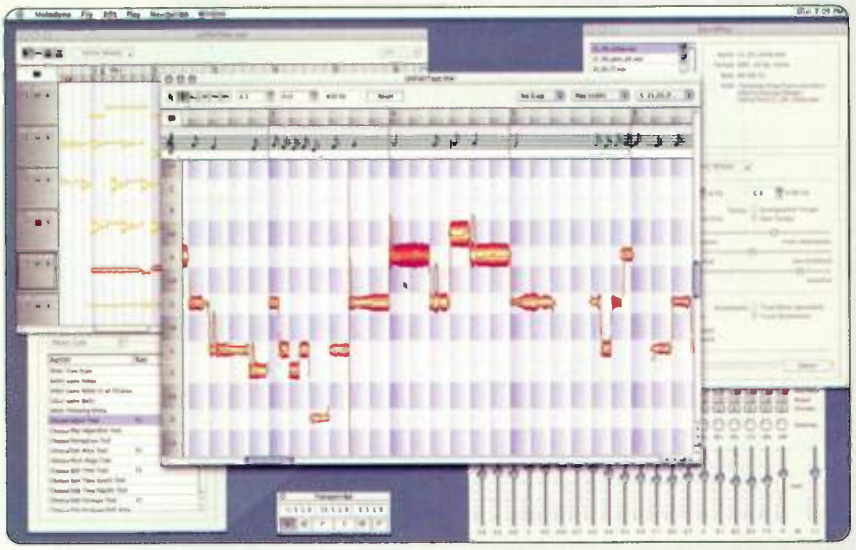
of triplets, additional editing tools, and more.

The program is available in two versions: Melodyne Studio Edition ($995) and Cre8 ($395). Cre8 comes with a single license; is limited to eight tracks of 16-bit, 44.1 or 48 kHz audio; and only processes mono sound files.

Along with overall enhancements to audio presence and fidelity, improvements to the synthesis and playback algorithms minimize or eliminate phasing and comb-filter effects that could create unwanted artifacts. New editing tools include markers and a Zoom and Scroll tool, which lets you move horizontally or vertically within the display and zoom in or out horizontally or vertically.

Version 1.5 also has a tool for setting up processing algorithms; if you want specific notes that have been processed with the rest of the recording to play back unaltered, you can apply processing to individual track segments. The Pitch Wide tool lets you perform coarse-tuning adjustments without canceling vibrato or altering the fine-tuning parameters. The new Formant Shift Style tool governs formant processing when changing an audio segment's pitch. Improvements have also been made to the Quantise tool.

The new Quantise Notes tool lets you quantize notes to a percentage, from 0 to 100. You can quantize to a time-based grid or make quantization relative to other tracks and events.



In earlier versions, selecting a region with a processing tool automatically initiated the process; in version 1.5, you can select a region with any tool and then double-click to edit. The user interface has been revamped in certain areas; for example, mixer tracks are numbered by track order, and the track's name appears when the mouse is positioned over the track number.

The volume sliders are now decibel-linear down to -25 dB and amp-linear from -25 dB to unity gain. The level meters are decibel-linear down to -25 dB, and you can reset all controls to zero position. The level meters have an improved display with peak-hold metering.

Melodyne will work with any Power Mac/300 MHz, Mac OS 9 or OS X 10.2, and 128 MB of free RAM. On the PC, Melodyne requires a Pentium II/400 MHz computer with Windows 98, ME, 2000, or XP and 128 MB of free RAM. Music Marketing, Inc. (distributor); tel. (416) 646-0900; e-mail info@celemony.com; Web www.celemony.com.

to all elements of the mix, including levels, effects, panning, and compression, and do your best to recreate each of them, as well as the overall blend of elements. Obviously, you need to have the original track cued up and ready to play so you can refer to it regularly throughout the process. Very important: this is *not* an exercise in creativity. The idea is to copy—note for note, lick for lick, and effect for effect. (You can get creative later when it comes to your own songs.)

Interestingly, it is precisely the intent to copy—which is to say, the commitment to stay true to the source and not insert your own ideas—that makes mimesis such a potentially deep learning experience. I have done mimesis with recordings twice—first with Patsy Cline's "Walking After Midnight" and later with the Elvis recording of "Blue Suede Shoes"—and I can't begin to tell you how much I learned in the process. But don't just take my word for it—Picasso copied works of the masters in his formative years, as did countless other great artists (including poets, playwrights, novelists, and composers). Indeed, it was only a few generations ago, before the rise of dedicated schools and masters' programs, that mimesis was the primary way people learned any art. Not surprisingly, it still works today.

—Brian Knave

X Marks the Spot

Many Mac-based musicians frequently need to alternate between booting up in OS X and booting up in OS 9. The obvious means to restart in a different OS is to open System Preferences, select Startup Disk, choose a system folder, and click Restart. But there's an easier way to restart in OS X: simply select

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15 Years Ago in EM

By Steve Oppenheimer

Our primary focus in March 1988 was on MIDI sequencing, starting with "Sequences That Swing with Performer," a feature on creating a swing feel by experimenting with quantization. The techniques could be applied to sequencers other than MOTU Performer, assuming they had the requisite quantization features. Groove quantization was unknown at the time, so you had to create a swing feel using a calculated combination of offsets, quantize-sensitivity settings, and a Quantize Strength (Performer's term) parameter that allowed you to move notes a specified fraction of the way toward the desired grid location.

"The Feel Formula" applied to sequencing the principles expounded in our popular October 1987 cover story, "The Feel Factor" (discussed in the October 2002 "15 Years Ago in EM" column). Author Dave Edwards discussed shifting the timing of drum and percussion parts to affect the rhythmic feel of a piece, and he provided a table for calculating the number of milliseconds per clock pulse for any given tempo (in beats per minute) and sequencer resolution (in pulses per quarter note). A copy of the table is available on our Web site at www.emusician.com.

EM WEB CLIPS

Frequent contributor Jim Johnson addressed the problems inherent in using sequencers in live performance. Although he touched on AC-power problems and sequencer song-loading speed (sometimes a problem in 1988), most of "Sequencing for Live Performance" discusses programming and using a "test and tune" sequence to make sure everything is properly set up and ready to go.

When a car crash cost Def Leppard drummer Rick Allen his left arm, MIDI-controlled electronic drums and samplers saved his career and kept the band rocking. Author Jay Savel reported on Allen's and mixing engineer Robert Scovill's MIDI system, which was highly unusual for a metal band like Def Leppard.

Legendary avant-garde master John Cage predicted the emergence of noise-based electronic music back in 1937. Although he is better known for percussive pieces, prepared piano, and experimentation with randomness and found sounds, he also created several computer-based works. John Diliberto brought us a wide-ranging interview with Cage, then 75 years old, that is well worth reading today.

"Eliminating Noise" focused on preventive medicine, including proper grounding, setting up an optimal gain structure, cleaning electrical connectors, and routing cables away from electrical and RF fields. We also offered two DIY stories: a program for the Commodore 64 computer that randomly generated Roland Juno 106 and Yamaha DX21 synth patches, and a simple hardware mod that makes the Roland JX8P keyboard's Aftertouch more sensitive.

We ran three full reviews: Craig Anderton's special report on the Ensoniq EPS sampler and SQ80 synth, Ian Gilby's evaluation of Voyetra's Sequencer Plus software for the PC, and Dean Friedman's investigation of a Sound Quest DXII editor-librarian program for the Amiga computer. Our brief First Take reviews were positive evaluations of four Atari ST programs and one C-64 program; however, only MIDImouse Fast Tracks, a live-oriented sequencer, was the least bit memorable.

TIPS

Restart from the Finder, and as your computer reboots, hold down the X key.

—Geary Yelton

Rack It Up in Sonar XL

Adding DX synths or ReWire devices in a Sonar project used to be a pain before the Synth Rack was introduced in Sonar version 2, but now, it couldn't be easier. Go to the View menu and select Synth Rack, and the Rack will appear on the main Track view. Click on the icon at the far left of the menu bar and pick a DX Instrument or ReWire Device from the list in the dialog. If you've loaded a VST shell such as Fxpansion VST to DX Adapter, you'll also find your VST Instruments there.

For each new synth or device you choose, Sonar will insert into your project a new MIDI track that has your instrument assigned to its output. To edit the instrument, click on the Properties button in the Rack (second from the right) and tweak to taste.

By the way, if Sonar crashes when you try to use a ReWire device (such as Ableton Live), be sure to grab the newest patch from the Cakewalk Web site, which fixes the problem.

—Dennis Miller

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WHAT'S NEW

By Marty Cutler

SE ELECTRONICS Z-SERIES MICS

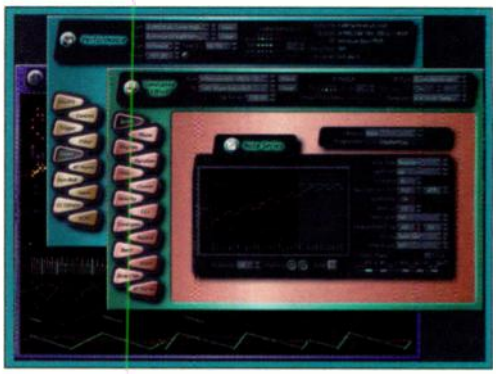
SE Electronics claims its new Z-series mics offer more detailed bottom-end response and higher sensitivity at an affordable price. The Z5600 ($699) is aimed at solo voice, chorus, and acoustic and amplified instruments. It has a 1.07-inch, 24-karat, gold-sputtered diaphragm; a replaceable vacuum tube; and a 9-point polar-pattern selector switch on its custom power supply. Frequency response is 20 Hz to 20 kHz, and self-noise is rated at 16 dBA.

The Z3300 ($375) features a 1.07-inch twin diaphragm with a choice of three polar patterns. The Class-A FET preamp is said to provide transparent, low-noise performance; self-noise is 18 dBA. The Z2200 ($315) offers a 100 Hz bass roll-off switch and a –10 dB pad instead of polar patterns. Both mics have a 20 Hz to 20 kHz frequency response.

The Z1100 ($249) features the same diaphragm as the Z5600 but uses a fixed-cardioid polar pattern. Its frequency response is 10 Hz to 20 kHz; self-noise is 18 dBA.

Z-series mics come with an external shockmount and a hard case. Network Pro Marketing (distributor); tel. (909) 272 3465; e-mail Marty@networkpromarketing.com; Web www.seelectronics.com.

KARMA LAB KARMA MW



Korg's Karma music workstation provides a host of user-programmable real-time performance controls and effects, but creating your own can be a cumbersome process. Enter KARMA MW software (Mac/Win, $149). Created by KARMA developer Stephen Kay, KARMA MW software lets you view and edit over 400 parameters that comprise a Karma Generated Effect (GE). It also lets you access all Program and Combination parameters associated with each Karma Module. The software lets you edit drum patterns, rhythm patterns, duration patterns, Index patterns, Cluster patterns, Velocity patterns, CC patterns, and envelopes.

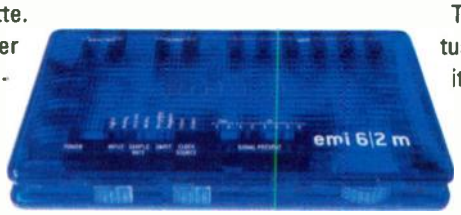
KARMA MW lets you create new GEs or modify existing GEs into new configurations. You can upload System Exclusive dumps of the new GEs (and associated Programs and Combinations) to the Karma or save files to floppy disk and import them directly into the synth. The editor can import Triton arpeggios and convert them to Karma GEs, automatically assigning GE parameters, knobs, and switches. Also notable is the ability to import and edit phrases and drum grooves from the Karma's internal sequencer or from any SMF for conversion to Karma GEs.

The GUI creates a real-time visual display of KARMA-generated MIDI data, and pop-up Tooltips provide instant access to relevant online Help sections. KARMA MW can even serve as four additional GE modules running simultaneously with those already onboard the synth.

KARMA MW requires a Mac PPC 604e/166, Mac OS 8.6, 64 MB of RAM, and OMS 2.3.8. For the PC, you'll need a Pentium II/233; Windows 98, ME, NT, or XP; and 64 MB of RAM. Karma Lab LLC; e-mail info@karma-lab.com; Web www.karma-lab.com.

EMAGIC EMI 6|2 M

Designed for mobility, the EMI 6|2 m ($399) from Emagic gives you 16 channels of MIDI I/O as well as 6 analog recording and 2 analog playback channels of up to 24-bit, 96 kHz audio. The interface's translucent blue plastic case is about the size of a VHS cassette. The unit draws power from its USB connection and needs no external power supply (though an optional external power supply is available).



In addition to its functions as an audio and MIDI interface, the EMI 6|2 m offers an integrated USB hub with two extra USB ports for connecting additional USB hardware devices. Two RCA-style sockets serve as either coaxial S/PDIF I/O or MIDI I/O. The unit provides six unbalanced RCA analog inputs and two unbalanced RCA analog outs. You also get an ⅛-inch stereo headphone jack.

The EMI 6|2 m's clock-source selector switch allows the unit to act as a digital master or slave device. When slaving, the EMI 6|2 m will lock to any external S/PDIF clock signal arriving at its digital input.

The EMI 6|2 m's status LEDs indicate digital or analog input, sampling rate, bit depth, and internal or external clock source. Each in and out has an individual LED that indicates the presence of a signal on that channel.

The EMI 6|2 m ships with drivers for Mac OS X Core Audio, EASI, and ASIO. The package includes a soft case to protect the device from scratches and dirt. Emagic, Inc.; tel. (530) 477-1051; e-mail emagic@emagicusa.com; Web www.emagic.de.

World Radio History

BIAS SOUNDSOAP

Berkley Integrated Audio Software (BIAS) says that its SoundSoap (Mac/Win, $99) application offers professional-quality noise reduction with a simplified user-friendly interface. With just two knobs, you can reduce noise from almost any digital media file, including digital-video soundtracks, PowerPoint and other presentation software, Flash and other Web tools, digital audio workstation tracks, and digitally archived analog tape recordings.

SoundSoap is initially shipping as a VST plug-in for Mac OS X and as a VST and DirectX plug-in for Windows XP host applications. Compatible host applications on Mac OS X currently include version 3.2 of BIAS Peak LE, Peak DV, and Peak as well as Steinberg Cubase SX and SL. Windows XP users may use SoundSoap with Adobe Premiere 6.5; Cakewalk Sonar; Sonic Foundry Sound Forge; Steinberg Wavelab, Cubase, and Nuendo; and other programs that support DirectX and VST plug-ins. An update in the works will allow SoundSoap to function as a standalone application.

SoundSoap can discriminate between noise and the desired audio. The software can reduce broadband noise such as room noise, tape hiss, and sounds from a moving vehicle, air conditioner, and fan. It also removes low-frequency rumble and 50 and 60 Hz electrical hum common in many audio recordings.

For the Mac, you will need a PPC G3/400 MHz, at least 128 MB of RAM, and Mac OS X 10.2. For the PC, you will need a Pentium III/600 MHz machine running Windows XP with 128 MB of RAM. BIAS; tel. (800) 775-BIAS or (707) 782-1866; e-mail sales@bias-inc.com; Web www.bias-inc.com.

DASH SYNTHESIS COMBO SISTER

The Dash Synthesis Combo Sister (Win, $39) is a VST instrument that specializes in single-transistor combo organ emulations. The manufacturer derived models from the Rheem Mk VII, Farfisa Compact, and Vox Continental and added additional features for greater sound-design flexibility. For example, unlike the original instruments, Combo Sister has Velocity sensitivity.

Dash claims Combo Sister is not a clone of any single model and that it is unique in its ability to combine elements of several different organs into one instrument. The plug-in accomplishes the mix using a combination of virtual drawbars, timbre switches, and oscillator bank selections.

You get two main oscillator banks: an "enriched sine-wave" bank for emulating Hammond-type electric organs, and a square-wave bank. For 16- and 8-foot ranks, the software provides an extra bank of bass oscillators. There are six drawstops: 16-, 8-, 5⅓-, 4-, 2⅔-, and 2-foot. You can switch the 5⅓-foot drawstop to one of two higher ranks, either 1⅓-foot or 1-foot plus 1⅗-foot. Maximum polyphony is 16 note notes.

Combo Sister's four timbre stops are String, Reed, Flute, and Add (which doesn't use a filter for tone shaping). The instrument provides a Percussion switch and a Sustain switch for long releases. You also get dedicated Rate and Depth knobs for tremolo and vibrato. For a bit of distortion, try the Booster, a defeatable analog saturation effect with adjustable distortion amount. A Transistor knob introduces electric click and other analog-style noisiness.

Combo Sister requires a Pentium II/300 MHz or equivalent, Windows 98, 128 MB of RAM, and a VST host application. Dash Synthesis; e-mail info@dashsynthesis.com; Web www.dashsynthesis.com.

KENTON SPIN DOCTOR

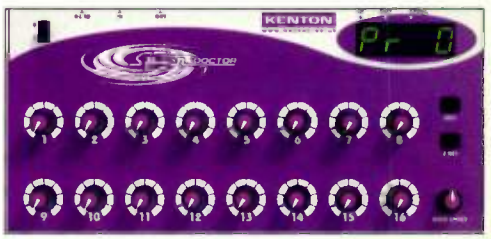
Kenton describes its Spin Doctor ($199) MIDI controller as an entry-level device. Nevertheless, the unit offers 16 assignable knobs, a programmable function key, an edit key, and a data-entry knob.

The Spin Doctor provides 25 memory slots for storing knob assignments; Kenton ships the unit with popular device profiles to get you started, and the company maintains hundreds of additional profiles on its Web site for downloading. The Spin Doctor is compatible with Kenton's Control Freak controller, adding another large list of available profiles.

You can program continuous controller assignments from the Spin Doctor's front panel. For deeper edits, download the Virtual Spin Doctor editor, a freeware program for Windows 2000 or XP. A Macintosh version of the editor is in development.

The Spin Doctor provides a four-character LED display with scrolling text to make editing simpler. If you need to troubleshoot something, the Spin Doctor offers a MIDI Analyzer mode.

The Spin Doctor is built in to a rugged metal housing and features MIDI In and Out jacks. Kenton includes a wall-wart power supply for the unit. Big City Music (distributor); tel. (818) 985-0855; e-mail sales@kentonuk.com; Web www.kentonuk.com.



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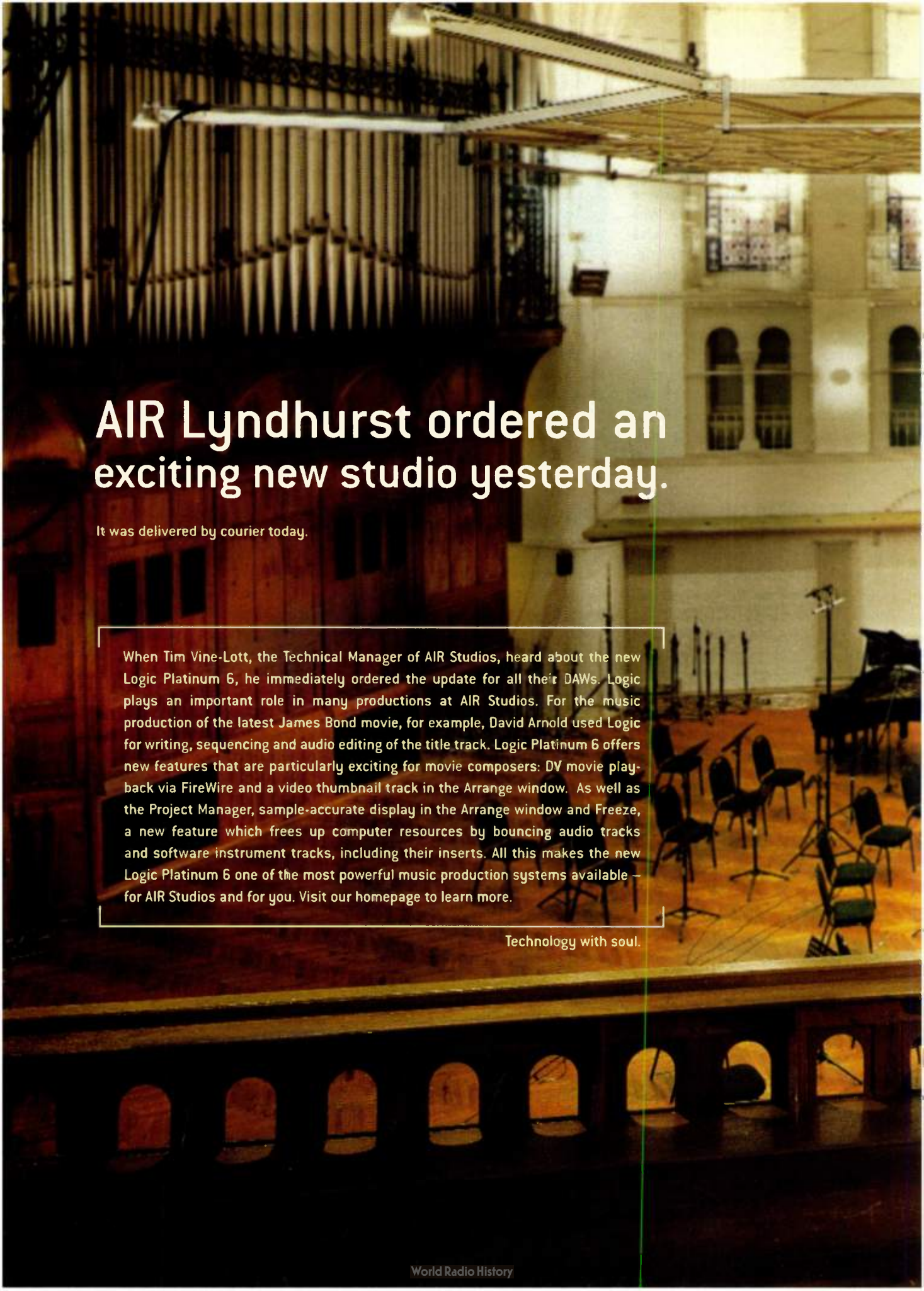

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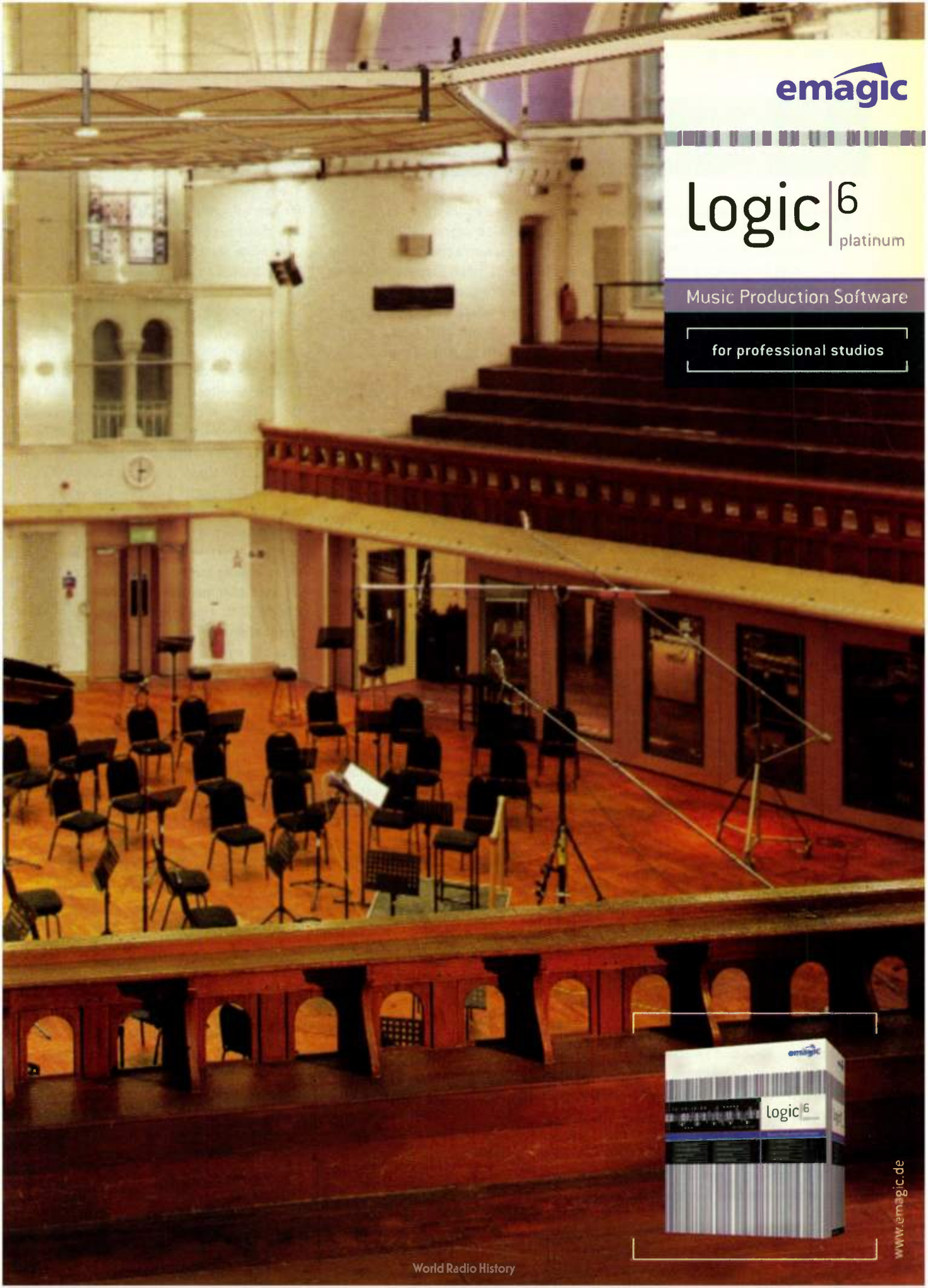

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ON THE HORIZON ▲▲▲▲

By the time you read this, CreamWare will have unveiled its first hardware synthesizer, Noah ($2,075), which it expects will ship in April. What is most remarkable about Noah is that it is not based on a hardwired synthesizer engine but relies on plug-in technology to determine the DSP. This makes Noah a tabula rasa capable of becoming a completely new sound-generating tool with each plug-in.

The unit will ship with a number of synthesis plug-ins; they will emphasize physical- and analog-modeling instruments. Many of the initial plug-ins are already available for CreamWare's Pulsar and Scope DSP card systems.

CreamWare touts its Minimax plug-in as an accurate reproduction of the Minimoog. B-2003 models drawbar organs in the style of the Hammond B-3. Vectron Player emulates the Sequential Circuits Prophet VS with its ability to create sonic motion by smoothly crossfading between oscillators. Lightwave is a wavetable synth with 128 waveforms, 2 multimode filters, and a flexible modulation matrix.

CreamWare claims the included Six-String physical modeling plug-in can produce stringed instrument sounds with an unparalleled degree of realism. Six-String focuses on acoustic and electric guitar sounds, but it can emulate other stringed instruments such as acoustic and electric basses, harps, dulcimers, and sitars. It can also produce soft, woodblocklike sounds or metallic and bell-like timbres.

The fundamental Six-String sound production technology was developed by

Dr. Rudolf Rabenstein and Dr. Lutz Trautmann at the University of Erlangen—Nuremberg, Germany. The model takes into account a string's physical characteristics in real time—including string diameter and tension, rigidity, and excitation type. These parameters are editable and exert influence over the modeled sound in the same fashion as their real-world counterparts. Because Six-String was developed specifically for guitar emulation, it also includes programmable parameters for emulating the acoustic characteristics of the guitar body and pickups.

You can select from different string types such as steel, nylon, or special bass strings and choose position and the type of string excitation (pick, fingernail, or fingertip). You can also select from various body profiles, adjust two virtual pickups, and control the slap behavior. Six-String's effects section includes guitar amp simulation and chorus and delay effects. A tube simulation section imparts amplifier characteristics and overdrive.

Initially, Noah will ship as a rackmount module. It features a 2 × 40-character display and is equipped with four combination continuous-control–push-button performance knobs. Noah provides analog stereo input and output; digital Lightpipe output; a headphone out; MIDI In, Out, and Thru; a USB interface; and a Compact Flash slot for data storage.

The Noah EX ($2,525) doubles the capacity of the synthesis engine. Noah EX can play as many as four instruments at a time (the standard version offers two). CreamWare, Inc.; tel. (800) 899-1939 or (818) 610-2896; e-mail info@creamware.com; Web www.creamware.com.

▶ TL AUDIO 5052

TL Audio's 5052 ($1,799) provides two channels of preamplification, dynamics processing, and EQ with independent stereo linking of the compressor, EQ, and limiter. Each channel offers a tube preamp stage, a tube compressor, a 4-band tube EQ, and an optical output limiter. The preamp accepts mic, line, and instrument-level inputs. You get a variable input gain knob and switches for a 90 Hz filter, a 30 dB pad, and phase reversal.

The 5052's compressor gives you variable threshold, ratio, attack, release, and gain makeup controls, and hard- and soft-knee modes. The EQ offers two fully parametric mids and high- and low-frequency bands, which you can switch between peaking and shelving modes.

The optical output limiter has a variable threshold control and offers brick-wall limiting of the output signal. You get VU metering for input and output levels and separate monitoring for compressor and limiter gain reduction.

The compressor, EQ, and limiter stages can be individually stereo linked, allowing channel A to be the master of channel B. A true bypass function lets you audition comparisons between the original and the processed signal.

The 5052's connections allow for digital I/O expansion with the optional DO-2 digital card ($249). Analog I/O includes two XLR mic inputs, two XLR line inputs, two unbalanced ¼-inch line inputs, two balanced inserts (with separate balanced ¼-inch I/O for send and return), two unbalanced ¼-inch compressor sidechain inserts, two front-panel unbalanced ¼-inch instrument inputs, two balanced XLR outputs, and two unbalanced ¼-inch outputs. HHB Communications U.S.A. (distributor); tel. (805) 579-6490; e-mail info@tlaudio.co.uk; Web www.hhbusa.com or www.tlaudio.co.uk.

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GET SMART

BERKLEE PRESS

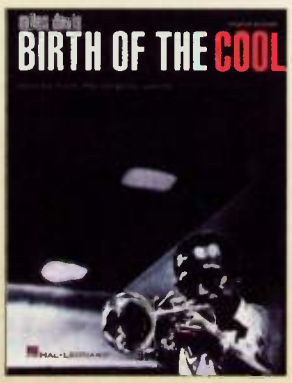
Whether you play the real thing or its software equivalent, Dave Limina's *Hammond Organ Complete* ($24.95) could prove useful for getting the most out of your instrument. Subtitled "Tunes, Tones, and Techniques for Drawbar Keyboards," the book explains and helps you strive for mastery of the combined use of drawbars, the expression pedal, and the Leslie speaker speed switch.

The book guides you step-by-step through drawbar-organ-playing techniques, one skill at a time. Limina reveals special effects used by the great Hammond organists, including unique tips and tricks for all drawbar instruments. Subsequent sections teach authentic rock, jazz, blues, and funk comping techniques. The book explains all the parts of the organ and how to use them, including percussion, expression pedal, vibrato, chorus, and the Leslie speaker.

Once you have mastered the basic skills, you receive instructions on playing idiomatic gospel, R&B, jazz, blues, funk, and rock with a series of hands-on exercises. The CD that accompanies the book includes 21 exercises as well as performances of 8 songs. Versions of the songs from which the organ parts have been removed so that you can play along. Berklee Press; tel. (617) 747-2146; Web www.berkleepress.com

HAL LEONARD

Miles Davis's *Birth of the Cool* represents the collaborative efforts of some of bebop's most fertile composers and arrangers. *Birth of the Cool: Scores from the Original Parts* ($24.95) contains restored versions of the charts that Miles Davis created in collaboration with such notables as Gil Evans, John Lewis, Gerry Mulligan, and John Carisi.



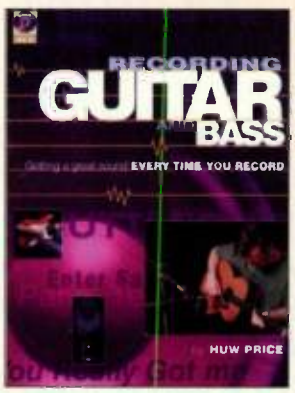
The publication is the product of more than two years of preparation. Although much of the material relies on transcriptions, some of the arrangements are derived from copies obtained from esteemed arranger and composer Gunther Schuller.

The volume begins with a short, colorful history of the origins of the songs and arrangements; that is followed by brief biographies of the project's core constituents. Before leading into the scores, editor Jeff Sultanof provides an interesting and illuminating section detailing the restoration of the charts.

Among the included charts are "Move" by Denzil Best; "Boplicity," by Miles Davis; "Budo," by Miles Davis and Bud Powell; and "Israel," by John Carisi. Arrangements include annotations accounting for variations between live performances of the material and recordings and details for optional endings. Hal Leonard Corporation; tel. (800) 637-2852 or (414) 774-3630; Web www.halleonard.com or www.musicdispatch.com.

BACKBEAT BOOKS

Ironically, guitarists and bass players who build personal studios often have difficulty capturing an ideal recording of their own instruments. *Recording Guitar and Bass* ($29.95) by Huw Price is a hands-on guide that describes the steps involved in getting a good recording from the bottom up.



The book provides practical advice for building your personal studio and choosing amplifiers and microphones. In addition, it describes an assortment of miking techniques that range from simple to complex. Price also covers processing and sound enhancement with effects and offers specific techniques for recording acoustic guitar and electric guitar and bass.

The book includes interviews with top technicians, producers, and musicians revealing some of their tricks of the trade. Interviewees include Steve Albini, Bob Brozman, Alan Moulder, and Chris Tsangarides.

Price's book comes with a 63-track CD that demonstrates sounds created by different amplifiers and microphones, the effects of mic positioning within the studio, and the use of EQ. Backbeat Books; tel. (866) 222-5232; e-mail backbeat@rushorder.com; Web www.backbeatbooks.com.

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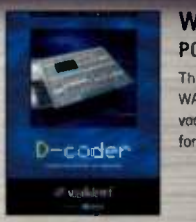

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World Radio History

PROFILE

By Matt Gallagher

Experimental Journey

Trip Tech searches for common ground within the electronic realm.

Dualities exist on many levels in Juan Carlos Mendizabal's music. Born in El Salvador, Mendizabal immigrated to the United States in the early 1980s as civil war ravaged his native country. Years later, he majored in music at San Francisco State University, studying both classical composition and electronic music. As a result, his music offers an intriguing mesh of contrasting styles.

Mendizabal's musical vision led him into a partnership with Kreed DuChat. They recorded together under various monikers and, along with bassist Rick Perko, eventually formed Trip Tech. The group's first release, *Children of the Secret* (on Mendizabal's Black Note Music label), is a daring electronic work that blurs stylistic boundaries. "This album is ambient-dub," says DuChat. It well represents Mendizabal's and DuChat's collaborations, in which free-form improvisation meets classical structure.

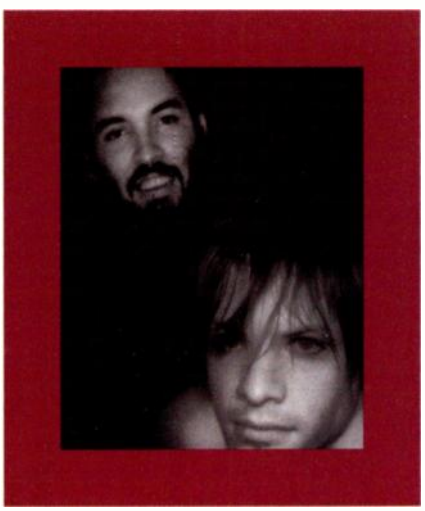
"At some point the two approaches melded," says Mendizabal. "I would find themes when we were improvising and then develop them. I would get an eight-bar section of, say, something Kreed played on his drum machine and then make variations based on that. It's all improvised and recomposed later."

Children of the Secret began with two nights of improvisation in Mendizabal's living room. DuChat played a Roland MC-303 Groovebox; Perko played bass; and Mendizabal played a Korg Electribe A EA-1, Korg Electribe R ER-1, and Korg Kaoss Pad while mixing all audio parts live on a Behringer Eurorack mixer. "I also had a drone going through a CD player," Mendizabal adds.

Mendizabal recorded audio and MIDI into his Mac IIci running MOTU's Digital Performer. "The computer was sending out MIDI Clock so that it would synchronize the two E-tribes and the MC-303," says Mendizabal. "Sometimes the drones, the drums, and the synths would all go into the Kaoss Pad and be processed and recorded live. I like it when two or more things are combined in one processor because it creates something that's a mix of everything. None of the people who are playing can predict what they themselves are going to sound like." *[Laughs.]*

The sessions yielded four hours' worth of "raw source material" that Mendizabal later reworked in Digital Performer using his collection of synths, samplers, and effects processors. Those include E-mu's Morpheus and Emax, BitHeadz's Retro and Unity DS-1, Cycling '74's Pluggo, and Passport's Alchemy.

Mendizabal would "take bits from here and there, erase things, and loop things. Sometimes there's a little melody or something that sticks out, and I'll use that as a theme and then use the other things as a counterpoint or contrast." For example, one of Perko's bass lines inspired much of the album. "When I was mixing it, I put it an octave up and I sent it through a ring modulator. What used to be the bass line turned into the melody of the first large piece," he says. "Then I started playing it in different ways and sending it through Retro to get different versions. It turned into the main theme."



DILCIA MENDIZABAL AND LAURI LEVENFELD

***Children of the Secret*/Trip Tech**

Trip Tech is currently working on a follow-up release. "It will be just as insane, but different from *Children of the Secret*," says DuChat. "But we're still going to use this approach," Mendizabal adds. "It's an approach that can go in all kinds of directions."

For more information, contact Black Note Music; P.O. Box 3251, Daly City, CA 94015-3251; e-mail jcmg@earthlink.net; Web www.deconstructionist.com/blacknote.

