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Electronic Musician
September 2007

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BOB MONTESCLAROS

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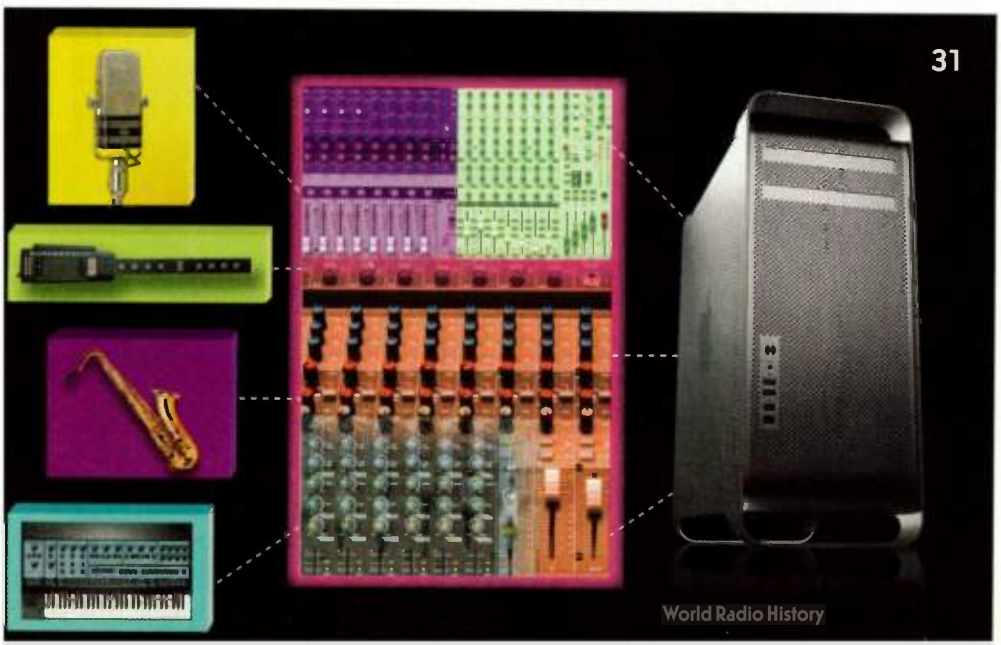

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amp-modeling pedals

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condenser microphone

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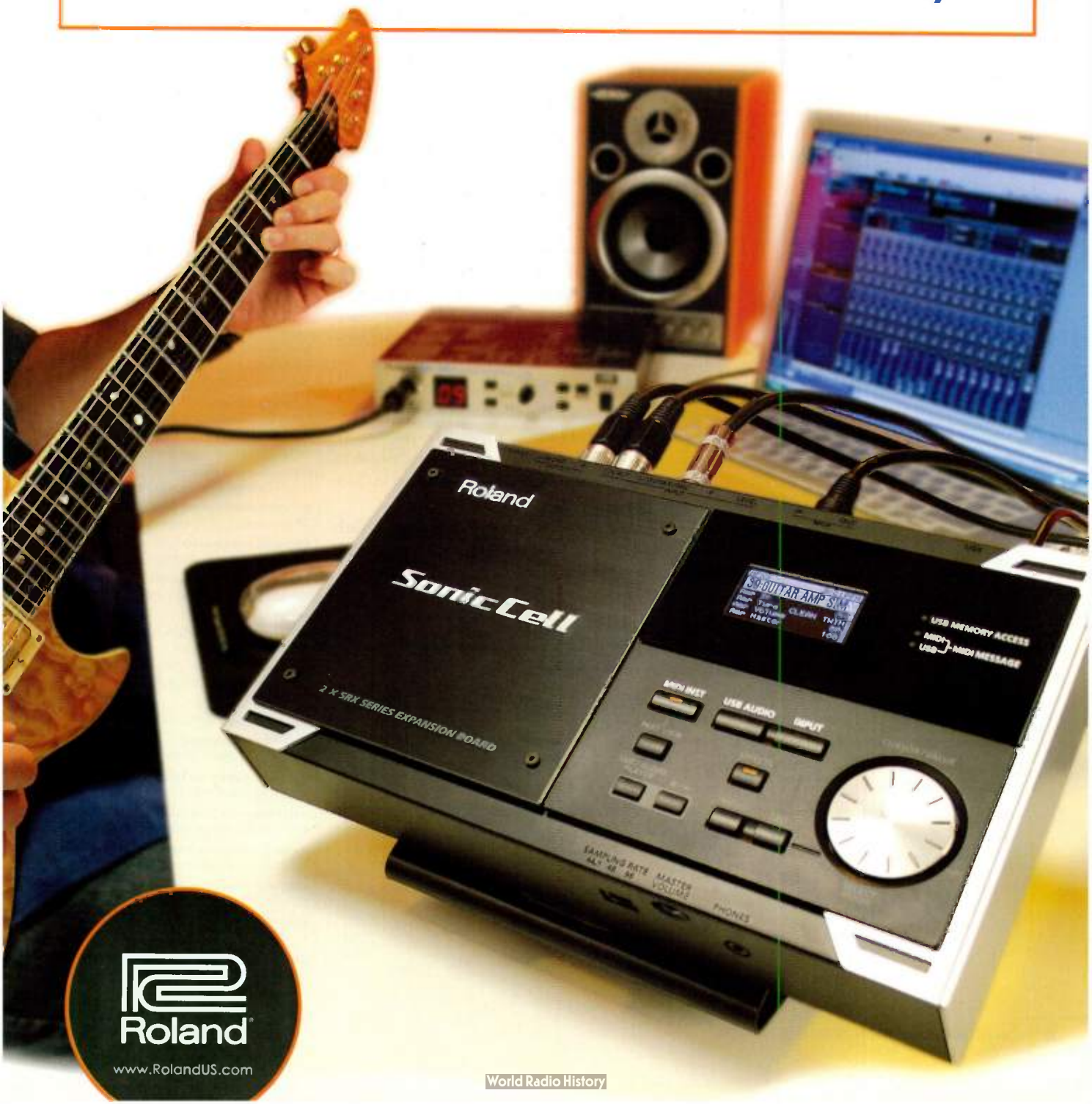

Roland

www.RolandUS.com

Welcome to EM 5.0

Electronic Musician has grown a lot since it evolved from *Polyphony* 22 years ago, and as the fifth man in the hot seat, I have plans to take it to greater heights without losing sight of its DIY music-production roots. But before I share my editorial vision, I want to tell you what's in store in the near future.

These are exciting times in the publishing world, where magazines are evolving from being purely print-based into a format that takes full advantage of the Web's potential. EM has already begun the transition, and the best is yet to come.

Starting this month, several of our articles will include streaming video in addition to audio Web Clips. That will let you see, as well as hear, our editors demonstrating features and explaining concepts. Our goal is to combine deep technical content in an easy-to-read print format with rich-media editorial online (see the Web Clips in this month's "Bizarre Hardware"). Still, this is only the beginning.

To further bridge the gap between software and treeware, we now offer a digital edition of EM, which is delivered each month by email. Using technology by Texterity (www.texterity.com), our digital edition is identical to the print version, but with active links throughout.

JANE RICHEY

Other changes are in the works at www.emusician.com. For example, daily updates give you the latest product news. If you want more, check out eMusician Xtra, our twice-weekly e-newsletter by Group Editorial Assistant Tracy Katz, which provides additional product coverage along with events, contests, and reviews of our readers' music.

In the coming months, our expanded Web coverage will also include reports from festivals, conferences, and other events that we don't normally have space for in print. There are plans for events of our own, as well as participation in Remix Hotel (www.remixhotel.com). And as Editor in Chief Steve Oppenheimer hinted at last month, there is much more to come from EM.

Running a successful magazine takes teamwork, and our crew is the best in the industry. Each editor has decades of experience and is putting it to good use during EM's transition. Senior Editor Mike Levine not only created "EM Cast," our biweekly Podcast, but is spearheading other online projects. Associate Editor Geary Yelton, who has written for EM since its first issue in 1985 (covering the Fender Chroma-Polaris!), now runs the review section, while Associate Editor Len Sasso takes over "What's New" and continues to produce "Sound Design Workshop" and "Making Tracks." Associate Editor Dennis Miller, our specialist in audio for picture and Windows, coordinates "Square One." And Copy Chief Marla Miyashiro makes sure the information you read is presented clearly and concisely.

Just as important is our partnership with you, the person for whom this magazine exists. But your contribution extends beyond the purchase of an issue—we want to hear from you, whether by email, snail mail, MySpace messages, or blog comments. Your feedback not only helps us determine the topics we'll cover, but also keeps us abreast of trends the industry might not be addressing. Tell us how we're doing, share some anecdotes or your music with us, or just say hello. EM's goal is to help musicians everywhere get the most out of technology, and the best way to do that is as a team.

Talk to you soon!

Gino Robair
Editor

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

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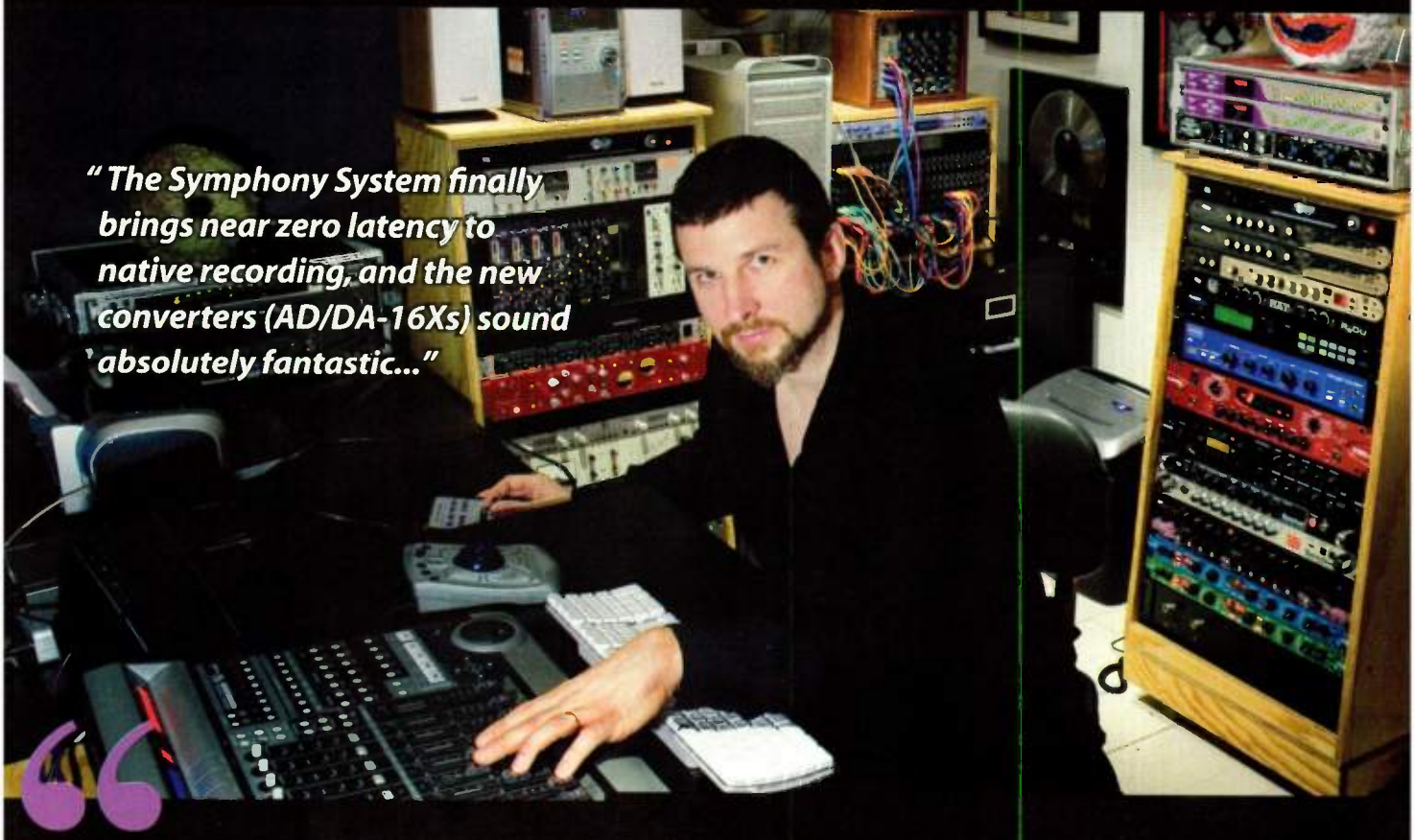

Ulrich **Wild**

Producer, Engineer, Mixer

"Technology has finally caught up to my needs in a DAW. I'm running Logic Pro with the new Symphony System with fantastic results. The Symphony System finally brings near zero latency to native recording, and the new converters (AD/DA-16Xs) sound absolutely fantastic. ***Logic Pro sounds much better than any other DAW I've used before.*** The low-end is warm and the high-end is silky smooth. It is a very efficient program and not very taxing on the CPU, which, along with the new Intel Macs, leaves me with an astounding surplus of processing power. ***The quality of this system meets and even surpasses the large format analog consoles I was used to.*** I have mixed many Rock and Metal records and until recently, I wouldn't even have considered mixing "in the box". Now, however, I mix nearly all projects in Logic."

Recent projects:

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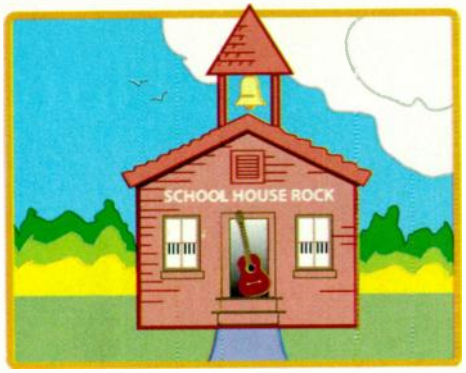

LAURA WILLIAMS

Letters

Hats Off to a Top Tutorial

After reading the first page or two of Michael Cooper's "Twelve Common Mixing Mistakes" in the July 2007 issue of EM, I couldn't resist the urge to remove the entire article from the magazine and put it where it belongs—inside archival-quality page protectors in a notebook that will sit permanently on my mixing desk. I started learning digital music production a year ago, and no other article, book, or tutorial has come close to teaching me so much, so clearly, in such a short time. More, please.

Mark Alsip
via email

Exporting Audio to Movie

I have enjoyed your magazine for years and read with interest the article in the May 2007 issue on film scoring (see "Picture Window"). It is something I've always wanted to try my hand at.

One thing, however, that you may or may not be aware of is that the Export Audio To Movie command in Apple Logic Pro does not work on Intel Macs. I know this because recently I did a movie project for my wife's company on my MacBook Pro, and when I tried to export the final soundtrack to the movie I had created, it didn't take. I got the movie but no audio! I took the problem to my local Apple store and consulted the "geniuses" there, but they were unable to figure out why it wouldn't work. I even took it to one of the flagship stores in downtown Chicago and got the same results.

Finally, in an online forum, I found out that the feature was not working on Intel-based Macs. I've sent several emails to Apple to inform them of the glitch, but so far, no fix. I just thought you might want to pass this info along to your readers. And if you know of a fix to this problem, please let me know! I did a work-around by saving the file as an MP3 and importing the video and audio separately into iMovie HD, where I was finally able to weld the two together. It sure would be nice not to have to go to all that extra mucking about to get the expected results.

Ron Devon
via email

Christine Wilhelmy at Apple replies: The reader is right—it's a bug, we're aware of it, and it will be fixed in a future update. For those who own QuickTime Pro, a work-around exists:

1. Bounce the audio in the Logic song.

2. Open the resulting audio file in QuickTime Player.

3. Choose Edit→Select All.

4. Choose Edit→Copy.

5. Open the movie file in QuickTime Player.

6. Choose Edit→Add To Movie.

7. Save the movie. Suggest using File→Save As to maintain a "clean" copy of the original movie.

More Than Just the Converter

As far as 24-bit converters go, it's not just the converter, it's also the clock, clock jitter, and how the rest of the surrounding circuitry is implemented (see the letter "Calculating Latency" in the July 2007 issue of EM). I've been inside some of these boxes and some are implemented well, while others look like there were some compromises or concessions regarding performance. I haven't seen anything that was totally piss poor, just a matter of well implemented versus just passable.

Latency, in my experience and from what I've seen so far, tends to be about line lengths and propagation delays in lines between devices, or within circuits where signals pass through a number of circuits and process blocks. Each block or line induces its own time delays to the process so as to add up to a total propagation delay. Some will be discernible, while others will not; it depends on your setup and the processes that a signal goes through with each device (if there is or is not bit depth and rate conversion involved as well). I also agree with Jim Aikin and Steve Oppenheimer that "latency is not related to sampling rate."

As for 24-bit, 96 kHz (or 192 kHz for that matter), when you start getting into those bit depths and sampling rates, there is something called sigma-delta modulation (SDM) that is part of the process chain within the analog-to-digital (ADC) and digital-to-analog converters (DAC), along with a noise-shaping stage (typical in converters for audio at these rates and bit depths). These are typically high-performance converters used for audio. Again, it's not just the converter, it's also how the rest of the circuitry is implemented

Next Month in EM

COVER

Online Collaboration Services

Let's jam! In this article, we test, evaluate, and compare services for online collaboration, including Digitalmusician.net, eSessions, i-studio.net, and sessionplayers.com.

FEATURES

Master Class: Pitch Correction

EM offers practical, hands-on tips to get the best results from pitch-correction software, with examples using Antares Auto-Tune, Celemony Melodyne, and Waves Tune.

DIY: Build Your Own Echo Chamber

Even with all the DSP available today, producers and engineers still use echo chambers to create ambience. Learn how to turn a basement, a stairwell, or even a tiled shower into your own echo chamber.

COLUMNS

Making Tracks: OMF/AAF

Bridge the gap between DAWs by using the Open Media Framework (OMF) and the Advanced Authoring Format (AAF).

Sound Design Workshop: Morphing Additive Oscillators with Zebra2

Add movement and life to your sounds in u-he's soft synth.

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Learn how logarithms are used in various audio applications.

. . . and much more

Letters

to bring out the best of the converter's capabilities.

Regarding dynamic range, 16-bit versus 24-bit is analogous to fine-grain film emulsion versus high-definition video. Sixteen-bit, 44.1 kHz is grainy as opposed to 24-bit, 96 kHz (or 192 kHz). The higher sampling rates also mean there is less of a need for high-order antialiasing filters (or any filters at all in some cases) on the front and back ends of the process, so there is little or no phase distortion that gets encoded and then decoded.

The reason you might not want a 32-bit converter is you run the risk of getting into the realm of diminishing returns. What you would get back out of it might not be discernible and therefore not worth it. The other thing is that you would want a host digital signal processor (DSP) IC chip to do 32-bit math to your 24 bits of data. You want your DSP math to do 4 bits or more than the 24-bit data block you are processing. Doing 32-bit math to process 24 bits of data leaves you with 8 bits of math headroom as a math buffer. To do 32-bit math on 32-bit data, you'd hit a math wall and that would create a host of problems, including truncated audio data splayed all over the place. Maybe someone will want to do 64-bit math to process 32 bits of data, but then again, you would have the question of whether or not you are getting into the realm of diminishing returns.

And then there is that problem again of it being not just the chips (DSP and converters), but also the surrounding circuitry and how it's implemented. Time, care, and good engineering are required. And unfortunately, there are cost-to-performance aspects as to how far a company will go with regard to product development.

There is potential for implementation of high performance and high resolution, but it's a matter of seeing and fulfilling that potential. After all, isn't the goal to get the best audio quality possible?

Partev Barr Sarkissian
Encino, California

Where Is Kevin Gilbert?

Thanks for putting the spotlight on Bill Bottrell (see "Production Values: Pushing the Right Buttons" in the July 2007 issue of EM). His impressive body of work deserves recognition. I was a little disappointed that EM left out Kevin Gilbert's name in Bottrell's list of projects. Gilbert's contributions to *Tuesday Night Music Club (TNMC)* are significant, and his solo works, *Thud* and *The Shaming of the True*, find new devotees daily.

Bottrell and Gilbert met while the former was at the helm of the critically acclaimed "Toy Matinee" sessions, and their shared passion for organic methods led to the *TNMC* collaboration. Gilbert's omission in the Bottrell discussion is especially noteworthy when one considers that the Neve console spoken of and pictured in the article came out of Gilbert's Lawnmower and Garden Supplies studio. Come to think of it, Gilbert would make a fine subject for a future EM sonic investigation. Though much has been written about Gilbert the composer and performer, many believe his true genius was as an engineer and a producer.

