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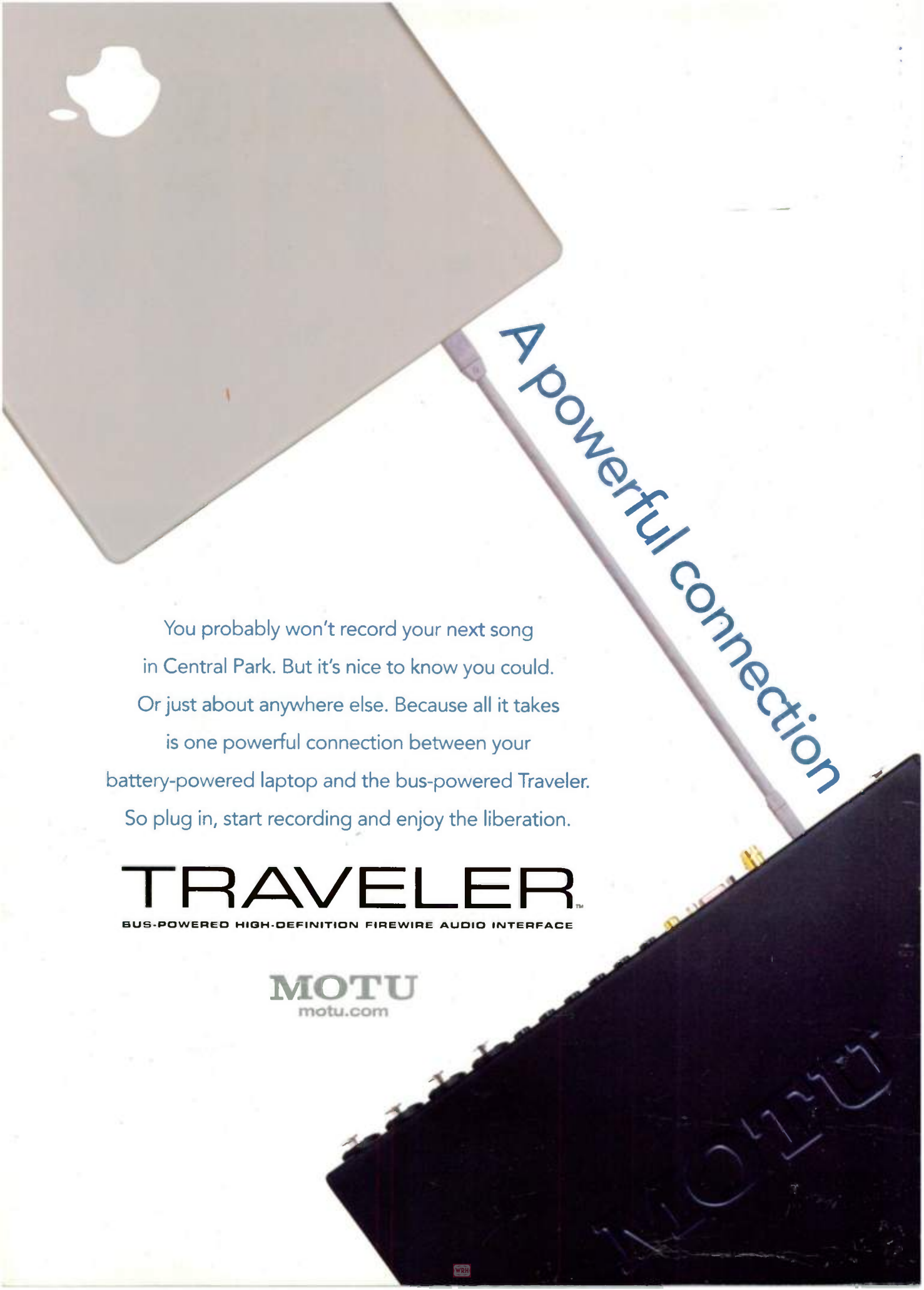

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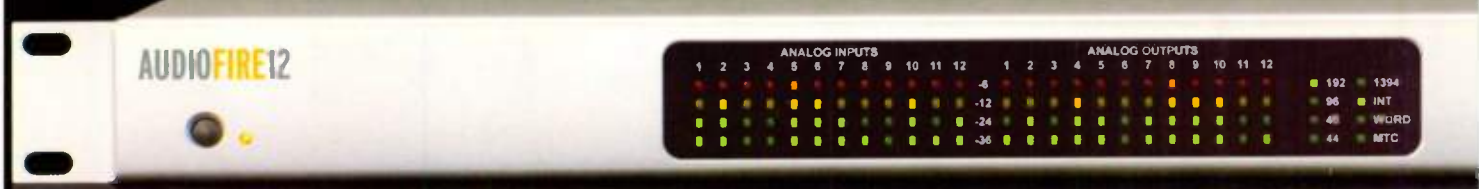

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It's Just Like Starting Over

By Larry the O

"Everyone who got where he is had to begin where he was," wrote Robert Louis Stevenson. "So, what's your point?" asked the "First Take" guy when I called him to toss around my ideas for this column. And I didn't know. Then he offered an intriguing quote from the opening of one of Chaim Potok's books, called *In the Beginning*: "All beginnings are hard, especially a beginning that you make by yourself. That's the hardest beginning of all."

It was an apropos thought and made me realize that, given the importance of beginnings, there must be many fascinating quotes on the subject. Indeed, I found quite a few, which I have woven into the rest of this column. And so, we begin:

Beginnings are a vital part of life. Days break, careers take turns, people fall in love, new works are started, worlds form. A new beginning is meaningful and significant, but its significance may be good ("Things are always at their best in their beginning," wrote Blaise Pascal) or bad ("Resist beginnings: it is too late to employ medicine when the evil has grown strong by inveterate habit," opined Ovid). And its meaning may change over time. In fact, a beginning can involve a complex mix of emotions and can have an assortment of ramifications.

> Moving to a different city can allow you to virtually reinvent who you are.

A beginning may happen by design, like deciding to buy a house or producing a new album. ("First comes thought; then organization of that thought into ideas and plans; then transformation of those plans into reality. The beginning, as you will observe, is in your imagination," wrote Napoleon Hill.) Or maybe a beginning can be caused by a turn of affairs, like meeting someone or having an opportunity drop in your lap. According to Albert Camus, "All great deeds and all great thoughts have a ridiculous beginning. Great works are often born on a street corner or in a restaurant's revolving door."

A beginning is often precipitated by something ending, for example, completing a project or a band breaking up. It may well be that a beginning is forced on you by an ending ("Every new beginning comes from some other beginning's end," said Semisonic).

However it comes about, a beginning can present opportunities and choices. ("The beginning is the most important part of any work, especially in the case of a young and tender thing; for that is the time at which the character is being formed and the desired impression more readily taken," said Plato.) You can take the next step in an ongoing development effort. For instance, if you move your studio to a new space, you have the chance to improve on your last studio, making the layout and systems better based on experience you gained and lessons you learned in your last studio. As Sir Francis Drake proclaimed, "There must be a beginning of any great matter, but the continuing unto the end until it be thoroughly finished yields the true glory."

On the other hand, when you start a new album or other work, it might be the time to change and head in a new direction. Moving to a different city can allow you to virtually reinvent who you are, since you are likely to have different work, new friends, and maybe even live in another culture. (Edith Lovejoy Pierce wrote "We will open the book. Its pages are blank. We are going to put words on them ourselves. The book is called Opportunity and its first chapter is New Year's Day.")

On and on the quotes go, expressing endless facets of beginnings with opposing viewpoints and dissimilar priorities. There is not even consensus on whether it is a good thing to make a beginning (Cesare Pavese said, "The only joy in the world is to begin") or a bad thing (Rainer Maria Rilke wrote, "It is a tremendous act of violence to begin anything. I am not able to begin. I simply skip what should be the beginning"). The points of view I found on beginnings were even more diverse than those I found on sex!

The only agreement then, is on the premise with which I began: beginnings are meaningful and significant. Not exactly a neat tie-up, but, as John Galsworthy said: "The beginnings and endings of all human undertakings are untidy." EM

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When setting up and maintaining a MOTU desktop studio, there are many considerations to factor in to your decision making. Both the hardware and software landscape are constantly changing, and it's hard to keep up with all of the advancements. That's where Sweetwater comes in. Your personal Sweetwater sales engineer offers much, much more than just a great price. They do the research, day in and day out, to ensure that you'll fine-tune your MOTU system to fit your exact needs.

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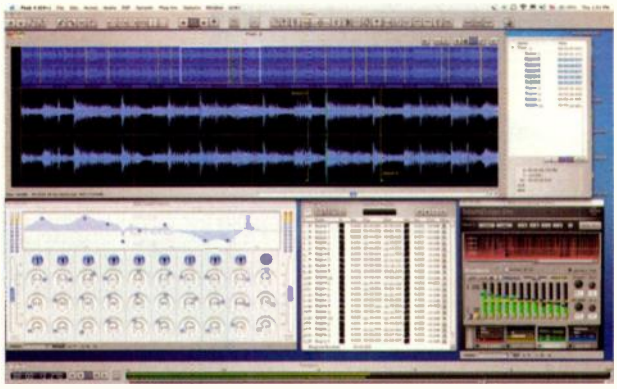

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Bend, mold, meld and morph sounds!

ABSYNTH was used extensively, together with Digital Performer, on the Matrix Reloaded soundtrack by electronica mastermind and Juno Reactor founder Ben Watkins. And now, this award-winning synthesizer hits the scene for the third time armed with a host of new and unique features. ABSYNTH 3 brings dozens of new features that greatly expand its already extraordinary sound spectrum. The powerful synthesizer now incorporates a new user interface with convenient one-window editing, envelope-controlled surround sound features, live audio inputs, real-time fractalization, unison mode, advanced envelope control, 2 new special effects and 256 additional presets. Combining FM and subtractive synthesis, ring modulation, a live stereo input, classic and granular sampling with the most advanced envelope control ever implemented, this unrivalled synthesizer will take you on the most outrageous sonic adventures. There's really nothing else like ABSYNTH 3.

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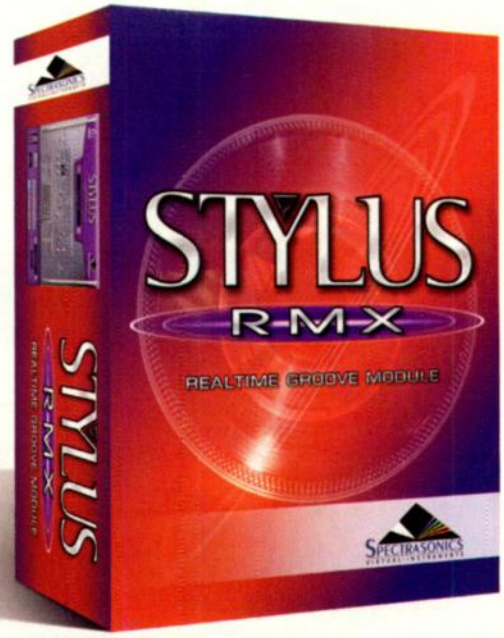
Stylus RMX is the first product to offer the combined power of Groove Control™ with Spectrasonics Advanced Groove Engine (S.A.G.E.™) giving users dramatic new control over groove production. Dozens of new features include a completely redesigned interface, a new 7.4 GB core library of cutting-edge grooves and sounds produced by Eric Persing, and the ground-breaking, always changing Chaos Designer™. Real-time groove creation has never been so simple, and has never sounded so good! Kits and over 10,000 new single-hits, too. RMX is the ultimate Remix-oriented sound module for building millions of grooves.



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Your first choice for convolution reverb

Altiverb broke new ground as the first ever convolution reverb plug-in, delivering stunningly realistic acoustic spaces to your MOTU desktop studio. Altiverb V5 continues to lead the way with cutting edge features. Altiverb V5's ever growing Impulse Response library provides the most diverse and highest quality acoustic samples on the market. Recent additions are shown below from the Altiverb Fall 2004 East Coast Tour. Version 5 delivers more seconds of reverb, more instances, and less CPU overhead than any other convolution reverb. And its new adjustable parameters are a snap to use! Altiverb takes full advantage of the Altivec™ processor in your PowerBook G4 or desktop Power Mac G4 or G5. THE must-have reverb for every MOTU studio.

- Highest quality samples on the market.
- Legendary concert halls and studios.
- Versatile damping and hires-EQ section.
- Click-and-drag 3D sound placement.
- 'Size' parameter shifts resonances and room modes.
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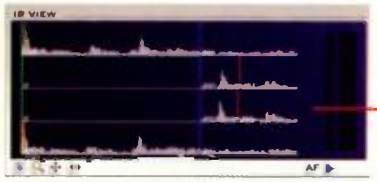
- Waterfall diagram shows time-frequency behavior in 3D.
- Surround up to 192 kHz.
- Snapshot automation for mixing and post-production.
- Available for MAS and all other Mac plug-in formats

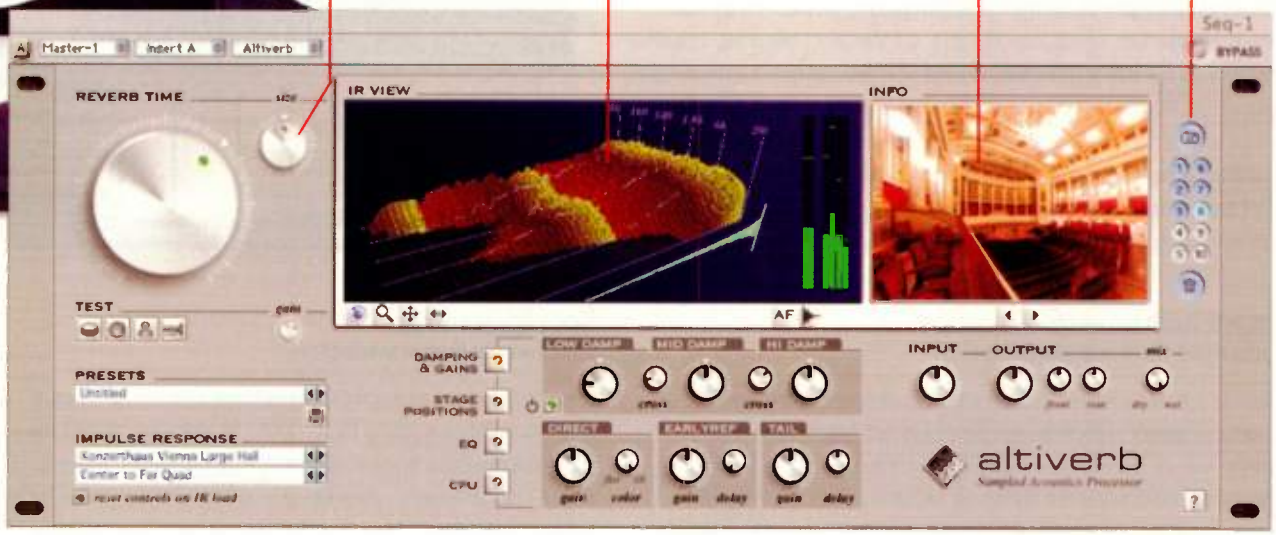


The new multi-channel waveform overview reveals crucial detail about gain levels and timing during the first tenth of a second of a reverb tail. The rotatable and zoomable 'waterfall' (3D time/frequency diagram) reveals even more about Damping, EQ and resonances.

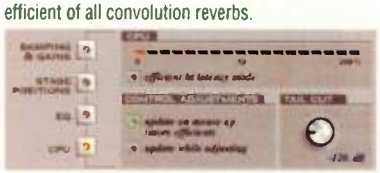
A rotating VR (Virtual Reality) movie helps you feel the presence of each room.

Snapshots let you automate complete preset changes.

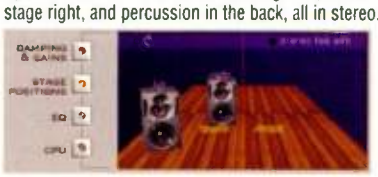
The sizing shifts the frequency behavior of a room while adjusting reverb times.



CPU Control — Altiverb is the most efficient of all convolution reverbs.



Speaker Placer — Put the violins stage left, cellos stage right, and percussion in the back, all in stereo.



EQ — Use up to four bands of EQ, tailored for reverb tail adjustment, to fine-tune the sound.

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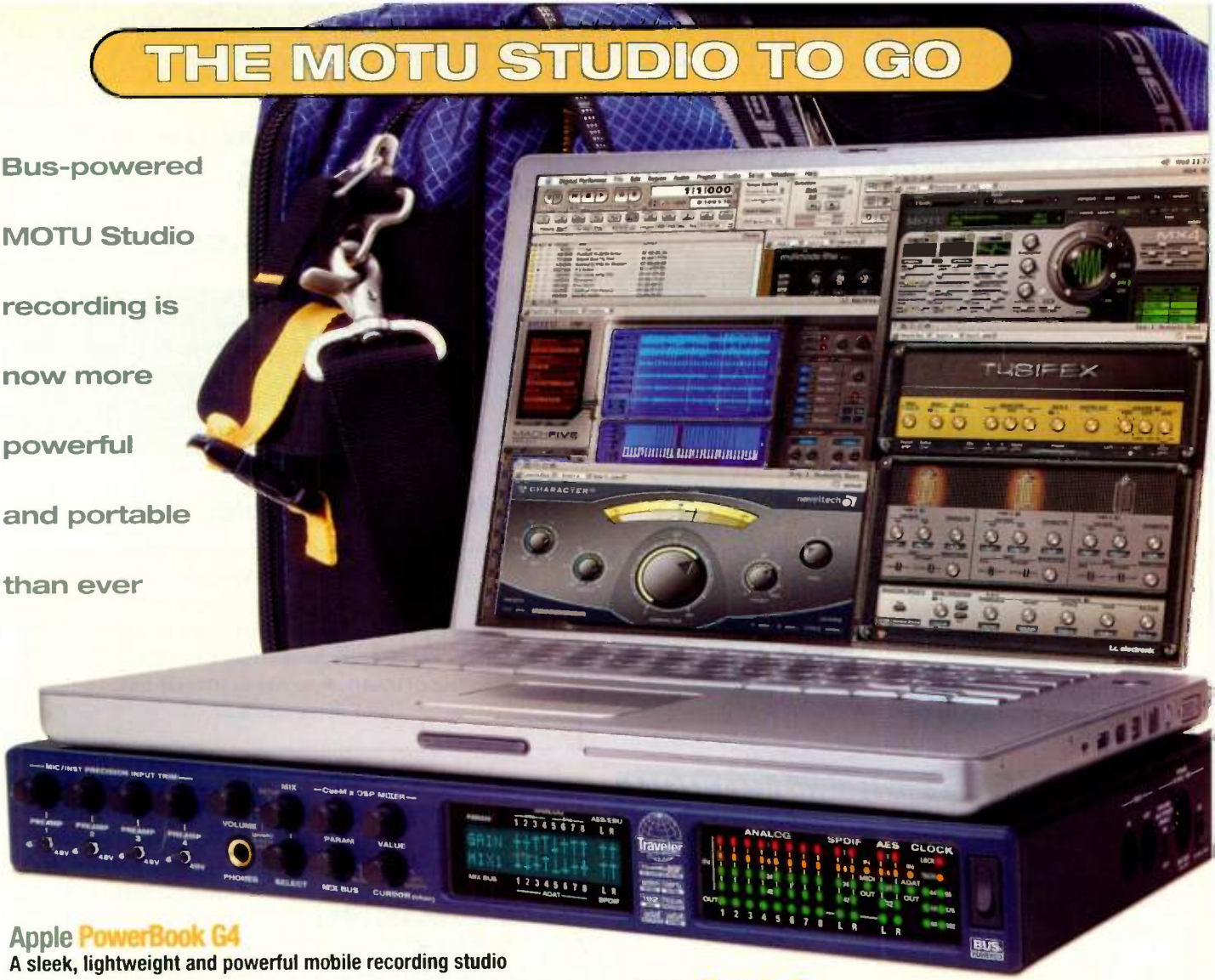

Apple PowerBook G4

A sleek, lightweight and powerful mobile recording studio

Starting at just $1,599, the newest PowerBook family offers more. More power. More speed. More Digital Performer — as in more tracks, more plug-ins and more virtual instruments. Whether you prefer the ultra-compact 12-inch model, the coveted 15-inch powerhouse or the breathtaking 17-inch stunner, every new PowerBook G4 features faster PowerPC G4 processors, with speeds topping the charts at 1.5GHz. Want to create your own CDs and even DVDs? The new PowerBook models offer 4x-speed SuperDrives. The PowerBook G4 is the ideal platform for Digital Performer, the all-new Traveler, and a host of third-party plug-ins and add-ons.

MOTU Traveler™

Bus-powered high definition FireWire audio

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This portable processing powerhouse slides easily into you bag

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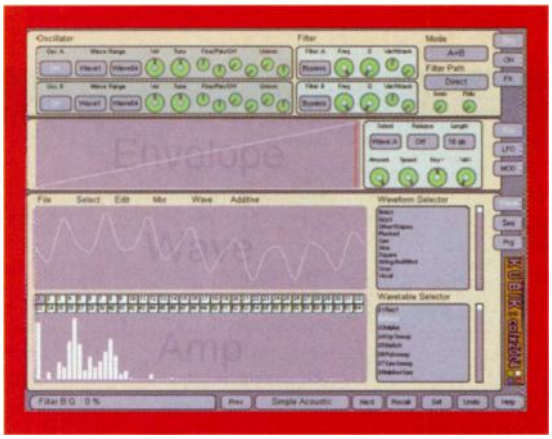

FIG. 1: Kubik's main window contains controls for its two oscillators and filters (top), a graphic breakpoint envelope editor (middle), and a waveform selector and editor (bottom). Each section has alternate views for editing other Kubik components.

All Over the Map

In addition to wave-mixing LFOs and looping, 32-step breakpoint envelopes, Kubik offers four modulation routers, which can target any Kubik control and whose sources include built-in waveforms, a sample-and-hold circuit, and various MIDI controllers. MIDI Control Change messages can also be routed to any onscreen control using Kubik's MIDI-learn function, but the advantage of the modulation routers is that they allow you to adjust the minimum and maximum values and set the slew rate.

Separate LFOs and envelope generators are provided to control each oscillator's wave position within the wave table, oscillator volume and pitch, and filter cutoff frequency. The LFOs allow you to mix sine, pulse, and sawtooth waveforms, each with its own speed and phase. You can set the envelopes to loop between any two breakpoints, segment shapes can be adjusted from concave to convex, and a collection of preset configurations together with a randomize function gives you a leg up on generating interesting shapes.

Wave Steppin'

Kubik really gets interesting when you start working with wavetables, which are collections of 64 or fewer waveforms. Ninety-two wavetables are provided to get you started, but there are also numerous tools that greatly speed up the process of creating your own. In addition to selecting from a large collection of preset waveforms, you can draw in waveforms or create them in an additive window that gives you amplitude and phase control of 64 partials. You can fill just a few of the wavetable slots with individual waveforms, then have Kubik morph or interpolate between them. (Morphing uses the waveform graphics, whereas interpolation uses the additive forms; the results are quite different.) Finally, and most interestingly, you can resynthesize a wavetable from an audio file in two ways: by slicing up the audio file or by extracting single-cycle waveforms from it.

In addition to using an LFO or envelope to move through the wavetable, Kubik includes a 64-step wavetable sequencer, which gets things really jumping (see **Web Clip 1**). Each sequence step specifies a wavetable slot, relative tuning in semitones, step length, volume, pan, filter cutoff, smoothing, and pitch slide. You have a separate sequence for each oscillator, and they can run free or restart with each new note. The sequences always loop, but you can freely set the loop start and end positions. As in the waveform editor, a number of tools are provided for generating interesting sequences, and wave sequences can be separately saved to disk.

Kubik offers a number of performance options, including a full-featured arpeggiator, a latch mode for allowing sequences to run without holding a key down, a variety of portamento controls, and separate pitch-bend ranges for each oscillator. It is well suited for sequencing as well as live performance, and latch mode combined with the wavetable sequencer makes it a great set-and-let-play machine. You can download a time-limited demo and audio examples from the ConcreteFX Web site, and I highly recommend giving Kubik a listen.

EM WEB CLIPS

Overall Rating (1 through 5): 3.5
Concrete FX
www.concretefx.com

duration) and then time-stretching them, Submersible had the drummers record each one at a variety of tempos, generally every 5 bpm over a pretty wide range. You won't always find a loop that precisely fits your song's tempo, but there will usually be one that's close. You can then use your sequencer's time-stretching features to match it up.

You can audition the loops with DrumCore in standalone mode or sync playback to your sequence using ReWire. The latter works great for judging how the loops fit your song, but it can only be done with grooves that precisely match your song's tempo.

You can also export DrumCore's MIDI files directly to Digital Performer (DP), Logic, or Pro Tools. However, those sequencers all handle importation of Standard MIDI Files differently, and in the case of Logic and DP (the sequencers I used for my testing), you're probably better off exporting the files to a folder and then dragging-and-dropping them into your sequence.

At the Source

In its function as a MIDI sound source, DrumCore offers a range of kits constructed of samples culled from the loop sessions. Because of that, Submersible states that the MIDI and audio drum sounds—from the same drummer—can be easily mixed and matched to build a complete part. I found this promise to be mainly unfulfilled. With some exceptions, the samples (the kicks and snares especially) didn't match up closely enough to the sounds in the corresponding loops to make them usable together. (Submersible plans to correct this in the upcoming upgrade.)

Nevertheless, the MIDI kits sound quite good. The sounds are extremely realistic, especially when triggered by the MIDI files from the DrumCore drummers (see **Web Clip 4**). Puzzlingly, there are more variations available in the audio files, even though MIDI files take up so much less disk space.

Both DrumCore's audio files and MIDI files can be put through a unique feature called the Gabrielizer, which generates variations of them based on a user-selectable set of rules. (I'm told that Peter Gabriel suggested the feature to Submersible, hence the name.) You can set it to give you a lot of variation or only a little. The results are hit or miss, but if you're persistent, you can usually generate some usable new loops and fills.

To the Core

Although there's room for improvement, DrumCore 1.0 is an innovative and extremely useful tool for music production. For its loop library alone, the program is worth its very reasonable price, but you get a lot more. Most importantly, DrumCore greatly simplifies the laborious task of putting together a drum track.

EM WEB CLIPS

Overall Rating (1 through 5): 4
Submersible Music, Inc./DrumCore
www.drumcore.com

CONCRETEFX

Kubik 1.1 (Win)

By Len Sasso

Kubik ($90) from ConcreteFX is a wave-sequencing VST-instrument plug-in for Windows reminiscent of the classic Waldorf MicroWave and PPG hardware synths. Loaded with features that make it a synth programmer's dream, Kubik can keep you busy for hours creating unheard-of sounds. If that doesn't sound like fun, you can, by learning a few slick tricks, start with its 14 banks of presets (448 in all) and tweak your way to wavetable Nirvana. Even if you approach Kubik simply as a preset synth, you're in for a treat.

Kubik's sound engine consists of a pair of wavetable oscillators followed by a pair of multimode filters. You can treat it like a standard analog-modeled synth by simply loading a single waveform into each oscillator. The oscillator outputs can be combined in a number if interesting ways, including simple mixing, ring modulation, FM, wave shaping, sample and hold, hard sync, and PWM. In all but the first mode, one of the oscillators acts as modulator. Unison controls allow each oscillator to be doubled with adjustable detuning to fatten the sound. The filters can be in series or parallel, and in addition to the usual suspects—12 and 24 dB-per-octave lowpass, highpass, bandpass, and band-reject—filters include formant, comb, and ring modulation modes. Alternatively, they can act as tuned noise generators.

But if you are a regular user of B4 and want to delve more deeply into the sound of the mighty Hammond, the B4D will help you get there.

EM WEB CLIPS

Overall Rating (1 through 5): 4
Native Instruments USA
www.native-instruments.com

SUBMERSIBLE MUSIC

DrumCore 1.0 (Mac)

By Mike Levine

Submersible Music's DrumCore ($249) is a multifunction, standalone ReWire application that serves as a drum-loop library, a loop database/organizer, and a MIDI drum source. You get over 8 GB of 24-bit audio loops, fills, and samples (on two DVDs) in a wide range of styles, all impressively performed by a stable of stellar drummers including Matt Sorum, Michael Shrieve, Zoro, Alan White, Sly Dunbar, and others (see **Web Clips 1** through **3**). MIDI-file versions of many of the performances are also included, as are hundreds of generic MIDI drum loops covering many pop genres.

You can use DrumCore with any Mac sequencer, but its most seamless integration is with MOTU's Digital Performer, Emagic/Apple's Logic Audio, and Digidesign's Pro Tools. From DrumCore you can export audio loops directly into the audio folders of open sequences in those programs, greatly reducing the tedium of the importation process.

Version 1.0 runs on Mac OS 10.2.3 or higher, and Submersible promises an updated version (v. 1.5) in the first quarter of 2005 that will add Windows support, among other features.

Core Features

DrumCore's interface is a snap. When you open its main screen, you choose by drummer or style and then from a list of available Grooves. The Grooves contain assorted loops and fills, both MIDI and audio, which show up as icons in the screen's bottom window. Click on an individual icon to start playback through CoreAudio or through your sequencer using ReWire.

You can search for the part you need using DrumCore's database, which makes it easy to hunt for particular feels, time signatures, individual hits, and file types. You can even import other drum libraries to be included in future searches.

A tempo dial shows you the available tempos for the loop you've selected. Rather than recording one version for each loop or fill (which are typically one measure in

DrumCore gives you the ability to quickly locate, audition, and export loops and MIDI files from its library of performances by top-flight drummers. It also functions as a MIDI drum module.

distinctive styles through their nimble manipulation of the tone controls. Native Instruments, in conjunction with Boehm Music International, have released the B4D ($449; $559 bundled with B4), a drawbar MIDI controller for Native Instruments B4 that allows the virtual tonewheel organist to take advantage of the vast tonal possibilities of the software instrument.

The desktop-style unit is small and portable enough to sit atop mid- to full-size MIDI keyboard controllers. The B4D's rear panel includes MIDI In and Out ports, two control-voltage footswitch inputs, proprietary Link and Swell ports, and an input for the hefty wall wart. The Swell jack accepts a volume pedal made by Boehm, and the Link ports can be used to tie multiple B4D units together. The B4D is compatible with systems that run B4—Mac OS 9 and OS X, and Windows 98, 2000, ME, and XP—and it supports VST 2, Audio Units, RTAS, DX, ASIO, as well as standalone operation.

The B4D organ controller offers lifelike control over Native Instruments' B4 virtual drawbar organ.

Cozy Up to the Bars

The B4D features a set of nine drawbars, colored and oriented the way they would be on a real Hammond organ. These drawbars feel more like the ratchet-style drawbars of the earlier model C2 organ, rather than the smooth drawbars of the C3 and B3. Above the drawbars and to the left are controls for percussion, vibrato/chorus, and Leslie speaker settings. These include On/Off and Slow/Fast buttons for the Leslie; On/Off and V1/V2/V3/C1/C2/C3 buttons for the Vibrato/Chorus section; and On/Off, Soft/Normal, Fast/Slow, and Second/Third harmonic buttons for percussion.

The preset section has six 2-position Select buttons, a Bank button, and increment/decrement buttons. This arrangement makes it easy to have all of your favorite organ sounds available for spontaneous on-the-fly selection. The three-drawbar selection buttons specify whether B4D is currently controlling the upper manual, lower manual, or pedal settings of B4. The volume and overdrive knobs are positioned above the preset selection area.

Getting Jazzed

I plugged the B4D into my MIDI interface, placed it on top of my MIDI controller, installed the B4 software, and was immediately up and running. The buttons are not physically similar to those on a Hammond, nor are they oriented in a layout that an organist is used to. Nonetheless, it took only a few minutes to get acclimated to their locations, and for the first time for me, B4 took on the character and fluidity of a real Hammond organ. All the controls responded as they should, and the inclusion of an overdrive knob added an extra twist that is unavailable on a real Hammond: the ability to increase the growl and distortion of the instrument over the course of a solo (see **Web Clip 1**).

The B4D can also function solely as a MIDI controller. If you don't have two-way MIDI communication between the B4D and your computer, preset changes in B4 won't update the corresponding LED settings on the B4D, which can be confusing. To trigger this behavior, you have to enable B4D Controller Dump on Program Change from the File menu. In my opinion, this should be the default behavior. In addition, the drawbars are not motorized, so preset changes in B4 will not update their hardware physical position, regardless.

Drawn In

I love the convenience of software-based sound generators, but always miss the physical controls of their hardware counterparts. The B4D solves this problem nicely for Native Instruments B4, elevating its expressiveness and usefulness significantly.

The B4D is a niche device, and 450 bucks for a single drawbar box might make you consider saving your pennies and buying a full-size organ keyboard with all the trimmings.

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Software's RAX using a Mac G4 with a dual-1.42 GHz processor and 2 MB RAM. Installation was an easy—albeit labyrinthine—task which involved challenge-and-response routines and downloading a special file that helps authorize a hardware dongle. Although I'm not happy about having yet another hardware dongle on my system, at least Yellow Tools lets you use this one to authorize the program on a second computer.

Covering the Basses

The instruments in this collection include a Hofner Beatles Bass, a Warwick Streamer Fretless, an Epiphone Jack Cassidy Signature model, a Fender Precision, and a fretless Fender Jazz bass. The articulations include picked, slapped, fingered, and muted notes recorded using a DI as well as miked British and American tube amps. Majestic also includes two very fine-sounding acoustic basses, with equalized variants.

After you have registered Majestic, you can download variations of the instrument collection, which are labeled "Warm" and are processed with different EQ settings.

Yellow Tools Majestic provides natural-sounding sampled electric and acoustic basses, with plenty of realistic performance artifacts.

This makes the Majestic bass collection suitable for use in a wider variety of musical styles.

Eight assignable slots, called Layers, comprise a Multi in Majestic, and each Layer holds a single program and its associated keymap. Each Layer can receive on its own MIDI channel or in Omni mode. Most often, Layers constitute components of a single, expressive instrument rather than providing a variety of basses over multiple channels. Because each articulation occupies its own Layer, discrete MIDI Controller assignments can bring any Layer to the fore.

Sample Layers include ghost notes, alternate scales and string choices, upward and downward slides, taps, slaps, and harmonics. Among my favorite instruments are the DI Fretless 1 featuring a lush, natural vibrato (see **Web Clip 1**) and a very lifelike upright bass.

Overall, the presets are nicely programmed, and the envelopes provide the basses with a realistic, animated musical "bloom," as if played through subtle soft-knee compression. The addition of a Hold parameter to the otherwise typical ADSR emphasizes the attack stage and endows the instruments with a bit more punch, if needed.

Majestic eschews filters and LFOs as a means of imitating real-world acoustic behavior. Instead, Velocity, Modulation Wheel, Note Number, and other MIDI controller messages bring in alternate playing techniques, fretting noise, vibrato, and more. Techniques such as vibrato offer new samples for contiguous keys rather than interpolating a few samples. The sources for modulation are sensible but somewhat limited in scope. For example, Aftertouch can often provide a more tactile playing experience, but it is absent from Majestic's menu of modulation sources.

Modulation destinations include sample start points, pitch modulation, panning, and envelope attack rate. You can apply customized modulation to any individual key of a Layer, all keys, or the whole multitimbral layout. Majestic supports automation with fixed Control Change messages for any key of each Layer. (It's important to note that the Layers provided are presets and can serve as jumping off points for your own patches.) Alternate-technique samples are engaged by key switching, Velocity, or with the modulation wheel.

Strung Up

Unfortunately, Majestic proved problematic at times. In Digital Performer, loading a new patch or adding an insert plug-in caused the screen to corrupt, which required minimizing and reopening the corrupt windows. In addition, the standalone version of Majestic mysteriously lost MIDI communication several times, and offered no setup window to fix the problem.

The manual provides a tour of the user interface, but it needs more thorough descriptions of how to work the often complex modulation schemes. Demo MIDI files would be a very nice addition.

Bass Hit

Once you have come to grips with the modulation assignments for the instruments, however, you will be rewarded with extremely high-quality and expressive basses. Majestic is a generous, but by no means comprehensive, collection of instruments. Instead, it focuses very well on the kinds of nuance that you will need to create realistic-sounding electric and acoustic bass performances.

EM WEB CLIPS

Overall Rating (1 through 5): 3.5
Yellow Tools/EastWest (distributor)
www.yellowtools.com

NATIVE INSTRUMENTS

B4D Organ Controller

By Nick Peck

The Hammond organ has been an important voice in music for more than fifty years. Changing the instrument's timbre on the fly is an essential part of the performance practice on the Hammond, and the great organists have developed

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file across a selected note range; Beat Machine, a beat-slice playback device; and Time Machine, which offers automatic time compression and expansion (for a full description of Intakt, see the October 2004 issue of EM). Loading most Instruments in Percussive Adventures 2 distributes examples of all three modes across the keyboard, providing instructive springboards for creating your own loops. Notable exceptions include Ambi Ants, which is a map of eerie electronic pads; and Big Hits, which features individual percussion hits for creating rhythm tracks from scratch.

Slices of Life

Although the full version of Intakt costs $170 less, Percussive Adventures 2 provides roughly three times as much content. (For $129.95, an LE version includes a reduced sound set.) However, this is not your garden-variety collection of drum loops. All 80 Instruments are painstakingly recorded and programmed. The producers, Kurt Wortman and Tony Humecke, characterize the beds as "evolving."

Each Instrument typically starts with a full mix assigned to the note C1. It usually begins with a simple percussion pattern that progresses in intensity and complexity over eight or more bars, overlaying multiple percussion instruments, drones, plucked instruments and harmonics, and pads, sometimes interspersed with a drum kit. Notes above C1 play segments of the full mix or individual overdubs that are mapped to successive keys, so you can reorder the way in which a groove develops. Higher notes play looped or beat-sliced elements of the full groove, individual hits, and processed variations.

Although the full mix might suggest one musical direction, most Instruments supply plenty of material for you to take a different tack. You can recombine loops in a different order, even from different Instruments, and regulate the relative volume between loop elements by varying each loop's Note-On Velocity. As with all Intakt-based instruments, you get two AHDSR generators for filter and amplitude; a simpler envelope for pitch; two resonant multimode filters; two syncable LFOs; and an effects section with distortion, lo-fi effects, and delay. You can save time-slice locations as MIDI files and then remove or rearrange events when you trigger a sliced groove.