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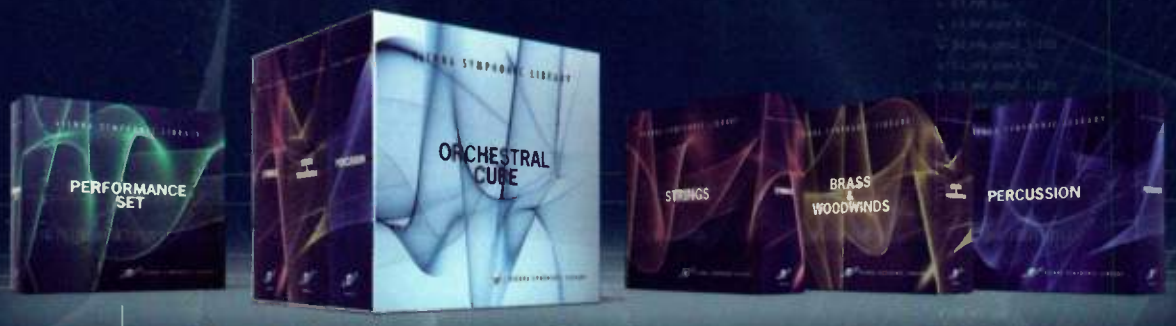

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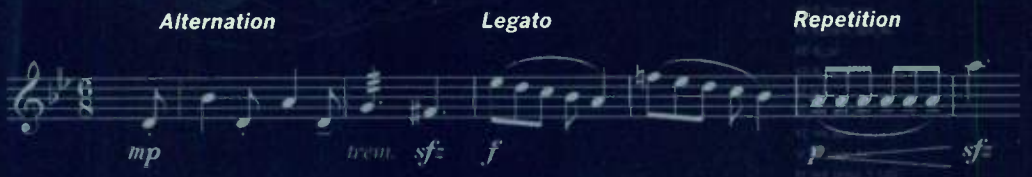

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World Radio History

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The Ultimate Brass Library

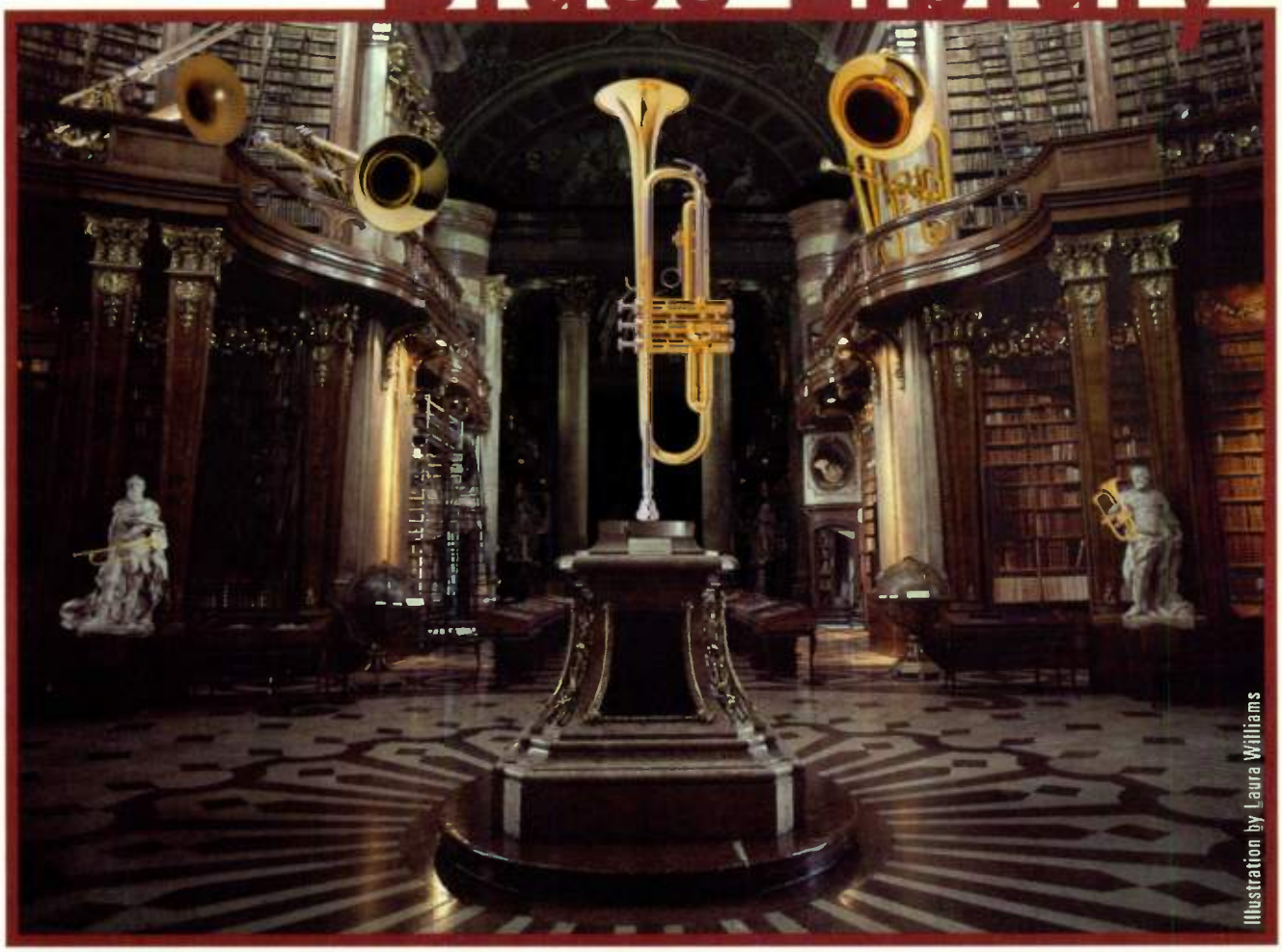

Illustration by Laura Williams

The December 2002 issue of **EM** premiered a new series highlighting top-notch titles in specific sample-library categories. The first installment focused on bass-guitar sounds. This month, we'll look at some of the best ensemble and solo brass libraries.

By Rob Shrock

Using samples to realistically and musically capture the sound of brass instruments is a tall order. A lot goes on within a good live brass section: various embouchure articulations are called for, overall tone changes drastically with swells and sforzandos, and potential dynamic range is enormous. Blending within an orchestral section, carrying a solo line in a symphonic setting, or blowing in a jazz or funk group each require vastly different playing techniques. Needless to say, there are plenty of opportunities for brass libraries to fill the need for good horn sounds.

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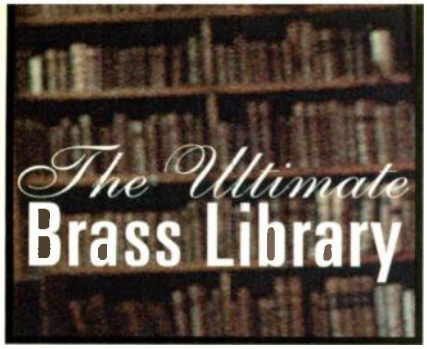


BIG FISH AUDIO

First Call Horns

First Call Horns is not yet commercially available, though it should be released by the time you read this. I had the opportunity to check out a beta version of the two-CD library, and it promises to be quite good. One of the few libraries that can function in pop/rock settings as well as orchestral, *First Call Horns*, in Giga format, has section and solo trumpet, piccolo trumpet, flügelhorn, trombone, soprano sax, alto sax, tenor sax, and bari sax. The final release may include more instruments than were on the beta version.

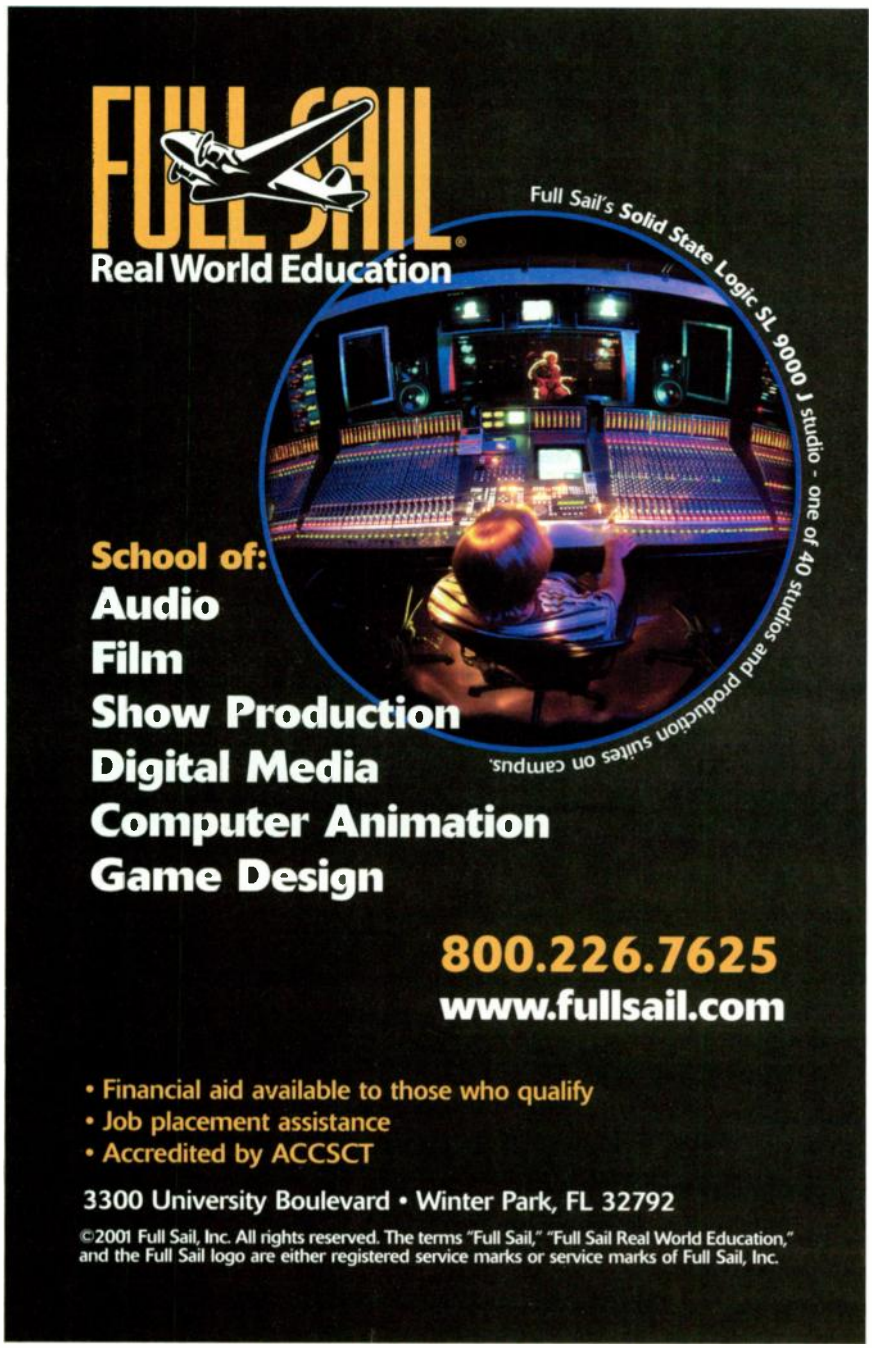
The programming was incomplete at the time that I reviewed the library, but the programs that were included were exceptionally good. Vibrato and non-vibrato versions of many instruments were provided. Mutes, falls, shakes, swells, and other idiomatic styles seemed well represented. Hopefully, the programmers will take full advantage of other techniques such as key-switching, Mod-wheel crossfading, and release samples.

DAN DEAN PRODUCTIONS

Dan Dean Brass Ensembles

One of the newest brass libraries, *Dan Dean Brass Ensembles*, concentrates on exquisitely detailed sections of four French horns, three trumpets, and three trombones (see **Fig. 1**). Both ambient and close versions are provided for all articulations of each instrument. The Giga library comprises 12 CDs: each instrument gets 2 discs of close-miked samples and 2 discs of ambient samples. Full release-trigger implementation is provided so that you can add the natural large-room reverb to all layers and articulations.

The ambient patches are gorgeous, although I generally prefer using the close-miked versions and applying a concert-hall preset from Audio Ease Altiverb to put the sounds in the same "room" with sounds from other libraries. Still, I like the ambient samples very much.



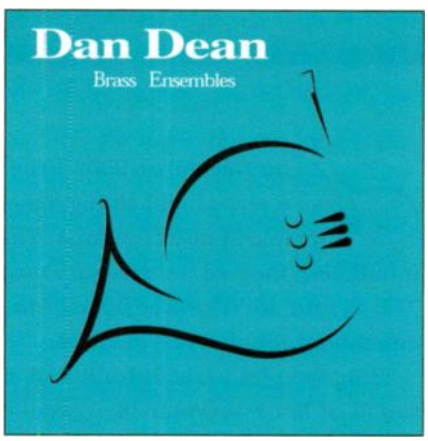


FIG. 1: From Dan Dean Productions, the recently released *Brass Ensembles* library specializes in beautifully sampled French horn, trumpet, and trombone sections.

World Radio History

A lot of detailed programming went into this library, which offers a huge variety of articulations and up to eight dynamic layers. This library has the best crossfades between dynamic layers that I've heard in a brass library, making the patches highly realistic and fun to play.

DAN DEAN PRODUCTIONS

Dan Dean Solo Brass

The predecessor to *Dan Dean Brass Ensembles*, this ten-CD library makes an excellent sonic complement. In addition to trumpet (vibrato and nonvibrato versions), trombone, and French horn, the library includes bass trombone, cimbasso (bass tuba), euphonium, tuba, and piccolo trumpet (vibrato and nonvibrato versions).

All of the samples are close-miked, which allows them to blend well with the close-miked samples in *Dan Dean Brass Ensembles*. The programming is thorough and the articulation choices are excellent with up to eight dynamic layers in many patches. The solo programs offer enough variety to create two- or three-part sections by combining different variations. (For more on building ensembles, see the sidebar "Sensible Ensembles.") As in *Dan Dean Brass Ensembles*, the recording of the samples is excellent, making *Dan Dean Solo Brass* immensely useful in a wide variety of musical applications.

EASTWEST

Peter Siedlaczek's Advanced Orchestra

I reviewed the Roland and Akai versions of Peter Siedlaczek's original *Advanced Orchestra* library a few years ago (see the September 1998 issue of **EM**). The library was excellent then, but even a few years can feel like a century in the world of sound design, and sampling has improved a lot since that review was published. The newer Giga version of the library has been reworked a bit to take advantage of the current GigaStudio technology, which makes this five-CD library still viable in today's market (see **Fig. 2**).

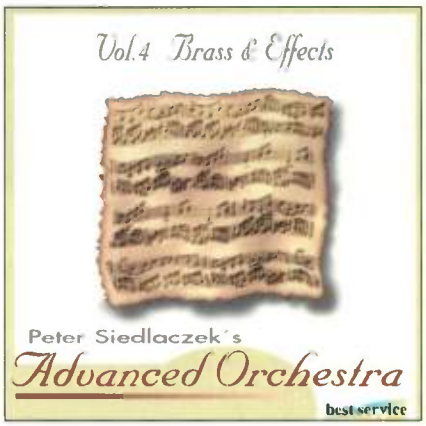
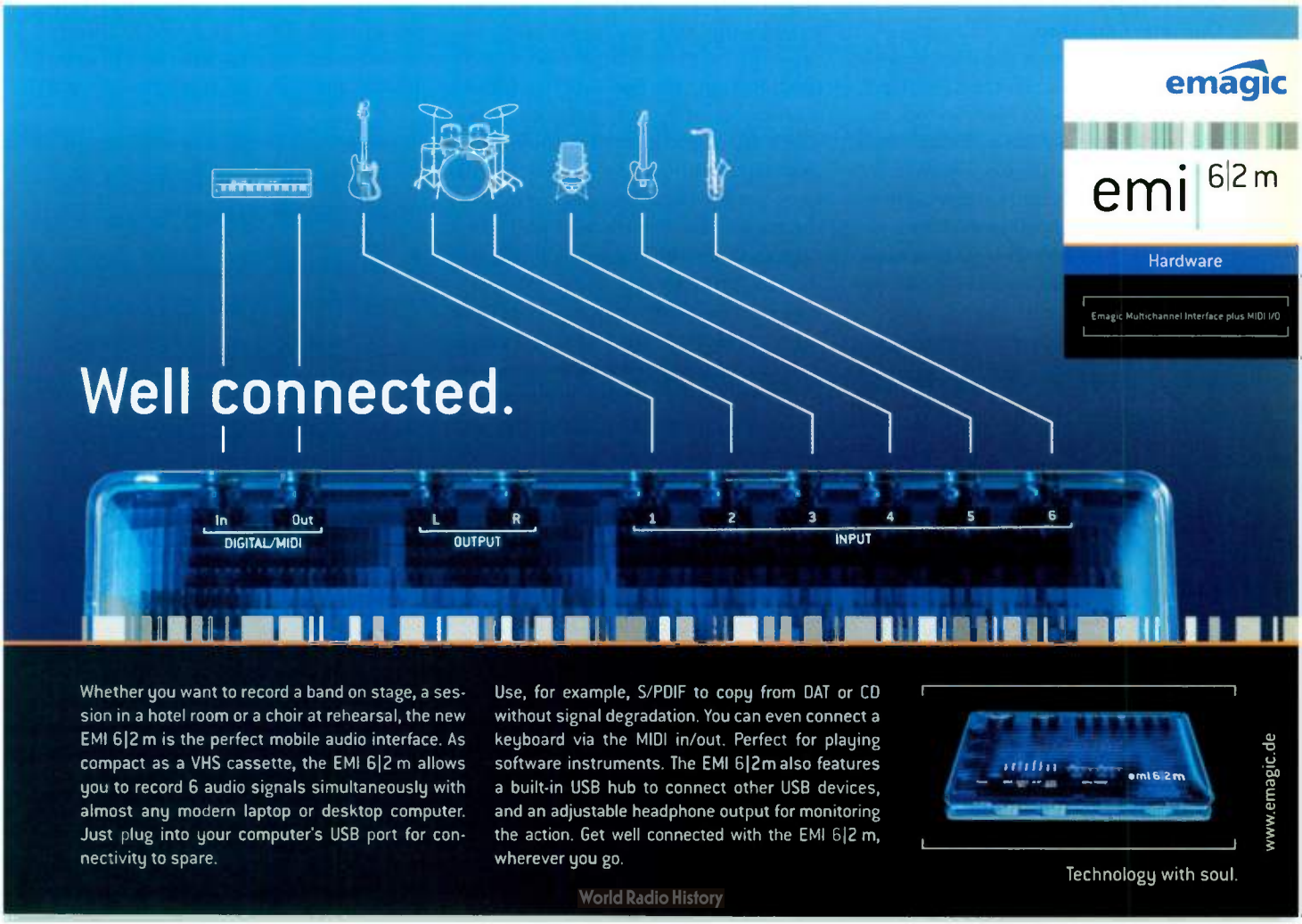


FIG. 2: EastWest's *Peter Siedlaczek's Advanced Orchestra* library has been updated to take advantage of the new Giga format.

Trumpet, trombone, and French horn sections are provided, along with solo versions of trumpet, piccolo trumpet, trombone, French horn, and tuba. A few solo phrases for the two trumpets



are also included. (Remember that for the price you also get strings, woodwinds, percussion, and harp.)

Overall, the samples are great and clean, although they have a touch of cloudiness that I remember from the original versions. (A bit of EQ usually solves that problem.) The library offers some fine crossfading programs as well as keyswitching versions. The dynamic crossfades are second only to *Dan Dean Brass Ensembles* in their smoothness and playability.

The solo sounds blend well with other libraries, although they sound a little "smaller" than some of the newer libraries, which may be preferable in some settings.

EASTWEST

Quantum Leap Brass

Quantum Leap Brass is the most versatile brass library in this roundup (see Fig. 3). The five-CD set works just as well in a pop/rock genre as in an orchestral movie score. You can easily mix a jazzy, Miles Davis–sounding muted trumpet with triumphant French horn ensembles.

Alto sax, bari sax, tenor sax, soprano sax, trumpet, trombone, bass trombone, and tuba are offered as solo instruments, and you can use them effectively to create pop horn sections as well as jazz and rock horn solos. The overblown muted trumpet (think "Minnie the Moocher") is a standout. For ensembles, the library includes a three-sax split, three trombones, three trumpets, and four French horns.

FIG. 3: EastWest's *Quantum Leap Brass* is a highly versatile library that's well suited to pop/rock and to orchestral and film-score projects.

Mod-wheel-controlled filtering on many of the programs adds life to the excellent collection of samples. Still, I wish there were controller crossfades of dynamic layers other than with MIDI Velocity, and I'd like to see some keyswitching programs to make the wide variety of articulations more immediately accessible.

This library is primed for some Giga articulation updates to take full advantage of its potential. Separate versions for Akai S1000 and S5000 are available to maximize the programming capabilities of those samplers.

EASTWEST

SAM Horns

When I first heard *SAM Horns* at a friend's studio, I was immediately impressed; the French horn sounds were phenomenal (see Fig. 4). (French horn sections are the only patches in this single-CD Giga library.) Although any individual note in the library sounds like a professional four-person section, the tones blend extremely well when playing three- or four-note chords, and the size of the section doesn't sound as though it has instantly jumped to 12 or 16 players. Both ambient and close-miked samples are provided, along with a slew of effects that include swells, rips, interval leaps, clusters, trills, and glissandos. Keyswitching, Velocity switching, release triggers, and three dynamic layers add to the library's playability.

Everything in this library sounds terrific—not a dud within earshot. The Dutch developer's Web site (www.projectsam.nl) indicates that the company is working on additional instruments, and samples of trumpets and timpani are available for free download.

Solo lines sound powerful and majestic in *SAM Horns*, and you can create some absolutely gorgeous soft pads;

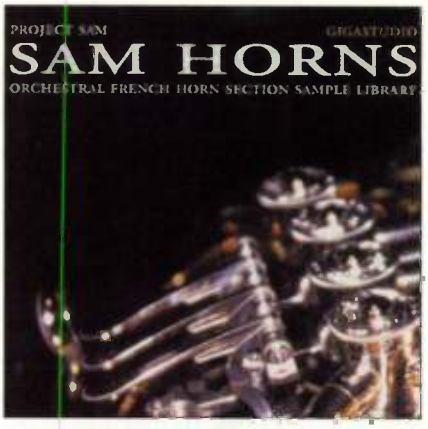


FIG. 4: EastWest's *SAM Horns* specializes in close-miked and ambient French horn sections.

I think I'll use some in my next project instead of synths.

ILIO ENTERTAINMENTS

The Memphis Horns

Few pop/rock horn libraries match the quality of the available orchestral brass libraries, but *The Memphis Horns* is an exception (see Fig. 5). Samples of the real Memphis Horns—Andrew Love and Wayne Jackson—absolutely drip with personality. The four-CD library includes lots of great licks and phrases in multiple keys, and it offers sustained

COMPANY CONTACT INFORMATION

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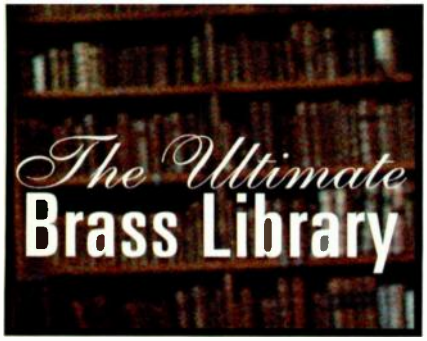

chords, falls, noises, and other goodies characteristic of the legendary duo.

Unfortunately, the collection doesn't include chromatic multisamples of the players individually or in unison. Part of the original Memphis Horns sound comes from the way that the players voice chords and overdub themselves, as well as from the types of licks that they play. I would have loved some multisampled instruments so that I could have fleshed out the potential of the sampled phrases; that missing feature is the biggest drawback to this library.

On the other hand, the licks are so outstanding that if you only use this library a couple of times, that will justify its price tag. If you create commercial music, you could write loads of cuts based around this collection and sound extremely hip. Moreover, the documentation includes a personal note from Jackson that explains the philosophy behind the Memphis Horns; it's a great minilesson in good pop orchestration. You also get a discography of all the cuts that Love and Jackson have played on as well as technical information on the sampling sessions.

ILIO ENTERTAINMENTS

Miroslav Vitous Solo Instruments I and II

Another of the revamped "Golden Oldies" of the '90s, the *Miroslav Vitous* libraries have been a favorite of composers for a long time (see **Fig. 6**). You can't get a complete collection of brass instruments without purchasing both of the discs, because the instrument groups are broken up between the different titles.

Solo Instruments I (one CD; two in Giga format) includes trombone, bass trombone, and trumpet (along with bass clarinet, bassoon, clarinet, contrabassoon, viola, and cello). *Solo Instruments II* (one CD; two in Giga format) provides the French horn and tuba (along with alto flute, English horn, flute, oboe, piccolo, violin, and contrabass). The samples sound great, and they're very musical. But the library suffers from some inconsistent programming in the Giga format.

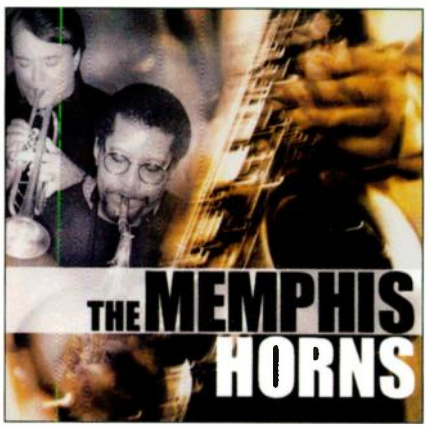

FIG. 5: Ilio Entertainments' *The Memphis Horns* is a great pop/rock library filled with licks, chords, falls, and phrases performed by Andrew Love and Wayne Jackson.

At most, each instrument has only four or five articulations, but they're in useful bread-and-butter patches. Keyswitched programs give you access to different articulations on the fly. The Mod wheel is used mostly for volume control. (I'd rather have the Mod wheel control filtering or crossfading between dynamic layers.) The instruments are dry, so you have to add ambience to them yourself.

The library is very good, but it's not a complete collection of brass sounds. More detailed GigaStudio programming coupled with some additional content would make this library more competitive by today's standards. Nevertheless, I know several composers who love these sounds and use them regularly on commercials and in film scores.

ILIO ENTERTAINMENTS

Miroslav Vitous Woodwind & Brass Ensembles

This single-CD library of ensemble patches has the sectional French horns, trombones, and trumpets in addition to bassoons, clarinets, flutes, and oboes (see **Fig. 7**). The samples are clear and punchy, and looped as well as unlooped

SENSIBLE ENSEMBLES

I wish sample developers would address how brass sections are created in real life and give us that option. What we need more than unison ensemble samples are multiple "players." For instance, a typical trumpet section consists of three players. When they play in unison you hear three distinct players on a single note. When they play a triad, you still hear three individual players, this time making up the chord with one player per note.

If you play a triad with an ensemble brass sound, you suddenly get the sound of nine "players" (three players per note), which causes an unsatisfactory shift in timbre. Using multiple copies of a single solo instrument to play each note of a triad is a poor substitute because the ear can hear that the subtle differences between players are missing and the voices are identical and therefore unnatural. What's more, you can't shift between harmony and unisons because of phasing on the unisons. The solution is to give us multiple solo instruments (First, Second, Third, and so forth) for those of us who like to build up sections one instrument at a time.

That approach is being taken already in many string libraries that offer completely different First and Second Violins with the same amount of detail provided for both. The result is an organic timbre that more closely rivals live recordings. Of course, that means a lot more work for the developers and repeated duplication of all of the available articulations, but today's technology supports that amount of data manipulation. For the most part, the lack of multiple individual solo players remains the biggest missing link in orchestral and ensemble simulations with samples.

World Radio History

Sample Libraries

Distributor	Title	Formats	Description	Price
Big Fish Audio	*First Call Horns*	Giga	2 CDs. Solo and section: trumpet, piccolo trumpet, flügelhorn, trombone, French horn, soprano sax, alto sax, tenor sax, bari sax.	$299.95
Dan Dean Productions	*Brass Ensembles*	Akai, Giga	12 CDs. French horn, trumpet, trombone.	$599 Akai; $699 Giga
Dan Dean Productions	*Solo Brass*	Akai, Giga	10 CDs. Bass trombone, cimbasso, euphonium, French horn, piccolo trumpet, trombone, trumpet, tuba.	$549 Akai; $649 Giga; $119 per instrument
EastWest	*Peter Siedlaczek's Advanced Orchestra*	Akai, E-mu, EXS-24, Giga, Roland	5 CDs. Solo: trumpet, piccolo trumpet, trombone, French horn, tuba. Section: 3 trumpets, 3 trombones, French horns. Also string ensembles, woodwinds, percussion, harp.	$495
EastWest	*Quantum Leap Brass*	Akai, E-mu, Roland, Giga, Kurzweil, Unity	5 CDs. Solo: trumpet, piccolo trumpet, flügelhorn, trombone, bass trombone, tuba, soprano sax, alto sax, tenor sax, bari sax. Section: 3 trumpets, 3 trombones, 3-sax split, 4 French horns.	$395
EastWest	*SAM Horns*	Giga	1 CD. French horn sections.	$99.95
Ilio Entertainments	*The Memphis Horns*	Mixed set: Audio/WAV, and Akai	4 CDs (2 mixed format/ 2 Akai). Trumpet, trombone, bari-sax, and tenor-sax phrases.	$299
Ilio Entertainments	*Miroslav Vitous Solo Instruments I and II*	Akai, E-mu EOS, Giga, Kurzweil, Roland, SampleCell	I: 1 CD (2 in Giga). Trumpet, trombone, bass trombone. Also bass clarinet, bassoon, clarinet, contrabassoon, viola, cello. II: 1 CD (2 in Giga). French horn, tuba. Also piccolo, flute, oboe, alto flute, English horn, violin, contrabass.	$795 each
Ilio Entertainments	*Miroslav Vitous Woodwind & Brass Ensembles*	Akai, E-mu EOS, Giga, Kurzweil, Roland, SampleCell,	1 CD. 3 trumpets, 3 trombones 4 French horns. Also 3 flutes, 3 bassoons, 3 oboes, clarinets.	$795
Ilio Entertainments	*Synclavier Brass and Winds*	Akai, SampleCell	1 CD. Trumpet, trombone, tuba, flügelhorn, 2- and 4-trumpet unisons, 2-trombone unisons, French horn, saxes. Also flute, oboe, clarinet, English horn, bass clarinet, bassoon, and exotic winds.	$249
Pyramid Sound Productions	*Prosonus Orchestral Collection*	Akai, Giga, Kurzweil	1 CD; 2 CDs in Giga format. Solo: Trumpet, piccolo trumpet, flügelhorn, French horn, trombone, bass trombone, tuba, cimbasso, cornet. Brass ensemble, brass orchestra. Also flute, piccolo, clarinet, obe d'amore, English horn, bassoon, contrabassoon, strings, percussion, harp.	$295

World Radio History

VIRTUAL WORKSTATIONS

The absence of DAW features, however, should not be taken as a limitation. SSWs are designed to make fast work of generating and manipulating patterns and loops. Because they always contain a multitrack song sequencer for stringing patterns together, SSWs are often all you need to create a finished product. Even if pattern sequencing is only part of your bag of tricks, an SSW is probably the fastest, easiest way to get that job done.

The SSW's simplicity also makes it an excellent creative tool. Once you've learned your way around—and that doesn't usually take long—you can fire up an SSW and have loops and lines bouncing off the walls in no time. You can see from the "Feature Comparison" table included in this article that a certain amount of creeping *featuritis* has hit the SSW world. More is not always better, and your music might be better served if you choose an SSW with only the features you need to get the creative juices flowing, leaving the more sophisticated stuff for your DAW.

Before getting into specific SSWs, two options are worth mentioning. Although several of the SSWs I discuss have audio-loop-processing features, if looping audio is your main interest, then software dedicated to loop processing might be a better choice; examples include Sonic Foundry Acid Pro, Ableton Live, and BitHeadz Phrazer. If you're into creating your own tools, packages such as Native Instruments Reaktor, Cycling '74 Max/MSP, and Sound Quest Infinity provide excellent environments for building your own SSW. Before dismissing that option out of hand, keep in mind that do-it-yourself applications typically have dedicated users groups with many users freely sharing their work. Several free or low-cost SSWs are currently available for each of the applications mentioned. (See the sidebar "Further Reading" for more information on both of those alternatives.)

FIG. 2: Orion's control-central is its virtual mixing desk (left). All generators, such as the drum module shown here (bottom right), have dedicated pattern sequencers. Songs are constructed by selecting patterns in the song sequencer (top right).

FRUITYLOOPS (WIN)

Image-Line's Fruityloops offers VST and DX instrument and effects plug-in support to supplement its array of built-in sound generators and effects. Fruityloops comes in two downloadable flavors, Pro and Full. You can use the Full version either standalone or as a VST Instrument plug-in in supporting hosts. The Full version is also available on CD-ROM with a printed manual and a large library of samples. It's available from Cakewalk, and it also includes Cakewalk's DreamStation DXi.

FIG. 1: Fruityloops uses a multitrack pattern sequencer (left) to enter patterns for all active sound generators. Songs are constructed in the Playlist (right) by toggling pattern playback on and off in its cells.

Fruityloops takes a slightly different approach to step sequencing than the other SSWs covered here, and it takes some getting used to. The reward is that it's extremely flexible and powerful and, once you know your way around, very fast to program.

Instead of having separate pattern sequencers for each sound generator, Fruityloops has a multichannel pattern sequencer with a separate channel for each sound-generator instance. The pattern sequencer's control panel is a button matrix with a row for each sound generator and buttons (called Dots) for each 16th note in the pattern (see **Fig. 1**). As you add new sound generators to a song, new rows are added to the pattern sequencer, which means that the 999 individual patterns might contain notes for one, several, or even all of the sound generators. That leaves you the flexibility of programming your patterns in the conventional manner, with only one instrument playing in each pattern, or of programming your patterns as song sections, in which several instruments play at once.

The bar length (from 4 to 64 16th notes) and the grouping of notes into beats for visual convenience is a global song setting. Fruityloops allows you to override the fixed bar length and the 16th-note quantization represented by the Dots by replacing any row of Dots with a piano-roll sequence. Piano-roll sequences can be any length and will all loop independently during pattern playback. You could use piano-roll sequences

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to program an entire song in a single pattern, but using Fruityloops' song Playlist is a better alternative.

The Playlist contains 999 tracks—one for each pattern. The tracks are divided into cells reflecting the fixed pattern length. Turning a cell on (by clicking) causes its pattern to play at that time position in the song. If you set up your patterns as song sections playing multiple instruments, then you would typically turn on at most one cell per time position (so that each Playlist column would contain at most one active cell). If you set up your patterns to play only one instrument, then you would most likely have several patterns playing in each column. Of course, the beauty of that scheme is that you can combine both methods, which makes song creation both fast and flexible. For example, you could devote some patterns to multiinstrument parts such as drum kits or strings and horns while devoting others to single instruments such as lead synths.

Fruityloops' assortment of sound generators includes all the usual suspects: a sample player, a SoundFont player for playing (but not for creating) multisamples, a subtractive synthesizer, a plucked-string physical-modeling synth, and a beat-slice player (software for beat-slicing is extra). You also get demo versions of several other synths, and you can expand your sound palette with VSTi or DXi plug-ins.

FIG. 4: ReBirth's control panel contains pattern sequencers (left) for each of its four sound modules (center). The output mixer and effects are on the right.

Fruityloops comes with an interesting complement of off-the-wall sound generators as well. It has BeepMap for converting BMP-format pictures to sound, Granulizer for sample resynthesis, and a speech synthesizer that will speak phrases you type using a variety of synthesized voices. Push that through a beat slicer, and you have a kind of robotic insta-rap. To hear an Orwellian example, listen to the MP3 audio file FruitSpeak on EM's Web site. Fruityloops also supports Buzz Machines (www.buzzmachines.com), an online collection of free virtual instruments and effects.

EM WEB CLIPS

Each pattern sequencer channel has an associated Channel window for making sound-generator settings. The window typically has several pages, the last of which includes a chord arpeggiator that allows you to select from numerous chord and scale types for arpeggiation.

For a flexible, easy-to-program pattern- and song-sequencing layout that you can apply to a diverse collection of plug-in sound generators, Fruityloops is a top choice. If you're looking for extensive built-in synthesis and multisampling, however, you might do better with one of the other SSWs.

FIG. 3: Reason's rack can hold as many sound and effects modules as your computer can handle. All modules except the Malström synthesizer are minimized here to conserve space. The sequencer (bottom) can be torn off and resized.

ORION (WIN)

If you're comfortable using an audio mixing desk, Synapse Audio Software's Orion might be your fast track into the world of SSW. Orion comes in three flavors—Basic, Pro, and Platinum—differentiated by their complement of built-in sound generators and effects. The Platinum version comes on CD with a substantial library of sampled sounds; the other versions are downloadable. Because all flavors will host instrument and effects plug-ins in VST and DX format, even the least expensive Basic version might do the job for you (see the "Feature Comparison" table).

Orion's architecture is based on an audio mixing desk to which a channel strip is added for each new sound generator (see Fig. 2). Each channel strip has four effects sends, slots for two insert effects, and four bands of EQ, one of which is parametric. A Master mixer includes four Return buses and a Master output strip, each with EQ and four inserts. ASIO supports multiple outputs, and you can route the master mix and buses to separate physical outputs.

Orion's built-in sound generators cover most popular synthesis methods as well as synthesized and sampled drums. The multisample player reads

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Akai, SoundFont 2.0, and Kurzweil format sample maps. The accompanying multisample editor can automatically detect sample pitches and generate keymaps accordingly. The sampler in Orion Pro and Platinum features a built-in beat slicer, which you can use to slice sample loops and automatically create triggering sequences directly in the sampler's pattern sequencer. Orion is the only SSW to provide that feature at no extra cost.

Each sound generator, including VSTi and DXi plug-ins, has its own pattern sequencer that holds 64 patterns, each with a maximum 999 steps. The number and size of the steps are variable, and they apply to all patterns for a given channel strip. Generally, you enter patterns in a piano-roll-style editor by using either real-time MIDI input or the mouse, but the drum generators provide buttons for the first 16 pattern-steps. The piano-roll editors have a controller lane for editing Velocity and automating any control-panel parameter. Parameters can also be assigned to MIDI continuous controllers, allowing automation to be recorded using MIDI.

FIG. 5: Storm's rack holds four sound generators (left) and three effects processors (right). Most sound generators, including those shown, contain their own pattern sequencers at the left side of their control panels. Storm songs are constructed by recording pattern changes in the song tracks along the top.

Orion offers several handy pattern-editing options, including randomizing, Velocity scaling, quantizing, transposing, and humanizing. In addition, you can apply a variety of groove and strum (called Pluck) templates to your patterns. Each generator (again including VSTi and DXi plug-ins) has a built-in arpeggiator and chord maker. They can be used separately, and when they're used together, the chords are arpeggiated. Arpeggio patterns are 16 steps long, in anything from quarter- to 128th-note steps, and each step can be set to play or rest.