Jay Jordan
via email

We Welcome Your Feedback

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Error Log

July 2007, "Pro/File: Montreal Pop," p. 114. The sequencer used in the production of WhiteRoom's self-titled CD was Steinberg Cubase VST 5. EM

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- We also make a signal model, which is measuring how the unit responds to test signals, and replicating the response. Most companies only make signal models.
- We compare the signal model and circuit model to ensure they converge. At this point, our model theoretically behaves exactly like the hardware.
- Finally, we A/B listen with industry profesionals, to verify that our plug-in is a true "match" within the unit-to-unit sonic variations of the original hardware.

Let your ears be the judge. Get the pure, sonic nirvana of classic audio hardware, made accessible and affordable in AU, VST or RTAS plug-in formats. We invite you to read our UAi whitepaper by Dr. David Berners at www.uaudio.com/uai

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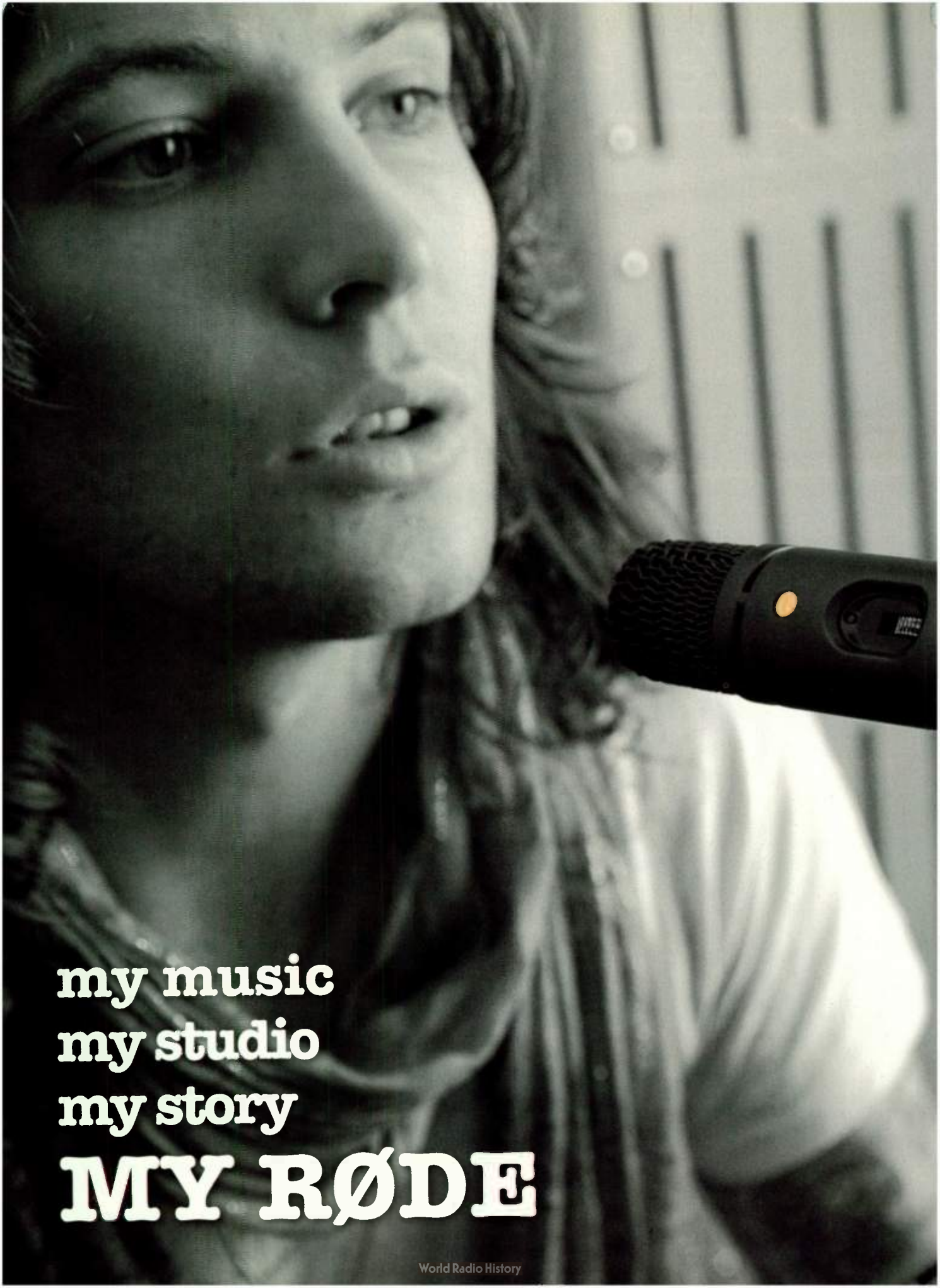

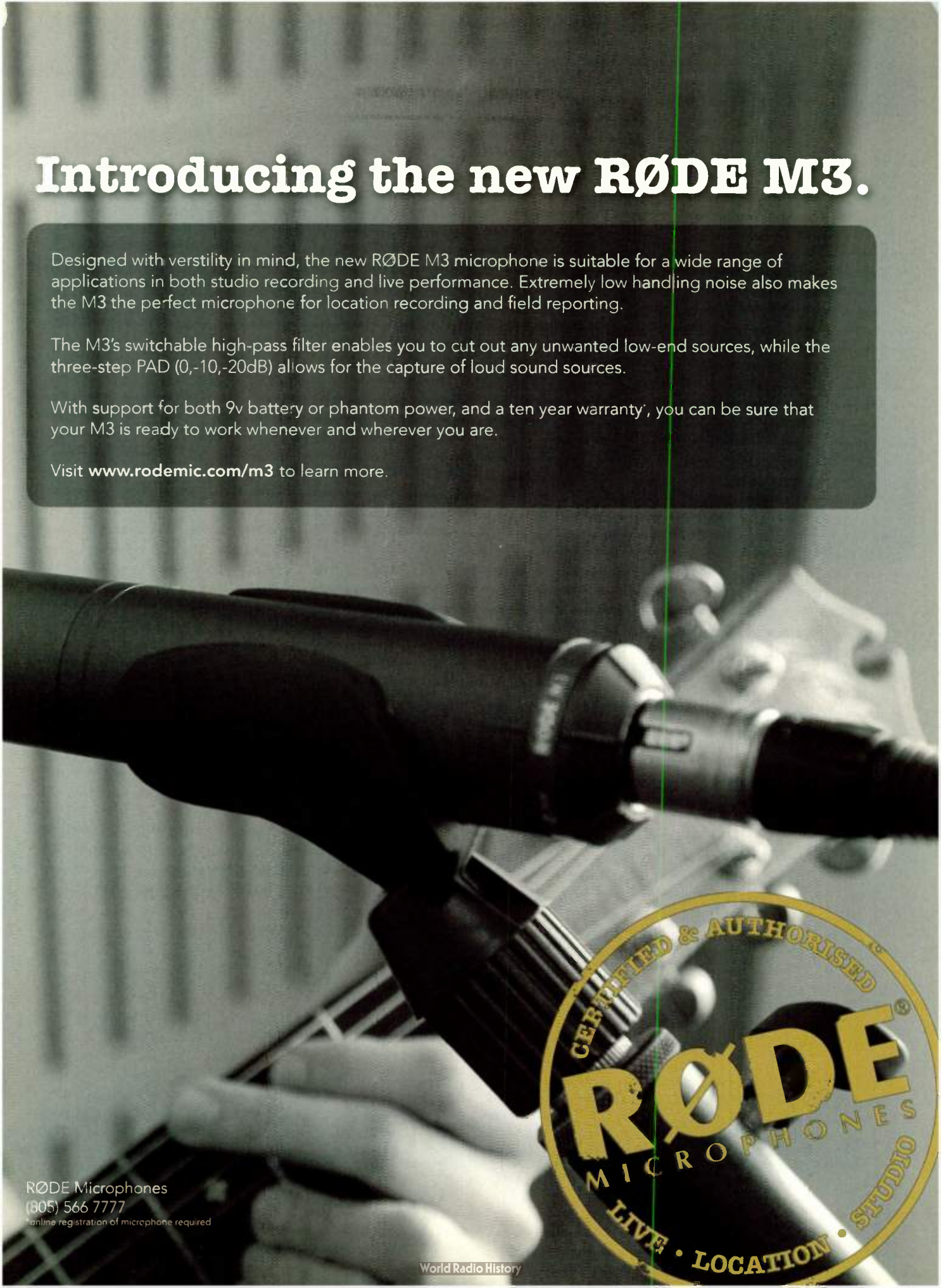

By Geary Yelton

Mackie HRmk2 Series

Mackie (www.mackie.com) has upgraded its HR series of biamplified reference monitors by releasing the HR624mk2 ($579) and HR824mk2 ($779). *HR* stands for *high resolution*, and the new models boast even dispersion over a greater frequency range than their predecessors, without distortion, according to the manufacturer.

Each one features a cast-aluminum baffle that minimizes diffraction, an optimized waveguide that widens the sweet spot, and a passive radiator that extends bass response and enhances depth of field. The HRmk2 monitors are THX pm3 certified for use in surround applications.

The HR624mk2 has a 6.7-inch low-frequency speaker and a 1-inch titanium-dome tweeter powered by two FR (Fast Recovery) Series amps delivering 100W and 40W, respectively. The larger HR824mk2 has an 8.75-inch low-frequency speaker driven by 150W and a 1-inch titanium-dome tweeter driven by 100W. In addition to switches for low-frequency rolloff and high-frequency shelving, the monitors have an integrated Acoustic Space Control that lets you adjust bass response to the room environment. HRmk2 monitors have balanced XLR and TRS inputs and unbalanced RCA inputs.

Roland V-Synth GT

Roland (www.rolandus.com) continues to build on the V-Synth platform with its new synthesizer, the V-Synth GT ($3,299). This top-of-the-line keyboard instrument has a dual-core sound engine that offers multiple synthesis techniques that you can use simultaneously. It blends features from the V-Synth XT module, such as Vocal Designer and VariPhrase-based Elastic Audio, with a new sound engine called Articulative Phrase (AP) synthesis. AP synthesis emulates the real-time timbral changes that musical sounds undergo as they're being played. The GT also introduces Sound Shaper II, an enhancement of the XT's feature for programming new timbres quickly and intuitively.

The GT has 61 Velocity- and Aftertouch-sensitive keys and a fixed-position color touch screen with an icon-driven user interface. Like previous V-Synths, the instrument sports a Time Trip Pad and twin D Beam controllers. Four oscillators deliver analog modeling and PCM waveforms, and 16 types of COSM processing range from multimode filtering and multi-effects to complex waveshaping. The V-Synth GT also has a user-programmable arpeggiator, a modulation sequencer, and the ability to function as a USB 2.0 audio interface.

ART TubeFire8

Applied Research and Technology (www.artproaudio.com) has announced the TubeFire8 ($649), a FireWire audio interface with eight Class A vacuum-tube microphone preamps. The single-rackspace unit furnishes balanced XLR and balanced TRS inputs with 70 dB of gain. With eight balanced TRS outputs as well, you can use the TubeFire8 as either a standalone multichannel preamp or an A/D/A converter for your Mac or PC. The outputs are summed to a front-panel stereo headphone jack for low-latency monitoring of the inputs, monitoring of the mix streaming from your computer, or a combination of both.

Each input has a discrete highpass filter, a –10 dB pad, a low-cut filter, a phase-inversion switch, a clip indicator, and an LED meter that monitors the preamp's output level. Variable output-level controls allow you to dial in each channel's tube warmth as desired. Two of the channels provide high-impedance inputs for guitar or bass on the front panel. In addition, you can enable 48V phantom power for two groups of four inputs. A copy of Steinberg Cubase LE (Mac/Win) is bundled with the TubeFire8.

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INSTRUMENTS

Universal Audio DCS Remote Preamp

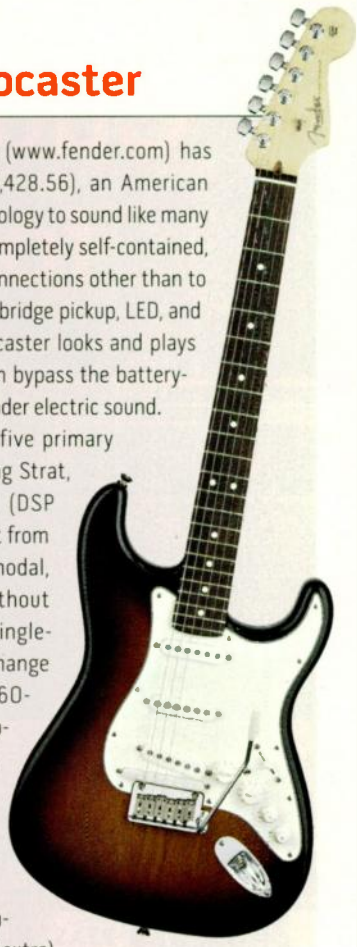
Universal Audio (www.uaudio.com) is now shipping the DCS Remote Preamp ($1,199), a modular hardware system developed with the founders of Euphonix. The DCS (Desktop Console System) was designed to bring big-studio performance to the project studio. By combining two console-grade preamp channels, talkback functionality, and sophisticated monitoring, the DCS expands and enhances computer-based recording.

Two separate modules—the Remote Pre and the Monitor Mixer—are connected by a Cat-5 cable to give you hands-on, digital control of the preamp's analog circuitry from as far away as 300 feet. The two preamp channels can be linked in stereo or configured for dual-mono operation. A built-in mid-side encoder lets you create stereo recordings using two mics in a coincident pair. Each channel accommodates balanced mic and line inputs, as well as high-impedance instrument inputs. The DCS Remote Preamp's headphone amp lets you monitor performances through onboard EQ and reverb. In addition, VU meters allow you to keep an eye on preamp output and cue levels.

Fender VG Stratocaster

Joining forces with Roland, Fender (www.fender.com) has developed the VG Stratocaster ($2,428.56), an American Series Strat that harnesses DSP technology to sound like many different guitars. The instrument is completely self-contained, with no outboard hardware and no connections other than to an amplifier. Except for its Roland GK bridge pickup, LED, and two additional knobs, the VG Stratocaster looks and plays just like a standard Strat, and you can bypass the battery-powered VG circuit for that classic Fender electric sound.

One knob lets you select from five primary modes: single-coil Strat, humbucking Strat, Telecaster, acoustic, and normal (DSP bypass). Another knob lets you select from five alternate tunings—normal, D modal, drop D, open G, and baritone—without changing the string tension. The single-coil Strat model not only lets you change tunings instantly, but there's no 60-cycle hum. Use the 5-position pickup-selector switch to choose variations on the primary modes, such as 12-string, dreadnought, and resonator guitar. The VG Stratocaster has a synchronized tremolo bridge and is available with a maple or rosewood fingerboard and a 3-color sunburst ($50 extra) or black finish.



Digidesign Structure

Nearly six months after beginning a public beta program, Digidesign (www.digidesign.com) has begun shipping Structure (Mac/Win, $499), an RTAS sampler plug-in specifically for Pro Tools. Structure integrates directly with Pro Tools' sound engine and supports 24-bit audio at rates as high as 192 kHz. You can drag-and-drop audio regions directly into Structure and then create patches with unlimited nesting levels. A resizable window facilitates graphic-waveform editing and keymapping, and a built-in file browser makes it easy to locate samples. Structure is 128-part multitimbral and supports interleaved samples with as many as eight channels for 7.1 surround applications.

Structure comes with a nearly 20 GB sample library, including instruments from Quantum Leap Orchestral Elements, as well as a 30-day trial of EastWest's Goliath. The plug-in can import EXS24, SampleCell, and Kontakt 1 and 2 files, and features an integrated REX player. Its multi-effects section provides more than 20 effects types, including stereo and surround convolution reverb, and hundreds of effects presets. In addition, Digidesign is offering previous owners of Soft SampleCell an upgrade to Structure for $199.

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XLN Audio Addictive Drums

The virtual drummer Addictive Drums (Mac/Win, $249) is now available from Swedish software developer XLN Audio (distributed by Big Fish Audio, www.bigfishaudio.com). Created by a team headed by Magnus Lidström, the programmer behind Sonic Charge MicroTonic and Propellerhead Malström, the AU-, RTAS-, and VST-compatible plug-in combines almost 2 GB of first-rate samples, an onscreen mixer with effects, and MIDI files of live performances by real drummers. Addictive Drums starts with an assortment of world-class, multimiked kits sampled in multiple layers and with alternate hits, and allows you to extensively tweak their playback parameters. You also get more than 3,000 beats and fills and a drag-and-drop groove browser that sorts instruments by name, category, tempo, or length.

For each of the 12 mixer channels in Addictive Drums, you can adjust the level, pan, effects, and routing, as well as mute, solo, and invert phase. Shape and process individual sounds using pitch and volume envelopes, multiband EQ, highpass and lowpass filtering, reverb, compression, and more. Although the emphasis in Addictive Drums is on rock 'n' roll, more than 100 presets cover an assortment of musical genres and production styles in 4/4, 3/4, and 6/8 time. If you want to check it out, you can download a fully functional demo that never expires.

Download of the Month

CRYSONIC EFFECTS PLUG-INS (WIN)

Crysonic utility effects plug-ins bring you professional sound and feel at bargain prices. These VST plug-ins for the PC address spectral enhancement, stereo imaging, EQ, maximizing, and mastering. Mac OS X and RTAS compatibility are in the works. Prices range from $29.95 for the vintage saturator, nXtasy, to $94.95 for the 10-band maximizer, Spectra'Q. Bundle prices range from $89.95 for various pairings to $584 for everything Crysonic makes, and promotional discounts are frequently in force. You can purchase the plug-ins and download fully functional demos, which drop out every 30 to 50 seconds, from www.crysonic.com.

The 10-band EQ Cry'Q will be the most familiar of these effects. Although it has the appearance of a graphic equalizer, each band is semiparametric; you can adjust the band's Q and shift its frequency up or down halfway to the next band. The band sliders have 12 dB of boost or cut, but using the ratio control, you can reduce that range to as little as 3 dB for finer resolution. Meters, which you can disable to save CPU, appear in the center of each slider. A Preserve Volume feature compensates for changes in perceived loudness, making A/B comparisons easier.

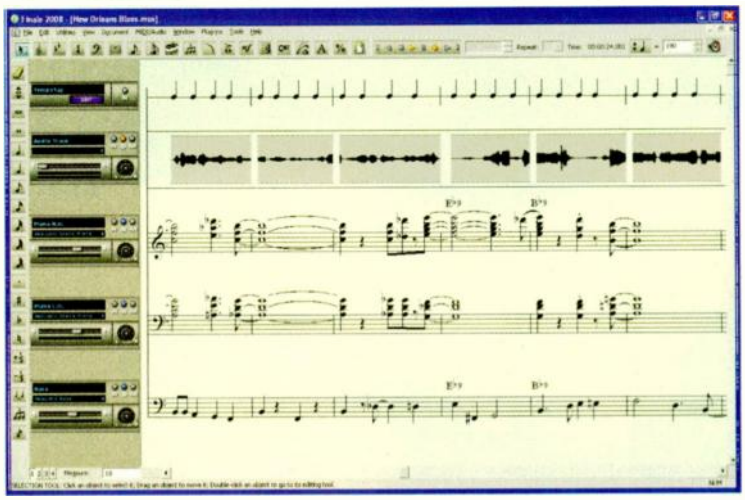
At the other end of the spectrum, Spectralive 2 and Spectralive NXT are the most enigmatic effects. They apply proprietary phase-coherent algorithms to add what Crysonic calls vitality to individual tracks or the whole mix. In other words, they're maximizers with a 5-band parametric EQ and a stereo enhancer thrown in for good measure. These plug-ins offer multiple spectral processes and multiple phase-coherent algorithms. Select one of each and tweak the knobs to taste, or choose from a large collection of mixing, mastering, and tracking presets.

Spectra'phy is my favorite Crysonic plug-in. It's a combination saturator and brickwall limiter that can sound as edgy or as subtle as you like. You set the limiter's threshold, ceiling, knee, and quality (from physical to digital) and then set the saturator amount. Simple and to the point, Crysonic's plug-ins are worth a listen.