At the Movies

Most Instrument titles suggest film-scoring applications, but anyone looking for unorthodox or intensely rhythmic tracks will find plenty of loops to like. Loops range from funky, dance-oriented grooves to creepy, insectile fever dreams that could provide an evocative backdrop for an H.P. Lovecraft tale. Other Instruments could easily serve as song starters for Weather Report-style fusion compositions. What I appreciated most was that so many loops, by virtue of their creative programming, provoke lots of fresh musical ideas.

EastWest Percussive Adventures 2 pairs 3 GB of creative rhythm-bed loops with a host of features for customizing sounds.

When playing back in Time or Beat Machine modes, loops automatically lock to the host sequencer's tempo and loop flawlessly. Although the producers make a qualified claim that Time Machine loops sync to reasonable tempo changes, I tested sync with wildly randomized tempo tracks in Digital Performer, and the loops hung in there with a degree of tightness that no human rhythm section could be expected to follow. They also maintained their sound quality at the same time (see **Web Clip 1**).

I can't think of a more apt moniker for this collection. Almost every loop was a revelation in groove and creative sound design. So many loops inspired compositional ideas that it will be a long time before I can catch up. The multiplicity of editing features afforded by the Intakt engine expands the sound library's versatility immensely, and the sheer depth and beauty of the sound content puts Percussive Adventures 2 in a class by itself. If you're looking for powerful, malleable rhythm beds that can stand out in a crowd, I highly recommend this set.

EM WEB CLIPS

Overall Rating (1 through 5): 5
EastWest
www.soundonline.com

YELLOW TOOLS

Majestic

(Mac/Win)
By Marty Cutler

Wringing realistic expression from electric and acoustic bass samples isn't easy. Some collections sound authentic at first, but quickly exhaust the ear due to short single-layer samples and static programming. Others contain sampled artifacts (such as vibrato on fretless instruments or fret squeaks) in an attempt to simulate a touch of humanity. In the end, the snapshot nature of many sampled instruments only provides a simulacrum of the real deal. Majestic ($399.95) gathers electric and acoustic bass samples with lots of instrument-specific tricks, techniques, and artifacts governed by the thoughtfully designed Modular Virtual Instrument (MVI) engine.

On the Mac, Majestic supports Audio Units, RTAS, and VST2. On Windows, it supports VST2, RTAS, and DX. I put Majestic through its paces as a standalone unit, and within MOTU Digital Performer 4.12, Steinberg Cubase SX 2.2, and Granted

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the SM57, the i5 is designed for both recording and sound-reinforcement purposes.

Eye on the i5

With its sleek black finish and durable, cast-zinc–alloy housing, the i5 looks like it can take a beating. The absence of plastic parts makes it less prone to occupational hazards such as drummers who accidentally miss the mark. Two rows of ports encircle the top of the i5, and a sturdy black mesh grille protects the element. An internal pop screen further reinforces the grille. The Audix logo and model number are etched into the black finish. The mic package includes a zipper pouch and stand adapter.

The i5 features a tight-cardioid pickup pattern and can handle more than 140 dB SPL. Those qualities make it well suited for stage work and situations where decent off-axis rejection is required.

The i5's frequency response ranges from 50 Hz to 16 kHz. The mic's response graph shows a rise in the low end between 80 Hz and 300 Hz, peaking around 3 dB at 150 Hz, with another pronounced rise between 2 kHz and 10 kHz. Beyond 10 kHz, the response slopes off steeply. The i5 exhibits a slight dip between 500 Hz and 700 Hz. The specs show that the i5 has low-end punch and high-end definition. Those attributes were evident when I tried the mic out in a variety of situations.

The Audix i5 is a cardioid, dynamic mic that performs well on a variety of sources.

Test-Drive

I used the i5 in the studio on snare drum, toms, electric and acoustic guitars, flute, percussion, congas, saxophone, vocals, and bass cabinet. I brought it on several sound-reinforcement gigs, as well including a rock concert and a musical-theater event. Though it would not necessarily be my first choice for some applications, the i5 performed admirably in all cases.

In the studio, fellow drummer and engineer Steve Orlando helped me test it on snare drum and guitar cabinet during a session with his band, the Jingle Punx. I also used the mic for a couple of jazz-recording sessions, running the signal through an Allen & Heath board. Additionally, I did some controlled tests in my home studio. At the live gigs, I ran the mic through either a Mackie 1604-VLZ or a Crest V12 console.

Overall, the i5 exhibited an open, beefy sound. Although it was a bit on the dark side due to its low-end emphasis, the mic had plenty of definition. At the rock concert, the sound was a bit boomy on a particular vocalist and on snare drum. Engaging the highpass filter tamed the sound a bit for the mix. But in other cases, such as the Jingle Punx session, the heavy bottom end was a boon. Orlando praised the i5 for its smooth bump in the highs, saying it wasn't overly bright or spitty-sounding on the snares.

In additional studio tests, the i5 sounded punchy and rich on a chunky, fast electric guitar and exhibited clarity and a rich low end on steel-string acoustic guitar. I was also impressed with the i5 on congas and toms. The mic accurately captured their roundness, tone, and attack.

The i5 was beefy enough to do justice to a bass cabinet; the sound it captured was full and defined. The mic was acceptable on alto sax, but it wouldn't be my first choice for that application because its high end sounded a bit brash. After listening to several of the recorded results, Orlando commented that the i5's response seemed about halfway between an SM57 and a Sennheiser MD 421.

Finally, when used onstage for a play with musical accompaniment, the i5 gave presence and definition without brittleness to flute, percussion, and spoken-word vocals.

Aye, i5

Audix's new mic is indeed versatile, performing well in almost every application. Its durable all-metal housing can withstand rigorous use, and its big, open sound enhances many sources. Factor in its affordable price, and you've got one attractive product. If you're looking to add another multipurpose workhorse to your mic collection, you won't go wrong with the i5.

Overall Rating (1 through 5): 4
Audix USA
www.audixusa.com

EASTWEST

Percussive Adventures 2

(Mac/Win)

By Marty Cutler

EM ★★★★★ hot pick

Even with all the drum and percussion loops available, I could pick out EastWest Percussive Adventures 2 (Mac/Win, $399.95) if I were blindfolded. This virtual instrument is a sequel to the original Percussive Adventures, a highly regarded sample disc that's available in various sampler formats and as an audio CD (see the September 2000 issue of EM). Powered by a customized version of Native Instruments Intakt, 3 GB of sampled rhythm beds take advantage of its formidable loop-slicing and processing capabilities.

I tested Percussive Adventures 2 using a dual-processor Power Mac G4/1.42 GHz with Mac OS X 10.3.5 and 2 MB RAM running MOTU Digital Performer 4.1.2, Steinberg Cubase SX 2.2, and the CoreAudio standalone instrument. Percussive Adventures 2 supports VST, DirectX, RTAS, and Audio Units plug-in formats. The standalone version provides drivers for MME, DirectSound, ASIO, Sound Manager, and CoreAudio.

The Intakt engine has three playback modes: Sampler, which maps a sound


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QUICK PICKS

ARTURIA

Moog Modular V 2 (Mac/Win)

By Len Sasso

Arturia's Moog Modular V 2 ($329) raises the bar another notch for software emulations of classic synths. The upgrade includes six new modules, enhancements to some of the original modules, the ability to process incoming audio, major improvements to the graphic user interface, and 200 new presets. The upgrade would be well worth paying for, but Arturia has generously made it free for registered users.

The Moog Modular V 2 (MMV2) is supplied in standalone and plug-in versions for Mac OS 9 through X and Win 9x through XP. Plug-in formats include VST, DXi, RTAS, and Audio Units. Arturia suggests a screen resolution of at least 1,024 × 768 pixels and a relatively fast computer to run the MMV2—there's a lot going on onscreen as well as under the hood. Aside from a brief overview, I'll concentrate on the new features for this Quick Pick. You'll find a full review of version 1.1 of the Moog Modular V in the January 2004 issue of EM.

The Moog Modular V's software instruments are arranged in five cabinets. From the top they contain an analog sequencer and effects modules, filters and modulators, oscillators and a 16-channel mixer, a keyboard and MIDI output, and a keyboard controller.

Rack 'Em Up

The MMV2 user interface is divided into five sections: three racks of synth modules, a keyboard controller, and a section that contains all keyboard-controller outputs for cabling to the synth modules. Most of the modules are copies of classic Moog modules, faithfully reproducing their look, feel, and sound. However, several modules are new to Arturia, and there are a number of user-interface enhancements that would not have been possible in hardware. For example, you can use context menus instead of manually drawing cables; each control-input jack has a built-in, bipolar amount control; and once you start drawing a cable, all jacks able to receive it become outlined in yellow.

The MMV2 rack is now scrollable and resizable. If you have limited screen real estate, you can reduce the MMV2 window to display only a single rack, then scroll between racks by click-dragging in any empty space or attempting to draw a cable beyond the visible area. All the modules in the middle rack of synth modules are now interchangeable. The four double-wide slots can hold the Filter or LFO from the original MMV or the new Bode Shifter and Formant Filter modules. The eight single slots can hold the original Envelope, Trigger, and Noise modules as well as the new Envelope Follower, Ring Modulator, and Sample and Hold modules. To reduce clutter, any of those slots can also have a blank cover plate.

It Bodes Well

The Bode Shifter is the most unusual new module—you probably won't find another one of these on your desktop. The Bode Shifter performs a variant of ring modulation called frequency shifting (also called single-sideband modulation), in which the sidebands above and below the carrier (in other words, the sum and difference frequencies produced by ring modulation) are sent to different outputs. The result is a linear shift in all harmonics that are present in the frequency spectrum of the input signal, as opposed to the exponential shift that occurs when pitch shifting.

The Envelope Follower generates envelopes and triggers based on the level of the audio signal at its input. The envelope's contour follows the amplitude of the incoming signal, whereas triggers are generated when the signal's level exceeds the level set by the Threshold knob. **Web Clip 1** uses the Envelope Follower and Bode Shifter to "tune in" a speech clip.

Other new modules include a sample-and-hold control source and a 12-stage phaser, both of which are emulations of rare Moog modules. A four-stage formant filter and a ring modulator, both Arturia originals, round out the complement of new modules. The formant filter is especially nice, providing presets for the standard vowels and independent modulation inputs for vowel selection as well as for each formant band's frequency, resonance, and gain.

Improvements to the Keyboard Controller include a new detunable Unison mode that automatically stacks voices to create fat sounds. Glide (portamento) can now be smooth or in semitone steps (lots of fun), and the action of the pitch bend wheel can be inverted (forward bends down). Master Volume and Tune controls have also been added.

If you're looking for the creativity offered by modular synthesis and want to get your hands on a real classic without the hassle or cost of the hardware original, look no further. The folks at Arturia have made a great synth even better.

EM WEB CLIPS

Overall Rating (1 through 5): 4.5

Arturia

www.arturia.com

AUDIX

i5

By Karen Stackpole

Audix's recently released i5 ($179) is a multipurpose, unidirectional dynamic microphone. The company touts it as a versatile, affordable workhorse along the lines of the ubiquitous Shure SM57. Like

such as Classic Analog, FM & Formant Synthesis, Additive Sounds, and Bonus Machines. Those are further divided by subgroups such as Ethereal & Atmosphere, Synth Bass, Bells, and Musical & Strange (see **Web Clip 2**). You can rearrange and reorganize presets by changing the contents of the folders. You can add a folder for your own presets or for any you download from USB's Web site, which is occasionally updated with new dual-layer presets for registered users. When you edit and save a preset, Ultra Focus prompts you to specify its location.

I was surprised to learn that only 64 of the installed presets use both layers. Those are the Master Presets, which are organized into two banks and have names such as Angel Sweep, Google Bells, and Smoothly Persian (see **Fig. 2**). The remaining presets, which total more than 2,000, are single-layer sounds.

One menu group contains Pure Waveforms and organizes them by synthesizer type: Xpand, MiniM, German Analog, and so on. According to the manual, Ultra Focus's developers sampled every note of almost every waveform generated by all the synths in their collection. Then they trimmed and looped them to give users the basic materials they need to roll their own sounds from scratch.

It would be nice if it were possible to add your own samples to Ultra Focus's library of sounds, but I suppose that's what soft samplers are for. You can, however, save presets that you create using the factory samples. Ultra Focus is not multitimbral, but if your computer has enough processing power, you can open multiple instances. I wish that the plug-in responded to Program Change messages, but at least you can load a preset simply by typing in its number.

Focus on the Future

Ultra Focus is certainly comprehensive. With so many outstanding timbres, it's difficult to pinpoint only a few as my favorites. I really like dozens, if not hundreds of them. One of my favorite categories is Stack-Chords, which has nice atmospheric textures (see **Web Clip 3**). I would like to have heard more sounds that respond to Aftertouch, but the one-source-per-mod-destination restriction limits that possibility.

The user interface allows for access to plenty of real-time controls, but I would like to see a future version go further in its editing capabilities. If you want lots of control over the building blocks of synthesis, you're still going to need a real synthesizer instead of a sample-playback engine. But if you want quick access to thousands of high-quality sounds produced by dozens of synths, Ultra Focus is a worthwhile and convenient source.

EM WEB CLIPS

EM associate editor Geary Yelton has been playing synthesizers for more than 30 years and writing about them for almost as long.

source to crossfade between layers, which is a nice feature. Using two layers cuts the polyphony in half.

The top display shows the names of the current preset and its two layers. You select presets by scrolling with arrow buttons, typing in a number, or selecting from a hierarchical pop-up menu. Clicking on a button beside the layer's name selects that layer for editing. Clicking on the layer name itself summons a menu of all the multisamples. To mix and match sounds, you can select any multisample from any inactive preset or layer.

Each layer is routed through one of four filters (three lowpass and one highpass). Two ADSR generators shape cutoff and amplitude, and Velocity can affect attack time, decay time, or both. Velocity also controls the attack rate of a pitch envelope, which has only Depth and Time knobs.

The Modulation section provides five routings, each with a knob to control depth. You can assign one of 20 sources, including four LFOs that can sync to tempo, to each of five fixed destinations: pitch, filter cutoff, overdrive, amplifier, and pan. The greatest advantage that a really fine synthesizer has over most samplers is its malleable nature, and Ultra Focus's flexibility would increase tremendously if the mod destination were user-assignable. .

One of the 20 assignable mod sources is a single MIDI CC of your choosing. Unfortunately, modulation depth is not among the fixed MIDI CC assignments, nor does mod depth respond to sequencer automation. In fact, none of the controls respond to automation. In a future version, I hope that more than one assignable MIDI CC routing will be available for controlling mod depth and that automation will be possible.

PRODUCT SUMMARY

ULTIMATE SOUND BANK Ultra Focus 1.1.1

software synthesizer
$399

OVERALL RATING [1 THROUGH 5]: 4

PROS: Hundreds of great sounds. Comprehensive coverage of many synthesis techniques. Intuitive user interface. Very good effects.

CONS: Limited modulation capabilities. No automation.

MANUFACTURER
Ultimate Sound Bank/Ilio Entertainments (distributor)
www.ultimatesoundbank.com

Hocus Pocus

Certain parameters always affect both layers simultaneously. The master lowpass filter has three controls for cutoff, resonance, and timbre. I can't say for sure what parameters the Timbre slider affects, but it sounds like it makes the cutoff frequency beat in the same manner that detuning oscillators causes them to beat (see **Web Clip 1**). At any setting, it doesn't sound like it contributes much to improving the sound.

Two effects processors, called FX01 and FX02, are common to both layers. Each has an off-on switch and a button that syncs time parameters to sequencer tempo. Clicking on an effect's name lets you select from more

FIG. 2: Presets are arranged in folders and accessed using a hierarchical pop-up menu. Master Presets are organized into two banks, each with 32 dual-layer selections.

than 125 effects presets in 29 categories, ranging from Simple Delay to a lo-fi effect called UVI Destructor and a ring-mod effect called Robotizer. Five soft knobs for each effects processor change their parameter assignments when you select a new effects preset. The selection and quality of effects are impressive, and they're useful for subtly or radically altering timbre.

The Glide section has a choice of four portamento curves optimized for different types of keyboards. Although the two layers share the same curve, you can control their portamento depths independently.

Several parameters that affect both layers have increment and decrement buttons to select their values. Those parameters include polyphony (from 1 to 128 notes), octave, bend range (up to 24 semitones), and which MIDI CC you assign as a modulation source. Another button selects whether samples are loaded in 16-bit or native 32-bit format.

Synth Collection

Ultra Focus supplies sounds sampled from a variety of electronic musical instruments. The manual lists the synths that were sampled such as Moog Minimoog and Memorymoog, Sequential Prophet 5 and Prophet VS, Oberheim Xpander and Four-Voice, Korg M1 and DW8000, and Yamaha CS80 and TX802 (but no DX7); the list goes on and on. Less obvious choices are the Technos Acxel, PPG Waveterm B, and the Casio VZ-1. A Kawai K5000 was the source of additive sounds, and a Mellotron M400 supplied taped strings, choir, and the like.

On your computer's desktop, the folders within the Ultra Focus Presets directory determine what menu groups and subgroups appear in the Presets menu. When you install Ultra Focus, ten groups are available and are primarily divided by synthesis type. These groups have categories

Resource.

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FIG. 1: Ultimate Sound Bank sampled a roomful of synthesizer hardware and designed an easy-to-use user interface to create Ultra Focus, an expandable instrument plug-in that supplies more than 2,000 electronic sounds.

ULTIMATE SOUND BANK Ultra Focus 1.1.1 (Mac/Win)

Thousands of synth timbres are yours to command.

By Geary Yelton

By the end of the last century, I had amassed an awful lot of synthesizer hardware. Analog, FM, PCM, VAST, additive, vector, physical modeling—I had all the bases covered in terms of synth engines. All that gear took up too much space, but I had no cause to complain.

Then I got married. My wife hung a sign on my studio door that read, "Everything must go!" Since then, I've gradually sold off the lion's share of my synth collection. Luckily, I've been able to replace most of those instruments with software emulations that covered the same bases. The virtual studio came along just in time for me to maintain my multiple-architecture synthesis habit and still satisfy my wife's need for an orderly existence. Still, I sometimes miss the days when I could switch on my Prophet-600, DX7IIFD, or Matrix-12 and just play. Why can't someone create a virtual instrument that gives me all the best sounds of my old favorites?

Ultra Focus, a sample-playback plug-in from Ultimate Sound Bank (USB), aims to make my wish come true. It combines more than 8 GB of 16- and 32-bit sample data with a user interface that offers hands-on access to a variety of synthesis parameters. Its developers sampled classic gear ranging from analog and FM synths to additive and PCM-based instruments to create a virtual instrument marketed as a "synthesis anthology."

Ultra Installation

Ultra Focus's minimum system requirements are a 500 MHz computer, 512 MB of RAM, and 8.4 GB of free disk space. I ran Ultra Focus on my dual-processor Mac G4/1 GHz with Mac OS X 10.3.5, 1.5 GB of RAM, and a PCI-424 card connected to a MOTU 2408mkII audio interface. My audio sequencers were Apple Logic Pro 7, Steinberg Cubase SX 2.2, and Digital Performer 4.5. Ultra Focus supports five plug-in formats: VST, RTAS, DXi, MAS, and Audio Units (AU). I used the AU, VST, and MAS versions.

Installation and authorization were painless. I copied two massive data files and a 28 MB folder full of presets from a double-sided DVD-ROM to my external hard disk and then ran the installer on my main hard drive. Ultra Focus's copy protection uses the familiar challenge-and-response method; I received the response by email almost immediately after I pasted the challenge into USB's Web site.

Focus Features

Ultra Focus's single-window user interface has the look of three-dimensional hardware, but it doesn't look like any synth I've ever seen (see Fig. 1). Thanks to its well-designed ergonomics, I quickly learned my way around. Most real-time parameter controls are knobs and others are sliders (where appropriate), and MIDI Control Change (CC) assignments are fixed; you can't reassign them. Most buttons have associated LEDs to indicate when they're engaged. Tiny but convenient displays showing parameter names and values are scattered across the panel, making it easy to see what's what at a glance. I wish a button were available for auditioning sounds, because Ultra Focus has no onscreen keyboard.

Ultra Focus's architecture is straightforward and easy to grasp. Presets can have two multisampled layers that you can edit either together or separately. Each layer contains a multisample of a single program recorded from a hardware-based synth. You can change either layer's level, tuning, and pan position. You can also assign a mod wheel or other

hollow, with a lot less beefy low end. The high mids sounded nasal, the horns sounded equalized, and the hi-hat was crunchy. Overall, that wasn't a flattering application for the 8-Ball, even if I hadn't been comparing it with more expensive mics.

One on One

On electric-guitar cabinets and organ speakers, the 8-Ball relayed the sound of the speaker with clarity and bottom, but without sounding too harsh like some condenser mics can. I had mixed results using the 8-Ball to record vocals, upright bass, and saxophone. I also had mixed results using the mics as drum overheads. Although I could have used these tracks in a pinch, in general, I found the sound to be somewhat equalized, with a little too much scooped out of the low mids and a little too much hype in the upper midrange for my taste. Again, the 8-Ball needed much more gain (about 8 dB) than some other similarly priced mics I compared it to, and the added gain increased the noise floor considerably.

The two applications on which the 8-Ball worked best were kick drum and bass guitar. The 8-Ball really shines when used as a secondary kick mic positioned a few inches from the front head (with another mic on the beater). The low mid scoop was perfect for getting the boxiness out of the kick drum without using EQ. When I miked an amplified electric bass, the 8-Ball had a similar frequency curve to the EQ I tend to put on bass, accentuating the extreme lows, cutting the low mids, and boosting the high end to make the bass stand out in the mix.

One attractive characteristic of the 8-Ball is its off-axis rejection. In a live recording setting, the 8-Ball did a splendid job of ignoring the rest of the band when positioned on the kick drum (pointed at the front head, which did not have a hole) and a bass amp. When used on a saxophonist, however, the mic's tight cardioid pattern highlighted any side-to-side movements the musician made with dramatic changes in tone.

My biggest complaint about the 8-Ball is that, when coupled with certain preamps through my patch bay, I heard radio frequency interference (RFI) in the signal. Plugging the mic directly into the preamp and bypassing the patch bay eliminated the RFI. I have used dozens of mics through my patch panels, but the 8-Ball was the first to pick up a local station. Of course, the extra gain the mic requires didn't help the situation.

My Sources Say Yes

Overall, the 8-Ball is a good value for the money, and I would recommend it to anyone building a mic cabinet on a budget. With a street price of $200, the mic is affordable for the average project-studio owner. And its striking appearance and durable construction ensures it will impress clients for years to come.

Eli Crews often consults his Magic 8-Ball while working at his Oakland, California, studio (www.newimprovedrecording.com).

one channel told me I was very close, because the mono-summed signal disappeared almost completely.

The 8-Ball worked best on kick drum and bass guitar.

Running a few reference CDs through the Genelecs and recording the output of the mics through a Focusrite Green Dual Mic Pre into Digidesign Pro Tools LE, I was able to compare the mics with each other to check for any differences they might exhibit in frequency response or output level. I could discern no difference between the pair, which speaks well for Blue's quality control.

I immediately noticed a robust low end; a healthy, almost hyped-sounding high end; and a somewhat scooped-sounding low mid response. The recorded kick drum had plenty of whomp but not much definition, and the snare and hi-hats were crisp—far more present than on the original recordings. Nonetheless, I was impressed with how close the 8-Ball recordings sounded to the originals.

Live, in Stereo

I put the mics up as a stereo pair in the live room of the studio where a seven-piece jazz band was practicing. To get a sense of how the 8-Ball sounds, I compared it with two mics I know well—Blue's Dragonfly Deluxe and Bluebird, an admittedly unfair comparison because both models are more expensive than the 8-Ball.

The first thing I noticed was that the 8-Ball needed about 10 dB more gain to get the same output level. The other Blue mics have hot outputs, so that wasn't much of a surprise, but the extra gain boost did bring up the noise floor a bit on the 8-Ball output. Compared with the other mics, the 8-Ball sounded a little

PRODUCT SUMMARY

BLUE MICROPHONES 8-Ball

large-diaphragm condenser microphone
$279

OVERALL RATING (1 THROUGH 5): 3.5

PROS: Eye-catching design. LED indicates phantom power. Extended high frequencies help achieve greater definition with certain instruments. Price. Sturdy housing.

CONS: Scooped sound in the low mids. Accentuated high end can sound harsh. Limited positioning with built-in mount. Low output. Prone to RFI in certain cases.

MANUFACTURER
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FIG. 1: The face of the 8-Ball is elegant and stark, with an LED that indicates phantom power is on.

BLUE MICROPHONES 8-Ball

A striking design that you'll want to get behind.

By Eli Crews

The latest addition to the Blue Microphone line is the 8-Ball ($279), a large-diaphragm cardioid condenser that resembles its dynamic cousin, the Ball, in shape and size (see **Fig. 1**). With its spherical black body and shiny logo, the 8-Ball pays tribute to the beloved Magic 8 Ball toy, but casts a striking—if not ominous—impression in the studio (prompting one client to refer to it as "that Death Star mic").

Above the logo sits an LED that glows red when the microphone receives the required 48V of phantom power (a feature I'd like to see in more microphones). The 8-Ball's rugged plastic housing seems nearly indestructible, and a sturdy female XLR connector sits slightly below the equator of the sphere, 180 degrees behind the address side of the mic. On the bottom is an integrated standmount, with standard threading and roughly 45 degrees of tilt from front to back. Although it's nice not to have to worry about misplacing your mic clip, that tight angle, coupled with mic's size and lack of sideways tilt, makes for limited positioning capabilities. (Blue offers the Ringer ($69), a shock-mount that enhances the isolation and the positionability of its spherical mics.)

Behind the 8-Ball

Using full-frequency program material, I tested the two mics I received for consistency, positioning them on a stereo bar in front of a Genelec 1030A and carefully matching the distance between each mic and the drivers on the monitor. A quick polarity flip on

8-BALL SPECIFICATIONS

Diaphragm	0.55"
Polar Pattern	cardioid
Frequency Response	35 Hz–20 kHz
Sensitivity	10 mV/Pa (1 kHz into 1 kΩ)
Power	+48V phantom power (±4V)
Output Impedance	50Ω
Noise Level	22 dB A-weighted
Maximum SPL	150 dB SPL (THD 0.5%)
Dynamic Range	128 dB
Maximum Output Level	+14 dBu (2 kΩ load)
Weight	1.10 lbs.
Diameter	4" (spherical)

crucial for understanding what the analysis did to the soundtrack. Since the first analysis included some of the dialog and music tones in the noise (see **Web Clip 4**), I used the sliders and the plug-in's Tilt function to create a final noise profile (see **Web Clip 5**) before bouncing the processed clip to a new track.

I checked out the Hum & Rumble and Click & Crackle tabs by mixing buzz, pops, and static from an unplugged guitar cable with a prerecorded track to create a file with noise problems more typical of a project studio. The plug-in was able to handle these basic problems well, depending on the level and consistency of the offending noise. In many cases, isolated clicks and pops are easily handled by basic digital audio editing tools, and low-frequency hum can be controlled by high-pass filters—if it's not out of control to begin with. That's the important thing to remember about software of this type. Although SoundSoap Pro can make your garbage cleaner, garbage is still garbage. The best way to control noise is at the source, before it ever arrives on disc.

Stronger Than Dirt

SoundSoap Pro is an excellent alternative to high-priced digital audio restoration suites. BIAS's plug-in has a complete set of tools that will appeal to the pro or project studio owner whose business involves making the most of bad recordings or transferring vinyl records to digital. And of course, even pros sometimes get caught making bad recordings—for example, in the field, where noisy traffic or wind doesn't seem to be a problem until the track is back in the studio.

Novices will need to pay attention to the plug-in's manual, which includes valuable information on types of noise reduction in general and clearly explains the plug-in's sometimes less-than-intuitive operation. But SoundSoap Pro is an ideal tool for most common problems in tracks that can't be rerecorded. When a track is sick with noise, SoundSoap Pro has all the surgical tools necessary to determine if the patient gets a clean bill of health or needs a dirt nap.

EM WEB CLIPS

PRODUCT SUMMARY

BIAS SoundSoap Pro

audio restoration software
$599

OVERALL RATING (1 THROUGH 5: 4

PROS: Multiple tools and parameter settings for various noise-control problems. Timed or instant noise analysis. Noise-only playback. Tilt function for fine-tuning noise curve. Modules work either independently or collectively.

CONS: Has a cluttered interface in Broadband tab.

MANUFACTURER
BIAS (Berkley Integrated Audio Software)
www.bias-inc.com

Rusty Cutchin is an associate editor of EM. *You can reach him at rcutchin@comcast.net.*

FIG. 4: The Broadband tab contains the Learn button, which takes an instant or user-defined measurement of designated consistent noise such as tape hiss. Visible under the plug-in are the original test track that was imported from DVD and the same track after processing by the Noise Gate module.

to total silence and from silence to gramophone. However, it was not SoundSoap Pro's broadband tab working this magic, but its noise gate section. Before fully reading the manual, I assumed that an "x" meant "off" in a tab's checkbox, and I had the Noise Gate's box checked. Still, that exercise demonstrated the accurate learning capabilities of the plug-in and the useful parameter presets in the Noise Gate tab.

gramophone track! That would surely constitute a trial by fire for SoundSoap Pro.

I imported the audio track into Digital Performer (DP). On the clip (see **Web Clip 1**), an exasperated Customs agent faces Harpo Marx and suspiciously demands, "Chevalier, eh?" There's a pause that's full of soundtrack noise as Harpo cranks the gramophone, which then plays while he mimes the French musical star Maurice Chevalier.

I positioned DP's cursor to begin playing at the beginning of the soundtrack noise, and then pressed the button with the clock icon next to SoundSoap Pro's Learn Noise button. I pressed Play in DP. At the end of the soundtrack noise and before the gramophone noise, I pressed the clock button in SoundSoap Pro again to halt the learning process. When I played back the same section, SoundSoap Pro applied its noise reduction algorithm to the frequencies it had analyzed.

The results were astonishing, but not for the reasons I thought. The noise between the Customs agent's question and the gramophone was completely gone (see **Web Clip 2**). There was also a smooth transition from the agent's speech

With the Broadband tab properly activated and other tabs bypassed, I performed the test again. This time, as you might expect, SoundSoap Pro produced a more subtle noise curve. I used the yellow reduction sliders to create a modified soundtrack with a lower level of ambient noise between the Agent's speech and the gramophone in the example (see **Web Clip 3**). With the broadband test, the plug-in's Noise Only button was

FIG. 5: Pictured above is the Noise Gate tab with a graphical display of imported audio before processing.

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contains some helpful text with an overview of the plug-in's four modules, displayed as tabs at the bottom of the window (see **Fig. 1**). Each tab can be enabled while any or all of the others are disabled, saving processing power. Each plug occupies a logical place in the chain of tabs from Step 1 to Step 4.

BIAS recommends working from left to right according to the order of the steps, because it's more efficient and easier, for example, to deal with Hum & Rumble first before proceeding to Click & Crackle. Next you can manipulate broadband noise and finally employ a gate for a set noise floor. If used properly you'll get a much cleaner track, especially if your noise problems are easy to isolate.

Within each tab, a versatile set of controls is present. The Hum & Rumble Window (see **Fig. 2**) is designed to deal with hum typically centered at 60 Hz and below and usually caused by bad wiring or improper grounding. Sliders provide control over filter width (Q), depth, and frequency parameters (between 20 and 500 Hz) and up to 10 harmonics as well as subsonic rumble. The Click & Crackle Tool (see **Fig. 3**) helps you isolate annoying transients (such as those on vinyl records) and static-induced pops and crackles. That tab's two threshold sliders control the degree of noise reduction.

All settings can be stored and recalled from disc, and four Compare settings are available in RAM. Every tab provides a useful waveform display for comparing the input and processed signals. SoundSoap Pro's Noise Only option is where you find the real dirt on your sound files. Engaging the button isolates the noise that you've analyzed, which is a great way to ensure you're not throwing out the music baby with the noise bathwater.

Scrubbing Bubbles

The Broadband tab (see **Fig. 4**) is where you control sonic infestations such as tape hiss, tire noise, wind, HVAC noise, fluorescent lighting noise and other continuous broadband problems. The module operates across 512 distinct audio bands (controlled by 12 threshold and reduction sliders that can work independently or as a group) and supplies knobs for attack, release, and tilt, which allow you to shift the targeted noise bands toward lower or higher frequencies.

FIG. 2: The Hum & Rumble tab allows for control over low-frequency noise in a range from 20 Hz to 500 Hz.

As with other restoration programs, SoundSoap's broadband module "learns" the characteristics of the noise you want to eliminate. You play back a section of the audio file where noise is isolated and press either an instant or timed learn button. The plug-in responds with a noise reduction curve that you can then fine-tune with 12 blue threshold sliders or 12 yellow reduction sliders. After the plug-in chooses the set of frequencies to be eliminated based on what it has learned, you can press the Noise Only button to hear them. If you hear any music mixed in with this noise, you can adjust the threshold and reduction sliders up or down individually or in a group to make sure no discernible tones are being cut with the noise. That balancing act is essential to avoid winding up with a track full of digital artifacts.

FIG. 3: The Click & Crackle tab has settings designed to eliminate transients (such as those found on vinyl records) and other sources of pops and static sounds.

SoundSoap Pro's last stage is its Noise Gate tab (see **Fig. 5**), which provides standard threshold, attack, and release controls. The gate can also be used creatively to generate extreme special effects. In all tabs, a real-time spectrogram enables visual monitoring of noise; the spectrogram's color-coding can help you locate necessary adjustments and see the results immediately. You also get thumbnail views of the other tabs' status when one is active. The plug-in has Bypass buttons for each tool and a global bypass button.

Stain Lifting

After installing SoundSoap Pro on my system (a dual 2 GHz Mac G5 running OS X 10.3.5), I was eager to try the Broadband tab for eliminating broadband noise. I needed a noisy audio track to load into Digital Performer. (The SoundSoap Pro CD has example audio files to use with the tutorial in the product's manual.)

I happened to have a DVD of the Marx Brothers film *Monkey Business* in my computer. The audio track of one scene offers not only a typically noisy 1930s-style soundtrack, but it also offers an even older (and noisier)

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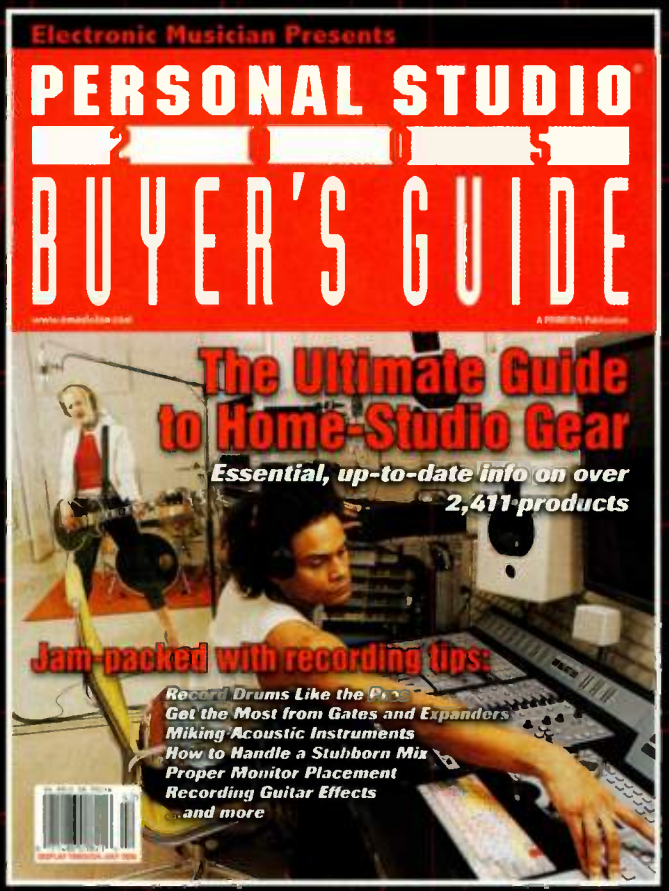

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FIG. 1: SoundSoap Pro's Launch screen provides helpful text on the operation of the plug-in.

BIAS SoundSoap Pro (Mac/Win)

Industrial-strength cleaning.

By Rusty Cutchin

Audio restoration software, which analyzes a digital file in an attempt to isolate and remove unwanted clicks, pops, and broadband noise such as tape hiss, is one of the little miracles of digital audio. Cleaning up old or flawed recordings, however, is still more art than science, despite the long strides that have been made in the technology of restoration software. (The programs may be miracles, but they're not magical.) In addition, there is a gap in the affordability range of such programs: there are either high-end suites with multiple DSP noise reduction tools or entry-level programs such as BIAS's SoundSoap. (For a review of SoundSoap version 1.1, see the February 2004 issue of EM online at www.emusician.com.)

BIAS now has filled that gap with the release of SoundSoap Pro, a serious restoration plug-in designed to handle the most common noise-elimination problems. Priced at an affordable $599, SoundSoap Pro provides a professional set of tools—including Hum & Rumble, Click & Crackle, Broadband, and Noise Gate modules—for dealing with old or unexpected noise. The modules operate together or independently, which helps save CPU cycles.