Orion's Song Playlist contains a track for each generator and works in much the same way as the individual piano-roll pattern editors. Controller lanes can be opened for any instrument or effects parameter for song-level automation. You can rearrange generators in the Playlist, and Orion will rearrange their mixer channels accordingly. Orion offers the most flexible tempo options, with a Tempo editor that allows graphic entry of tempo changes. EM WEB CLIPS The MP3 example Drag-Drum illustrates tempo modulation of a simple drum loop.

If you're interested in easy, button-style pattern sequencing, Orion might not be your first choice, but its mixing and effects handling are among the best of the group.

FIG. 6: VirSyn TERA's offers a variety of synthesis techniques. The synthesizer is modular, and connections are made using the pop-down menus above the various controls.

REASON (MAC/WIN)

Propellerhead Software's Reason is probably the most sophisticated of our SSWs (whereas Propellerhead's other entry, Re-Birth, is the simplest of the bunch). Its sequencer is the most full featured, though still well short of what you'll find in a professional DAW. Its sound generators run the gamut from basic synthesis to multilayered sample mapping, and its complement of DSP effects covers all the bases.

Reason works on the analogy of an endless rack to which you add modules as needed (see Fig. 3). Its signal path is completely patchable, allowing you to insert effects and create submixes as you choose. Numerous gate and control-voltage (CV) inputs and outputs provide extensive control and triggering options, as well.

Reason 1.0 contained four sound-generator modules: a mono, subtractive synth (Subtractor); a basic multisample player (NN19); a ten-pad drum machine (Redrum); and a loop-slice player (Dr.Rex). Version 2.0 adds two more modules: Malström, a stereo synth featuring a unique combination of granular and wavetable synthesis, and NN-XT, an advanced multisample player that allows zoning and layering of samples and offers an extended set of modulation and playback parameters. Reason ships with over a gigabyte of samples, presets, and sliced loops (in REX file format), and you can, of course, use your own. You'll need Propellerhead's Recycle beat-slicing software if you want to make your own REX files. The MP3 EM WEB CLIPS example Malfeasance illustrates some of Malström's capabilities.

Reason's pattern-sequencing capabilities offer patterns that can have as many as 64 steps; step size can range from 128th notes to half notes with

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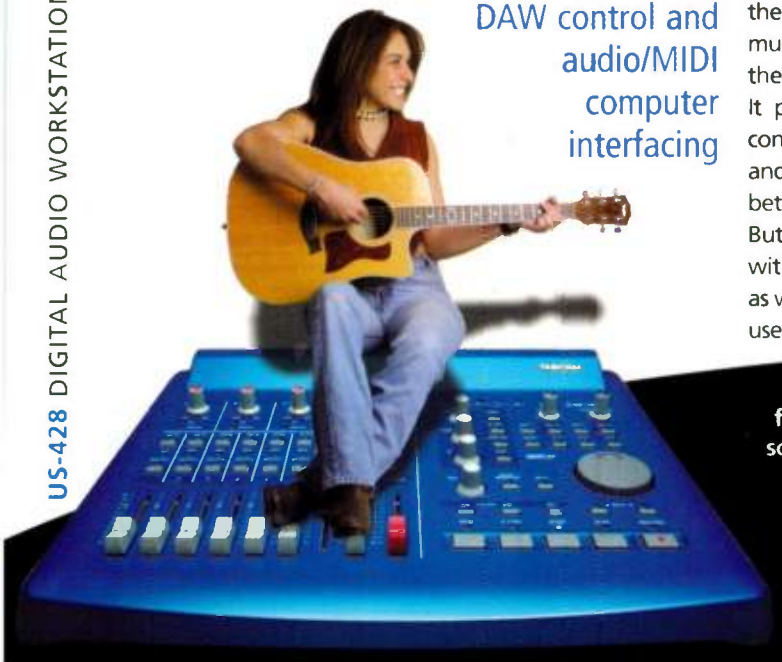

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eighth- and 16th-note triplets thrown in. In addition, you can control Velocity, and shuffle and flam are available. Redrum has its own pattern sequencer, but all other pattern sequencing is accomplished by patching in Matrix, a separate pattern-sequencer module. Matrix also has a CV mode that allows you to use it to automate other module parameters. You can merge Matrix steps to provide different step sizes within the same pattern.

Reason's sequencing options range the farthest of all of our SSWs from the strict pattern-sequencing model. Its dedicated arrangement-style sequencer offers piano-roll and drum-style note sequencing, pattern-change sequencing (not limited to measure divisions) for the Redrum and Matrix modules, slice-sequencing for Dr.Rex, and controller lanes for automating any panel control. You can record notes and automation in real time using either MIDI or onscreen controls. You can also use the mouse to enter and graphically edit data in the various sequencer lanes. On the arrangement level, blocks of data can be grouped for duplication and rearrangement.

Reason supports ReWire hosting of ReBirth, which allows ReBirth to function as an additional Reason module, with separate inputs provided for each ReBirth drum pad as well as all mixes and submixes. Reason does not have a dedicated audio-track player, though you can load arbitrarily long audio files into NN19 and NN-XT. A better solution for incorporating audio-file playback into Reason is to slave it to a ReWire host that supports audio-file sequencing and looping. Reason and Ableton Live are a good combination in that regard, each complementing the other's features.

REBIRTH RB-338 (MAC/WIN)

Among the first generation drum 'n' bass sequencers, the machines that

NAME OF THE GAME

Here's a brief glossary of terms used in this article as they apply to soft-synth workstations.

Automation: Most sound generators and effects processors have onscreen control panels for adjusting their settings. Automation is the process of recording changes in those settings on either the pattern or song level. All the SSWs covered here allow automation recording in patterns. Some also support global automation on the song level. Some SSWs provide graphic editors for automation data, whereas others allow you to rerecord only rather than edit automation data.

Beat slicing: Beat slicing is the process of cutting an audio file—usually a beat loop—into sections corresponding to time segments or audio events within the file. For example, you might cut a drum loop into equal slices a 16th note long or into slices that correspond to individual drum hits. Some SSWs include a player for beat-sliced files along with a library of such files. Doing your own slicing usually requires a separate software application, though Orion includes that feature at no extra charge.

MIDI remote: Many SSWs allow you to assign incoming MIDI continuous controller messages to the onscreen controls for their sound generators and effects processors. That allows you to change settings for those devices from a MIDI control surface or even the modulation wheel of a MIDI keyboard. Most SSWs also offer a MIDI Learn feature that automatically assigns the next incoming MIDI continuous controller message to the selected onscreen control.

Multisample: A multisample is a collection of individual audio files (samples) together with a keymap that defines what keys and Velocities play which samples. Most SSWs include a multisample player and a collection of multisample files, but currently only Reason allows you to create your own multisample files for its samplers.

Pattern sequencer: A pattern sequencer (aka a step sequencer) records and plays short sequences of equally spaced notes. In the case of drum sounds, the patterns are usually programmed using a matrix of onscreen buttons in which rows correspond to specific drum sounds and columns correspond to fixed time positions. For pitched sounds, there is typically an onscreen music keyboard for selecting pitch and a knob or numerical field for selecting the position in the sequence. Most SSWs incorporate some form of pattern sequencing, though it's now common to also include a piano-roll editor and allow unlimited length as well as unquantized note positions.

Piano-roll editor: A piano-roll editor is a two-dimensional window for graphic editing of note sequences. The vertical dimension represents pitch and usually displays a music-keyboard graphic. The horizontal dimension represents time. Notes are displayed as horizontal bars whose position indicates when they sound and whose length indicates their duration. Piano-roll editors are a staple of MIDI sequencing software and are now available in most SSWs as well.

Standard MIDI File: In addition to defining how MIDI devices and computers exchange information in real time, the official MIDI 1.0 specification includes a digital file format for recording time-stamped MIDI messages (for example, sequences of notes). Most SSWs can import and export files in the Standard MIDI File (SMF) format.

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Feature Comparison

	Fruityloops			Orion
VERSION DETAILS				
Model	Pro	Full	Full	Basic
Tested Version	—	3.5.4	—	—
Price	$49	$99	$139	$49
Delivery	download	download	box	download
Printed Manual	no	no	yes	no
Other Documentation	Help, PDF	Help, PDF	Help, PDF	Help
Copy Protection	Internet	Internet	Internet	serial number
Downloadable Demo	yes	yes	yes	yes
PLATFORM AND PLUG-IN FORMATS				
Platform (Primary/Secondary)	Win	Win	Win	Win
As Plug-in	n/a	VSTi	VSTi	n/a
Hosts Plug-ins	VST, VSTi, DX, DXi	VST, VSTi, DX, DXi	VST, VSTi, DX, DXi	VST, VSTi, DX
ReWire Master/Mixer	no	no	no	no
ReWire Slave	no	no	no	no
PATTERN SEQUENCER DETAILS				
Maximum Number of Steps	64	unlimited	unlimited	999
Variable Step Size	yes	yes	yes	yes
Patterns per Track or Instrument	999	999	999	64
Arpeggiator	yes	yes	yes	no
Automatic Chord Generator	yes	yes	yes	no
Polyphonic Steps (chords)	no	yes	yes	yes
Button Step Entry	yes	yes	yes	yes
Piano-Roll Style Editor	no	yes	yes	yes
Automation Recorded in Patterns	no	yes	yes	yes
Graphic Automation Editing	yes	no	no	yes
MIDI IMPLEMENTATION				
MIDI Real-Time Entry for Patterns	yes	yes	yes	yes
MIDI Step Entry for Patterns	yes	yes	yes	no
MIDI Control of Synth Parameters	yes	yes	yes	yes
MIDI Learn for Controller Assignments	yes	yes	yes	yes
MIDI Automation Recording	no	yes	yes	yes
Standard MIDI Files (pattern level)	import	import	import	no
Standard MIDI Files (song level)	import/export	import/export	import/export	no
SONG SEQUENCER DETAILS				
Song Sequencer Steps	999	999	999	512
Song Sequencer Variable Step Size	no	no	no	yes
Song Tempo Changes	no	no	no	yes
Song Meter Changes	no	no	no	no
Global Automation in Songs	no	yes	yes	yes
Graphic Automation Editing	no	yes	yes	yes
SYNTHESIS				
FM	yes	yes	yes	no
Granular	yes	yes	yes	no
Percussion	yes	yes	yes	yes
Physical Modeling	yes	yes	yes	no
Subtractive (analog-style)	yes	yes	yes	yes
Wavetable	yes	yes	yes	yes
SAMPLE PLAYBACK				
Audio-File Player	yes	yes	yes	no
Multisample Player	no	yes	yes	yes
Multisample Mapping	no	no	no	no
LOOP HANDLING				
Automatic Time Stretching	yes	yes	yes	yes
Automatic Pitch Shifting	yes	yes	yes	yes
Beat-Slice Playback	yes	yes	yes	no
Beat-Slicer Utility ($=separate product)	$	$	$	no
RECORDING, MIXING, AND RENDERING				
Audio-Input Recording	no	no	no	no
Channel Strip Mixer	yes	yes	yes	yes
Built-in Effects	yes	yes	yes	yes
Effects Inserts (Channel, Bus, Master)	CBM	CBM	CBM	CB
Bounce to Disk	yes	yes	yes	yes
Fast Rendering	yes	yes	yes	yes

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		Reason	ReBirth	Storm	TERA
Pro	Platinum	—	RB-338	—	—
3.06	3.06	2.0.1	2.0.1	2.0	1.1
$99	$199	$399	$179	$149	$279
download	box	box	box	box	box
no	intro	intro	no	yes	full
Help	Help	PDF	PDF	HTML	PDF
serial number	CD	library	CD	Internet	library
yes	yes	yes	yes	yes	yes
Win	Win	Mac/Win	Mac/Win	Win/Mac	Win/Mac
n/a	n/a	n/a	n/a	VSTi	VSTi
VST, VSTi, DX, DXi	VST, VSTi, DX, DXi	no	no	no	no
no	yes	ReBirth only	no	yes	no
no	no	yes	yes	yes	no
unlimited	unlimited	64	16	16	64
yes	yes	yes	no	no	yes
64	64	32	32	64	512
yes	yes	no	no	no	yes
yes	yes	no	no	yes	yes
yes	yes	yes	no	yes	yes
yes	yes	yes	yes	yes	no
yes	yes	yes	no	yes	yes
yes	yes	yes	yes	yes	yes
yes	yes	yes	no	no	yes
yes	yes	yes	no	yes	yes
no	no	no	no	no	no
yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes
import/export	import/export	no	no	no	no
no	no	import/export	no	no	no
512	512	unlimited	999	100	256
yes	yes	yes	no	yes	no
yes	yes	no	no	yes	no
no	no	no	no	yes	no
yes	yes	yes	no	yes	no
yes	yes	yes	no	no	no
no	no	yes	no	no	yes
no	no	limited	no	no	no
yes	yes	yes	yes	yes	no
no	no	no	no	yes	yes
yes	yes	yes	yes	yes	yes
yes	yes	yes	no	yes	no
yes	yes	yes	no	yes	no
yes	yes	yes	no	yes	no
no	yes	yes	no	no	no
yes	yes	no	no	yes	no
yes	yes	no	no	yes	no
yes	yes	yes	no	no	no
yes	yes	$	no	no	no
no	no	no	no	yes	no
yes	yes	yes	no	yes	yes
yes	yes	yes	yes	yes	yes
CBM	CBM	CBM	CB	BM	CM
yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	no

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most captured the imagination of the techno and dance community—particularly the TR-808 Rhythm Composer, TR-909 Rhythm Composer, and TB-303 Bass Line synthesizer—came from Roland. Those boxes, if you can find them, cost more today than they did when they were new. Enter Propellerhead's ReBirth RB-338.

The original version of ReBirth put two virtual TB-303s and a TR-808 on your desktop for $179. Version 2.0 (see Fig. 4) added a TR-909 to the package. All four software modules look and sound remarkably like the originals, which is probably why Roland granted Propellerhead the right to use the names and graphics.

And there's a bonus: without too much trouble, you can create your own graphic skins for ReBirth and stuff your own sounds into the TR-808 and TR-909. Dozens of such customizations, called Mods, are available free to registered users from Propellerhead's Web site. That gives ReBirth a lot more legs than you might initially expect, because you can change Mods, and therefore sounds, without affecting a song's structure or patterns. The MP3 example Remod plays an eight-bar song using several Mods.

Each ReBirth module has its own pattern sequencer that stores 32 patterns. Patterns can have as many as 16 steps, and a step is always a 16th note. Shuffle, which delays alternate 16th notes, and flam, which produces double hits, can be turned on or off on a per-pattern and per-note basis, respectively. Thirty-two patterns is not a particularly generous endowment, but it's probably enough for most songs. Considering that you can load and save songs along with all their patterns on your hard drive, the 32-pattern limit is not terribly restrictive.

A ReBirth song is a four-track arrangement of patterns—one track for each sound generator. A measure is always 16 steps long, and pattern changes are quantized to measure boundaries. Patterns are not automatically retriggered at the end of each measure, however, and that allows you to easily create extended rhythm cycles by using patterns of different lengths. For example, playing a 12-step pattern against a 16-step pattern produces a 3-measure (48-step) cycle.

Theoretically, all songs are 999 measures long, but you can define a loop as starting and ending at any measure. When ReBirth renders your song to an audio file, it exports only the measures within the loop, so you can actually create songs of any length. If you synchronize ReBirth to other software or external MIDI devices, you need to leave blank measures (by using empty patterns) whenever you want ReBirth to be quiet.

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You can create patterns and songs using ReBirth's onscreen controls or your computer keyboard. It's quite easy to create patterns and songs using the computer keyboard, and with a little practice, you can actually develop some playing chops. Pattern development is also facilitated by the Randomize, Shift Pattern, and Alter Notes options in the Edit menu.

ReBirth's output section consists of a four-channel mixer and four DSP effects: a Pattern-Controlled Filter (PCF), distortion, compression, and delay. The first three are insert effects, whereas delay is a send effect and can process a mix of the four channels. Each channel has a separate distortion processor, but only one channel at a time can use the PCF and compressor. If none of the channels use the compressor, you can apply it to the master output. The PCF is the most unusual of the effects, consisting of a bandpass or lowpass filter controlled by a retriggering envelope. Fifty-four retriggering patterns are provided, ranging from rhythmic to random; they are most effective on TB-303 bass lines.

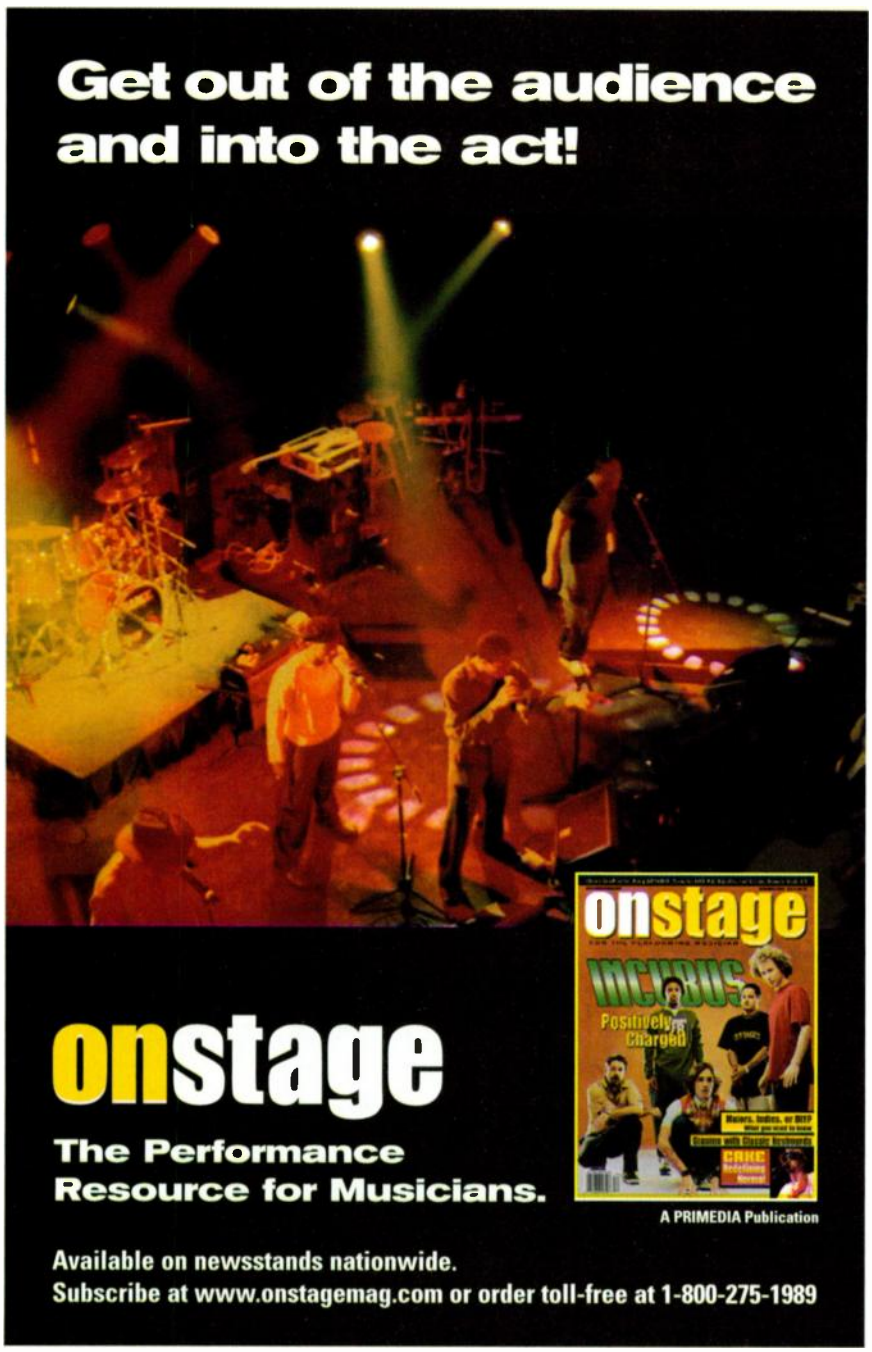
ReBirth is not available as a plug-in instrument, but it does support Propellerhead's ReWire 2 interconnectivity protocol. That means you can channel ReBirth's audio output into any software that can act as a ReWire host, which includes most DAWs, as well as soft-synth workstations Reason, Storm, and Orion Platinum. The other function that ReWire provides is MIDI tempo synchronization, which allows you to slave ReBirth to another application's clock and follow its tempo changes.

ReBirth is the leanest of the SSWs considered here, both in terms of sound generation and sequencing flexibility. But for the fast production of techno and dance-oriented drum 'n' bass lines, it's a gem.

STORM (MAC/WIN)

Arturia's Storm falls somewhere between ReBirth and Reason in terms of its sequencing and sound-generation capabilities, but it also incorporates several unique features. Like Reason, it uses the rack-of-gear analogy, but the rack size is fixed at four sound generators and three effects (see **Fig. 5**). You can double the module count by linking two instances of Storm with ReWire, but you'll need a hardy CPU to make it fly. The Storm package includes a VST Instrument plug-in version, so you can use Storm as an instrument with or without its sequencing features within any VST host (such as your DAW).

Storm's complement of sound generators includes five drum boxes that feature everything from standard and Latin acoustic kits to the ubiquitous Roland TR-series sounds (from the 606, 808, and 909). There's also a drum synth



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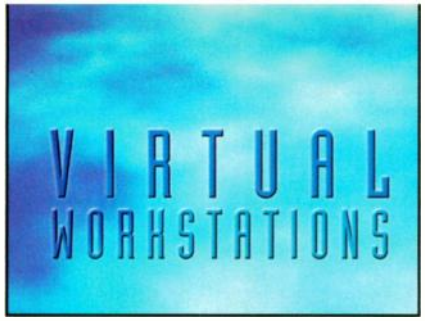

based on sine-wave and noise generators. Each drum box holds 8 sounds and has a 16-step pattern sequencer filled with 64 patterns, which you can modify or replace. The patterns are especially easy to program because the pads are arranged in an eight-by-eight matrix, allowing you to see all the parts at the same time. You can click each pad through five Velocity levels, which provides an unusual level of dynamic control from buttons. If you load Storm's rack with drum boxes and throw in compression, delay, and distortion effects, you have full-featured and easy-to-program 32-pad drum machine.

For synthesis, Storm offers two bass synths (one resembling the TB-303 and the other emulating an electric bass), two chord synths, and a polyphonic synthesizer. Like the drum boxes, their pattern generators are 16th-note based, but the polysynth and one of the chord synths accommodate patterns as long as eight measures. Also like the drum boxes, each comes with 64 user-modifiable patterns.

Storm's collection of sound generators is rounded out by three audio-file players: EZtrack, for recording audio as well as playing bounced tracks; H3O+, for playing clips and loops; and Scratch, which is a dual turntable for DJ-style scratching. Storm is the only SSW in our roundup that will record audio input. Storm comes with a generous 500 MB collection of samples.

One unique feature is Storm's harmony-pattern generator, Kepler. Kepler patterns are four measures (eight two-beat steps) long, and each step designates a root key and mode (major or minor). You can link all of Storm's pitched sound generators (including the H3O+ loop player, but not EZtrack) to automatically follow the root key. The chord generators will also modify the third and sixth degrees of the scale according to the mode.

Storm's song sequencer quantizes measures like ReBirth does, but you can specify the number of beats per measure on a measure-by-measure basis. For example, you can follow a measure of four beats by one of three beats to get a 16-step pattern followed by a 12-step pattern. You can also record one tempo change per measure

MANUFACTURER CONTACTS

Arturia
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User Profile

	Fruityloops	Orion	Reason	ReBirth	Storm	TERA
Spare me the details. Get me straight to the groove.				•	•	
I need lots of audio loops and samples to work with.	• (CD-ROM only)	• (Platinum only)	•		•	
I want to play all those synths and samplers live with my MIDI keyboard.	•		•			•
Step sequencing is my thing. I want all the bells and whistles.	•					•
Bring on the drum 'n' bass.				•	•	
I need lots of multisampled acoustic instruments.			•			
I want to use my own plug-in effects and instruments.	•	•				
I must be able to beat-slice my loops.	•	•	•			
Give me lots of knobs. I want to program my own sounds.			•			•
I need to make my own multisampled instruments from my sample library.		•	•			

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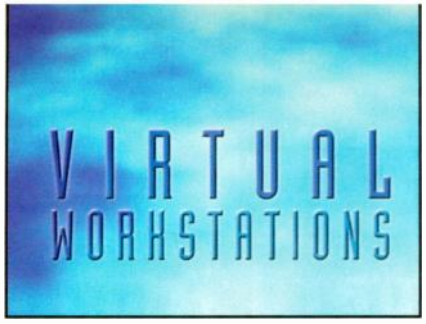

and insert nonplaying tags to delineate sections of the song.

The song sequencer contains four tracks (one for each sound generator), along with a fifth track for effects and mixer automation. Drum-module automation is always recorded within the drum patterns, and synth automation is recorded on the corresponding song tracks. You can record pattern changes and automation either in real time or in Static mode, in which a setting or pattern change is applied to all selected song measures.

Storm's factory patterns for its various modules have been carefully designed to work together. In fact, it's difficult to stuff the rack full of virtual gear and then select four patterns that don't work well together. Storm comes with Composition Wizards in five styles—Dance, Dub, Hip-hop, House, and Jazz Funk—and you can download a new Ambient Wizard from Arturia's Web site. Storm's Wizards are interactive tutorials that lead you step-by-step through constructing a song in the indicated style. Those features make Storm a top choice as an idea generator, especially if you're new to the SSW style of music construction. EM WEB CLIPS The MP3 example JazzWiz illustrates Storm's composition wizardry.

TERA (MAC/WIN)

If you're a traditional synthesist who's familiar with multitimbral hardware workstations, VirSyn's TERA might be just the SSW for you. TERA is about as close as you can get to the synthesis and sequencing architecture that's typical of those machines.

TERA provides you with 16 instances of one extremely flexible modular synthesizer. Those instances can be mapped across 16 MIDI channels or grouped among fewer channels with any desired Velocity and key-zone layering. And if your computer boasts enough processing power, you can assign as many as 32 voices to each instance. Like Storm, TERA includes a VSTi version, making its powerful synthesizer available from within any VST instrument host. (According to Virsyn, TERA will also support Audio Units by the time you read this.)

TERA's synthesizer combines a variety of synthesis methods that include standard subtractive synthesis; frequency, amplitude, and wave modulation; physical modeling; and formant-shifting additive synthesis (see **Fig. 6**). Four types of oscillators in combination with a tuned delay line (for Karplus-Strong physical modeling) provide the sound sources. The signal path provides two multimode filters and a peak or notch formant filter. Those are followed by five effects processors: ring modulation, waveshaping, stereo delay, distortion, and phase-shift effects (chorus, flange, and phaser). All modules are activated independently, and inactive modules do not draw on the CPU. Inactive modules also have their controls grayed out to make the control panel easier to decipher—a real blessing, because things can get pretty complex. EM WEB CLIPS Listen to the MP3 file TeraFirma for examples of formant-shifting and physical modeling synthesis.

Aside from its variety of modules, what makes TERA such a powerful synth is its modularity. Instead of using patch cords, signals are routed using drop-down menus for audio and dialog boxes for modulation by TERA's four envelopes and four LFOs. Any module's output can be routed to the input of any other. A five-channel mixer can be reconfigured as separate three- and two-channel submixers, letting you mix sources before routing them through the various modules. For example, you could use the two filters in parallel by routing them through a submix or in series by routing one into the other. TERA comes with plenty of factory presets that illustrate its full range of capabilities, but you'll get the most out of it if you're into synth programming. Otherwise, an SSW that combines sample and loop processing with a less robust synthesis engine might be more appropriate for your needs.

TERA offers a very robust MIDI remote-control system. Any MIDI continuous controller may be instantly assigned to any active synthesis parameter by using TERA's MIDI Learn function. Furthermore, a separate screen, called 8D Access, contains four on-screen *x-y* controls, each dimension of which can be assigned to any synthesis parameter with any desired range and direction. You can control each of the eight dimensions with MIDI, which allows you to use a single MIDI controller to modify multiple synth parameters with different ranges and directions in real time.

TERA has perhaps the most powerful step sequencer of all the SSWs mentioned in this article, and again, the model is classic analog. It can hold 512 patterns in memory, and you can use any pattern in any of the 16 song tracks

FURTHER READING

To learn more about some of the software discussed in this article, check out these reviews in past issues of **EM**:

Audio-Loop Sequencers

Ableton Live 1.1 ..... June 2002
BitHeadz Phrazer 1.0.1 ..... June 2001
Sonic Foundry Acid Pro 3.0 ..... May 2002

Digital Audio Sequencers

Cakewalk Sonar XL 2.0 ..... October 2002
Emagic Logic ..... March 2003
MOTU Digital Performer 3.01 ..... January 2002
Steinberg Cubase VST/32 5.0 ..... January 2001

Do-It-Yourself Software

Cycling '74 Max 4.0/MSP 2.0 ..... April 2002
Native Instruments Reaktor 3.0 ..... March 2002
Sound Quest Infinity 2.05 ..... August 2002

Soft-Synth Workstations

Arturia Storm 1.5 ..... February 2002
Image-Line Fruityloops 3.5 ..... November 2002
Propellerhead Reason 1.0 ..... July 2001
Propellerhead ReBirth RB-338 1.5 ..... May 1998
Synapse Audio Orion Pro 3.03 ..... January 2003
VirSyn VirSyn 1.1 ..... April 2002

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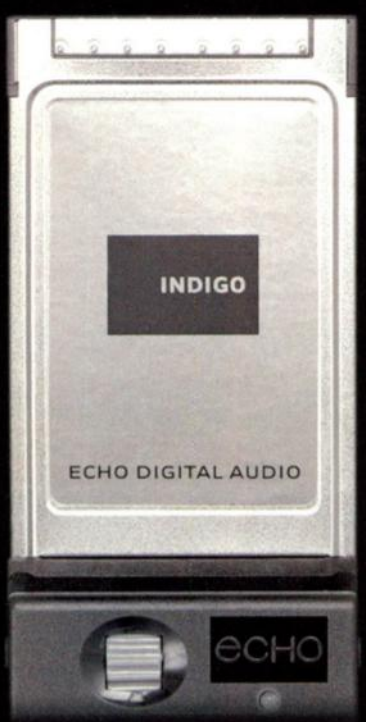

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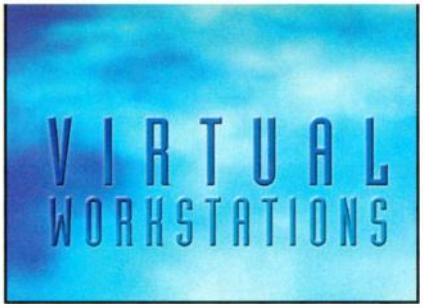

(corresponding to the 16 instances of the synthesizer). Patterns have a maximum of 64 steps. Step size and gate time can be varied on a per-step basis, and individual steps can be skipped or muted. Each pattern has its own beginning and end markers, and if the end marker is placed before the beginning marker, the pattern will play backwards. Each pattern also has Velocity and controller lanes, both of which can be applied to any synth parameter. You can enter patterns onscreen or record them in real time with incoming MIDI.

Each step in a pattern can be a single note or a chord. Chords are selected from a drop-down menu containing most of the common three- and four-voice chord types, including inversions. You can also use the pattern sequencer as a very flexible real-time arpeggiator. In arpeggiation mode, each step is assigned a position within the currently held chord (played on your MIDI keyboard). When a pattern step holds a chord, the whole chord is transposed to the arpeggio note.

TERA's song sequencer has 16 tracks (one for each synthesizer instance) and allows songs as long as 512 measures. Each 16-beat measure is represented by a cell, which can be empty or linked to any of the 512 available patterns. Patterns longer than 16 beats automatically fill the required number of cells. A loop can be defined between any two cells, making it easy to construct and edit song sections.

WHICH ONE'S FOR YOU?

Choosing an SSW is like choosing a pair of shoes; no one size or style fits all. The six I've covered here offer different approaches to generating sounds and creating patterns. On the other hand, with the exceptions of ReBirth, which is limited to drums and bass, and TERA, which is pure synthesis, you could probably produce very similar results with any of them. And you could buy them all for a fraction of the cost of a full-featured hardware workstation.

For instant gratification, ReBirth and Storm are both standout choices. The setup is fast, the options are limited, and their sequencers come packed with factory patterns that work well together. Storm's Composition Wizards provide an excellent starting point for creating songs in various styles.

For pure synthesis, TERA and Reason will keep you busy for a long time. TERA's synthesis engine is as robust as any you'll find inside or outside of an SSW. Reason's two synths, Subtractor and Malström, offer a lot of programming flexibility. With some back-panel patching, they become a powerful duo.

If you have a DAW that hosts VST or DX Instrument plug-ins, then TERA, Storm, and Fruityloops offer dual functionality by providing their resources as plug-ins. That adds step sequencing and additional sound generators to your DAW kit.

If you have a relatively fast computer and lots of RAM, then Reason, Orion, and Fruityloops let you build large and varied kits of sound generators, as well as take advantage of their advanced step-sequencing features. For Windows users, Orion and Fruityloops offer the advantage of hosting all of your instrument and effects plug-ins.

For users of ReWire master applications such as Cubase, Live, Logic, Orion Platinum, and Sonar, you can synchronize to ReBirth, Reason, and Storm and pipe their audio output directly into those hosts.

Have a look at the "Feature Comparison" and "User Profile" tables accompanying this roundup, and then download demos of the SSWs that might suit your needs. It won't take you long to tell which shoe fits.

Len Sasso *can be contacted through his Web site at www.swiftkick.com.*

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

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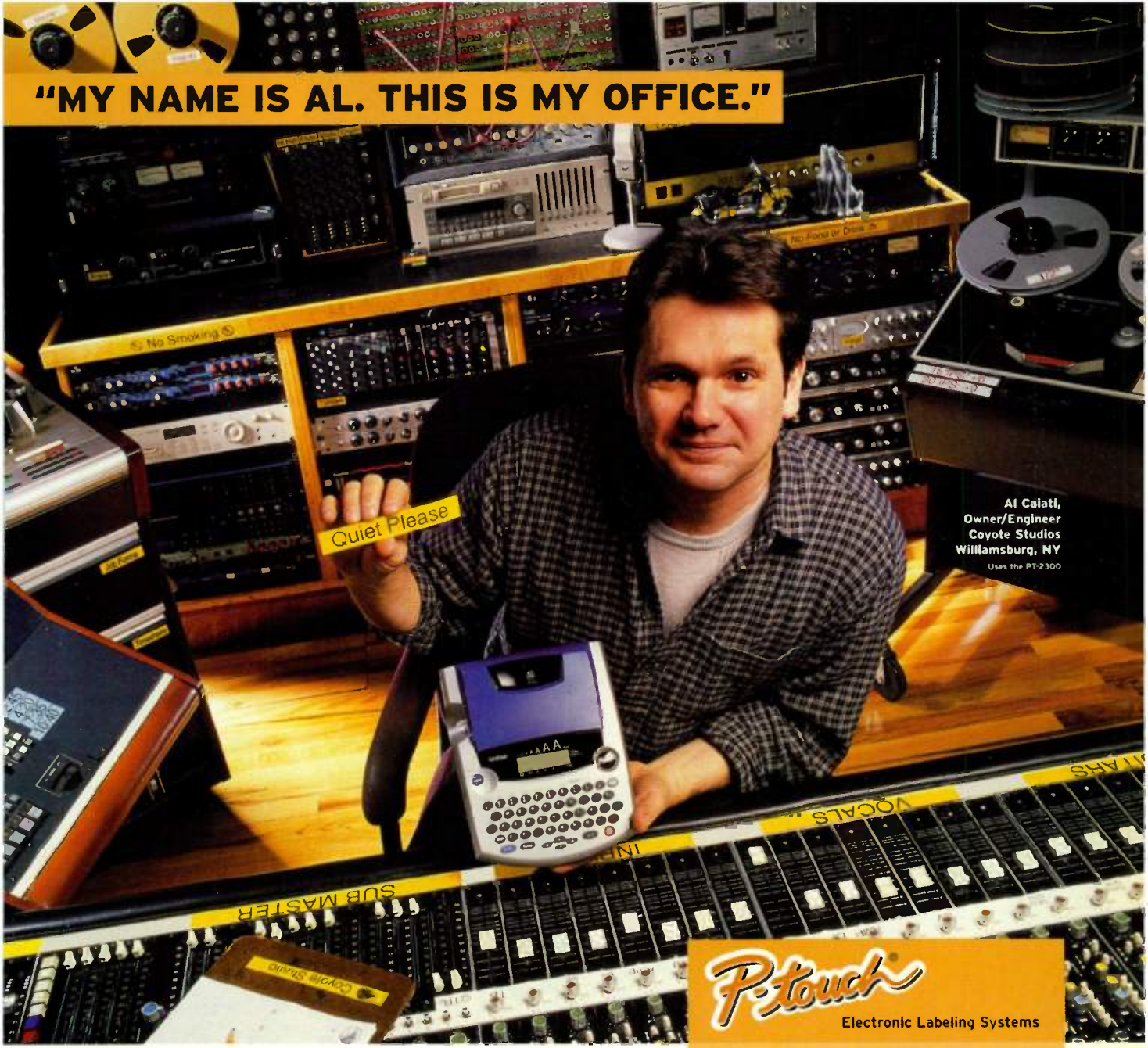

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Oxygen8
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> Powered via USB bus, batteries or AC
> 4 lbs., fits in Studio Pack or 19" rack

Radium/Radium49
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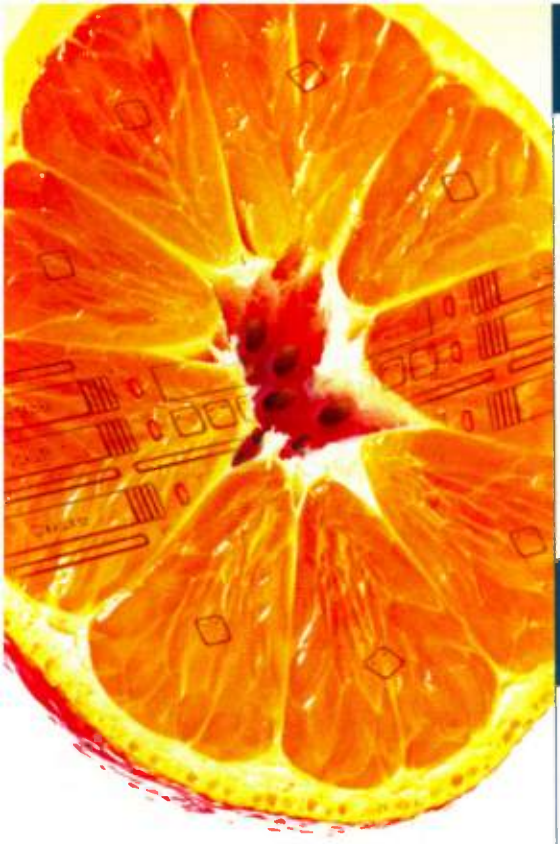

Sweet Fruit, STRANGE Fruit

Sink your teeth into the powerful and exotic features in Fruityloops 3.5.

by Jim Aikin

Master CLASS

People who have been using Image-Line Software's Fruityloops for a while tend to be fanatics about it— and with good reason. From its humble beginnings as shareware, the program has grown into a monster, packed with esoteric features and capable of a surprising range of musical effects. Fruityloops isn't a conventional sequencer, however; nor are its included software synths run-of-the-mill. Because its primary orientation is toward dance music, and because new bits have been grafted on as it has grown, finding the power tools you need isn't always a snap. In this article, I'll cover some advanced applications that you may not have known Fruityloops was capable of, from using sampled loops to coaxing evocative tones from the mysterious BeepMap.