EM WEB CLIPS

—Len Sasso

MakeMusic Finale 2008



MakeMusic (www.finalemusic.com) has announced the release of Finale 2008 (Mac/Win, $600), its flagship music-notation program. The updated edition boasts new playback options, productivity enhancements, and greater control over printed musical scores. Finale 2008 lets you quickly transcribe your musical ideas in standard notation and immediately hear the results played by more than 250 instrument sounds from Garritan Libraries. Now you can combine all of the included sounds, add any Native Instruments–supported sound library, and save the results as an audio file.

The most significant new feature in Finale 2008 is its ability to record or import a mono or stereo audio track. You can record a vocal track, import a stereo drum performance, or add a live trumpet solo to a jazz arrangement. After you import a recording, you can match its playback using TempoTap, line up the bar lines, and then add orchestration. Improved notation features include an enhanced setup wizard, colored note heads, new copy-and-paste options, and ScoreMerger, which combines multiple parts and scores into a single document. Finale 2008 also features a streamlined user interface with greater tool consolidation, Windows Vista compatibility, searchable help files, and expanded support for MusicXML. Upgrade pricing starts at $99.95; the academic edition is $350.

Sound Advice

The EBow is a handheld device that allows you to precisely control a guitar using an electromagnetic feedback loop, resulting in infinite sustain without ever touching the strings. Introduced in the mid-'70s, the EBow (short for *energy bow*) produces a signature sound that's immediately recognizable, rich in harmonics, and used by guitarists ranging from David Gilmour and Frank Zappa to Peter Buck and U2's the Edge. **Soniccouture** (www.soniccouture.com) captures that sound in a new sample library called *eBow Guitar* ($90.47 download, $94.49 on disc). You get 1.2 GB of content comprising 950 individual 24-bit samples formatted for Kontakt 2 and EXS24. Two guitars were sampled, a Santa Cruz dreadnought acoustic in stereo and a Gibson SG electric in mono. You can crossfade between high and low EBow settings using your modulation wheel, and use keyswitching to select samples with or without vibrato. *eBow Guitar* also gives you alternating round-robin samples and a selection of note releases you can mix to taste.

In addition to being a prolific composer with literally dozens of CD releases, synthesist Ian Boddy has produced a number of unique sample libraries. One of the latest is *Transmission-X* ($99.95), a 3-CD collection of loops from **Sample Magic** (distributed by Big Fish Audio, www.bigfishaudio.com). *Transmission-X* contains twisted percussion, atmospheric textures, analog arpeggios, bit-glitched squeals, heavily processed vocals, and other alien effects. The collection divides sounds into five categories and three tempos in Acidized WAV, REX, Apple Loops, EXS24, HALion, Kontakt, NNXT, and audio formats. EM

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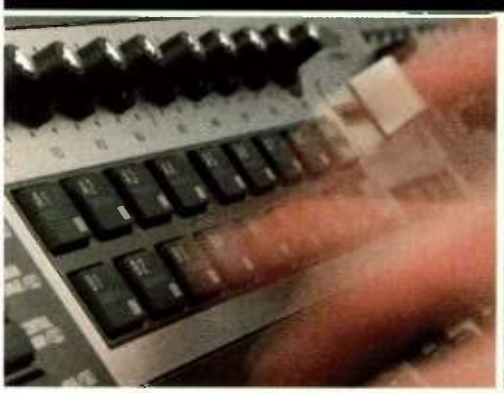

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What Was Old Is New Again

By Scott Wilkinson

A century-old idea gives wireless mics new life.

Wireless microphone systems have been a mainstay of performing musicians, offering much more freedom to prance around the stage than their wired counterparts. However, these systems are not without their drawbacks—for example, other signals on nearby frequencies and reflections from structures in the vicinity can interfere with the intended signal. To make matters worse, virtually all conventional wireless audio systems will be completely disrupted when the radio-frequency (RF) spectrum is reallocated to accommodate new services, such as digital TV and wireless Internet access, when analog TV broadcasts are shut down in February 2009.

The problem of interference is inherent in the way most wireless mic systems operate. Essentially, they are little FM radio stations that transmit the audio signal by modulating the frequency of a sinusoidal carrier wave. When that signal is reflected within the environment (called multipath interference) or other signals near the carrier frequency are present (which will be more and more likely in the future), the intended signal is often garbled or lost.

Audio-Technica (www.audio-technica.com) has adapted an all-digital approach that overcomes many of the problems associated with conventional wireless mic systems. Called ultra-wideband (UWB), this approach is different from FM transmissions. Instead of modulating a high-amplitude, single-frequency carrier, UWB sends short-duration, low-amplitude pulses that span a wide range of frequencies encompassing at least 500 MHz around the center frequency (see Fig. 1).

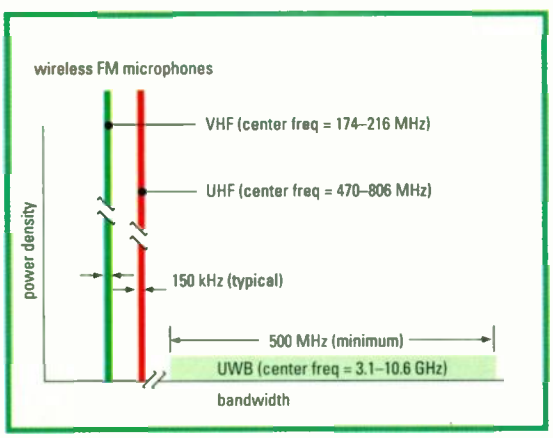

FIG. 1: Conventional FM transmission modulates the frequency of a high-power, narrow-bandwidth carrier well below 1 GHz, whereas UWB sends low-power, wide-bandwidth pulses centered anywhere between 3.1 and 10.6 GHz. SpectraPulse is centered at 6.35 GHz with a bandwidth of 500 MHz.

The idea dates back to the late 1800s, when Guglielmo Marconi developed a "spark-gap" system that transmitted Morse code pulses wirelessly across the Atlantic Ocean. After that system was supplanted by more efficient narrowband techniques, the concept languished for 100 years until it was revived in the form of UWB, which was made possible by the ensuing advance in digital electronics.

The Audio-Technica system, dubbed SpectraPulse, was developed with Multispectral Solutions (www.multispectral.com). It operates in the 6 GHz range with pulses that span a bandwidth of about 500 MHz and last less than 3 nanoseconds (ns). Whereas traditional wireless mic systems transmit about 50 milliwatts of power, SpectraPulse transmits about 40 nanowatts, roughly a million times less. Interestingly, this puts the signal within the noise floor of a typical operating environment, providing unparalleled security against unintended detection, yet the receiver can be programmed to decode the precisely defined pattern of pulses with ease.

A-T's first SpectraPulse product is a wireless mic system designed for conference rooms. Using a technique called time division multiple access (TDMA), up to 14 boundary mics can be used together with no concern about interference, intermodulation distortion, or crosstalk between them—each mic's pulses are precisely timed to interleave with the pulses from other mics in the system. A 16-bit, 24 kHz A/D converter in each mic digitizes audio from 100 Hz to 12 kHz, which is fine for speech applications. The ADC's output is fed to a transmitter, also located in the mic housing. The system achieves a data rate of 8 Mbps over a distance of 75 feet.

Among the many benefits of UWB is low latency compared with other digital wireless audio systems and fast recovery if synchronization is lost. SpectraPulse exhibits a latency of less than 1.2 ms, and it can recover from lost sync in only 3 ms—by comparison, it takes 1 to 2 seconds for a typical FM system to recover from lost sync.

Audio-Technica plans to apply its SpectraPulse technology to music-oriented wireless mic systems. With no need for frequency selection and coordination, as well as immunity from dropouts and interference from other RF sources and multipath reflections, the promise of UWB is definitely worth pursuing. EM

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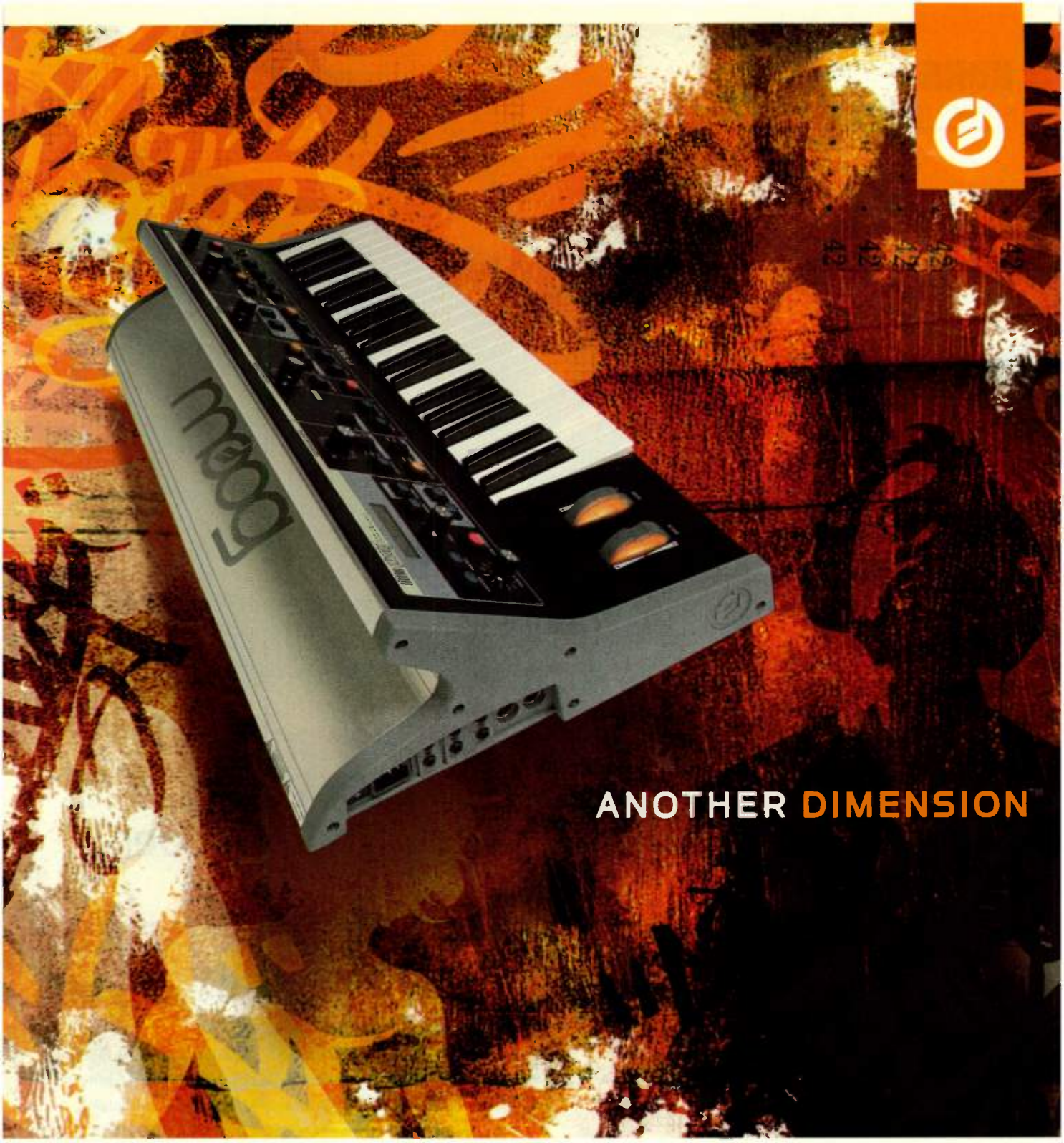

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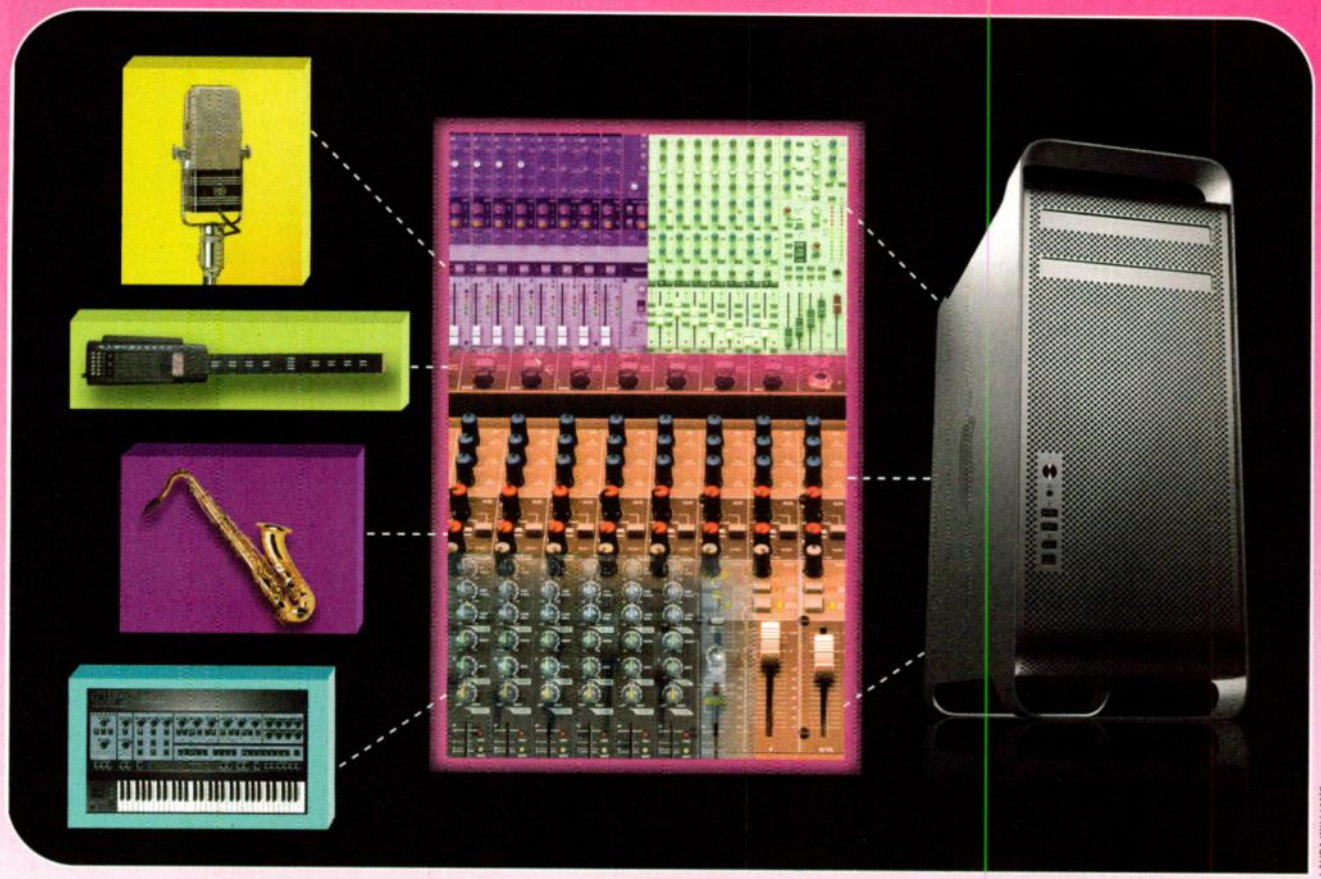

LAURA WILLIAMS

Meet the Hybrids

By Rusty Cutchin

Four analog mixers with digital audio interfaces.

The nerve center of the recording studio, the audio mixer, has changed roles dramatically in the digital age. A marvel of electronic engineering, the traditional analog mixer has become for many people a mixer in name (or graphic image) only, because digital mixing is done by mathematical computation rather than by hardware wizardry.

But reports of the death of analog mixing are greatly exaggerated, and producers and engineers have come to appreciate the flexibility of hybrid systems that allow a combination of analog and digital processing. One obvious application is live band recording, where multiple analog sources (drum mics, instrument feeds, and so on) need to be mixed for the house while being sent to a digital recorder for processing later. Another application is submixing for the keyboardist who needs to assign several instrument and module signals to one or more recorder tracks.

The Playing Field

Several new small-format mixers make these tasks convenient. We looked at four of them: the Alesis MultiMix 16 FireWire, the Mackie Onyx 1220, the M-Audio NRV10, and the Phonic Helix Board 24 FireWire MKII. All have built-in FireWire interfaces to get signals to and from a computer for recording and monitoring. In addition to these four, Yamaha is about to introduce two mixers in this category (see the sidebar "Coming from Yamaha"). Although they are designed to sit on a desktop, you can also install any of these mixers in a rack. Each allows you to mix a group of analog signals for monitoring or rerouting while converting the signals to digital audio and passing them on to a FireWire-equipped recording system.

These mixers work well with newer computers. All require drivers to work with Windows, but two work immediately with the Mac OS X Core Audio system. Generally, you need to be using

either Mac OS X 10.3 or Windows XP with SP2 and have a G4 or 1 GHz Pentium processor, 512 MB of RAM, and as much free hard-drive space as you can get. Check the companies' Web sites for detailed system requirements (see the sidebar "Manufacturer Contacts").

Beyond the features just described, these units differ significantly. Input and conversion capabilities vary. Some units provide no digital features beyond the conversion and monitoring capabilities offered by the interface, whereas others come with onboard digital effects and recording software, making them a complete recording studio in a box. Their various capabilities and prices ensure that there's a mixer to fit just about any need, from solo singer-songwriter demos to 16-mic ensemble recording.

Bear in mind that except for the M-Audio NRV10, these units are best for front-end mixing; they aren't designed for final mixdown of digitally recorded tracks. Three of the units provide for only a stereo return from your computer—you can't route recorded tracks back through the mixer channels. The NRV10 is the only mixer in this group that can receive multiple previously recorded discrete tracks over FireWire. (The NRV10 EQs and faders process converted digital signals, whereas the channel circuitry of the other units affects the original analog signals.)

Mackie Onyx 1220

The Onyx 1220 ($689.99) is the smallest of the Onyx line and, like its siblings, is designed mainly for analog mixing. The 1220 follows the same design scheme as the other Onyx units (see **Fig. 1**) but has fewer input options. For computer connectivity, you need to buy an optional FireWire card ($519.99). The unit sports four of Mackie's very good Onyx mic pres (as well as two instrument inputs and ten line inputs) and offers convenience features—such as a talkback section and alternate stereo bus—that are familiar to musicians who grew up with analog mixers. The 1220 comes bundled with Mackie Tracktion 3 sequencing software.

FIG. 1: Mackie's Onyx 1220 requires an optional FireWire card for sending its 14 channels of audio to individual tracks of your recording application.

The biggest convenience option may be the FireWire interface. With the Onyx 1220, the FireWire card allows you to stream up to 14 channels of 24-bit digital audio to a Mac or PC. (If you're working with a PC, you can combine two mixers and have them appear to your computer as a single 28-channel mixer. Mackie says

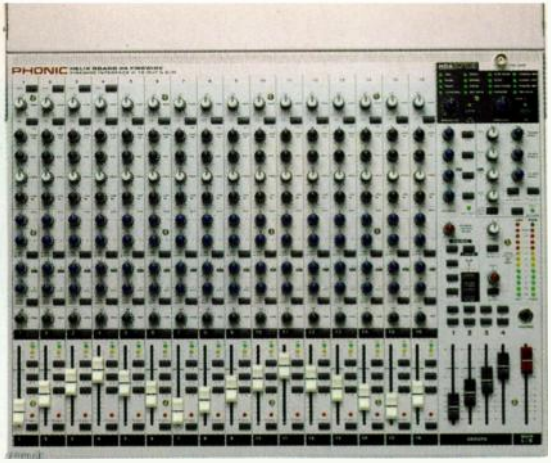

FIG. 2: Phonic's Helix Board 24 FireWire MKII has a list of features as long as its name, including 16 mic pres with direct outs, 108 onboard effects presets, 2 footswitch inputs, and a dedicated subwoofer output with inserts.

Mac support is coming soon.) The 14 channels show up in your audio software as 12 individual audio inputs and a stereo L/R mix. You can also monitor two channels of audio from the computer through the Onyx's Control Room Source matrix. Those two channels can feed the phones, control room, or main-mix outputs. You can select alternate sampling rates for the card's A/D/A converters using the Onyx Control Panel on a PC and directly from your audio software on a Mac. Sampling-rate options include 44.1, 48, 88.2, and 96 kHz.

The A/D conversion process and routing to the FireWire port occur before the signal reaches the EQ section, so the 1220's channel EQ sections have no effect on them. However, if you really want or need to EQ a signal at the board before recording it, you can use an aux send or Mackie's Alt 3–4 bus to send a processed channel to an open one that can then feed the FireWire port. The unprocessed signal will still be available to your recording software.