Liquid or Powder

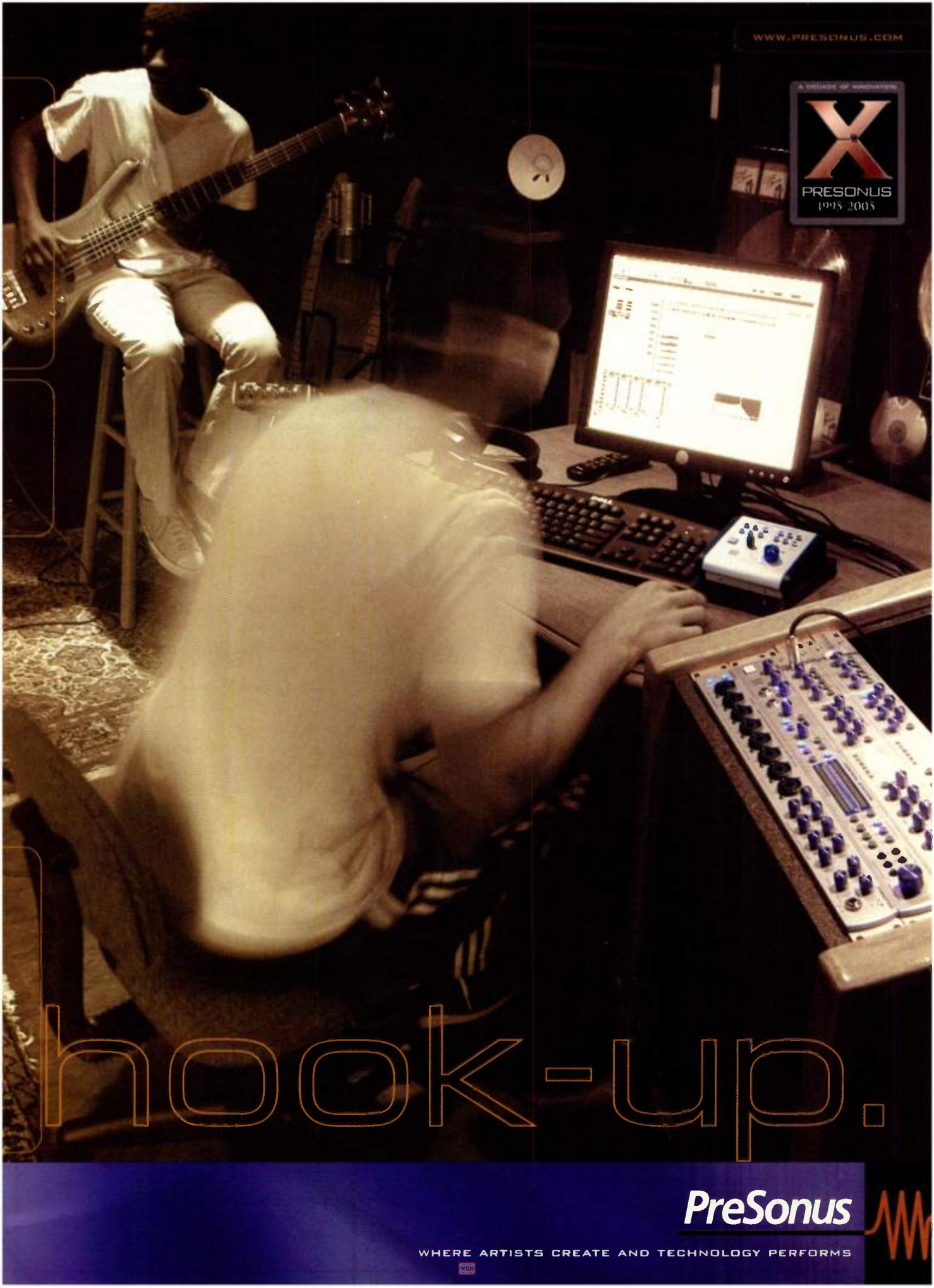
SoundSoap Pro is compatible with most major plug-in formats, including VST, RTAS, DirectX, and AU. (There is no MAS version, but I used the AU version in Digital Performer 4.12.) Mac users will need a G4 or G5 (a 500 MHz processor is recommended) with OS X 10.2 or later. A Pentium III or 4 running Windows XP is required for PC users. BIAS recommends an 800 MHz processor.

The installer program will deposit all of the disk's plug-in versions in the proper folders on your hard drive. Then you begin the authorization process, a straightforward if annoying chore. The program comes with a BIAS Key, which is a small dongle that lights up when properly inserted in a USB port. With the key in, you can launch an included control panel that prompts you for your copy's serial number. Entering it gets you a version of SoundSoap Pro that lasts for 14 days.

For permanent use—and an authorized BIAS key that you can then use on any computer with a SoundSoap Pro installation—you must also obtain an authorization code from BIAS's Web site. It's best to register immediately, and the panel makes it easy (assuming you have internet access on your studio computer) to go to the web site, register, obtain your authorization code, paste it into the proper field in the control panel, and begin working. (If you don't have Internet access, you can obtain your code by phone, fax, or mail.) With the plug-in authorized, SoundSoap Pro will appear in the list with other plug-ins of the same type within your digital audio application.

Pretreating

When you first call up SoundSoap Pro to process an audio track, you'll see the Launch Area of the plug-in. This area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PRODUCT SUMMARY

MACKIE Onyx 1620

analog mixing console
$919
Onyx FireWire I/O card $499.99

OVERALL RATING (1 THROUGH 5): 4.5

PROS: Excellent analog sound. Improved preamps. Extended bandwidth on midrange EQs. Talkback section. Rackmountable. FireWire interface option. Good converters.

CONS: Limited DAW control with interface.

MANUFACTURER
Mackie
www.mackie.com

simultaneously. By keeping the faders at 0 and adjusting levels with the channel trim controls, I achieved good levels on DP track meters without overdriving any Onyx channels. The converters sounded fine at all sampling rates. No degradation was apparent in the analog mixing section or in the FireWire card's conversion on playback. The system as a whole sounded excellent.

The inclusion of a convenient, speedy, and fine-sounding 24-bit, 96 kHz FireWire interface option for all Onyx mixers is the icing on another triumphant mixing cake by Mackie. The 1620's primary assignment—processing, blending, and improving mic, instrument, and line-level sources—is handled beautifully. Every signal I fed the 1620 came out better on the other end, and I had no trouble interfacing the mixer with my recording application.

I'd be surprised if the Onyx line didn't achieve the same high popularity of previous Mackie mixers. The 1620 is a great choice for those who need to mix the old-fashioned way, and it makes a great front end for those who want to record like young whippersnappers.

Rusty Cutchin is an associate editor of EM. *He can be contacted at rcutchin@comcast.net.*

Because I had a connection to the Mac, I pressed the FireWire switch in the Onyx's source section to check Mac audio while I was testing the mixer's input section before launching a recording application. I was surprised to find that OS X's menu bar volume slider, the System Preferences Sound panel, and the Audio MIDI Setup panel didn't offer control of the audio level exiting the FireWire port. Although this is not a problem when using a recording application or other program (such as iTunes) with output controls, it meant that for sounds like system alerts and certain Web pages with audio, the computer was always sending full-volume audio to the Onyx. This could pose a threat to your monitors if (as I did) you trigger an alert or access an audio Web page with the Onyx's control room pot set too high. I emphasize that this is not a problem when running a recording application. However, it's safest to hit the FireWire switch on the Onyx after an audio application with output controls has been launched.

FIG. 3: The Onyx FireWire I/O card contains an output level control and two FireWire connectors for daisy-chaining mixers.

Other than that minor bump, the 1620 was a complete pleasure to work with. I filled up the 1620's inputs with mics, stereo keyboards, a sampler, and guitars in channels 1 and 2 and found it to be one of the quietest and best-sounding Mackie analog mixers I've worked with, including my fondly remembered 32 × 8 unit.

The Onyx pre-amps may not make you toss your outboard tube pre out the window, but they are the best sounding mic pres that I have heard in a small format mixer at this price. The Onyx maintained the character of each of the mics I tried: all sounded crisp and clear, exhibiting a slight boost in the highs around 12 kHz with all settings flat. Channels 1 and 2 took a direct input from a jazz archtop guitar as expected. Each channel offered plenty of headroom, which is a well-known Mackie feature. The extra bandwidth on the new EQ designs made most adjustments a breeze, and the results were warm and musical, even when adding gain to midrange frequencies. Keyboard and sampler sounds were fully formed, and the noise floor stayed put as more inputs were added. As a basic analog mixer, the 1620, like previous Mackie designs, stood out in quality.

ONYX 1620 SPECIFICATIONS

Channels	(8) mono, (4) stereo, (4) stereo aux
Faders	(12) channel, (1) stereo master (60 mm)
Analog Inputs	(8) XLR balanced mic; (14) balanced TRS ¼" line; (2) unbalanced ¼" high-impedance inst.; (2) RCA L/R tape; (1) XLR balanced mic (talkback)
Analog Outputs	(2) XLR balanced mic (Main L/R); (6) ¼" balanced/unbalanced TRS (Main L/R, Control Room L/R, Aux 3-4); (2) RCA L/R tape
Digital I/O	optional FireWire card
Auxiliary I/O	(4) ¼" balanced/unbalanced sends; (8) ¼" balanced/unbalanced returns
Inserts	(8) ¼" TRS
Headphone Outputs	(1) ¼"
Dynamic Range (Mic In to Main Out)	>110 dB
Distortion (THD)	< 0.004%, 20 Hz–20 kHz @ +4 dBu (Mic In to Main Out)
Frequency Response	Mic In: +0/–1 dB, 20 Hz–50 kHz Mic Out: +0/–3 dB, <10 Hz–>100 kHz (both @ Unity Gain)
Dimensions	17.3" (W) × 20.3" (H) × 6.6" (D)
Weight	22 lbs.

Interface the Music

As a multitrack interface for recording, the FireWire card is an excellent addition. After launching Digital Performer (DP) 4.12, I recorded a pass featuring acoustic guitar and female vocals, along with a solo piano track playing

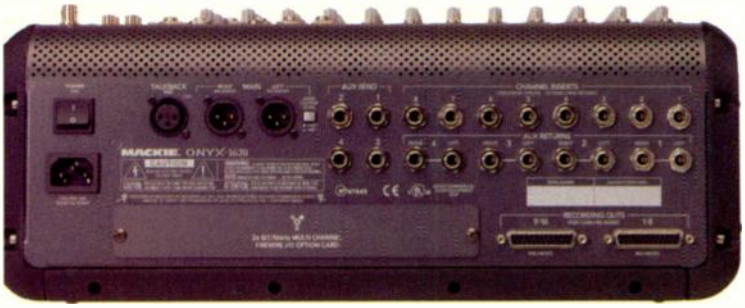

FIG. 2: The 1620's rear panel houses twin DB-25 connectors for direct-out analog recording and a slot for the optional FireWire card.

that most people interested in recording with the Onyx will want to pick up.

The I/O card lets you stream the 1620's 18 independent channels of audio to a Mac or PC to a maximum of 24-bit, 96 kHz resolution and near-zero latency. You can assign 16 independent channels of audio and a stereo mix to the card's output and monitor two channels of audio coming back from the computer. On a PC, the card also allows you to daisy chain two mixers and assign 32 channels at full resolution to the computer. (On a Mac, that capability requires OS X 10.4, according to Mackie.) The card works with any Windows XP ASIO/WDM host application, such as Steinberg Cubase, Cakewalk Sonar, Ableton Live, or Mackie Tracktion software (included with the card). The card also works with any Mac OS X (10.3) Core Audio host, including Apple Logic, MOTU Digital Performer, Cubase, and Tracktion.

Back to the Mines

I hooked up the Onyx 1620 and the FireWire I/O card with barely a glance at the manual. I removed two screws, connected the card to a 34-pin ribbon cable, slid the card into the slot until it clicked, replaced the screws, and connected the supplied FireWire cable to a port on my dual-processor Mac G5. As promised, the card showed up immediately in OS X's Audio MIDI Setup panel, where you can select 44.1, 48, 88.2, or 96 kHz sampling rates. On the Mac, no driver installation is necessary as long as you're using OS X 10.3.5 or greater. On a PC, however, the drivers and control panel, which allows control of latency settings, must be installed using the included CD. (Follow the instructions closely, especially if you're connecting two Onyx mixers to a PC, to ensure proper configuration.) I also connected the Onyx's control room outputs to my powered monitors.

routing, and EQ controls. Low and high frequency EQ points are fixed at 80 Hz and 12 kHz, respectively. The Low Mid frequency is variable from 100 Hz to 2 kHz; the High Mid frequency ranges from 400 Hz to 8 kHz. Both can be cut or boosted by 15 dB. Each of channels 1 through 8 has a low-cut switch (18 dB per octave at 75 Hz) and a 48V phantom-power switch.

Channels 1 and 2 offer high-impedance instrument inputs with switches to engage them. For many this will mean keeping a guitar plugged into channel 1 or 2 (along with a mic) and switching it in as needed. Channels 3 through 8 automatically switch between mic or line input according to what's plugged in. All channels feature four aux sends with pre/post switches, true hardware EQ bypass switches, solo switches, and 60 mm faders.

The four channel strips to the right of channel 8 host stereo channels 9-10 through 15-16. These channels offer fixed Low, Mid, and High EQ controls set to 80 Hz, 2.5 kHz, and 12 kHz, respectively. The gain pots on these channels provide a range of ±20 dB while the mic pre channels allow a gain of 60 dB (–20 to +40 dB).

The mixer's top panel also houses most of the major output connectors, including stereo control room, Alt 3-4 (accessed whenever a channel's mute button is depressed), headphone, and main outputs, as well as phono-jack tape inputs and outputs. (Although many users may prefer having those outputs on the rear panel, this configuration facilitates quick live setups with the rackmountable 1620.)

The control section of the 1620 houses a bank of switches for monitoring the main mix, Alt 3-4, FireWire card, or tape. Four aux return controls accompany four aux master sends, which can be switched pre or post. The talkback section features an external mic switch, momentary talkback switch, and a switch for assigning the signal to control room and headphone outputs or Aux 1-2 (when using these outputs for headphone mixes). A 12V 0.5A lamp connector, 12-segment stereo LED meter (–30 to +20 dB), and Mackie's trademark Rude Solo Light complete the top panel.

Fire in the Hole

The Onyx 1620's rear panel (see **Fig. 2**) contains eight ¼-inch TRS channel insert jacks, eight ¼-inch jacks for the four stereo aux returns, and four ¼-inch aux send jacks. Two XLR main outs can be switched from +4 dB to mic level for using the 1620 as a submixer. The main power switch sits above a cable receptacle that accesses the 1620's switching power supply, which works anywhere on earth. (Mackie provides a U.S. and an international power cable with the unit, so you can throw the mixer in a suitcase with confidence when you jet off to parts unknown.)

The bottom portion of the 1620's rear panel has two DB-25 connectors for establishing analog direct-out connections to external devices using standard Tascam-format adapter cables. Next to those connectors is an 8-inch horizontal slot that accepts the optional Onyx FireWire I/O card (see **Fig. 3**), an add-on

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FIG. 1: The Onyx 1620 mixer from Mackie has redesigned mic pre and EQ sections, talkback capability, and an optional FireWire card.

MACKIE Onyx 1620

An analog mixing console that's just right.

By Rusty Cutchin

Had Goldilocks been as interested in bussing 16 channels to disc as she was in the perfect bowl of porridge, she would have appreciated the Mackie Onyx mixing consoles: not too analog, not too digital, but just right for a project studio signal hub. The Onyx analog mixer series, including the 1620 model reviewed here, is a superior successor to the mixer design that put Mackie on the map. To some, analog mixers are relics of old-school recording in the wake of complex DAWs, loop recording, and single overdubs. But if you want to record a live band or keep a lot of keyboards and guitars ready to track at any time, you still need a top-shelf mixer. An Onyx series mixer is a little gem of an option.

Bling on Board

The Onyx 1620 brings the functionality of Mackie's groundbreaking CR-1604 and VLZ-series mixers into the present. The Onyx mixers look and feel like Mackie's Digital 8-Bus and Mackie Control, but the heart of an Onyx is all analog. The 1620's design brings to mind a 1604-VLZ with major upgrades to all specs, especially the mic pre and EQ sections. But the mixer's ace in the hole is the optional Onyx FireWire I/O card, which provides an 18-channel pathway for tracking to your computer and a stereo return that pops right into the control room bus for monitoring.

Designed from the ground up to handle live sound and multiple-mic recording sessions, the 1620 (see Fig. 1) features Mackie's Onyx mic preamps on channels 1 through 8. The company had already improved its mixer mic pres with the XDR designs in the VLZ Pro mixers. With the Onyx series, the company claimed to achieve the low noise, high headroom, and dynamic range of boutique preamps.

Also adding a new level of quality to the 1620 is the Perkins EQ section, which is named for its designer, Cal Perkins. Perkins, along with Greg Mackie, designed other Mackie successes such as the XDR mic pres and the HR-series monitors. Perkins went after the sound of certain British mixing consoles of the '60s and '70s by analyzing their circuitry. His efforts give the Onyx EQ sections an extra 6 dB of control (±15 dB) without excessively narrowing the bandwidth of the filters. He was also able to minimize phase shift and add a hardware bypass on every channel.

Other modern additions to the Onyx series include a built-in talkback section with an onboard mic (you can also use an external mic), a DB-25 connector that provides a balanced analog direct-output for every channel, and selectable instrument inputs on channels 1 and 2. The other members of the Onyx mixer line are the 12-channel 1220 ($639) and the 16-channel, 4-bus 1640 ($1,539).

Getting on Top

The 1620's face offers the familiar mixing controls. Channel strips 1 through 8 provide identical mic pre,

site. The set includes Tibetan Bells II, an Instrument that uses two Plate Modules to create deep and rich tones; and a tenor-sax patch that produces a variety of wind timbres. Adjusting the Mod Wheel on the sax's ModW preset changes the pressure of the air being forced into the bore (see **Web Clip 4**). More Visser patches are available from the designer's Web site at www. hvsynthdesign.com.

My only complaints about Tassman 4 are that subpatches are not well documented, and there's no guide to the example instruments (some modular soft synths offer that feature). It would also be great if there were a search feature in the browser—the single-column listing of all folders and their contents can quickly get unwieldy. And the sequencers, although much improved in version 3, are still not as easy to use as they could be. I do admit, however, that their nesting possibilities give them a vast range of potential for complex note triggering.

What keeps me coming back to Tassman time and time again is the sound—the crisp metallic bells, the breathy, airy flutes, and the ethereal bowed beams and plates. With Tassman, you also have the ability to create any imaginable (or unimaginable) sonic hybrid. There's no soft synth on the market today that has as many unique sonic building blocks as Tassman, and the range of possibilities it offers is awesome.

Tassman is a growing force in the desktop-music world—the size of its user base can be measured by the number and diversity of user-contributed patches found at the company's Web site. If you're looking for a tool to create new sounds or you simply want to play some of the most interesting and unusual physically modeled instruments, give Tassman 4 a try. But just remember to come up for air when you plunge into the depths of the preset patches!

EM WEB CLIPS

EM associate editor Dennis Miller is hooked on virtual instruments and plans to throw out all the cork grease and spit rags in his closet.

PRODUCT SUMMARY

APPLIED ACOUSTICS Tassman 4

software synthesizer
download $289
upgrade from Tassman 3 $99
OVERALL RATING (1 TO 5): 4.5

PROS: Outstanding preset Instrument library. Support for external audio as exciter. New Output section is a huge time-saver.

CONS: Subpatches and included Instruments poorly documented. Browser needs a search feature.

MANUFACTURER
Applied Acoustics Systems/
Ilio (distributor)
www.applied-acoustics.com

or tweak a drum loop by "scraping" it along a wooden marimba bar. You can easily build those and other types of designs by using the audio-file Player Module (from the Generators category) and then selecting the file you want to process while working in the Player interface. If you use the Audio In Module in your Instrument, you could process your voice in real time the same way. When using Tassman as a plug-in, simply place it on an audio track as an effect, and you're set. Check out **Web Clips 1** and **2** at the EM Web site for some examples of that technique.

All Tassman patches now include an Output section by default. That component provides Sync, Delay, Output (volume), Reverb (which has a small on/off switch), and Recorder modules. In previous versions, those modules had to be added to each Instrument. The Output section appears at the top of every Instrument by default, which is a huge time-saver. It comes with ten preset effects settings, and it's easy to create and save your own. The Recorder Module offers 8- and 16-bit settings, a mono or stereo toggle (Tassman supports the WAV format on the PC and AIFF and AIFC on the Mac), and a few triggering options, but that's about it. Still, you no longer need to bother including a Recorder Module in your designs, which is something that many users did on a regular basis in previous versions.

Program changes are now supported, which is an addition that will be especially appreciated by those using Tassman as a plug-in (see **Fig. 2**). A map associating the 100 presets in the Super Models category is included, and you can change associations by dragging a preset from the Browser directly into the map. You can, however, have only one map at any time.

FIG. 2: Tassman 4 now offers a map to associate any preset with a Program Change message.

Presenting the Presets

The new presets in Tassman 4 are alone worth the upgrade price. There are now nearly 50 unique synth designs that employ more than 1,000 presets. Those resources represent a fantastic collection of sounds and span a vast range of sonic possibilities (see **Web Clip 3**). I could spend the rest of the review discussing my favorites, but I'll keep it to a bare minimum.

> Tassman 4 retains its position as the top modeling program around.

Expanding the Instruments folder in the browser reveals the new Instruments, which are grouped into categories such as Acoustic, Analog, Drums, Hybrid, and FM. In the Kalimba folder under the Acoustic category, you'll find Breeze, which combines a Beam, Plate, and String Module with controls for Thumb stiffness and strength and Soundboard amplitude and decay. Turning off all chorus, reverb, and delay and then adjusting the Thumb's stiffness reveals a range of sounds from sharp and metallic to something resembling a struck clay pot. Moon Wolf, in the FM category, kicks off with a sharp attack and a complex sustain that includes a howling sound worthy of a Halloween night. The patch has a step sequencer adjusting filter cut-off, three oscillators, several LFOs, and a chorus and delay.

In the Super Models category, Airy sounds like a young flute player trying to get his or her chops in order. If you load Bubbling Dream and change the Sync Tempo while a note is sounding, you'll get some excellent light-saber sound effects. The Motion group has some winners, including the wooden-sounding Knocked Up, which combines a slew of FM oscillators, each with its own set of envelopes, panner, and mod control.

Low Resonator, in the Bowed category, has a beautiful tone that sits somewhere between a metal and wooden cello body (Fholes, Top Plate, and Back Plate are individually adjustable). In My Mind 1, with a bowed plate at its core, has a subtle inharmonic quality that thins out as you sustain a note.

If you're looking for more traditional patches, have no fear—there are a huge number of bass models and leads. A variety of electric pianos, reminiscent of the patches in Applied Acoustics' Lounge Lizard, are also on hand.

Special recognition goes to sound designer Harm Visser, who supplied some outstanding acoustic-instrument models to the mix. Visser's HV Collection, a small subset of his complete offerings, is available for free download from the Applied Acoustics Web

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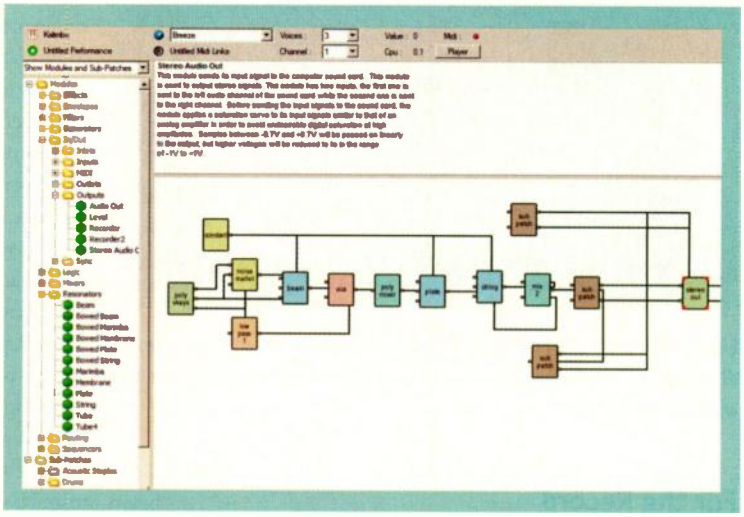


FIG. 1: Tassman Instruments are constructed in the Builder screen, which provides access to the included Modules (left). When you click to select any Module, text describing its usage appears at the top of the screen.

APPLIED ACOUSTICS Tassman 4 (Mac/Win)

Physical modeling takes a leap forward.

By Dennis Miller

Since the initial release of its Tassman soft synth, Applied Acoustics has been the leader in the field of physical modeling on the desktop. Not content to rest on its laurels, the company has released Tassman version 4, which adds a vast number of new presets, a default Output section, and the ability to use either audio from disk or real-time input as an exciter in patches. Combined with the new and optimized instrument-building Modules and a number of performance tweaks, Tassman 4 retains its position as the top modeling program around.

EM reviewed versions 1.2 and 3.02 of Tassman (you can find the reviews online at www.emusician.com), so I'll focus on the new features in version 4 for this review.

From the Top

Physical modeling is a demanding process for any CPU, and Applied Acoustics has put forth its many years of research knowledge to handle the task. The result is a soft synth that is efficient in its standalone and plug-in (VST, DirectX, AU, and RTAS) configurations.

Creating patches (which Tassman calls Instruments) begins in the Builder screen. The Builder screen is a dedicated work area in which you can place and connect modules from Tassman's extensive browser library (see **Fig. 1**). After you've created patches, you can jump to the Player work area to audition or play your Instruments. Tassman 4 offers the same ten categories of design elements (Effects, Envelopes, Filters, Generators, and so on) as in version 3. There are only a few new modules, including the Tube Reverb Module (found under Effects) and the Audio In and Stereo Audio In. New in version 4 is the ability to have the browser display only those folders that you want. You can't, however, have a separate view enabled for the Builder and Player work areas—it would make sense, for example, to see only modules in the Builder screen and only Instruments in the Player area.

Also new in this release is the Performance file format, a complete instrument design that includes a MIDI map, presets, and effects. Earlier versions of Tassman used different file types for all the categories of components, and although Tassman 3 made a leap forward in integration, Tassman 4 files can now include everything but samples in a single bundle.

Enter Audio

Many soft synths (and some audio editors) allow you to input a live audio signal as a sound source for modification by the host's signal-processing modules. That feature was noticeably absent from earlier Tassman versions. Now you can use audio input from an external source, an audio track in your DAW, or a file on a hard drive in an Instrument.

Tassman is not simply keeping up with the others in this regard, however, as the types of processing you can do to the audio signal are unique. You can pass your voice through the body of a cello or through a large metal pipe

FIG. 4 With the VS20-VGA option installed, the Home screen on an external display reveals pull-down menus, transport controls, and other details you won't see on the LCD.

For the Record

After working with the VS-2000CD for a month, I'm very impressed. Even without the VGA expansion board, it is a superb desktop recorder. With an easy-to-use mixer, 20 recorder tracks, a rhythm sequencer, harmony processing, and well-implemented CD burning, the VS-2000CD should be ideal for a songwriter or a working band. I really like the ability to back up and restore data to my computer. The internal effects have enough flexibility for most situations, and the expansion slots are a real bonus. The VS8F-3 plug-in board is terrific: for the price of a single piece of rack gear, you can load up on great-sounding, flexible plug-ins.

On the downside, the quality of the harmony voices left much to be desired. I would like to have seen support for multiple sampling rates, even at the expense of fewer tracks. I also would have preferred a status light to let me know when phantom power was enabled. Auto-punch is poorly implemented: in spite of what the manual says, you cannot automate multiple passes while looping. Soloing and muting tracks require too many button pushes. Some operations—in particular changing plug-ins and using USB storage mode—take a long time to load.

But once I had installed the VGA expansion board and grabbed the mouse, all was forgiven. Editing, mixing, and mastering were as easy as anything I've done on a computer. For a relatively modest outlay, the VS-2000CD is a machine that can take a recording project from start to finish.

Mark Nelson lives in Southern Oregon's Applegate Valley, where he makes music on things made from wood with strings. You can find him on the Web at www.mark-o.com.

would you want to? Given the huge difference it made, I can't imagine using the unit without the expansion board unless portability were critical.

Mastering and Storage

Once I had polished the mix, I used the Mastering Tool Kit's band-dependant compressor, EQ, and soft-clip limiter to add some punch and sizzle. Because effects resources are limited and that meant losing a reverb plug-in, I first went back and printed the effects and remixed my tracks—not the best solution, but workable. I later learned a better trick: record your Master Tracks (Roland's name for the stereo mix) dry, move them to any open pair of V tracks, and then remaster with effects.

I was delighted to discover that I could record several alternate Master Tracks for each Project, either on the 16 virtual tracks or lined up back-to-back for easy CD burning. Both TAO (track-at-once) and DAO (disc-at-once) recording are supported. To take advantage of DAO, though, you must first import Master Tracks from all of your songs into a single Project. Recording Master Tracks in CDR Rec mode stores a disc-image file with your Project, which is handy for burning multiple CDs. Although I always say you should have critical projects professionally mastered, Roland's innovative virtual Mastering Room is quite good.

Using the built-in CD-RW drive, you can also import and export audio data and back up or restore Project files. And with a few exceptions, you can easily move Projects between other VS models.

Using the VS-2000CD's USB 2.0 port to back up and restore data files and folders to and from a remote computer is easy, once you get past all of the warning screens. Roland's Wave Convert software for exchanging AIFF or WAV files with a computer worked flawlessly on my iMac. I do wish, however, that you could record direct to an external USB drive.

PRODUCT SUMMARY

ROLAND VS-2000CD

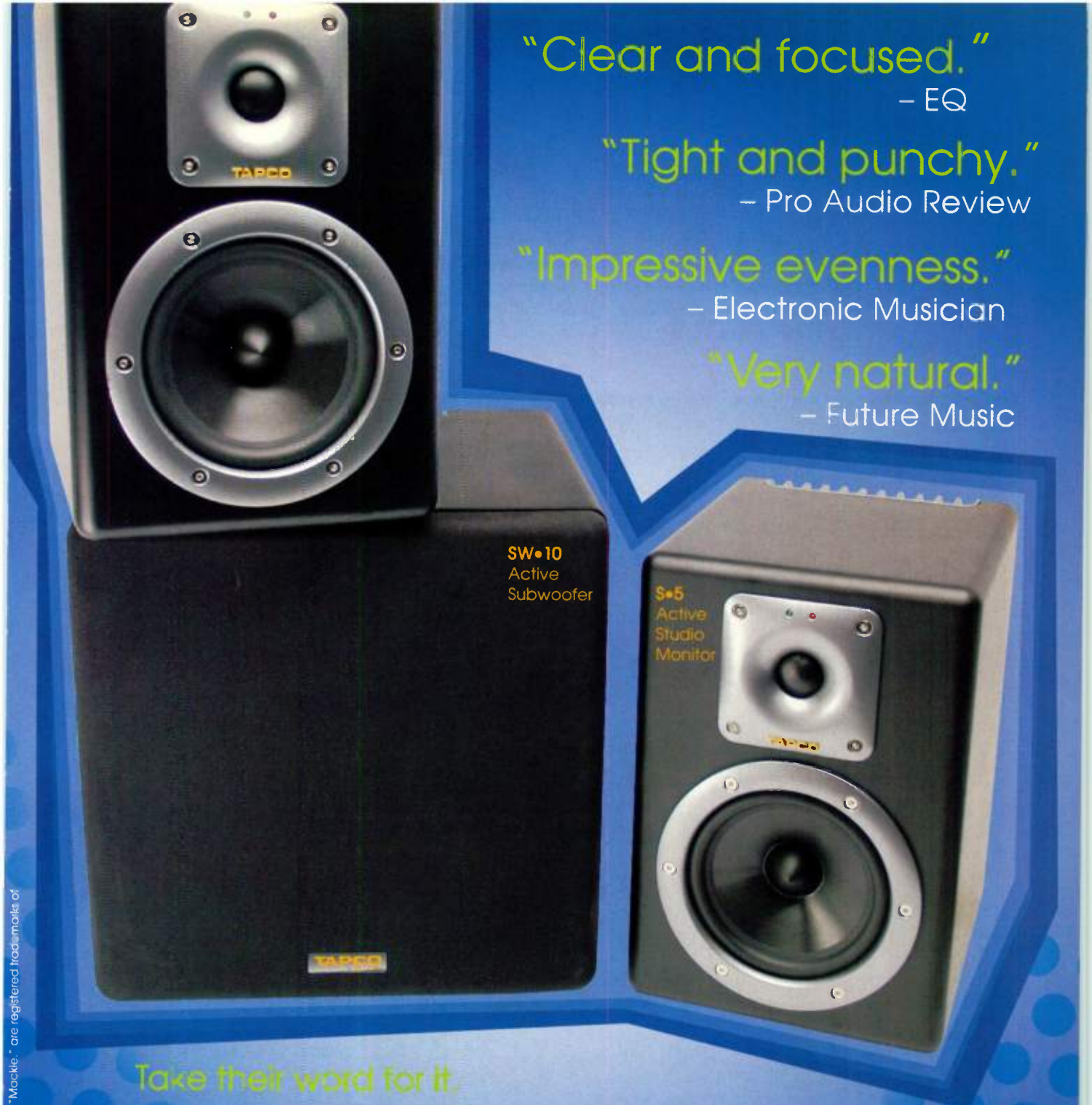
portable digital studio
$2,395

OVERALL RATING [1 THROUGH 5]: 4

PROS: Easy to use. USB 2.0 port for archiving and transferring audio tracks. Built-in drum machine. Optional support for mouse, display, and drag-and-drop editing. Optional third-party plug-in support. Easy CD burning.

CONS: Effects parameters can't be automated. No word clock. Lackluster harmony processor. No support for multiple sample rates. Monitor and aux outs use RCA connectors.

MANUFACTURER
Roland Corporation U.S.
www.rolandus.com



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card provides two additional parts, for as many as six independent voices.

I've had enough experience with artificial harmony to know that good results require good source material. To give the processor a fair chance, I tracked my lead vocal with pitch correction. Using a keyboard, I played in my first harmony part, only to hear the harmony voices jump around randomly. It turned out the processor assigned every other note to a different part—a fact not adequately described in the manual. I had better luck using the Track/Status buttons and selecting Chord to instantly generate both parts at preset intervals. In either case, editing was more difficult than it needed to be: although notes are displayed graphically, you make changes in an edit list, which quickly grows tedious.

I eventually had a basic two-part harmony, which I promptly recorded to free up the internal effects. Despite my tweaking the formants, the harmony sounded artificial and required large amounts of chorusing and EQ. In spite of its faults, though, the harmony feature has potential. You can use it to quickly flesh out a demo, and in the proper context, it could be just what you need.

Editing and Mixing

I have never enjoyed editing on a portable desktop studio, and certainly wasn't looking forward to it on the VS-2000CD. I changed my mind, however, when I installed the optional VS20-VGA ($275). The board supports a VGA display, a PS/2 keyboard, and the included two-button mouse. It is easy to install. With a large monitor, suddenly I had access to pull-down menus, drag-and-drop editing, larger meters, and all the main display's features. It was like working with a computer-based DAW (see Fig. 4). All the buttons and knobs on the unit's surface continued to operate normally, effectively doubling the number of user-interface options.

Using a display and a mouse makes editing a snap. Toggle to a waveform view for pinpoint control, or use the preview function to scrub a snippet of audio. Standard audio-editing features such as cut, move, copy, insert, time compression and expansion, and normalizing are supported for both Regions and Phrases (Roland's term for a chunk of audio). A handy Take Manager that keeps track of every recorded pass (until you optimize the Project) makes comping tracks a breeze. My only quibbles are that the waveform view doesn't scroll during playback and the screen redraw rate is quite slow.

Mixing on the VS-2000CD is a joy. Mix automation extends to most everything you'd need, except that the only way to make dynamic changes to effects parameters is through MIDI. Automation data is displayed graphically, and you can twist it into shape using the mouse.

Even without the VS20-VGA, you can accomplish all of the same tasks using the built-in display, the data wheel, and the cursor keys—but why

VS-2000CD SPECIFICATIONS

Channels	(20) tracks (14 mono, 2 stereo, 1 stereo master); (2) aux send/return; (6) effects send/return; (8) Direct Paths
Track Record/Playback	(8) tracks simultaneous recording; (320) virtual tracks; (18) tracks 16-bit playback; (12) tracks 24-bit playback
Sampling Rate	44.1 kHz
Analog Inputs	(8) balanced ¼" TRS; (8) balanced XLR with phantom power (switchable in channel pairs); (1) unbalanced ¼" TS high-impedance
Analog Outputs	(2) balanced ¼" TRS master; (2) unbalanced RCA monitor; (2) unbalanced RCA aux; (1) ¼" stereo headphones
Digital I/O	coaxial S/PDIF
MIDI	(1) In, (1) Out/Thru
Other Connectors	(1) USB 2.0; (1) ¼" footswitch
Faders	(17) nonmotorized
Dynamics	compression, expansion on (10) inputs, (20) tracks
EQ	4-band (2 parametric, 2 shelving) on (10) inputs, (20) tracks
Effects	(2) internal stereo multi-effects; (6) maximum using expansion slots
Hard-Disk Drive	40 GB
Optical Disc Drive	CD-RW; 24× read, 4× write
Additional Features	onboard drum machine; (1,000) markers per Project; (96) locate points per Project; expansion options
Dimensions	18.38" (W) × 4.69" (H) × 14.56" (D)
Weight	14.8 lbs.