I'll assume that you've installed Fruityloops 3.5 or higher and have prowled through the Help manual. If neither the Help section nor this feature answers your questions, a great resource is the online forum at www.fruityloops.com. It appears the Image-Line staff monitors traffic there, as I've gotten answers within minutes. You can download the example Fruityloops song files that are mentioned in this article from the **EM** Web site. (There are also MP3 examples, so you won't need to download and install a Fruityloops demo to hear these techniques in action.)

As of this writing, Image-Line is starting to drop hints about the new features in 4.0—cool stuff, like variable-length patterns that can be triggered anywhere, not just on bar lines. But there's plenty to talk about in 3.5, so let's get started.

CUSTOMIZED SHUFFLE

You might have noticed that Fruityloops' Shuffle slider operates globally for the entire song, delaying all of the offbeat 16th notes by some fixed amount. The way to get pinpoint control over the rhythmic feel is to forget about the slider and edit your patterns note by note. That takes more time, but depending on what you're trying to achieve, it can be well worth the effort.

MIKE CRUZ

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For a modest example, download shuffle.flp or shuffle.mp3. EM WEB CLIPS This hip-hop drum groove (shown in Fig. 1) uses the Shift parameter to delay various offbeat 16ths by different amounts. Simply click the controller button at the upper-right corner of the pattern, click the green light next to the track that you want to edit, and slide the selector all the way to the right to the Shift position. When an offbeat note is followed immediately by an onbeat one, I usually lower the Velocity of the offbeat note a little, as well.

The most useful shift values for programming shuffle rhythms lie in the bottom quarter of the range. But by pushing the Shift for an offbeat 16th up near the top, you can create a flam (double strike) on the following beat.

USING SAMPLED LOOPS

Because Fruityloops offers so many tools for creating your own beats, you may not have noticed that it can also import—and even tempo-match—sampled beats. Just create a new Sampler or Granulizer generator, load the loop into it, and then adjust it to fit the tempo. Although the Granulizer's time-stretching feature isn't as high in quality as the ones in programs like Sonic Foundry's Acid, you can adjust the tempo using its Grain Spacing or Wave Spacing knobs. Another option is to purchase Image-Line's BeatSlicer (Win, $35), which does ReCycle-style splitting of drum loops. BeatSlicer loops can be played back by the Fruity Slicer generator. I generally use a Sampler for importing beats, but the method described below can also be used with the Granulizer.

Let's go through the process step by step. After creating an empty Sampler instrument in the Channels/Add One menu, click on the button labeled Sampler in the Step Sequencer to open the instrument's Channel Settings window. Next, click on the SMP button to display its SMP (Sample Parameters) page. The sample assigned to this instrument is "(none)." Clicking on the folder icon will open your computer's File/Open dialog box, where you'll be able to select any WAV file you like.

Choose a two-measure sampled loop. Once you've mastered the technique, you'll be able to use shorter or longer loops as needed. Before going on, you might also change the name of the instrument to SampLoop (by clicking on the little waveform button in the upper-left area of the Channel Settings window).

At this point, we come to a fork in the road. Using the loop at its original tempo is different than adapting it to the tempo of an existing song—it's a little trickier, but not much. Just create a two-bar note and then adjust Fruityloops' tempo until the loop sounds right.

Here's how: in the Step Sequencer, click in the first box of the SampLoop to create a note that will trigger the sample, but don't hit the Start button yet. Instead, right-click on the SampLoop instrument button and select Send to Piano Roll. Assuming your pattern is only one measure (16 16th notes) long, and the loop is two-measures long, you'll need to extend the note so that it lasts for two measures.

After doing that, click the Start button. (You should be in Pattern mode, not Song mode. Also, it will be easier to hear what's going on if you mute any other instruments that are being played in the pattern.) The orange triangle will proceed across the top of the window, and you'll hear your loop. Unless the tempo of your song happens to already match the tempo of the loop, one of two things will happen: either there will be a gap at the end of the two-measure phrase before the loop repeats, or you'll hear an overlapping collision of sound on each repetition. Raise or lower Fruityloops' tempo setting as needed until the loop cycles smoothly.

If you like the tempo, you're ready to start working on a new song. But let's say you'd like to change the tempo of the loop. That is even easier.

Create a two-measure-long note, as before. Then go to the lower-left corner of the Channel Settings window and grab the Fit parameter with the mouse. Set it to 32, as shown in Fig. 2. That is the number of 16th notes in the loop. Once you've set a value for Fit, the loop will automatically change tempo to match your song.

FIG. 1: By adding some Shift to offbeat 16th notes, you gain control over the feel of your shuffle rhythms. Note also that this pattern is 32 16th notes long (two measures). This is programmed in the Options/Song Settings box.

FIG. 2: After importing a sampled loop by clicking on the folder icon (upper left), you can match it to Fruityloops' tempo using the Fit parameter (lower left).

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Fruityloops adjusts the tempo of samples the old-fashioned way, by changing their pitch. If you're changing the tempo up or down by only a few beats per minute, that probably won't cause any undesirable sonic changes in the loop. If there are extreme changes, you might even decide you like them. Maniacally sped-up drum loops are a staple of some dance styles.

When the Fit parameter is active, you won't be able to change the pitch of your sample by moving the notes up or down in the Piano Roll window. But you can produce syncopated stuttering effects in which the sample is restarted at some point in the pattern by shortening the main note and inserting new ones. You can even use the Edit/Chop command in the Piano Roll to make machine-gun fills. (You'll need to set the Sampler's volume envelope to instant attack, no hold, and instant release for the chop to work properly.)

CONTROLLERS

When it comes to responding to both internal and external controller data, Fruityloops is more powerful than some programs that cost five times as much. But its documentation on how to customize the controller setup, especially about using mathematical equations, is pretty sparse.

If you think Fruityloops has only DAHDSR envelope generators, think again. With the Peak Controller (available only in the Fruityloops Full version), it's easy to create multisegment envelopes. In fact, the envelopes can be different from note to note. To explore this technique, you can download the controller.flp file, which is ready to go; follow the steps in the excellent online tutorial on www.fruityloops.com; or proceed as follows:

EM WEB CLIPS

FIG. 3: After assigning a Peak Controller to FX bus 16 (bottom), you can select it as a control source for any knob in Fruityloops.

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1. Set up a drum pattern that you like.

2. Create a bass line, perhaps something with some sustained tones using a 3xOsc instrument. Drop the filter cutoff and add a quick filter-envelope blip at the beginning of the notes.

3. Add a Sample instrument and load a kick-drum sound into it. We won't listen to that instrument; it's a modulation source. Program some offbeat accents into it during the bass tone's sustaining notes.

4. Assign that instrument to its own effects bus and add a Peak Controller effect to it. You'll stop hearing its output because the Peak Controller's audio output is muted by default. (Notice the little checkbox in the lower-right corner.)

5. Select your bass instrument, right-click on its filter-cutoff knob, and choose Link to Controller. That brings up the Remote Control Settings dialog box (see Fig. 3). I always uncheck the Remove Conflicts checkbox at the lower left, as I often want to assign one controller to several parameters.

Fruityloop Formulas

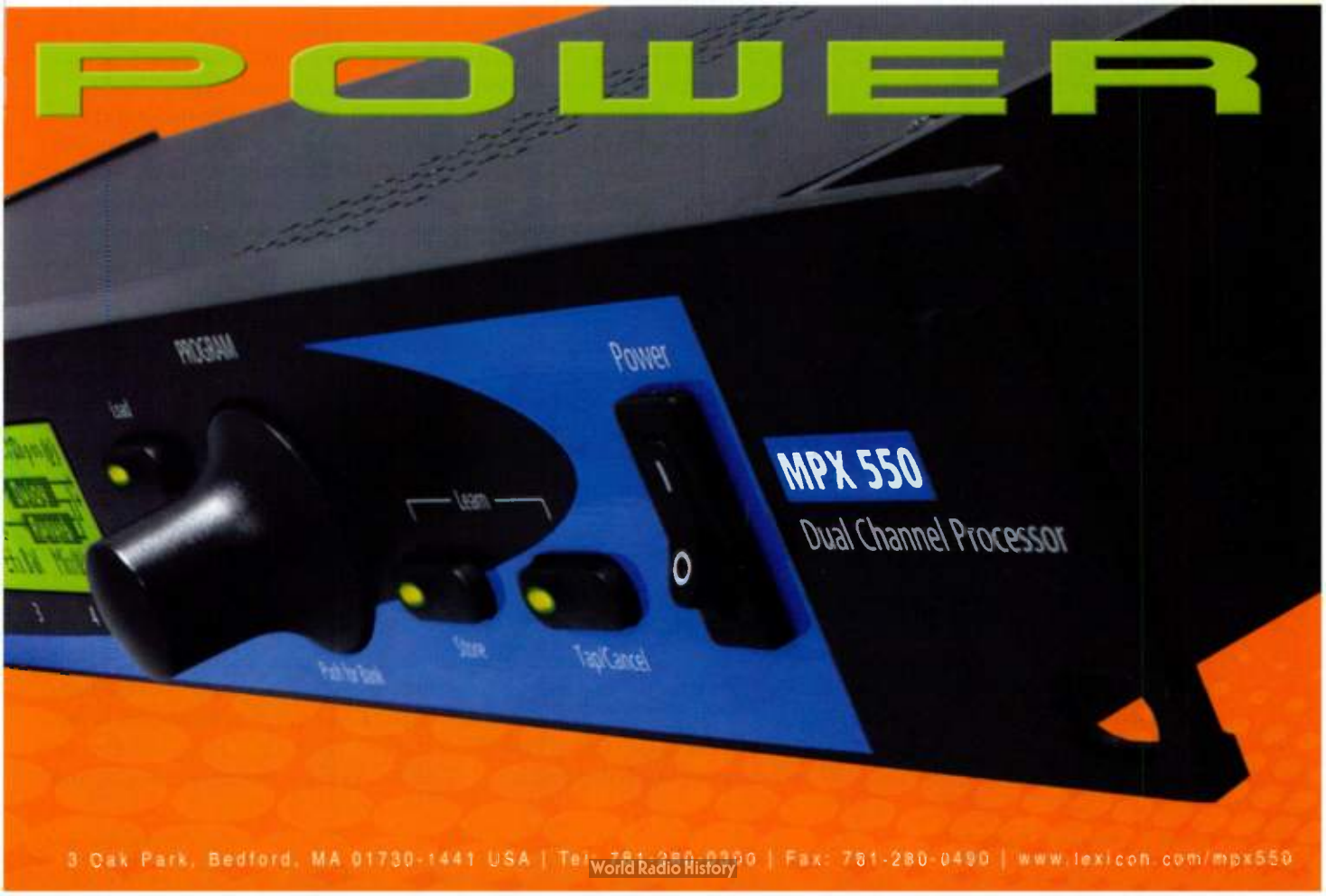
These formulas and others like them can be used in the Remote Control Settings dialog box to customize Fruityloops' response to either internal or external controller data. In the fourth example, I'm using sin (the trigonometric sine function) and pi, which are two of the special values and variables supported in formulas.

Formula	When Input Is 0	When Input Is 1
1 – (Input/3)	1	⅔
(3 * Input)/4	0	¾
(Input/2) + _	½	1
sin (Input * pi)	0 (rises to 1 as Input rises to ½)	0 (rises to 1 as Input falls to ½)

6. Select Peak ctrl - Peak. When you click OK, the output of the Peak Controller will modulate the filter cutoff of your bass tone.

You may need to fiddle with parameters to give the right shape to the rhythmic pulses added by the Peak Controller. Start with the filter cutoff of the bass synth and the knobs in the Peak Controller itself. You can also play with the Vol envelope in the instrument you're using as the input for the Peak Controller.

Note that the Peak Controller's Dec (decay) knob is implemented backward: moving it to the left will give you a longer decay. The Vol knob is bidirectional; turning it left of center will cause peaks in the input to *lower* the output value, which means you'll need to turn the Base value up so the peak will have something to subtract from.



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FORMULAS

Once you've linked a knob or an external MIDI input to a controller, you can customize the parameter's response to the controller by typing an equation into the Mapping Formula box (see the sidebar "Fruityloop Formulas"). The mapping formula is used by Fruityloops to process any controller data assigned to the knob you've chosen. Don't be put off by the math; even a simple equation can give you musically useful results.

Until you enter your own equation, the Mapping Formula box will say Input. Input means "pass the input on to the knob on a 1:1 basis." If you leave the formula as is, a minimum controller value (0) will turn the knob completely to the left, while a maximum controller value will turn the knob completely to the right. For musical purposes, processing the controller data is often useful.

When creating formulas in Fruityloops, keep three things in mind:

1. Although MIDI controller data has a 0 to 127 range, Fruityloops "normalizes" all controller data internally to a 0 to 1 range before processing it.

2. To be useful, the output also needs to be in the 0 to 1 range. Values less than 0 will simply turn the knob hard left, and values greater than 1 will turn it hard right.

FIG. 4: This simple drum pattern is different every time it repeats, because the Layer instrument is using randomization.

3. If you've done any computer programming, you may have heard that multiplication is faster than division. With real-time processing, it's usually better to multiply by 0.5 rather than to divide by 2. You can't do that with a Fruityloops formula though, because decimal values for constants aren't recognized. If you want to cut the "throw" of the input controller in half, use the formula (Input/2). (In computer programming, the symbol "/" is used for division, and "*" is used for multiplication.)

Let's use these ideas to add real-time control of filter resonance. For this experiment, you'll need an external MIDI keyboard with a mod wheel or joystick connected to your computer. First, make sure Fruityloops is set up to receive MIDI data by going to Options/MIDI Settings and choosing the Remote Control Input where your keyboard is plugged in. When you select a Fruityloops instrument and play the keyboard, you should hear it.

Right-click on the instrument's Res (resonance) knob and choose Link to Controller, as before. Uncheck both the Remove Conflicts and Auto Detect boxes. Auto-detection is handy for wiggling a controller and having it assigned automatically, but auto-detect will also close the dialog box.

For the resonance-control mapping formula, enter the following:

(Input/2) + ¼

Now click on OK and move your Mod Wheel. You should see the Res knob move from about 9:00 to about 3:00. This is a useful range for adding thicker resonance to a synth tone such as an analog-style bass.

A formula like this has two parts, a constant and a variable, which are added to or subtracted from one another. The constant (in this case, ¼) is where the knob will be when the input is zero. The variable part could simply be the word "Input," or it could be a division or multiplication that uses "Input."

A word of warning: don't put the Input in the bottom of a fraction (as in 5/Input). When the Input goes to zero, that will result in an illegal divide-by-zero error, which may cause other modulation routings to misbehave until you correct your formula.

The Fruity Formula Controller utilizes the same kind of algebra, but with three inputs. This handy device, which can be parked on any unused FX bus, is used for controlling a single knob from up to three sources. You could assign a Peak Controller to one of the Formula Controller's knobs and an external MIDI controller to a second knob, for instance, and then record automation moves for the third knob.

To get information on the special constants and variables that can be used in a formula, select Help from the little menu in the Formula Controller. If this doesn't open up a Help window (it didn't in my computer), you can find

SAVING SPACE

Is the Step Sequencer window getting crowded? The Channels menu gives you two ways to unclutter the workspace. The Group Selected command tucks selected channels

into the Groups pop-up menu (lower left). Alternatively, you can use Zip Selected, which minimizes channels to narrow bars, as shown above. Right-clicking on a zipped channel restores it to normal size.

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the help files for the effects in Windows Explorer. Go to Program Files/Fruityloops3/Plugins/Fruity/Effects, look in the folder for the effect you're using, and double-click on the HMTL file.

BEEPMAP

The BeepMap is Fruityloops' most bizarre sound generator. Though it's very versatile, the online help gives almost no information about it. You can discover a lot by clicking around in the controls on the Plugin page of the Channel Settings window. But before you do that, take the following steps:

1. Insert a note at the beginning of the bar in the pattern you want to experiment with and send it to the Piano Roll.

2. In the Piano Roll, extend the note so that it lasts for about three and a half bars.

3. In the Ins/Vol page of the Channel Settings window, set envelope sustain to full, attack to about 11:00, and release to about 1:00. That will give you a sound that swells and dies away smoothly.

BeepMap is an additive-synthesis device that generates tones using the information in the graphic image in the middle of the Plugin page. (It may have been inspired by U&I Software's Metasynth.) The Frq knob governs the spread of the additive sine waves, and the Len knob controls how quickly the image is scanned from left to right. With short Len settings, you may want to turn on the Loop button so that the sound will keep going throughout the note. When Frq is set very low, all the sine waves will be at close to the same pitch, so you'll get a chorused beating tone that you can use melodically.

When you fiddle around with BeepMap, it may seem that the number box on the right side, just above the image, isn't doing anything. Here's the secret: this setting is used only when you open a graphic file using the Open button. The larger the number, the more pixels the image will cover vertically. Because the vertical axis controls the frequencies of the various sine waves, changing this setting and then reloading the image will change the tone color subtly or drastically. Computing the tone for a tall image takes lots of CPU power, but you can do a lot with BeepMap using images that are less than 50 pixels high.

For a musical example (perhaps reminiscent of the Residents) that uses two BeepMaps, download EM WEB CLIPS beepmap_tones.flp. In your own experiments, try loading other graphics files in addition to the ones stored in the Fruityloops folder. BeepMap will even load JPGs, so if you have access to the Web, your sound sources are never-ending.

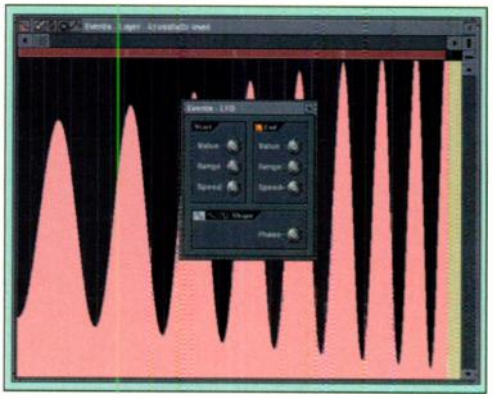

FIG. 5: The LFO utility in Fruityloops' Edit Events window is the key to creating filter sweeps and many other types of smooth rhythmic effects.

LAYERED INSTRUMENTS

The features of Fruityloops' Layer channel are well described in the online help, in the Generators section. But some of the things you can do with layers are not obvious.

Fig. 4 shows a simple pattern, called random_layer.flp, that I created. The EM WEB CLIPS Layer channel is in the top row, and all four of Fruityloops' default instruments have been assigned as children of this Layer. It looks like a pretty normal pattern except that I've activated the Random switch in the Layer. Because only a few notes are included in the Layer, the rhythm is anchored by the rest of the pattern. The Layer simply adds spice to the beat.

Crossfading among two or more Layers with the Layer channel's Crossfade knob isn't something you'll need to do every day, but it has some uses. It's a quick way to set a blend between two snare sounds, for example. Set the blend the way you want it, and then use the Layer channel just as if it were your snare channel.

A more interesting possibility is automating the Crossfade knob. We're going to use several features of Fruityloops in this example. (It's downloadable as crossfade_layer.flp.) First, create three EM WEB CLIPS Sampler instruments that use the same snare sample and assign them all to a Layer. Leave the first one in its default state. Assign the second one to FX bus 2, and strap a nice reverb onto that bus in the FX window. Add some rhythmic echoes to the third snare using the knobs on the Func page in the Channel Settings window. (When I'm doing this, I generally can't resist pulling down the cutoff knob and pushing up the resonance in the Echo Delay area.)

Next, create some kind of basic kick/snare pattern using the Layer as the snare. Switch to Song mode, open the Playlist window, and (this is important) select the Main Automation pattern. When this pattern is selected, any automation moves you make can run for the length of the song rather than being confined to one pattern. In the Playlist, insert your pattern 16 times in a row.

Returning to the Layer channel, click the Crossfade button, right-click on the Fade knob, and choose Edit Events. This will open the Controller Curve window. Zoom this out so that it shows all 16 measures of the song, choose the Dotted-outline tool, and drag in the time ruler at the top of the window so that all 16 measures are selected.

Now comes the fun part. Start playback, as you won't be able to use the transport buttons once you take the next step. Open the Event Editor-Options menu using the button in the

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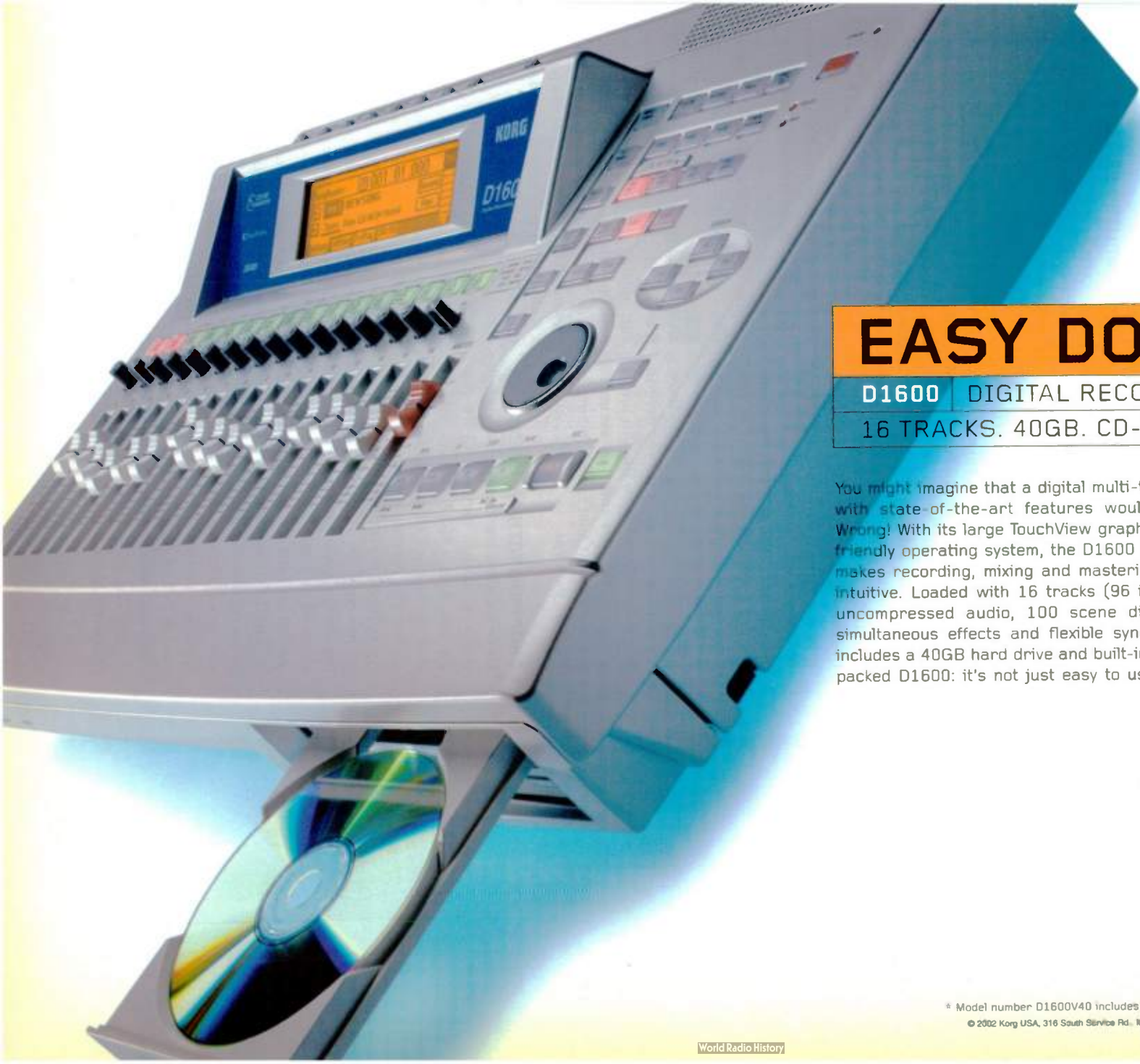

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upper-left corner of the Controller window, and choose Edit/LFO. The LFO (low-frequency oscillator) utility will insert controller sweeps into whatever time range you've selected. Play with the knobs in the LFO until you like what you hear; you might end up with something like **Fig. 5**. If you've followed the steps I've outlined, you'll hear a dry snare when the LFO curve is near the bottom, a reverb snare when the curve is in the middle, and an echoing, bouncing snare when the curve is near the top.

You could get a similar musical result and have more pinpoint control by skipping the Layer and automation process entirely and just triggering whichever snare sound(s) you want in a given pattern. The advantages of doing it with a Layer and automation are that you need to program only one pattern, yet the snare can change from bar to bar throughout the song. In addition, it's much easier to edit the curve in one Controller window than to fiddle with the Velocities and note events of three different snare instruments in all those patterns.

CHOPPING WITH AN EVENT LFO

Here's a cute trick. Assign a sound that you want to chop up to its own FX bus. Add a Mute 2 to the effects bus. Right-click on the Mute knob, choose Edit Events, open the LFO utility from the menu, and choose a square wave for the LFO. Crank up the Range knob for the LFO: values above 50 percent will unmute the bus, and values below 50 percent will mute it. The LFO isn't calibrated to give you a regular 32nd-note rhythm, but you can make the chopping rhythm speed up or slow down by activating the LFO's End parameters. The Phase knob will control when the first chop occurs. For an example that uses this technique and a couple of others, download chopped.flp.

To get a regular chop rhythm finer than 16th notes, set the pop-up in the Recording Panel to ¼-step or ½-step and then use the Pencil tool in Edit Events. If the Recording Panel isn't visible, you can get to it by right-clicking in the blank area in the upper-right corner of the screen.

PRECOMPUTED EFFECTS

As an exercise, you might want to try programming a pattern using only a single sample as your source material and see how many different sounds you can come up with. There's a lot of variety to be found in the Precomputed Effects, in the SMP page of the Channel Settings window (see Fig. 2). The knobs in this section are well explained in the online help, but playing with them will yield some surprises. The FX1 knob is great for adding aggression to dull kicks, and a taste of Sine FX can change the character of a hi-hat or snare.

Using only the default kick-drum sample, I came up with the madness in EM WEB CLIPS one_sample.flp. I couldn't resist adding some step-filter offsets. Speaking of which, when customizing your sounds, don't overlook the Filter pop-up menu in the INS pages. The SVF LPx2 setting has a harder sound than the normal lowpass, which will help low-level sounds cut through a mix.

PICKING THE FRUIT

There's much more to Fruityloops than what I've had space for in this Master Class: effects busing, the *x-y* controller, using external MIDI synths, strategies for assembling songs from patterns, and so on. As you explore the possibilities, you'll develop your own style with Fruityloops, which will make your music more personal and dynamic. Have fun!

Jim Aikin *writes about music technology for a variety of magazines and Web sites. Look for his book* Quick Start: Fruityloops *(Wizoo/Music Sales, 2003).*

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Maximum Conversion

Calibrate your A/D converters for the highest resolution recordings.

By Michael Cooper

Many people regard A/D converters simply as boxes that translate analog voltages into digital 1s and 0s, changing nothing else in the process. But every A/D also has analog front-end circuitry that affects the signal levels going into the digital domain in much the same way that a mic preamp affects levels going to tape. That front-end circuitry can be calibrated to either boost or attenuate the analog signal before it's converted to digital format(s), in effect raising or lowering the sensitivity of the converter.

DMITRY PANICH

In a perfect—that is, imaginary—world, the analog-circuitry calibration for all A/Ds would be permanently set at the factory to always deliver a 0 dBFS (0 dB Full Scale) meter reading in the digital domain, regardless of the signal you fed it. But in the real world, your A/D's calibration should routinely be readjusted to accommodate the varying levels that tracking and mixing applications present, so that robust input levels and optimal signal-to-noise ratios are always attained at the converter. Sure, you can get by with a set-it-and-forget-it approach, but your recordings might suffer audible signal-to-noise degradation if you do.

For example, say your A/D's calibration is set at too low a level (thus lowering the converter's sensitivity). In that case, you might not be able to get enough gain out of a typical mic preamp to attain full-scale levels (0 dBFS) at the A/D when tracking, say, delicately picked acoustic guitar or soft-spoken voice-overs. Or you might have to crank your preamp to the point at which its gain-boost circuitry is maxed out and thus not operating optimally. In either case, the noise floor and apparent resolution of your recordings will suffer when recording such quiet sources.

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Conversely, if your A/D's calibration is set at too high a level (thus increasing the converter's sensitivity), superhot signal feeds from an analog mixing console during mixdown will probably clip the A/D's input, causing ugly-sounding digital "overs" (levels exceeding 0 dBFS on the analog side of things). You could lower your mixer's stereo-bus output levels to avoid that fate, but why pull levels down at the board's output only to jack them up again at the A/D's analog front end? Such poor gain-structure practices can sabotage your signal-to-noise ratio and therefore the resolution of your recordings. And if you use a digital console's analog outputs when mixing (to insert analog gear before the A/D, for instance), you're faced with the same dilemma. You don't want to be forced into lowering your digital console's (or analog outboard gear's) output levels to accommodate a rip-snortin' A/D front end. Peak console-output levels that are well below 0 dBFS are a recipe for veiled, flat-sounding (as opposed to round-sounding) mixes.

To avoid such booby traps and capture the highest-quality recordings, you'll probably need to recalibrate your A/D (depending on the ancillary gear you use with your converter) when switching from tracking to mixing and vice versa. This article will guide you through the procedures for calibrating A/Ds and will make suggestions for ballpark settings appropriate to each application. Because most outboard A/D converters are optimized to integrate with professional levels and balanced signals, I'll limit my discussion of calibration settings to those pertinent to working with +4 dBu–nominal gear.

FIG. 2: You can set reference levels on the Lucid AD9624 by adjusting continuously variable gain-control knobs on the unit's front panel.

Calibrating an A/D is actually a quick and simple process, once you understand how analog levels relate to digital-meter readings. I'll make that relationship crystal clear in a moment, but first let's look at the calibration controls found on currently available A/D converters.

GOING TO POT

Most A/D converters offer some means of calibrating their analog inputs, typically supplying an independent calibration control for each channel of A/D conversion. Assuming that the model A/D you own can be calibrated, the controls for adjusting the settings are usually in the form of either a trim pot (adjustable with a small screwdriver); a dual- or multiposition switch, such as that found on the Benchmark AD2402-96 (see **Fig. 1**); or continuously variable gain-control knobs, such as those found on the Lucid AD9624 (see **Fig. 2**). Some units, such as the Sonifex Redbox (see **Fig. 3**) use a combination of switches and level trims for setting levels. Check your unit's owner's manual for the type of calibration controls offered and their location on the unit.

Both trim pots and continuously variable gain-control knobs are generally preferable to switches for calibration purposes, as they offer infinite adjustment resolution within their range. Obviously, trim pots are more of a hassle to adjust than gain-control knobs because you have to deliberately turn them with a tiny screwdriver. Then again, that makes them less apt to get changed unintentionally, so the settings are pretty much locked in. Switches constrain you to a limited choice of preset calibration levels. And though switches do lock in your calibration levels, analog circuitry has a nasty habit of "drifting" over time, raising the possibility that calibration levels for different channels could eventually become mismatched.

ON YOUR MARK

The procedure for calibrating an A/D converter is to route a sine-wave generator's output to the analog input(s) of your converter and then tweak the A/D's calibration controls to achieve the desired level on the converter's digital meters. (More on what that digital-meter reading, called a reference level, later.) Just about any sine-wave generator (also known as an oscillator) that can output a 1 kHz tone at +4 dBu will work for calibrating an A/D, whether it's an outboard unit or one that's built in to a mixing console. The oscillator's frequency should be set to 1 kHz because 1 kHz is smack in the middle of the audible frequency range and thus provides a good proxy for average levels that the converter is likely to encounter when presented with broadband material. The 1 kHz tone should be output at +4 dBu because that is the standard for all pro-level gear that the A/D is likely to interface with in your studio. In fact, most converter manufacturers suggest you use a +4 dBu signal to calibrate their A/D converters.

How do you know when your oscillator

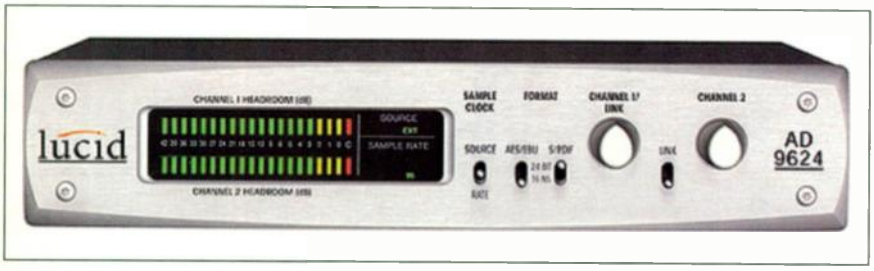

FIG. 1: On the Benchmark AD2402-96, reference levels are adjustable in 2 dB increments using the unit's stepped input-level control.

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is outputting +4 dBu? If you're using an outboard unit, it should have an output level knob and an accompanying readout that tells you when the level is at +4 dBu. If you're using a pro-level (+4 dBu–nominal) analog mixer with an onboard oscillator, 0 VU should be equivalent to +4 dBu level. Route the generator's output to your console's master L/R outputs and adjust the generator's output level for a 0 VU reading on your console's L/R meters.

Adjusting the sine-wave generator on a digital console for +4 dBu output takes a bit more thought. Your owner's manual should give the level the master L/R digital meters should be in dBFS for an equivalent +4 dBu output level at your analog (+4 dBu–nominal) stereo-bus outputs. For example, many consoles are set up to output +4 dBu at their analog stereo-bus outputs when their L/R digital meters read –18 or –20 dBFS (18 or 20 dB below a 0 dB full-scale reading).

But what if the owner's manual for your digital console doesn't specify an equivalent +4 dBu level in dBFS? In that case, you can determine yourself which digital-meter reading on the console equates to +4 dBu by checking the specifications table in the owner's manual to see what the maximum output level is for the console's analog (+4 dBu) L/R outputs. For example, the Yamaha 02RV2's maximum output level for its analog L/R outputs is stated to be +24 dBu. Knowing that, we can surmise that +4 dBu is 20 dB down from 0 dBFS on the 02RV2's meters (that is, +24 dB minus 20 dB equals +4 dB). Put another way, +4 dBu equals –20 dBFS on the 02RV2's L/R meters, and +24 dBu equals 0 dBFS on those same meters. So, when I want to send the 02RV2's internal oscillator's 1 kHz tone out the console's balanced analog outputs at +4 dBu level, all I need to do is adjust the generator's output level for a –20 dBFS reading on the console's L/R meters.

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FIG. 3: The Sonifex Redbox uses a combination of dip switches and ±3 dB input-level trims to calibrate the A/D to a wide range of reference levels.

CA-LI-BRATE GOOD TIMES!

Once you've set the oscillator's 1 kHz tone to output a +4 dBu level, route the signal to your A/D converter, making sure that no other equipment that could alter the signal's level is placed between the oscillator source and converter. (Rather than remove any gain-altering gear from the signal path, you could simply switch the gear to hardwire bypass, assuming that there is one.) With a +4 dBu tone now routed to an analog input on your A/D converter, it's time to adjust the input's calibration control to attain the desired reference level on the converter's digital meters.

I generally like to calibrate my Apogee Rosetta 96 A/D converter (see Fig. 4) to a reference level of –14 dBFS when tracking with outboard mic preamps capable of delivering 60 dB of gain maximum. In plain English, that means I adjust the A/D's respective trim pots for each channel clockwise or counterclockwise as needed until a +4 dBu oscillator tone at the Rosetta's inputs results in a reading of –14 dBFS on the Rosetta's meters. Your needs may vary. You may, in fact, find that a reference level of –12, or even –10 dBFS, works better for recording ultraquiet sources in which an additional 2 or 4 dB of gain is needed at the A/D's inputs. (This would especially be the case when recording with dynamic or other mics with very low output.) With my Rosetta calibrated such that +4 dBu equals –14 dBFS, my mic pre needs to deliver only +18 dBu output to get a 0 dBFS reading on my Rosetta's meters. (That is, 14 dB plus –14 dBFS equals 0 dBFS. Add the same amount, 14 dB, to +4 dBu to arrive at +18 dBu as the analog equivalent of 0 dBFS at this particular calibration setting).

Of course, if your A/D converter offers only switched calibration presets, you'll need to choose the setting with the value that's closest to your desired reference level (assuming your preferred level setting is not provided). Also, you should check to see if the converter has a special calibration mode for the A/D's meters, as this will typically shrink the range of the meters down to where each meter segment represents a 1 dB step up or down in level from adjacent segments, allowing for more exact adjustments. The Apogee Rosetta's calibration mode goes

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FIG. 4: The Apogee Rosetta 96's meters offer a special calibration mode that allows you to adjust the reference level to within ±0.1 dB tolerance.

one step further, using a combination of meter LEDs and Over indicators to guide you to calibrate your reference level to within ±0.1 dB tolerance (which comes in handy for exacting mastering applications).