Interface options aside, the unit is a formidable small-format analog mixer that can serve a variety of applications. You get mic pres on channels 1 through 4. Channels 1 and 2 have high-impedance instrument inputs and a switch to engage them. Channel strips 5 through 8 are stereo, but you can configure them as dual mono for recording. Channels 1 through 4 have individual 48V phantom-power switches and low-cut filters (18 dB per octave at 75 Hz).

All mono and stereo channels have fixed-frequency, low- and high-shelving EQs centered at 80 Hz and 12 kHz. The mic channels provide selectable midrange EQ (100 Hz to 8 kHz) with 15 dB of cut or boost, whereas the stereo channels have a fixed 2.5 kHz midrange control. The Perkins EQs are quiet and very usable—a staple of Mackie mixer designs.

Other traditional niceties such as a dedicated talkback mic input, stereo sends and returns for external decks or players, and switchable pre- and postaux master controls make this a solid and dependable board for live mixing.

We're Going Places

STAGEPAS 500... Yamaha's newest ultra-compact PA system follows closely in the footsteps of its smaller, market-leading counterpart, STAGEPAS 300. The differences, you ask? Higher power, more channels, additional features, and even greater sonic performance, for those more demanding applications.

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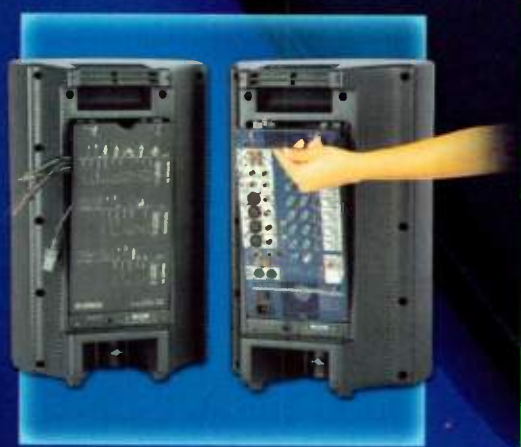

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If you happen to have a recorder with Tascam-format DB-25 connectors, you're all set; the unit has built-in output connectors for those machines. Otherwise, you can use adapter cables to send balanced direct outputs from these connections to analog inputs on other devices.

Phonic Helix Board 24 FireWire MKII

The Helix Board 24 FireWire MKII ($999.99) is a 16-by-4-by-2-channel mixer with onboard digital effects (see Fig. 2). With 16 mic pres, 16 line inputs, and 16 channel inserts, it offers the most input options of any of the mixers in this roundup. The Helix Board 24 can send 18 independent channels of audio at 24-bit, 96 kHz resolution to your computer with near-zero latency. The mixer's S/PDIF digital output is preset to a 44.1 kHz sampling rate, but you can change it using the included PC-control software or in the Mac's Audio MIDI Setup utility. A 32/40-bit DSP engine powers the board's 16 digital effects, and its 17.5-inch-wide frame is packed to the gills with six aux sends, four subgroups, two footswitch inputs, and an XLR mono/subwoofer output with insert points. You also get Steinberg Cubase LE workstation software.

The Helix has a rotating I/O module (reminiscent of the ones on classic Mackie 1604-series mixers) that you can position for desktop or rack use. The module rotates easily, but the screws used to secure the cover plate after rotating the module are small and difficult to work with. In fact, everything is small on this unit because of its multitude of controls. Even so, most are easy to grasp and operate.

The board's analog features include 3-band EQ with a sweepable midrange-frequency control on all 16 channels. Each channel also has a 75 Hz low-cut switch, its own phantom-power switch, ¼-inch TRS insert jacks, and a direct-out jack. Four knobs set the six aux-send levels. You can set send 1 and 2 collectively to pre or post, and you can switch send 3 and 4 to feed aux outputs 5 and 6.

Aux send 3 doubles as the send to the internal effects section, which includes reverb, chorus, and delay, and a total of 108 presets and 4 test tones. You will not find distortion effects or dynamics processors (besides some gated reverb presets), so you'll want to use guitar processors or outboard compressors when recording guitars and vocals. Also missing are dedicated instrument inputs.

The Helix provides several useful digital options to facilitate recording and playback over FireWire. The most important of these is also the most cumbersome to access: setting the outgoing digital signal from any channel to be post-EQ (and post-low-cut filter), which allows you to record using the board's EQ. To access the switches that enable this option, you must remove a plate on the bottom of the unit. In most cases, you can probably set these once and forget them. But if you want to bypass the EQ section entirely on certain channels before digital conversion, then you'll either have to plan for those channels in advance or perform the same tasks session-by-session: power down the board, turn it over, remove the plate, and set the switches.

You can select which stereo pair will be sent over FireWire as channels 17 through 18: main L/R, group 1/2, or aux 3/4. That's a useful option if you need to record, say, a live drum mix but don't want to take up more than two tracks. You can also assign the stereo mix returning from the computer to the aux 1 output. That way, if you're using aux 1 for a headphone mix, you can send the players a mono mix of the recorded tracks with the push of a button.

At $1,000, this unit is a bargain. Its preamps sound good, its effects are useful, and the included software makes it a versatile, professional-quality recording system (you add the monitors). Although you can't access its EQs and effects individually for mixing from the computer, you can use these processes for recording, and that is extremely handy.

M-Audio NRV10

The NRV10 ($899.95) is a compact mixer with four mono mic/line channels and two stereo channels (5/6 and 7/8). Channel 5/6 includes an XLR connector, allowing five mics to be used simultaneously. A third stereo

COMING FROM YAMAHA

Yamaha's new n-series FireWire Digital Mixing Studios, the n8 and n12, were not available for evaluation at the time of this writing but should be released by the time you read this. They promise to offer 24-bit mixing and processing at a 96 kHz sampling rate, mic pres with phantom power, 3-band sweepable EQ, and high-resolution reverb. Both units feature comprehensive monitoring capabilities, and the n12 includes surround support.

The n12 is a 12-by-16-channel unit with an additional two bus and two aux input channels. Those are routed through its 16-by-16-channel FireWire audio interface, which includes full 5.1 surround support. The n8 is an 8-by-12-channel unit, but again it has an additional two bus and two aux inputs, all routed through its 12-by-12-channel FireWire audio interface.

FIG. 3: M-Audio's NRV10 approaches the flexibility of full 2-way digital mixing by sending its channels to individual tracks of your computer audio application and routing the returns of those tracks back to individual channels of the mixer.

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INSTRUMENTS

channel (9/10) is dedicated to a corresponding output from your computer and DAW.

Unlike the larger units covered here, the NRV10 lets you do more with your recorded tracks than just listen to a stereo mix (see **Fig. 3**). When you assign DAW tracks to NRV10 outputs 1 through 8, those tracks become available on the corresponding NRV10 mixer channels, allowing you to use the mixer's EQ, faders, and effects section. These can, in turn, be recorded back to the DAW as individual tracks or a stereo mix.

Because it is an M-Audio product, the NRV10 works with Pro Tools M-Powered ($299.95) version 7.3 or later, which is a paid upgrade for users who bought versions of Pro Tools M-Powered prior to November 2006. The NRV10 comes with a trial version of the application, along with a utility to manage the mixer's onboard effects section and drivers for both Mac OS X and Windows. You must install drivers on either platform before the NRV10 will be recognized by your computer. M-Audio recommends connecting the unit while it and the computer are powered down.

The NRV10 is an 8-by-2-channel analog mixer with a built-in 10-by-10-channel FireWire 400 audio interface that operates at 24-bit resolution and an up to

MANUFACTURER CONTACTS

Alesis www.alesis.com
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M-Audio www.m-audio.com
Phonic America Corp. www.phonic.com
Yamaha www.yamaha.com

DESKTOP MIXER FEATURES COMPARED

Product	Alesis MultiMix 16 FW	Mackie Onyx 1220	M-Audio NRV10	Phonic Helix Board 24 FW MKII
I/O Configuration	16 × 2 × 2 analog, 18 × 2 digital	12 × 2 × 2 analog, 14 × 2 digital	8 × 2 analog, 10 × 10 digital	16 × 4 × 2 analog, 18 × 2 digital
Analog Inputs	(8) balanced XLR; (16) bal./unbal. ¼" TRS line	(4) balanced XLR; (1) bal. XLR talkback; (2) unbal. ¼" high impedance; (10) bal./unbal. ¼" TRS line; (4) ¼" TRS inserts; (2) RCA tape; (2) 16-ch.	(5) balanced XLR; (8) bal./unbal. ¼" TRS line; (4) ¼" TRS channel inserts; (2) ¼" TRS main mix inserts	(16) balanced XLR; (16) bal. TRS line; (16) TRS channel inserts; (2) TRS main inserts; (2) RCA 2-track ret.; (2) footswitch (effects on/off, tap)
Analog Outputs	(2) bal./unbal. ¼" main; (2) bal./unbal. ¼" Alt 3–4; (2) bal./unbal. ¼" CR; (1) TRS headphone	(2) bal. XLR main; (2) bal./unbal. ¼" CR/headphone; (2) bal./unbal. ¼" Alt 3–4; (2) RCA tape; (2) 16-ch. Tascam DB-25	(2) bal. XLR main; (2) bal./unbal. ¼" main; (2) bal./unbal. ¼" CR; (1) TRS headphone	(2) bal. XLR main; (2) bal./unbal. ¼" main; (2) bal./unbal. ¼" CR/headphone; (8) mono direct; (4) mono group; (2) DSP effects; (2) RCA rec.
Digital Ports	(2) FireWire 400; (1) S/PDIF out	(2) FireWire 400 (w/optional card)	(2) FireWire 400	(2) FireWire 400; (1) S/PDIF out
Aux Sends	(2) bal./unbal. TRS	(2) bal./unbal. TRS	(2) bal./unbal. TRS	(6) bal./unbal. TRS
Aux Returns	(2) bal./unbal. TRS stereo/dual-mono pairs	(2) bal./unbal. TRS stereo/dual-mono pairs	(2) bal./unbal. TRS stereo/dual-mono pairs	(4) bal./unbal. TRS stereo/dual-mono pairs
Effects (programs × presets)	10 × 10	none	16 × 16	108
Phantom Power	grouped, ch. 1–8	individual, ch. 1–4	grouped, ch. 1–5	grouped, ch. 1–16
EQ	low, 80 Hz; mid, 2.5 kHz; high, 12 kHz (ch. 1–8, 9/10–15/16)	low, 80 Hz; high, 12 kHz; mid, ±15 dB, 100 Hz–8 kHz (ch. 1–4); mid, 2.5 kHz (ch. 5/6–11/12)	low, 80 Hz; mid, 2.5 kHz; high, 12 kHz (ch. 1–4, 5/6, 7/8)	low, 80 Hz; mid, ±15 dB, 100 Hz–8 kHz; high, 12 kHz
Faders	60 mm	60 mm logarithmic taper	45 mm	60 mm
Size (desktop W × H × D)	13" × 3.2" × 15.2"	13.9" × 5.9" × 17.3"	10.4" × 4" × 14.2"	17.5" × 8.3" × 17"
Weight	10.1 lbs.	16 lbs.	8.2 lbs.	23.1 lbs.
Price	$799	$689.99; FireWire card, $519.99	$899.95	$999.99

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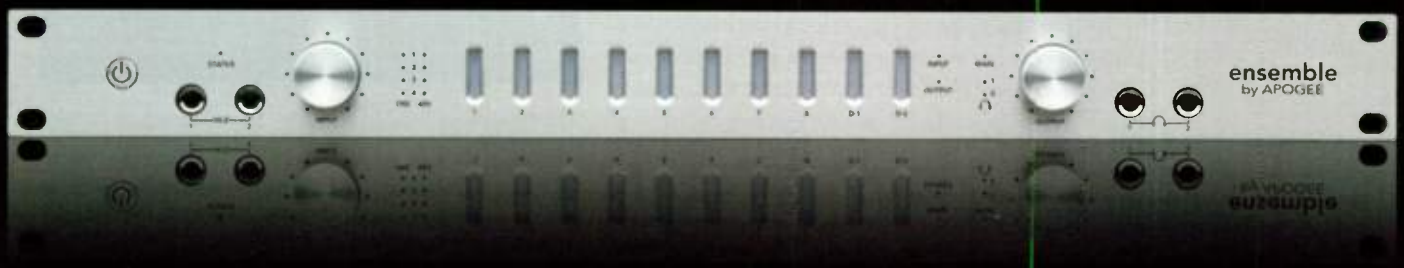

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96 kHz sampling rate. Its integrated digital effects processor features 16 effects with 16 variations each. These are mostly reverbs with some delay and chorus effects thrown in. You can monitor three different sources over headphones: the main mix, the cue mix (muted channels), or the monitor mix (aux 1). In each case, you get the stereo 9/10 feed (from your recording software's main outputs) mixed in on its own pot.

You can select whether the channel signals assigned to the FireWire bus will be pre- or post-EQ, allowing you to record processed channels to DAW tracks. But you must use this feature carefully: because the computer is sending and receiving to and from the same channels, it's possible to create feedback loops that could damage your system.

You can use the unit's two aux buses to access external processors or create a custom headphone mix. Aux 2 also feeds the internal effects section. That is particularly useful for adding effects during live performance or overdubbing. And M-Audio sweetens the effects pot by including a dedicated version of Audiffex's interFX program, which functions as a digital insert point for each of the mixer's input channels. With this little gem, not only can you add compression and gating to any input, but you can also directly access any two VST plug-ins on your computer from the same channel.

FIG. 4: The Alesis MultiMix 16 FireWire offers onboard effects to go with eight mic-pre channels and four stereo/dual-mono channels.

As long as your computer is fast enough that latency is not a problem, the NRV10 provides enormous flexibility for signal processing and basic recording in a performance or rehearsal situation. Its handling of digital signals gives it a great deal of power in an amazingly small box. (For a full review of the NRV10, see the June 2007 issue of EM, available at www.emusician.com.)

Alesis MultiMix 16 FireWire

The MultiMix 16 FireWire mixer ($799) is a very compact 16-channel mixer with eight mono mic/line channels

and four stereo/dual-mono channels. (A USB 2.0 version is anticipated for summer release.) Its compact size owes a lot to the 3-pound in-line transformer on its power cable, which attaches to the mixer with a 3-pin twist connector. The MultiMix 16 handles 24-bit audio at either 44.1 or 48 kHz sampling rates and comes with Steinberg Cubase LE. The mixer has optional ears for rackmounting.

This mixer sends all 16 of its inputs (4 stereo/dual-mono and 8 mono channels) down the FireWire cable, along with its main-mix signal as channel 13/14 (see Fig. 4). It converts the signals postgain, -EQ, and -fader, so you can tailor individual signals somewhat before recording them. However, the MultiMix 16 offers only fixed-frequency 3-band EQ on all channels and provides no insert points on any channel nor any gain controls for its stereo channels.

The mixer does provide a lot of effects presets—100 28-bit effects including reverbs, delays, chorus, flanging, pitch, and multi-effects. These are accessed from the aux 2 sends on each channel strip. Only one can be active at a time, and none are available on the FireWire stream, which means the effects section is primarily useful for monitoring—for example, for providing a master reverb or a flange effect for a group of synths on a live gig.

The 2-track return from the computer is available at the mixer's 2-track bus. You get RCA connectors for this bus, and if you have a CD player or other device plugged in, its signal is merged with the signal from the FireWire return. However, you get no controls for the corresponding signal levels other than a headphone/control-room knob.

Each of the eight mic/line channels has a 75 Hz highpass filter and gain control. A single switch toggles phantom power for all eight channels. Each of these channels also has a balanced ¼-inch TRS line input. The channel strips have two aux sends. You can set aux send 1 to pre or post. Aux send 2 is post and feeds the effects section and the aux 2 output connector.

A channel strip's Mute button routes the input signal to the Alt 3/4 bus. Each channel strip also has a Solo button. The Solo Mode switch in the master section toggles the Solo buttons between PFL (Pre-Fader Listen) and Solo mode.

A single S/PDIF output jack is located between the XLR and headphone connectors at the top of the unit and is accompanied by an illuminated Digital Out label. That will be an easy connector to find if you must operate the unit in the dark. The only other illuminated signs are the power and phantom-power indicators, and the 2-digit LEDs that list the selected effects program.

Mix in Your World

Although all four mixers offer some sort of digital transfer capability for getting live analog signals to your digital recording application, the features and prices of these boards put them at different levels of digital recording usefulness. The Alesis MultiMix 16 FireWire is the most economical way to get 16 channels into the computer.

The M-Audio NRV10 points the way to the future of hybrid recording, with digital tracks flowing seamlessly back and forth from mixer to application. If you need better mic pres, Mackie's tried-and-true Onyx 1220 (or one of its siblings) provides the reliable path to seamless multitracking. But the bargain of the lot may be Phonic's feature-rich Helix Board 24 FireWire MKII, which puts an impressive group of features into a rackmount mixer and lets you EQ 16 channels of audio before routing it to your computer through FireWire. EM

Rusty Cutchin is a former editor of EM and a producer, engineer, and music journalist in the New York City area.

The CD Production Studio

By Mike Levine

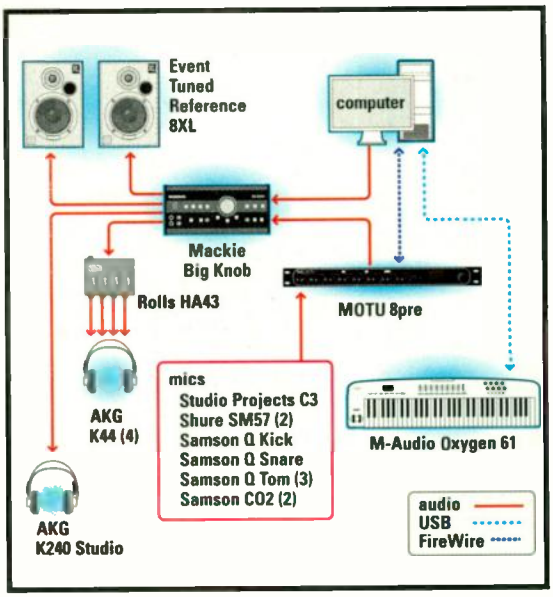
These CD production studios are designed for composing, tracking, and mixing. Both have the gear to record a full drum kit, and both have an array of soft synths on hand. In addition to full-featured digital audio sequencing software, both studios also have software for editing and assembling master CDs. I opted to go mixerless, using outboard hardware units that handle talkback as well as monitor, input, and speaker switching. In the killer studio, I included a control surface to provide tactile faders and knobs.

The Budget CD Production Studio

A digital audio sequencer is the center of the modern studio, and we spend the majority of our time staring at its various screens. With that in mind, I decided not to economize in that area and instead picked the fully featured Apple Logic Pro 7 ($999) for its powerful audio engine and its awesome collection of plug-ins (see Fig. 1). You get a nice collection of synths, as well as excellent compressors, EQs, reverbs (including Space Designer, a convolution reverb), filters, modulation effects, pitch correction, and a lot more. For the Windows incarnation of this studio, I would substitute Cakewalk Sonar Producer 6 ($619), which has, among its many features, the V-Vocal editing section that provides excellent pitch correction and manipulation, or Steinberg Cubase 4 ($999; and can be used on the Mac instead of Logic if you prefer), which also offers a solid selection of plug-ins and software instruments.

FIG. 1: Although it costs about $1,000, Apple Logic Pro is actually a bargain considering the depth and breadth of its plug-in collection.

To control Logic's virtual instruments, I opted for an M-Audio Oxygen 61 ($249.95). In addition to a 61-key synth-action keyboard, it gives you plenty of knobs and sliders for tweaking plug-ins and virtual instruments.