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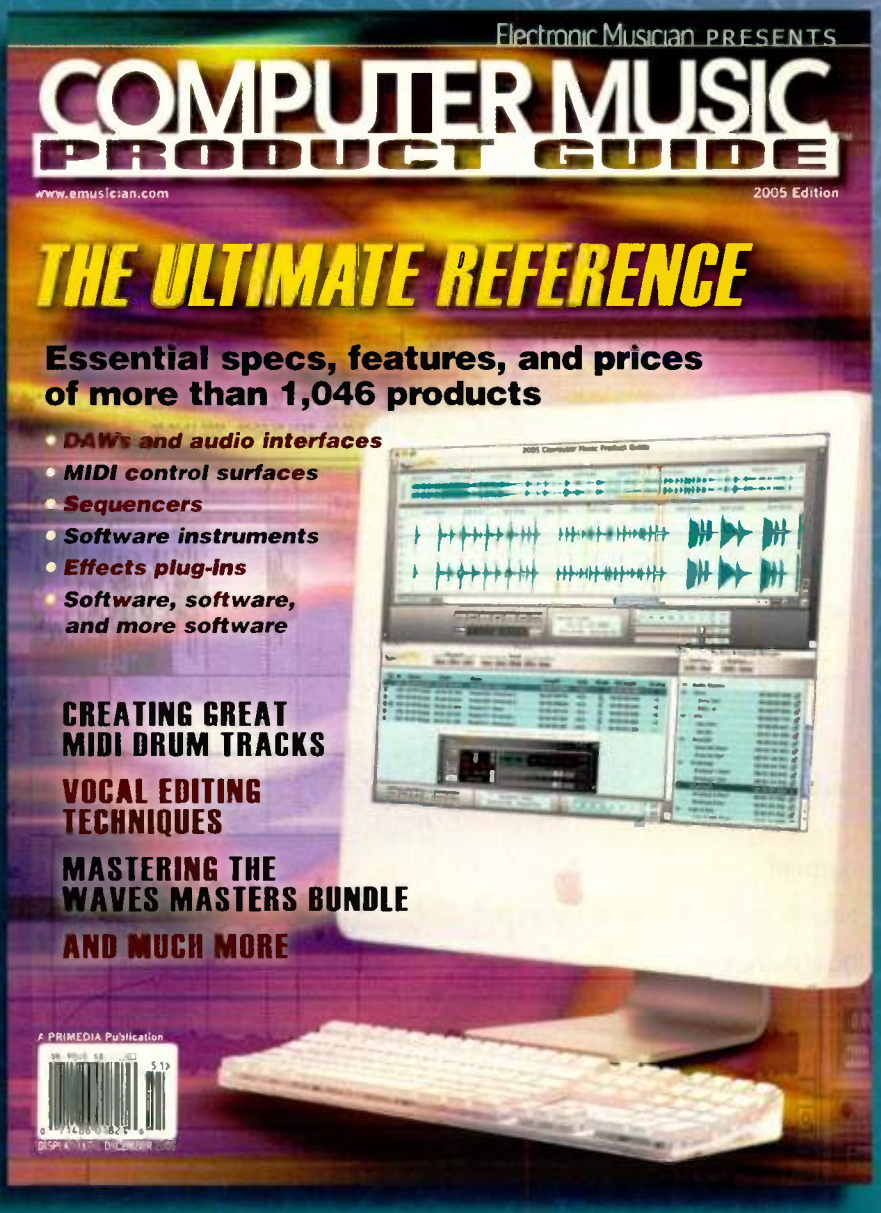

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I installed those, however, I wanted to try using the unit by itself. After powering up, two quick button presses summoned a screen in which I created my new Project (a folder containing all the audio files and settings for a song). The 40 GB internal drive comes formatted into three 11.5 GB partitions and one 6.7 GB partition; even at 24 bits, that allows almost 90 hours of total recording time. Because I planned to burn my song to CD, I chose 16-bit recording. (That wasn't necessary, though, because the VS-2000CD will convert on the fly when creating a disc image from a 24-bit Project.) The only sample rate that the VS-2000CD supports is 44.1 kHz.

I plugged a mic into channel 1 and my guitar into channel 8's high-impedance input. I inserted a vocal-channel-strip effect into the mic channel and one of Roland's excellent COSM mic-modeling effects into the guitar channel. Another button press and the display became a fully chromatic tuner that can be referenced to any input or recorder track.

Next I jumped to the EZ Routing screen to assign the guitar to track 2, checked input levels in the Home screen, armed the tracks, and hit Record. I wasn't satisfied with my first take, so I hit Undo. (Nearly a thousand levels of undo and one redo allow a lot of flexibility.) Another pass and I had my scratch tracks. I quickly added a second guitar and a bass part. All in all, it took about 15 minutes from turning on the machine to making my first recording. I handled all of my recording chores right from the top of the machine without having to scroll through pages.

I wish I could say I was as impressed with the 442-page manual. Several features are either inadequately described or downright confusing. The Turbo Start DVD helps, but it gives only a brief overview and also misses several critical features.

Rhythm Track

The VS-2000CD features the same rhythm sequencer found in the Boss BR-1600 and BR-1180CD. Once engaged, the Rhythm Track mutes any recorded audio and takes over stereo track 17/18. All of the channel dynamics, EQ, and effects apply to the Rhythm Track, the same as any other tracks.

Using the Rhythm Track couldn't be easier: just select from a huge array of preset patterns (or create your own) and chain them into a song. Use the Track/Status buttons (or a MIDI keyboard or drum pads) to enter data. Select sounds from an array of drum kits, including Standard1, Heavy, Jazz, and 808. The sophisticated tempo mapping offers options for manual entry, tap tempo, and converting external sync tracks.

FIG. 2: The footswitch jack on the rear panel of the VS-2000CD allows remote punching and transport control. The VS20-VGA slot adds connections for a monitor, mouse, and keyboard.

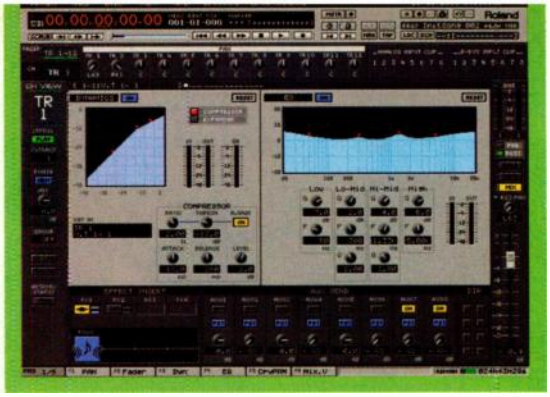

FIG. 3: The comprehensive Channel View screen (shown here on an external display) shows all your settings at a glance.

For tracking, I set up a simple kick/hat/snare click track. After I'd fleshed out my song, I went back and added variations for the intro, verses, bridge, and ride-out. The Rhythm Track's pattern editor supports both real-time and step-time recording, and it can record MIDI Velocity if you use an external controller. I applaud Roland for having such a useful feature as Rhythm Track.

Effects Generation

The two internal effects generators pack a fair amount of processing power. They supply a nice collection of patches optimized for specific tasks. Holding the Shift key along with one of the six FX buttons jumps directly to presets for reverb, chorus, vocal, guitar, COSM modeling, and the Mastering Tool Kit. The reverbs and choruses are quite serviceable, and the guitar multi-effects chains sounded quite good once I toned down some of the more extreme settings. Though no one will be fooled into thinking I used a vintage tube mic, I appreciated the quick tonal changes the COSM microphone modeling gave my vocals and acoustic guitar.

With only two internal effects processors, the two option slots come in handy. Each slot accommodates two additional effects, bringing the total to six when fully loaded. The VS8F-2 expansion card ($395) essentially duplicates the internal effects, whereas the VS8F-3 ($395) adds third-party plug-in capability. You can mix and match any combination of expansion cards.

The review unit featured a single VS8F-3 and a full complement of plug-ins from Antares, Universal Audio, McDSP, and TC Electronics. The card is bundled with Roland's suite of plug-in effects, which includes more powerful reverbs and vocal channel strips than the standard internal effects, and a greatly improved Mastering Tool Kit. I found the plug-ins to be uniformly excellent and useful for every stage of recording.

Living in Harmony

Roland's harmony processor creates two independent parts using the internal effects processors. Each VS8F-2

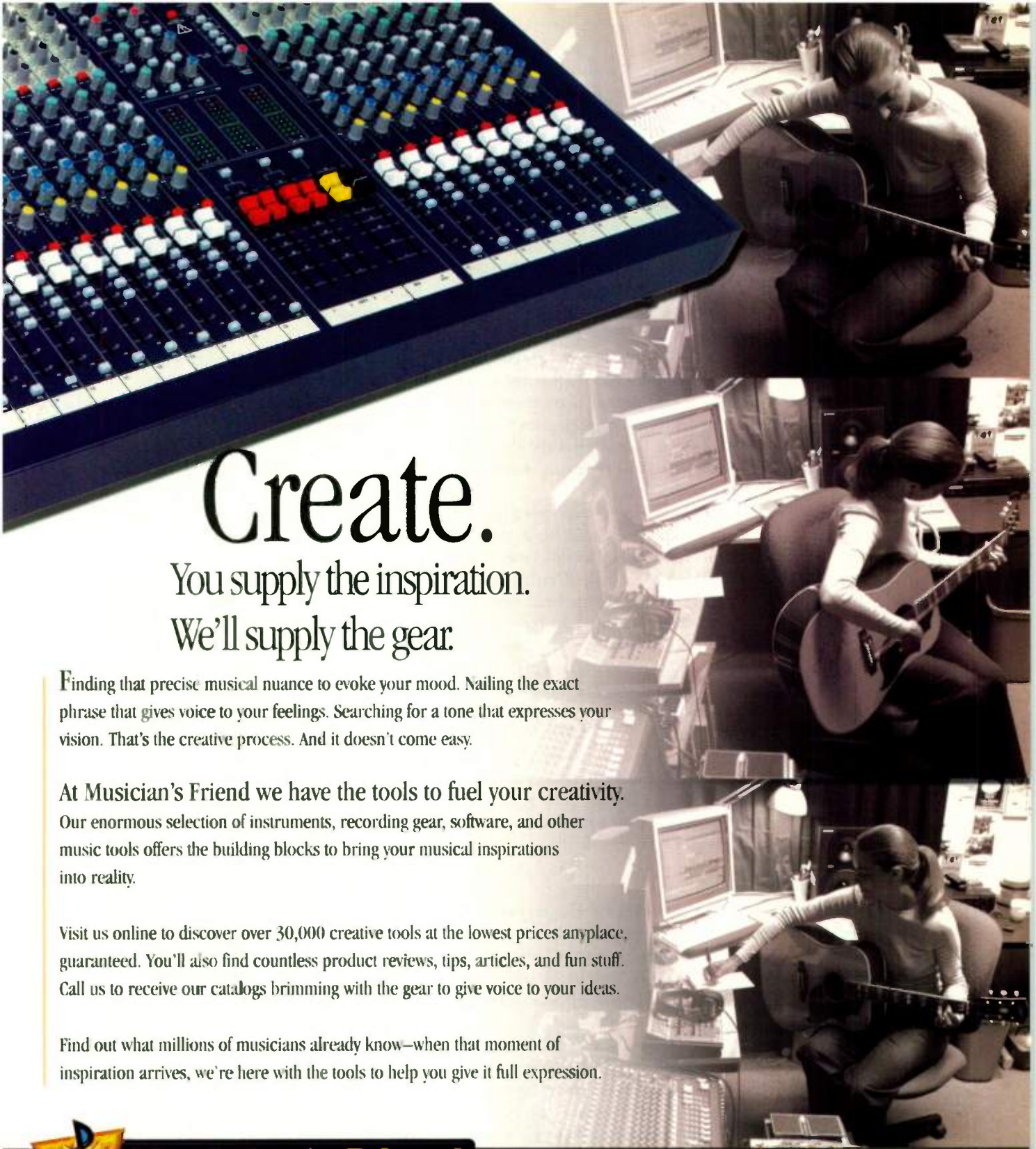

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FIG. 1: The VS-2000CD from Roland is a portable 20-track studio that has many features most often found in a computer-based DAW. A logical user interface and a detailed display enhance workflow. Top-panel connections simplify rerouting audio signals. Also shown here is an external display, which requires the optional VS20-VGA expansion card.

ROLAND VS-2000CD

Impressive multitrack features in a self-contained package.

By Mark Nelson

Combining the power of a computer workstation with the convenience of a dedicated desktop recorder, Roland's VS-2000CD offers most of the VS-2400DVD's features at close to half the price. The VS-2000CD's powerful drum sequencer and multipart harmony processor are unique to the VS series. With optional support for a VGA display and mouse, two effects expansion slots, and support for third-party plug-ins, the VS-2000CD is an impressive multitrack studio with a small footprint and a reasonable price.

From the Top

Housed in an attractive silver and grey case, the VS-2000CD reveals its strengths at a glance. Almost everything you need is accessible using a well laid-out array of clearly labeled buttons, knobs, and switches (see **Fig. 1**).

Seventeen nonmotorized faders handle 14 mono and 2 stereo recorder tracks and the master level. A row of Track/Status buttons serves multiple purposes. In addition to the usual recorder chores (such as mute, solo, channel select, and arming tracks for recording), they call up locate points (16 per bank stored in six banks, or 96 per Project), and scenes (also 96 per Project). They also come into play when using the onboard drum machine and harmony functions. Although confusing at first glance, the buttons' multifunctionality makes a great deal of sense once you start to work.

Each of the eight analog inputs has XLR mic connectors with phantom power, ¼-inch TRS jacks, and dedicated trim pots. Input 8 also features an unbalanced ¼-inch jack for connecting an electric guitar or bass. Top-panel outputs include two ¼-inch TRS master outs, stereo aux and monitor outs on RCA jacks, and a single ¼-inch headphone jack with its own volume pot. On the rear panel, RCA coaxial connectors provide S/PDIF I/O alongside MIDI I/O, a footswitch jack, and a USB 2.0 port (see **Fig. 2**). Sadly, there is no word clock.

Each input and recorder track features a dynamics processor and 4-band EQ (two bands shelving and two bands parametric). Four soft knobs afford hands-on control of the compressor's threshold, attack, release, and level (you use the cursors and data wheel to set the ratio). The same four knobs also wrangle EQ gain. Although the manual doesn't mention it, you can hold down the EQ button and use the knobs to sweep the frequency. The EQ and dynamics get the job done without coloring the sound.

In the Channel Edit screens, you can select among the 16 virtual tracks, link channels to stereo groups and assign groups, insert effects, select the aux or effects send that's controlled by the hardware Send knob, or select a Direct Path (see **Fig. 3**). A Direct Path is a legacy of the VS-2480; it allows you to quickly route an input or track to one of the hardware outputs—for example, to insert an external processor.

Basics First

Roland supplied me with an optional VS20-VGA card and an effects card loaded with plug-ins. Before

PRODUCT SUMMARY

STEINBERG Cubase SX3

digital audio sequencer
$799
upgrade from earlier versions of SX $149

OVERALL RATING [1 THROUGH 5]: 4

PROS: Play Order rearranging for songs. Time warping for audio files. Acid Loop support. MIDI editing directly in Project tracks. Expanded Freeze function. After-the-fact audio capture using Audio Pre-Record.

CONS: Limited selection of factory plug-ins. No expanded mixer overview. Requires powerful computer for low-latency performance.

MANUFACTURER
Steinberg
www.steinberg.net

Using Cubase SX while writing this review was mostly smooth sailing, but there were occasional problems. Random and unrepeatable minor graphics glitches would crop up from time to time. Furthermore, SX3 would crash when quitting about a third of the time; to be fair, however, I suspect that many of those crashes were related to errant VST plug-ins in my system. Overall, I found Cubase SX3 to be very stable, and none of the problems mentioned seriously impeded my workflow.

Steinberg has a clear winner in Cubase SX3. It's a top contender in the DAW market, and the new features, such as Audio Warping, Play Order, and In-Place Editing, make it even more powerful. It is a must-have upgrade for current users, and anyone looking for a full-featured digital audio sequencer would do well to give SX3 serious consideration. EM WEB CLIPS

Orren Merton is the author of Logic Pro 7 Power *(Muska & Lipman, 2005) and is a former moderator of Cubase.net.*

such as a high-end tube compressor, EQ, or reverb. You can then access them from within Cubase SX3 as you would any other effect. You set up the external hardware interface in the External FX tab of the VST Connections window by entering the name and selecting audio inputs and outputs to which the hardware is connected. You can then patch your hardware in just as you would a VST plug-in. You can even set up delay compensation.

Those who have extensive hardware MIDI setups will want to check out the new MIDI Device Manager. That feature allows you to install MIDI Devices, including patch lists. It also allows you to construct Device Panels for real-time control of MIDI hardware. Cubase SX3 comes with patch lists for many devices and some sample Device Panel constructions to get you started. Device Panels are accessible anywhere MIDI Devices themselves can be accessed, including in a track's Inspector and Extended Mixer view.

The Big Picture

In addition to the major features just discussed, lots of little niceties have been added to Cubase SX3. A new Color Tool lets you to apply custom colors to tracks and parts. Window Set management and Snap and Hitpoint behavior have been improved. The new Audio Pre-Record feature lets you to capture as much as ten minutes of incoming audio before recording is activated, so you won't lose a perfect take if you forget to engage recording. The Freeze function now works for audio tracks and VST Instruments.

Cubase SX3 has added support for Yamaha's Studio Manager 2 software to allow for remote control of its digital mixers and recording hardware. Event-based volume envelope automation is now available in addition to the usual track-based automation. Beyond that, there are numerous bug fixes and small improvements.

On the down side, Cubase SX3 does not offer a collection of plug-ins that is as professional or as extensive as some other high-end DAWs. Cubase SX3 isn't, however, as expensive as other DAWs. One helpful addition would be an extended overview mode for the Mixer, in which you could access individual inserts, sends, and EQs. It would also be nice to have printed documentation; there is, however, extensive third-party documentation available (see the sidebar "Help Is on the Way").

HELP IS ON THE WAY

Cubase SX3 is a huge program, and no one manual could reveal all its nooks and crannies. Cubase ships with a short, printed Getting Started manual as well as five more specific manuals in Adobe Acrobat PDF format, which cover general operation, score layout and printing, remote control devices, VST effects and instruments, and MIDI devices and features. While those cover the bases, none take you step-by-step through the learning process. Several independent providers do offer more detailed instruction.

ASKVideo Interactive Media (www.askvideo.com) offers a cross-platform DVD course in the form of 28 videos designed to get you making music quickly. Topics include audio, MIDI, and VST connections setup; recording and looping audio; MIDI editing using SX's mixer; and mastering the new features in SX3 (sample clips are available at the company's Web site).

Thompson (www.courseptr.com) offers beginning and advanced books on Cubase SX3. *Cubase SX3 Ignite!* is aimed at beginners and includes lots of screenshots and step-by-step instructions. *Cubase SX3 Power!* offers an in-depth look at Cubase's many power-user features and is as close to a printed manual as you'll get without printing it yourself.

The Digital Music Doctor Web site (cubase.digitalmusicdoctor.com) offers video tutorials aimed at both the beginner and experienced Cubase user. Each course offers two hours of training as well as a variety of sample projects, which cover the basics as well as advanced features.

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*$199

Optional Adat Output *$99

The PR8MKII is a 2U 19" rack-mount preamplifier with a brand new design utilizing features never before possible at this price range! With eight discrete high-quality microphone preamps, Detented gain control, Combo connectors, Separate switches with LED indicators for Phase and Phantom, Insert points on every channel, XLR balanced and 1/4" Unbalanced outputs and with the addition of an optional ADAT™ light pipe output, the SM PR8 MKII seamlessly fits into many digital audio workstation configurations.

*$249

TB101 Single Channel Version *$149

The TB202 valve (12AX7) mic pre-amp is a twin channel valve mic preamplifier that features independent switchable phantom power, phase reverse, -20dB Pad, optical compressor, and fully functional EQ all housed together in a single 1U rack mount chassis. With a warm valve sound and the addition of an Optical Compressor the TB202 is a tool for those who want that SPECIAL sound this type of equipment can produce. With XLR inputs and 1/4" inputs the unit can be used with microphones or instruments without the need for adaptors.

*$499

The Amazing OC8 is a rack-mount optical compressor. With eight discrete high-quality optical compressors. Optical compressors are sought after for the distinctive musicality they give to vocals, guitars and other instruments. The OC8 's adjustable ratio, attack, release and output controls are calibrated to generate a distinctive soft, rich character while providing magnificent control over dynamics. Fantastic for use as inserts on your multi-channel recording or live tracks.

PR4 value *$79

4 Channel Mic Preamp

HP4 value *$79

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DI8 *$99

8 Channel DI/MIXER

IN5 *$199

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Music123.com

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*Estimated Selling Price

All specifications are subject to change without prior notice.

The Inspector view for the Play Order Track is divided into two sections with the Play Order List on top and a list of all Play Order Parts on the bottom. To create a Play Order from your Play Order Parts, simply drag them from the lower to the upper section—individual Play Order Parts can be used multiple times.

You can rearrange the order of the various Play Order Parts in the Play Order List and specify how many times each one should repeat. You can rename and duplicate the current Play Order List and easily manage multiple Play Order Lists. Those who prefer a larger view than the one provided by the Inspector can use the Play Order editor.

FIG. 3 : The In-Place editor offers a miniature Key editor in the Project window.

Play Order Tracks offer a great way to experiment with new arrangements of a project (see **Web Clip 1**). Play Orders play back seamlessly regardless of the complexity of the Play Order Track. When you find one that you like, you can use the Flatten Play Order function to reorganize your parts to reflect the new arrangement.

A New Warp in Time

Audio warping is one of the most exciting new features in Cubase SX3. It offers real-time time stretching and pitch shifting. As with the Play Orders, audio warping is easy and intuitive.

Cubase SX users who are already comfortable working with Hitpoints will have no trouble setting up audio warping. After opening an audio event in the Sample editor, use the Audio Tempo Definition Tool to set its tempo, length, and time signature. Then turn on Music mode, select a time-stretching algorithm, and use the Warp Samples tool to position Warp Tabs to match your audio clip to the bars and beats grid (see **Fig. 2**). If you've already set up Hitpoints, you can automatically convert them to Warp Tabs.

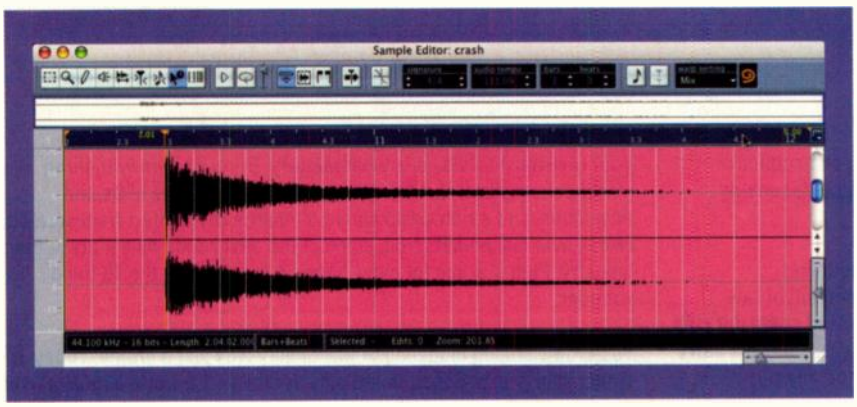

FIG. 2: Cubase SX3 allows you to define warp markers in the Sample editor. These markers determine where Cubase SX3 will stretch and compress your audio when audio warping is engaged.

Real-time pitch shifting is handled in the Project Window using the Transpose field on the Event Info Line. Cubase SX3 supports ACID Loops, and their tempo, length, and time signature are automatically recognized.

Your Place or Mine?

Cubase SX3 now allows you to edit MIDI parts in the main Project window. When you press the Edit In-Place button on a MIDI track, a miniature Key editor opens in the track lane (see **Fig. 3**). Although lacking the full toolbar and some of the advanced editing features of the full Key editor, the In-Place editor is intuitive and easy to use.

Clicking on the upper-right corner of the MIDI track displays a local toolbar with buttons for audition and edit-active-part-only as well as boxes for inserted-note Velocity and quantize settings. The Project Window's Snap button and Snap Type settings determine the snap functionality in the In-Place editor, but the Snap Grid is controlled by a local Quantize menu on the In-Place editor toolbar. Vertical zooming and scrolling are handled by clicking on the left edge of the miniature piano keyboard and dragging. It would be nice if you could also assign key commands to zooming within the In-Place editor.

In a nice touch, you can edit continuous controller and Velocity information below the notes in the In-Place editor, just as you can in the Key editor. Moreover, you can edit notes and controller information simultaneously, which is something that you can't do in the Key editor.

Bringing the Outside Inside

Steinberg has been at the forefront in developing virtual studio technology to keep everything inside the box, but SX3 adds some new features to help interface with equipment outside the box. The new External FX Bus allows you to connect external hardware units to your audio interface,

CREATE

ION

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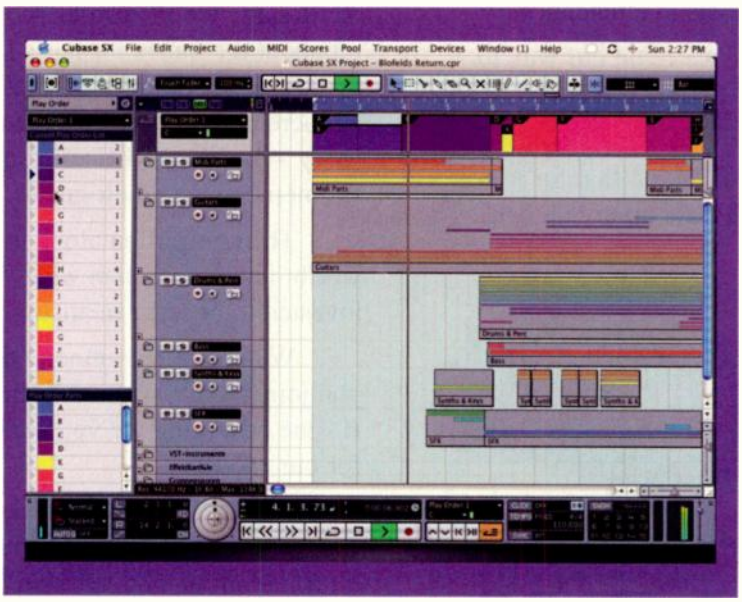
REVIEWS

STEINBERG Cubase SX3 (Mac/Win)

Steinberg proves that the third time is the charm.

By Orren Merton

With a heritage dating back to the first commercial MIDI sequencers, Cubase SX is one of the most powerful and innovative digital audio workstations (DAWs) available. Steinberg's recent update to version 3 boasts a host of new features, including workflow and functionality enhancements. In this review I'll focus on the new features; for a complete review of Cubase SX2, see the May 2004 issue of EM.



Cubase SX3 requires a powerful computer, especially to use low audio-buffer sizes. Although very efficient at higher settings, at buffer settings of 64 samples or lower, complex projects (including the demo song "Blofeld's Return") exhibited artifacts on a dual-G5 2.0 GHz PowerMac and a P4 2.8 GHz PC, whereas a faster PC played them without problems. For this review, I primarily used the dual-G5 machine.

Your Play Order, Please

Play Order is one of the big-ticket new features in Cubase SX3. It allows you to designate sections of your song as Play Order Parts, then rearrange them in any order you wish (see **Fig. 1**). Play Orders are easy to set up: you simply add a Play Order Track to your song and use the pencil tool to create Play Order Parts on it. There are no restrictions on the length or position of the Play Order Parts; they can overlap, and you can even create one Play Order Part completely inside of another.

FIG. 1: The Play Order Track allows you to create Play Order Parts and organize them in the Track Inspector to rearrange playback.

"A Dozen Labels and Publishers Came To Our Showcase Because We Joined TAXI"

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He signed on to represent us, and with our attorney and TAXI spearheading the effort, we began to build a buzz. That lead to an industry showcase in Los Angeles with A&R people from more than a dozen labels in attendance.

Now, we're on our way to New York to do a round of showcases there.

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The DAW Apprentice

By Lory Kohn

Hire a pro to help you improve your mixing skills.

If elevating your recording consciousness from the science of engineering to the art of mixing sounds appealing, there's a reality show you might be interested in: *The DAW Apprentice*. You're eligible if you've ever had the feeling someone else could do a better job with your mixes than you can. You might be too close to the songs to evaluate them objectively, or you simply may not have the skill level necessary to make your tracks sound truly professional. In either case, your options are to keep plugging along, hoping to make it work, or to seek out the assistance of a top-gun engineer. The latter option comes with a significant benefit: by interacting closely with a top pro, any mentoring you receive stays with you for the rest of your life.

Even though sentient beings enjoyed my mixes for a self-recorded CD, in my heart of hearts, I suspected the tracks had sonic possibilities that my mixes failed to exploit. These suspicions were confirmed after Grammy-winner Larry Seyer gave the final CD a thorough going-over. In Electric Larryland—Seyer's studio—timing issues were resolved by "slipping" audio, or using the Split and Slip tools on misaligned waveforms via a series of keyboard shortcuts. Zooming in and out of waveforms and nudging audio horizontally required more keyboard shortcuts and plenty of trial and error. These operations would have burned up alarming amounts of time and money if Seyer hadn't attacked his shortcuts like Edward Scissorhands shaping topiary. Seeing exactly how one of the big boys manipulated digital audio in the course of enhancing my mixes was a nice twist on adult education. Picking up the ability to fix other people's timing problems was a bonus.

SHERI MCILLWAIN

Mark "Captain EQ" Rossi's success proves that a skilled and experienced engineer can produce world-class mixes with welfare plugs.

You can have similar experiences with top pros by hiring them to mix what you've tracked or to reveal tips and tricks one-on-one. Perhaps you've heard the adage that a great engineer can get more out of "welfare plugs" (the free plugs that come with DAW software) than a lesser one can accomplish with standalone plugs? I witnessed living proof when I hired Mark "Captain EQ" Rossi for the final mix of a complex production anchored by the piano part.

During tracking, I'd been unable to dissuade the player from depressing a MIDI sustain pedal for any moment of a 6-minute take. I was convinced the take was unsalvageable, and fretted that an otherwise sterling performance would be consigned to the bit bin. My attempts to communicate these concerns to Captain EQ elicited no response. Rossi was preoccupied calculating the results of minute EQ corrections over four frequency bands. He was also deliberating how these calibrations would effect his approach to seasoning dozens of instruments and voices. After its makeover with a welfare plug, my "unsalvageable" piano part had the gloss and sheen of Burt Bacharach's Steinway B. Bringing in Rossi gave me an opportunity to pick up invaluable tips about EQ, compression, and creating reverb space that I never would have learned trying to fix the track on my own.

Even if you can afford only one session with a seasoned pro, the benefit to your tracks and your knowledge base is priceless. DAW forums are particularly fertile grounds for identifying potential mentors. Pro audio dealers are also good sources for leads. It is easy to find out which pros are most knowledgeable, but make sure you choose one who will *convey* the most. You want someone capable of slowing down and letting you drive, enabling you to get the most out of your sessions.

If you worry that asking for help on your tracks is a sign of weakness, consider that working with someone else can provide a catalyst for positive change. Just as aspiring moguls want to work side-by-side with Donald Trump to learn the secret of his success, you can reap the rewards of mixing next to a top pro. Someone may even aspire to be *your* apprentice one day. EM

Lory Kohn has apprenticed with Larry Seyer of Electric Larryland (engineer@seyer.com; www.larryseyer.com) and Mark Rossi of AVR New Media (mixwiz7@yahoo.com). Contact Lory at lory@themilkmen.com, or if you're in the market for milk lore, check out www.themilkmen.com.

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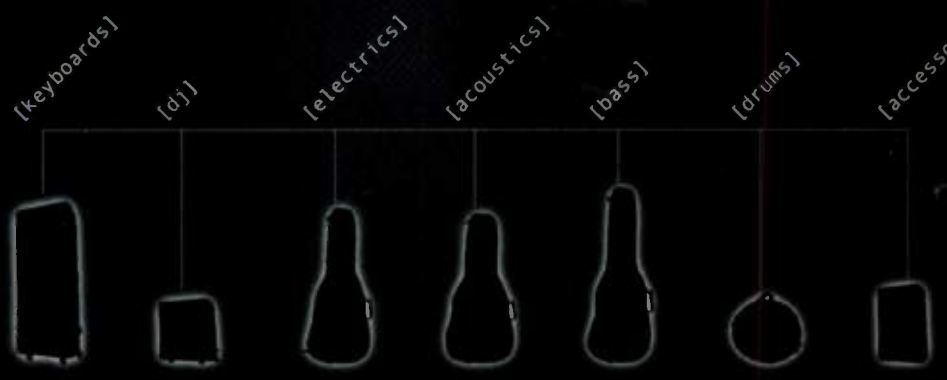

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A Stitch in Time

By Brian Smithers

Manipulating time and pitch for fun and profit.

As every musician knows, pitch and time go hand in hand—if you speed up the playback of a tape machine, the song's tempo will increase, and its pitch will rise. But though nobody has been able to repeal the laws of physics, it is now possible to manipulate a sound's timing and pitch independently: if we can adequately describe a sound's behavior over time, we can reproduce that behavior over a different time scale realistically. This process of analysis and resynthesis is fundamental to the time-compression/expansion, pitch-shifting, and automatic-tuning processes that have inundated music production.

A common technique used to transpose samples is to play the sample back at a different sampling rate. For example, if you play a 44.1 kHz sample back at 22.05 kHz, it will sound an octave lower and for twice its original duration. If it's a rhythmic sample, such as a drum loop, it will play back at half its original tempo. That is exactly analogous to changing the playback speed of a tape machine, and it suffers from the same timbral shifts, creating mud at lower sampling rates and cartoonish effects at higher ones.

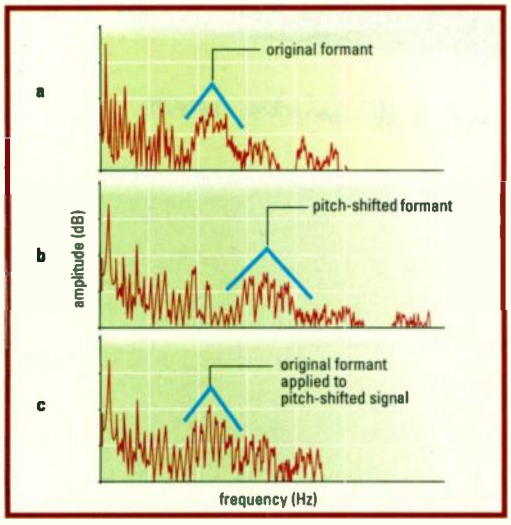

FIG. 1: Preserving formants after phase-vocoder pitch shifting is important. When sound A is transposed, its formant is transposed (B). Applying the spectral envelope of A to the pitch-shifted version restores the formant to its characteristic location (C).

Phase One

To do the job properly, you need to separate frequency information (on which pitch and timbre are based) from timing information (on which articulation and rhythm are based). The *phase vocoder* is equipped to do just that. A phase vocoder—not the more common channel vocoder that makes synthesizers seem to talk—picks apart a sound's harmonic structure, allowing the sound to be manipulated from the inside out and then recombined.

The phase vocoder extracts the harmonic content of a signal by performing a *Fourier transform*. The signal is first sliced into small chunks of time called *windows*. Each window is then analyzed for its frequency content. A large number of frequency bands called *bins* (typically as many as 1,024) is examined for the amplitude and phase of any harmonic components they contain. The exact pitch of a harmonic is determined by examining the phase of the waveform at two adjacent windows. The greater the phase shift, the further the frequency is from the center frequency of that bin, so the phase shift can be used to identify the frequency precisely.

The phase vocoder is like a filter bank that measures the time-varying energy of the signal passing through each bandpass filter. This interpretation reveals the family resemblance to the channel vocoder, which directly maps this information to envelope generators on corresponding bands of a carrier wave. The phase vocoder, however, can use this information to synthesize an output signal directly. A perfect phase vocoder would be able to analyze a signal and then resynthesize it from scratch accurately.

Note that we have just successfully separated frequency from time. By remapping the envelope of any filter to another filter we can change frequency content without affecting timing. By changing the rate at which the envelope information is re-created, we can change timing without changing pitch.

Smiling Phases

If we shift the entire harmonic spectrum of a sound equally when changing pitch using phase-vocoding techniques, we get the same timbral degradation that variable-speed playback exhibits. That is due to the shifting of the *formant* along with the fundamental. A formant is a characteristic emphasis or peak in a sound's frequency spectrum that does not change along with the fundamental. It is caused by the natural resonance of an instrument or vocal tract, and it is a primary means by which our ears distinguish one voice or instrument from another. It is, in fact, the shifting of the formant that causes the chipmunk effect.

Fixing the formant problem is simple. After the pitch has been shifted, the spectral envelope of the original signal is mapped onto the new sound, restoring the formant (see **Fig. 1**). Of course, once we know how to fix a formant, we know how to manipulate it for creative effect—such as mapping a female's formant onto a male voice.

Another common failing of the phase vocoder is its tendency to smear transients. Since the Fourier transform is performed in windows of fixed size, it is impractical to describe events such as transients, whose durations are shorter than a window.

Time Out

Given the limitations of phase-vocoder techniques, let's dream up the ideal method for stretching or shrinking the timing of

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Twang, Plunk, Boing

By Len Sasso

Five ways to liven up your percussion tracks.

Resonator effects are useful for adding pitch to unpitched sounds and for bringing out the harmonic content of pitched sounds. I'll use Ableton Live 4's Resonator plug-in to illustrate both processes. Although true resonators are more complex, if you don't have Live 4 or another resonator plug-in, you can experiment with several very short feedback-delay lines in parallel. The delay time in milliseconds for a resonant frequency *F* in Hertz is 1,000/*F*. (To calculate it in samples use *SR/F*, where *SR* is the sampling rate.)

Applied to broad-spectrum sounds (noise and percussion, for example), resonators "ring" at each of the resonator frequencies. Applied to pitched sounds, resonators reinforce harmonics at the resonator frequencies; if those frequencies are not present in the sound, the resonator will dampen and discolor the sound.

In Perfect Harmony

To get a feel for using resonators, create a MIDI track and insert Live's Impulse plug-in followed by the Resonator plug-in. Fill the eight Impulse pads with some pitched and unpitched sounds. Turn off the Resonator's input filter, and use mode A with high Decay, Color, and Dry/Wet settings. Set the pitches for resonators II through V to –12, 7, 16, and 19 semitones, and set the fine-tuning of resonators III through V to 2, –14, and 2 cents, respectively. (The cents settings compensate for equal-tempered tuning.) Set resonator I's Note an octave above the desired pitch.

To hear just the odd harmonics, turn off resonators I and IV. To set all resonators to odd harmonics, set the pitches of resonators II through V to –19, 9, 15, and 21, and set the fine-tuning of resonators I through V to 2, –2, –16, –33, –4. Finally, set resonator I's Note an octave and a fifth above the desired pitch. The Live project called TryEm.als on the EM Web site has both setups, and the table TryEm.rtf shows the semitone and cent offsets for the first 16 harmonics.

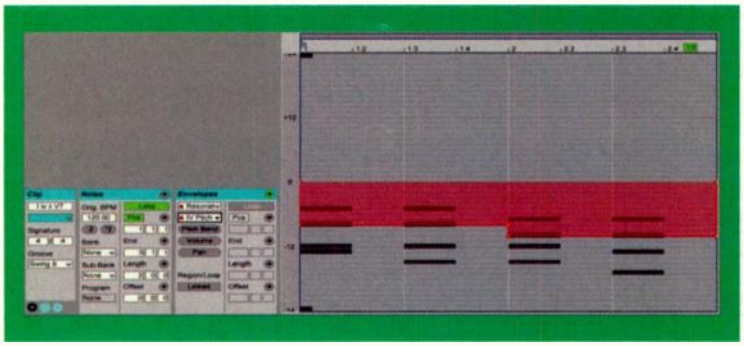

FIG. 1: A clip envelope for resonator IV's Pitch is used to track the third voice of a chord sequence. The vertical zoom and pitch range of the MIDI sequence are critical to accurate tracking.