Some A/D converters lack meter increments that are fine enough to accurately set a +4 dBu reference level. Don't fret. There is an alternative method for calibrating such ill-equipped A/Ds. Instead of using +4 dBu as your analog reference level, calculate which analog level would be needed to deliver 0 dBFS and use that level for your oscillator's output to align your A/D to a full-scale reading. For example, I stated previously that my mic pre needs to deliver +18 dBu to get a 0 dBFS reading on my Rosetta when the Rosetta is calibrated to a –14 dBFS reference level. So it follows that, rather than feed my A/D a +4 dBu-level oscillator tone, I can accomplish the same thing by feeding it a +18 dBu signal and calibrating my Rosetta (or any other model A/D) so that the meters read 0 dBFS.

Actually, the Rosetta's meters can show only –0.5 dBFS or Over (a level exceeding 0 dBFS) at the very top of their range. To obtain an exact 0 dBFS reading on a given Rosetta channel, I simply turn the channel's calibration pot clockwise until the corresponding Over LED lights up, and then back off the pot barely enough to make the Over LED go out when I clear the meters. (The Rosetta has peak-hold metering, so you must clear the meters to make the Over LEDs go out and show current levels.)

I've discussed calibration techniques in general and ballpark reference levels for tracking in particular. Next I'll discuss calibrating A/D converters for mixing applications.

ALL MIXED UP

Depending on how hot your mixes are, the reference level you calibrate your A/D to at mixdown might need to be set anywhere from –24 dBFS to –14 dBFS. Provided that no gain-altering signal processors (compressors, for example) are placed between the mixer and A/D converter, the mixer's maximum analog output level will dictate which reference level you should calibrate the A/D to. That is true regardless of whether you mix on an analog or digital console.

For example, the Mackie Analog 8-Bus Series analog consoles are specified to deliver a maximum balanced output level of +28 dBu. You want your A/D to produce a 0 dBFS reading when the Mackie 8-Bus console is cranking out +28 dBu, so that both console and converter top out at the exact same level. Therefore, for basic mixdown applications, calibrate the A/D so that 0 VU (+4 dBu) on the Mackie 8-Bus registers as –24 dBFS on the converter's meters. That gives you 24 dB of headroom (above +4 dBu nominal) on both the console and converter before they distort.

As another example, my 02RV2 dishes out +26 dBu at its balanced analog stereo outputs when the console's meters read 0 dBFS (that is in spite of the fact that the mixer is specified to deliver only +24 dBu maximum output levels). Since +26 dBu is 22 dB hotter than +4 dBu, I would need to calibrate my A/D converter to a reference level of –22 dBFS when mixing with my 02RV2 and unity-gain outboard gear.

Yamaha's new 02R96 console, on the other hand, is currently calibrated at the factory to output only +18 dBu, which is the European standard. (According to Yamaha Corporation of America, the company is working with the main headquarters in Japan to change the 02R96's calibration so that the board outputs a maximum +24 dBu, which is what American engineers are used to working with.) Because +18 dBu is only 14 dB hotter than +4 dBu, you would need to calibrate your A/D to –14 dBFS when feeding it signal from the 02R96's balanced, stereo analog outputs and any unity-gain analog outboard gear placed between the mixer and A/D converter. For mixing on most consoles issued in the United States, however, you would need to set your calibration levels considerably lower (typically to –20 dBFS or lower) to accommodate the hot output levels typically characteristic of mixdowns.

END FADE

Unless you're using a mic preamp that can deliver 65 to 70 dB of gain, basic tracking applications generally call for calibrating your A/D to a higher reference level than that used for mixing. No matter whether you're tracking or mixing, however, always make sure you adjust the controls for each channel to the same exact reference level when calibrating two channels of A/D for use on stereo program material. Otherwise, your stereo image may become skewed.

I've covered only the basics of calibrating A/D converters in this article. The procedures and optimal reference levels change as soon as you start using analog dynamics processors and other gain-altering gear with an A/D converter. Moreover, certain creative mixing and mastering applications suggest alternative calibration methods—but those will have to wait for another article. Until then, I hope you'll use the techniques discussed here to make higher-quality recordings. The sonic rewards will be well worth your efforts.

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

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Tax Tips for Musicians

Keep your money in your pocket and out of Uncle Sam's.

By Jeffrey P. Fisher

Everybody complains about taxes, but how many of us do anything about them? Well, you can improve your tax situation by doing several things. Even though it's too late for the 2002 tax year, you can save a bundle, legitimately, with your music business for this year's taxes and for years to come.

If you're making even the tiniest amount of music-related money, there's no reason to pay more taxes than you have to. To reap the most tax benefits, start running your music career as a legal small business (see "Working Musician: Going Legit" in the February 2002 EM). The IRS loves small businesses. According to the Small Business Administration, there are 25 million small businesses in the United States today, and a large percentage of them are *sole proprietorships*, or one-person shops. As a sole proprietor, you report your music business income as part of your personal income using the IRS Schedule C and a few other forms. (Tax forms and Schedules can be downloaded from the IRS Web site, www.irs.gov.)

MIKE CRUZ

It all comes down to income and expenses—the money you make and the money you spend. The more you make, the more you pay in taxes. Even the most convoluted of IRS instructions make that point painfully clear. That means the converse is also true. Because the IRS taxes only your business profits, cut back on the profit and pay less in taxes.

You might be thinking, "But, dude, I gotta eat." I'm not saying that you should earn less. Instead, look for all the possible ways to convert your everyday expenses into legitimate business deductions. Even some personal expenses may be deductible against the business. The more expenses you have, the more you reduce

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"Four Major Labels Came to See Me Because I Joined TAXI"

Lizard McGee -- TAXI Member

Most musicians never get a chance to meet an A&R person in the flesh. I had A&R guys from Columbia, Dreamworks, Maverick and Hollywood all come to see my band, Earwig, play live.

I spent the next day hanging out with one of them at his house. I played more songs, and we talked one-on-one for hours.

All this happened as a direct result of becoming a member of TAXI.

Ironically, I almost didn't join. Like so many other people, I didn't know a lot about TAXI, and I wondered if it was really legitimate. It just sounded too good to be true.

But I spoke with a few friends who were already members, and they explained how TAXI worked. It made sense.

I began to think about not only getting my music to record labels and publishers, but also pitching my songs to TV shows and movies to make some extra money with my music.

So, I joined, and it's already paying off big-time. Earwig is building a huge buzz because of all the contacts we've made through TAXI.

We haven't signed a deal yet, but we've definitely penetrated the so-called "inner circle" of the music industry. And that's exactly where you need to be to get yourself signed.

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This private convention is renowned for being the best in the business. Just one pass is worth far more than your TAXI membership fee, but you'll get three for FREE.

Whether you're pitching yourself as an artist, pitching your songs, or going for Film and TV placements, TAXI is definitely the place you need to call.

Just ask for their free information kit, and get yourself signed up in a hurry.

I did, and my only regret is that I didn't do it sooner. TAXI has turned out to be the best investment I've ever made in myself.

your taxable income. And because you were going to spend the money anyway, you might as well realize some tax benefits from those expenses.

WRITE-OFFS

Basically, all the expenses you incur to run your small music business are deductible. To be fully deductible, however, business expenses must be "ordinary and necessary" according to the IRS. That's just fuzzy enough to be dangerous. *Ordinary* means the expenses must be typical for the business. Buying a new guitar could apply; buying a dishwasher wouldn't. *Necessary* means the expense is vital to the success of your business. Office equipment, postage, phone charges, graphic-design charges, recording-studio fees, duplication, dues, magazine subscriptions, and other such related items are definitely necessary for the success of the typical music business (see the sidebar "Deductible Reasoning" for a list of typical deductions).

For every $100 you earn, you pay approximately $45.30 in taxes. (This is assuming you're in the 27 percent tax bracket, pay the 15.3 percent self-employment tax, and send an additional 3 percent to your state. Furthermore, these percentages are given only for the purpose of discussion. The Tax Code changes from time to time, so you should verify your federal and state income tax brackets.) Of course, that also implies that for every legitimate $100 business expense you *incur,* you also save $45.30 you would otherwise pay in taxes. Hey, that's like getting everything you buy at a discount.

Why does the IRS let you deduct all these expenses? It wants you to succeed. It lets you invest money in your business as incentive for you to earn more. And the more money you make, the more you'll pay in taxes. You see, it has an ulterior motive.

Here's the caveat: your business must turn a profit three out of every five years or it will be classified a hobby, and you forfeit the expense deductions. The bottom line here is a very high tax bill.

The burden of proof falls solely on you, so it is vital that you record all your music business income and expenses diligently. A shoebox full of receipts does not a bookkeeping system make. Get help setting up your books or look for a software solution to help document your business financial transactions.

Here's another important gotcha: If you're just launching your music business, startup expenses can't be deducted all at once. You must amortize them over five years by taking 20 percent portions of the total expenses and deducting them over five consecutive years.

DEDUCTIBLE REASONING

Here are some common business-expense deductions for music-related businesses.

- Advertising and promotion costs
- Car and truck expenses
- Commissions and fees you pay to other people and businesses
- Depreciation and section 179 deduction
- Insurance (except health insurance, which is a personal deduction)
- Interest on business loans
- Legal and professional fees
- Office expenses
- Rent or lease payments
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GEAR LUST = TAX SAVINGS

Did you know that the gear you buy for making your music could be a sweet tax deduction? Under section 179 of the Tax Code you can deduct or "expense" up to $25,000 of tangible property this year and write it all off when you prepare your taxes next year. For tangible property, think expensive, long-lasting items, such as a new computer. This amount is above and beyond many other normal business expenses you might incur.

If you've had a particularly strong earnings year, you can offset some of that gain by deducting all the cost of large purchases in one year (up to the $25,000 limit). Alternatively, you can depreciate what you buy and deduct a portion of those costs over the next several years.

HOME SWEET HOME

If you do the majority of your music work in your home office, you can deduct a portion of the same expenses that currently do little or nothing to lessen your tax burden. You can write off rent or mortgage interest, property taxes, utilities (gas, electricity, water/sewer), insurance, repairs, and depreciation. First, dedicate a portion of your home entirely to your music business. Keep it free of personal items and make it your primary business location. Beware that if you do most of your work elsewhere (gigging, for instance) and use this home office only occasionally, your deduction may be limited or entirely verboten.

Here's how to figure your deductions. Total up the square footage of your exclusive place of business and compare it to the total square footage of your residence. Say your math works out to 10 percent. You can then deduct 10 percent of the aforementioned expenses using Form 8829—Expenses for Business Use of Your Home. The total deduction then flows through to your Schedule C, reducing your income and therefore your taxes.

There is a recapture clause for homeowners to consider. If you sell your home and make a profit, those profit dollars become taxable business income at the same percentage rate as your deduction. Score a $50,000 gain from the sale of your home and, following the above example, $5,000 of it belongs to the business (subject to self-employment tax and regular income tax, of course). It's important to note that the personal income you make from a house sale is generally not taxed, though. If you stop taking the home-office deduction for two tax years prior to the home sale, this recapture clause doesn't apply.

SELF-EMPLOYMENT TAX

Yes, we self-employed people have a special tax just for us. Actually every worker pays the same tax—funding for Social Security and Medicare—it's just a little different when you're on your own. You must contribute both the employee and employer contributions, which total up to a whopping 15.3 percent. Yep, just over 15 pennies on every buck you earn goes right into the Social Security kitty. This is, of course, before you start paying any regular income taxes. Ouch!

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GET HELP FROM THE IRS

Surf on over to the always exciting IRS Web site (www.irs.gov) and download the free guides that explain the specific tax benefits for small-business owners.

#334, Tax guide for small business
#463, Travel, entertainment, gift, and car expenses
#533, Self-employment tax
#535, Business expenses
#583, Starting a business and keeping records
#587, Business use of your home

You have to pay the self-employment taxes (along with income taxes) quarterly. You need to predict what you are going to earn this year, and the taxes that would be due on that dollar amount. Then, you send in 25 percent of that money on April 15, June 15, September 15, and January 15 of the next year. These estimated tax payments are important, because if you don't pay enough, there's a penalty due the next April 15.

EAT, DRINK, AND BE MERRY

When you entertain your clients, the money you spend is another write-off. However, meals and entertainment are subject to a 50 percent limitation, so if you spend a $100 on a pizza party, you can take $50 off on Schedule C. Give clients gifts, up to $25 per client, and you can take that as a full deduction, though.

When you travel as part of your music business, those expenses are deductible including airfare, lodging, and meals. You must support your travel and lodging deductions with receipts. However, instead of keeping track of your meals, you can take the government's standard per diem allowance of $30 for "meals and incidentals." A few cities (such as New York City) may have a higher rate than the $30 standard; check the official Web site (www.policyworks.gov/perdiem) to be sure. Meals on the road are, of course, still subject to the 50 percent limit.

VEHICULAR REDUCTIONS

Yes, that old beater is worth money! Keep track of actual vehicle expenses (gas, repairs, and so on) or take the standard mileage rate (which changes every year; check with the IRS). In either case, you must document the miles you drive for business, the date and purpose of trips, and the expenses incurred. A dedicated notebook/diary earns a gold star from the IRS.

Even if you use your ride for business and personal use, the business portion of

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your expenses is still deductible. Determine your business percentage by dividing your business miles by the total miles driven (2,500 business/10,000 total = 25 percent). If you just use the standard mileage rate, multiply your business miles driven by that rate (2,500 × $/mile = deduction) to arrive at your deductible expense amount. You can also deduct the full cost of tolls and parking fees incurred while on business. Furthermore, the loan interest on the car is deductible (subject to the business-use percentage).

YOUR HEALTH AND FUTURE

Your health-insurance premiums are deductible. That doesn't come off the Schedule C but is a front-page deduction on your personal 1040. In 2003, self-employed individuals can finally deduct 100 percent of the premiums they pay. Other typical medical costs are deductible on Schedule A (if you qualify).

You also save money by contributing to a qualified retirement plan. The IRS makes it easy to sock away some cash for a rainy day, and it rewards you with a nice, fat deduction each year. This is another 1040 deduction, not Schedule C. IRAs are the first method that pop up. However, they're limited to $2,250 this year. With a SEP (Simplified Employee Pension), you can deduct as much as 15 percent of your business income topping out at $30,000 total per year. The more you put away, the more you save. And since you're really helping yourself down the road, it's a smart way to manage your taxes and your retirement. For some of us, a Roth IRA may be more prudent. Roths give you no up-front deduction, but the earnings are tax-free. You should talk to a financial planner to figure which approaches will benefit you the most.

EOY TAX TIPS

At the end of each year, you have another opportunity to reduce your tax burden: accelerate expenses and decelerate income. First, spend some cash on business expenses. Don't just blow the wad; make sensible purchases this year that will reduce your taxable income. Ideal last-minute purchases include postage, equipment, general office supplies, and promotions. You can also pay your mortgage and health insurance premium before the year-end to realize some other tax savings on the personal side. Second, this December, put off collecting money until January by billing your clients a little later. Though you'll have to pay taxes on the money eventually, you defer that payment for a whole year.

Even though we all have to pay taxes, we are only required to pay our fair share. Make sure you are not throwing money out the window. Take advantage of these and all the other tax breaks available to you. Put more music money in your pocket, where it belongs!

Jeffrey P. Fisher's *latest book, Moneymaking Music (artistpro.com, 2003), is a guide to making, keeping, protecting, and growing your music success fortune. See it and other resources at www.jeffreypfisher.com.*

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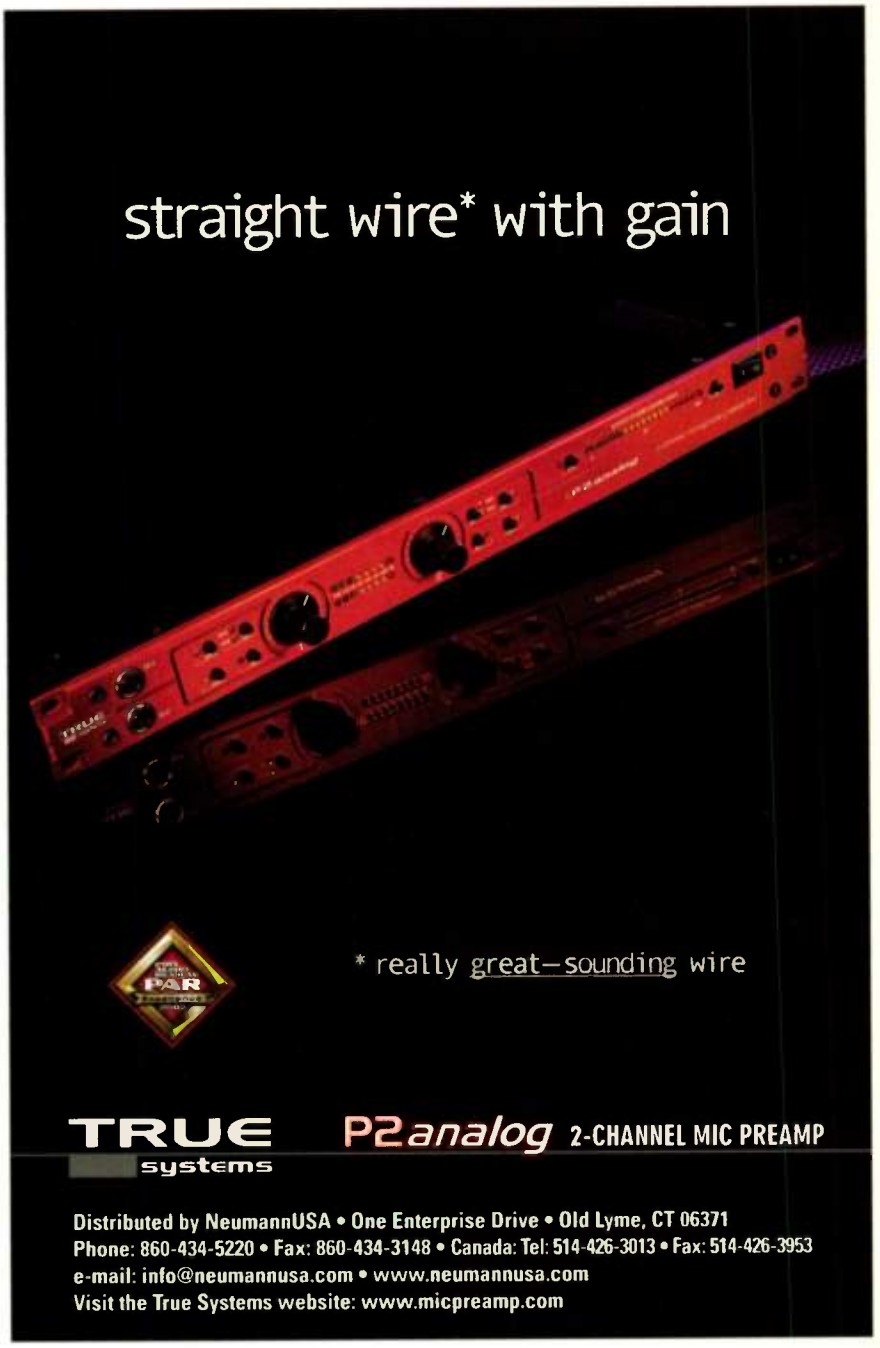

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EMAGIC

LOGIC PLATINUM 5.5 (MAC/WIN)

An old reliable takes giant steps into the future.

By Rob Shrock

Compared to previous versions, Emagic Logic 5 is a big leap forward in terms of features, power, and ease of use. With version 5.5, Logic now runs under OS 9 and OS X on the Mac as well as on Windows on the PC. Although future development of Logic on the Windows platform has come to an end, ongoing support of Emagic's current products has not slowed one bit, resulting in a steady stream of significant updates. New features in automation; surround mixing; 24-bit, 192 kHz compatibility; software instruments; and control-surface hardware support make Logic Platinum 5.5 a formidable package that currently rivals all other audio sequencers, on both computer hardware platforms.

Logic 5.5 is available in three versions for both Windows and the Mac OS. The version reviewed here, Logic Platinum, is the full-tilt package with the most plug-ins and the greatest capabilities. For $300 less, Logic Gold ($649) offers fewer audio tracks and other features. Note that the word "Audio" has been dropped from the product name of Platinum and Gold. The previous entry-level version, Logic Audio Silver, is now simply Logic Audio ($399) in version 5.5.

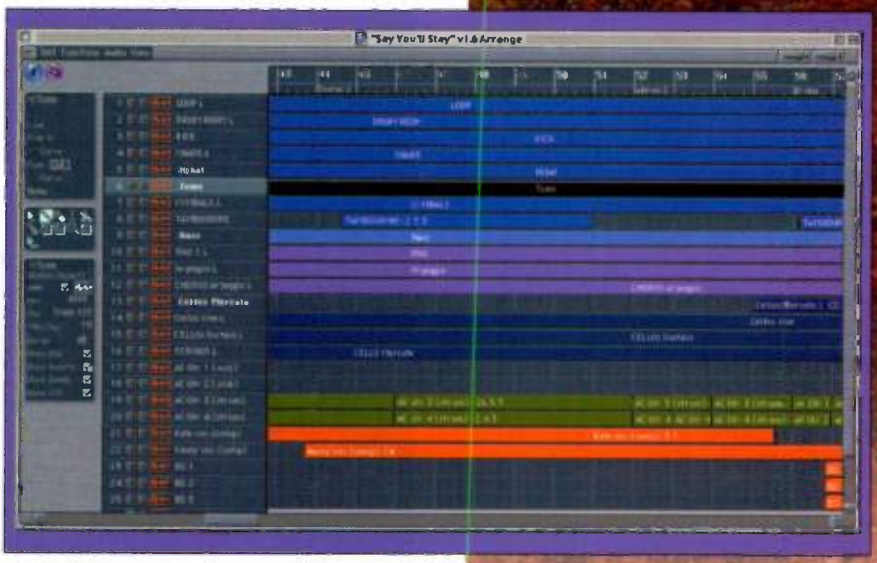

FIG. 1: In the upper right of the Arrange window, telescoping controls let you zoom in to see the waveforms or MIDI data of each track. You can apply nondestructive editing such as delay, Velocity scaling, and transposition to MIDI tracks.

World Radio History

PLUG THIS IN

If I could only take one DSP effects box with me to the moon, it would have to be the Kurzweil KSP8."
Alan Howarth, Engineer, Composer

"I really like the KSP8 and from the minute I hooked it up it has become a vital part of my mixing session."
Michael Wagener, Double Trouble Productions, Inc.

"The KSP8s routing flexibility and parallel processing capabilities were ideal for the situation. We also used one to process Mike Garson's main piano sound. Using the same sound source through a combination of subtle distortion, EQ, and ambience effects we were able to get piano sounds that had quite radically different character. For many songs, instead of changing patches on his keyboard, Mike's just changing to a different KSP8 chain program."
Tony Widoff, Programmer: David Bowie *Heathen* Tour

"This is the one to beat."
Paul Orofino, Engineer - Milbrook Studios

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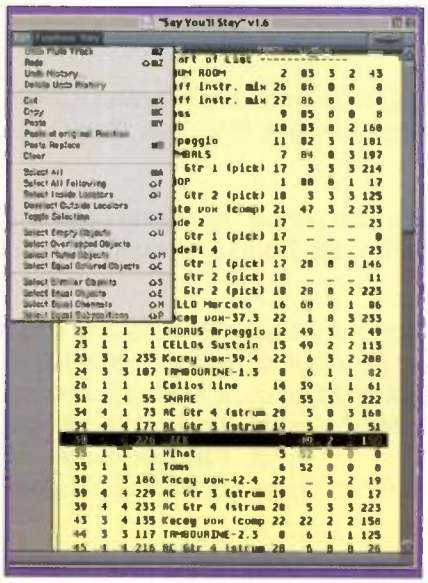

FIG. 2: In Logic's List editor, you can edit MIDI and audio events numerically. Notice the drop-down mini-menu; Logic makes extensive use of specialized menus in most edit windows.

FACE-LIFT FORWARD

The key word to Logic is flexibility. No other digital audio workstation allows such a degree of customization for its users. In the past, its depth of features intimidated many novice users. Logic 5.5 streamlines many operations and menus, resulting in a more user-friendly experience without compromising any of the power that professional users demand.

Logic 5.5 maintains the graphic style that was introduced in version 4; however, you can still choose to apply the look of version 3 if you prefer. I last used Logic extensively in the days of Logic 3, so the newer graphics were a bit unsettling at first. The new look takes a dark and futuristic approach to its knobs and faders—especially in the native plug-ins—which I didn't care for initially. After spending a few weeks with the new interface, though, I switched to the version 3–like graphics and immediately preferred the newer look, which I've now grown to like quite a lot.

The main menus and submenus have been further refined in their organization since version 4, especially as new features have been added to the program. I didn't spend a lot of time comparing the current version to older ones, but I can say that the Logic's much-appreciated, context-sensitive approach to submenus is even better in version 5, making navigation of the interface easier overall.

OPENING WINDOWS

Logic's Arrange window is the center of the action (see Fig. 1). In the Arrange window's list of MIDI and audio tracks, individual tracks can be edited, quantized, automated, muted, and soloed. As you zoom in on a track, its region content becomes visible (and editable) in the form of an audio waveform or MIDI data display. The Parameter and Extended Sequence Parameter boxes offer nondestructive editing of parameters such as quantize, loop, transpose, Velocity, dynamics, gate time, delay, and audio fades. Better yet, as a sequence is playing, you can tweak those parameters in real time without a hiccup, which is perfect for painlessly tweaking dynamics and timing in the context of an entire sequence.

In addition to the feature-packed Arrange window, Logic offers a number of other editing windows, including the Mixer, Event List, Score, Transform (for creating complex MIDI-editing operations), Hyper Edit, and Matrix (piano-roll) windows and the all-powerful Environment window. Each window contains submenus pertinent to its editor (see Fig. 2). If you're familiar with the basics of MIDI and audio editing, there's very little you can't do in Logic's editors. One feature that I've always liked is Logic's ability to resize the Transport window and open multiple instances—one dedicated to SMPTE readout, one for bars and beats, and one handling the traditional transport functions, for instance.

Managing all of those windows could be a nightmare—but not in Logic. You can create custom Screensets and recall them at the touch of a computer key. Logic defaults to using the numbers on the numeric keypad to recall as many as 99 Screensets, and you can customize all key commands. Logic 5.5's user interface is so snappy that hopping between editors is instantaneous, even in huge sequences that are otherwise taxing the CPU.

SETTLING THE SCORE

Although I'm an avid Coda (now MakeMusic) Finale user, Logic's scoring capabilities impress me. I don't know that I would use Logic for commercially publishing an orchestral score (though some people do), but Logic's scoring tools are more than capable of fulfilling most performance and recording requirements. (I once did a TV show with George Duke as musical director, and he prepared all of the band's charts exclusively in Logic.) The symbiotic integration of Logic's MIDI features with its notation capabilities will be a natural fit for many users.

Logic 5.5 lets you use the Sonata, Jazz, and Swing fonts in addition to its native Emagic music font, though those are oddly the only choices. I'd prefer the option of using any available music font, but I can live with the choices provided.

Importing and exporting 24-bit OMF files is a breeze, making it simple to shuttle projects to and from Pro Tools or Digital Performer. If you drag a Standard MIDI File (SMF) into your Autoload document's Arrange window before you import the OMF file, your new file will contain both a correct tempo map

CONTROLLED LOGIC

Emagic supports several hardware controllers, including the Radikal Technologies SAC-2K, Mackie HUI, Mackie Control, and (of course) Logic Control. Overall, integration is a smooth affair. Emagic sent me a Logic Control and Logic Control XT (eight-fader expander) to evaluate along with Logic. Setup was a piece of cake. Overall, the combination worked great, though there was some occasional bugginess such as the Logic Control freezing up or refusing to see the current Logic file. Usually, a reboot of the Logic Control or the application solved the problem. For the most part, however, I enjoyed an enhanced mixing experience. I've used hardware controllers for DAWs for a while now, and I really like the responsiveness of the Logic Control.

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much more sensible and easier to control. For example, a region in a track plays until a new region begins, much like playing a second note on a monophonic synth while still holding the first note down; the second note takes priority and steals the voice. That model makes much more sense to me for audio playback than managing a convolution of overlapping audio layers. When a new region begins, the previous region stops playback, even if there is overlap. (Of course, you can create crossfades between the regions.)

Not only do multiple regions within a track share a voice, but you can also assign multiple tracks to share a single voice. In that case, Logic gives priority to the topmost track in the Arrange window's vertical track list. In addition to securing a higher track count by sharing a voice between tracks that never play at the same time, that feature can lead to some creative applications. For instance, it's quite easy to comp a vocal track by assigning all the individual takes and the destination comp track to the same voice. If the comp destination is placed below the individual takes in the Arrange window and left unmuted, then unmuting any take above the comp will steal the voice (remember, tracks higher in the list get priority) and you can audition that track's audio region instead of the comp track; muting the take will allow you to hear the comp track again.

It's important to understand that muting a track does not automatically mute the mixer's fader attached to the voice (each voice gets a fader, but not each track). Of course, muting the fader in the mixer automatically silences all tracks assigned to that voice. Perhaps one day

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PRODUCT SUMMARY

Emagic
Logic Platinum 5.5 (Mac/Win)
digital audio sequencer
$949

FEATURES	4.5
EASE OF USE	3.5
SOUND QUALITY	4.5
VALUE	4.0

RATING PRODUCTS FROM 1 TO 5

PROS: Extensive, powerful feature set. Highly customizable. Nondestructive MIDI processing. Incredible software instruments. Updated mixer automation features. Support for surround mixing and 24-bit, 192 kHz audio. Good scoring features. OMF import and export at 24-bit. As many as 99 Screensets. Support for various hardware controllers. Extensive set of killer native plug-ins. Stable VST effects and instrument support (in OS 9). Supports Core Audio, CoreMIDI, and Audio Units under OS X.

CONS: No VST support under OS X. Bounce-to-disk is in real time only. No alternate takes per track. Can't display multiple plug-in windows simultaneously. Can't easily resize or reconfigure mixer.

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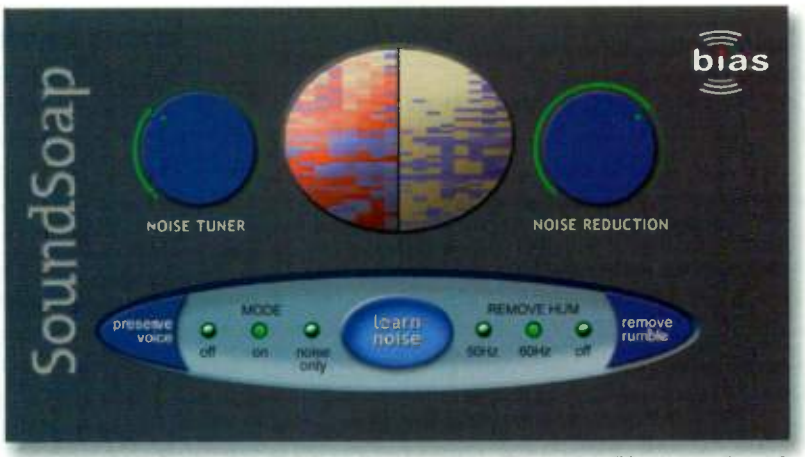

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Logic will provide two mutes in the Arrange window—Track Mute and Fader Mute—for easier navigation and to more easily distinguish between the two.

MIXER TRICKS

Logic has combined the multiple mixers found in previous versions into one supermixer. You can now view MIDI, audio, audio instruments, I/O, and GM objects all together as well as separately. The mixer's most significant feature enhancement is the automation section, which now supports common techniques like Overwrite, Touch, and Latch. Currently, you can automate volume, pan, mute, send, plug-ins, and solo. One missing feature that I'd like to see is a Trim for both Touch and Latch modes, which would maintain the previously written automation moves while relatively trimming the volume, for instance, as much as a decibel or two.

Logic 5's mixer is a big improvement over previous versions, but there are still a few refinements I'd like to see. You can't squeeze more faders onto the computer screen by using the telescoping zoom to resize the audio tracks. Unless you create a new mixer configuration in the Environment window, the order of the tracks is fixed (MIDI, audio tracks, audio instruments, buses, outputs, and master, in that order); that limitation is perplexing, especially considering that so many aspects of Logic are highly customizable. Clicking on an audio or audio-instrument track in the Arrange window can automatically select the Mixer window (if it's open) to make that track visible, but that feature doesn't work for MIDI tracks. I'd also like options beyond those currently available for creating custom mixer views as I do in other DAWs. Logic is way behind Digital Performer and Cubase in its mixer functions.

ALL PLUGGED IN

Using Logic 5.5 under Mac OS 9, the old issue of frequent incompatibilities with VST plug-ins is a thing of the past. I didn't exhaustively test every VST plug-in available, but I had no problems with any of the VST plug-ins I commonly use, including soft synths. In fact, I felt that most third-party plug-ins ran more efficiently and with more stability in Logic than in any other software I've used.

In addition, I don't need as many VST plug-ins as before. More than 50 native plug-ins ship with Logic Platinum 5.5, and they're stunning. I've never seen a more musical, powerful, and useful set of native plug-ins in an application. You name it, and Emagic probably has it covered. Although there are too many plug-ins to cover in this review, the standouts include Stereo Delay and Tape Delay (which let you set groove amounts as well as beat subdivisions) and several cool distortion effects. Fat EQ is a tasty five-band equalizer (see Fig. 3). Enveloper does amazing things to guitar sounds, and Ensemble produces a great chorus effect. Enverb and PlatinumVerb are fine reverb plug-ins. I was also impressed with Multipressor (a multiband compressor), AutoFilter, Spreader, StereoSpread, and subBASS. Really, there are no dogs in the whole collection. I still love my Waves, PSP, and Audio Ease plug-ins, but if I had to, I could certainly get by with only Logic's native plug-ins.

STRIKE UP THE BAND

Arguably, Logic's most exciting new set of features is the plethora of great, native software instruments that are available. The current crop includes several free mono and polyphonic synths in addition to some great virtual instruments sold separately by Emagic: EVB3 organ, EVD6 clavinet, ES2 synthesizer, EVOC 20 polysynth and vocoder, EVP88 electric piano, and the flagship EXS24 mk II sampler.

When you buy Logic 5.5, you receive evaluation versions of all the virtual instruments that run for four weeks—enough time to get hooked. Every instrument is spectacular. It's hard to single out any one of them, but I have to point out that the EXS24 mk II sampler now supports streaming samples and reads and converts Giga, Akai, SampleCell, SoundFont, and DLS formats. I tested several of my Giga and Akai libraries, and the EXS24 mk II worked flawlessly. I would put this instrument, as well as the EVP88 and EVB3, on the must-have list.

I'm happy to report that all of my VST instruments worked great in Logic 5.5, too. If you're currently a HALion or Kontakt owner, you'll have to stay in OS 9 for the time being, but you won't be disappointed in the performance.

OS X FACTOR

It gets even better. Version 5.5 supports Mac OS 9, OS X, and Windows. The OS X version requires OS 10.2 (Jaguar) because Emagic's new owner—Apple Computer—has now released Core Audio, CoreMIDI, and Audio Units as integral components of the Mac OS (see the sidebar "Apple to the Core").

Logic 5.5 supports the new core-level drivers in spades. Running Logic under OS X is amazing. Because all of Logic's native plug-ins are either built in to Logic's code or designed for Audio Units—and therefore much more processor-efficient—you can spread plug-ins around like crazy. MIDI latency now seems to be determined only by the

APPLE TO THE CORE

Unless you've been living under a rock, you're probably aware that Apple Computer has standardized the way that music applications communicate with the Macintosh by addressing audio, MIDI, and plug-in processing at the operating system's kernel level. The result is unprecedented amounts of DSP and nearly nonexistent latency in native systems, and that's a very good thing.

Basically, Core Audio replaces ASIO, EASI, MAS, and all other audio drivers by connecting the hardware straight into the OS, reducing latency to less than 1 ms. CoreMIDI takes the place of the OMS/FreeMIDI juggle that many Mac users perform frequently. The Audio Units format promises to become a standard for plug-in development that will eventually replace older, less efficient plug-in technologies. For those of us making our living with digital audio, the world is becoming a brighter place.

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hardware synths themselves, and working with software synths in Logic under OS X is nirvana.

The downside is that there is no immediate support for VST plug-ins under OS X (and VST plug-ins need to be rewritten for OS X anyway). Perhaps a third-party developer will create a VST shell for Logic in the near future; I suppose that Emagic won't, because Apple is sticking by its guns on establishing Audio Units as a true standard. Otherwise, I hope that plug-in developers can quickly get their products working with the new Apple drivers; some have begun shipping revised plug-ins already.

As of this writing, the price to pay for the inherent power gains of running Logic 5.5 under OS X is the loss of VST plug-ins. However, I applaud Apple and Emagic's bold move because users stand to gain immensely by the transition. It needs to happen across the board sooner than later, and *everyone* needs to sign on.

THE LOGICAL CHOICE

Logic has always been a great tool for composers, and with the great collection of software instruments available from Emagic, never more so than now. Logic Platinum is a serious contender for anyone involved in post-production audio, including record production and surround mixing. Small complaints aside, Logic Platinum 5.5 is the closest thing to a "desert-island" application I can think of. It has it all, especially with the inclusion of the optional software instruments.

A few areas still need small improvements. I'd like individual Velocities for audio regions, which would be great for smoothing out levels while comping tracks. I wish a few features I'm fond of in Digital Performer were available in Logic, such as the ability to drag the mixer's Mute and Solo buttons without having to click on them individually; an additional layer of unlimited takes in each track, which would eliminate the need to create new tracks for each overdub; and the ability to automatically create a folder for the audio files nested in a project folder. I'd also ask for bounce-to-disk in less than real time (for computers powerful enough to process that quickly).

Emagic must be applauded for its vigorous development of new features and its continued support for OS 9 and Windows (currently, Logic is still the most mature DAW on the PC platform). Apple and Emagic are also to be commended for biting the bullet and dragging us into Mac OS X, which is the future of professional audio production. I, for one, am jumping on the bandwagon. ●

Minimum System Requirements

Logic Platinum 5.5

MAC: PPC 604/250; 128 MB RAM; Mac OS 9.1/X 10.2; CD or DVD drive; USB

PC: Athlon/Duron/Pentium/300; 128 MB RAM; Windows 98SE/2000/ME/XP; CD or DVD drive; USB

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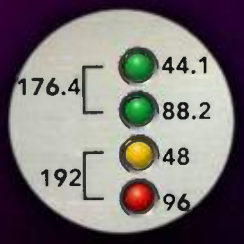

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AKAI

Z8 (MAC/WIN)

Akai's latest offering brings hardware samplers into the 24/96 domain.