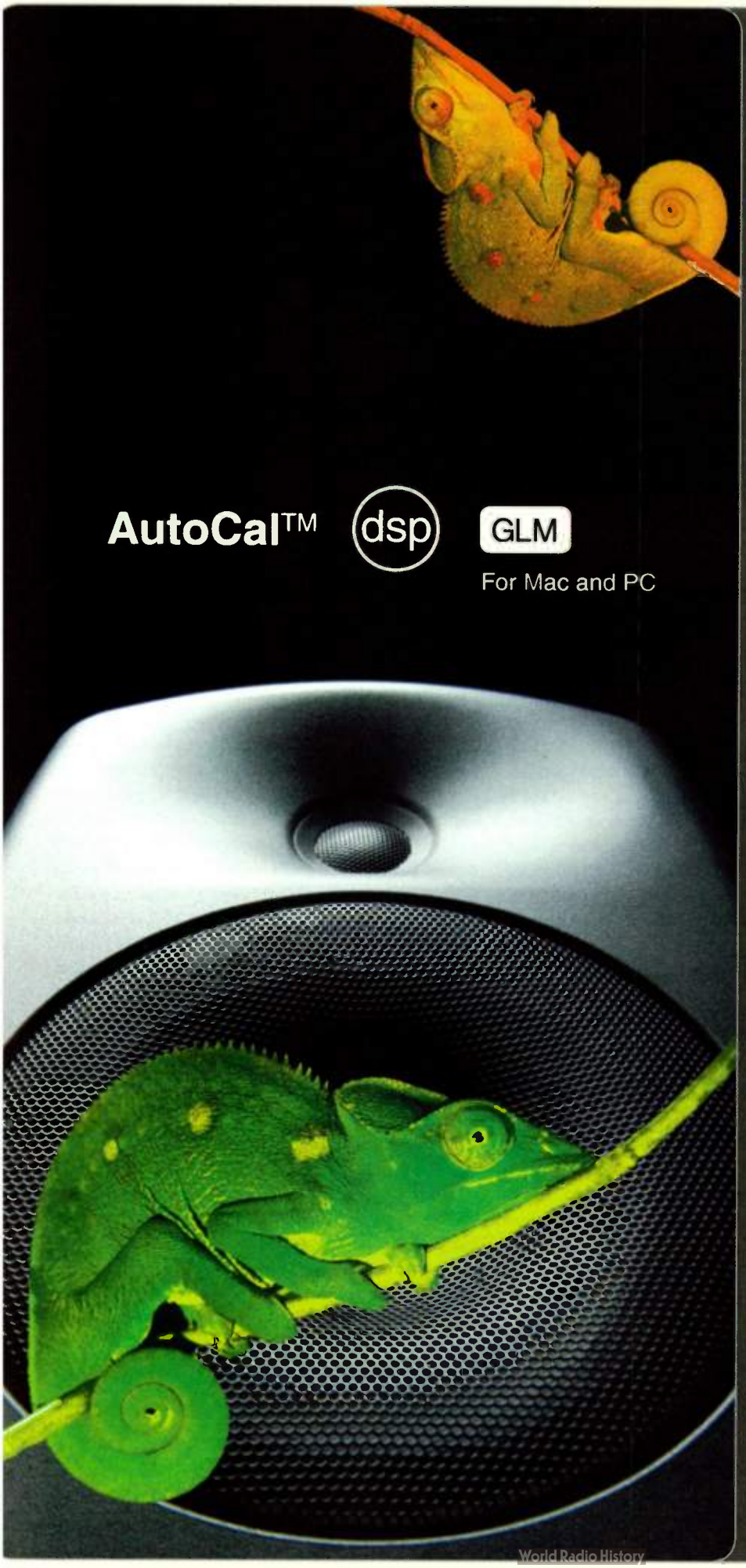


For around $5,000, this studio is equipped for composing, recording basic tracks (including a drum kit), overdubbing, and mixing.

I chose the MOTU 8pre ($595) as the audio interface because it offers eight transparent mic-preamp/instrument inputs. That would, for instance, allow you to simultaneously record five tracks of drums, two guitars, and a bass when cutting basic tracks.

The mic collection for this studio is small but functional. The vocal mic is a Studio Projects C3 ($479), which offers not only good sound, but also multiple patterns, giving you more miking flexibility. For miking the drums, I chose the Samson 7Kit ($374.99), a bundle that includes a kick mic, a snare mic, three tom mics, and a pair of C02 pencil condensers for overheads. You won't have enough inputs to use all seven on the drums at once (you likely have to leave at least two inputs for the other instruments), but you'll have options for drum miking, depending on the situation. The C02s can also be used for tracking acoustic instruments during overdubs. Also on hand are a pair of tried-and-true Shure SM57s ($170 each) for other miking needs, most notably guitar amp cabinets.

The monitor controller is the Mackie Big Knob ($389.99), which gives you plenty of input- and speaker-switching capabilities and provides Mute and Dim controls, a talkback mic, and monitor routing. The studio is equipped with six pairs of headphones: one pair, the AKG K240 Studio ($165), is of studio-reference quality. The other five are AKG K44s ($43 each), which are budget headphones but are of sufficient quality for musicians to wear during tracking and overdubbing. Headphone amping chores are handled by the basic but solid Rolls HA43 ($100), which provides four headphone outputs



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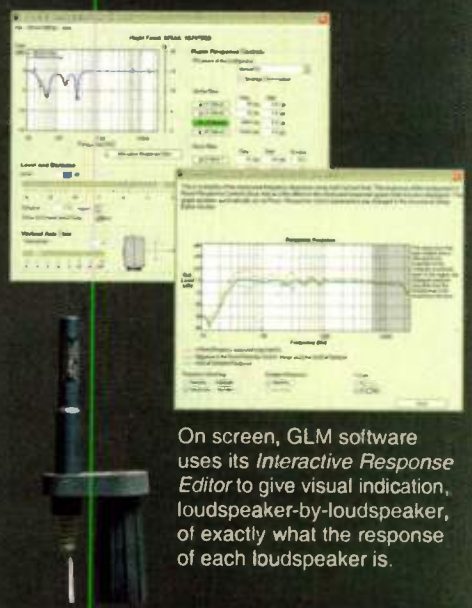

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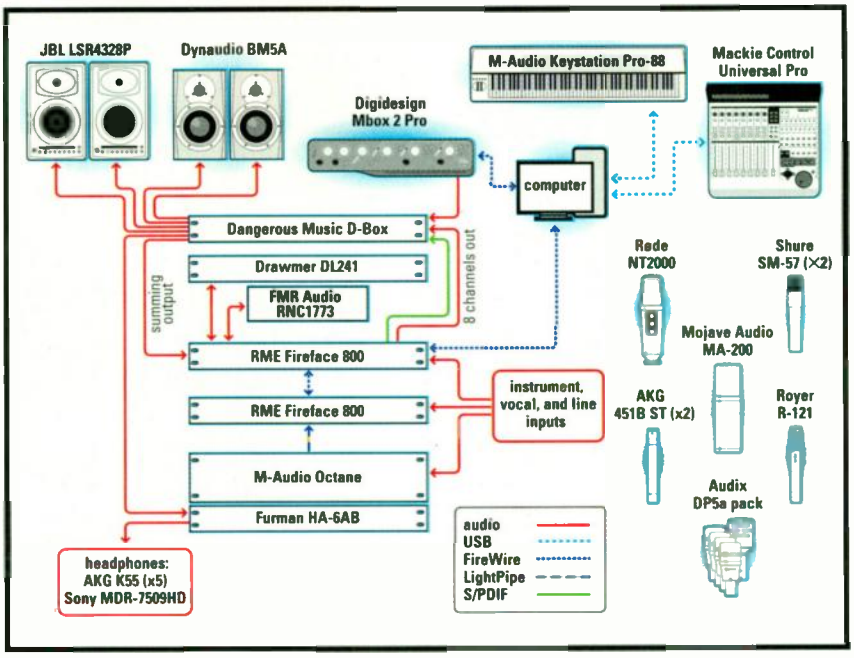
with individual volume controls. You can also grab two additional headphone feeds from the Big Knob.

For monitoring, I chose the Event Tuned Reference 8XLs ($699), which have 8-inch drivers and do a great job of representing the full audio spectrum. Those monitors were the top choice in an EM roundup of active monitors (from the March 2005 issue, available at www.emusician.com). I would have liked to have included a second set of monitors for an alternate perspective during mixdown, but the budget didn't allow it.



The killer CD production studio offers plenty of inputs, a good range of mics, analog summing capabilities, and lots of I/O flexibility.

Once you've finished mixing and need to prepare discs for mastering or to burn CDs for clients, you can use DSP Quattro ($149) from i3 Software Engineering, which offers, among other things, both 2-track audio editing and CD burning to Red Book specifications. For those on Windows, substitute two programs: the freeware Audacity for editing and Sony Media Software's CD Architect 5 ($149.95) for burning.

The Killer CD Production Studio

Because Digidesign Pro Tools is the platform of choice in the record industry in the United States, my original intention was to anchor this studio around a Pro Tools HD system. But even with my budget of $25,000, I couldn't afford an HD system and all the mics, preamps, monitors, and other goodies on my wish list. So I decided on a system based around MOTU's Digital Performer 5.12 software (DP; $795) and two RME Fireface 800 interfaces ($1,799 each). DP not only has all the features you need for both audio and MIDI production, as well as a straightforward user interface, but it also has beat detection and pitch correction—staples in the modern world of record production—built in. Windows users can substitute Cakewalk Sonar Producer 6 ($619).

The RME Fireface 800 (a 2006 EM Editors' Choice Award winner) offers high-quality mic preamps, excellent jitter-free clocking, and lots of I/O options (see Fig. 2). Between the two Firefaces (which can work in tandem), there are 8 XLR inputs and a total of 16 line inputs. You can even patch outboard gear into it, which is handy considering that this setup has no mixer. For additional mic preamps, I included an M-Audio Octane ($749.95), the 2005 EM Editors' Choice Award winner that adds eight more preamp/instrument inputs and can connect to the Fireface through its ADAT optical interface.

DP and Sonar both offer audio processing and instrument plug-ins, but for a killer studio, I wanted more. So I added several more plug-in bundles. For audio processing, there's the Universal Audio UAD-1 Ultra Pak ($1,495), a card-based system that gives you access to a wide range of excellent plug-ins, including emulations of classic analog processors. It was a tough choice between the UAD-1 and the TC Electronic Powercore, another hardware-accelerated DSP solution. I ended up choosing the UAD-1 because of its large selection of vintage-processor emulations, but the Powercore would be a great choice too and offers a more diverse plug-in collection.

FIG. 2: A pair of RME Fireface 800 interfaces (such as the one shown here), which offer excellent mic preamps, solid clocking, and expandability, provide much of the I/O for our killer CD production studio.

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I also included SoundToys Native Effects ($495), an Editors' Choice Award winner in 2007 with a range of excellent effects, including EchoBoy and FilterFreak, two of the top plug-ins of their kind anywhere. Windows users can substitute the high-quality PSP Effects Pack ($389) from PSP Audioware, which offers several delay effects and Nitro, a filter plug-in. To make this studio truly killer for MIDI productions, I also chose Native Instruments Komplete 4 ($1,499), which provides the entire range of NI virtual instruments and effects, including Reaktor 5, Kontakt 2, Absynth 4, Guitar Rig 2, and many more.

For playing all those great sounds, this studio is equipped with an M-Audio Keystation Pro-88 ($599.95), an 88-key weighted-action controller that sports plenty of programmable knobs, buttons, and sliders. To allow you to mix with real faders rather than a mouse, I incorporated a Mackie Control Universal Pro control surface.

A CD production studio is likely to get sessions brought to it that were begun in another studio in Pro Tools, so I added a Pro Tools LE system centered around the Digidesign Mbox 2 Pro FireWire audio interface ($799). Because Digital Performer easily accommodates multiple audio interfaces, the Mbox 2 Pro can be utilized as a secondary interface if more inputs are necessary when working in DP.

For vocal mics, I specified two large-diaphragm condensers: the Røde NT2000 ($899), which offers not only excellent sound, but also continuously variable patterns, filter, and pad; and the Mojave Audio MA-200 ($995), which EM reviewer Eli Crews called "refreshingly exquisite" (see the April 2007 issue of EM, available at www.emusician.com). I also included the classic Royer R-121 ribbon mic ($1,295), which can be used for a variety of applications.

For miking the drums, I opted for an Audix DP5a drum mic pack ($1,149), which features a snare mic, a kick mic, two tom mics, and a floor tom mic, all with gooseneck clips for easy positioning. For drum overheads and acoustic instrument miking, I chose a matched pair of AKG 451B ST pencil condensers ($1,513). For miking guitar amps, and as an alternate snare mic, I threw in a pair of Shure SM57s ($170 each).

Monitor control, talkback, and speaker switching are handled by the Dangerous Music D-Box ($1,599). In addition to the aforementioned functions, the D-Box offers 8-input analog summing, making it an amazingly versatile unit. The summing output can be connected to the Mbox 2 Pro, so mixes from the Fireface can be recorded into Pro Tools.

It's always helpful to switch between speakers when mixing. Therefore, I included two sets of active monitors in this studio: the JBL LSR4328Ps ($1,699), which have 8-inch drivers and built-in technology that allows them to adjust to the frequency characteristics of the room they're in; and the Dynaudio BM5As ($1,250), which are excellent-sounding monitors with 5-inch drivers that were described by EM reviewer Myles Boisen as having "clean power handling, transparent highs, and above-average bass response" (see the January 2006 issue of EM).

For headphones, you get a pair of Sony MDR-7509HDs ($265), high-quality cans that provide accurate reproduction. For the tracking musicians, I included five pairs of AKG K55 headphones ($52.40 each). The headphone amp is a Furman HA-6AB, which can drive six sets of cans.

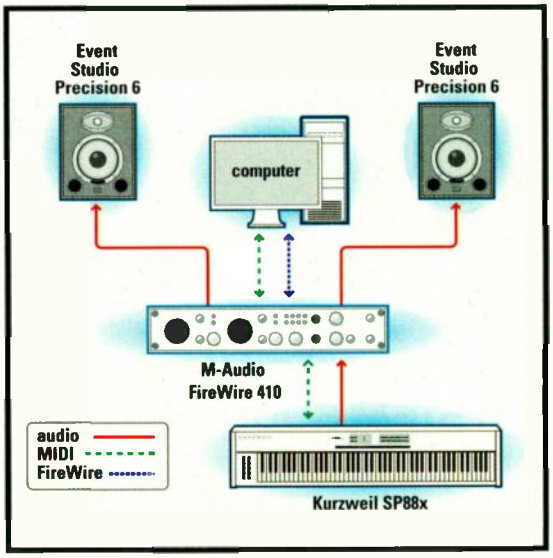
I added an outboard compressor—the 2-channel Drawmer DL241 ($899)—primarily to use when tracking, but for mixing too. The unit also offers gating and expansion. And in case I need more than two channels of outboard compression, I added the great-sounding FMR Audio Really Nice Compressor 1773 ($199).

The Composing Studio

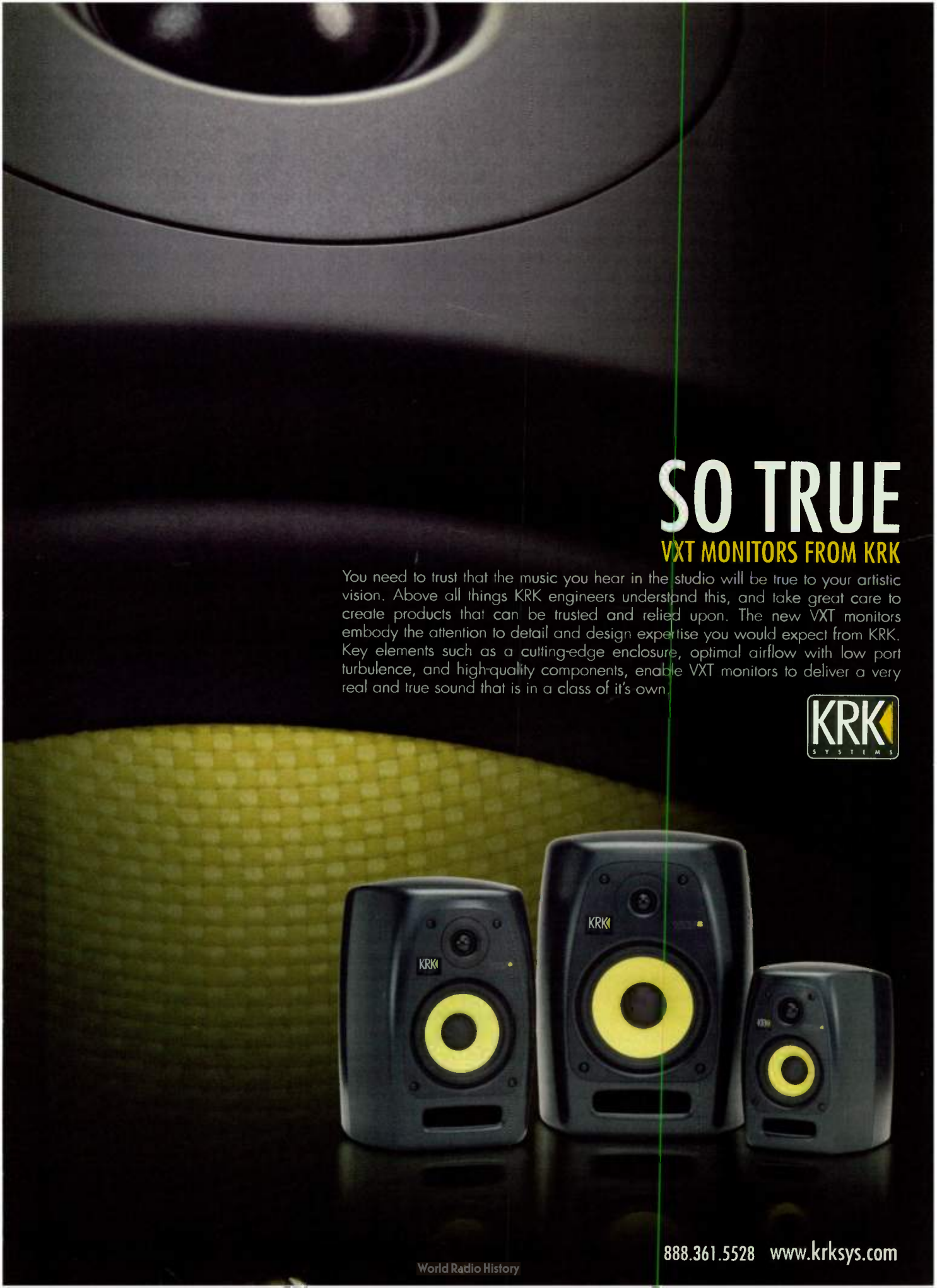
By Dennis Miller

The Budget Composing Studio

My budget studio will focus primarily on composing orchestral emulations for picture and will also be well suited for other compositional purposes. I'll offer solutions that are compatible on both Windows and Mac computers, but where that's not possible, I'll provide Mac alternatives for the Windows software. And because I need only a few key tools, I'll opt for the high-end versions of the principal applications, with an emphasis on audio playback to ensure that I hear all the details in my



The budget composing studio is built around a Kurzweil SP88x keyboard controller, a pair of Event Studio Precision 6 monitors, and an M-Audio FireWire 410 interface.



mixes. Whenever possible, I will quote the price for the download version rather than the boxed version.

A sequencer is at the core of most scoring jobs, so on the Windows side, I've chosen Cakewalk Sonar Producer 6 ($619) for the bulk of my sequencing tasks. It has a very useful tool set for scoring to picture, and the updated Synth Rack greatly enhances my use of VST plug-ins. Sonar is a perfect host for the Garritan Personal Orchestra library ($174) that I'm buying at a discount because I'll also be using Garritan sounds with my notation program (more on this later). I'll also include a copy of Garritan Jazz & Big Band (also at a discount; $224) so that I can enhance my woodwind and brass sections for charts that need a contemporary flair.

Sonar's support for video playback will be very handy as I score my cues, and once all my parts are composed as MIDI notes, the Bounce feature will quickly turn the parts into new audio files, ready for delivery to the music editor. If I need any last-minute tweaks to my audio, the new Audiosnap feature will let me make fine adjustments to the tempo of my cues (without changing their pitch) to ensure that they line up just right.

On the Mac, I'll opt for MOTU Digital Performer 5.12 (DP; $795) because it has more dedicated scoring tools than most other sequencers in its class. As with Sonar, you can view your video track on an external monitor via FireWire, and you'll have no trouble figuring out what tempo your music will need to sync with the picture once you get comfortable with DP's Find Tempo option.

FIG. 3: The M-Audio FireWire 410 is a reasonably priced audio interface that has more than enough ins and outs for a composing studio. In addition to playback at up to 24-bit, 192 kHz, the unit includes MIDI In and Out.

Of course, if you prefer to compose using a notation program, then you're better off with a tool that integrates a high-quality sound set. I'm picking MakeMusic Finale 2008 ($600) as the centerpiece of this rig because it has a vast number of features for the composer, including an autoharmonizer and the ability to create variations on a melodic theme. And, using the many processes found in the Composer's Assistant plug-ins, you can turn the simplest musical idea into a well-formed main title theme with endless variations. The ability to import a video makes it easy to synchronize cues, and the availability of Finale Notepad, a free program that can open, play, and (minimally) edit Finale files, makes collaboration simple. Moreover, the Garritan Orchestra sounds that Finale provides are well integrated into the program (and qualify me for the discounts mentioned earlier).