Follow Me

You can use clip automation to make the Resonator follow the chords in a MIDI clip. Setting up the automation is easiest if you ensure that the pitch span of the MIDI clip is C2 to C6 by temporarily editing the clip. Enable Clip Envelopes, select resonator II's Pitch for editing, and set the Clip Window's vertical zoom so that you see just the –24 and +24 scale markers (see **Fig. 1**). Then, in Automation Draw mode, set the value to the lowest note in each chord. Repeat for the resonator III through V Pitch envelopes, matching successively higher chord notes. Do not automate resonator I's Note setting, and manually set it to the C that produces the best results (usually C3 or C4). Other settings will transpose all the chords, which can be useful as long as you aren't playing the original MIDI clip at the same time.

Alternatively, you can automate resonator I's Note to follow a bass line or lead and use one of the harmonic settings previously described to enhance the material's harmonic content (see **Web Clip 1**). Turn different resonators off or adjust their gains to alter the effect. Try mode B, which works especially well with bass. Finally, turn on the input filter, set it to bandpass or notch mode, and apply some clip automation to its frequency.

Vocode Me Not

Resonators can be used to impart a quasi-singing character to speech that is different from the effect of vocoding; the speech is more clearly articulated, but the timbral range is more limited. Resonating vocals works better with chords than harmonics. For an interesting contrast, vocode the speech with noise to turn it into a whisper before resonating. That trick also works well with bass and lead tracks (see **Web Clip 2**).

Post–Resonator processing is especially useful when applied separately to the two sides of the stereo output because resonators II and IV are sent to the left channel, while resonators III and V go to the right channel. (Resonator I goes to both channels.) Ensure that Resonator's Width is set to the maximum, and then try equalizing the channels separately as well as adding a small delay to one of them (see **Web Clip 3**). EM

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Len Sasso is an associate editor of EM. *He can be contacted through his Web site at www.swiftkick.com.*

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In Digital Performer, the record path can be verified or changed in the Audio Monitor window. The default path, as in Pro Tools, is to the Audio File folder inside the project folder. In Logic, when you press Record, the software asks you to name the audio and direct its path. Logic doesn't create a song folder around your file, so you have to create one yourself, along with your own Audio Files folder (optional but highly recommended). You can rename the audio later in the Audio Files window and redirect audio to a new recording path if you wish.

FIG. 3: Using simple identifiers like numbers and dates in file names gives every file a link to its original project and avoids duplicate file names when recording numerous takes on multiple projects.

Name That Tune

Speaking of naming, DAWs usually name the audio file after the track on which the file is recorded. Subsequent takes on each track have numeric extensions. So, if your first audio track is called Audio 1 (the usual default name for a new track), then your first take will be called Audio 1_01, your second take will be called Audio 1_02, and so on. Track 2's audio will be called Audio 2_01 and the second take will be named Audio 2_02. If you have several songs with multiple takes, one file misstep spells disaster. Audio 1_01 from one song may be vocals, while in another song the same filename could refer to an alto sax track. If you inadvertently redirect the file to the wrong audio you will have sax where once you had vocals. The easy way to avoid this kind of conflict is to name the tracks before you start recording.

I take it one step further. If I am going to record multiple songs for a project, I assign a number to each song in its title, such as "1_I Really Love You," "2_Night and Day," "3_Harvest Moon," and so on (see **Fig. 3**). In the track names, I put the same number in front of the instrument name before recording, which imprints that number into the audio file's name. After recording, I know that all the audio files for "1. I Really Love You" begin with 1—for example, 1.Kick_01, 1.Snare_01, and 1.Bass_01. If you are recording a live session with a lot of musicians during a hectic production schedule, this technique can save your bacon. Even in the relative calm of your own project studio, numbering songs within a project really helps avoid confusion down the line.

The same principles apply when creating subsequent versions of a song as it develops. I have a simple way to keep from altering a file, saving over it, and losing previous work. First, I always include the date in the file name, for example, "1. I Really Love You 12/20/04." Then, before I open that file the next day to alter it, I create a duplicate file and change its name to reflect the current date. This way, all my edits, levels, plug-in settings, groups, whatever, are still intact from the previous session.

If I tweak the new file and make a mistake, I can go back to the previous day's version. If I make a major edit, like removing the bridge, I will tack a higher version number extension onto the file name. "1. I Really Love You 12/05/04 1.1" is a different edit than "1. I Really Love You 12/05/04 2.0." If I decide that the edit wasn't a good idea, I can always return to the previous file.

Organization techniques like these may seem obvious, and in practice they may feel tedious. But the first time you keep 50 musicians and one impatient producer waiting while you search hopelessly for yesterday's killer sax solo, you'll see the logic in practicing good housekeeping. EM

FIG. 2: Pro Tools' Disk Allocation window clearly shows where the audio for each track is being stored and allows you to reassign the files to a different folder.

Dave Darlington won a Grammy for Best Instrumental Jazz Album of 2003 for his mixing on Wayne Shorter's Alegria. *He recently completed work on a new album by Joan Osborne.*

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Good Audio Housekeeping

By Dave Darlington

Give your filing system the seal of approval.

Hard drives continue to increase in speed and capacity, giving recordists lots of extra storage room for their audio files. But with this extra "closet space" comes the danger facing closets everywhere—extreme clutter. Audio projects can create a seemingly unlimited number of files that can become lost if you don't follow the application's rules of organization. Those people blessed with innate good housekeeping skills seldom lose files, but the rest of us don't have it so easy. For anyone who has ever misplaced an important audio or song file, here are some organization tips I've learned the hard way.

Follow the Path

Anyone recording digital audio needs to know where audio files are being stored. I've known musicians who install software and immediately start recording without considering where the digital audio is being stored. Later, after a spate of folder relocating, file copying, and trash emptying, a message pops up onscreen as the engineer tries to load a project's title cut. This message—something like "Please locate file Audio 01_01"—means the software can't find a needed file in its expected location. Understanding how your DAW software "thinks" is the key to avoiding that problem.

When you create a new song file, your application places the file inside a folder of the same name. For example, the Pro Tools file called My Hit lives inside a folder also called My Hit. Pro Tools and similar DAW applications such as Digital Performer and Logic also create subfolders inside the project folder to store crucial files. The most important subfolder is usually called Audio Files, and is created to house the expected audio recordings. Other subfolders include Fades and Plug-In Settings.

Any audio that you record for My Hit will go into the Audio Files folder (if you haven't specifically redirected it elsewhere), and whenever you reload My Hit, the software will happily find all pertinent files located within that folder (see **Fig. 1**). The directory path to these files looks something like this: My Drive>Documents>My Songs>My Hit>Audio Files. As long as you don't move, copy, or rename the folders, all is well.

Trouble can arise, however, if you rename the Audio Files folder something like My Hit Audio. Although this sounds like a good idea because all the My Hit audio files are inside this folder, that confuses the application because the original path was to the Audio Files folder. If you copy the entire My Hit folder to another drive and then try to load the song from the new drive, the application can be confused again. The original audio path, which is stored in the My Hit file with all the song data, is not the path you want. You must tell the software to place new audio on the new drive, or the application may decide for itself where to put the next batch of files.

Talk to Me

Following two simple rules will eliminate most file location problems: first, don't change the Audio Files folder's name or remove it from the song's project folder, and second, remember to tell the song file where the new audio goes when copying audio files to another drive. If all the audio files are in the same folder, locating one file will usually enable the DAW to find all the audio for that song. Once all the audio is located, saving the song will store the new path and eliminate confusion.

One way to be sure your audio files are going where you want them to is to check the file assignments in your software before you start recording. In Pro Tools, that can be found in the Disk Allocation window under Setup in the main menu (see **Fig. 2**). If you've copied your song to a new hard drive, you must use this window to change the audio path and target the new Audio Files folder inside the song folder on the new hard drive. Pro Tools will direct the audio properly if you just select the proper hard drive. Holding the option key when you click to reassign a track will redirect all the tracks.

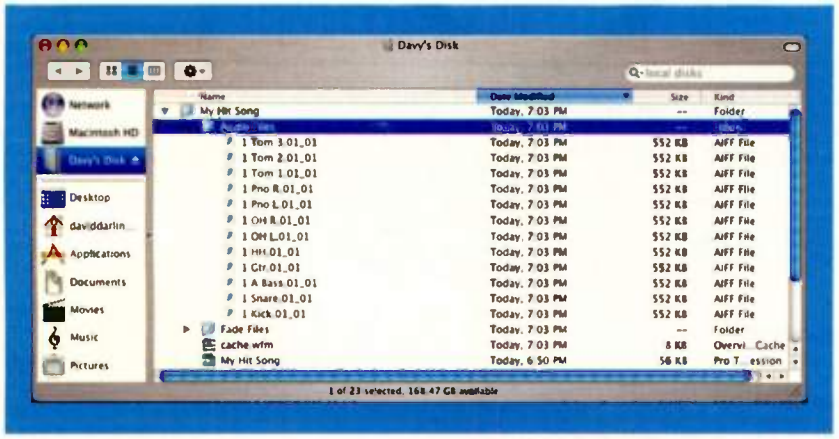

FIG. 1: Most popular recording applications create an Audio Files folder within the main project folder, such as the Pro Tools Song folder shown here.

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are a lot of subtle and not so subtle characteristics about mics. In this case, it was usually best for me to stick with the simple thing and concentrate on the performance.

Do you improvise your parts or write them out?
di Fiore: If it's a solo for a record, it's written out. This isn't a jam band; I want to be sure of what we're doing. Whenever there's an idea—mine or somebody else's—it's a real time-saver to write it out first and play off of the sheet music. That way, you can be consistent about your takes. You're not fishing around for the right notes. Since it's all right in front of you, it becomes about how you physically feel to perform it right.

What kind of preamp did you use on the trumpet?
di Fiore: Mostly we went right through the Mackie, with no compressor. Actually, my trumpet was pretty neglected [laughs]. There are no other horn players in the band, and we don't have a producer who's worked with horns. I end up going on the fly and hoping it sounds good. If it doesn't, we'll usually just rerecord my part and try to get lucky in some other way. We tend to go for the distorted sound, and then we make it more lush by overdubbing a second track.

Recording *Pressure Chief* on their own allowed members of Cake to more fully control their artistic vision.

Cake's arrangements leave space for the trumpet.
di Fiore: That's right, and that's different from most bands. In general, we make my horn parts

ERIC MCNATT

sound not too good on purpose. Instead, they're kind of junky, not super smooth. That caters to the record and how it works with the electric guitars. Just like John plays his nylon string guitars through a Fender Sidekick amp, then overdrives it all the way so it sounds really grainy and scratchy and unnatural. It's a similar approach with the trumpet. We're trying to get good melody and rhythm, but we don't necessarily want it to sound too smooth.

The lead and backing vocals are very present. It sounds like you're not processing them at all.
McCrea: We don't put anything on my vocal, as far as reverb, effects, or delay. I don't think any of that works for my voice. I compress it a bit.

The other band members were more involved in singing background vocals on *Pressure Chief* than on past CDs.
McCrea: That's another really important advance that we've made as a band. It was a big hurdle for certain people in the band. Again, it could be a product of not having a stranger in the room.

Are the vocal parts written out?
McCrea: They're all in our head. We just listen to the song and imagine what will work. I think it's better not to sing the first harmony that you come up with. It's better to live with it for a week.

How do you record the background vocals?
di Fiore: We all gather around one mic. Sometimes we leave one person at the board, or one person presses play at the board and runs in the room to get on the mic. We usually use a Sennheiser or a Røde NTK [in omnidirectional mode] and try to match each other's timbre a bit.

Was the album difficult to mix?
McCrea: We were sort of mixing the whole time. But there was a time when we sat down to do final mixing, and of course, it was brutal. Mixing is really the left-brain part of the process. It's about cutting things away to give space, and throwing away hundreds of hours of work. It's very much an editorial process. Some people are good at that. Most people aren't.

I tried to get everybody in the band involved in that part because it's really a magical process. A magical brutality, all those beautiful parts that you basically have to throw away. It's fascism, really. It's not about whether something's great; it's about whether it's appropriate.
di Fiore: The hardest part is deciding what to take out. We always end up taking out a lot more than we expected. Patrick Olguin showed us an EQ trick that helped get us through mixing. For example, if the guitar isn't sitting right, you can separate the frequencies, accentuating the high and lows to spread it out, but leaving room in the middle for the vocals, which are in the same frequency range. We tried to make not only rhythmic space, but also frequency-range space for things. We also used the Pro Tools onboard compression quite a bit to get things out of the way.

So you're happy with how *Pressure Chief* turned out?
McCrea: Yeah, I think I'd buy it if I weren't in the band.

Maureen Droney's engineering credits include, Carlos Santana, Aretha Franklin, Kenny G, and Tower of Power, among many others. Currently she is Los Angeles Editor for Mix *magazine and general manager of House of Blues Studios.*

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What mics did you use?

di Fiore: To be honest, since we were engineering ourselves, it seemed like we were more successful if we didn't have a system that we stuck with. We just felt around in the different situations. We didn't have a regular drummer at the time, so we had different setups for two drummers. And a lot of the drum tracks were programmed, and we mixed live drums in with them. We really manipulated them a lot, bringing fills up, etcetera. It's hard to hear which are the programmed drums and which are the live ones, but on one of the tracks, at least, I can think of a fill that really does sound different from the rest of the track. But we were careful not to do that too much. We didn't want to bring attention to different timbres in the drum sound.

Did you use a click track?

di Fiore: We played to a hi-hat click. That's one of the first things we put down, which turned out to be a good reference for us when we'd go back and try to line things up.

How do you come up with your arrangements? The word cinematic comes to mind to describe them. Not wide-screen, but . . .

McCrea: [*Laughs.*] Certainly not wide-screen. Sort of like a Super-8 movie, maybe 16 mm. Again, the arrangements were a product of our feeling unencumbered by the traditional studio process. I think that sometimes studios can, inadvertently, slow things down. Maybe it's just that they're trying to be thorough and professional. Or maybe it's something else. But if you're on a creative jag and you need to move quickly to keep the idea from dying, to have to spend a half hour to set up is stultifying. Without the official studio rhythm, we found that, in our own clumsy way, we were able to move with more mercurial ease. It's not so much about saving time to save money; it's about saving energy. When you feel really creative and then everything you have to do takes a long time, you end up not wanting to try ideas because it takes too long to make them happen.

What microphones did you use the most?

McCrea: [Shure] SM57s. We tried fancy-pants microphones but we ended up liking the SM57s.

What about preamps?

McCrea: The one with the purple light. I forget its name.

In general, you used the same preamp and microphone on everything?

McCrea: Yeah. I'm not into the pornography of equipment.

Did you play with room acoustics?

McCrea: Yes, especially with the trumpet. We tried a lot of different rooms for the trumpet. We had lots of cables leading to different rooms and getting crushed in doors.

Let's talk about recording trumpet.

di Fiore: One of the reasons it's fun playing trumpet in this band is that I'm not part of a section. It's a guitar band and I'm the thing that sounds different. The trumpet is a good foil for the electric guitar. It gives it something different to react against.

We recorded trumpet mainly in a small bedroom where we'd put some carpet on the floor. There was a little bit of room sound, but not too much. The reverb wasn't washy, and for the most part, I played right up on the mic. We used an SM57 quite a bit. I tried other, more lush mics, like the Røde NTK. The Røde sounded really present, and we used it on about half the songs, but we got a tight sound on the SM57 that worked for a lot of the songs.

Once you're sure you're using the right mic, it makes it easier to record. You don't feel as ambivalent about things, because once you understand the mic, it's all up to you as the player. You know what you're going to get out of it, and the rest of it—the tone, etcetera—is up to you.

It's important to spend a lot of time with a mic, to listen to it in different rooms and see how it's responding. That gives you a sense of consistency. That's why I went with the SM57. I understood it. With some of the other mics there seemed to be too many factors that went into getting the most out of them. A lot of times I had to play something really in the moment, without time for an elaborate setup. I didn't have to have to treat the mic gingerly. I could just slap up the 57 and go.

That's true with the board setting too. You want to know what's coming from the mic, and what's coming from the board. I have to admit that I didn't want to even begin learning about the mics. I thought they weren't as important as the performance. But that's not really true. There

FIG. 3: The one piece of outboard gear that the band relied on for recording *Pressure Chief* was the Universal Audio 6176, a tube preamp and compressor that was used both during tracking and mixdown.

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we're not able to do that. Instead, we have unintentional distortion on things that shouldn't have it. We could have redone things, but we ended up liking the way it sounded. To me, it's not about having things sound perfect. It's about things sounding appropriate for the song.

Did you work on one song at a time?
McCrea: No. We recorded basic tracks on things, then we made editorial decisions, sometimes weeks later. Luckily, we had the luxury of working with a lot of songs. If we got stuck, we could just leave a song for a while.

What instruments are in the basic tracks?
McCrea: Drums, bass, guitar, and vocals.

The keyboards, especially the synth parts, are particularly cool on this album.
McCrea: You know why? When we recorded at conventional studios, we had to lug huge keyboards in the back of the station wagon everyday and then drag them into the studio, dinging up the doorways and dropping them on our feet. Out of laziness, on our earlier records, we had fewer keyboards set up.

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FIG. 2: The members of Cake in their unassuming Sacramento-based project studio. Left to right: Nelson, McCurdy, McCrea, and di Fiore.

Did you have tons of gear set up to experiment with?
McCrea: Not a lot, but enough so that we could whimsically decide to try something out. Having everything set up all the time made all the difference for us.

Were the keyboards running through a console?
McCrea: We tried to have everything running through a little Mackie mixing board.

The keyboard programming sounds pretty sophisticated.
McCrea: Actually, we're pretty much Luddites in disguise. For example, we didn't use MIDI at all. We tried, but it was a big hassle and it seemed easier to play things.

"No Phone," the first single from the album, is about wanting to get away from constantly being in touch. It's kind of an electronically sophisticated presentation of a Luddite philosophy.
McCrea: It's really not a Luddite anthem; it's just sort of wanting to talk about it. The inability to disconnect is kind of the opposite of freedom.

Infinite choices don't equal freedom?
McCrea: Infinite choices are actually a prison. It's all energy expenditure. You don't get more energy because you have more choices. That's especially true in the studio.

Did someone set up your studio for you?
McCrea: Somebody tried to help us, but they didn't really know what they were doing. So we ended up doing it, which was very empowering for us. We took the tools of production into our own hands. That's something that I think is also a greater societal trend. It's really a very salutary feeling to have made this record by hand. It's like a craft project we did that went too far; especially because we design our own CD covers and make our own videos.

Did you have Pro Tools knowledge before you started?
McCrea: Just barely. But it's not that hard. We went a little farther than the tape-machine level, but we didn't go all the way into it, certainly. We didn't want to or need to.

Did you overdub one by one or play together?
McCrea: We play together sometimes. It depends on what the song requires.

There are live drums on the songs.
McCrea: Yes. We used several live drummers, and Gabe Nelson, the bass player, played drums at times. There are some live drums on just about all the songs.

You can't really tell which drums are live, and which are programmed.
McCrea: We didn't want that to be the point. I think sometimes people get caught up in the form rather than the song. We're just trying to communicate musical ideas.

Most people think recording live drums requires some engineering expertise. How did you do it?
di Fiore: One thing we did was to use one mic above the snare and one below, kind of a tricky thing that our bass player showed us. You get a different sound from above and below, and you either choose one or mix the two. We also used overhead mics. We pretty much miked everything, so we ended up with about six tracks of drums.

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aware of arrangement issues and of keeping space in the song. It was, "if you have something really good to add, track it. But if your ideas aren't developed, then maybe wait for later."

How long did the project take?

di Fiore: About nine months. We got a two-bedroom house, and we got what we needed: the latest version of Pro Tools, the Digidesign interface, and a tube Universal Audio 6176 for preamping and compression (see **Fig. 3**). It's the remake of the 610B preamp and the 1176 LN limiting amplifier. We also had some Tannoy [Reveal series] speakers.

McCrea: There were a few months of learning curve, just recording things, which you can actually hear on the CD. A lot of bands now are meticulously working to sound a little bit roughly hewn. I call them wax-museum bands: they sound exactly like spring of 1968, or New York Bowery early summer 1973. I admire the craftsmanship that goes into being able to suss out exactly the right kind of mic to use and how much to compress it to re-create a sound. But

CAKE MIXER

Patrick Olguin (see **Fig. A**) lives in the Sacramento area where he's an engineer and the owner of Velvet Tone Studios. He was called in to help toward the end of the recording of *Pressure Chief*. "It was just a service call originally," Olguin says with a laugh. "I've known Gabe [Nelson, Cake's bass player] for a long time. He called up and said, 'we're having problems with our Pro Tools rig. Can you come in and clean out our computer?'"

COURTESY PATRICK OLGUIN

FIG. A: Patrick Olguin helped Cake with engineering and mixing during parts of the *Pressure Chief* recording process.

Olguin's facility with Pro Tools convinced the band to ask him to stay on for final mixing and editing. He describes the band's recording setup as "very, very basic." Except for the Universal Audio 6176, mixing was entirely done within Pro Tools.

"We worked mostly on the 001 system, using only 32 tracks," he continues. "I spent a few days and got it working better, but it was a Macintosh G3 that, for some reason, had incompatibilities with the Pro Tools software, and caused us problems all the way up to the end. There were instances when we were bouncing mixes to disk when we didn't know if the system was going to be able to handle it.

"The 1176 is one of my main choices for compressor, so the 6176 worked out pretty well," Olguin notes. "We used it mainly for vocals, inserting it when we mixed. For some songs it was a little too harsh, so we used the stock Digi compressor that comes with the system. For a couple of the bass tracks we also used the 6176. We printed it so that it would be free to use on the vocals for mixing. Except for that, we pretty much stuck with those stock Digi plug-ins. There were times I wished I had more to use, but I caught myself and thought, 'I can handle this. I can make the best of what I have.'"

Asked to describe the room that was used for both recording and mixing, Olguin says, "Take your basic everyday living room, don't do anything to it, and drop a Pro Tools rig in. The console, Pro Tools, and the speakers were all backed up against the wall in a little desk type of area. You weren't going to get an ideal listening spot, no matter where you were at in the room. I just kept that in mind when I was listening and went for the vibe of the songs rather than getting too technical."

In addition to the Tannoy Reveal monitors, mixes were auditioned, through iPod playback, on a portable sound system complete with a built-in subwoofer. Headphones were also used for listening, as was John McCrea's car stereo.

When Olguin came in, he laid Cake's tracks onto a grid to preserve their original tempos, making slight adjustments where necessary. He conformed the grid to Cake's existing tempos, rather than the other way around. "I think it was a bit of an eye opener for them. When they tracked things, they did a pretty good job, but they didn't do it as quickly as they would have liked to. Also, while a lot of the drum tracks had a great feel, they wanted to make some adjustments, sometimes moving certain instruments to another part of the song. I didn't want to lose the original feel of how they had put it down," he recalls. "To me it would have been sacrilegious to alter the rhythm or feel they'd already established."

Olguin is used to working on a Pro Tools HD3 system, so the Cake project was a bit of an adjustment. "We really had to slim things down to make it work," he says. "But it was fun, and we had a good time. Going into an environment like that really humbles you. It makes you open up your ears and listen."

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was recorded democratically by McCrea, di Fiore, Nelson, and McCurdy in a converted, two-bedroom house in Sacramento (see **Fig. 2**). Cake's surprisingly modest setup was based around an Apple Macintosh G3 running a Digidesign Pro Tools LE system through Digi 001 and 002 interfaces.

The CD, which was recorded mainly without the benefit of an engineer, is a punchy-sounding delight. In typical Cake fashion, it's skewed, deadpan, and ingenuous. EM caught up with McCrea and di Fiore just a few days before *Pressure Chief*'s release and asked them about the studio, their production techniques, and a lot more.

FIG. 1: From an engineering standpoint, the recording of *Pressure Chief* was essentially on-the-job training for the members of Cake.

Why did you choose to record this project outside of a commercial studio?

McCrea: Because we finally got smart! We wasted a lot of energy recording in conventional studios. It took us a long time to have the confidence to do this: get an old house, buy microphones, get a computer, and learn how to record ourselves. There's something to be said for not having a stranger in the room with you who's thinking about that TV show he's missing and looking at his watch. It's really about creative expression. I think that, in the past, we were somewhat held back by the false professionalism of conventional recording studios.

It sounds like you've had bad studio experiences.

McCrea: Conventional studios work for a lot of people. I'm not against them. But we've produced ourselves from the very first album, and it was always an effort to communicate. We expended a lot of energy trying to describe to other people the exact color red we wanted in a painting, or how thick the paintbrush should be. All that energy could have been focused solely on music. There's a lot of diplomacy and communication that has to happen when you're trying to get an engineer—who knows the right way to do things—to do something the wrong way. And from the very beginning, we've done things the wrong way—technically. Especially on this album. I think this album hearkens back to the ineptitude of our first album when we really didn't know what we were doing. The engineer back then, who was sort of a hard-rock engineer, was pretty much rolling his eyes. The fact that we wanted things to sound smaller was completely alien to him. I wanted things to sound small and economical, very different from the typical early '90s bombastic, big-time rock.

> "Mixing is fascism, really. It's not about whether something's great; it's about whether it's appropriate."
> —*John McCrea*

Did you have any engineering help on *Pressure Chief*?

di Fiore: We engineered the entire album ourselves, but we brought in an engineer named Patrick Olguin to help during the mix. We needed somebody confident, who could help us organize some of the files that had become disordered. In case anything bad happened that might take us a day or two to fix, we wanted somebody around who wasn't going to make the problem worse.

Did you all engineer equally?

di Fiore: We did. Everybody learned Pro Tools on this record. Xan, our guitarist, was a little faster. He's also very impatient, so he ended up at the [computer] keyboard a lot. For the most part we all took turns, but it's hard to be at the keyboard with someone tapping his foot wishing you were going faster. So Xan ended up in the hot seat a lot of the time. Pro Tools is a great program, and once you learn to use it, it's a lot of fun. We just kept on sharing information with each other about new things we'd learned.

Did you use manuals?

di Fiore: Our bass player brought in this book, one of those red-and-gray ones you see in the bookstores for iMovie and Macintosh software. That was helpful. The learning curve wasn't that steep once we got going. We were able to track right away, and as we got better with it, we were able to do all the things that we needed to.

Did you find it interesting to be a total novice at something?

di Fiore: It's liberating, and it also keeps your mind on the [song] arrangement. Everybody had to keep really sharp. When you're recording by yourself and you have all the time in the world to come in late at night and track your parts, it's easy to pile things on. With us, everybody's got their head in the mix. You don't want to come in as an individual and pile on a bunch of ideas that everybody has to wade through to make sense of the song again. So I think [being novices on Pro Tools] did make us more

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ERIC MCNATT

Home Cooking with Cake

By Maureen Droney

Frustrated by commercial studios, the band records its latest CD in a surprisingly modest home setup.

When describing the sound of the band Cake, many music reviewers often have to stretch their imaginations to come up with just the right words. Wry, ironic, iconoclastic, contrarian, sardonic, mechanized, organic—the list goes on and on—are all appropriate descriptions for the band's unusual sound. Although Cake's music may be hard to categorize, the band developed a loyal fan base and a number of hit songs simply by staying true to itself.

Cake's debut album, *Motorcade of Generosity*, was released in 1994 on the band's own indie label. Picked up by Capricorn Records, *Motorcade* was rereleased and garnered a college radio hit, "How Do You Afford Your Rock 'n' Roll Lifestyle?" Cake's second album, *Fashion Nugget* (Capricorn, 1996), scored platinum success and spawned the hits "The Distance" and a cover of Gloria Gaynor's disco classic "I Will Survive." (Cake's penchant for out-of-left-field covers is evident on its latest CD *Pressure Chief*, which includes a version of Bread's 1972 hit, "Guitar Man.")

Based in the Sacramento, California area, Cake has endured both personnel and label changes. Front man, principal-songwriter, and guitarist John McCrea and trumpeter Vince di Fiore are founding members. Bassist Gabe Nelson has been settled in since 1997, and guitarist Xan McCurdy joined in 2000. (The band currently has no permanent drummer.) It was then that Cake signed with Columbia Records and recorded *Comfort Eagle*, which produced the hit single and video "Short Skirt/Long Jacket."

Cake plays a singularly original and intelligent style of pop featuring sparse arrangements, wry lyrics, often-funky grooves, solo trumpet fills and lines, and melodic guitar and synth work. The band members have always produced their own music and videos and designed their own album covers. *Pressure Chief* (see **Fig. 1**), the group's fifth and latest release, continues and expands upon that same tradition. The CD

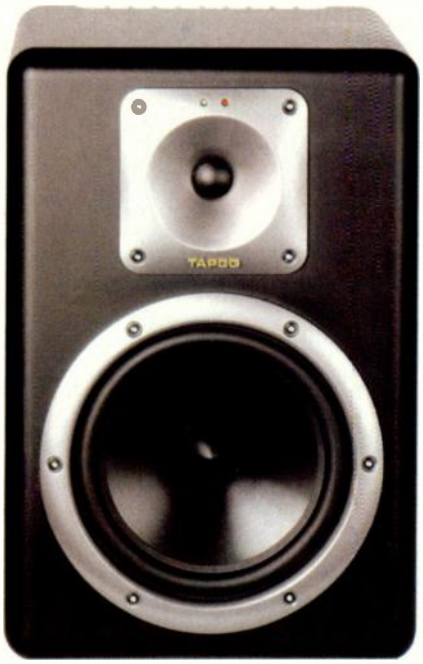

FIG. 6: The Tapco S8's rear panel contains an adjustable sensitivity control and a low-frequency EQ switch that provides a +2 dB or +4 dB boost at 100 Hz and below.

sounded fine, shouted chants like those in the chorus of the Usher/Ludacris tune became ear-splitting at high volumes. That kind of EQ curve might work well in rooms with limited response in those frequency ranges. If you like to mix loud hip-hop, the S8 is a good choice, but you'll need to check your mix carefully on other systems for lower vocal and bass levels, because you'll be hearing somewhat elevated levels of both on the S8.

Loud and Proud

In our real-world tests of the monitors examined here, we relied on comparison listening and off-site evaluation to come up with our favorites. Experience has taught us to consider not only the sound we prefer personally, but also what is likely to appeal to clients and to work in a competitive marketplace. If you're thinking about buying one of these monitors, consider the kind of projects you're working on, and listen to many different kinds of program material on different monitors before making a choice. Also, don't hesitate to return a set that isn't working in your studio space. After all, if the music doesn't sound good to you, it probably won't to the client or the public.

If you are looking for monitors under $800 a pair, you would not make a serious misstep with any of the units we looked at, although certain models will require tooling with built-in compensation settings or outboard equalizers to ensure they are providing the most bang for your buck. For most small studios, however, we would recommend the Event TR 8XL for the widest range of projects. For ample bass in smaller studios, the Alesis ProLinear 720 is an excellent choice, while the Fostex PM-2 provides an even balance and crispness rivaling the TR 8XLs for a list price of $100 less.

Rusty Cutchin is an associate editor of EM. *He can be contacted at rcutchin@comcast.net.*

front panel features two slotted vertical ports next to the 1-inch tweeter and 8.75-inch woofer, the largest LF driver in our survey. The rear-mounted amps provide 150W to the woofer and 75W to the tweeter. The rear panel also hosts balanced TRS and XLR connections, an input level control, a three-way power mode switch that puts the monitor to sleep after five minutes of inactivity, and EQ controls.

A Low Match switch allows you to select 45, 60, 80 or 100 Hz crossover points to use the monitor with a subwoofer. (Phonic also offers the P28 subwoofer.) A High Match switch adjusts highs by ±6 dB. A room compensation switch attenuates low frequencies by ±6 dB to help deal with wall proximity.

The P8As exhibited accurate midrange definition and depth of field when set flat. But they also exhibited a noticeable lack of bass response and slightly less ultra-high-frequency response in the 12–15 kHz area, resulting in a sound that seemed heavy on mids and truncated the high and low ends of the frequency range. We were able to improve the sound somewhat with the P8A's controls. Boosting the Low Match switch gave us a fatter bottom and a little bump in the low mids (around 200 Hz), but without any added definition. (In fact, when we switched monitors to the Yamaha NS-10M's powered by the Bryson amp, the improved bass definition and energy were startling, even with the NS-10M's 7-inch woofers and limited low-frequency range.) Boosting the high end with the High Match control (8 kHz) resulted in more strident upper mids and not the silky sheen we were looking for. We kept the setting flat for listening.

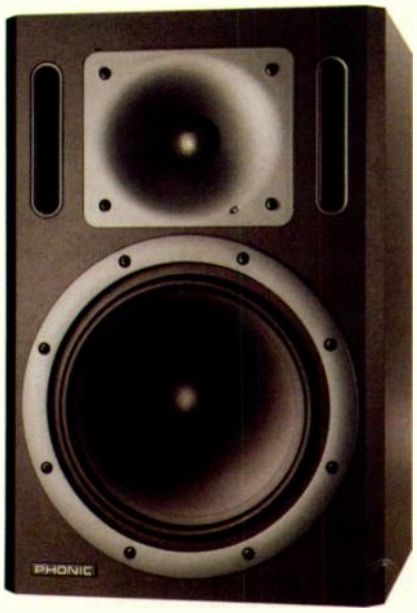

FIG. 5: The Phonic P8A offers a large 8.75-inch woofer and a Low Match switch for selecting crossover points to use with a subwoofer along with a ±6 dB High Match switch.

The P8As didn't generate much apparent loudness. Monitoring at moderate levels, we were able to get an accurate picture, but not the thumping volume necessary for monitoring rock and hip-hop accurately at high volumes. We were most concerned about the apparent roll-off in the bass response, which seemed to descend rapidly starting at about 150 Hz, creating a sense of lightness in the low end. The high end sounded mostly flat with a little too much energy in the midrange between 1 to 2.5 kHz.

Tweaking the band mix on the P8As was difficult because the tracks had plenty of midrange energy already. Darlington struggled to get an accurate reading on the kick drum and electric bass. The sax and guitars, however, were clear and nicely separated, and the ambiences were well defined. But we agreed that we would be tempted to increase the hi-hat and drum overhead (cymbal) tracks to bring a little more shine to the mix. Overall, the P8As were noticeably lacking in full-range tone, and especially bass energy, compared to others in our survey.

Tapco S8

Mackie resurrected the Tapco brand in 2003 and made budget monitors one of the new company's priorities. When I reviewed the first offering, the Tapco S5 (see the May 2004 issue of EM, available online at www.emusician.com), I was impressed with the monitor's value but wished that it had a big sibling with an 8-inch driver. As if on cue, Tapco released the S8, a hefty bi-amped monitor with a much heftier bass output than the S5.

And the heft doesn't stop there. The S8 is also the most expensive of the monitors we tested, with a list price of $750 for a pair. It is also the heaviest, weighing in at 35.2 pounds. On the other hand, it has the lowest listed power rating of the six monitors, at 60W RMS each for the 8-inch polypropylene woofer and 1-inch silk dome tweeter. The rear panel has an adjustable sensitivity control and low- and high-frequency EQ switches, providing standard boosts and cuts (+2 dB or +4 dB at 100 Hz and below and ±2 dB at 5 kHz and above). The crossover point is set at 3 kHz.

The S8 provided exactly what I was hoping for—more bass. The monitor sounded very good and never suggested that listening to it could become fatiguing. That may be because a slight scoop is apparent in the lower mids, and a slightly elevated bass is apparent below 100 Hz. That results in a slightly muddier bass as attack transients disappear on bass guitars and low frequencies tend to cannibalize each other. The monitor's high-frequency response was very good in my studio with all switches set flat. In my room I saw no need to use either the LF or HF adjustment switches.

At Bass Hit, Darlington was impressed with the low-frequency energy of the S8, which produced a lot of volume, efficiently using its 60W of power. The sound was somewhat reminiscent of Bass Hit's Tannoy 2.1 system (used to more closely emulate a club environment). But as a stickler for tight, accurate bass for jazz and R&B projects, Darlington found the S8s pumped out too much of a good thing. The S8s didn't need bass boost, although setting the HF switch to +2 dB seemed to balance the monitor nicely in that room. When Darlington remixed the rock band, however, without making adjustments for the monitors, the mix was short on bottom and upper frequencies during the car stereo test.

Bass frequencies, however, were very intense on hip-hop mixes such as "Yeah." Although midrange male vocals

Powered Monitor Specifications

	Alesis	Event Electronics	Fostex	M-Audio	Phonic	Tapco
Model	ProLinear 720	Tuned Reference 8XL	PM2	Studiophile BX8	P8A	S8
Woofer	7" Kevlar	8" mineral-filled polypropylene	8" polyamide	8" mineral-filled polypropylene	8.75"	8" polypropylene
Tweeter	1" silk dome	1" ferrofluid-cooled silk dome	1" polyurethane film laminated cloth dome	1" magnetically shielded silk dome	1" silk dome	1" silk dome
Crossover Frequency	1.8 kHz	2.6 kHz	N/A	1.8 kHz	8 kHz	3 kHz
Power Output RMS (woofer/tweeter)	80W/40W	100W/50W	120W/120W	65W/65W	150W/75W	60W/60W
Frequency Response	50 Hz–20 kHz (±1.5 dB)	35 Hz–20 kHz (±3 dB)	50 Hz–20 kHz (±2 dB)	37 Hz–20 kHz	45 Hz–22 kHz	40 Hz 20 kHz (±3 dB)
Peak Output SPL	~110 db	>111 dB	N/A	90 dBA	88 dB	113 dB
Distortion	<0.4% (50 Hz–20 kHz)	N/A	<0.05% @ 50W/6Ω, 20 Hz–20 kHz	N/A	N/A	< 0.035%
Signal-to-Noise Ratio	> 90 dB A-weighted, Analog In to Analog Out	>100 dB below full output, 20 kHz bandwidth, unweighted	90 dB, 20 Hz–30 Hz, unweighted	>100 dB below full output, 20 kHz bandwidth	N/A	101 dB, 20 Hz–20 kHz, unweighted, referenced to 60W into 4 Ω
Input Type	XLR/TRS	XLR/TRS/RCA	combo XLR/TRS	XLR/TRS	XLR/TRS	XLR/TRS/RCA
Nominal Input Level	+4 dBu	+4 dBu	+4 dBu	+4 dBu	+4 dBu	+4 dBu
User Controls	input level	input level	volume, HF gain, LF switch (0 dB/–3 dB/+3 dB)	volume, switches: Acoustic Space (0, –2, –4, dB) High Frequency (0, –2, –4 dB) Midrange (Presence, Flat) Low Cut-Off Frequencies (37 Hz, 47 Hz, 80 Hz)	Input Trim, High Match, Room Compensation, Low Match	LF Boost (+2 dB, +4 dB @≤ 100 Hz), HF Boost/Cut (± 2 dB @ ≥ 5 kHz)
Enclosure Type	ported	ported	ported	ported	ported	ported
Size (WxHxD)	9" × 15" × 12"	10.25" × 14.75" × 11.75"	10.0" × 16.125" × 11.8"	9.8" × 15.0" × 11.8"	10.6" × 16.9" × 12.6"	11.6" × 16.2 "× 13.8"
Weight	25 lbs.	26.3 lbs.	32.4 lbs.	20.32 lbs.	33 lbs.	35.2 lbs.
Price	$698.00	$699.00	$599.00	$599.95	$599.99	$749.00

somewhat flabby at higher levels without really increasing the apparent bass response. The high frequency boost worked as advertised, but in this particular environment, flat was better.