By Nick Peck

Akai's new flagship sampler, the Z8, is the latest in a long and popular product line. The Z8 comes loaded for bear with its 60 GB internal hard drive, SCSI and USB connectors, and the capacity to hold 512 MB of RAM. That's enough to toss some pretty big samples around, and the Z8 needs all the space it can get; it enters the audiophile stratosphere by offering 24-bit, 96 kHz sampling.

The 2U rackmount Z8 is top vented and fairly heavy and deep. The front-chassis-mounted power, volume, and record-level controls are big and friendly; the rest of the front-panel controls are on a removable panel that connects to the Z8 with a cable. That lets you access the sampler's controls from a comfortable position while the unit sits in a rack.

FACE-OFF

The removable panel includes eight primary-mode buttons that determine the sampler's current function: saving or loading programs and samples, recording and editing samples, creating programs and multiprogram configurations, editing and adjusting real-time DSP effects, and accessing utilities (see Fig. 1). The details are displayed on a 248 × 60-pixel monochrome LCD. An array of six soft buttons provides access to the most important functions without requiring excessive scrolling or searching through multiple menus. The well-designed matrix of mode and function buttons lets you work quickly and efficiently.

To the right of the display, four cursor keys surround a jog dial. These controls are used primarily for data entry, and they're a bit awkward to use. The buttons are narrow, and the dial takes some getting used to. A nearby Window button opens and closes dialog boxes, and a Shift key, when used with the function buttons, provides access to additional parameters.

Three buttons along the bottom left of the panel provide additional functions: Play triggers the currently selected sample or program, Clipboard lets you copy material to a temporary location for A/B comparison and undo functions, and Q-Link lets you map program parameters to a series of eight knobs for real-time tweaking. The knobs are large and take up the rest of the left side of the panel. Despite their size, however, they don't feel quite as solid as I'd like.

Rounding out the front panel is one of the Z8's two USB ports. That port is designed for USB-based devices such as CD-ROM drives, Zip drives, hard disks, and computer keyboards for typing in sample names.

BRINGING UP THE REAR

The Z8's rear panel is a study in digital connectivity (see Fig. 2). It includes coaxial S/PDIF I/O, a 50-pin SCSI connection for external hard-drive storage, another USB port for connecting to a Mac or PC, and a BNC connection for word clock. Dual MIDI I/O provides MIDI control of 32 separate programs simultaneously, which is quite useful in a sampler with this RAM capacity and polyphony. An option slot accepts I/O cards providing either eight additional analog outputs or two inputs and eight outputs over ADAT Lightpipe.

Minimum System Requirements

Ak.Sys

MAC: any USB-equipped PPC; 8 MB available RAM; Mac OS 8.6; USB Manager 1.21

PC: USB-equipped Pentium/200; 32 MB RAM; Windows 98

The TRS inputs and outputs are –10 dBV balanced, but I discovered a global parameter that lets you set the default output level to –12 dBV. Setting the level to 0 dBu gave the Z8 enough juice to work with a +4 dBu system. Be aware, however, that as you increase polyphony, the increased number of voices may overdrive the output. The lack of AES/EBU I/O is unfortunate on a product that will clearly find its way into high-end studios.

Lifting the cover of the Z8 reveals two PC100 DIMM slots along with 16 MB of RAM soldered to the motherboard. One of the slots is loaded with a 256 MB DIMM. The other slot is tantalizingly empty, waiting for a 256 MB off-the-shelf DIMM to max out the Z8 at 512 MB. A 60 GB internal hard drive comes with a juicy starter set of samples:

FIG. 1: With its detachable front panel and easy-to-access knobs, Akai's Z8 provides convenient control of synthesis parameters and effects. You can also use the knobs to tweak other hardware units.

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strings, brass, drum kits, Minimoog, orchestral and ethnic percussion, a 256 MB grand piano, and much more. The hard drive inevitably makes some noise, but fortunately, it's not that obtrusive.

SAMPLE MY WARES

The Z8 organizes samples within a fairly familiar hierarchy: groups of related samples are organized into Programs, which can be thought of as instruments, such as trombone or orchestral percussion. A sample's region on the keyboard is known as its Keygroup. Adjacent Keygroups can overlap and crossfade, moving smoothly from one sample to another as you play up the keyboard. Each Keygroup offers up to four separate Zones that can contain different samples. You can trigger samples in Zones through Velocity or play them simultaneously when a key is struck. Drum programs don't use Keygroups but simply assign samples to individual notes. You can adjust parameters such as filter cutoff or LFO depth at the Program, Zone, or Keygroup level.

Program parameters include typical subtractive synthesis tools. Two LFOs provide half a dozen waveshapes. Of the three envelopes, one ADSR envelope is hard-wired to amplitude. The dedicated filter envelope offers four rates and four levels, as does an assignable auxiliary envelope. A whopping 36 filter types include a triple filter that gives you three individually configurable 2-pole filters simultaneously. The filters are quite flexible, albeit a bit polite sounding; they didn't grab me on a visceral level. The resonance is ringy rather than squelchy. For certain applications, the Z8 would sound great running through an analog filter box.

The sampler reveals its programming depth at the Matrix Modulation screen, where you can find dozens of modulators, ranging from envelopes to MIDI controllers, that you can assign to 30 Program parameters. You can modulate all Keygroups in a Program or have different controls for individual Keygroups.

A Multi can hold up to 128 Programs, each of which can have its own MIDI channel assignment with individual control over level, pan, and effects send. That's a great way to set up an entire orchestra in a single box with a maximum 64-note polyphony. Multiple Programs assigned to the same MIDI channel will all sound when notes are sent on that channel. You can assign Programs to occupy adjacent key ranges to create splits or splits and layers. However, there is no Velocity split or crossfade programming at the Multi level.

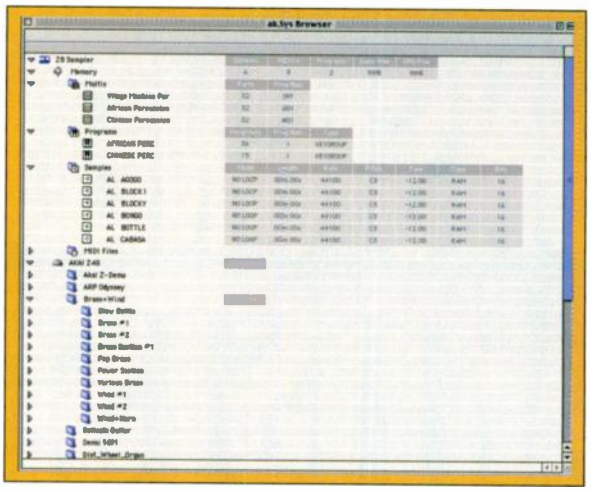

FIG. 3: Ak.Sys creates a tight, friendly interface between the Z8 and a computer.

SOUND IDEAS

The Z8 is compatible with a large number of sample formats, including Akai's S1000, S3000, S5000, S6000, and MPC2000XL and E-mu's Emulator III. Akai expects to add compatibility with the Emulator IV and Roland's S-700 series shortly. The Z8's native file format is WAV, which means it is also compatible with WAV-format CD-ROM libraries.

Sampling with the Z8 is a straightforward and streamlined process. Selecting the sampling mode brings up a page with a level meter and recording parameters. You can select analog, S/PDIF, or ADAT inputs (if you have the ADAT card); or you can select the main outputs as an input source, allowing you to resample the Z8 itself. A recording setup window lets you specify the sample's resolution and whether to automatically normalize the sample. A Pre-Recording Time feature lets you specify a length of sampling time before the recording is triggered, ensuring that the attack of the sample is captured correctly.

Once you specify mono or stereo recording and set the recording time and input level (peak level and headroom indicator displays help with this task), pressing the Record button begins the sampling process. You can sample in one of three ways: manually triggered instantaneous recording, threshold recording when the signal reaches a certain trigger level, or recording when the Z8 receives a MIDI Note On message. After you make your recording, the Z8 lets you audition the sample and determine whether to keep it or try again. If you keep the sample, the Z8 can automatically bring you to a page where you can add the sample to a Program and then determine the original note and key range for the sample.

An Auto-Sampling feature allows you to automatically record and add a series of samples to a Program. Once you begin recording, the Z8 creates and maps a new sample whenever the amplitude falls below the specified

FIG. 2: The Z8's rear panel features coaxial S/PDIF I/O, a 50-pin SCSI port for external hard-drive storage, a USB connector, a BNC word-clock input, and dual MIDI I/O. Stereo analog inputs and outputs are on balanced TRS jacks.

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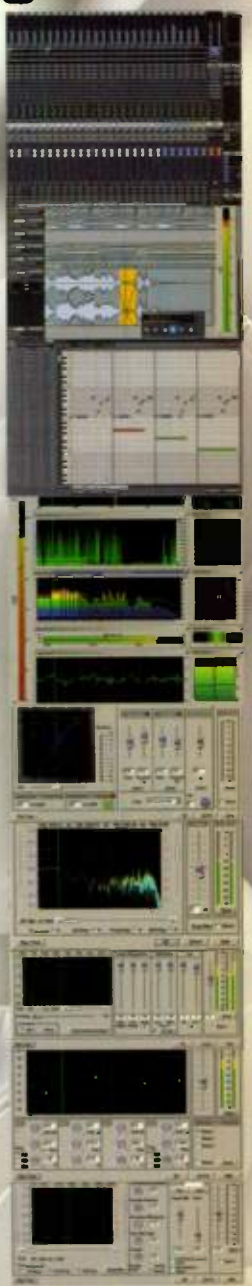
the master of pro audio



Complete Solution

Samplitude offers everything that a digital audio work station requires:
Recording, mixing, editing and mastering – in fact everything up to and including the burning of manufactured Red Book-compatible audio CDs. You can also carry out DVD productions in the standard 24 bit with up to 192 kHz. The feature set is a complete In-the-Box-Workshop, from composing with MIDI and VSTi up to the final CD:

Low Latency Audio-Engine - VST* and DirectX-Plugins - Automatic Latency Compensation in the complete signal flow
External Remote Control - Realtime Room Simulator with Convolution

Outstanding Sound and POW-r Dithering

One of the strongest suits in the Samplitude family is absolute sound neutrality – Comparable in fact with high end analog consoles. The sound always remains full and transparent, retaining its depth without tingeing. Highly developed digital algorithms, absolute phase stability and constant use of floating point computation ensures that the sound retains its positive sound nuances during intensive digital editing. These are: transparency, neutrality, preservation of transients and stereo field, best possible receipt of the signal form.

Samplitude 7 now comes with POW-r, a high-quality dither algorithm. Developed and patented by the POW-r Consortium, it reduces word lengths of 20, 24 or 32 bits to the standardized 16 bit CD format with a high degree of perceptible signal dynamics and low noise level.

Comprehensive Editing Functions

Samplitude offers a huge range of professional editing functions. Recorded samples can be arranged in any way, cut, and be reworked into soft crossfades. Dozens of tools are available. Precision volume and pan envelopes that can be automated while remaining true to the original sample round off the tool pallet. Of course, editing is performed virtually – and therefore non-destructive – so that every parameter can at any time be altered without losing valuable material.

Unique Object-Oriented Editing

As an enhancement to the traditional concept of mixer-supported editing of complete tracks, all versions offer countless possibilities for direct real-time sample editing. Recorded audio tracks can thus be cut into as many objects as you wish. Every object can be edited with individual fades and effects, such as Equalizer, Timestretching, Pitchshifting or plugins. Samplitude also offers Aux-Sends on the object level, the well-known linearphase mastering effects, and a widely variable signal flow.

First Class Effect Setups

From mixing to mastering, all production needs are met: Award-winning equalizers, various dynamic processors, Timestretching, Pitchshifting, Reverb and Delay, plus the high-end mastering effects: Multi-tape compressor, Multi-band stereo enhancer, FFT filter with over 30,000 bands, Amp Simulator, Vocoder, room simulator with folding principle, Denoiser (utilizing the noiseprint method) and Dehisser for real-time noise reduction. Besides routing possibilities for all effects that allow a freely configurable signal flow, these possibilities are not only available to the object level, but also in each mixer channel.

Further features: improved solo effects, unlimited routable busses and Aux-send busses, VST and DirectX plugin support, flexible routing of all integrated and plugin object effects and mixer channel effects.

Burning CDs

It couldn't be easier: Red Book-compatible audio CDs can be burned on-the-fly from the arrangement, without having to take any destructive intermediary steps. The continuously updated support makes sure that even the latest models burn perfectly with Samplitude.

Track Speed and Stable Playback

Intelligent cache management means that the harddisk installed will be used to its fullest capacity – confining to history the old problem of too few tracks while producing with 24 bit/96 kHz. Stable playback: Arrangement playback has priority over all other operations such as opening menus. No more crashing or bumping playbacks!

2 GB File Breakthrough

The Windows WAV file size limit of 2 GB is history. Now you can record up to 2 billion stereo samples. That means 10 hours of sounds in just one file with 44,1 or 48 kHz. Complete radio broadcasts can now be recorded in one take.

Further Features

- Easier handling: Work area presets offer interface clarity whereby only the pallet of the function being used currently is displayed
- 5.1 Surround capability (only Samplitude Pro /Sequoia)
- Midi and VST* instruments (Samplitude Pro/Sequoia)
- Support of all audio and internet file formats, such as Broadcast WAV, MP3, OGG Vorbis and WMA
- Visualizer: optimal metering with highly precise and size-variable peakmeter and spectroscope
- Total control via configurable shortcuts: Samplitude is renowned for its flexibility and effective functionality. For almost every command there's an individually configurable shortcut available (only Samplitude Pro /Sequoia)
- Support of all important driver models: ASIO*, WDM, MME
- Outstanding helpful user community.

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threshold. That's a quick, hassle-free way to pull a number of samples from audio-sampling CDs.

The Q-FX feature lets you route the input signal through the built-in effects processor before sampling. You can specify the standard effects (such as chorus or reverb) or a number of exotic "command" effects (preprogrammed groups of effects using phasing, flanging, or compression), which have such names as "Power," "Robot," and "Undersea." These are great fun for creating instant weirdness. You can also resample your sounds through the effects after you record them.

Every system has disadvantages. In the case of the Z8, selection of regions for sample editing is a major weakness. Editing the start, end, and loop points for your sample can involve twirling the jog wheel until your thumb falls off. You can speed up the process by holding down Shift and moving the cursor keys to raise or lower the resolution of the wheel, but any way you slice it, this aspect of the user interface is clunky and could stand improvement. Editing samples in the computer is still the way to go.

Other than the awkward region editing, the Z8's sample-editing features are complete and easy to use. Sample-editing amenities include trim, sampling-rate conversion, copy, insert, and merge-type processes as well as silence, reverse, pitch-shift, time-stretch, normalize, and change gain.

Q-LINK

The Z8's Q-Link system provides a series of eight control knobs for real-time expression. Each knob can adjust Program parameters and effects settings or send MIDI continuous controller messages to another device. When adjusting Program parameters, such as filter cutoff or amplitude, you can assign a knob to a single Program or to all Programs within a Multi. When controlling effects settings, such as delay time, you can only control one of the four effects from a single knob.

A Scaling feature makes the Q-Link

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PRODUCT SUMMARY

Akai
Z8 (Mac/Win)
sampler
$2,299

FEATURES	4.5
EASE OF USE	4.0
AUDIO QUALITY	5.0
VALUE	4.5

PROS: Has excellent-sounding high-resolution audio. Comes with removable control panel. Reads Akai, E-mu, and Roland sampler formats. Has comprehensive sample programmability.

CONS: Audible, though fairly quiet, hard drive. No analog XLR I/O. No AES/EBU I/O. Sample editing with jog wheel is difficult.

Manufacturer
Akai Musical Instrument Corporation
tel. (800) 433-5627 or (817) 831-9203
e-mail info@akaipro.com
Web www.akaipro.com

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knobs even more powerful. Twisting a knob can either replace the programmed value of the parameter it is controlling or offset the value by a selectable amount. Each knob can also send MIDI continuous controller information in addition to or instead of Program parameter data. That's useful for controlling other devices or sending real-time expression control to a sequencer for playback. The eight little knobs are easy to configure, and they greatly enhance the expressive capabilities of the instrument.

VERY EFFECTIVE

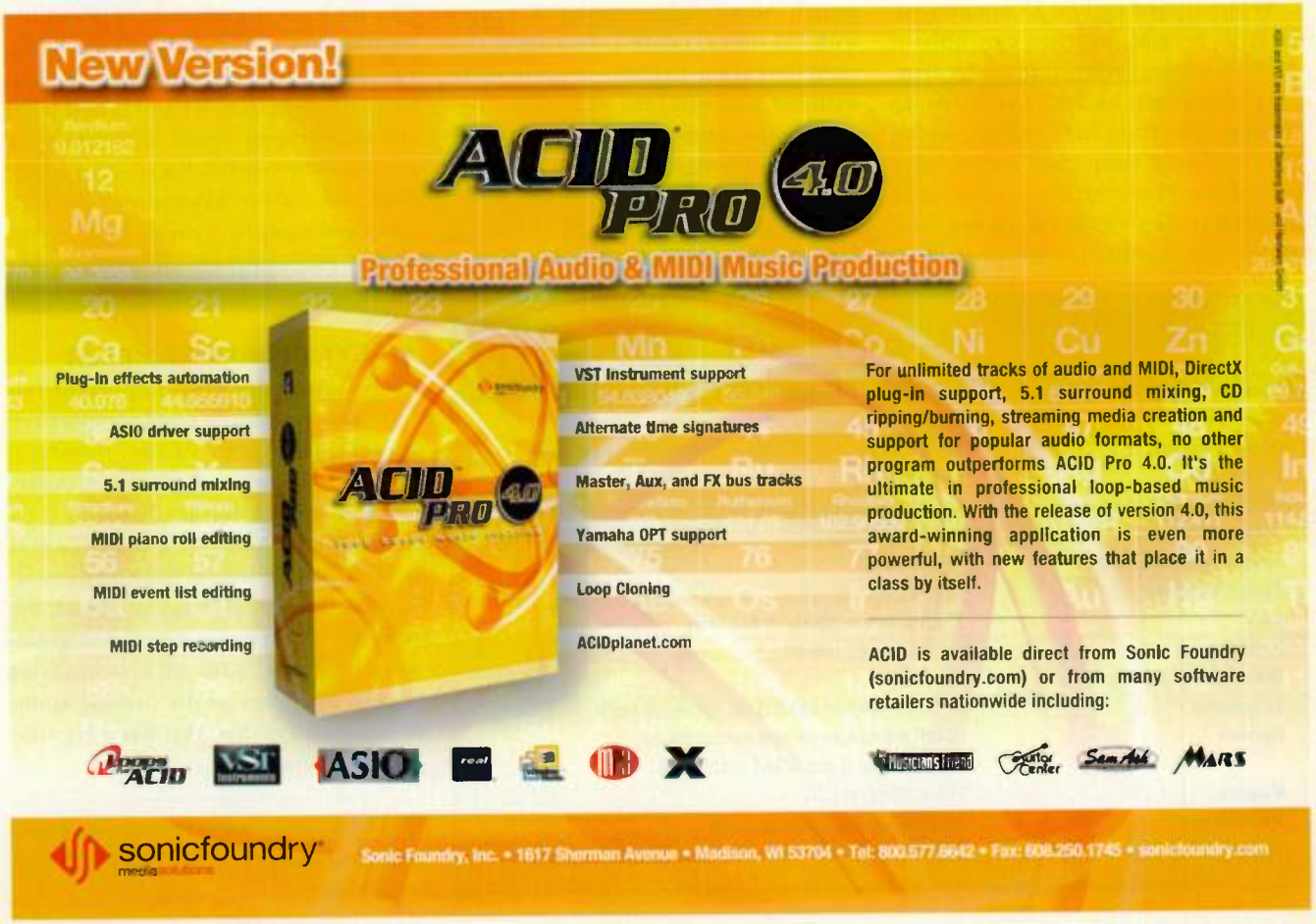
The Z8 comes with four mono channels of 96 kHz effects processing. The 61 types of effects are fairly standard but comprehensive, including chorus, flange, compression, EQ, delay, autopan, wah-wah, pitch shift, and reverb. The effects are clean and perfectly useable garden-variety algorithms, though they lack the character of a dedicated Lexicon or Eventide processor. You can edit any effect's most salient parameters, although the process is easier and more immediate from the computer than from the front panel.

The Z8's effects routing is quite flexible. Each of the four effects channels has a mono input and stereo outputs that you can route to hardware outputs or into other effects channels. In addition, you can link channel pairs for true stereo input operation. Four effects-send buses route different Programs to different effects within the Multi screen. For example, you can route a drum set to a plate reverb, strings and brass to a hall reverb, and a guitar part into a distortion and then chorus, all simultaneously. That flexibility goes a long way toward making the Z8 an all-in-one box for a recording date or for live performance.

JUST ASK THE AK.SYS

One of the Z8's strongest features is its tight integration with computers, made possible by the included software program, ak.Sys (Mac/Win). Compatible with the Z4, Z8, MPC4000, S5000, and S6000 samplers, ak.Sys provides a clean, easy-to-use remote front end. Its finder-like opening window displays the Z8's internal structure, including samples loaded into RAM, Programs, and Multis, as well as the contents of all storage devices connected to the Z8 (see Fig. 3).

You can drag samples from your computer's hard drive and onto the sampler's memory icon, and they will load right into RAM. I've been designing sounds on a tight schedule for an adventure game, and dragging sounds from my library into the Z8 for quick manipulation has been a fluid and effective way of working; it has produced some great-sounding results. Whole folders of data can be dragged from the internal hard drive to your computer's hard drive for storage and vice versa. That's incredibly powerful and a terrific time-saving feature.



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Ak.Sys also behaves like a traditional editor-librarian in that it offers editing windows for Multis and Programs. The windows look nice, are well thought out, and speed up programming quite a bit. Double-clicking on samples in the Z8's RAM opens them for editing in your favorite sample editor, and saving the files loads them right back into the Z8. A virtual-Z8 mode mimics the Z8's front panel flawlessly. The computer reflects any changes made on the physical front panel in real time and vice versa—that's great stuff.

Ak.Sys is not free of flaws. Though the software is up to version 2.53, it's missing some key features, and it can be fragile. Every time you boot the software, the program greets you with a dialog box that cheerily informs you that "No S5000/6000 samplers are found." You can dismiss that annoyance by striking the Enter key or removing the drivers for those units from the ak.Sys folder, but it shouldn't come up at all.

As mentioned earlier, Z8 samples are in WAV format, but you can upload AIFF files from your computer by dragging them into ak.Sys. The software converts files from AIFF to WAV on the fly, creating a temporary file on your hard drive. However, if you try to drag an AIFF from a CD-ROM, ak.Sys complains that the disc is write-protected, and it won't let you do it. The software should have a temporary storage area specified on your system drive for that purpose.

Dragging a folder of samples from the Z8's hard drive to my computer's drive for backup caused the program to crash. An attempt to drag an audio-CD track from the computer's CD-ROM drive onto the Z8's hard drive brought ak.Sys down. Likewise, dragging AIFF files with fairly long names into ak.Sys also crashed the program. Crash problems aside, ak.Sys absolutely rocks. Akai needs to test its software thoroughly and sew up a number of holes in the code. A dedicated effects-editing screen would be a welcome addition, but the basic idea is great.

LISTENING TESTS

The Z8 is a fine-sounding sampler with an extremely low noise floor. Samples that I recorded at 24-bit, 96 kHz captured the subtle dynamism of the source material in detail, and sounds with sharp transients retained their punch. Many of the samples that came with the unit exhibited crisp highs and tight lows at the expense of warm mids; with my new samples, the entire frequency spectrum was well represented. As a sound designer, I was pleased that sound effects kept their sonic character and crisp shape instead of dissolving into mush when pitched down.

I had heard that perhaps the greatest aspect of the Synclavier was its 100 kHz sampling rate: recording very bright sounds with high-end equipment and then transposing them down brought previously inaudible frequencies into the range of human hearing. So I eagerly set the Z8's sample rate to 96 kHz and ventured into territory I had not previously explored. I grabbed a Neumann KM184 microphone, ran it into a Millennia HV-3D mic pre, and sent the signal to the Z8.

I sampled sounds with lots of high-frequency energy: Tibetan prayer chimes, jingle bells, wine glasses clinking, and long pieces of metal clanking against each other. I then played the samples back three octaves lower. The results were quite beautiful; the chimes turned into unearthly bells and gongs, and the jingle bells turned into sounds reminiscent of steel drums.

I routed a Q-Link knob to control pitch and lowered the sample pitch smoothly as I played back the sample. I could hear the previously inaudible higher harmonics slide into the audio range as I lowered the pitch. I then reset the system to 44.1 kHz and tried the experiment again. This time the results were brittle, harsh, and nasty. This was a clear example of the CD-standard sampling rate's inability to accurately capture high-frequency energy.

AN EXEMPLARY SAMPLER

In my book, the most important criteria for choosing a good sampler are sound quality, ease of use, programmability, storage and playback capacity, and sample-library base. The Z8 just nails them all at a price that is half of what I would have expected. If Akai fixes a few bugs in the ak.Sys software and releases a bunch of great-sounding new 24-bit, 96 kHz libraries to take advantage of the pristine audio format, I'd say that Akai has a big winner on its hands.

Z8 Specifications

Analog Inputs	(2) balanced ¼" (–10 dBV)
Analog Outputs	(2) balanced ¼" (–10 dBV); (1) ¼" stereo headphone
Digital I/O	coaxial S/PDIF
Other Connectors	(2) MIDI In/Out; (2) USB; (1) 50-pin SCSI; (1) BNC word-clock in
Sampling Resolution	16-bit, 24-bit
Sampling Rates	44.1, 48, 96 kHz
RAM	272 MB (expandable to 512 MB)
Hard Drive	3.5" 60 GB IDE drive
Maximum Sampling Time	96 minutes
Polyphony	64 notes (44.1 or 48 kHz), 32 notes (96 kHz)
Options	IB48P 8-channel analog output board; IB4ADT 2-in, 8-out ADAT optical I/O
Display	248 × 60-pixel LCD
Dimensions	19.0" (W) × 3.6" (H) × 16.3" (D)
Weight	14.1 lb.

Nick Peck *creates sound for film and games and plays jazz on a 75-year-old piano with no MIDI port.*

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live

The end of sequencing as you know it.

Live 2's revolutionary concept of elastic audio sequencing lets you record, import, arrange and process multiple audio clips and loops into complete songs regardless of their pitch or tempo—all in real time while the music continues. You can even change tempo and pitch independently after the fact. And Live 2 is so simple to use that these are the only two screens you'll ever see.

Start your loops and sessions at any tempo, then change tempo later without affecting pitch—even as playback continues. The music never stops as you play, record, resample and process your audio.

Browse and audition audio clips or even entire songs from your hard disk via the private headphone send, then drag-and-drop them into your session—all while the music keeps playing. All clips automatically stretch to play in sync with the song.

Real-time quantization insures that loops are always triggered in sync. Live's proprietary real-time elastic audio algorithms insure optimal fidelity for all types of source material.

Transpose and detune clips in real time without affecting their tempo.

Trigger clips using the mouse, keyboard or MIDI notes. Operate all effect and mixer parameters via any MIDI controller.

Each row of clips is a scene—much like a song section. Copy and drag clips to create and modify scenes while playback continues. Trigger all clips in a scene simultaneously or independently for break-down passages.

Control up to four effect send channels for each track.

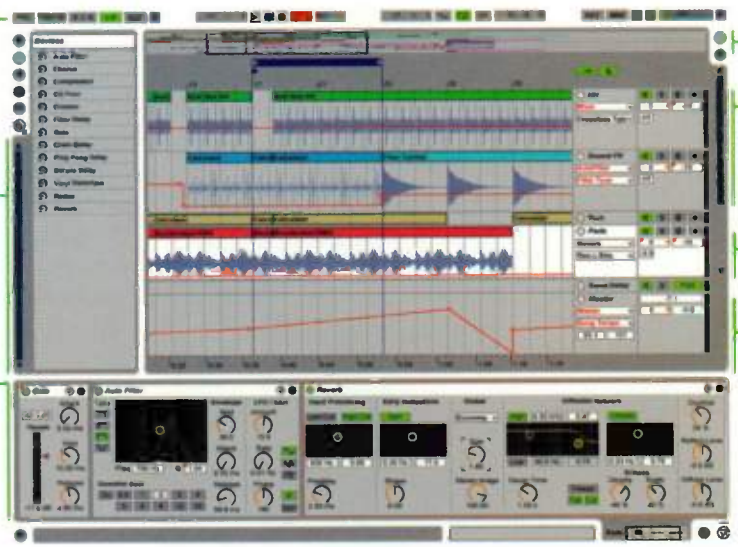
Access multiple inputs and outputs on your ASIO or CoreAudio interface. Connect Live to ReWire master or slave programs to exchange audio and sync.

Change the playback region, length and downbeat of looping clips or one-shots—all while the music continues.

Change tempo during or even after recording, including tapping to sync Live to musicians or the DJ. Elastic audio means that all audio stretches to change tempo and pitch independently anytime you desire anytime you desire.

Live comes with a range of high-impact effects such as reverb, filter delay, ping pong delay, erosion, gate, grain delay, EQ and many more. Add your favorite VST effects as well.

Drag-and-drop internal and VST effects into chains for tracks, sends and master in real time. All effect and mixer parameters are fully automated.



Your entire arrangement is displayed in an overview for quick navigation.

Live captures every action during your jams so you can improvise with total freedom, then edit to perfection later. Edit clips and breakpoint envelopes, add and remove material. Render your work after it's finished.

Record unlimited takes on unlimited tracks. Linear tracks can span looping sections.

Scale tempo over time to conform scores to film and TV.

Live 2 will forever change the way you make music: Easy demos for songwriters. Unprecedented flexibility for composers. New inspiration for performing musicians and DJs. Audio recording for Reason.

"...the Holy Grail of software. Now I do cues in 7 minutes. I had to have it at any price."
—Charlie Clouser, former keyboardist, Nine Inch Nails; composer, Fox TV's "Festlane"

Download a demo from www.m-audio.com.

ableton

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STEINBERG

PLEX 1.0 (MAC/WIN)

No need to be perplexed by this one-of-a-kind synth.

By Len Sasso

This one's different. In the crowded world of plug-in virtual instruments, Steinberg's Plex joins the likes of Native Instruments' Absynth, Antares' Kantos, and Green Oak's Crystal in offering something that looks, feels, and sounds unique. Plex is the brainchild of Wolfgang Palm, inventor of the PPG Wave synthesizers in the 1980s. But Plex is not a software version of the Wave or any other vintage synth; instead, it offers a completely different algorithm, called Restructuring Synthesis, to analyze and resynthesize a library of sampled sounds. Plex's user interface is a bit unusual, but the layout is intuitive and can be mastered in short order. No demo version is available, though you can download audio examples from Steinberg's Web site.

Plex is a VST Instrument plug-in, and accordingly, performance will depend on your VST host software as well as your computer's processing speed. For this review, I tested Plex in Logic Platinum 5.3 and Cubase VST/32 5.1 on a Mac G4/800 PowerBook running Mac OS 9.2.2. The audio interface was an RME Multiface. I was able to achieve low latency along with low CPU usage in both hosts.

Minimum System Requirements

Plex 1.0

MAC: G4/400; 180 MB RAM; OS 9.1/X; VST-compatible host

PC: Pentium III/600; 180 MB RAM; Windows 98/2000/ME/XP; VST-compatible host

THE SUM OF THE PARTS

Restructuring Synthesis begins with a collection of 98 preanalyzed sounds ranging from acoustic-instrument samples to complex synthetic waveforms. The analysis process is not part of the Plex plug-in, and in any case, it's too complex to perform in real time; therefore, you can't use your own sounds in Plex. But because a Plex Preset combines components from three different sounds, you have 941,192 combinations with which to work (check out the EM Web site for MP3 examples of several Presets).

The analysis that Plex uses splits each sound into Top, Base, and Filter components. The Top and Base components are the upper- and lower-frequency spectra of the sound—much as it would sound through steep highpass and lowpass filters. The Filter component is a time-variant analysis of the sound's spectral evolution. You can think of the Filter component as a series of snapshots or frames of the sound's frequency spectrum as it evolves.

Plex's Filter component is probably the most difficult to grasp if you're coming from a typical subtractive-synthesis background. When you sweep through the frames of a Filter component, you don't usually get results similar to changing the cutoff frequency of a typical low-, high-, or bandpass synthesizer filter. It's more like moving through different settings of a multiband graphic equalizer. As you might imagine, some very unusual sounds result.

Plex's Sound Palette holds a maximum of 33 of Plex's 98 preanalyzed sounds (see Fig. 1, left). Right-clicking (Control-clicking on the Mac) a position in the Palette opens a menu from which you can select the sound for that position. The Palette contains icons for the Top (green), Base (red), and Filter (yellow) components. Dragging an icon to a position on the Palette selects the corresponding component of that sound. Thoughtfully, one of the provided sounds is silence, which, if you include it on the Palette, will allow you to audition the Top and Base components individually and without any filtering. The Sound Palette might seem superfluous because each Preset uses at most three sounds, but it allows you to quickly create variations of a Preset by simply moving the component icons around. The MP3 file ReZound is an example of what that can produce.

FIG. 1: Plex's Preset window, shown at right, allows you to select Presets from four Groups of 16 Presets each. The Sound Palette on the left is where you mix and match Top, Base, and Filter components of analyzed sounds for resynthesis.

PLEX YOUR MUSCLES

Each component (Top, Base, and Filter) has its own LFO and ADSR envelope

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To Each His Own

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generators. Those control the level of the Top and Base components in the mix. For the Filter component, they control the frame position and provide many alternatives beyond the original spectral evolution of the analyzed sound. The LFO and ADSR setups are a bit out of the ordinary and contribute a lot to Plex's uniqueness, so let's take a quick look at each.

Fig. 2 shows Plex's LFO controls. An LFO pattern always consists of 16 steps, each of which has a range of 16 values. The waveform buttons below the Wave display call up preset patterns, which you can then modify by clicking in the display. You can use the Smooth knob to smooth the transition between steps; smoothed is good for modulation effects, whereas unsmoothed is good for step-sequencing effects.

The LFOs can be free-running or synchronized to the host song's tempo. When free-running, the Speed knob's scale is logarithmic, with a range of 0 to 100. It would be useful to have it calibrated in milliseconds like the Delay knob, which sets a fade-in time of a maximum 11 seconds for the LFO. In a nice touch, you can link the LFOs by clicking the Master button; the settings of the Master LFO then apply to all three sound components.

Conspicuous in its absence is any provision to apply the Top and Base LFOs to pitch. Although a Pitch LFO is in the Global section, it does not offer the step-editing features of the individual LFOs, and it applies equally to both components. Except for octave transposition, there is no way to tune the Top and Base components separately—for example, to an interval of a fifth. Those both seem like severe limitations that would have been easy to avoid.

FIG. 2: Plex's LFO patterns are actually 16-step sequences. The buttons below the display select preset patterns. The LFO can be free-running or synced to the host's tempo.

Fig. 3 shows Plex's ADSR controls. The first thing to notice is that two ADSR shapes are displayed. The blue one applies to the high end of the MIDI note range, and the gray one applies to the low end. The ADSR pattern morphs from the gray to the blue shape as you move from the low to the high end of a standard five-octave MIDI keyboard.

FIG. 3: Plex's ADSR envelopes morph between two patterns (gray and blue) over the MIDI note range C0 through C5. The curves of the attack, decay, and release segments can be modified from concave to convex.

You can edit the ADSR settings by dragging on the numbered handles in the graphic display or by using the sliders below the display. For each setting, the left slider controls the low envelope and the right slider controls the high one. Having separate ADSR settings allows you, for example, to make the Base component's level increase while the Top component's decreases as you move up the keyboard. Because the Top component of most sounds tends to be quite buzzy in the upper registers, that feature is very handy. (Transposing it down a couple of octaves would be another alternative.) You can edit the curve of the attack, decay, and release segments by dragging between handles, but unfortunately, the same shape is applied to both the high and low envelopes.

The ADSR section contains several other important settings. You can set the effect of MIDI Velocity on the envelope amount and attack time. For the Top and Base components, you can also set the sample-playback start position as well as the effect of Velocity on that position. You can transpose the Top and Base components up or down two octaves, but (as I mentioned previously) you can't tune them separately. Finally, you can set an offset for the frame position in the Filter component, which, together with the Amount control, allows you to restrict the Filter motion to a narrow range of frames. With the amount set to zero, the high and low Offset settings provide a form of filter key-tracking.

▼

The first thing to notice is that two ADSR shapes are displayed.