For knocking off parts by hand, I'll purchase a Kurzweil SP88x keyboard controller ($1,395), which offers 88 weighted keys and the ability to transmit on two separate MIDI channels simultaneously. Its electric piano sounds will fill a niche not served elsewhere in my rig, and the organ presets should come in especially handy.

For monitoring, I'll use an M-Audio FireWire 410 audio interface ($399) driving Event Studio Precision 6 active monitors ($1,199 a pair). The FireWire 410 has four analog inputs and ten outputs, in addition to stereo digital ins and outs in both coaxial phono and Toslink optical formats (see **Fig. 3**). It supports 24-bit, 96 kHz recording, and playback at up to 24-bit, 192 kHz on the first two outs (or 24-bit, 96 kHz if all eight outputs are used). MIDI In and Out are also provided. The included mixing software will provide flexible control over my various sound sources, and the FireWire 410's support for Pro Tools M-Powered might just come in handy someday.

The Killer Composing Studio

Though there is a good bit of overlap between the high-end and budget composing studios, I will add enough tools to make this rig suitable for even more compositional tasks. I'll keep Finale 2008 and Sonar 6 (or DP 5 on the Mac), then include several physical-modeled acoustic instruments, which have the added advantage of being usable for sound-design purposes. I'll also want a dedicated sampler and a number of video tools for use alongside my basic music applications.

At the heart of our high-end Windows studio is Tascam's Giga Virtual Instrument (GVI; $369), the plug-in version of the company's powerful and popular professional sampler, GigaStudio. GigaStudio pioneered the concept of disk streaming, and following years of tweaks by Tascam, it's a real sound-design powerhouse. Not only can you choose from numerous outstanding libraries, but if the library includes embedded GigaPulse convolution information, as many do, it will open in GVI with the convolution configured as the library author intended. (You can use the Perfect Space reverb in Sonar if you want convolution processing on other sounds.)

GVI comes with more than 7 GB of samples but is a little light on the included orchestral sounds. So I'll buy SoniVox's Complete Symphonic Collection (CSC; $2,995) to be sure we have all the bases (and basses) covered. CSC takes advantage of many of GVI's programming options (for example, custom recording environments programmed by Larry Seyer) and offers a wide

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Eight Channel Tube Preamplifier with Firewire

The ART TubeFire8™ delivers the best of all worlds in one tube driven digital audio interface package. Ideal for any recording application, the TubeFire8™ adds eight incredibly warm tube driven microphone or line inputs and eight balanced outputs to any FireWire equipped computer.

Complete FireWire Based Studio Solution

Designed as a complete studio package, the TubeFire8™ is shipped with Steinberg's Cubase LE 48-track for both Mac and Windows operating systems making it a truly plug and play recording solution, although it is compatible with many popular ASIO and Core Audio based applications.

Class-A Tube Design

ART's TubeFire8™ packs eight quality second-generation discrete Class–A vacuum tube microphone preamps in a single rack space audio interface with balanced I/O and FireWire connectivity.

Versatile I/O

ART's microphone preamps provide clean quiet gain while maintaining incredible transparency through the input stage. The eight balanced outputs of the TubeFire8™ can be driven from either the analog microphone preamp inputs making the TubeFire8™ an in-line eight channel tube preamp, or from the internal high quality D/A converters making it a high quality multi-channel audio output for your PC.

Full Input Control & Low Latency Monitoring

Every input channel offers both XLR input and 1/4-inch TRS balanced input with 70dB of gain. All inputs have –10dB Pad, High Pass filter, Phase Invert clip indicators and a wide range LED meter to monitor the preamp levels. The eight balanced outputs can be summed to an integrated headphone output providing either a mono or stereo mix function for low latency input monitoring and for monitoring audio playback from the computer.

Features

- **Shipped with Steinberg's Cubase LE 48-track** *(for both Mac and Windows operating systems)*
- **8 x quality second-generation discrete Class–A vacuum tube microphone preamps**
- **8 x XLR & 1/4-inch TRS Combi-jack Inputs**
- **2 x 1/4-inch instrument jack Inputs (CH1 & 2)**
- **8 x 1/4-inch TRS balanced Outputs**
- **1 x 1/4-inch TRS headphone jack**
- **8 x Input Gain / Channel Level / HPF / Phase Invert**
- **8 x Channel Metering** *(4 bar led graph w/ clip indicator)*
- **44.1KHz, 48KHz, 88.2KHz, 96KHz Sample Rates**
- **24-204KHz External sample rate**
- **44.1K, 48K, 88.2K, 96K, 176.4K, 192K Internal sample rates**

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variety of articulations and playing styles. I will also add Tascam's own GigaViolin ($129), an inexpensive solution for those times when our scores require solo strings.

Mac users should consider picking up a cheap Windows XP computer and dedicating it to GVI or GigaStudio 3 or waiting for the Mac version of GVI to appear later this year. But if those options are not appealing, then I'd recommend Native Instruments Kontakt 2 ($449) as the sampler of choice. There's broad third-party support for Kontakt 2, and it can read any content created for Kontakt 2 Player.

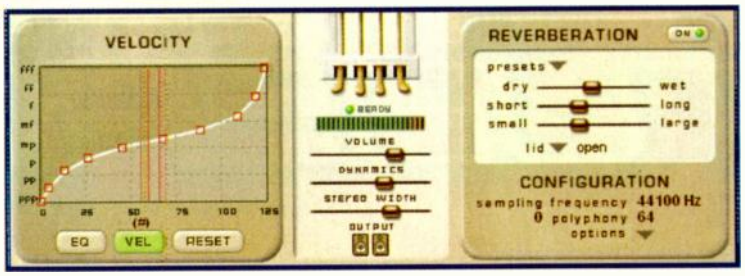


FIG. 4: Modartt's Pianoteq offers a highly customizable physically modeled piano. Along with altering aspects of the body resonance and string tuning, the user can create unique Velocity response curves (left).

Kontakt 2 ships with 15 GB of content, including samples from all the members of the orchestra. But I'll enhance it with a number of other resources. For starters, I'll include Native Instruments Akoustik Piano ($339), which runs standalone and as a plug-in; its pianos are also loadable into Kontakt. I'll beef up my world-music timbres by adding SoniVox's Afro-Cuban Percussion ($99.95) and Silk Road ($249), and to be sure I have enough variety in my core orchestral collection, I will add IK Multimedia's Miroslav Orchestra and Choir sample collection ($599), a 7 GB library that runs standalone or as an AU plug-in under Digital Performer.

I will also enhance my basic sound sets with software that uses physical modeling, which can produce uncanny simulations of real acoustic instruments and is especially suited for creating believable musical performances. Though I've got a fair number of good piano sounds already, I'll add Modartt's Pianoteq 2.0.1 ($330) to my rig (see Fig. 4). Pianoteq provides controls for changing many aspects of the instrument's construction, including hammer hardness, soundboard tweaks, and various aspects of tuning. To add more sonic variety, I'll include Applied Acoustics Tassman 4.1 ($349), which has a large number of acoustic-model presets. Its flute sounds are astoundingly realistic, and its percussion instruments (balafons, congas, and kalimbas, for example) give me resources for a variety of ethnic flavors. Moreover, the bowed beams and plates provide the perfect touch for contemporary textures.

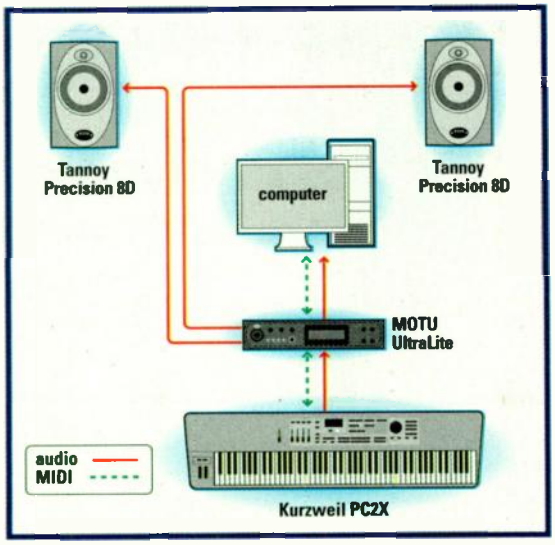
For vocal renditions on the PC, I am buying Zero-G's Leon and Lola ($199 each), both of which use Yamaha's Vocaloid vocal-synthesis technology. Yamaha is hard at work on a major update to Vocaloid, and I'll be sure to see what new voices appear when the enhancements make it to market. For the Mac, I'll opt for Virsyn's Cantor 2.1 ($465), even though it would be a less convincing substitute for a real vocalist than either Vocaloid program.

I will upgrade my controller to the Kurzweil PC2X ($2,730)—the included orchestral sound block adds even more high-quality samples to my roster. With its 64-voice polyphony piping to my mixes over digital outputs, the PC2X can take the load off my computer and allow me to dedicate some additional processing power to other tasks, such as effects.

My options for an audio interface are wide open because unlike GigaStudio 3, GVI doesn't require a GSIF-compliant sound card. So I'll go with a MOTU UltraLite ($595), which packs 10 inputs and 14 outputs in a half-rackspace footprint, for both the Mac and Windows. The UltraLite supports rates up to 24-bit, 96 kHz, and because it's powered by the PC's bus, there are literally no strings attached. For monitors, I'll choose Tannoy Precision 8Ds ($2,058 a pair), which deliver the clarity and range I need for my orchestral renditions.

Because I am serious about working in the film-scoring business, having some high-quality video tools will be a bonus. For a dedicated Windows video editor, Sony Vegas 7 provides a familiar multitrack interface that musicians will grasp right away. Cutting and crossfading video clips is a breeze, and the number of output formats it can render will allow me to deliver my composited

Although some of the software tools are the same as in the budget configuration, the killer composing setup includes Tannoy Precision 8D monitors, a Kurzweil PC2x controller, and a MOTU UltraLite.



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Alpha Channel

A great recording starts with a great front end, and the AlphaChannel is the perfect lead-in for your DAW. The studio-grade mic preamp boasts "Variable Harmonic Drive" along with SSL parametric EQ and limiting for the ultimate fidelity for DAW-based studios. It's literally like you pried a channel from an SSL board, minus the fader.

SSL Alpha Channel at a Glance:

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- SSL mic preamp with 3-band EQ, Filter, and Limiter
- Variable Harmonic Drive circuit
- Analog or digital outputs direct to your DAW
- Intelligent auto compression for maximum headroom

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After you've laid down tracks with the AlphaChannel, do your processing with SSL as well — with no load on your CPU. Duende conjures its own brand of magic with EQ and dynamics ripped straight from the C200 console. Plus, you get the world-famous Stereo Bus Compression that engineers have been using for years to "Stick a mix like audio glue!"

SSL Duende at a Glance:

- Classic SSL sound in a plug-in
- DSP-accelerated processing lightens load on CPU
- EQ, dynamics, and stereo bus compression
- FireWire connectivity
- VST/AU (RTAS available with included wrapper)

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video and music files to meet the client's needs. For DVD authoring and burning, Sony DVD Architect 4, which can be purchased in a bundle with Vegas ($559.96), supports a number of common output formats. Surprisingly, its AC3 audio-encoding options are limited to a single default value, and that with attenuation. Be sure to create a higher-quality AC3 file in Vegas before you do the final authoring in DVD Architect.

On the Mac, there's no real match for the price and features of the Vegas/DVD Architect combo, but if you have an Intel Mac, consider running that same software under Parallels Desktop ($79.99). Another option would be simply to use the tools in Apple iLife, but those won't get you nearly as far into the video world. The professional solution is Adobe's massive new Creative Suite 3 Production Premium (CS3; $1,699), which includes all the tools you'd need for professional video editing and DVD authoring. You'll find CS3 versions of After Effects, Premiere Pro, Encore, Photoshop, Flash, and even the new Soundbooth audio editor in the bundle, and the list price is not a lot higher than Apple's own Final Cut Studio 2. (Keep in mind that a dedicated RGB video monitor or dual-VGA display setup is a must if you're doing serious video work.)

If you already own Final Cut Pro, by all means consider buying Final Cut Studio 2 ($1,299), which includes Final Cut Pro 6, DVD Studio Pro 4, Motion 3, Soundtrack Pro 2, and other useful tools. Note that there's no support for Blu-ray discs in Final Cut Studio (Adobe Encore supports the format), though that could change by the time you read this.

Hear, Hear!

There are many other good choices for building a killer composing studio, and you'll find an endless number of specialized sample collections you'll want to consider as the need arises and your budget allows. And keep in mind that there are many free resources online to help you hone your orchestrational skills. Be sure to check out the Garritan home page (www.garritan.com) and the Philharmonia Web site (www.philharmonia.co.uk/thesoundexchange/sound_samples/sample_libraries) for some great tips on orchestral composing.

The Postproduction and Sound-Design Studio

By Geary Yelton

The Budget Postproduction and Sound-Design Studio

Even without a barrel of money, designing a respectable studio for sound design and postproduction is not impossible if you pinpoint the essentials. With a computer and a budget of $5,000, I can assemble all the software and gear I'm likely to need for composing soundtracks, syncing audio to picture, producing voice-overs and dialog, and recording and editing Foley and other sound effects. Although I'm primarily a Mac user, I'll select cross-platform products whenever possible and offer Windows-based alternatives when a product is specific to the Macintosh.

After considering numerous alternatives, I decided to build my budget studio around Digidesign's Mbox 2 Pro Factory ($899). Practically every post house works with Pro Tools, and many video, film, and radio professionals are comfortable in a Pro Tools–oriented world. My other reason is pure economics; it's almost ironic that Digidesign now offers some of the most cost-effective multitrack recording systems around, considering that not many years ago, Pro Tools was practically beyond the reach of budget studios.

For under a grand, Mbox 2 Pro Factory features Pro Tools LE 7.3 and a FireWire audio interface with 4 analog inputs, 6 analog outputs, stereo S/PDIF I/O, and 16 channels of MIDI I/O—all available simultaneously. To accommodate microphones, two inputs have mic preamps and 48V phantom power. The interface has two additional inputs for guitar or bass and a phono input if I ever need to connect a turntable.

Along with Pro Tools LE, a bundle of nearly 50 DigiRack and Bomb Factory plug-ins covers most essential dynamics, effects, and utility functions. The Mbox 2 Pro Factory bundle also includes plugs-ins such as Joemeek EQ and compression and Moogerfooger analog-style delay. Along with Digidesign's soft synth Xpand and a soundware library, the included Pro Tools Ignition Pack 2 contains very useful software from Ableton, Celemony, IK Multimedia, Propellerhead, and others.

Pro Tools LE gives me plenty of sequencing and mixing capabilities and quite a bit of editing power, but I want more-detailed audio editing and the ability to edit video as well. Apple's Final Cut Express HD ($299), which includes Soundtrack 1.5 and a sizable library of music loops and sound effects, fits the bill perfectly without breaking the bank. If I were using Windows, I could get similar functionality for the same price using Sony's Sound Forge Audio Studio 9 ($59.95) and Vegas Movie Studio Platinum Edition 8 ($129.95).

To play software instruments, I'll need a USB/MIDI keyboard controller. The least expensive I've found offering all the features I want is E-mu's Xboard 61 ($249). In addition to full-size keys, 16 assignable knobs, and its own editing software, it has a very good synth action with Aftertouch and an input for either a footswitch or a pedal. The Xboard 61 is bundled with Proteus X LE software, giving me access to a nice collection of bread-and-butter timbres.

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Mariah Carey
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Rod Stewart

"When working in a recording environment, I've found it critical to 1. create an atmosphere that people find comfortable and 2. make sure the listening environment, especially your speakers, are as good as you can get - so you don't second-guess what you're hearing. When I first used the LSR6300s, I just loved what I was hearing and I've been using them ever since. They're smooth across the entire spectrum. I don't hear the speaker - just the music. Working in a range of rooms in LA, London, and here in Manhattan, the ability to tune the LSRs to the room is extremely useful. I'm really stoked about the new LSR4300 series especially the 6-inch model. The 4300s, with automated Room Mode Correction, go one step further. I put the supplied calibration mic in the center of the room, push a button and the speaker does all the work. It not only does it, it does it well and it does it right! The technology's amazing - I'm blown away by it. I take my LSRs wherever I go."

Hear why award-winning engineer, producer, Frank Filipetti is blown away by the LSR series studio monitors. Visit JBLPRO.com/LSR

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To access a larger selection of soundware and to create my own, I'll need a sampler. Because I have sound design in mind and therefore can't afford to cut corners, I'm going to spring for my favorite top-shelf sampler, Native Instruments Kontakt 2 ($449). Probably more sound libraries are available for Kontakt than any other software format, and its onboard effects processing and sample-mapping facilities are hard to beat. Its audio-editing talents run deep, and 64 multitimbral parts should be enough for most any arranging job. It's bundled with a well-rounded 15 GB of superb content, half of which comes from Vienna Symphonic Library, and it also includes two very good pianos.

Because I want a soft synth that offers as much versatility as possible, I've chosen Native Instruments Reaktor 5 ($449). In addition to supplying an extensive collection of ready-made synths, drum machines, and effects, Reaktor serves as a software construction kit that lets me create original instruments and download dozens of new ones from the Web (see Fig. 5).

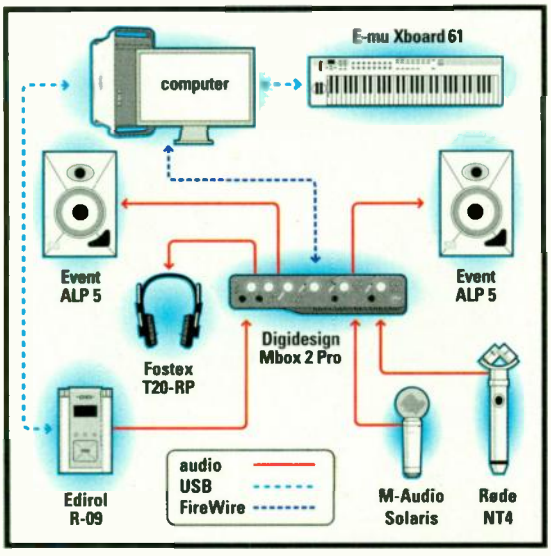
I've also chosen a Kontakt Player 2–based synth that gives me 21 GB of high-quality content and lots of bang for the buck. With more than 2,000 instruments, Vir2 VI.One ($399) is a solid choice that furnishes synths, acoustic instruments, and loops in just about any style I might need.

After looking at several close-field monitors, I've settled on two Event Electronics ALP 5s ($429 a pair) for their high-quality sound at a low price. The active ALP 5 is biamplified, with more than enough power to adequately fill a small studio, and its 5.25-inch low-frequency driver offers plenty of bass response for my needs. I also want a pair of headphones for certain mixing applications and for voice-over talent. As in years past, I'll choose the Fostex T20-RP ($119) for its accuracy, durability, and comfort.

FIG. 5: Native Instruments Reaktor 5 is more than a collection of over 60 software instruments and effects; it's an expandable modular construction kit that lets you download new ensembles and design your own.

Although I'll be doing much of my sound-design and postproduction work inside the box, I still need microphones, primarily for recording voice and sampling ambient sounds. I want a versatile mic that won't strain my budget, and M-Audio's Solaris ($349) suits my needs very well. The Solaris is a large-diaphragm condenser mic that can switch between cardioid, figure-8, and omni patterns to suit almost any situation. And for occasions that demand stereo recording, I've selected the Røde NT4 stereo condenser mic ($899). It has two capsules in a fixed XY configuration and runs off either phantom power or a 9V battery, perfect for studio or remote recording.

That leaves me with just enough money for what I consider another essential item for sound design: a field recorder. The Edirol R-09 ($450) is compact and affordable, and it records in stereo to inexpensive Secure Digital cards. It has two built-in omnidirectional mics and acceptably quiet mic preamps.



With $5,000 and your computer, you can assemble all the software and equipment you need to do postproduction work and sound design.

The Killer Postproduction and Sound-Design Studio

Obviously, with $20,000 in my pocket I can assemble a studio that goes far beyond what I could with one-quarter that much. To maximize compatibility with others working in postproduction, I'll stick with Pro Tools, but now I can upgrade to Digidesign's 003 Factory ($2,495). Like the Digidesign bundle in my budget studio, the 003 Factory is built around Pro Tools LE and comes with all the same software and soundware but even more plug-ins. The system gives me more I/O than Mbox 2 Pro's interface, as well as a hands-on control surface. (A full review of the unit and a list of features are available at www.emusician.com.)