Acoustic guitar tracks sounded full and rich—clear but not overly bright. Brass tracks exhibited good presence due to the mid bump, and trumpets were shiny without being brash. The trombones sounded excellent on the low end.

On the rock mix, Darlington ducked the sax and guitar because of the aggressive mids. As you might expect, the result was that when listening to the mix on other systems, sax and guitar levels seemed lower than in prior mixes. After listening to a few more passes in the studio, we agreed that the separation and imaging were fine and that only minute adjustments would be needed to compensate for the midrange bump. Mixes needed little or no tweaking on the bottom or top. The PM-2 sounded accurate across the frequency spectrum, delivering a satisfying bass and clearly defined highs with a slightly aggressive midrange. We felt the monitor would be reliable in critical applications.

Manufacturer Contacts

Alesis/Numark—www.alesis.com
Event Electronics—www.event1.com or www.eventelectronics.com.
Fostex Corporation of America—www.fostex.com
M-Audio—www.m-audio.com
Phonic America Corporation—www.phonic.com
Tapco (Loud Technologies, Inc.)—www.tapcogear.com

M-Audio Studiophile BX8

Except for a blue power indicator, most of the BX8's action is on the rear panel. The monitor is rear-ported, with a 2.5-inch circular port directly above the monitor's compensation controls. A volume pot controls amp output (rather than input trim). The BX8's EQ features include an Acoustic Space control, a PSC (presence) control for a midrange boost, and variable low-frequency roll-off and high-frequency cut switches. The LF roll-off can be set at 80 Hz, 47 Hz, or 37 Hz (what is essentially a bypass). You can set the HF switch can be set to 0 or use it to attenuate frequencies (2–5 kHz) by either 2 dB or 4 dB.

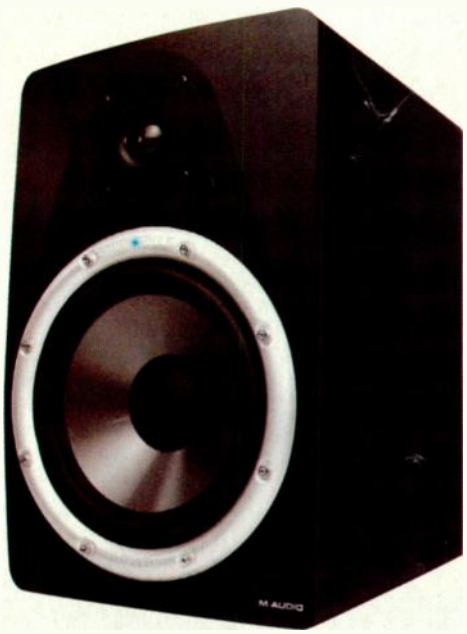

FIG. 4: The rear-ported M-Audio Studiophile BX8 features a three-position Acoustic Space switch designed to compensate for speakers positioned close to studio walls.

The Acoustic Space switch is a three-position switch designed to compensate for speaker positioning according to the following settings: 0dB (speakers against a wall), –2 dB (speakers in corners or close to wall), or –4 dB (speakers away from wall). The BX8 was one of the lower-powered monitors we looked at, providing 65W each to its 8-inch woofer and 1-inch silk-dome tweeter.

The two BX8s, though packed in the same box, had radically different switch and control settings. I made sure the Acoustic Space control was set at –2 in my home studio because of the monitors' close proximity to the front wall. I started off my listening with the PSC engaged. That was a mistake. The midrange boost (unspecified by clearly centered around 1 kHz) created far too much brittleness in the upper mids.

Setting HF to –2 and PSC to Flat made a world of difference. The results were much improved, but even then crash cymbals and female vocals were sometimes strident. The BX8s were loud, but we felt the upper mids couldn't be attenuated enough. With the HF cut at –4, which attenuates highs to a maximum of 5 kHz, there was little noticeable difference in overall brittleness. This limitation wasn't that noticeable in a dance mix like BT's "Knowledge of Self," but it turned fatal in a female ballad—Norah Jones's sexy smokiness turned into a raspy smoker's hack. That could threaten your mix with a loss of presence if you compensate for the elevated mids you're hearing.

The BX8s were generally good in the lower midrange, but Darlington and I agreed that the bass was slightly muddy and unfocused, albeit ample. The BX8s didn't perform well on fingered bass guitar tracks, losing attack transients. When mixed the bass guitar tracks with other heavy low-frequency sounds such as seven-string guitars, the sound became a bit mushy.

With the right settings, however, the BX8s could sound excellent on certain material. We agreed that they would probably benefit from an outboard stereo graphic equalizer. If your mixes don't rely on bass instruments of different textures playing at the same time and you like a scooped sound with a truncated upper midrange for your mixes, the BX8s might be a good choice because of the aggressive upper mids.

Phonic P8A

Phonic is relatively new to the studio monitor business, although the company caries an extensive line of live sound, DJ, and other audio products. The flagship of its recently introduced monitor line is the P8A. The

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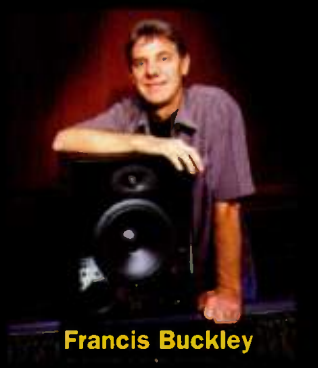
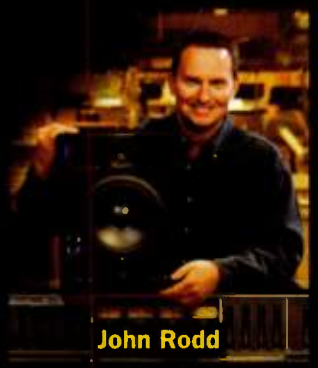
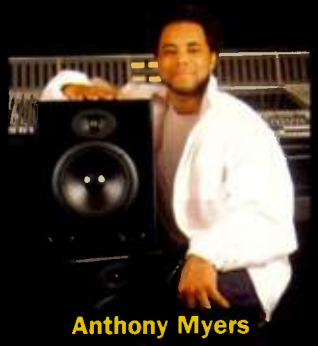


Francis Buckley
Multi-Platinum Grammy-Winning
Engineer / Producer



John Rodd
Orchestral Scoring Recordist
Music Scoring Mixer

"Prince Charles" Alexander
Multi-Platinum Grammy-Winning
Engineer / Producer



Anthony Myers
Engineer / Producer
Sound Designer

Gerhard Joost
Multi-Platinum Engineer
Mixer / Producer

Andraé Crouch
Multiple Grammy-Winning
Gospel Singer / Producer / Pastor

Lionel Jarvis
Multi-Platinum Musician
Musical Director

DJ Ron G
Remixer / DJ

Steve Pageot
Grammy-Winning Producer
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we were surprised by the quality that Event managed to build into the $699-a-pair 8XL.

The 8XL uses an 8-inch woofer and 1-inch tweeter that are powered by amps providing 150W and 50W RMS, respectively. The rear panel hosts an RCA jack as well as balanced XLR and unbalanced ¼-inch jacks. Like the Alesis monitor, the 8XL offers no cut or boost switches for room compensation. (I found it interesting that my two favorite monitors out of the group didn't offer those extras. It suggests that all the effort went into making these speakers sound their best right out of the box.) A power switch and a long, thin Input Sensitivity knob (–20 dB to Max) are the only controls on the rear panel.

A 2.375-inch circular port sits between drivers and off to the right on the 8XL's front panel. A power-on LED is positioned at the bottom of the woofer rim. The 8XL's tweeter sits in a housing that is barely larger in diameter than the tweeter itself.

Our first impression of the 8XL was that it provided a smoothness and full-range frequency response that boded well for long listening sessions without fatigue. Though concerned about the lack of options to compensate for room acoustics, Darlington was surprised by the 8XL. He felt that the bottom end of the D'Angelo record, though understandably not as strong as it was on the Genelec 1031A's, was impressively tight and clear. Vocals were crisp, pleasing, and properly proportioned.

The classical recording was absolutely stunning in detail, and the reflections of the concert hall translated well, sounding as though we were seated in center orchestra. The upper midrange reproduced consistently at lower and higher listening levels, so we could accurately deduce vocal and soloist levels. The tweeter was silky, not harsh, and reproduced an extended range of high frequencies. Hi-hats and vocal sibilants were audible without being overpowering, and the strings sounded bright without any scratchiness. Darlington's acoustic guitar recording sounded the best of all on the 8XLs, very natural and clear, while hand percussion also came through accurately.

FIG. 3: The Fostex PM-2's amps provide 120W RMS each to the woofer and tweeter, and its rear panel features a variable Tweeter Gain pot and a three-position Woofer Gain switch.

The Burnett/Marsalis project sounded as Darlington remembered it from mixing on the Genelecs, although the sax appeared a bit dominant over the guitars on the 8XLs. We attributed that to a slight boost in the upper mids. We also noticed that on the 8XLs it was easy to distinguish between instruments that were close together in frequency. Sensing a lack of low end, Darlington raised the level of the bass guitar and added some extra low end into the kick drum around 40 Hz. We took the remix outside and played it on an average car sound system, and agreed that the increased bass had been unnecessary. However, the correction was slight, and Darlington felt it would be easy to adjust mixes to the low-end response of the 8XLs. We also agreed that they were the most accurate of the bunch, and could be relied upon for critical listening and mixing. Frequency relationships were consistent at all listening levels, and the monitors reproduced many different genres of music equally well.

Fostex PM-2

The 8-inch LF driver and 1-inch soft dome tweeter are housed in a cabinet with dual circular ports, one to each side of the speakers. Both drivers are powered by matched amplifiers that provide 120W each to the woofer and tweeter. The cabinet feels hefty but its width-to-height ratio gives it a slimmer look than the other models.

The rear panel hosts a ¼-inch/XLR combo connector, a volume pot, a variable Tweeter Gain pot (±3dB at 5 kHz), and a three-position Woofer Gain switch that can be inactive or provide a 3 dB boost or cut at 60 Hz. Half of the rear panel is taken up by a large heat sink.

We were impressed with the PM-2's volume and punch as soon as we connected it to a music source. The overall frequency response reminded us of the Genelec 1031As and a direct comparison brought the PM-2 high marks. The low end of R&B CDs sounded full and strong with a satin high end and impressive stereo imaging. We detected a slight bump in the sound around 1.5 kHz. With the response controls set flat, the sound was robust but not hyped and aggressive at low levels, making the PM-2s a good choice for home studios where nighttime noise levels might be a problem. The orchestral music translated well, although the sense of room acoustics and instrument separation fell a little short of the clarity we perceived from the 8XL. The lower instruments, however, translated somewhat better, indicating superior low frequency imaging and perhaps better cabinet damping.

None of the compensation controls brought the PM-2s more in line with Bass Hit's reference monitors, so Darlington reverted to flat settings on the rear panel. When boosting bass frequencies, the drivers became

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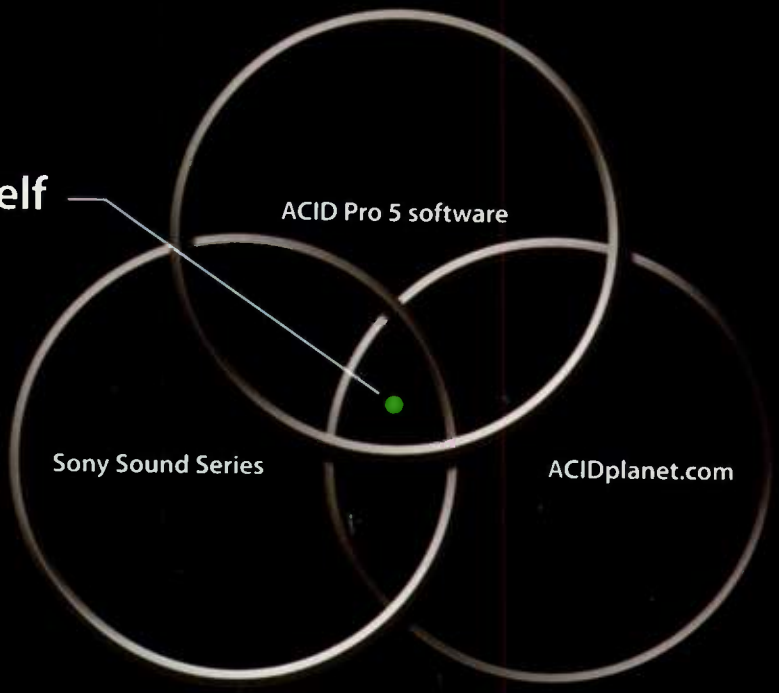

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monitors while I was listening to another to avoid any sort of electrical interference.

At Bass Hit, Darlington and I also A/B'ed each pair of monitors using commercially recorded CDs. Darlington selected D'Angelo's "Brown Sugar," a contemporary R&B track with a strong, clear low end and prominent vocals. The Berlin Philharmonic's recording of Ravel's "Bolero" on Deutsche Grammophon served as an example of a pristine recording of acoustic instruments in a detailed, naturally reverberant environment. Sade's "Your Love Is King" provided a well-recorded and beautifully mixed live band.

We also listened to recordings of individual instruments that Darlington had made for various projects. Among them were a stereo track of nylon string guitar, various close-miked hand percussion tracks, and a brass quintet. As a whole, the audio samples covered a wide frequency range and spanned the dynamic spectrum from piano to fortissimo.

Finally, Darlington pulled up a recent project he engineered by the rock power trio of Carl Burnett (*Life Before MIDI*) that featured Branford Marsalis on sax. The tracks had been challenging to record because of high volume levels in the studio and difficult to mix because of the amount of competing midrange information. Tweaking the EQs and balances on different monitors told us a lot about their usefulness in a real-world application.

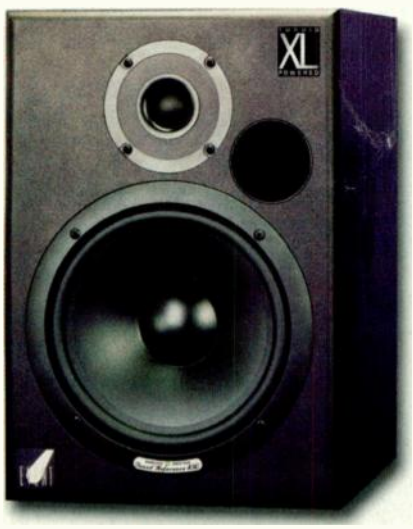

FIG. 2: The Event Tuned Reference 8XL's round port sits between the monitor's 8-inch woofer and 1-inch tweeter, which is surrounded by a tight 1.5-inch flared rim.

After all was played and heard, we agreed on a monitor we would choose if we wanted to add a pair from this group to augment our existing systems. The Event Tuned Reference 8XL came the closest to our personal preferences while representing a significant value. We differed on our second choice. Darlington preferred the Fostex PM-2 while I leaned toward the Alesis ProLinear 720. With experience learning their unique characteristics and perhaps some room adjustments, neither of us would be apprehensive about mixing with them.

In your situation any of the six monitors we checked out might make economic sense and represent a vast improvement over your current setup. Check out the following evaluations, head to the audio dealer with your favorite CDs, and let your ears decide.

Alesis Prolinear 720

Although first on the list, the Alesis 720 was in some ways the odd man out in the group, with its comparatively smaller cabinet and 7-inch woofer. The 720's sibling, the ProLinear 820, offers an 8-inch driver and negligible improvements in low-end frequency response and SPL handling. The 820's list price, however, was a full $300 more per pair than the 720's and $200 over our targeted price limit. The 720 was close enough to the 820 in its listed performance specs that we decided to include it in the roundup. (Alesis sells two other ProLinear models with built-in digital processing, the 720DSP and 820DSP.)

The ProLinear 720 contains a Kevlar woofer and 1-inch ferro-fluid-cooled silk dome tweeter. A bi-color LED on the front baffle is green when power is on and turns red to indicate clipping. Two slotted vertical ports on either side of the tweeter's wave guide push air for enhanced bass.

The 720 has no room compensation switches on the rear panel. A combo connector for TRS and XLR connections and an Input Level pot marked 0–10 are the only adornments. Though the 720's cabinet is about 10 percent smaller than that of the 820 (and those of the other monitors we evaluated), you would never know it from its sound, which is big.

We were glad we included the 720 in our tests, because it is an excellent-sounding monitor. Its strong bass was surprising, considering it has the smallest woofer in the group. The monitor is rated flat down to 45 Hz, a limit that will not satisfy hardcore club remixers looking for the lowest of the low frequencies. Those with limited desktop space, however, will want to check out the 720.

In fact the 720's weakness is not its frequency range; its weakness lies in its slight cloudiness in the bass. We noticed a minor loss of definition in bass guitar attacks on Earth, Wind, and Fire's funkier tracks. The 720's strong upper midrange can be too aggressive in spots such as the shouted vocals and blistering guitars in the fade-out of Jane's Addiction's "True Nature." Compared to the Genelec 1031As at Bass Hit and the Mackie HR824s in my control room, the 720s made tracks sound a little more intense in the upper mids, indicating a risk of losing some intensity on mixes. We also felt the stereo imaging of the 720s was not as clearly defined as we would have liked. An auto-panned bell sample during the intro of Usher's "Yeah" had a narrower spread than it did on our reference monitors.

Nevertheless, the Alesis ProLinear 720 is a fine monitor and a good choice for those who want to get big sound in a small space for a reasonable price.

Event Electronics Tuned Reference 8XL

Event's Tuned Reference 8XL was the hit of our tests. Neither of us was very surprised by this, having enjoyed working with Event monitors in the past. (Event's Studio Precision 8 Active, with a list price of $1,499 a pair, recently won EM's 2005 Editors' Choice award in the Powered Monitors category.) But

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had our favorites, any of the speakers we looked at may perform well in your studio with the proper adjustments. We also learned more about why some classic monitors are classics. (Hint: if you still have a pair of Yamaha NS-10Ms, don't throw them out—they still sound fantastic.)

Where We Listened

To give the monitors as extensive a workout as possible, I tested them in my home studio control room in the suburbs of New York City, and a few days later I schlepped the whole group into Bass Hit Studio, a busy commercial recording facility in Manhattan. I also enlisted the help of Bass Hit owner/engineer and EM contributor David Darlington, the composer for HBO's *Oz* series and a recent Grammy winner for mixing on Wayne Shorter's *Alegria*.

My home studio control room is in a tight 8' × 10' space in a finished basement. Like many home studios, it's in a constant state of flux, with equipment moving in and out on a daily basis and remodeling in progress within and outside of the studio walls. The monitor setup remains constant, however, with a pair of Mackie HR824s positioned about five feet apart on a large curved computer workstation that cuts diagonally across adjoining walls. The midpriced HR824s have gained wide acceptance as an accurate midpriced reference monitor.

FIG. 1: The Alesis ProLinear 720 has a big sound, despite being the most compact of the monitors evaluated, with a 7-inch low-frequency driver and smaller cabinet.

Only three inches of clearance exist between the left and right rear corners of the HR824s, which are aimed about five feet away in the center of the room. The angled walls (relative to the monitors); the interplay of carpet, drywall, and natural diffusers such as bookcases and gig bags; and a little luck have combined to make the room a fairly reliable listening area with no bass build-up or stray reflections. My mixes have translated very well to other environments, which also may owe something to my having been recording and mixing as a working musician and pro engineer for more than 25 years.

The control room at Bass Hit is a tad more fine-tuned than my home studio. The 15' × 15' room features powered Genelec 1031As and Yamaha NS-10Ms powered by a Bryston 4B amplifier (300W per channel into 8Ω). The room is acoustically tuned for those speakers with various RPG diffusers and bass traps and is accurate. The speakers and listening position form a 6.5-foot equilateral triangle. The monitors are positioned about three feet from the front wall, which minimizes bass build-up, and about 12 feet from the rear wall, minimizing unwanted reflections. Carpet extends halfway from the front wall to the listening position, providing additional dampening.

We frequently referred to our own powered monitors, the Mackie HR824 ($1,699 per pair) and the Genelec 1031A ($4,100 per pair) during our evaluations. However, we made no judgments about the budget monitors based on direct comparison with the Mackie and Genelec units. We used the more expensive monitors to set a standard by which we could compare the lower priced monitors with each other. We came away impressed with what manufacturers have been able to achieve for a fraction of the cost of industry-standard reference monitors.

Getting with the Program

For initial listening in my home studio, I selected a wide range of recordings representing several different musical styles as well as finished and unfinished projects of my own. I listened to some CDs that have proven to be reliable guideposts for judging monitors over the years, and I checked out current hits. Although in theory accurate frequency response doesn't change, in practice changing musical tastes have meant that today's budget-priced close-field monitors have to reproduce more bass and more volume while remaining accurate. (For an excellent tutorial on close-field monitor design, see Brian Knave's article "Good References" from the June 2001 issue of EM, available online at www.emusician.com.)

For comparison I chose a reliable group of classic and state-of-the-art recordings by artists including Earth, Wind, and Fire; Jane's Addiction; Norah Jones; Alan Jackson; and Usher. Each CD featured tracks by the best engineers in the business with instrumentation that helped me evaluate different aspects of a monitor's sound quality, power handling, stereo imaging, dispersion characteristics, and other technical criteria. In my studio I positioned each pair of monitors as close to the HR824s as possible, being careful to maintain the distance between monitors and listening position and to avoid creating hum or other artifacts caused by power amps and magnets operating close to each other. I frequently cut AC power to one set of

Six budget powered studio monitors that kick bass.

Sound Choices

By Rusty Cutchin

Now that powered monitors have taken over pro and project studio airspace, a speaker seems to be available for every room and budget. The studio owner who is shopping for a pair will find it easier to name the audio manufacturers that don't offer a powered monitor than to list all the ones that do.

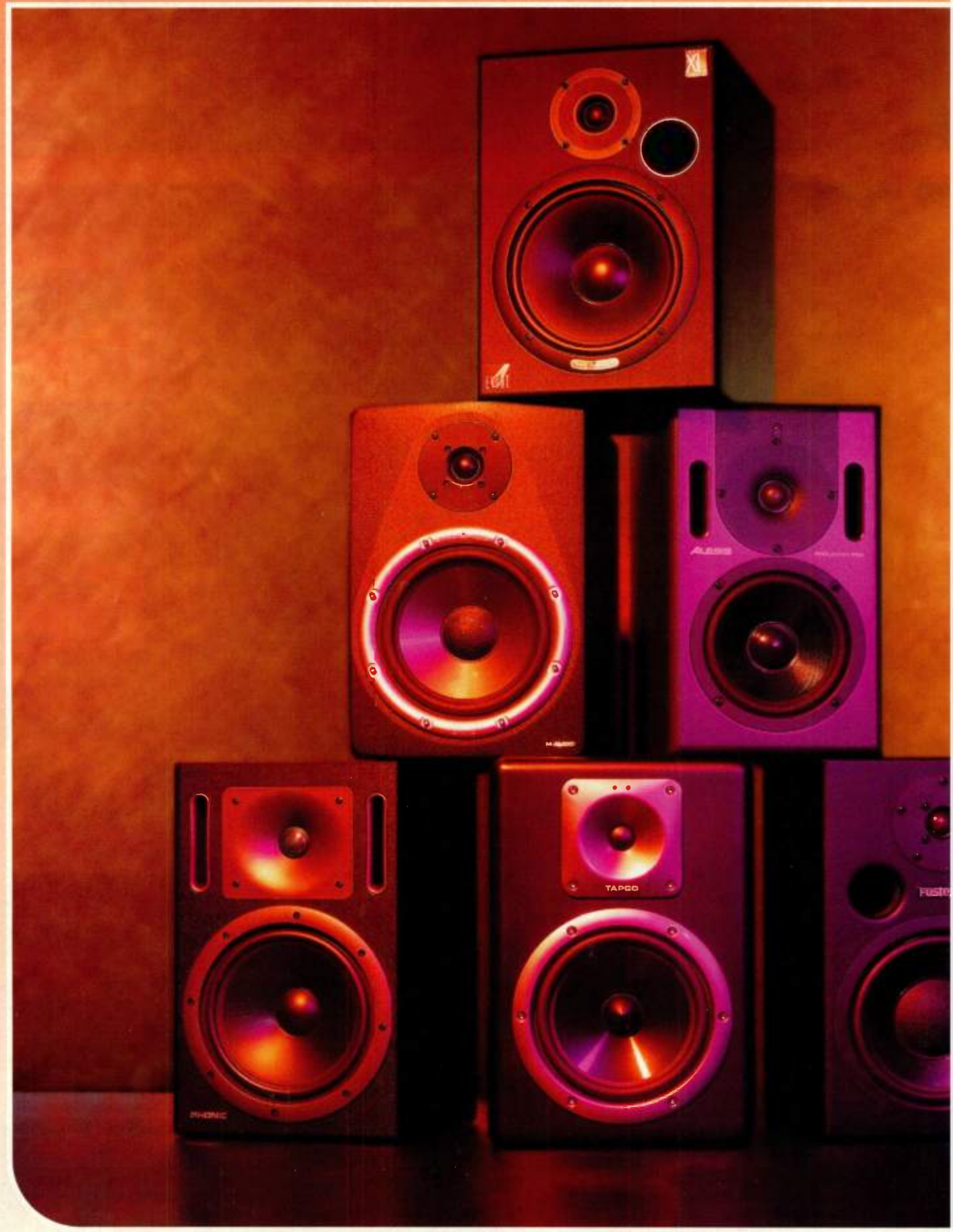
In an effort to cut through the clutter, we rounded up a group of similarly equipped and priced models and gave them a listen. First, of course, we had to choose which models to compare. With the proliferation of low-priced active monitors geared to the home-studio owner, we needed to set some boundaries. The first part was easy: we wanted to examine a set from the large group of monitors priced under $1,000 per pair, but we didn't want to include speakers that are sold as desktop or personal monitors.

Next we decided to stick with stereo configurations that we felt would move enough air for monitoring hip-hop or hard-rock mixes at high volume without requiring a subwoofer. We decided to limit ourselves to monitors built around 8-inch low frequency drivers. (We allowed some latitude in diameter measurement.) We also looked for units that offered similar power specs. (See the table "Powered Monitor Specifications" for details.)

Setting those limits enabled us to whittle the list down from a group of about 35 candidates to a group of six, with components, specifications, and list prices that would appeal to any studio owner who is interested in purchasing a pair of speakers that cost between $600 and $800. Five were from manufacturers with familiar names: the Alesis ProLinear 720, the Event Tuned Reference 8XL, the Fostex PM-2, the M-Audio Studiophile BX8, and the Tapco S8. One relative newcomer, the Phonic P8A, also joined the listening party.

All the monitors are two-way, bass-reflex (ported) designs. All feature magnetic shielding, which prevents the monitors from affecting a computer display when positioned nearby. All offer at least balanced XLR and ¼-inch TRS inputs. None of them offer digital inputs or processing.

After spending time with these monitors in home and pro studio environments, we were impressed with the quality of products available in this price range. Although we



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pulse. Let the parts diverge, but ensure that each section follows the most rhythmic part of the orchestra. You can accomplish that by loosely quantizing the main voices in each section, then letting the other voices contrast to a measured degree.

If you must quantize a passage, I recommend groove quantizing or quantizing by a percentage, because strict quantizing can remove those little hesitations or anticipatory strokes that give life to a performance. And only quantize when you truly need it. Many parts will already be drifting a bit, so it only makes sense for a part to line up numerically if most of the orchestra does.

Real Is Better

If you play notes far outside an instrument's physical range, it will sound fake. The same goes for trying to jump from pizzicato to triple stop in less than two seconds. The best way to ensure realism is to empathize with performers. Are they bowing or plucking? Must they stop and breathe? Are they switching mallets?

Leafing through an orchestration handbook will expose the limits of each instrument as well as suggest many exciting ways to perform. And, when you need that whisper-through-a-trumpet effect that just can't be simulated, there are plenty of soloists willing to come to your aid.

Many low-budget projects still use live performers, and as a rule, the more skilled the players you use, the better the overall sound. Even if it only means recording a real tambourine part for an otherwise synthesized scherzo, it's amazing how that one instrument will improve your perception of the whole recording.

Adding subtle gestures to your sequences demands patience, so it pays to store them as clippings or reusable components. You'll also discover the point of diminishing returns. In a tutti section details get buried, so you can use fewer gestures when the orchestra plays in unison. But don't skimp. To remind yourself of the goal, go to concerts and listen to recordings. Instrumental solos and chamber works are often best for revealing a particular instrument's character; you'll notice bent pitches, slow attacks, loud harmonics, and other organic variations. As much as possible, make your music sound like the real thing. The gestures might be subtle, but the improvement will be vast. EM

EM WEB CLIPS

David Pedergnana (www.moodpaint.com) creates film scores at Mood Paint, his San Francisco Bay Area company. You can hear samples at www.moodpaint.com/gestures. Thanks to Rich Busby for his trombone knowledge.

Crash or Slide

The piatti or crash cymbals have indefinite pitch and can be played in more than one way. When a cymbal is struck near its rim the tone is low, and when it's hit up further, the sound starts to bloom. Use more than one cymbal sound to represent different strike zones, and use Pitch Bend to approximate small variations within each strike zone. Layering several cymbal sounds can enhance a climactic crash. Piatti can measure as much as 30 inches in diameter and sound quite low, so you needn't be shy with Pitch Bend.

Piatti can also slide. Sliding involves continuous changes in pitch as undulating cymbals meet at different points. A piatti roll involves continuous circular sliding, which is most easily simulated through digital audio editing. Start by reversing a sample of a sustained cymbal crash. That becomes the first crescendo of the roll. Just before the sample reaches its peak, crossfade to the original cymbal hit without its initial attack. The roll should swell smoothly up and down, with no breaks, as shown in **Fig. 7.** If you want another iteration, crop the attack and tail from another copy of the crescendo and repeat before the first surge has a chance to decay. You can stop on either a crescendo or a diminuendo or finish with a big crash.

A tremolo begins with a loud crash, followed by a soft Doppler effect, as the performer moves the resounding cymbals toward and away from the audience. Using a long sustaining cymbal sound, wait at least one second after the attack, then start rocking the Pitch Bend control to achieve the Doppler effect.

Build Sections with Soloists

Instrumental section patches with names like "Brass Ensemble" or "Three Flutes" might sound full and detailed, but they lack the feel of live performance because they're homophonic. When eight violas or three trumpets play in unison, the result is the sound of that many individuals following the conductor. Although playing 20 or 30 solo violin parts would be overkill, it's worth at least separately performing the First Chair Violin, Violins I, and Violins II parts on three separate MIDI channels, using different samples or patches that contrast and blend in a realistic way.

In a section built from solo woodwinds or brass, have the players alternate breaths. For example, a lead trombonist might take breaths on the fourth beat, while other players breathe on the second to allow continuity.

Don't copy and paste. Instead, perform each line, allowing slight differences in the dynamics of each musician, the start and stop times of each note, the onset and speed of vibratos, and the tuning of each instrument. At the end of a measure, some musicians will stop ahead of others. To simulate normal variations in string tuning, add very slight pitch bends to one or more tracks.

Orchestral Rhythm

When playing to a metronome, be sure that the pace varies organically, the way a conductor would lead, with scaled ritardandos and accelerandos. It's more important that parts stay together than that they follow a rigid

Triangulation

Triangles can resonate at many indefinite pitches depending on how and where on their three sides they're struck. Single strokes are played at the bottom of the triangle, where pitches are relatively low. Tremolos are played by quickly beating the two upper sides of the triangle, where the harmonics can be as high as 20 kHz. In addition to a muted hit, there should be at least three distinct open-hit pitches available for triangle performance. If you have only a single open-hit triangle sound, use Pitch Bend over a narrow range, with one shift per hit.

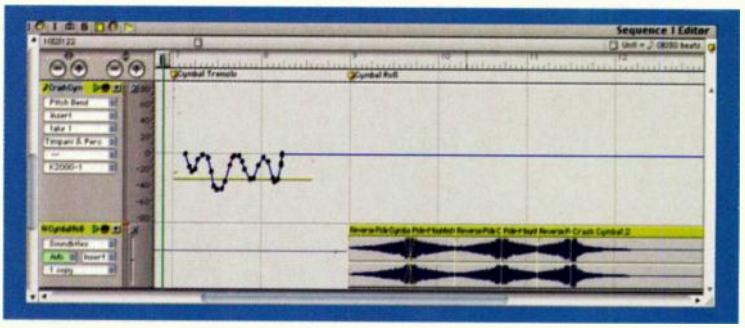

FIG. 7: The cymbal tremolo (left) was constructed using Pitch Bend, and the cymbal roll (right) was constructed from crossfaded reverse and forward samples.

Be sure to vary Velocity widely with each strike to properly accentuate rhythm as well as to help fool the ear into believing that the triangle is being struck in many different places. The first stroke in a tremolo is often the loudest and can be accentuated by doubling it with a muted triangle note. Tremolo dynamics should swell up and down and sound most convincing if you perform the part with two fingers on separate keys or pads of your MIDI controller. Even if you have only the triangle sound assigned to one key or pad, play the part using two, then move all notes to the correct key or pad. That is much better than performing with two fingers on one key, which cuts off the decay of each note.

Synths are also often underequipped in the gong department. Many have only a single sample or patch dedicated to this sonorously rich instrument. A gong's timbre shifts slowly as it evolves, and the initial impact influences how many overtones are heard. If you have only one gong sound, try applying a gentle lowpass filter sweep to produce some variations. A gong's natural decay carries on for a long time, but for a damped-gong effect, apply a quickly falling Expression curve.

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Straight mutes allow frequencies above 1.8 kHz to pass, whereas a cup mute acts as a bandpass filter whose center frequency lies somewhere between 800 Hz and 1.2 kHz. The Harmon mute passes frequencies between 1.5 and 2 kHz (see **Web Clip 7**). Mute action should always be enhanced by a simultaneous boost of around 1.5 to 3 kHz. To avoid sounding like a filter sweep, thin your EQ automation to just a few nodes—no more than one message every 100 ticks or so.

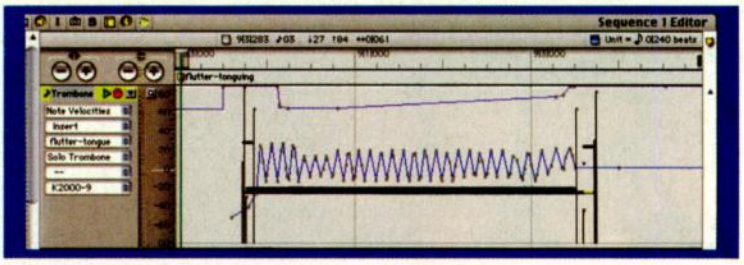


FIG. 6: Flutter tonguing uses a quiet dissonant partial to create a buzzing effect. Soft notes shifted an octave higher at the attack and release simulate brassy upper harmonics.

Dem Bones

Like string players, trombonists find pitches by feel, adjusting the slide and noting its relationship to the bell. The tuning is usually not equal tempered, and the pitches are generally less stable than other instruments. Bends occur when it's necessary to move the slide in a legato or a nonlegato phrase. Use small amounts of Pitch Bend to simulate those transitions and to keep the trombone sounding loose and natural.

Trombonists often use their tongue to quiet the slurs that accompany slide movement, so except when the slurs are a desired effect, use the Expression Controller to soften slides, as if you were trying to hide them. Knowing when and how far to bend the pitch requires either direct experience or a chart detailing the notes playable on the seven trombone slide positions. When in doubt, keep an orchestration textbook handy.

Colors of Woodwinds and Brass

Woodwinds and brass grow brighter as the volume swells, and darker as the player runs out of breath. You can emulate continuous timbral shifts on many synths by varying CC 74, which is often assigned as a filter-cutoff or brightness controller. Other instruments often provide custom brightness controls.

Another technique common to brass and woodwinds is flutter tonguing, produced by rolling the tongue as if saying "r-r-r" while playing. Airflow is never shut off completely between tongued accents, and a pretty faithful simulation can be made using sustained notes and Pitch Bend, as shown in **Fig. 6**. To emulate the rapid alternation, try drawing a triangle-shaped wave with a very short period. Infuse variety by avoiding completely uniform amplitude. It sounds more natural if the rolling slows a bit and the Expression curve drops near the end.

Timbre shifts rapidly during a flutter, producing a distinctive buzzing quality. To simulate that, add a dissonant partial a semitone above the tonic, and have it start 20 to 30 ticks after the fundamental note. To avoid its sounding like a chord, make sure that the added note has no more than a third of the fundamental note's Velocity. You can also add a short, parallel dissonant note, shifted up an octave, a few ticks before the note to brass up the onset of the flutter.

Timpani Sympathy

Cymbal crashes and timpani rolls are less about keeping time than generating excitement, so accents should be treated with care. Vary note Velocity more than you might think is necessary in order to clearly emphasize rhythms and allow timing to slip when you want to create suspense. Because percussion instruments can't express themselves through melody, gestures are especially important.

If you have several timpani patches, use darker samples for heavy hits or attacks with harder mallets. You can also try using separate timpani patches to represent two physical drums. If a drum is played heavily during a passage, let a tiny but growing amount of downward Pitch Bend creep in over time, lowering the pitch to simulate natural detuning. Just be sure to fix it before the next movement starts, the way a real percussionist would.