The final set of Plex controls is in the Global section (see **Fig. 4**). They are the Pitch LFO settings mentioned earlier, Pan controls (including randomization on a per-note basis), MIDI Modulation-Wheel Destinations (which includes most LFO, ADSR, and effects parameters),

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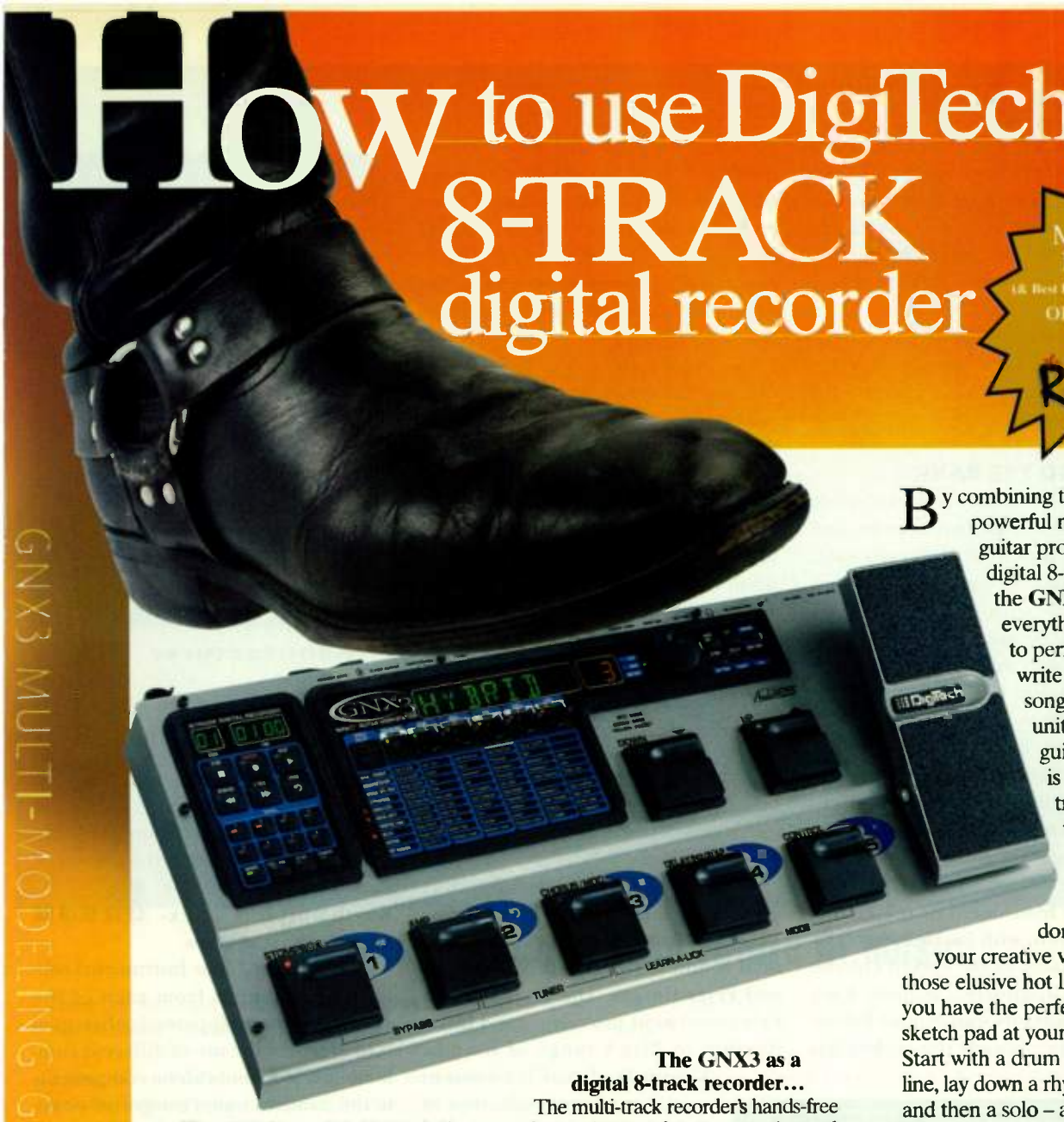

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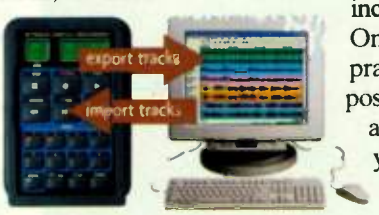

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ALESIS

CLX-440

An affordable, full-featured digital dynamics processor.

By Karen Stackpole

The latest studio tool from Alesis is the CLX-440, a four-channel digital dynamics processor that includes compressor, limiter, expander, and gate functions, all in a two-rackspace box that sells for a remarkably low price. This attractive piece of gear promises to enhance the flexibility and capabilities of any personal or professional studio without costing a small fortune.

ANALOG LOOK

At a glance, it's all but impossible to tell that the CLX-440 is a digital processor (see Fig. 1). The unit's interface is reminiscent of classy analog gear, providing individual knobs for each function and eschewing the menu-heavy LCD-screen navigation that's characteristic of many digital processors and recording devices. With only ¼-inch jacks and no digital I/O, even the unit's rear panel is devoid of evidence that the device is digital rather than analog.

The CLX-440's front panel features a sleek, silver-matte finish with 30 matching beveled knobs. All labels are screened in simple black lettering. In addition to an Input and Output knob, each stereo channel has separate sets of controls for the compressor (top) and expander (bottom) sections. All sections contain Threshold, Ratio, Attack, Release, and Knee knobs; the compressor sections also provide a Detect knob, and the expander sections provide a knob labeled Hold. Each stereo signal path through the CLX-440 has a Limiter Threshold knob at the end for setting the threshold of the dedicated output limiter. The output limiter provides extra insurance against overloading a digital mixdown deck. Although that feature might seem redundant (limiting is also available at the compressor stage), it actually comes in handy in certain situations.

A slightly domed, backlit power button glows when the unit is on. Similar red or green backlit buttons provide a bypass option and sidechain and key engage for each channel. A fifth backlit button engages a global look-ahead function that delays the input signal by 2 ms. (That compensates for the 0.02 ms latency characteristic of the digital processor, allowing for the immediate onset of compression.) Each channel also provides a recessed red LED, labeled Limit, which lights up when limiting occurs.

Four 12-segment LED meters for each stereo channel indicate input and output dBFS levels as well as gain reduction for the compressor and expander. However, if you're looking down at the unit at all, the meter window's overhang all but obscures the tiny numbers labeling the meters.

TO THE REAR

The rear panel of the CLX-440 is simple and uncluttered, providing 14 balanced ¼-inch TRS jacks in two neat rows (see Fig. 2). Channels A and B each have jacks for left and right input, a stereo direct out (which is the sum of the left and right inputs), a compressor sidechain input, an expander key input, and impedance-balanced left and right outputs.

The unit can receive from two stereo sources, essentially providing four channels of compression, or you can use it as a dual mono processor by simply plugging in to only the left input of either channel. A handy switch lets you select +4 dBu or –10 dBV signal levels.

The CLX-440 employs Alesis's proprietary technology (based on the company's patented semiconductor design), including 24-bit, 128× oversampling Sigma-Delta A/D/A converters and 48 kHz internal processing. According to John Hancock, Alesis's director of product development, that translates to less extraneous circuitry and thus lower cost for the end user.

ON DECK

In the studio, I tested the CLX-440 on vocals, bass, acoustic and electric guitars, flute, kick drum, snare drum, drum overheads, and several stereo mixes. I also tried it out on a couple of location recording gigs, which included a live multimic mix to DAT and a simple stereo recording to 2-track. For sonic reference, I put the Alesis unit up against two other VCA compressors in its price range, the dbx 266XL and FMR Audio's RNC1773.

In my home studio, I used the CLX-440 with a Mackie 1202-VLZ and an Allen & Heath 16:2 mixer, processing signals from ADAT, DAT, and CD-R. At Ex'pression Center for New Media, I

FIG. 1: Although the Alesis CLX-440 dynamics processor might look like an analog device, it's digital through and through. As you can see, its front panel provides plenty of hands-on control.

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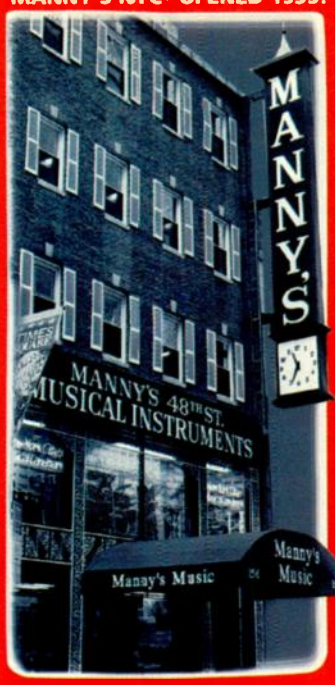

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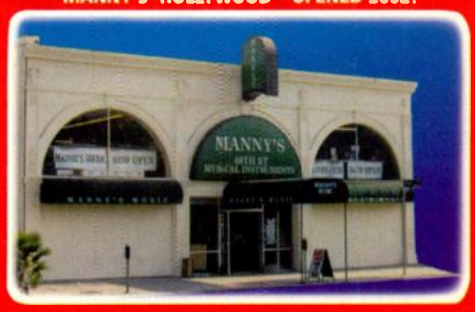

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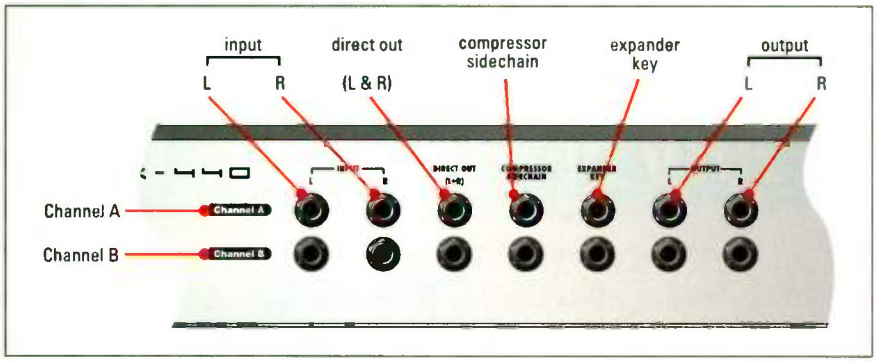

FIG. 2: On the CLX-440's rear panel are ¼-inch jacks for two stereo pairs of analog I/O.

put the CLX-440 through its paces on a Neve VR Legend console, using CD-R and analog tape as sources. I used the CLX-440 for the standard applications of compression, limiting, and gating, and, working with fellow instructor Dave Bell, I experimented with the unit's sidechain and key functions. In both locations, I used the CLX-440 on several mixes.

Overall, I was pleased with the processor's performance and had fun trying out all the possibilities it has to offer. The unit's full complement of controls, its "extra" features such as the Detect and Look Ahead circuits, and the fact that it lets you to set the balance between input and output levels all make the CLX-440 quite flexible.

IN THE RING

The CLX-440 uses a stereo-detection feature that, according to Alesis, prevents shifting of the stereo image. The left and right inputs on each stereo channel are linked so that the hotter side determines the amount of overall gain reduction (based on the selected channel settings).

To test this feature, I ran a stereo mix through a single stereo channel and then, for comparison, ran the left and right channels of the same mix through individual channels in mono, varying the parameters a bit. The linked stereo channel performed as promised, avoiding the occasional imbalance that resulted from running the mix through individual channels.

While working on stereo material, I adjusted the compression controls to achieve different amounts of gain reduction. I was pleased by how clean and transparent the sound was.

A continuously variable detector between peak and average (RMS) levels from the input signal is another nice touch. That feature, called Detect, lets you choose between compression and limiting based on peaks in the material, average input levels, or anything in between. Naturally, the RMS selection allows for a clearer, more dynamic and transparent sound, whereas peak selection clamps down harder on the signal, resulting in a bit less clarity due to the reduction in range. The CLX-440's continuously variable Knee controls (settings range from Hard to Soft) gives users even more options.

On the individual tracks during mixdown, the compressor performed uniformly well, responding smoothly and sounding very clean. The unit doesn't impart any distinctive character to the sound like some compressors do, and it allows for transparent processing that you can adjust for a variety of effects. Because of its transparency and great flexibility, the CLX-440 was consistently reliable on vocals, bass, and drums. At extreme settings—with the attack set to 0.02 ms on a strummed acoustic guitar, for example, and ratio set at 8:1—I was able to coax compression artifacts out of the device,

CLX-440 Specifications

Inputs	(4) ¼" balanced TRS (all –10 dBV or +4 dBu switchable)
Outputs	(4) ¼" impedance-balanced TRS; (2) ¼" direct (all –10 dBV or +4 dBu switchable)
Sidechain Inputs	(2) ¼" balanced TRS
Key Inputs	(2) ¼" balanced TRS
Maximum Input/Output Level	+19 dBu (@ +4 dBu nominal)
Internal Sampling	48 kHz
A/D/A Converters	24-bit, 128× oversampling
Compressor Threshold	–60 to 0 dBFS (continuously variable)
Compressor Ratio	1:1–∞:1 (continuously variable)
Compressor/Expander Attack	0.02 ms–1 sec (continuously variable)
Compressor/Expander Release	100 ms–2 sec (continuously variable)
Compressor/Expander Knee	hard–soft (continuously variable)
Compressor/Expander Detect	peak–RMS (continuously variable)
Look-Ahead Delay	2 ms
Limiter Threshold	–20 to 0 dBFS (continuously variable)
Expander Threshold	100–0 dBFS (continuously variable)
Expander Ratio	1:1–gate (continuously variable)
Power Supply	90–230V, internally switched; IEC connector
Frequency Response	20 Hz–20 kHz
Dynamic Range	103 dBA
Total Harmonic Distortion + Noise	< 0.003%
Signal-to-Noise Ratio	–103 dBA
Dimensions	2U × 6" (D)
Weight	5 lb.

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but typical settings sounded natural and transparent.

Using the sidechain and a parametric equalizer on a Neve console channel, I fashioned a de-esser for a vocal track. (By the way, Alesis recently introduced the PEQ-450, a parametric equalizer designed to be used in tandem with the CLX-440.) I also experimented with the key input on the gate, both to create a gated-reverb effect for a snare drum and to add some 40 Hz *whomp* to a kick drum part. The sidechain and key functions both worked well and resulted in good sounds.

The CLX-440's response and character were similar to those of the 266XL and the RNC, but the CLX-440 had more clarity under heavier compression conditions and offered a higher degree of makeup gain. Even when I used the CLX-440 to apply a squashing 18 dB of compression to a guitar track, the sound maintained a great deal of transparency, and although the reduction in dynamic range was evident, the processing didn't throw a wool blanket over the sound. Other features that set the Alesis compressor apart from the dbx and FMR Audio compressors are its input-gain control and input and output meters that allow you to visually gauge the gain structure when balancing levels during processing.

PRODUCT SUMMARY

Alesis
CLX-440
dynamics processor
$399

FEATURES	4.0
EASE OF USE	3.5
AUDIO QUALITY	4.0
VALUE	4.0

PROS: Affordable. Feature-laden. Flexible. Clean, transparent sound. Informative and well-written manual. Visually obvious gain structure.

CONS: Potentially complex range of options. Numbers on LED meters difficult to read. No digital I/O.

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THE TAMING OF THE SHRILL

The CLX-440 is well suited to a variety of applications; I found it especially helpful in facing the the challenge of effectively compressing a flute track. That task was tough because breath sounds and bleed from headphones had crept into the flute mic and were emphasized when the compressor released between passages. I used moderate ratio and threshold settings on the CLX-440 to attain 6 dB of gain reduction on just the shrillest notes, and I used the expander/gate to reduce the ambient sounds that faded up between passages as the compressor released. The expander setting was tricky, as were the attack and release settings for compression, but some careful tweaking and balancing effectively tamed the problem without sounding unnatural.

For certain applications, I was concerned about the digital processor's inherent latency, so I checked out the possible effects that characteristic might have on stereo material and on individual sources with significant bleed from adjacent instruments. I also tested the look-ahead function, which delays the input signal by 2 ms to facilitate the immediate onset of compression if desired.

The timing test that produced the most obvious results involved sending a bass signal through a prefader aux and bringing it back into another channel of the Mackie 1202-VLZ so that I could process one signal and combine it with the original. Not surprisingly, some comb filtering was evident when the two signals were blended, giving the bass a hollow, growling sound. Engaging the look-ahead function further emphasized the phasey effect.

Admittedly, the test was a little out of the ordinary and was performed only to hear the timing delay. On individual, isolated sources, the inherent 0.02 ms delay is pretty much imperceptible, and stereo material run through a stereo channel shouldn't suffer from latency problems. The delay may pose some issues, however, if you use the compressor for, say, overheads on a multimiked drum set. The latency that results from A/D/A conversion creates the potential for a noticeable effect on the sound of the overheads and the stereo image when all the sound sources are mixed together. Of course, you won't encounter phase issues in every situation, but as long as you're aware of a digital processor's latency characteristic, you can avoid or otherwise compensate for any odd artifacts.

SOUPED-UP BARGAIN

The Alesis CLX-440 is a flexible, feature-rich, and very clean-sounding dual-stereo digital dynamics processor. Its wealth of features might prove overkill in some instances—in live situations, for example, there isn't much time for tweaking—but its range of control options is certainly welcome in the studio. The accompanying reference manual is informative and well written, covering in detail not only the functions of the processor, but also the basic principles and applications of compression and expansion—a real boon for the uninitiated.

The CLX-440 performed well with a variety of instruments and vocals, compressing without coloration or loss of high-end frequencies under high gain-reduction conditions. Although its inherent latency might introduce phase issues when processing sources with bleed from adjacent instruments, the delay is virtually imperceptible in most cases. Remarkably transparent and effective, the CLX-440 offers lots of quality sound-shaping options without costing an arm and a leg. This processor promises to be a valuable addition to any studio looking to expand its dynamics-processing capabilities.

Karen Stackpole *operates Stray Dog Recording Services and teaches sound arts at Ex'pression Center for New Media.* *Special thanks to Dave Bell for his contributions.*

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EGO SYSTEMS

WAMI RACK 192X (WIN)

Plenty of features and an ultrafast sampling rate.

By Allan Metts

Ego Systems has upped the ante for makers of computer audio interfaces. The company's ever-widening product line now includes the WaMi Rack 192X, which brings 192 kHz audio to the table.

The WaMi Rack 192X has four channels of audio input and ten output channels. All its A/D/A converters are 24-bit, offering a wide dynamic range (123 dB for input and 106 dB for output). The unit offers 16 channels of MIDI I/O and has excellent driver support.

The 192X has three components: a PCI host adapter, a 1U rackmountable audio interface, and a cable to connect the two. The 16-foot cable is the longest I've seen in such a product, and the extra length was certainly appreciated in my studio (my rack isn't very close to my computer).

PLUG IT IN

Audio flows into the 192X through four ¼-inch balanced line inputs on the back of the rack unit or through the onboard microphone preamps. The preamp inputs appear as XLR jacks on the front of the unit, complete with switches for 48V phantom power. These jacks are not of the locking variety, and my cables weren't particularly snug in them—a little duct tape may be in order for your critical recording jobs. Switches let you select mic or line sources. Unfortunately, only two sets of phantom-power and input-source switches exist (each switch controls a pair of audio inputs).

Also on the front of the rack unit are level controls for each input channel and a headphone jack with a dedicated level control. The back panel contains MIDI In and Out ports, the line inputs, the host-adapter connector, and eight analog outputs on balanced ¼-inch connectors. A stereo monitor signal appears on a pair of XLR outputs, which carry the same signal as the headphone output (more on this later).

All of the analog inputs and outputs operate at +4 dBu and are not switchable to –10 dBV. That is unfortunate because it prevented me from running my MIDI sound modules directly into the line inputs. The lack of –10 dBV outputs also diminishes the product's capabilities for surround sound—consumer-grade A/V receivers are still a popular solution for monitoring 5.1 mixes in the studio.

A set of coaxial S/PDIF connectors that appear on the host card rounds out the product's audio I/O. I'd have preferred them on the rack unit with the rest of the audio connections (the less I have to fumble around behind my computer, the better). On the input side, the S/PDIF connector takes the place of analog inputs 3 and 4 (switchable with software). The S/PDIF output appears as outputs number 9 and 10 in your software applications. An optical S/PDIF (Toslink) input is available with the MI/O DI/O add-on card, which is sold separately. This optional card also has an additional coaxial S/PDIF I/O along with an extra MIDI In and Out.

Minimum System Requirements

WaMi Rack 192X

Pentium II/350 or Athlon/400; 128 MB RAM; Windows 98SE/2000/ME/XP

Installation on my Pentium 4 running Windows 2000 was painless. I installed the host adapter into a spare PCI slot, connected the rack unit, and switched on my computer. Windows found the new device, I pointed it to the installation CD, and I was up and running. I was a bit confused by the multiple requests to reboot the system, having failed to note the manual's recommendation to ignore all but the last request for a reboot.

AT THE CONSOLE

After installation, you'll use the 192X's Console application to control its features. The Console, which appears in your Taskbar (see Fig. 1), is efficiently laid out and provides most of its functionality in its main window. For example, there you can choose between the analog and digital inputs for channels 3 and 4 and enable either consumer or professional formats for the S/PDIF I/O. You can also select which one of ten different sample rates to lock to, or you can choose to let your audio application select a rate automatically.

If you have more than one 192X in your system (you can install up to four), you'll use a menu option in the Console to enable or disable them. To sync them all together, you'll need to set one card to Internal and the others to CardSync. You can also slave the 192X's clock to an incoming digital audio stream.

The Console's faders are rather fancy.

FIG. 1: The Console provides everything you need to control the WaMi Rack 192X. You can monitor inputs, adjust output levels, and watch your levels on the built-in VU meters.

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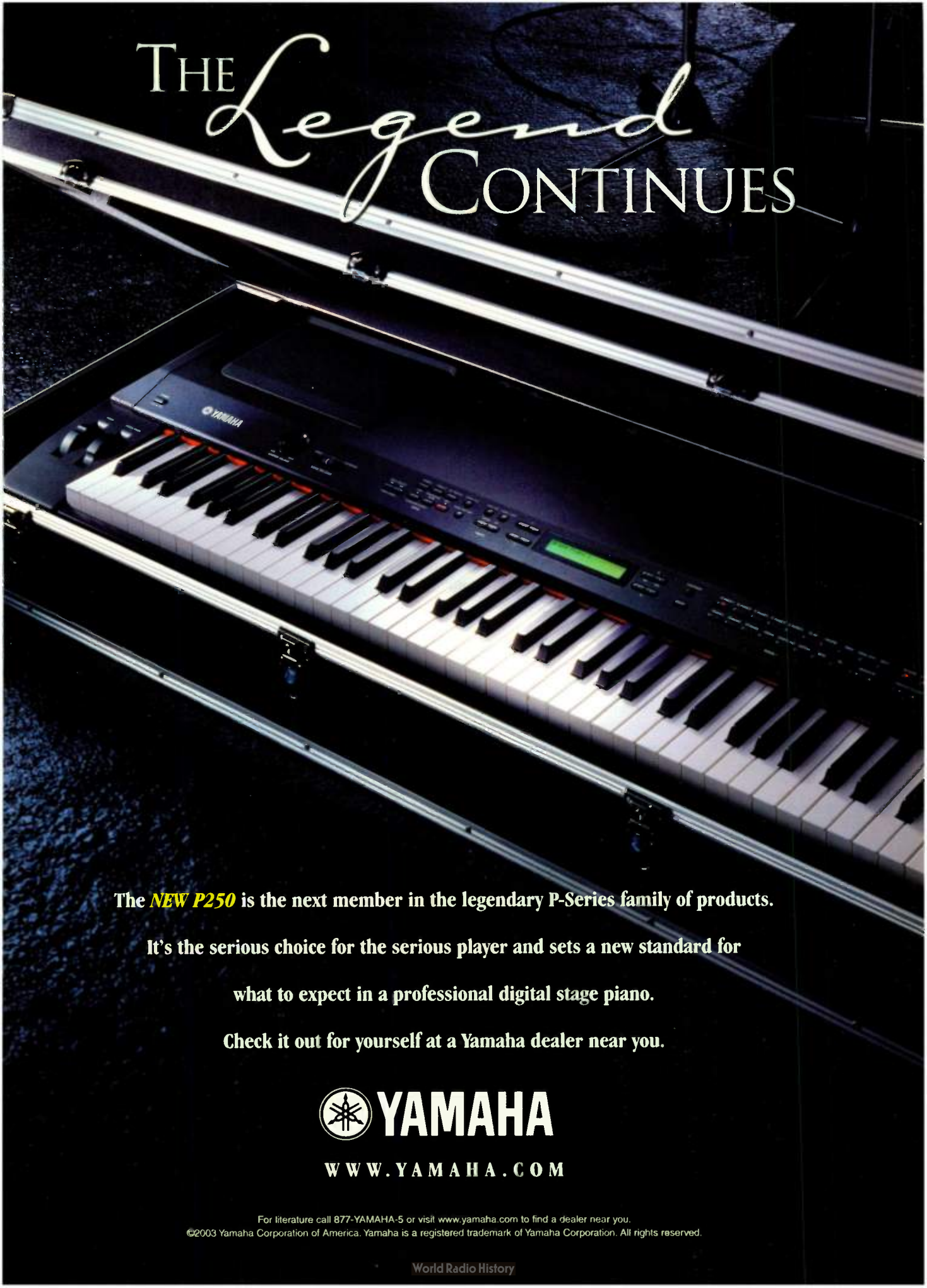
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Each stereo pair is presented with its left and right channels. As your mouse floats over the stereo pair, either the left or right fader lights up, indicating your ability to move it. Put your mouse between the two channels, and you can move both faders at once. If you have a mouse wheel, you can also use it to move the faders; you can even adjust how much the fader should move with each step of the wheel.

The Console has two sets of input faders and five sets of output faders. Each has a stereo VU meter and a numerical decibel display that doubles as a mute button. The input faders don't affect the signal recorded by your audio application. Instead, they control only what feeds to the 192X's monitor mix (you enable input monitoring with a button above the channel 1/2 output faders). If you like, you can monitor your inputs in mono or stereo.

The monitor signal routes to the headphone jack and to the XLR outputs on the back of the rack unit. However, it's worth noting that this is not a true monitor mix—only the four input channels and output channels 1 and 2 can appear here (the remaining eight output channels appear only at the direct outputs). And unfortunately, you cannot send the monitor mix to the S/PDIF output.

I was a bit confused by the presence of four additional sets of faders, which are labeled MME and numbered to match the analog output channels. These faders lack VU meters and represent their position as a percentage rather than a decibel value. I spoke to my contact at Ego Systems about them, and he said he uses them to mute the Windows System sounds. The manual states that I should use them to adjust the output level of the MME driver, which is "sometimes lower than its actual output level."

I'm not exactly sure what to do with them, but I can report that they work. I routed a GSIF-based GigaStudio instrument to the same set of outputs that Sound Forge (an MME-based application) was using. I could hear both signals, which speaks well of the 192X's multiclient drivers. Adjusting the MME fader for the output changed only the Sound Forge signal, and the GigaStudio instrument was not affected.

WaMi Rack 192X Specifications

Analog Inputs	(4) balanced ¼" TRS (+4 dBu); (4) balanced XLR
Analog Outputs	(8) balanced ¼" TRS (+4 dBu); (2) balanced XLR
Sampling Rates	16–192 kHz
Maximum Resolution	24-bit
Digital I/O	(1) S/PDIF on coaxial connectors
MIDI Ports	In, Out
Mic Preamp	4 channel, 48V phantom power
Dimensions	19.00" (W) × 1.75" (H) × 5.25" (D)
Weight	5 lb.

FIG. 2: The exceedingly useful DirectWIRE lets you route audio between different audio applications and driver technologies. You can, for example, send audio from Tascam's GigaStudio, which uses GSIF, directly to Cakewalk's Sonar, which uses MME.

DESIGNATED DRIVERS

The 192X has impressive driver support. In addition to the standard Windows MME drivers, there is a multichannel MME driver (a subset of WDM, which Ego Systems recommends for use with Cakewalk's Sonar), ASIO support, and support for GigaStudio's GSIF. Mac OS X drivers should be available by the time you read this.

GSIF worked well for me. GigaStudio had no trouble finding the drivers, and I could bring the 192X's latency setting down to 64 samples (using a menu in the Console) without any audible artifacts. With this latency, I could play GigaStudio instruments in real time with no noticeable delay. Cakewalk's DirectX Instruments worked just as well in Sonar.

By far the coolest thing about the 192X drivers is DirectWIRE, which lets you route audio signals between the various audio technologies that are supported by the product. For instance, you can send the output of your MME-based DVD-player software to the input of your ASIO-based sequencer or record GigaStudio with your audio editor by routing GSIF outputs to MME inputs.

You make these connections with the DirectWIRE panel in the Console (see Fig. 2). This panel presents all ten channels of the 192X in multiple columns of inputs and outputs. You make a connection by drawing a patchcord, so that connecting ASIO output channel 3 to MME input channel 7 is as simple as a click and a drag of the mouse.

I routed GigaStudio to Cakewalk's Sonar with DirectWIRE, lowered latency settings everywhere I could, and turned on Input Monitoring in Sonar. Out of my speakers came a GigaStudio instrument, playable in real time! When you consider the amount of number crunching taking place, this is nothing short of amazing. Granted, Sonar did switch off its audio engine after a minute or so, but I'm told this has been fixed in the latest version of the software. And just for fun, I managed to record a Sonar DirectX Instrument using Sound Forge.

The 192X's drivers are also well suited

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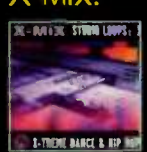
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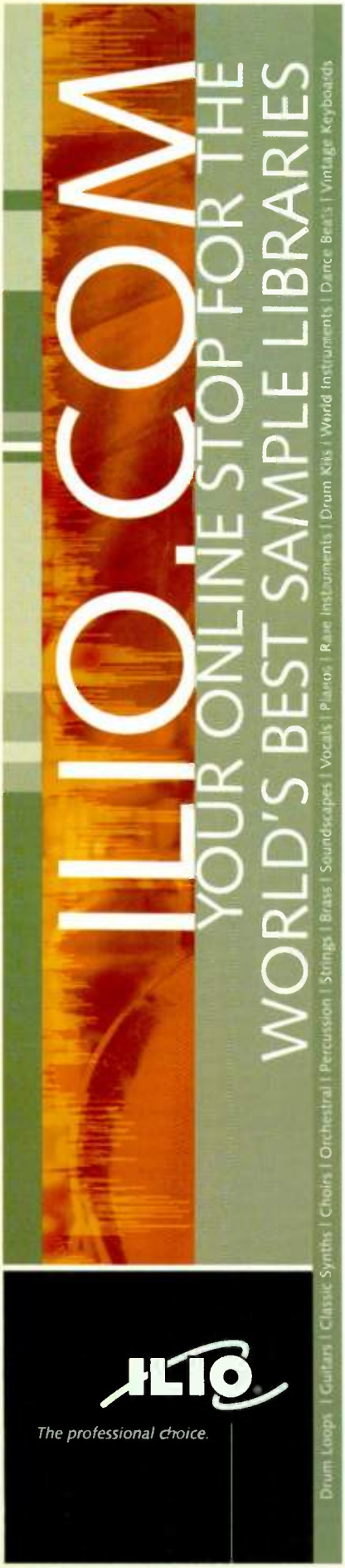

for 5.1 DVD playback. I selected the multichannel MME driver in the Windows Control Panel, then downloaded a trial version of Cyberlink's PowerDVD program and configured it for six-speaker output. I loaded a copy of *Pearl Harbor* into my DVD drive and had the sounds of Japanese "Zeros" in six separate outputs of the 192X. It's a good thing the PowerDVD demo had a time-out feature or I might have missed my deadline for submitting this review!

IT'S ALL ABOUT THE SOUND

To check out the 192X's preamps, I made a number of recordings. For comparison, I made similar recordings with my trusty PreSonus MP20 (a 2000 EM Editor's Choice winner) connected to the line inputs of the 192X. I applied RMS normalization to each recording in an attempt to remove any bias that could be attributed to different recording levels.

The 192X held up well. The MP20 sounded better, but the difference was very subtle—I can only describe it by saying the MP20 had better "clarity" across the frequency spectrum. In recordings with a full gamut of frequencies (such as acoustic piano and guitar), I heard each of the frequency components slightly better in the MP20 than in the 192X. My methods weren't particularly scientific, however, and your mileage may vary. So be sure to listen for yourself before you buy.

I also made recordings at several sampling rates to see if recording at 192 kHz really made a difference. I had no trouble recording at 44.1, 48, or 96 kHz (both at 16 and 24 bits) with any of my audio applications. However, only two of my programs support 192 kHz audio: Syntrillium's Cool Edit Pro and Sonic Foundry's Sound Forge.

Cool Edit Pro wouldn't record from the 192X at this sampling rate; it told me that my device doesn't support it. Sound Forge recorded the audio just fine, but then it gave me a "sampling rate unsupported" message when I tried to play back the audio. I tried reducing the bit depth, and I tried a mono recording. Neither helped. I've made Ego Systems aware of these issues, so hopefully they'll be resolved by the time you read this. (The manufacturer claims that 192 kHz recording and playback works properly under Windows XP with the XP service pack installed.)

PRODUCT SUMMARY

Ego Systems
WaMi Rack 192X
audio interface
$749
MI/O DI/O expansion card $59.99

FEATURES	3.5
EASE OF USE	4.0
AUDIO QUALITY	3.5
VALUE	3.0

PROS: Excellent driver support allows connections across technologies. MME driver supports 5.1 surround sound. Good-sounding preamps. Long host-adapter cable.

CONS: No –10 dBV inputs or outputs. Cables can pull out of XLR jacks too easily. Monitor mixing is limited.

Manufacturer
ESI America
tel (408) 519-5774
email sales@esi-pro.com
Web www.esi-pro.com

I WANT MY WAMI

The 192X is an intriguing piece of equipment. It has a good set of preamps, excellent driver support, and plenty of capability for recording and mixdown (including 5.1 projects, provided you can use the +4 dBu outputs). The documentation is minimal but adequate, though the translation (presumably from Korean) is rather rough. The company posts drivers and manuals on its Web site, but my attempts to retrieve them were often unsuccessful (according to Ego, the main server is in Korea, and the company is working to set up a mirror site).

All things considered, though, the 192X is worth a look. If you're in the market for a new audio interface, go check this one out.

Allan Metts *is an Atlanta-based musician, software/systems designer, and consultant.*

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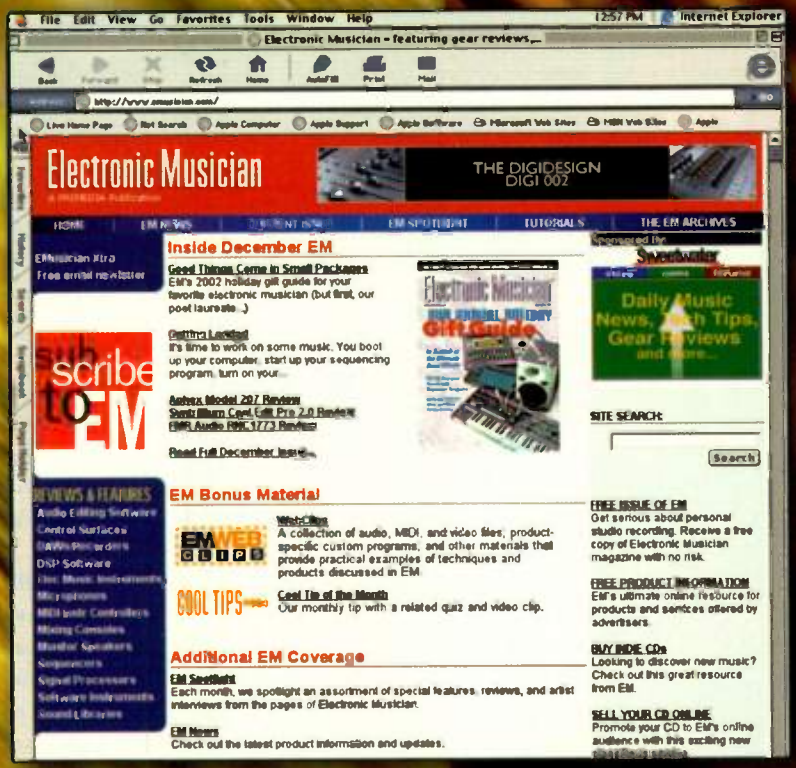

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FIG. 2: Besides the CD-R drive, the front panel holds balanced XLR and ¼-inch inputs and many of the record-related controls.

For example, I plugged the Røde NT4, a battery powered stereo microphone, in to the XLR jacks to record a series of rehearsals in an auditorium. This proved to be a handy setup, but it was also the one time I wished the PSD300 itself could be powered by batteries: I needed an extralong extension cord to power my recording rig from the middle of the third row of seats.

The PSD300's mic preamps have the audio quality of an average portable mixer; they're perfectly suitable for sessions where you want to use a minimum of equipment but still get professional sound quality. When I was back in my studio, I powered the NT4 from an external mic preamp with phantom power (rather than the 9V battery) and ran the signal into the ¼-inch inputs of the PSD300. That arrangement yielded the best-sounding results.

SO MANY WAYS TO RECORD

The PSD300 was designed to cover a wide range of musical uses and offers numerous easy-to-use recording features. To begin with, it has a built-in microphone and speaker. The onboard mic is perfect for informal recording requirements, such as documenting a lesson or a speech, and the speaker is great for quickly checking a recording or dub. The PSD300 records and plays standard CD-R and CD-RW media; it accepts CD-Rs meant for computer data as well as the more expensive CD-Rs intended for music

When you press the Rec Mode button with the CD drive empty, Record mode comes up first, allowing you to use the analog and digital inputs. For analog recording, you can set individual input levels, choose a bandpass or highpass filter, and add automatic limiting with the ALC switch. (Limiting begins when the input exceeds –12 dB.) You can also set the balance between the left and right channels independently for the CD drive or the CD-R drive.

Unfortunately, the button for incrementing track IDs while recording can only be found on the remote. The PSD300 does have a feature that automatically adds an ID every minute; that makes it convenient to search through, say, a recording of an hour-long lecture.

If there's a disc in the CD drive when you press the Rec Mode button, the Rec with CD mode comes up first. In this mode, you can use the internal mic, external mics, or line inputs and record along with the disc in the CD drive. The PSD300's complement of inputs makes this mode very useful, and you can independently set the front panel audio inputs to accept either a mic or a line-level instrument.

PSD300 Specifications

Analog Inputs	(2) XLR; (2) ¼"; (2) RCA
Analog Outputs	(4) RCA; (1) ¼" stereo headphone
Digital I/O	S/PDIF
Resolution	16-bit, 44.1 kHz
Frequency Response	20 Hz–20 kHz
A/D Converters	24-bit, 64× oversampling
D/A Converters	16-bit, 8× oversampling
Digital Input Sampling Rates	11–58 kHz
Accessories	Play/Pause footpedal; hard-shell case
Power Connection	120 VAC
Dimensions	11" (W) × 4" (H) × 9" (D)
Weight	7 lb.
CD-R DRIVE (playback)	
Signal-to-Noise Ratio	85 dB
Dynamic Range	85 dB
Total Harmonic Distortion	0.05%
CD DRIVE	
Signal-to-Noise Ratio	75 dB
Dynamic Range	75 dB
Total Harmonic Distortion	0.1%
LINE-LEVEL INPUTS	
Signal-to-Noise Ratio	80 dB
Amount of Gain	58 dBu
Total Harmonic Distortion	0.05%
MIC LEVEL INPUTS	
Signal-to-Noise Ratio	60 dB
Amount of Gain	58 dBu
Total Harmonic Distortion	0.5%
ANALOG AUX INPUT	
Signal-to-Noise Ratio	75 dB
Total Harmonic Distortion	0.5%

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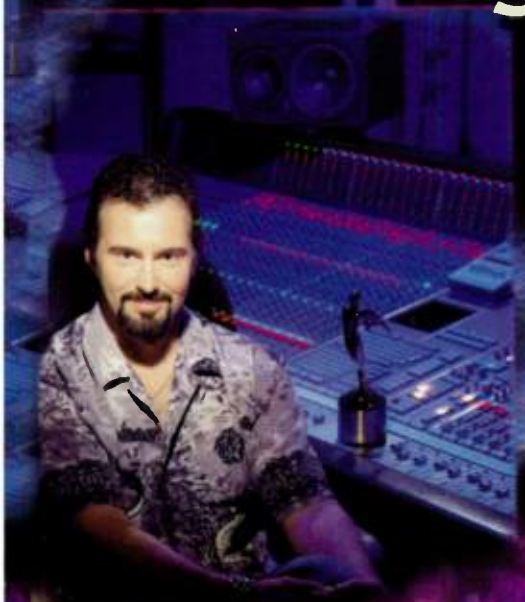

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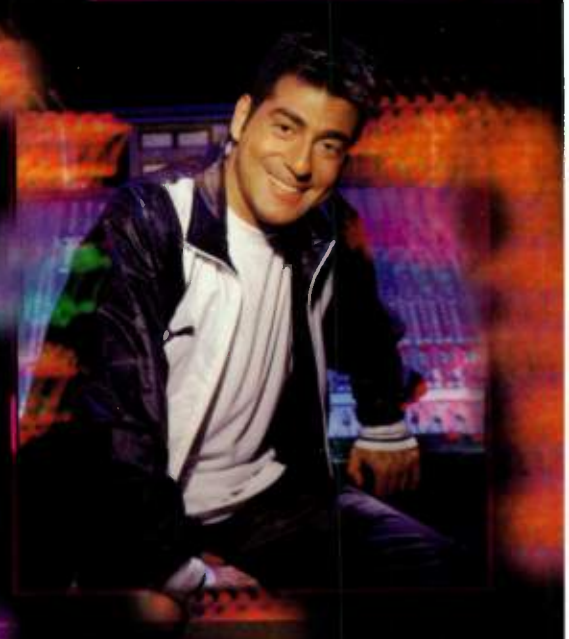

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finalizes the disc when double-speed duplication is finished. If you're dubbing a CD that has Serial Copy Management System (SCMS) encoding—which controls the number of second-generation, "serial" digital copies that can be made—the dub will include the code. However, the PSD300 does not add SCMS encoding.