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The Abbey Road Keyboards ReFill brings the sound of legendary Abbey Road Studios into your Reason rack. Recorded on location using Abbey Road's recording rooms and original vintage equipment, this ReFill gives you access to seven time-honored Abbey Road instruments, instruments whose sound can be heard on countless immortal Abbey Road recordings.

The Instruments:
Mrs. Mills Piano, Challen Piano, Hammond RT-3 Organ, Mannborg Harmonium, Premier Tubular Bells Schiedmayer Celeste, and the Mellotron M400.

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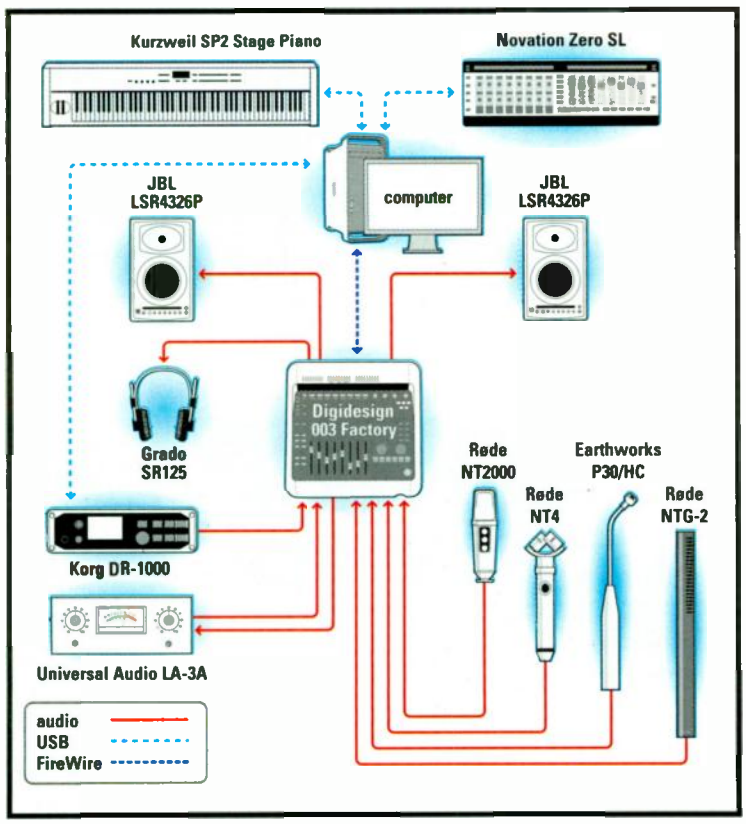
To extend Pro Tools LE considerably, I'm springing for two expansion bundles from Digidesign: Music Production Toolkit ($495) and DV Toolkit 2 ($1,295). Even though both include the TL Space Native Edition convolution reverb, DINR noise-reduction plug-in, and Pro Tools MP3 Option, the additional features of either make it well worth having both packages. And with the addition, Pro Tools LE supports 48 stereo audio tracks at 96 kHz. Music Production Toolkit includes the excellent Hybrid soft synth, indispensable SoundReplacer, Smack LE compressor and limiter, and more. DV Toolkit 2 supplies the VocAlign Project track-alignment tool, DigiTranslator 2.0 file converter, and DigiBase Pro file manager, and it gives Pro Tools numerous other features very useful for postproduction.

Because I want much more audio- and video-editing power than my budget system allows, Apple Final Cut Studio 2 ($1,299) is a must. Besides supporting AU and furnishing many terrific plug-ins I wouldn't have otherwise, the suite lets me edit and mix video in almost any format, as well as author and master standard and high-definition DVDs. Soundtrack Pro 2, one of the suite's six programs, lets me precisely align sound with picture and, if desired, automatically updates my audio projects when anyone makes changes to the video. Final Cut Studio 2 also supplies a sizable collection of sound effects and music tracks. For a few hundred less, Windows users could perform many (but not all) of the same tasks using Sony's Sound Forge 9 ($299.96) and Vegas+DVD Production Suite ($524.96) (both are priced as downloadable versions).

A $20,000 budget can buy a Digidesign 003 Factory with all the trimmings, tons of first-class software, awesome monitors, an 88-note keyboard, and a well-chosen mic cabinet you can be proud of.



CHUCK DAHMER

More of Everything

Such a generous budget means that I can afford more virtual instruments and effects. I'd still want Kontakt 2 as my go-to sampler, and I'd still want Reaktor for its tremendous versatility, but I'd add two additional products from Native Instruments. When it comes to FM synthesis, FM8 ($339) is state-of-the-art; its unique character and enormous collection of patches explore timbral territory that few DX7 owners ever imagined. Native Instruments Massive ($339) takes the concept of a virtual analog modular synthesizer quite a bit further than software that emulates classic instruments, and it can deliver very modern sounds. I can choose to rely on its extensive patch collection or use it as a springboard for experimenting with new timbres.

I looked around at various sound libraries available for Kontakt 2 and discovered no sample collections as stylistically versatile and far-reaching as the one that comes with SoniVox Muse ($595). Muse is based on Tascam's GVI and offers everything from fine pianos and organs to excellent strings and woodwinds. Its more than 37 GB of content covers all the bases and delivers consistently high quality.

Because postproduction may demand scoring for orchestral instruments, a larger budget means I can afford a music-notation program for printing scores and handing them out to players a producer might hire to record tracks. My choice for music transcription is MakeMusic Finale 2008 ($600), which can handle any scoring job I throw at it; the latest version even supports onscreen video. Finale also comes with a custom version of Garritan Personal Orchestra. Between the sampled content in Finale, Muse, and Kontakt 2, I'm set for arranging orchestrations.

Two more categories in which a bigger budget buys more muscle are dynamics and effects processing. I'm really impressed with SoundToys Native Effects ($495) and feel that it's an amazing bargain. For less than half a grand, its six effects processors run the gamut from realistic tape-delay simulation and pitch-shifting reverse echo to just about any filter effect you've ever heard.

Universal Audio is one of the big names in dynamics and effects processing, and for good reason. The UAD-1e Expert Pak ($1,299) features a DSP card that takes some of the load off my computer's CPU and, just as important, comes with a nice assortment of invaluable plug-ins that emulate classic compressors, limiters, EQs, reverbs, and more. It also includes a $750 voucher so I can select additional plug-ins from UA's sizable stable.

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A killer studio needs at least one killer piece of processing gear, and I'd love to own a Universal Audio LA-3A ($1,749). It's an electro-optical compressor (aka leveling amplifier) that captures the vintage sound of the UREI LA-3A. Although the UA LA-3A has solid-state circuitry, it would give my studio a rich, natural sound that's difficult to achieve with plug-ins.

A postproduction studio doesn't need a huge selection of microphones, but versatility and quality certainly count. My first choice is the Røde NT2000 ($899). Rather than switching between polar patterns, it is continuously variable between cardioid, figure-8, and omnidirectional patterns. The NT2000 should suit just about any application that calls for a large-diaphragm condenser mic (see Fig. 6).

Two additional Røde mics will be useful for audio post and sound design. For remote recording and for sampling in the studio, the NT4 ($899) is once again my favored stereo mic. And for occasions when I want to record sources at a distance, I'm going to need a shotgun mic. The Røde NTG-2 ($369) should suit my needs quite well. It's a lightweight supercardioid mic powered by either a AA battery or phantom power.

If I'm going to get serious about sound design, there's one more mic I'd love to own. With its extremely wide frequency response, the Earthworks P30/HC Periscope ($995) comes closer to fitting the description of a high-definition microphone than any I've seen. It has a flexible 4-inch neck and a tiny, supersensitive capsule you can position in places other mics can't reach. And its hypercardioid pattern lets me pinpoint microscopic sounds I want to record.

FIG. 6: The Røde NT2000 is a large-diaphragm condenser mic that has a continuously variable polar pattern and outstanding versatility.

While I'm on the subject of high-definition recording, the remote stereo recorder I want is the Korg DR-1000 ($1,499). It is very portable, has balanced XLR and TRS inputs and an internal 40 GB hard drive, and records in an astonishing variety of audio formats. For 1-, 16-, and 24-bit recording, the DR-1000 is almost the only game in town.

My choice for monitors is a pair of biamplified JBL LSR4326Ps ($1,399), together with a room-calibration mic. How can you go wrong with accurate sound and a variety of analog and digital inputs? For headphones, I'd like to step up to the Grado SR125 ($150), an open-back design known for accuracy and comfort.

After looking at all kinds of USB/MIDI keyboards, I finally decided on the newest keyboard instrument from Kurzweil, the SP2 Stage Piano ($1,390). In addition to a superb 88-note weighted hammer action, it has Kurzweil's latest stereo grand piano samples and a variety of electric pianos, pads, mallets, and other sounds and onboard effects (see Fig. 7). What it lacks, however, is control surface functionality. No problem—the Novation Zero SL ($499), with its versatility and easy setup, is just what I need for controlling synths, samplers, and other software. Having the Zero SL lets me use the 003's control panel exclusively for mixing and navigating in Pro Tools.

FIG. 7: Kurzweil is back, and the new SP2 Stage Piano offers some very desirable features without blowing your budget.

The Mobile Studio

By Geary Yelton

The Budget Mobile Studio

In the past year, notebook computers have become so powerful that it's perfectly reasonable to put together a pro-level recording studio without a desktop computer. Give me a dual-core PC laptop or an Apple MacBook Pro, and I'll be out the door and composing and recording music on the run. Mobile studios are different things to different people, however. Whereas I want a very portable setup I can use to produce my own music and to record individual performers remotely and mix wherever I like, you might prefer a mobile studio that lets you do everything you could do in a fixed location, from creating sampled loop libraries to producing albums recorded live. Because this is a budget system, though, I'll stick with modest applications.

No one could be more surprised than me at my recommendation for a digital audio sequencer. I use all the major sequencers, and each has its own strengths. Once again, however, Pro Tools offers the greatest flexibility at the least expense. How is this possible? If I buy a compatible audio interface from M-Audio, then Pro Tools M-Powered ($299) costs less than any other full-featured competitor. Pro Tools M-Powered has virtually all the same features as Pro Tools LE, but the price of admission can be much lower.

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The key to this particular Pro Tools–based system is M-Audio's Ozonic ($599), a FireWire audio/MIDI interface with a 37-note keyboard and enough knobs and sliders for you to deftly control audio software. The Ozonic offers features that many compact keyboards lack, including Aftertouch, an excellent semiweighted action, and independent inputs for a sustain switch and an expression pedal. Audio features include a phantom-powered XLR input, an instrument input, and two line-level inputs, as well as two balanced and two unbalanced outputs on ¼-inch jacks. The Ozonic draws power from the FireWire bus or a DC adapter, and it's portable enough to tuck under your arm.

There are many free resources online to help you hone your orchestrational skills.

With portability in mind, I've also selected some transducers from M-Audio. The Studiophile AV 40 powered monitors ($199 a pair) are exactly what I'm looking for: reasonably accurate speakers that are lightweight enough to transport easily. They have 4-inch woofers and 20W of power per channel. They even have a headphone output; along with the Ozonic's headphone out, I'm covered whenever I need more than one. But instead of traditional headphones, I want M-Audio's IE-10 ($129) earphones. These in-ear monitors work well for noncritical mixing and offer a surprising degree of acoustic isolation from the surrounding environment.

The M-Audio Solaris ($349) is a large-diaphragm condenser mic at a bargain price. Its response is surprisingly flat, and its user-selectable polarity—cardioid, figure-8, or omni—makes it suitable for almost any scenario. And I have enough in my budget for a versatile dynamic microphone, the Audix OM-2 ($149). Suitable for recording voices or instruments, the OM-2 is always an excellent mic to have on hand.

Once again, I'm selecting two dependable software instruments from Native Instruments. Massive ($339) gives me a variety of synthesis features that include analog emulation, wavetable scanning, a wide range of filter types, extensive modulation routing, a user-configurable architecture, and a large library of presets. And once again, I've chosen Kontakt 2 ($449) as my sampler because of its depth, power, and dynamite content.

I can expand my setup considerably with one inexpensive bundle. The Waldorf Edition ($149), a trio of plug-ins from pioneering synth maker Waldorf, provides a modeled analog filter, a multitimbral drum machine, and an emulation of the classic PPG Wave wavetable synthesizer.

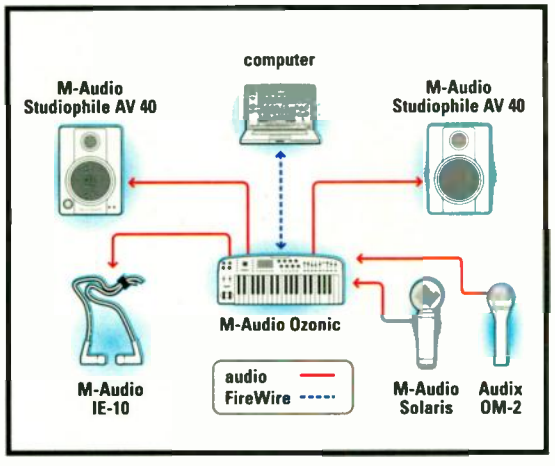
I also play guitar and bass, and in the spirit of doing everything inside the box, I'll need guitar-amp and effects-modeling software. Native Instruments Guitar Rig 2 Software Edition ($339) sounds great and fits my budget perfectly. With a slew of simulated guitar and bass amplifiers, cabinets, microphones, and effects, Guitar Rig 2 should suit my needs for quite some time.

The Killer Mobile Studio

To keep my killer studio mobile, I want to do as much as possible within the computer. Nonetheless, to do everything I want, I'll still need quite a bit of hardware—mics, monitors, an audio interface, a control surface, and a MIDI keyboard—so I'll start with that. But because it's a mobile studio, I want to be able to pack up the whole kit and caboodle and take it with me, so size and weight are prime concerns.

I want a well-rounded audio interface no larger than a single rackspace, with lots of I/O and at least eight channels of A/D/A conversion. The Apogee Ensemble ($1,995) fits my needs perfectly. This Mac-specific FireWire interface has four mic preamps (two with inserts), four instrument inputs, four line inputs, eight monitor outputs, and S/PDIF and Lightpipe I/O. My only complaint is that the Ensemble isn't Windows compatible. If I had a notebook PC, then, I could save a couple of hundred bucks and get an RME Fireface 800 ($1,799).

For monitors, I want something I can depend on to give back what I put in, and if they're portable, so much the better. The Genelec 8020A ($890) is an excellent choice, owing to its light weight (barely over 8 pounds each) and reliable sound, even with a 4-inch woofer.



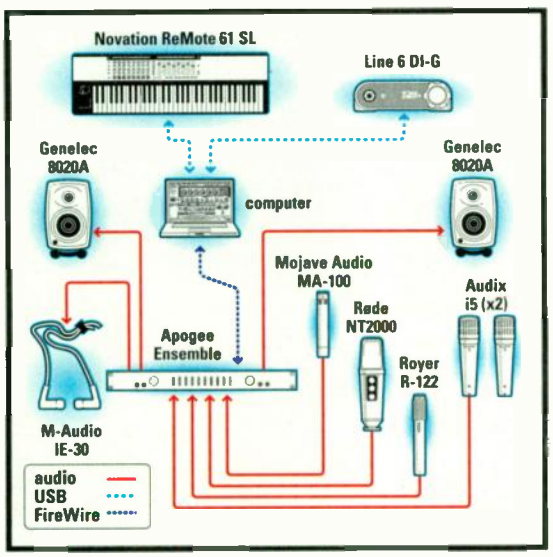
CHUCK DAHMER

With your notebook computer in tow, you can afford everything you need to produce music for less than you might imagine.

The rugged 8020A is biamplified, with a total of 40W into 8Ω, and it comes with Genelec's IsoPod stand. I also want an in-ear monitor that's well suited to mobile applications: M-Audio's top-of-the-line IE-30 earphones ($299). Like the IE-10, the IE-30 offers excellent environmental isolation, but it contains separate transducers for the bass and treble.

It wouldn't be a killer studio without some killer microphones. I don't need a ton of mics in my mobile cabinet, though. If I'm recording live bands, I'd prefer to take direct feeds off the house mixer as often as possible, and a handful of first-class mics should be all I need for most applications.

At the top of the list is the Royer R-122 ($1,895), a ribbon mic with active circuitry. It has a well-defined sound and it's very quiet considering its high output level. Next up is Mojave Audio's MA-100 ($995), a small-diaphragm tube condenser model. It has interchangeable cardioid and omnidirectional capsules and is useful for a variety of tasks. Farther down the list is the versatile, multipattern Røde NT2000 ($899), for all the same reasons I chose it for my killer postproduction and sound-design studio. Add to that a pair of Audix i5s ($358), because you never know when a couple of dynamic mics will come in handy for recording amps, drums, and various other sources.



Even a killer mobile studio can be compact enough to pack everything up and toss it in the backseat of your car.

I still need a MIDI keyboard and a control surface, and I get both with the Novation ReMote 61 SL ($899). In addition to keys with Aftertouch and Velocity-sensitive pads, the ReMote 61 SL has lots of assignable knobs and buttons. It also features Novation's Automap, a system that automatically configures its controls to the software you're using.

Although you can control the Apogee Ensemble from within Logic Pro 7, it's been years since Apple's sequencer had a major overhaul (of course, that could change by the time you read this). Steinberg Cubase 4 ($999) has all the up-to-date capabilities I want for the same price, and it's a cross-platform application to boot. With scads of professional features and a learning curve that's easily scaled by mere mortals, Cubase does almost anything any other sequencer can do, from live multitrack recording to printing scores. It also includes some very cool soft synths and lets you set up a virtual control room.

In addition to playing my two current favorites from Native Instruments—Massive ($339) and Kontakt 2 ($449)—I'd like to turn my computer into a Hammond organ; for that, I'm going to need B4 II ($229). And because I'll need a grand piano to accompany it, I want my favorite sampled piano, Synthogy Ivory ($349). B4 II and Ivory are the most realistic and controllable virtual organ and piano I've ever played.

IK Multimedia offers a bundle that includes three desirable instruments for a bargain price. For only $100 more than Miroslav Philharmonik (a virtual orchestra I wanted anyway), the Total

Workstation Bundle ($699) includes Sonik Synth 2 and SampleTank 2.1 XL. Not only do I get three cool sample players, but I also get plenty of dynamite content ranging from Miroslav Vitous's symphonic library to dozens of vintage synths and drum loops.

It looks like I'm on track for my mobile system to serve as an entire virtual band. That means I'll need my favorite software drummer, FXpansion BFD ($399). BFD gives me killer content and tremendous control over the selection of drums, their mic placement, and every aspect of the groove. Lots of expansion packs are available for BFD, but the one I consider essential for my music is BFD Percussion ($349); owning BFD Percussion is like being friends with a bunch of drummers from around the world.

For guitar, a generous budget lets me step up to Line 6's Gearbox Plug-In Gold ($699). It's a suite of more than 130 plug-ins supplying practically every modeling algorithm Line 6 has developed. In addition to amps, cabinets, and effects for guitar and bass, it gives me processors I can use with vocals and all kinds of instruments. It also comes with a compact audio interface, the DI-G, for my guitar.

I love to use effects plug-ins, and I feel that no dream system would be complete without SoundToys Native Effects ($495). (But like Mike Levine, I would substitute PSP Audioware's PSP Effects Pack [$389] in a Windows-based system.) I also need a top-notch convolution reverb, and I couldn't go wrong with Audio Ease Altiverb 6 ($595). With Altiverb, I can download impulse responses of just about any environment I might need from Audio Ease's Web site.