Also use Pitch Bend to vary the pitch depending on where and how the drums are struck. Add Pitch Bend to the strongest beats, but rarely go off more than a quartertone unless you're actually detuning the drumheads while playing. For that effect, apply a lurching Pitch Bend (timpani skins are adjusted with a foot pedal), don't use an interval greater than a major third, and avoid chromatic steps.

Timpani players usually stop a drum with their hand on a final staccato note to avoid its ringing awkwardly after other players have stopped. You can damp the decay of your drum by quickly ramping down the Expression Controller at the end of a piece.

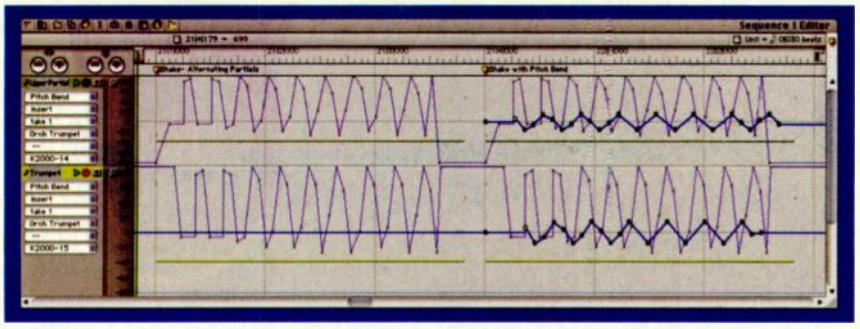
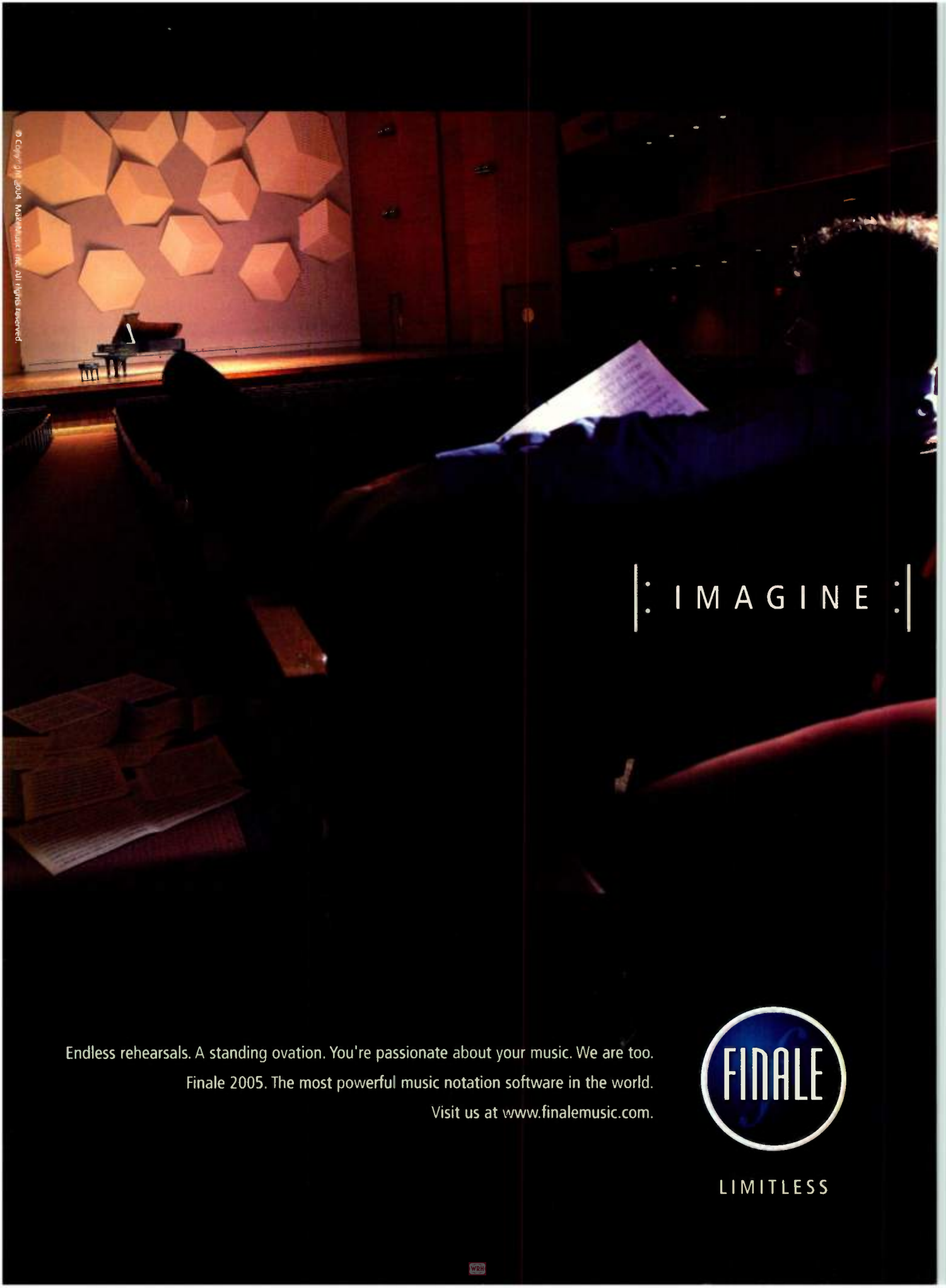


FIG. 5: Trumpet shakes require two MIDI channels that have symmetrically crossfading notes. Adding Pitch Bends extends realism.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otherwise, the listener will start to feel asphyxiated. Performing with a wind or breath controller will force you to take breaths naturally. To simulate a breath, create a drop in Expression, release any note you're sustaining, and begin the next note with a definite attack. Releasing a note slightly early is the best way to suggest a breath. If a new musical phrases begins immediately, play its first note a touch late, too.

The Bends

Woodwind vibrato is similar to string vibrato in that it involves Pitch Bend, but it also entails noticeable changes in dynamics as airflow is restricted and resumed. You can create a dynamic curve that matches Pitch Bend in most sequencers by first creating Pitch Bend data, then copying and transforming that data to Expression. To achieve the result in **Fig. 3,** I used Digital Performer's Reassign Continuous Data (copy) command to duplicate Pitch Bend as CC 11. Because Pitch Bend messages are centered around zero, I used DP's Change Continuous Data command to add an offset to the Expression curve. Finally, I used DP's Reshape tool to emphasize the attack, draw a slight crescendo, and finish with a diminuendo.

Glissandos are achieved by altering the embouchure and air column while playing a chromatic scale or by rotating or moving the instrument in or out of the mouth for a smoothly bending portamento. There are limits, however, as to how far a natural pitch bend can go. For example, the opening clarinet solo for Gershwin's "Rhapsody in Blue" starts with a trill, followed by a seemingly wide pitch bend. In reality, few clarinet players can bend that far. They typically play a chromatic scale that ends with a glide, giving the impression of a full bend. Long clarinet glissandos should be performed the same way—start with discrete notes and end with about a four-semitone pitch bend.

FIG. 4: The natural overtone series of a B♭ trumpet shown here is used in playing rips. Black note heads indicate tones that don't coincide perfectly with chromatic steps and sound flat.

Rip It Up

With brass, you can use legato, nonlegato, and staccato, as described for the woodwinds, but vibrato is rare. A more characteristic technique on trumpet is the rip, played by rapidly varying lip tension and air pressure to produce natural overtones at the release of a note. Trumpet overtones follow the fixed series shown in **Fig. 4.** Most trumpet players can play only the first eight overtones, and rips spanning four overtones are most common. If you use the seventh overtone in a rip, remember that it is a little flat, so use Pitch Bend to emulate that.

In addition to rips that accompany the release of a note, you can run up the overtone series before striking a note. You can also fall off (run down the overtone series) when the tongue is relaxed after playing a high note. All rips should be played quickly and quietly—like a single grace note—overlapping each tone slightly (see **Web Clip 5**).

As an example of a brass instrument's broadly shifting timbre, you can add punch (or "brassed tone") to any loud note by doubling it with a low-Velocity note an octave higher. The listener will perceive the added note as upper harmonics of the fundamental, rather than as a distinct note. That technique is best used briefly during the attack of a note or at the tail end of a crescendo.

Shake It Up

Shakes are produced by moving the lips, tongue, jaw, or brass instrument to shift between two different partials while sustaining a note. **Fig. 5** shows a trumpet shake between pitches D and F. You should hear an initial attack, followed by rapid, smoothly alternating pitches. You create that effect by starting two pitches simultaneously on separate MIDI channels and crossfading between them using the Expression Controller. The two pitches alternately grow louder and softer, shown as a mirrored pattern of purple Expression curves in Fig. 5.

The upper partial in a shake should be significantly quieter, approximately one-third the Velocity of the fundamental. Always start with the fundamental note at maximum Expression and with the upper partial at zero. If the melody continues afterward, end with the fundamental note at maximum Expression.

Because there's a lot of random motion during a shake, small pitch bends also occur (shown as blue lines in Fig. 5). The amount of bend is discretionary, but I generally keep it within a third of a semitone in either direction. To produce a more organic feel, don't synchronize the Pitch Bend and Expression curves (see **Web Clip 6**).

Permutations

Any brass or woodwind instrument can be muted, though the average synth provides only muted trumpet sounds, and those are usually staccato. You can create a more flexible trumpet mute by rendering your trumpet part as an audio track, then applying an automated filter or EQ effect. That way you can mute notes of any length and at any speed, try effects such as a muted rip, and simulate different styles of mutes.

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lengthening accented and weak notes, respectively (see Web Clip 3).

Winds of Inspiration

Woodwinds have a pronounced attack, rising sustain, and controlled release, which are physically produced by tongue movement, airflow, and the cessation of air. To sound convincing, woodwinds need even more dynamic contour than strings do. Use Expression to heighten or deemphasize attacks, create continuous swells, and sculpt natural releases. You can also add Pitch Bend during the attack to simulate a slow surge of air. To do that, start the note about a quartertone low, then quickly release the Pitch Bend controller after you strike the key.

During sustain, airflow is regulated by the player's lungs, and pitch can be modulated to produce vibrato in three ways: with the diaphragm, with jaw movement, and by changing the orientation of the mouthpiece to the lips. The third type, called mechanical vibrato, is easy to produce but considered inferior on most woodwinds. Flutists are more likely to use diaphragmatic vibrato, whereas sax players use jaw vibrato.

TAKE CONTROL

Most of the techniques mentioned in this article involve automation using MIDI continuous controllers, which include widely known MIDI messages such as Pitch Bend, Aftertouch, Note On Velocity, and Control Change (CC) messages 7 (Master Volume) and 11 (Expression Controller). I also make use of the lesser-known CC message 68 (Legato Footswitch), but because that is often poorly implemented or not implemented at all, I offer a work-around that, while not perfect, will generally get the job done. Another, also imperfect, alternative is to use the MIDI Channel Mode messages CC 126 (Mono Mode On) and CC 127 (Poly Mode On)—with Mono Mode acting as a kind of forced legato. In short, if it works, use it.

My use of the Expression Controller needs some further explanation. The routing of the Expression Controller varies from instrument to instrument and often from patch to patch within an instrument. I use it as a pre–Master Volume control, which is the most common implementation. But it is often simultaneously routed to affect filter-cutoff frequency and sometimes to also control envelope amount or attack time. Affecting filter-cutoff frequency is probably not a problem in most cases, but affecting the filter or amplitude envelope will distort the uses for which I intend it. The rule of thumb here is to know your synth.

Finally, with today's highly programmable synths and samplers, you can route virtually any MIDI continuous controller to any synth parameter. Some instruments will have consistent assignments for some parameters from patch to patch, whereas others—typically software instruments with patches from a variety of sound designers—will be all over the map. Using what's provided as well as implementing your own automation routings can add a lot to your toolkit of gestures.

A woodwind soloist can play legato, nonlegato, or staccato, which you can emulate by varying note durations and Velocities as well as using MIDI legato (CC 68) if available (see Web Clip 4). Legato phrases contain smoothly connected notes with only one clear attack at the start of the phrase. Nonlegato phrases give each note a soft attack, controlled with the tongue; the flow of air is lightly interrupted for each attack. Staccato notes have strong attacks and are clearly detached from each other.

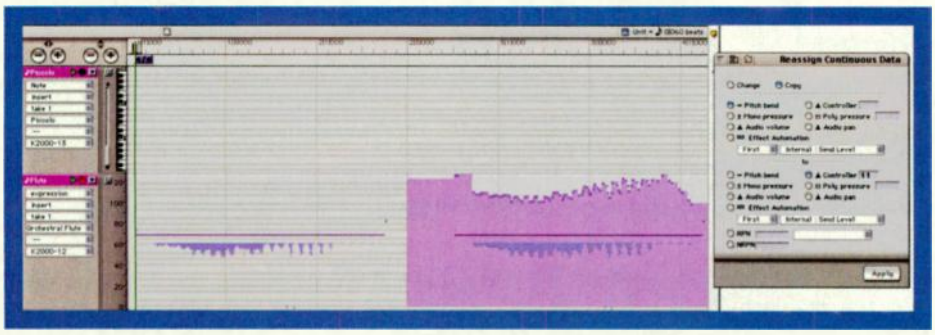

FIG. 3: The Pitch Bend curve in blue, below the left note, is mirrored by the Expression Controller automation in purple. On the right note, the Expression Controller curve has been further altered to simulate an attack followed by a slow crescendo.

In your MIDI sequence, legato notes should overlap slightly for continuity and to mask the attacks. Whether you use CC 68 or another approach to legato, the result should be a silky, continuous sound with no apparent note transitions.

Nonlegato notes should come close to joining, but should be separate. After the first note, notes in a nonlegato phrase should have relatively low Velocities, gradual releases, and only small Expression peaks to mimic soft-tongued attacks. Often, it's most convincing to play connected notes in legato mode, while using Expression to sculpt the soft attacks and quick releases.

Staccato notes require higher Velocities and Expression Controller values. Use short note durations with rapidly falling Expression curves to effect a sharp release.

Breathing Naturally

Due to their pronounced attacks, chiffy flute patches often sound weird in legato and nonlegato phrases. For realistic flute solos, use chiff samples to start a musical phrase, but switch to flute sounds with little attack to slur successive notes. You should vary playing with legato, nonlegato, and staccato techniques as melody demands, but be mindful of how much air each approach requires.

When playing legato or nonlegato, there should be a quick interruption or musical break every 8 to 16 seconds;

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Bowed but Not Broken

A violinist will often slur together several notes with a single bow stroke. If your synth or sampler supports MIDI Legato Footswitch (CC 68) or has some other form of legato control, use that to simulate slurred notes. The trick is to ensure that the envelopes don't retrigger for each note. For MIDI instruments that have poor-sounding legato, try the following workaround.

If your instrument allows you to edit the attack portion of its amplitude envelopes, you can create a string patch that has almost no attack. First copy your normal violin sound to a new memory location, then edit its amplitude envelope to deemphasize the attack. You may also want to experiment with reducing the filter-envelope amount. When you want to play legato notes, use the new patch on a separate MIDI channel, overlapping the notes slightly to ensure continuity.

One from Column A

Of course, a violinist can't go on bowing in one direction forever. Eventually, he or she must either lift and replace the bow or change direction. For long smooth passages, the player can softly reverse the bow to avoid a sharp transition, but that still entails a subtle shift in timbre. When the violinist pulls the bow toward the body, it's called up-bowing, whereas pushing away is called a down-bowing. Accented notes are generally played with down-bowing.

To simulate real bowing, place two distinct violin sounds—one with a harder attack—on separate MIDI channels. After recording a violin part, drag your down-bowed notes to the channel with the harder attack, and put your up-bowed notes on the other channel (see **Web Clip 1**).

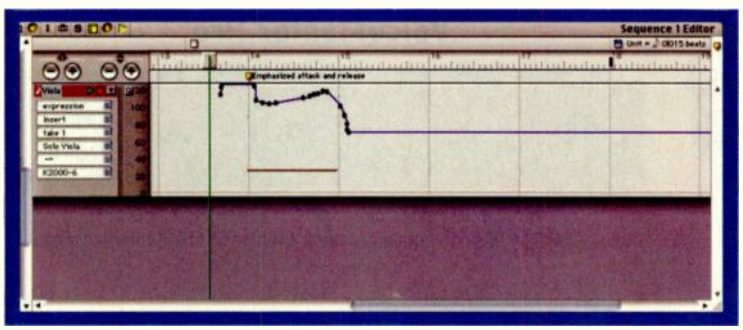

FIG. 1: Expression Controller is used here to create a natural-sounding dynamic contour for a bowed string instrument.

Your Own Vibe

To create vibrato (an undulating change of pitch), string players move one finger back and forth while holding the string against the fingerboard. Vibrato can be performed rhythmically or offbeat, fast or slow. Synthesized vibratos that fluctuate at a fixed rate sound phony and should be avoided, or at least mixed with custom vibratos. The problem with using sampled vibratos is that they are usually provided at only one speed and depth. You can add organic dimension to string and woodwind parts by performing your own vibratos.

Vibratos start soon after an attack, often speeding up and growing shallower as they progress. To emulate that, start with a string patch or sample that has little or no vibrato, and wiggle your finger back and forth on the Pitch Bend controller while sustaining a note. If your Pitch Bend controller is too sensitive, just focus on the rhythm and scale down the Pitch Bend values afterward. In Digital Performer, I use the Change Continuous Data command to limit the amount of bend, but you can also set the Pitch Bend Sensitivity to a comfortable range in advance. **Web Clip 2** illustrates an accelerating vibrato performed individually by several members of the string family.

FIG. 2: Bowed tremolos are played by bowing rapidly on a single string. Here, a cellist starts by bowing in triplets, bowing irregularly by the end. Note that down-bows are generally shorter than up-bows.

Bowed Tremolos

Bowed tremolos are played by rapidly bowing down and up on a single note. Like vibratos, they can be played rhythmically or not. But the technique is tiring, causing players to inevitably slow down or bow sloppily if the tremolo must be sustained. Bear in mind that a tremolo is not the same as a trill, which uses only one pitch and is much faster. As with vibrato, tremolos are often included in sample libraries, but they are usually recorded at only one rhythm and tempo. By performing your own, you can, for example, construct bowed tremolos in triplet 16ths that will automatically match the passage's tempo.

To avoid a monotonous machine-gun sound, use separate up- and down-bow patches. **Fig. 2** shows a tremolo constructed using two MIDI channels—one with a marcato cello patch for down-bows, the other with a softer cello patch for up-bows. Both the initial attack and final release notes are doubled (played on both channels) to produce a heavily accented sound. (When stacking notes, keep the note Velocity on one of the channels low to avoid its sounding like two cellos.) During the tremolo, emphasize downbeats by using higher Velocities, and keep note durations short, with a little overlap between down-up pairs. You can color the tone by adding tiny amounts of Pitch Bend, as well as by shortening and

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LAURA WILLIAMS

Subtle Gestures

By David Pedergnana

MIDI controller automation can make the difference between a real-sounding orchestra and a real mess.

No matter what technology you use, from high-resolution samplers to FM synthesis, an essential part of orchestral simulation lies in giving passionate performances, and that requires understanding the orchestra and using subtle gestures. Here, I'll describe how to use MIDI continuous controllers to effect those subtle gestures. Unless you chant MIDI parameters in your sleep, you might want to read the sidebar "Take Control" for a quick refresher on MIDI continuous controllers.

String Expression

Violin samples or patches are usually programmed to start with a relatively hard attack, a drop in loudness, a sustain with a little vibrato, and an eventual decay as simulated by the MIDI Expression Controller (CC 11) curve in **Fig. 1.** But, violinists have many different ways to play a note—they might hit the strings hard, reverse bow direction, and slowly decay, or they might strike softly and slowly swell in a long crescendo that slurs together several notes. Your synth or sampler may not have those articulations, but you can also use Expression to simulate those.

In the opening notes of the score for Alfred Hitchcock's "Psycho," composer Bernard Herrmann calls for the strings to play aggressively and swiftly. To create that effect, start the note with maximum Expression, and then quickly move to a much lower level followed by a slight swell and a final decay. That effect is best applied to a marcato patch or sample, which has a heavy attack. If your instrument responds to Aftertouch or Note Off Velocity, you can further differentiate bow strokes using those messages. Alternatively, you can use the Expression Controller to soften the attack of a string by starting at a low level, then ramping up slowly. That produces a soft bowing effect. Applied tastefully, CC 11 will

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Sonic Sculpture

By Matt Gallagher

Mouse on Mars questions traditional songwriting.

Since 1994, Jan St. Werner and Andi Toma of Mouse on Mars have rocked dance floors while searching for uncharted sonic frontiers. "We don't aim for a particular style," says St. Werner. "For us, music is abstract. We shape it like sculpture and present different layers. Our tracks can juxtapose elements that don't work together. We have to construct all the sounds ourselves, because exploring a sound is what makes a track happen. If we used preset sounds, there would be nothing to explore."

For their eighth release, *Radical Connector* (Thrill Jockey, 2004), the duo built intricate, sonically dense tracks by experimenting with individual samples. "Single sounds were often edited and mastered separately before they found their part in the finished song arrangement," St. Werner says. "We edited lots of bits several times. Various edits and alterations of the same sounds gave the record a more coherent flow. The voice was the binding element, and we worked with lyrics more than ever before."

ROSA BARBA

Radical Connector/Mouse on Mars

St. Werner and Toma have recorded since 1997 in their well-appointed St. Martin recording studio in Düsseldorf, Germany. "It's a beautiful space in a former factory," St. Werner says. "A friend took over the building, restored it, and made it into a special place with studios and artists' spaces. If we want a natural room sound, we use the loft space that surrounds the studio. We also have a little recording room, which is soundproofed. In there we record drums, bass, and guitar."

St. Martin's control room has a Soundcraft DC2020 analog mixing console with fader automation; a bevy of outboard compressors, EQs, and effects processors; and hardware synths and samplers such as an Akai S1100, Clavia Nord Modular, E-mu E6400, and Roland JD-800. St. Werner and Toma recorded all tracks into a Mac G4 running Mac OS 9, Emagic Logic Audio version 4, Celemony Melodyne, Native Instruments Reaktor, Propellerhead Reason, STEIM Lisa X, VST instruments, plug-ins, and more. "We have a PC as an external sampling device," St. Werner says. He and Toma also work individually on a laptop-based digital audio workstation.

Mouse on Mars's songs usually begin with a guitar riff, a drum pattern, a vocal part, or any other original audio sample. From there, St. Werner and Toma break down, analyze, edit, and rebuild samples. "We go back and forth until we have lots of different versions cruising around," St. Werner says of their creative process. The evolving results lead them in new directions and ultimately yield complete tracks. "We mix most tracks a dozen times," St. Werner says. "Usually, we edit that one final track from different sessions.

"For 'The End,' I programmed a drum kit that I constructed in a strange way," St. Werner says. "We recorded the drum set into the Mac, and then cut it into pieces. I also played guitar. Andi took over and made it into an orchestral piece. I reconstructed [the track] by processing the stuff he had played. 'Send Me Shivers' went through many stages. We constructed a lot from the basic tracks. Niobe [the vocalist] brought in the melodic line, and we shifted the pitch of her voice digitally. We then doubled it with synthetic sounds and processed that. Then we cut it into pieces and made melodic and percussive sounds.

"Don't try to copy something someone else has done," St. Werner advises. "Everything has been done already. Everyone is using the same software. I always find it much more interesting if people produce their own sounds. Don't use the stuff that's already provided. As a musician, it would just stunt my imagination." EM

For more information, go to www.mouseonmars.com or www.thrilljockey.com.

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HD Audio

By Scott Wilkinson

Intel updates its audio architecture.

As the world's largest microprocessor manufacturer, Intel has long been concerned with computer audio capabilities. In 1997, the company introduced an audio architecture called Audio Codec '97 (AC'97). It offered standardized hardware and software specifications to ensure that the quality of a computer's internal audio system was up to snuff.

Of course, technology moves ever onward, and what was up to snuff eight years ago seems woefully inadequate today. Intel recently unveiled its next-generation audio spec, High Definition (HD) Audio, which will supplant AC'97 as the audio standard for all new Intel-based Windows PCs. (It is also available for Linux platforms; developers can download the source code at www.alsa-project.org.)

As you would expect, the resolution of HD Audio is higher all around than that of AC'97. For example, the old spec allows sampling rates of up to 96 kHz for 2-channel audio or 48 kHz for 6-channel operation; HD Audio can output up to six channels at 192 kHz. And the new spec's maximum bit depth is 32 bits as opposed to 20 bits in AC'97. HD Audio can also accommodate all of the latest audio codecs, including Dolby Pro Logic IIx, which simulates a 7.1-channel surround soundfield from a 2-channel source. In fact, Intel has been working closely with Dolby to certify the audio quality of the new spec.

Intel's Audio Studio application demonstrates the capabilities of HD Audio.

COURTESY INTEL

New in HD Audio is the ability to process multiple, simultaneous, independent streams of audio—up to 15 inputs and 15 outputs—each with up to 16 channels of audio data. Each output stream has a maximum bandwidth of 48 Mbps, while each input stream can handle 24 Mbps. These bandwidths determine the maximum number of simultaneous audio channels in the stream, which depends on the sampling rate and bit depth. That's a big jump beyond a single stream of no more than six channels in AC'97, and it's a serious boon for electronic musicians who need simultaneous input and output streams to overdub new parts while monitoring recorded tracks.

Of course, recent-model PCs can handle simultaneous input and output streams, but up until now, that has required an add-in sound card. With HD Audio, multiple streams will be a standard feature of all new Intel-powered PCs. Granted, the I/O capabilities on most stock PCs are likely to be less sophisticated than serious musicians need (for example, unbalanced minijacks and rudimentary A/D and D/A conversion), so some form of add-in card might still be necessary for optimum recording.

The default Windows driver for HD Audio is Microsoft's new Unified Audio Architecture (UAA), which provides support for USB and 1394 audio devices as well as the internal PCI bus. UAA is scheduled to ship with the next generation of Windows, code-named Longhorn, which, rumor has it, will be available in 2006. The driver is designed to consume a minimum amount of CPU time while streaming, and it will follow the planned Longhorn real-time coding guidelines for glitch-free audio. UAA will support a minimum of 2-channel recording and playback of 24-bit/96 kHz PCM as well as 6-channel playback if the underlying hardware allows it.

Interestingly, HD Audio was not designed to be backward-compatible with AC'97. As a result, HD Audio must be considered a completely new specification with new hardware requirements. To that end, Intel has introduced the 915 and 925 chipset families to implement the new standard. These chipsets are available now, and Microsoft has released patches to existing versions of Windows to support them. All in all, HD Audio promises much higher-quality audio performance from all new Intel-powered Windows PCs, which is good news for recording musicians and consumers alike. EM

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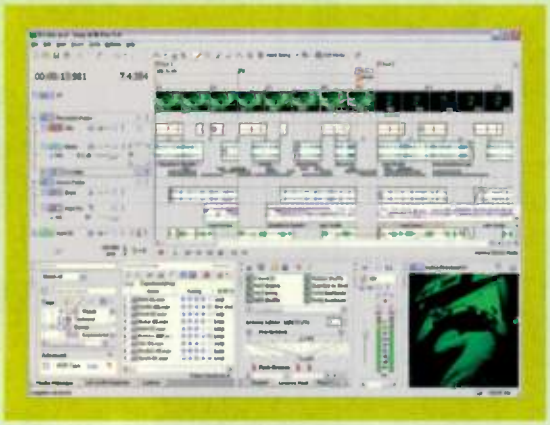

SONY ACID PRO 5

Sony's (www.sony.com/mediasoftware) flagship loop sequencer has undergone a major revision, giving it innovative capabilities and a long list of enhancements. Major new features in Acid Pro 5 (Win, $499.95) range from Media Manager technology and Groove Mapping to floating docks, Folder Tracks, and support for VST effects with tempo sync and automation. Additional features include a customizable user interface and key commands, a built-in metronome, and an audio plug-in manager. Time-stretching and beat detection have also been improved.

Acid Pro 5's Media Manager scans your hard drives and lets you tag, organize, and search your loop collection by maintaining a database of your files. The included Media Reference Library automatically tags existing files from Sony's Loops and Samples collection. Nestable Folder Tracks let you organize multiple tracks into a single track on Acid's Timeline. Acid Pro 5 provides more than 50 grooves you can customize and apply to loops and MIDI data, and you can extract a groove from one file and apply it to others.

Bundled with Acid Pro 5 are extras that include Native Instruments Xpress Keyboards and more than 1,000 loops from the Sony Sound Series. Xpress Keyboards, which alone retails for $119, features "lite" versions of Pro-53, B4, and FM7, which run standalone or as plug-ins.

IK MULTIMEDIA SONIK SYNTH 2

Produced in collaboration with Sonic Reality, Sonik Synth 2 (Mac/Win, $399; crossgrade from SampleTank, $199) is the latest sample-playback plug-in from IK Multimedia (www.soniksynth.com). The Audio Units-, DirectX-, RTAS-, and VST-compatible instrument contains 8 GB of content on two DVD-ROMs—more than four times as much sample data as Sonic Reality's original Sonik Synth sound library.

Sonik Synth 2 is a 16-part multitimbral soft-synth workstation with 32 DSP effects and as many as 5 effects per instrument. You can tailor the sounds as needed from the user interface's virtual front panel, which presents knobs, buttons, wheels, an onscreen keyboard, and a large data display. Maximum polyphony is 256 notes.

Sonik Synth 2's emphasis is on emulating vintage synthesizers from Moog, Oberheim, Roland, and many other manufacturers, including rare classics such as the Gleeman Pentaphonic and ARP Quadra. Also at hand are acoustic and electronic pianos, drums and percussion, guitar and bass, brass and winds, orchestral strings, world instruments, and electronic effects. The sampled grand piano alone is 152 MB. You can get a downscaled version of the plug-in with a limited sound set, Sonik Synth 2 Free, at no cost from the company's Web site.

APPLE GARAGEBAND 2.0

Apple Computer (www.apple.com) is shipping iLife '05 (Mac, $79), the newest version of its creativity suite, which includes an updated version of GarageBand. GarageBand 2.0 boasts many enhancements, including multitrack recording, music notation, an instrument tuner, and the ability to correct the pitch and timing of audio tracks. It can import Acid loops and Standard MIDI Files. Turn your audio or software-instrument tracks into Apple Loops that you can tag, browse, search, and audition. Resize the onscreen keyboard and display up to ten octaves at the same time. You can even enter musical notes using your computer keyboard.

With an appropriate multiport interface, you can now record as many as eight simultaneous audio tracks and two simultaneous software-instrument tracks.

GarageBand 2 will display tracks in standard notation as you record, and you can edit software-instrument tracks in a new music-notation view. The program also features new and improved software instruments.

GarageBand 2 lets you adjust recorded audio so that it follows changes in tempo or key, just as you can with Apple Loops. Change the tempo and key of entire projects, and recorded audio will stay in sync. You can also render audio to disk, freeing up computer resources, and lock tracks to prevent accidental changes. EM

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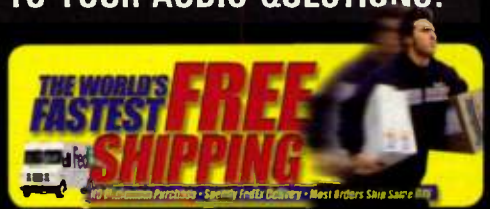

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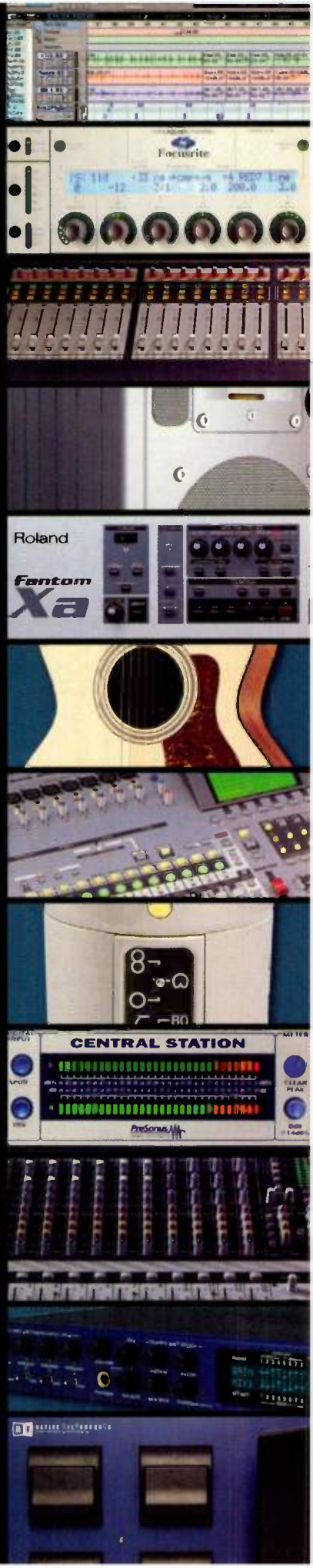


Audio-Technica AT2020

Addressing the needs of small-studio owners and other budget-minded recordists, Audio-Technica (www.audio-technica.com) has introduced the AT2020 ($169), a condenser microphone with a fixed cardioid polar pattern. The AT2020 has a 0.63-inch diaphragm and is addressed from the side rather than the top. According to specifications, it handles sound-pressure levels as high as 144 dB with only 1% THD at 1 kHz, with a typical dynamic range of 124 dB. The AT2020 weighs around 12 ounces and requires a 48V phantom-power source. A pivoting stand mount lets you precisely position it as needed.

Future Retro Revolution

You say you want a Revolution? Here's your chance to get one. Electronic music hardware maker Future Retro (www.future-retro.com) is shipping the Revolution ($650), an analog synth module with a round form factor. The Revolution is a monophonic instrument that has a digital step sequencer, digital effects, and a range of control interfacing that includes MIDI, control voltage (CV) and gate, and DIN sync.

The Revolution's synthesis section is patterned after the Roland TB303. It has a single oscillator, a 3-pole resonant lowpass filter, and one envelope generator for the filter. You can control filter cutoff using the internal sequencer or an external CV source. The stereo 24-bit effects processor furnishes chorus, delay, flanging, reverb, filtering, and rotary-speaker effects. The Revolution can also process external audio signals.

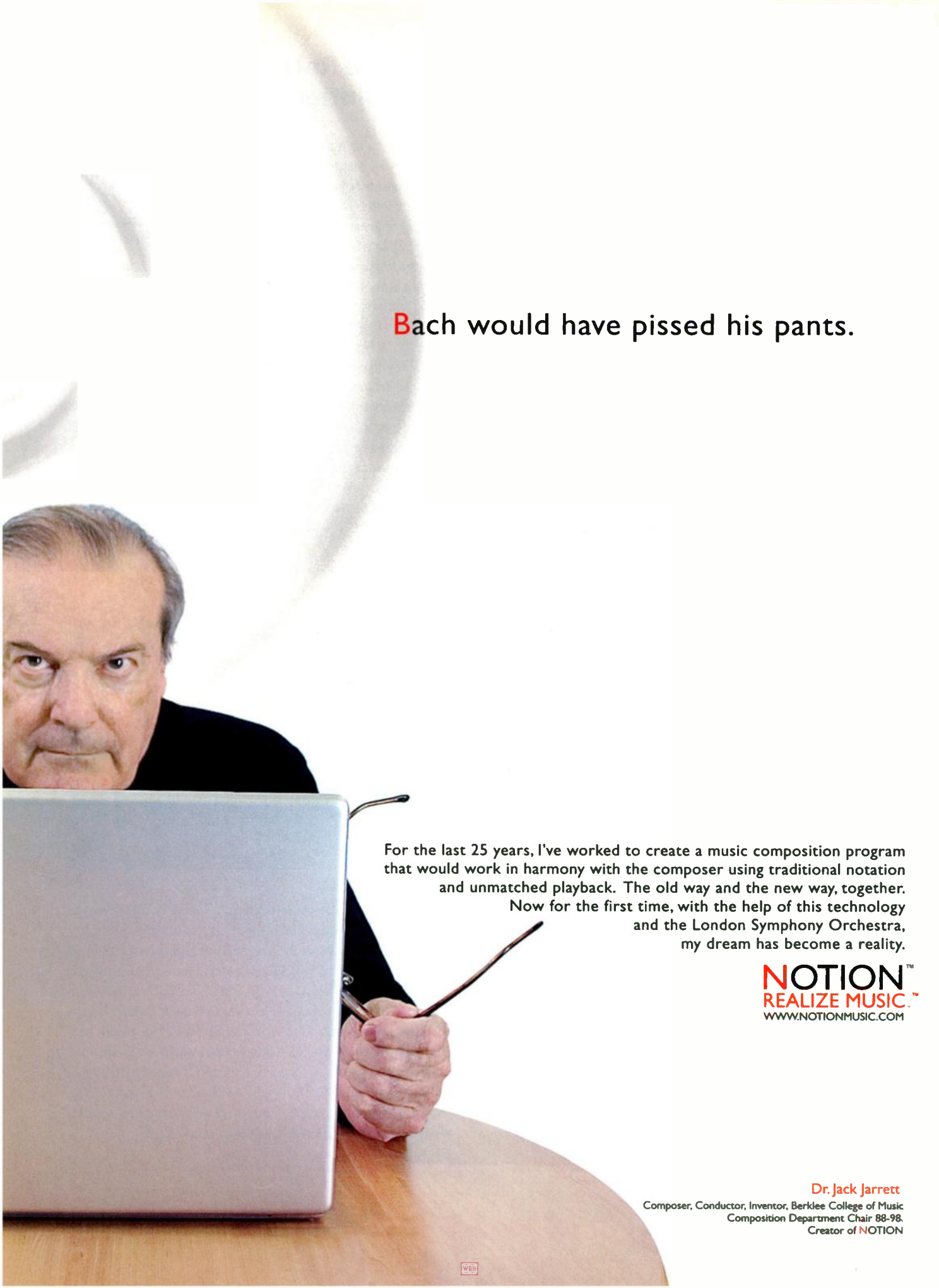
The sequencer lets you record a maximum 256 patterns and 16 songs, each with as many as 3,580 measures. You can specify pitch, duration, accent, and glide for each note, as well as the meter, loop point, and swing amount for each pattern. As the sequencer runs, you can transpose and chain patterns, and a Remix feature produces 256 variations for every pattern and song.