For the transcribing musician, the Conv Halfspeed mode dubs the selected tracks at double speed, so the tracks you want sound an octave lower and half as fast. The half-speed results have the aliasing artifacts you would expect from such a digital process, but they are certainly usable for the purposes of transcription. In this mode, you'll have to manually stop the CD-R recorder when the CD drive has finished playing your selections.

Like many CD players, the PSD300 includes a Program mode so you can select the order of the songs you want to play back. The Program mode can also be used as you duplicate a CD in Copy + Listen, Copy 2X, Copy 2X + Final, and Conv Halfspeed modes.

The remaining modes include Sync Record, which allows you to initiate recording from an external device (DAT, Minidisk, and so on), and Sync Record+Final, which adds finalization automatically.

The dubbing capabilities of the PSD300 are part of the reason I wanted to do this review. I imagined it would be convenient to be able to give my clients a duplicate CD-R of the event I recorded before they left the venue—and I was not disappointed. Using Copy 2X mode, I found I could often burn more than one copy before everyone was packed up for the night.

PITCH AND TIME

The PSD300 has controls for changing the pitch and tempo of audio coming from the CD drive. The pitch feature, for example, allows the practicing musician to tune a CD track to a fixed-pitch instrument (such as a piano) or change the key of a song for a singer. Slowing down the tempo of a song is great for learning difficult licks, and speeding the tempo up is great for woodshedding a lick once you've learned it.

On the PSD300, you can change the key of a track as much as an octave, in increments of eighth tones, without changing the speed, by pressing the ♭ or ♯ buttons. You can also change the tempo of a track in 1 percent increments—as much as 50 percent faster or 33 percent slower—without affecting pitch, by pressing the + and – buttons. When you change tempo first and then press Key, you change the pitch of the CD in 0.1 percent increments , as much as 20 steps higher or lower. Percentages are not a musically useful way to show the amount of pitch change, but at least the functionality is there.

You can toggle between the original key or tempo and the one you've set by pressing the ♭ and ♯ or + and – buttons simultaneously. The tempo and key changes remain even if you scroll through the tracks on the CD drive. The pitch and time controls work even in Rec with CD mode; I found that very handy.

The pitch and time changes sound remarkably good when used judiciously; the artifacts become more apparent as you reach the extreme settings. But even if you pitch a song an octave down and slow the tempo down by half (which you can do automatically in the Conv Halfspeed mode), the results are fine for transcription or practice. If you want to isolate a musical section to work on, the PSD300 lets you set a loop point manually using the A-B button.

A LA MODE

The PSD300's feature list includes a few nice surprises. Voice Reduction (VR) mode significantly lowers audio material panned in the center, so you can use the PSD300 karaoke-style. This mode works remarkably well when the voice is panned dead center. Sometimes I could hear a very subtle bit of distortion on the material that was being subdued, but that was only when I was listening on headphones with the level cranked way up. The VR mode is certainly a nice bonus on this device.

PRODUCT SUMMARY

Superscope
PSD300
CD recorder
$1,099

FEATURES	4.0
EASE OF USE	3.5
AUDIO QUALITY	4.5
VALUE	4.0

PROS: Two CD drives. CD-duplication capabilities. Balanced XLR and ¼-inch inputs. Digital I/O. Pitch and time independently controllable. Voice Reduction mode. Built-in mic and speaker. Ability to record along with CD. Filters on analog inputs.

CONS: No phantom power. No battery option. Unbalanced RCA analog outputs only. Remote required to increment IDs while recording. Power cable doesn't fit snuggly.

Manufacturer
Superscope Technologies
tel. (630) 820-4800
Web www.superscopetechnologies.com

In Changer mode, the PSD300 will automatically switch between the two CD drives in playback mode: it plays the disc in the CD drive first, then plays the disc in the CD-R drive. In addition, the PSD300 reads and writes CD text. The data Select wheel is used for choosing the text characters.

TAKE ME ANYWHERE

The PSD300 offers a combination of portability and useful features that just about any musician can use. The only drawbacks are the lack of phantom power and the ability to run the device from a battery. These two additions would make the PSD300 a formidable product.

For the price, however, the PSD300 is a superb deal considering it includes a CD duplicator, a built-in microphone and speaker, and handy transcription features. The PSD300 is one item you'll want to take almost everywhere you go. I know I did.

Gino Robair *is an associate editor at* **EM.**

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Quick Picks

ILIO ENTERTAINMENTS

Memphis Horns

By Dan Phillips

You may not know them by name, but you've certainly heard their music. Wayne Jackson (sax) and Andrew Love (trumpet and trombone) have played together for more than 30 years as the Memphis Horns, contributing to some 300 hit records along the way. Among their many impressive credits are Aretha Franklin's "Respect," Peter Gabriel's "Sledgehammer," Sam and Dave's "Soul Man," and U2's "Angel of Harlem." You can get more information about Jackson and Love on their Web site, www.memphishorns.com.

Ilio Entertainments brings the Memphis Horns' legendary sound to your sampler. *Memphis Horns* is available as a two-disc set with both audio and WAV formats ($149) and also as a five-disc set that adds three Akai S3000 CD-ROMs ($299). The S3000 version is also compatible with E-mu EOS, Kurzweil, GigaSampler, EXS 24, HALion, and Kontakt formats.

Smooth Sounds

Memphis Horns includes various hits, swells, and effects, and it emphasizes complete phrases. There are 153 selections in all, ranging in tempo from 70 to 140 bpm. Each phrase is presented in five keys, and most phrases offer the same assortment of keys (C, E♭, F, G, and B♭), making it relatively easy to mix and match the different phrases.

While the basic phrases remain the same in all keys, their specific voicings often change. Apparently, Jackson and Love work out their arrangements without detailed charts. Perhaps they altered the voicings to better fit the tonal ranges of their instruments, or maybe they just wanted to try something different. Either way, the variations provide a welcome organic quality.

Doubling is a characteristic of the Memphis Horns sound, and many tracks are overdubbed two, three, or even four times for multiple sax, trumpet, and trombone lines. The resulting blend is warm, sweet, and soulful. As I listened to the discs, the words *smooth* and *effortless* kept coming to mind. Of course, this is the kind of effortlessness that only comes from decades of hard work!

The phrases themselves run the gamut from moody to move your feet. Some of my favorites on the slow side include the flowing, liquid melody of Honesty (70 bpm); the smooth, lilting groove of Ruff (80 bpm); and the gentle, relaxed slides of Red (90 bpm). In the up-tempo category, I particularly appreciate the easy, brisk sax groove of Class (100 bpm); the staccato punch of Motor (100 bpm); the chugging motion of Express (120 bpm); and the sweet, uplifting sixths of Pages (140 bpm).

Ilio Entertainments' *Memphis Horns* sample CD-ROM collection documents licks and phrases by the soulful, legendary horn section of the same name, for a wide range of formats.

Soulful Seasonings

I tried seasoning a dance-music track with a dose of *Memphis Horns*. Luckily for me, the song was already in the key of C—one of the keys used for most of the disc's phrases. Through trial and error, I figured out which samples were in C major and which were in C minor. The documentation includes tonic keys, but no major or minor designations; Ilio felt that listing major and minor keys would limit the user's perception of the phrases. All but one sample fell instantly into the groove; that last one needed a bit of massaging before it locked in, even though the stated tempo was the same.

As I've come to expect from Ilio products, the material is well organized, with phrases neatly sorted by tempo. The documentation is attractive and filled with entertaining background info. However, I would prefer to see a little more information on the samples themselves, such as whether the keys are minor or major and whether rhythms are straight or swung. It would also be helpful to have key information included in the WAV file names, which are instead merely designated 1 through 5.

These small quibbles aside, *Memphis Horns* is a joy to work with. These guys have great feel, fabulous tone, and a classic melodic sense. Moreover, the recordings are beautifully done. Jackson and Love liken their work to finishing off a recipe with salt and pepper. For adding a quick dash of soulful brass, this set is just the ticket.

Overall EM Rating (1 through 5): 4

Ilio Entertainments; tel. (800) 747-4546 or (818) 707-7222; e-mail info@ilio.com; Web www.ilio.com

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ELECTRO-HARMONIX

Holier Grail

By Gino Robair

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pushed forward in the mix, it still sounded springlike, but without the tell-tale intermodulation you get from real springs. Still, there was plenty of "boing" for surf-style guitar riffs.

One interesting artifact in the effect algorithm is that the short Spring setting resonates at around a concert G. Needless to say, I found myself exploiting the resonance on occasion.

The Hall and Room presets are also very nice when they're blended behind the source signal. They sound especially good on volume swells. Both presets, however, have pronounced early reflections—verging on slap-back echoes—that become increasingly noticeable as you balance the mix toward the wet side.

The Flerb preset sounds great on swells and arpeggiated figures and is a nice addition. In the Long setting, the flanger resonates strongly in a B♭ tonality, which was a little more difficult to work with. But this is one preset where you'll want the mix leaning toward a wet balance.

Open and Shut

The Holier Grail's gate works nicely with the reverb presets, and you can use it on its own by dialing out the reverb signal altogether. However, there are limitations to editing the gate: Gate Threshold is the only gate control other than the two-position speed and direction switches.

More than once I wanted to set a quick attack and slow release on the gate, which, unfortunately, can't be done. But with some careful tweaking of the Gate Threshold knob, I was usually able to find a setting that I could work with.

Another minor annoyance is that you get a pop when you change Gate settings. According to Electro-Harmonix, that happens because the gate is in the audio path. Hitting the bypass switch before you change the Gate setting will alleviate the problem.

Final Chapter

The Holier Grail seems a bit pricey for a digital reverb with only eight presets. However, the fact that you also get a gate (and a bit of flanging thrown in for good measure) helps soften the blow.

Nonetheless, the Holier Grail is a solid, no-frills processor that is quiet and sounds great. Its collection of reverbs will work well onstage and in the studio.

Overall EM Rating (1 through 5): 3

New Sensor Corporation (distributor); tel. (800) 633-5477 or (718) 937-8300; e-mail info@ehx.com; Web www.ehx.com or www.newsensor.com

WAVEMACHINE LABS

Drumagog 3.0 (Win)

By Daniel Keller

Some products make our lives easier simply by doing one thing and doing it right. Wavemachine Labs' Drumagog 3.0 ($269) is just such a product. It's a deceivingly simple drum-replacement DirectX plug-in that makes nearly obsolete the grueling task of replacing drum tracks by triggering external samplers.

Drumagog can be a total no-brainer if that's what you want. Pull it up in an effects slot and assign it to a drum track, and it will trigger a drum sample when the incoming audio exceeds a predetermined threshold. It's quick and easy to use and practically does the job for you, right out of the box.

If you're a tweaker at heart, you'll love Drumagog even more. Delving into its interface is like peeling back the layers of an onion, with new little surprises everywhere. Much thought has been given to the needs of both engineer and drummer, and the result is as powerful as it is easy to use.

Beats Working

By far the most common issue in replacing problematic drum parts is unwanted leakage, where sounds from one or more elements of the drum kit leak from one track onto another. Drumagog offers a number of clever ways to correct this. Triggering levels can be adjusted not only relative to sensitivity (amplitude), but also by duration (what the program refers to as Resolution); that is, how long it will wait after triggering a sample before triggering another. This can come in handy on a track with lots of bleed by allowing you to set retriggering according to

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Wavemachine Labs' Drumagog is a DirectX plug-in that can trigger sampled sounds to replace or enhance drum and percussion tracks. It's also useful for live drum tracks recorded under less-than-optimal conditions.

tempo. For example, if the tempo is 100 bpm and you know the drummer only hits the snare on the second and fourth beats, Drumagog can be set to ignore any signal occurring between those beats, even if it exceeds the programmed amplitude threshold.

You can run audio through Drumagog's bandpass filter to remove unwanted frequencies prior to triggering. Using Stealth mode, audio passes through unchanged until a specified amplitude threshold is reached; then the plug-in crossfades smoothly between the triggered sample and the original track. The trigger level and crossfade time are adjustable. This worked nicely for me on a snare track that had lots of hi-hat leakage.

Auto-ducking mode functions much like a sidechain on a compressor and can also be used to remove unwanted bleed from a track. For example, if you've got too much snare drum in the overheads, simply plug Drumagog in to that track and trigger it with the snare track: it ducks the level on the overheads when the snare track sounds.

Drumagog supports three multisample modes. The Dynamic and Random modes trigger different samples based on input level or at random, respectively. The third option, Positional, will analyze incoming audio and trigger one of several samples—for example, samples of a drum played at various positions on the head. This allows you to create realistic replacement tracks, especially when all three modes are employed simultaneously.

Finger Trigger

One particularly nice feature is Drumagog's Visual Triggering. In this window, a scrolling waveform is displayed on a grid with sensitivity and resolution controls. Visual "hits" are shown each time the audio exceeds the threshold, making it easy to set levels quickly.

Sample management in Drumagog is also easy and intuitive. Samples can be dragged and dropped to different positions in a graphical matrix, loaded from files, or sampled directly from any existing audio track or external source. Entire setups can be saved for later recall. Drumagog supports GIG files, as well as WAV, SND, and AIFF formats, and it offers MIDI output to trigger external devices or software samplers such as Tascam's GigaStudio or Steinberg's HALion.

Drumagog features a number of other interesting features, such as sampling-rate conversion, ghost notes (adding extra drum hits to an existing pattern), and multiple polyphony modes (256 voices for shorter samples or 16 voices for longer sounds). There's also a Choke mode, where a sound is "choked" when the next sound is played. That is very useful for creating realistic hi-hat parts. Plugging Drumagog in to a less conventional audio source can create some pretty interesting results as well. I tried it on bass and clavinet tracks and was able to add a nice "tuned" element to a kick-drum track.

But where Drumagog really shines is in doing exactly what it was designed to do. It's so much easier and more efficient than the time-honored drum-replacement rituals. It may not be particularly flashy or exciting, but in its own way, Drumagog is quietly revolutionary. ❁

Overall EM Rating (1 through 5): 4.5

Wavemachine Labs; tel. (877)-318-WAVE or (847) 208-6150; e-mail support@drumagog.com; Web www.drumagog.com

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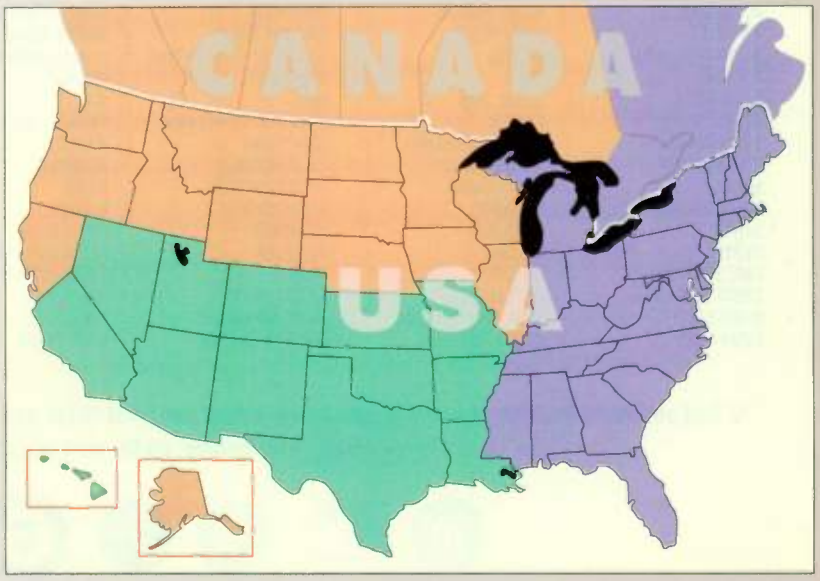

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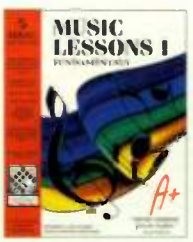

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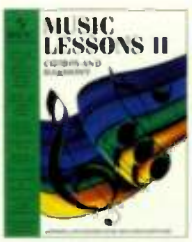

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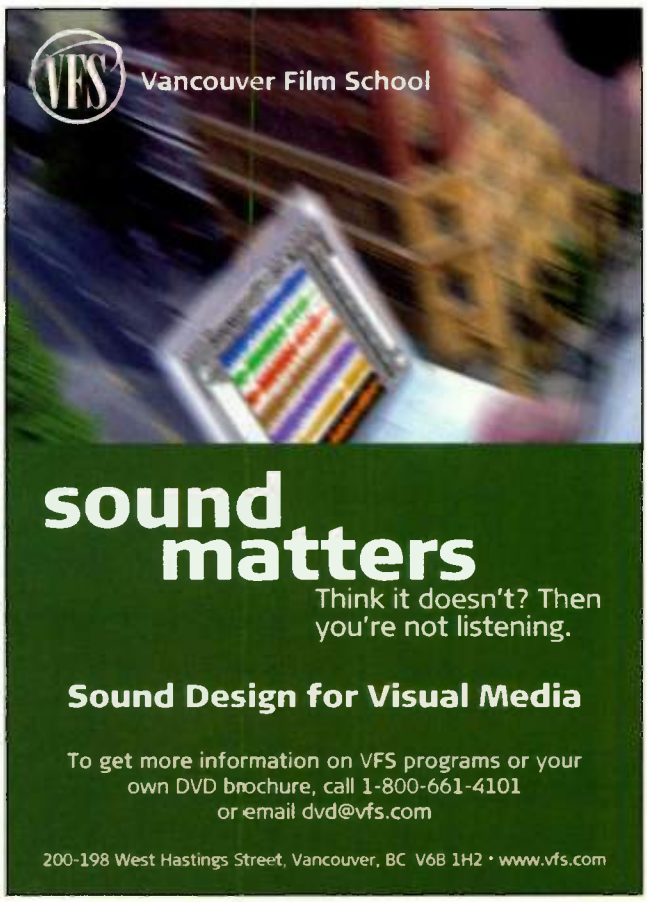

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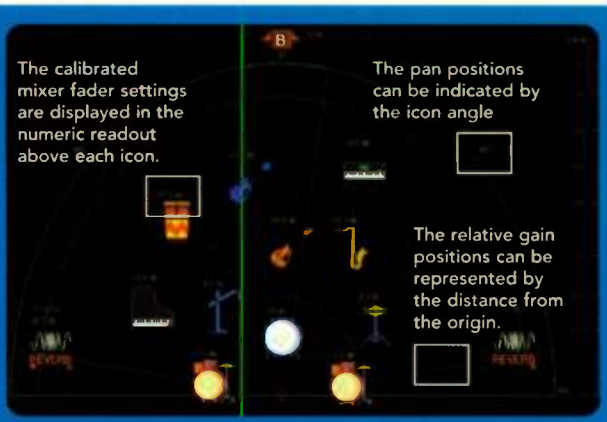

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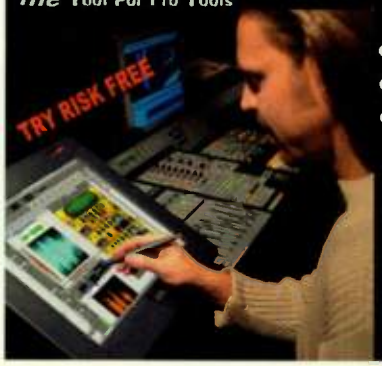

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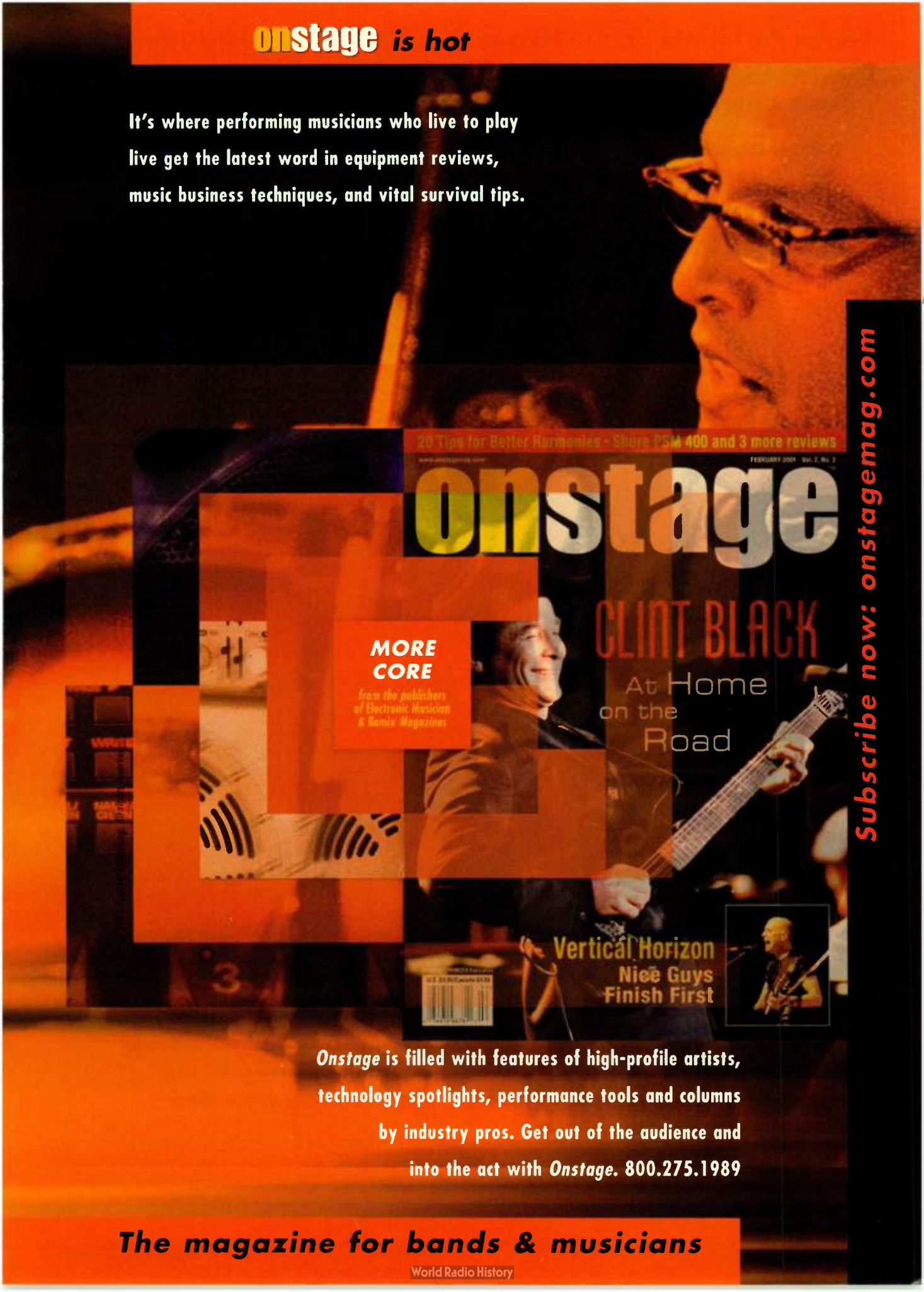

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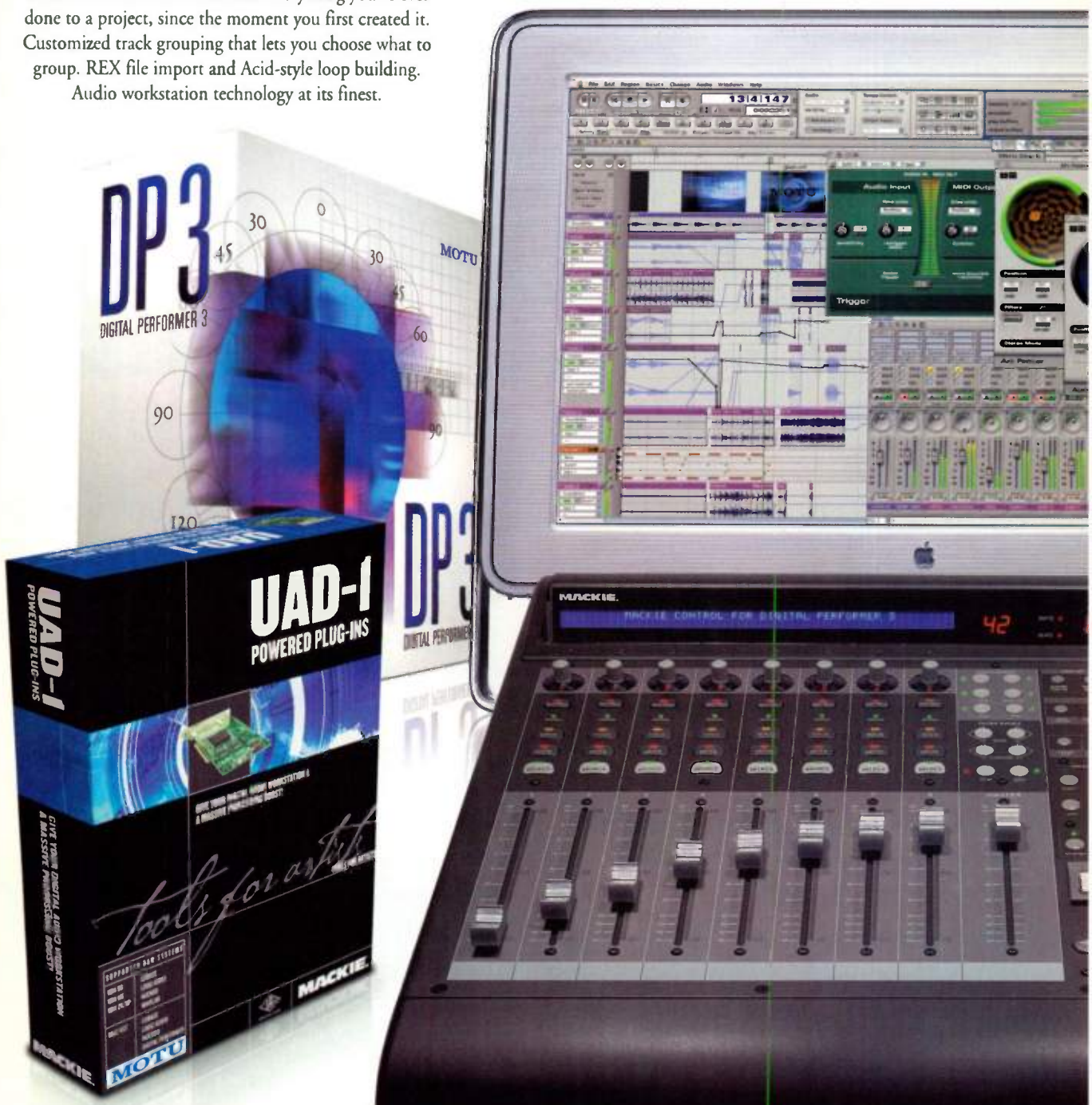

Mackie UAD-1

UAD-1 is a PCI card that allows you to run dozens of sophisticated effects plug-ins inside Digital Performer without bringing your Mac to its knees. What's the secret? A custom-built, monster DSP. It's like adding an extra $20,000 worth of effects gear to the dozens of native plug-ins included with DP.

Mackie Control for DP3

Designed in direct collaboration between Mackie and MOTU, the new Mackie Control automated control surface puts 9 touch-sensitive Penny & Giles automated faders under your fingers (8 plus a master), 8 motion-sensitive rotary encoders, and dozens of custom-programmed switches. Want more faders? Add 8-channel Control XT expanders. You'll feel like you are putting your hands on Digital Performer itself.

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The New Power Mac G4

Dual-processor heaven for Digital Performer.
Don't make Digital Performer sing.
Make it scream.

Spectrasonics Atmosphere™

Introducing Atmosphere: a breakthrough native virtual plug-in instrument for Digital Performer from renowned developer Spectrasonics that integrates a massive 3.7GB arsenal of lush pads, ambient textures and powerhouse synths with a "powerfully simple" user interface for shaping and creating your own sounds with up to one million layer combinations. Features over 1,000 NEW cutting-edge sounds by acclaimed producer Eric Persing.

MOTU 2408mk3 and 24I/O

MOTU's new powerhouse interfaces give you 96kHz analog and digital recording in a system that's expandable to 96 inputs and outputs. Connect all your synths, sound modules, drum machines and effects processors and mix it all from your computer desktop with absolutely zero host buffer latency. Looking for the latest breakthrough in native audio recording? Look no further.

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Applied Acoustics Lounge Lizard

Lounge Lizard is the very first physical modeling virtual instrument for Digital Performer. What does that mean? Incredible realism and warmth. Physical modeling reproduces the sound and feel of a real instrument in ways that synthesizers and samplers can't. Choose from many classic electric piano presets, or shape your own with powerful, yet intuitive controls. Lounge Lizard delivers the complete, authentic electric piano experience to your Digital Performer studio.

TC Works D-Coder

Produced by Waldorf, the legendary German synth company that brought you PPG Wave and Attack, D-Coder is a Vocoding synthesizer plug-in for TC PowerCore and Digital Performer. D-Coder goes way beyond classic vocoder concepts by providing 100 bands (instead of the usual 30 or so) and an integrated tone-generating synthesizer, allowing you to create vocoding effects with no external carrier signal. It's like having a Waldorf Q synth inside DP, but with no processor drain on your Mac, thanks to Powercore.

VoiceMaster Pro/Baby Bottle

The next generation Focusrite VoiceMaster Pro is the complete vocal channel featuring Class A mic pre, Vintage Harmonics processor, Voice-optimized EQ, Opto-compressor, Tube Sound circuit, 24 bit/96 kHz A-D option, revolutionary Latency Free Monitoring and much more. The award-winning Blue Baby Bottle is a handmade, Class A studio mic ideal for recording vocals, percussion, or any acoustic instruments. Add the Blue Pop/Shock kit and you have an oustanding bundle. $1548 retail value, now $999 for a limited time.

BIAS Peak 3

Burn Redbook CD's. Read and write MP3, Dolby AAC™, 24 bit WAVE and more. Batch process hundreds or even thousands of files. Ultra-fast waveform editing. Run standalone or launch directly from DP3. Unlimited undo/redo with graphic edit histories. View multiple audio documents simultaneously. Unique DSP and looping tools like Convolve, Repair Clicks, Loop Tuner™, Loop Surfer™, Guess Tempo™, Duplicate, and more. Hot swap real-time effects in series, parallel, or hybrid using Peak's Vbox™ SE VST matrix. Native for Mac OS 8.6 thru Mac OS X - including version 10.2 Jaguar. Optimized for Apple's G4 Velocity Engine. The ultimate editing, processing and mastering companion for Digital Performer.

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Summit Audio 2BA-221

The better your audio sounds going into your MOTU workstation, the better it sounds period. Introducing the extraordinary new 2BA-221 continuously variable impedance microphone preamp. Mix mic, line, and Hi-Z instrument inputs through the 2BA-221's hybrid vacuum tube output and/or its solid state output. Modular, expandable input design, swept high pass filter, insert jack, and internal power supply make the 2BA-221 a powerful tracking and mixing tool.

Glyph Trip2

Glyph Technologies, the industry leader in high-performance audio storage, brings you the ultimate in FireWire disk storage: Trip2. Early-warning SMART technology alerts you to potential drive problems before they happen. Slide a Glyph-engineered, vibration-resistant (and therefore ultra-quiet) drive cartridge into one of six expansion bays and feel the bullet-proof reliability through your fingertips. Glyph FireWire is the perfect compliment to MOTU PCI on today's latest Power Macs because FireWire disk access and PCI audio streaming are handled on different busses, so you maximize the performance of your system.

Raxxess IsoRaxx

The only sound you should be hearing in your MOTU studio is the sound of your speakers. Simply install your computer, external hard drive or any other acoustically challenged equipment in your studio into the IsoRaxx. IsoRaxx has all of the features you need to keep your equipment safe and quiet, reducing fan and hard drive noise by an average of 21 dB. IsoRaxx's electrostatic filter intake helps keep dust bunnies out of your hard drives, and the lock-and-key front door keeps your gear from growing legs. With IsoRaxx, you won't miss what you've been hearing.

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By Larry the O

You Got to Carry the LOD

As with most arts, the craft of music and audio has a great deal to do with editing. Once you have a collection of raw materials, the process of shaping the final work is largely a matter of deciding what to leave in, what to take out, and how to handle what you've kept. That process amounts to no less than a series of decisions rating the importance of each element under consideration, and nothing could be further from absolute: value judgments depend entirely on context, and most especially on your objectives and your frame of reference.

The most oft-discussed aspect of the editing process concerns density. Many believe the greatest impact comes from restraint; one famous saying has it that "perfection is reached not when there is nothing more to add but when there is nothing more to take away." That's a restatement of the old maxim "less is more"—more or less.

In my view, that is frequently but not always the case: sometimes more is more. Jimi Hendrix felt that the effects and filigree he added in his final rounds of overdubs were the most important aspect of his recordings. Carl Orff's *Carmina Burana* just wouldn't be as rockin' with a chamber ensemble and a vocal quartet as it is with a double orchestra and a 200-member chorus.

This is part of the larger question of the level of detail (or LOD) at which the artist can or should work. The more broadly one considers this question, the more vital and multidimensional the discussion becomes. It is not enough to ask whether more or less detail is needed; it is also necessary to balance levels of detail between different elements and to define what constitutes fine detail.

What does the expression "good enough for rock 'n' roll" really mean? Not that the element under consideration is insignificant, but that, taken alone, its importance to the work as a whole is limited. For instance, some of the greatest rock and jazz music of all time does not adhere strictly to tempo. Carl Palmer often rushed fills in classic ELP recordings; what mattered, however, was not that he hurried noticeably but that the rest of the band stayed locked with him—or that everything was so raging that the tempo variation was okay. Something of greater general importance overshadowed the tempo variation.

An example from the other side of the coin is dealing with noise and leakage on tracks. In the heyday of analog tape, each track contributed a little noise to the mix. The noise of one track was often not objectionable, but 16 or 24 tracks combined sounded like a snake pit. Thus, muting tracks that weren't playing was one of the first essential moves mixing engineers made. An equivalent practice today is to put fades on both ends of every region in a DAW document in order to avoid tiny clicks and unintentionally abrupt attacks.

One of the most fascinating LOD topics is subliminal effects. I'm not talking about one-frame messages urging listeners to buy Flondopowicz Beer, but about the impact of sounds on the edge of perception. The barely perceptible can be incredibly important.

Returning to tempo: what makes it so impossible to sit still while listening to a great blues shuffle? It is the amazingly fine level of detail at which the rhythm section works, both individually and collectively. It is the precise fashion in which they do deviate from that click that makes blues so compelling.

Audio post-production is another area where subliminal detail is important. If you see someone using an expensive 1920s-era silver cigarette lighter in a movie, but the Foley artist used a Bic Flic, something feels wrong for a moment, disturbing the immersive experience of the film.

Editing sometimes makes me think of sculpting, where each tiny chip must be made with the finished product in mind. So, as you place your chisel each time, consider whether you really have the LOD-down on that chip's impact before you swing your hammer.

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

STEVE CURL

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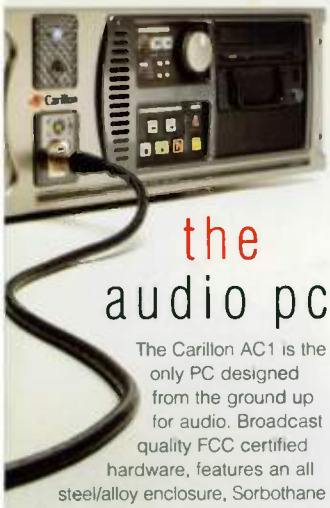

the audio pc

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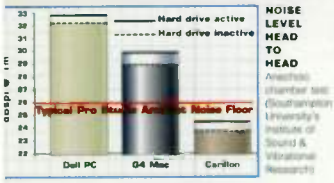

NOISE LEVEL HEAD TO HEAD

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Chis Nutall *Sound Designer: AIR Studios (with Tim Vine-Lott)*

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Chuck Ainley *Producer: Mark Knopfler, Lyle Lovett etc.*

"The Carillon computer rocks! The hardware is beautifully designed and barely audible. It's also really well optimized - Nuendo runs like a dream"

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Sonar Foundation System	$1749	Core Systems from	$1199
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Please visit **www.carillonusa.com** for full specifications

SOUNDCHASER STOP PRESS

As of October 25th, Sound Chaser has ceased normal business. Carillon and Soundchaser have reached an agreement whereby Carillon will be the exclusive source of Soundchaser's most successful configurations, most notably the GigaDAW TK1. All systems will be revised and optimized for Carillon's AC-1 hardware and include Carillon's own 'Fix' remote support and system specific 'How' & 'Help'.

Soundchaser CEO Paul Erlandson said "We are confident that Carillon will provide excellent service and high quality products for all of your DAW and audio needs".

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