Sound Advice

If you're among the ranks of EM readers who use **FXpansion**'s (www.fxpansion.com) extraordinary virtual drummer BFD (Mac/Win), you might already have discovered that two huge expansion packs are available. BFD XFL ($249) and BFD 8-Bit Kit ($199) supply 24-bit drums, cymbals, and percussion instruments to supplement BFD's already massive sample library. XFL gives you five DVD-ROMs totaling 22 GB of new content that emphasizes vintage snares and other hard-to-find instruments, all recorded in fine detail. BFD 8-Bit Kit is on three DVD-ROMs containing 14 GB of sounds recorded at Los Angeles' The Sound Factory. The collection features hundreds of exquisite sounds ranging from classic drum kits to classic drum machines.

The newest 24-bit sample collection from **Cycling '74** (www.cycling74.com) is Incidental Gesture ($99). The DVD-ROM was produced by sound designer Ron MacLeod and includes an audio CD for auditioning sounds. In addition to many timbral textures that extend the content of the two previous Cycles discs, Incidental Gesture contains more melodic material and traditional instrumental sounds such as saxophone and penny whistle. Categories range from Narrative Expressions to Rhythmic Beds, with some tracks exceeding four minutes in length.

IK Multimedia (www.ikmultimedia.com) has developed numerous sample libraries for SampleTank 2 and for other sample players. The Expansion Tank series (Mac/Win, $99 each or $249 for three) supplies content from soundware developers such as AMG, Sonic Reality, and Masterbits, as well as original content from IK Multimedia, each one packaged on a single CD-ROM. For users who don't already have SampleTank 2, each disc includes SampleTank LE. Sonic Reality's Sonik Capsules series (Mac/Win, $99 each or $249 for three) supply installers that format their content for any of six virtual samplers: Kontakt, Reason NNXT, Battery, HALion, EXS24, or SampleTank.


Bach would have pissed his pants.
For the last 25 years, I've worked to create a music composition program
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and the London Symphony Orchestra,
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Dr. Jack Jarrett
Composer, Conductor, Inventor, Berklee College of Music
Composition Department Chair 88-98.
Creator of NOTION

McDSP Channel G

Plug-in innovator McDSP (www.mcdsp.com) has introduced Channel G (Mac, $995), a suite of four TDM plug-ins for Digidesign Pro Tools. Channel G models the compression, expansion, limiting, gating, filtering, and equalization capabilities of high-end mixing consoles. The bundle comprises G Dynamics, G Equalizer, G Console, and G Surround Compressor. Each plug-in's layout mirrors the center section of Digidesign's Icon control surface and supports 48-bit audio at sampling rates as high as 192 kHz.

For surround mixing and processing, G Surround Compressor provides four independent compressor/limiters (LR, C, LsRs, and LFE). You can set the key signal for each compressor individually and link any of the four compressors to a single master. G Dynamics is an expander/gate with controls for range, threshold, and continuously variable ratio. Fully sweepable lowpass and highpass filters each have four selectable slopes and a notch mode with four variants. The same filters are also available in G Equalizer, which features five-band parametric EQ with switchable shelving and clip metering on every band.

G Console is a channel-strip configuration that combines G Dynamics and G Equalizer in a single plug-in. According to McDSP, G Console can reproduce the response and control calibrations of numerous classic analog mixing consoles. Channel G's interactive signal-path flowchart allows you to monitor routing changes in real time.

Arturia ARP 2600 V

The ARP 2600 was one of the first portable synthesizers, a versatile synth-in-a-suitcase that let you reconfigure its hardwired connections using patch cords. Almost 35 years later, ARP 2600 V (Mac/Win, $310) is the newest soft synth from Arturia (www.arturia.com). Like the company's previous emulations of classic instruments (CS-80V, Moog Modular V2, and Minimoog V), ARP 2600 V models the original in every detail and adds 21st-century capabilities such as full MIDI control, more than 400 presets, and maximum 32-note polyphony.

Like its namesake, ARP 2600 V has three oscillators, a noise generator, a resonant lowpass filter, an LFO, ring modulation, spring-reverb simulation, two envelope generators, and an envelope follower. It provides extras such as a virtual ARP 1601 sequencer, chorus and delay effects, and an emulation of the ARP 2500's multimode filter. In addition, four tracking generators interact with the syncable LFO to offer unique modulation possibilities. ARP 2600 V runs standalone or as a plug-in for hosts that support Audio Units, DirectX, HTDM, RTAS, or VST formats.

Key Changes

In a continuing game of corporate musical chairs, Pinnacle Systems, the California-based video software company that acquired German audio software developer Steinberg (www.steinberg.de) in January 2003, has announced Steinberg's impending sale to Yamaha Corporation of Japan . . . More than three years after suspending operations, effects hardware manufacturer **Electrix** (www.electrixpro.com) is back in business. The maker of Repeater, FilterQueen, MoFo, and other unique processors and audio loopers has updated its Web site, offering product support, software updates, downloadable manuals, and online forums. New product announcements are expected soon . . . **Line 6** (www.line6.com) has announced that it is the new U.S. distributor of Propellerhead Software products, replacing M-Audio, and will be responsible for all U.S. customer support . . . **Focusrite** (www.focusrite.com) recently acquired British synth and keyboard maker Novation Digital Music Systems, with U.S. distribution being handled by American Music & Sound . . . **VirSyn** (www.virsyn.com) is offering a free update to its vocal synthesizer Cantor (Mac/Win, $389). Cantor 1.5 features a revised synthesis engine that makes it easier to produce intelligible vocals, thanks to an improved filter model and a new rule-based phoneme sequencer . . . **PG Music** (www.pgmusic.com) has released Band-in-a-Box Pro 2005 for Windows ($88; upgrades $49 to $59), introducing more than 50 new features. The popular auto-accompaniment program now provides piano-roll editing and jazz chord symbols, and supports alternate guitar tunings. It also includes the Bonus 10-Pak with every new or upgrade purchase . . . **Symbolic Sound** (www.symbolicsound.com) is shipping Kyma X.1, a free upgrade to owners of Kyma X (Mac/Win, $3,470). It adds three new oscillator types, a new PresetSpace module, support for graphics tablets, and other enhancements.

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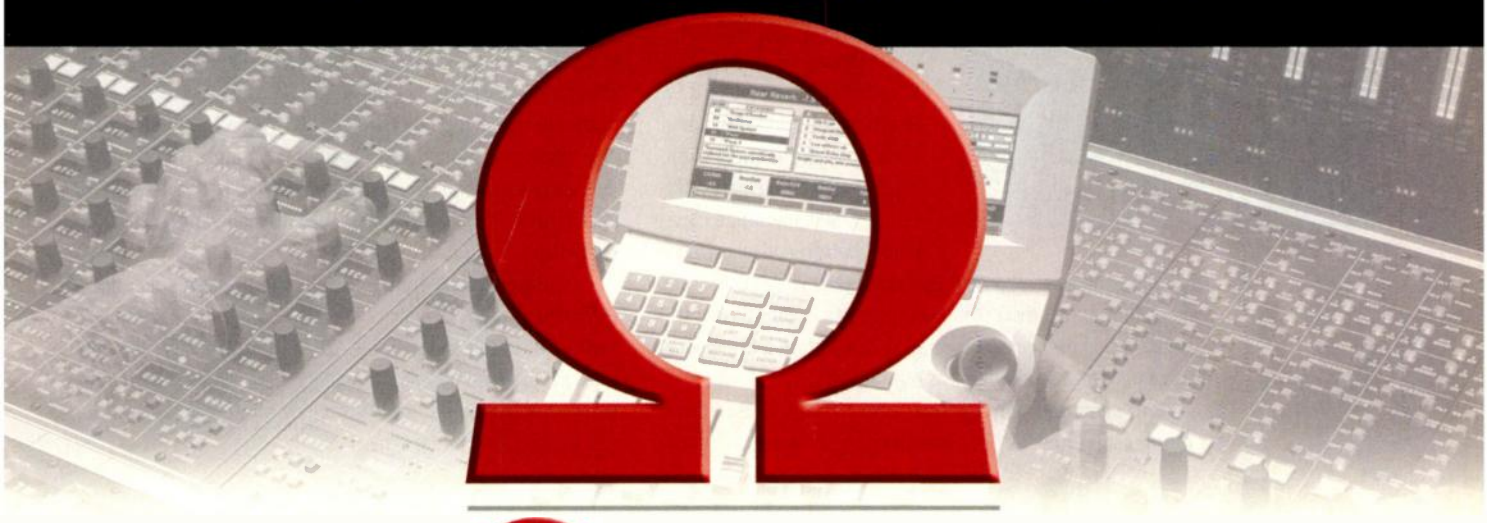

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iZotope Spectron, Trash, Ozone 3

M-Audio (www.m-audio.com) has announced distribution of three plug-ins from iZotope: Spectron (Mac/Win, $129.99), Trash (Mac/Win, $199.99), and Ozone 3 (Mac/Win, $249.99). Spectron is a spectral domain processor that delivers a range of effects that includes delay, flanging, chorus, and morphing. It allows you to modulate parameters within specific frequency bands.

Trash is a multiband, dual-stage distortion plug-in with 48 algorithms suitable for a variety of applications. Used as a guitar-amp simulator, it offers a rectified overdrive, three mic models, and 85 speaker-cabinet models. It also has 36 filter types, gating, and multiband compression. Delay modeling simulates analog, tape, and other types of delay.

Ozone 3 is an integrated suite of mastering processors with a single user interface. Its 8-band equalizer has real-time analysis and linear phase, tube-modeled, and matching modes. Ozone 3's intelligent loudness maximizer offers multiple detection modes and brick-wall peak limiting. The modeled reverb algorithms are optimized for mastering applications. Additional features include a harmonic exciter, frequency-dependent stereo imaging, and MBIT+ dithering.

All three plug-ins run under VST, RTAS, HTDM, AudioSuite, DirectX, MAS, and Audio Units hosts and support automation, unlimited undo, 64-bit processing, and sampling rates as high as 192 kHz. Each also includes documentation and a library of presets.

Download of the Month

REVITAR 2.0 (Win)

CutterMusic's Revitar 2.0 ($69) is a guitar synthesizer in the form of a VST instrument plug-in for Windows. It physically models various aspects of a guitar, starting with a string modeler that emulates 120 points along six strings. Following the string modeler is a modeler for different picks and pick positions. The body modeler consists of 20 separately tuned resonators and is based on the bodies of real acoustic guitars. Revitar's output is a mix of the signal from a movable pickup and the sound from the resonating body.

The plug-in provides two modes for playing single notes and two more for playing chords. One single-note mode allows Revitar to choose the string being played, whereas Mono mode plays all notes on the same string. Mono mode is ideal for slides and for hammer-on and pull-off techniques.

Relative Chord mode allows you to play the same chord at different string positions. Absolute Chord mode allows you to play different chords at fixed positions. In either mode, 24 different chords are held in memory, and you choose the chord by playing the middle two octaves of the keyboard. You can slide between chords, just as you can between single notes in mono mode.

Other features include palm damping, string stop, bridge damping, slap, variable-rate vibrato, and controlling the strum rate and direction. Revitar provides 48 presets in four categories—clean, electric, effects, and bass—as well as additional banks of presets for six popular third-party guitar-amp and distortion plug-ins. You can download a time-limited, save-disabled demo from the CutterMusic Web site (www.cuttermusic.com).

—Len Sasso

Proteus X

Desktop Sound Module

E-MU Systems brings the power and sounds of the world's most popular sound module line to your desktop with Proteus X – a 24-bit/192 kHz desktop sound module that delivers all of the filters, effects and pristine sounds of E-MU's rackmount modules to your PC. Proteus X ships with over 2 GB of sounds, including every last sample from E-MU's Proteus 2000 sound module, and can be expanded with the original soundsets from E-MU's legendary modules like Mo'Phatt, Planet Earth and Virtuoso 2000. Want even more sounds? Proteus X lets you load your favorite sound libraries (Emulator X, EOS, GigaSampler, Akai, and many more) and play them back with Proteus X's powerful streaming engine. And, unlike other software instruments, Proteus X's audio/MIDI interface is optimized to deliver ultra-low latency performance with unmatched fidelity – Proteus X actually plays and sounds like a real hardware instrument.

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By Geary Yelton

Tascam FW-1082

Tascam (www.tascam.com) is certainly doing its part in bringing down the cost of digital recording. The new FW-1082 ($999) offers many of the FW-1884's features at a significantly lower price. The FW-1082 is a MIDI control surface with motorized faders and a 10-in, 4-out audio and 2×2 MIDI interface with FireWire connectivity. Alongside balanced 1/4-inch jacks on all eight analog inputs, four inputs have balanced XLR jacks with switchable 48V phantom power. Two inputs provide insert jacks, and one input can accommodate either line-level or instrument-level signals. The FW-1082 handles 24/96 audio, and furnishes balanced 1/4-inch outputs and coaxial S/PDIF I/O. Two pairs of MIDI ports handle 32 discrete MIDI channels.

As a control surface, the FW-1082 is a front end for almost any DAW. In addition to nine 60 mm faders, it provides transport controls, a jog/shuttle wheel, locate buttons, four assignable rotary encoders, assignable F-keys, an assignable footswitch, and eight channel strips with trim pots, indicator LEDs, and Select, Solo, and Mute buttons. Mackie Control and HUI emulation supplement its native mode.

Bundled with the FW-1082 is a software suite that includes Steinberg Cubase LE (Mac/Win), Tascam GigaStudio 3 LE (Win), and Nomad Factory plug-ins (Mac/Win).

Joemeek twinQ

For occasions when a simple audio interface isn't enough and a multichannel mixing console is too much, the new twinQ Dual Studio Channel ($999.99) from Joemeek (www.joemeek.com) offers a full-function channel strip and an A/D converter in a 2U rackmount unit. Each of the twinQ's two channels provides a high-gain, low-distortion mic preamp; a photo-optical compressor with variable ratio, slope, attack, release, and makeup gain; three bands of equalization; and a vintage-style analog VU meter that displays input or output signal strength. Each channel also has front-panel switches for parameters such as 48V phantom power, mic/line switching, and phase reversal. The twinQ's Iron switch enables a transformer that offers a different sound than its Burr Brown–based design.

The twinQ is no slouch in the I/O department, offering balanced 1/4-inch line and XLR mic inputs, a 1/4-inch TRS insert, a +4 dBu XLR output, and a switchable –10 dBV/+4 dBu output on both channels. In addition to an XLR AES/EBU output, coaxial and S/PDIF outputs are available. The internal master clock offers switchable 44.1-, 48-, 88.2-, and 96 kHz sampling rates at 24 bits, or you can sync the twinQ to an external word clock received by its BNC connector.

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Emulator X software brings E-MU's years of sampling experience to the desktop in what is quite possibly the most powerful software sampler around, but with an interface that's a joy to use.

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GEORGE HOLZ

EMspotlight

Bigger Science with Laurie Anderson

Laurie Anderson's crafty songwriting portrays a dream-spun world that is well suited to electronic sound. In this exclusive interview from the EM archives, Anderson talks about songwriting, technology, and performing her epic stage work, *United States I–IV*.

emusician.com/em_spotlight

On the home page

EM web clips

A collection of supplemental audio, video, text, graphics, and MIDI files that provides examples of techniques and products discussed in the pages of *Electronic Musician*.

EM cool tip of the month

Digidesign Pro Tools TDM 6.7 is a powerful DAW for recording and mixing. This month we offer useful tips for creating multiple headphone cue mixes within a session.

show report

2005 Winter NAMM

The 2005 Winter NAMM show is the biggest annual musical-instrument expo in the United States. Visit emusician.com for Senior Editor Mike Levine's report on the exciting new recording gear, the music software, and the electronic musical instruments unveiled at this year's show.

editor's picks

Associate Editor Rusty Cutchin delivers his favorite EM articles on studio monitoring. Topics range from monitoring basics to tips on setting up a complete system.

emusician.com/editorspicks

EM news

A weekly update on new hardware and software releases, manufacturer contests, and pertinent industry news.

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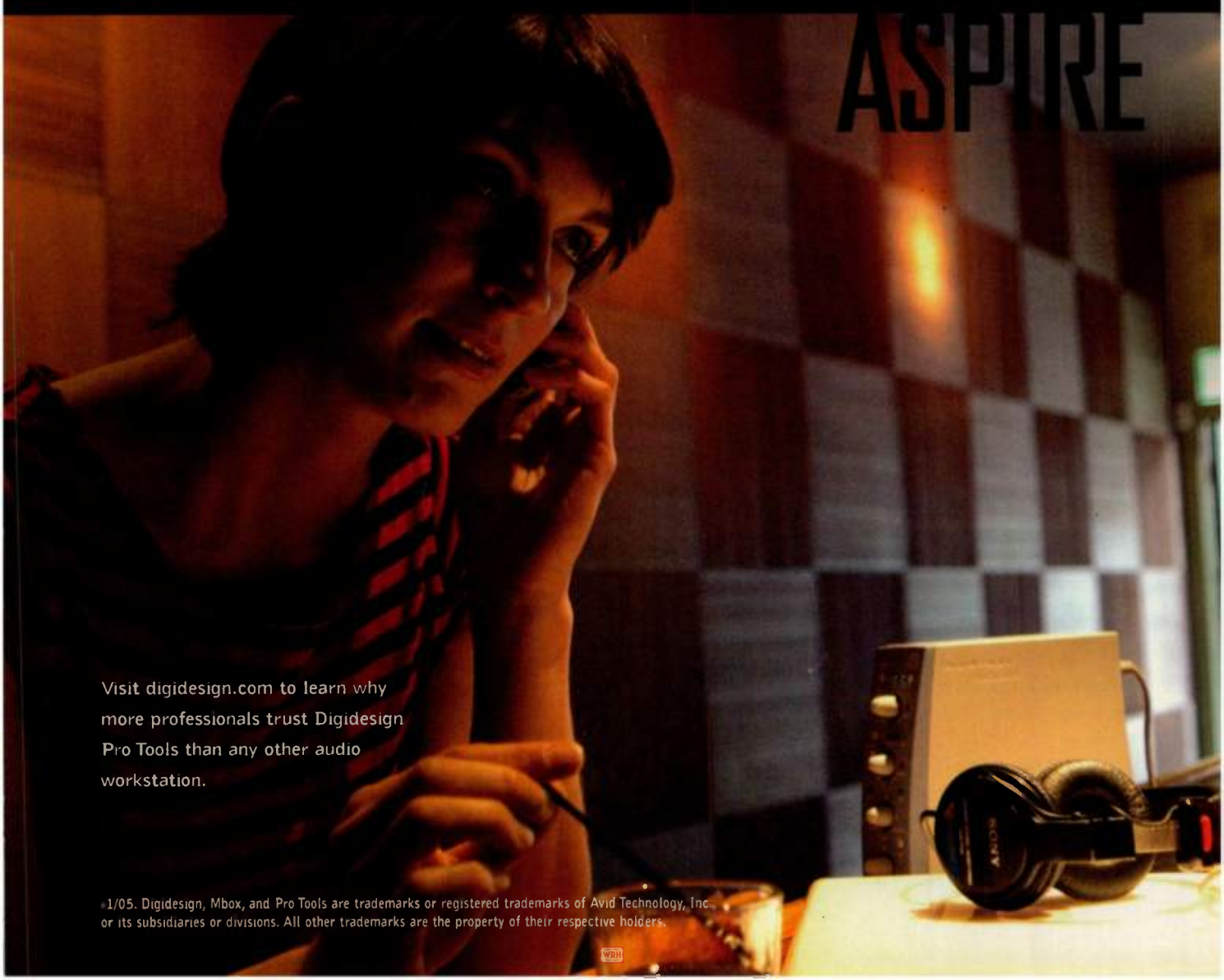

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Next Month in EM

COVER STORY

Buried Treasure

EM explains what E-mu's SoundFont sample format is, how it works, where you can get SoundFonts, how you can create your own, and how to use them in your music.

FEATURES

Special Treatment

Even the best reference monitors can't give you an accurate reproduction of your recordings if your room hasn't been acoustically treated. We spoke with six experts to get the lowdown on common acoustic problems in personal studios and how to fix them on a tight budget.

Master Class: Pro Tips LE!

Whether you're using an MBox or a Digi 002 interface, these tips and techniques for Digidesign Pro Tools LE 6.7 will help you increase productivity and streamline your workflow.

COLUMNS

Making Tracks:
Player Against the Machine

How to create sequencer tracks based on specific musical styles.

Sound Design Workshop:
Convolution Reverb and Beyond

You can use convolution-based processing for much more than reverb.

Square One:
Get with the Program

What's under the hood of your favorite software?

...and much more!

Letters

Mixed Up

I agree that mixing in the computer is very desirable because it is inexpensive, powerful, and convenient ("The Power Within," January 2005). But I've read that for both technological and creative reasons the sound that results from mixing in the computer doesn't measure up to that of analog mixing.

For example, the current standard for bit depth in computer mixing is 32 bits (floating point), but this may not be enough to account for all the multiplication and addition that has to be done without losing audio quality. I've heard that Pro Tools uses a 48-bit (linear) bit depth, but according to some people (such as Chris Vrenna, who was interviewed for the article "The Groove Is Out There" in the August 2003 issue of EM), even this doesn't sound as good as analog mixing.

I enjoyed your article, but I wish that you covered more on the sound of digital versus analog mixing. I've researched the Web and books to find more information on this subject, but there is precious little depth to any information I've found. I would like to keep mixing "in the box," but from my limited experience, it seems that the proponents of analog mixing are right—mixing in a computer doesn't sound as good, spacious, or real as using a good analog mixer.

Andrew Barker
via email

We Welcome Your Feedback

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or email us at emeditorial@primediabusiness.com.
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No Fun in Games

I thank Larry the O for his column entitled "Game Over" ("Final Mix," January 2005). As an 11-year veteran of the computer-game industry I have also witnessed a huge shift.

He's right on the money about how these big companies do business. Many of my friends quit their audio positions due to 60- to 80-hour workweeks that now seem to extend over 11 out of the 12 months of the year. I've worked as an independent contractor for about five years now. I prefer this kind of work except for the fact that film post houses have been doing game sound recently—submitting low bids, having interns do the work, and taking all the business away from people who are trying to make a living at what we once thought was our niche. More and more companies are low-balling budgets, and it's becoming increasingly difficult to make a living doing audio in the game business unless you happen to own the developing company.

Perhaps one day we will see labor laws for the game industry that are similar to those for the film industry. After all, with the release of Microsoft Xbox's *Halo 2* and its $150 million opening day, it's easy to see that the game industry is moving toward the most profitable media and that the people who create this "magic" are getting very little sleep, no overtime pay, and tiny bonuses (if any).

R. King
via email

R.—Thanks for your letter. I have also received a few private responses saying, "Ain't that *the truth" from friends who are still in the industry and thus reticent to go public with their comments. The issue has been surfacing everywhere from blogs on the Web to a report on NPR. My most fervent hope is that this sad and outrageous situation will change before the videogame industry starts experiencing instances of* karoshi, *the Japanese term for "death by overwork."—Larry the O*

cakewalk

SONAR 4

"In this business, we don't care what a program says it does, we care about how it sounds—And let me tell you, SONAR 4 sounds great. One example that I'm absolutely floored with is the MPEX Time Scaling for correcting vocal tracks. It's as if the vocalist just nailed the take, you can't hear the processing and I couldn't find any artifacts."

Terry Howard Producer/Engineer
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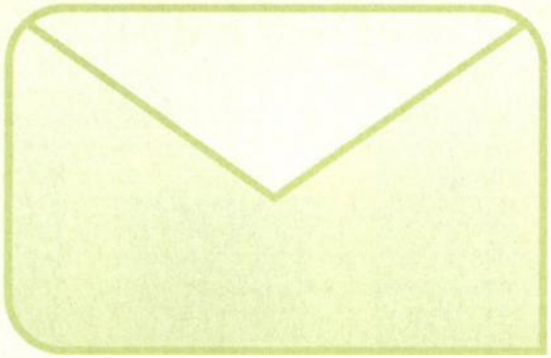

Letters

Doesn't Add Up

In the January 2005 issue, David Phillips talks about "setting up shop" in his article on releasing your own CD ("Working Musician: Add It Up"). On p. 84, Phillips states, "Reseller permits allow you to sell to record stores and distributors within your state and not charge them sales tax." Although that statement is somewhat close, it's incorrect.

A reseller permit allows one to purchase items to be resold later and avoid paying the sales tax at the time of purchase. For example, a holder of a reseller's permit does not have to pay the sales tax when purchasing CDs from a manufacturer or a duplicator. In similar fashion, a record store or a distributor does not have to pay you the sales tax, because they hold a reseller's permit. In other words, one must always charge the sales tax when selling records, unless the buyer holds a reseller's permit.

Michael Lazarev
Tranceplant Records

David Phillips's "Add It Up" article in the January 2005 issue of EM made me wince a few times. I realize that Mr. Phillips was showing artists how to do what the major labels do on a much smaller budget. But as an advertiser in your magazine for short-run duplication services, I found it disconcerting that one of your writers would dismiss our product out of hand.

On p. 88, in the first paragraph under the subhead "Manufacturing" he states, "Duplication, rather than replication, isn't recommended, because not all CD and DVD players will play duplicated discs." His sidebar "The Cost of Doing Business" shows how you can spend between $2,420 and $7,350 for your first thousand CDs along with promotional and various other fees.

Mr. Phillips ignores a large percentage of your readers who can't afford to spend that kind of money on a local release. Our customers spend around $300 on the same type of package mentioned in the article. When they've sold 100 CDs they order another 100. There is no wasted inventory; they buy what they can sell. Many local musicians are fortunate to move 100 to 200 CDs.

One thousand CDs are only a bargain if you sell them all. You have to figure your cost per CD by the number you actually sell, not the number that you paid for. Often when you amortize the real price of doing 1,000 CDs, it can end up costing as much as $5 to $12 per CD when you figure the number you sold. That is not very profitable.

Mr. Phillips is correct that duplicated CDs won't play in all CD players. But we have found that over time, as technology improves, that has become a very small issue. Many of our customers who print 100 to 200 CDs have no complaints at all. Some of them might experience two or three instances of incompatibility. We agree that replication is a better overall solution if you sell 1,000 or more CDs. But for many independent bands and artists out there, duplication gives them the chance to look and sound good on a small initial budget. Test the water before you blow a wad of cash.

In the real world, duplication is often the best solution. I was disappointed that this article ignored that fact.

Mark McLelland
President
ELS Productions, Inc.

"One thousand CDs are only a bargain if you sell them all."—Mark McLelland

Boxed In

I like your magazine, but I would get much more out of it if the articles offered more how-to information. I was reading your article about mixing in your computer ("The Power Within," January 2005) and did not get any information that would push me to do it. I have been mixing in my computer for years, and I thought the article would tell me some cool new ways to do things. I did not read about any capabilities that were new or exciting.

It would be cool to read more advanced articles that spill the beans on how different people use this stuff. Give us some information on settings, applications, configurations, and how to get some of those big-studio sounds.

Shawn Everette
via email

www.propellerheads.se

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John French, jfrench@primediabusiness.com

PRIMEDIA INC.
745 Fifth Ave., New York, NY 10151

CHAIRMAN
Dean Nelson, dean.nelson@primedia.com

PRESIDENT AND CHIEF EXECUTIVE OFFICER
Kelly Conlin, kelly.conlin@primedia.com

VICE CHAIRMAN & GENERAL COUNSEL
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Emulating Sliding Piatti

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Electronic Musician
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EDITOR IN CHIEF
Steve Oppenheimer, soppenheimer@primediabusiness.com

MANAGING EDITOR
Patricia Hammond, phammond@primediabusiness.com

SENIOR EDITORS
Mike Levine, mlevine@primediabusiness.com
Gino Robair, grobair@primediabusiness.com

ASSOCIATE EDITORS
Rusty Cutchin, emeditorial@primediabusiness.com
Dennis Miller, emeditorial@primediabusiness.com
Len Sasso, emeditorial@primediabusiness.com
Geary Yelton, gyelton@primediabusiness.com

ASSISTANT EDITOR
Matt Gallagher, mgallagher@primediabusiness.com

COPY EDITOR
Lori Kennedy, lkennedy@primediabusiness.com

CONTRIBUTING EDITORS
Michael Cooper, Mary Cosola, Marty Cutler, Maureen Droney, Larry the O, George Petersen, David Rubin, Rob Shrock, Scott Wilkinson

DIRECTOR OF NEW MEDIA
Tami Needham, tneedham@primediabusiness.com

GROUP ART DIRECTOR
Dmitry Panich, dpanich@primediabusiness.com

ART DIRECTOR
Laura Williams, lwilliam@primediabusiness.com

ASSOCIATE ART DIRECTOR
Mike Cruz, mcruz@primediabusiness.com

INFORMATIONAL GRAPHICS
Chuck Dahmer

SENIOR VICE PRESIDENT
Peter May, pmay@primediabusiness.com

ADMINISTRATIVE ASSISTANT
Karen Carter, kcarter@primediabusiness.com

PUBLISHER
Dave Reik, dreik@primediabusiness.com

ASSOCIATE PUBLISHER
Joe Perry, jperry@primediabusiness.com

EAST COAST ADVERTISING MANAGER
Jeff Donnenwerth, jdonnenwerth@primediabusiness.com

NORTHWEST/MIDWEST ADVERTISING MANAGER
Greg Sutton, gsutton@primediabusiness.com

SOUTHWEST ADVERTISING MANAGER
Mari Deetz, mdeetz@primediabusiness.com

MARKETING AND EVENTS DIRECTOR
Christen Pocock, cpocock@primediabusiness.com

MARKETING COORDINATOR
Clarina Raydmanov, craydmanov@primediabusiness.com

MARKETING AND EVENTS COORDINATOR
Megan Koehn, mkoehn@primediabusiness.com

ONLINE SALES AND MARKETING MANAGER
Samantha Kahn, skahn@primediabusiness.com

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

WEST COAST CLASSIFIED SALES ASSOCIATE
Kevin Blackford, kblackford@primediabusiness.com

EAST COAST CLASSIFIED SALES ASSOCIATE
Jason Smith, jasmith@primediabusiness.com

CLASSIFIEDS PRODUCTION COORDINATOR
Jennifer Kneebone, jkneebone@primediabusiness.com

GROUP PRODUCTION MANAGER
Melissa Langstaff, mlangstaff@primediabusiness.com

ADVERTISING PRODUCTION COORDINATOR
Jennifer Hall, jhall@primediabusiness.com

GROUP AUDIENCE MARKETING DIRECTOR
Philip Semler, psemler@primediabusiness.com

AUDIENCE MARKETING MANAGERS
Craig Diamantine, cdiamantine@primediabusiness.com
Jef Linson, jlinson@primediabusiness.com

DIRECTOR OF HUMAN RESOURCES
Julie Nave-Taylor, jnave-taylor@primediabusiness.com

OFFICE COORDINATOR/RECEPTIONIST
Lara Duchnick, lduchnick@primediabusiness.com

ConcreteFX Kubik 1.1 software synthesizer (Win)

Electronic Musician
March 2005

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EDITOR IN CHIEF
Steve Oppenheimer, soppenheimer@primediabusiness.com

MANAGING EDITOR
Patricia Hammond, phammond@primediabusiness.com

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Mike Levine, mlevine@primediabusiness.com
Gino Robair, grobair@primediabusiness.com

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Rusty Cutchin, emeditorial@primediabusiness.com
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ASSISTANT EDITOR
Matt Gallagher, mgallagher@primediabusiness.com

COPY EDITOR
Lori Kennedy, lkennedy@primediabusiness.com

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Dmitry Panich, dpanich@primediabusiness.com

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INFORMATIONAL GRAPHICS
Chuck Dahmer

SENIOR VICE PRESIDENT
Peter May, pmay@primediabusiness.com

ADMINISTRATIVE ASSISTANT
Karen Carter, kcarter@primediabusiness.com

PUBLISHER
Dave Reik, dreik@primediabusiness.com

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Joe Perry, jperry@primediabusiness.com

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EastWest Percussive Adventures 2 percussion sample player (Mac/Win)

Yellow Tools Majestic sample library (Mac/Win)

Native Instruments B4D Organ Controller MIDI controller

Submersible Music DrumCore 1.0 drum-track creation software (Mac/Win)

ConcreteFX Kubik 1.1 software synthesizer (Win)

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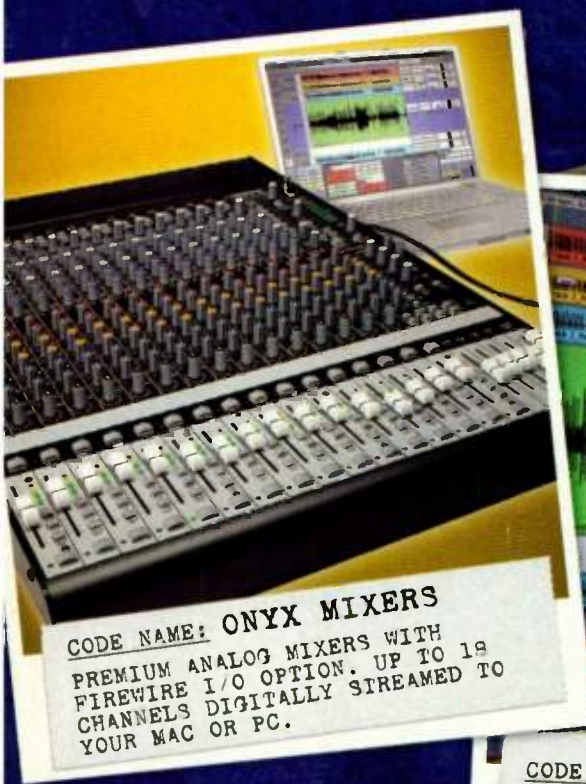

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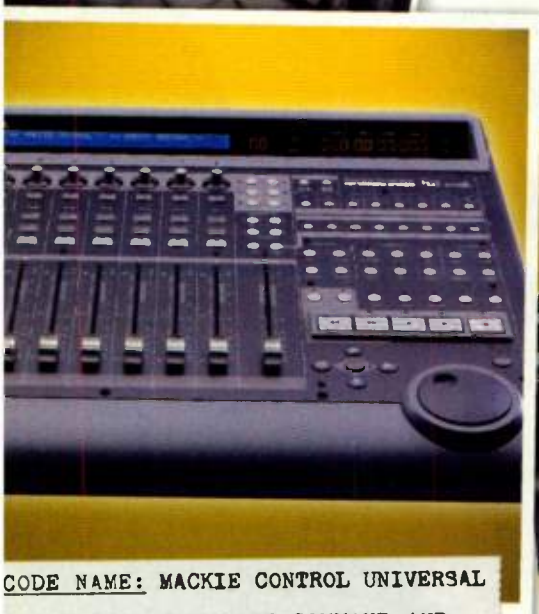

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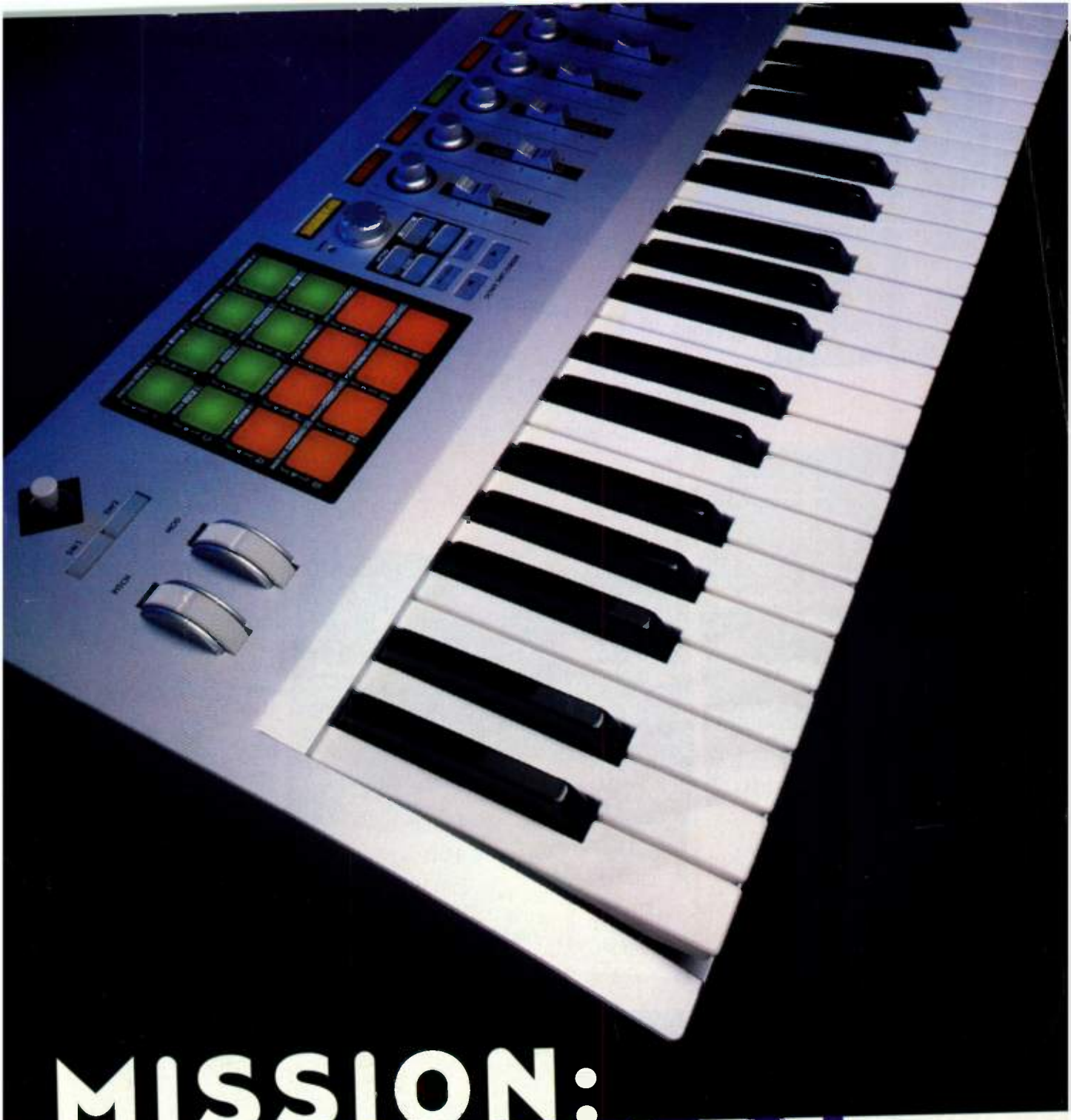

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