My choice of stereo audio editor also comes with a premium collection of processors. In addition to the comprehensive waveform-editing and processing features built into BIAS Peak Pro 5, the Peak Pro XT 5 suite ($1,199) includes the entire contents of the Master Perfection Suite. In a single bundle, I get pitch correction, audio analysis, multiband compression, advanced gating, spectral matching, and up to ten bands of parametric EQ. (BIAS has announced Peak Pro XT 6 [$1,199], which promises to build on the strengths of version 5 and, according to the company, is scheduled to ship shortly after you read this.) For Windows users, the closest combination that offers Peak Pro XT's functionality is probably Steinberg WaveLab 6 ($699) paired with Wave Arts Master Restoration Suite ($499). EM

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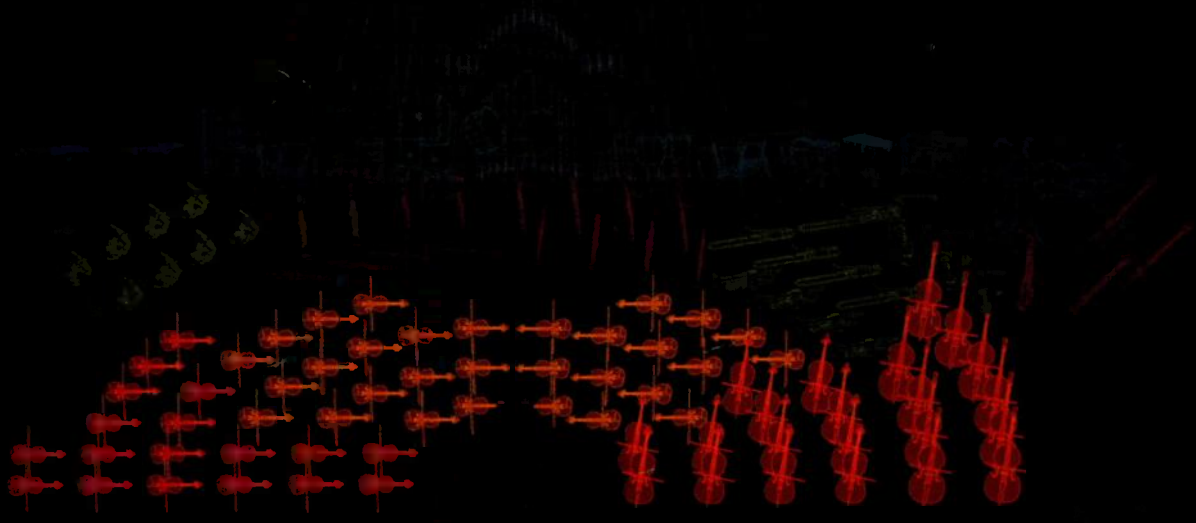

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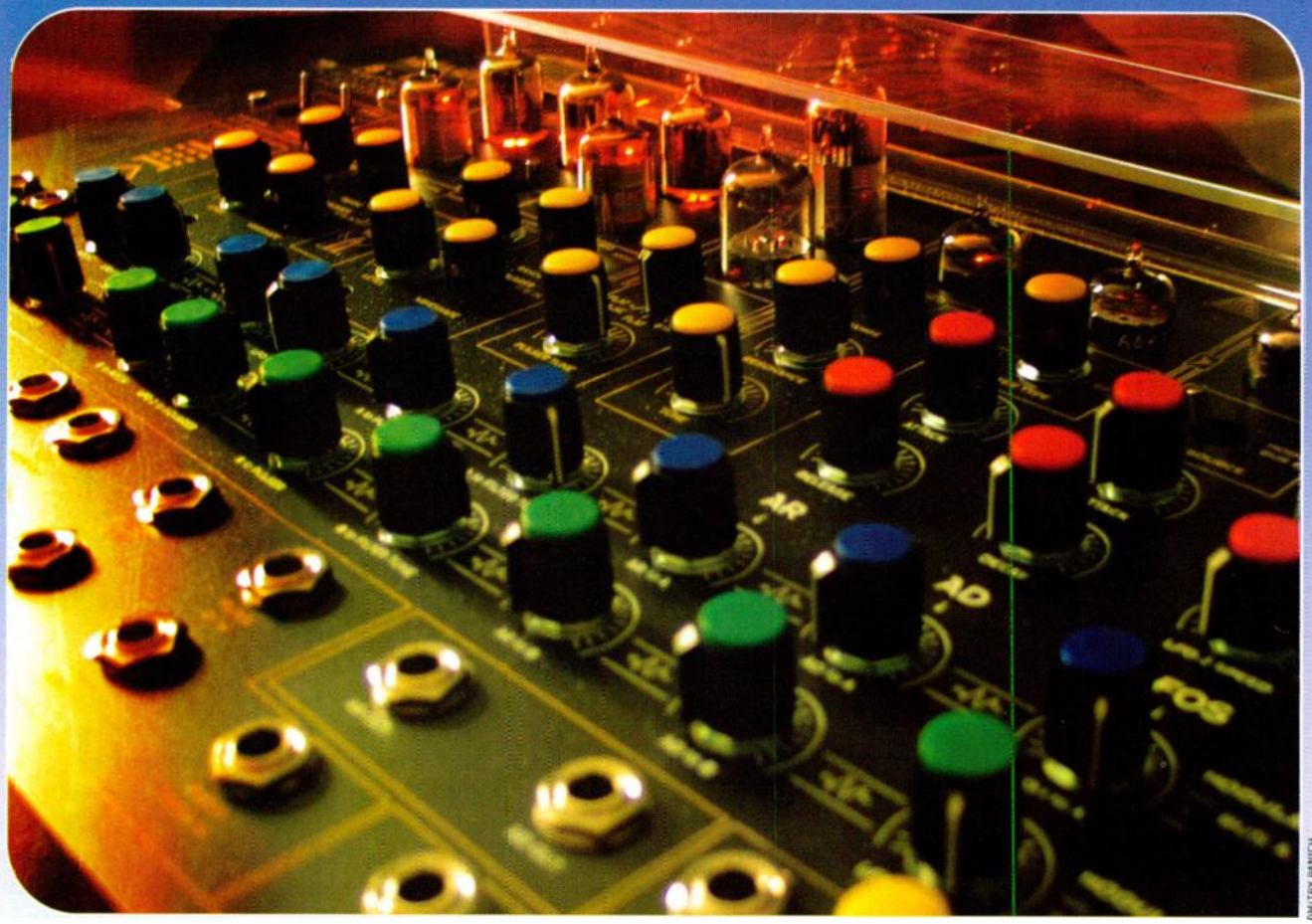

DMITRY PANICH

Bizarre Hardware

By Gino Robair

Five unusual products that spark creativity.

I like to think of my studio gear as partners in the creative process rather than as tools. Like their human counterparts, instruments and effects with a strong personality are inspiring, especially if they fight back a little or offer a bit of mystery. Equipment with attitude is what this article is all about.

I've chosen five products—two instruments and three effects—that offer a fresh approach to music making, even when the initial interface (as in the case of the Wretch Machine) follows a somewhat traditional layout. Each offers a healthy amount of unpredictability that can be creatively harnessed in real time. So whether you're looking for unusual textures, outrageous loop fodder, or exotic spices to sprinkle into your tracks, these hardware "collaborators" are worth getting to know.

Microchip Glossolalia

The futuristic babbling of a circuit-bent toy is a wonderful source for sound-design elements and groove mining. Although the indeterminacy of the creative short circuit is hard to beat, sometimes a composer needs a bit more control over the sounds. That's where the Flame MIDI-Talking-Synth ($549) comes in handy.

The German-built Flame marries a pair of voice chips to hardware controls and a MIDI interface to take advantage of the chips' musically rich possibilities (see Fig. 1). The 8-bit Magnevation SpeakJet chip offers a single-voice, 5-channel synthesizer using the company's proprietary Mathematical Sound Architecture technology to model specific *allophones* that are created by

the vocal cavity when a person speaks. (Allophones are variations of particular phonemes depending on where they would occur in the mouth when used in actual words.)

The chip is programmed with 72 speech elements and offers real-time control over rate, frequency, pitch-bend, and volume parameters. The Flame's front-panel controls are designed to take advantage of these parameters, while the MIDI interface adds further functionality by letting you access strings of allophones that have been formed into words, so you can build sentences with a keyboard controller or sequencer.

The SpeakJet chip also offers 12 DTMF (dual-tone multifrequency) Touch Tone sounds, like you hear when dialing a phone, and 43 sound effects. (Further information on the SpeakJet chip, especially for you DIY-ers, can be downloaded at www.magnevation.com/pdfs/speakjetusermanual.pdf.) The Flame's two SpeakJet chips work in tandem, and each chip gets its own output, giving you a 2-channel, pseudo-stereo signal that you can exploit with the onboard controls. However, the unit has a single output jack, so you'll need a ¼-inch Y-cable (such as an insert cable) to hear the left and right channels simultaneously.

With a sturdy metal case about the size of a thick paperback, the Flame is small enough to sit on a crowded desktop or a MIDI keyboard controller. It features 2 joysticks, 6 knobs, and 18 switches, and it's very easy to use in its standalone Sequencer mode: just move the Talk joystick, and the Flame will speak (see **Web Clip 1**). Its position determines which allophone you hear. The Note joystick changes the frequency of the sound depending on its position (see **Web Clip 2**).

The Flame's two performance modes are Sequencer, for using the built-in controls, and Expander, for using an external MIDI controller. You select the modes from the front panel, as well as start and stop the internal clock and determine whether the Flame uses its internal clock or locks to MIDI Clock. An onboard tempo knob controls the internal clock.

FIG. 1: The Rec, Loop, and Hold switches on the Flame MIDI-Talking-Synth let you set up repeating patterns.

Independent switches let you select whether each chip plays allophones or sound effects, and you can dial in one of seven sound banks using a stepped pot (some of the sound banks are duplicated on the switch). In Expander mode, MIDI notes are mapped to words.

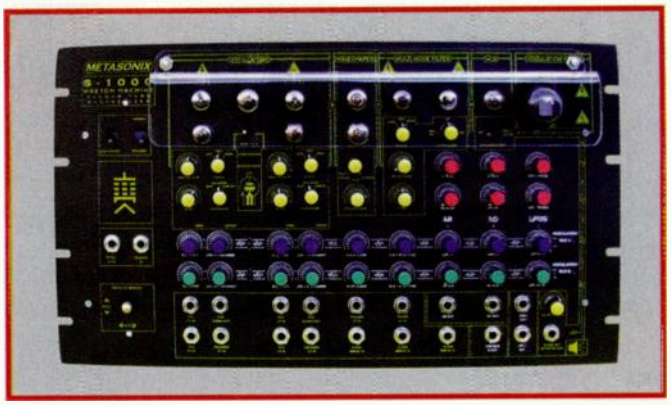

FIG. 2: Eleven unusual vacuum tubes are at the heart of the Metasonix Wretch Machine, a monophonic synth for people who like to take chances.

To add variety, you can switch in the "randomize" function for each chip and control the degree to which the sounds are affected (see **Web Clip 3**). To take the processing one step further, you can independently add tremolo to the sound of each chip, in rhythmic unison or alternating (see **Web Clip 4**). You can also corral the allophones into a major or minor sonority, and a stepped knob lets you select the key center from 12 chromatic steps.

Most important, from a performance point of view, there are two kinds of switches that set up a loop. Each joystick has an associated Rec switch: turn it on, and the joystick's movements from the last two bars (based on the MIDI Clock) are recorded and looped. To hold a specific joystick position, use the Loop and Hold switches. The looping functions are a clever addition to the Flame, and I found myself endlessly exploiting them (see **Web Clip 5**).

I've used the Flame onstage and in the studio, and it has never disappointed me. With the ability to add a degree of uncertainty using the Random control, as well as the Tremolo and Tuning functions, the Flame works well as a sound-design tool for instances where you want to create and control vocal-like textures that have movement and musicality in real time. And it's just plain fun to use.

Synthesis in a Vacuum

Although Eric Barbour designed an all-tube, 4-voice synth several years ago, it was an expensive and labor-intensive instrument, and only a couple were made. After perfecting various synth components in pedal form through his Metasonix TM- and TX-series, Barbour recently unveiled his next-generation tube synth, the S-1000 ($2,950), code-named the Wretch Machine.

In terms of features, the Wretch Machine follows a fairly standard mono-synth layout: two VCOs, two LFOs, a resonant multimode VCF, a pair of 2-stage envelope generators (one attack-release and one attack-decay), a VCA, and a waveshaper. Eleven vacuum tubes protrude from the top panel: a clear plastic frame protects fingers from accidental burns and the tubes from breakage (see Fig. 2). The top of the largest tube, located on the right,

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displays a set of green bars that move independently to indicate the speed of the LFOs, as well as the shape of the AR envelope—a useful feature.

The instrument can sit on the desktop and is also rackmountable (6U). Everything you need is on the front panel except for the power connector, which you'll have to leave room for above the synth in your rack.

As with other semimodular analog synths, the Wretch Machine has a jack field on it, but it can be played without using patch cords by simply pressing the joystick. Right out of the box, the Wretch Machine gives you rich, band-limited sounds that would fit nicely into a '50s sci-fi soundtrack or a Nine Inch Nails song (see **Web Clip 6**). So don't look to it for shiny, perky sounds: It screams. It howls. It broods darkly. Moog-like it ain't! And just when you thought you'd heard all it can do, patch in some CVs and triggers from an external source, and an entirely new instrument appears (see **Web Clip 7**).

You'll be hard-pressed to get the exact same sound each time you try to re-create a patch, because there are subtle differences in the behavior of each tube. But this variability is exactly what makes the Wretch Machine sonically rewarding.

The thyratron tube–based VCOs have an overall frequency range of 33 Hz to >2 kHz, with roughly a 2-octave range in each of three settings. The waveforms offered are triangle, square, and square with suboctave. Each oscillator has a master tune pot, range and level controls, and recessed span and trimmer pots for fine-tuning the response. Setting up the Wretch Machine to play exact pitches over the full two octaves with both oscillators in tune requires a bit of extra effort, but it's doable. A soft-sync switch is also included.

The VCOs go straight to a waveshaping circuit that allows you to add a tunable, pulsing component that is the aural equivalent of panfrying your sound. Next is the filter—the classic Twin-T notch design using two parallel bandpass filters—which offers bandpass, lowpass, and "bass-only response," as on the TM-6 multimode filter (see the review at www.emusician.com). The resonant pitch depends on the range setting and filter type chosen, but the maximum frequency is about 1.7 kHz.

The futuristic babbling of a circuit-bent toy is a wonderful source for groove mining.

A welcome feature of the Wretch Machine is the built-in multifunction joystick, which not only acts as a trigger when pressed quickly (and a gate when held in), but also changes the pitch of the oscillators (up and down) and opens and closes the filter (left and right). The attack and release knobs control the VCA's behavior.

The joystick is very sensitive and helps make the Wretch Machine a useful performance instrument on its own (see **Web Clip 8**). However, it doesn't always return to the same place when you move it, so your finely tuned oscillators will go astray each time you use the joystick or accidentally bump it. According to Barbour, the weight of the brass ball on the end makes it prone to shifting from vibration. The joystick is friction fit, so if you want the VCOs to remain tuned, gently twist and pull the stick off the control shaft to disable it. (I kept the joystick in place when using MIDI to control the synth, being extra careful not to nudge it, and I didn't have any problems.)

FIG. 3: The effects send and feedback loop in the Effector 13 Truly Beautiful Disaster can be controlled with the built-in photosensitive eye.

The main trigger/gate input can handle 5 to 12V positive signals, including a strong audio signal. If you use a MIDI-to-CV converter to control the Wretch Machine, then it must be Hz/V compatible if you want scales in 12-tone equal temperament or a predictable CV response. Of course, you can also use a volts-per-octave converter and just deal with the results. Although Metasonix no longer offers the option of installing a Synhouse MIDI In port into the Wretch Machine, a number of products support V/octave and Hz/V, such as the Kenton Pro Solo Mk II (www.kenton.co.uk) and the Future Retro Mobius (www.future-retro.com).

Another interesting feature of the synth is the pair of modulation buses that let you use the LFOs and EGs to control VCO pitch, the filter, and the pulser. The LFOs, which are triangle waves with a range of 0.5 to 10 Hz, can also control the squarer (clipping) function when an oscillator is in square-wave mode.

With its 18 ¼-inch patch points, the Wretch Machine

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integrates well into a modular analog system. Each VCO has an audio output, a pair of pitch CV inputs, and a CV input to the squarer. (The response of the squarer and pulser to CVs is very subtle.) I often processed the VCO outs separately and mixed them back into a patch (see **Web Clip 9**). External audio inputs are provided for the filter, waveshaper, and VCA if you want to use the Wretch Machine as an effects processor. Lastly, there are CV inputs to the waveshaper and filter, as well as individual outputs for the LFOs, EGs, and Mod Bus B. Clearly, Metasonix thought things through.

As a mono synth costing nearly $3,000, the Wretch Machine is a serious investment for almost anyone. However, like other Metasonix products, its sound and behavior are unique and designed to open ears and minds. The Wretch Machine will inspire musicians who enjoy dangerous audio surprises.

Send and Return

I love stompboxes—the wackier the better. Thankfully, there are dozens of boutique pedal manufacturers that care enough about sound—high- and low-fidelity—that my wish list will never be completely fulfilled. But if you think stompboxes start and end with fuzzes, flangers, and phasers, read on: there are some delightfully strange ways to mess with your tone and add a new dimension of creativity to your existing pedalboard.

Effector 13 Truly Beautiful Disaster. Combining oscillating distortion, a feedback effects loop, and a photoresistor, the Effector 13 Truly Beautiful Disaster (TBD; $225) is a stompbox that easily becomes an instrument (see **Fig. 3**). As a fuzz box, the TBD offers a gnarly square-wave distortion with strong suboctave tones that pop out and arpeggiate downward, depending on how you set the controls (see **Web Clip 10**). The octave portion can be set to drop in pitch as your string decays or override your guitar sound altogether, with plenty of gradation in between. Knobs for fuzz, blend, octave (oscillation),

FIG. 4: The Audible Disease Rupture RP-1 offers an inexpensive way to get feedback with an effects loop.

and output volume are provided, as is a gate switch that cuts off the effect after your string decays past a certain level.

However, the most exciting part about this box is the effects loop, which includes a Feedback mode that can be controlled with a photoresistor. The feedback circuit and photosensor can be switched in and out independently. Any pedals you've plugged into the effects loop come alive when you switch on the feedback.

The photosensitive eye can be used to lower the pitch of the TBD's octave effect or gate the output altogether. At one point, I was able to create a subtle vibrato by waving my hand over the eye when an Effector 13 Torn's Peaker was in the loop. Of course, the sonic results of the feedback loop depend on which effects are used and how their parameters are set. Eventually, the feedback signal builds to a point where an input signal isn't even necessary—or audible.

For example, a distortion box in the loop creates a sustained, wide-band sound that changes with the settings of the TBD's feedback control, as well as the distortion box's controls. With an Alesis Philtre multimode filter in the loop, I was able to get stepped-frequency feedback tones thanks to the Philtre's onboard LFO. Combining the Torn's Peaker and Philtre resulted in a crunchy randomized melody (see **Web Clips 11 through 13**). Of course, flangers and phasers also sound great in the loop.

Audible Disease Rupture RP-1. If you can live without the fuzz and photosensitive eye of the TBD, Audible Disease's Rupture RP-1 ($75) provides a less expensive way to get effects-loop feedback. Whatever pedals you place in the loop will behave normally until you hit the switch and kick in the feedback path. The knob controls the amount of feedback introduced into the signal. And there are six designs from which to choose (see Fig. 4).

The Rupture's feedback loop worked equally well with fuzz, phaser, and filter pedals in its path. I particularly liked how it sounded with a fuzz box and a TC Electronic Phase XII reissue (www.tcelectronic.com) (see **Web Clip 14**). You'll have hours of fun rediscovering the hidden potential of the pedals lying around in your studio.

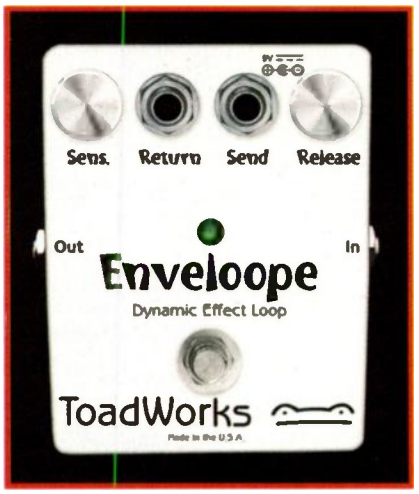

FIG. 5: The ToadWorks Enveloope can be used as a high-quality, dynamically controlled effects loop.

ToadWorks Enveloope. Another twist to putting an effects loop in a stompbox format is the ToadWorks

MANUFACTURER CONTACTS

Audible Disease/NoiseFX (distributor)
www.effectpedals.us

Effector 13/Analogue Haven (distributor)
www.oohlalamanufacturing.com
www.analoguehaven.com

Flame/Analogue Haven (distributor)
http://flame.fortschritt-musik.de
www.analoguehaven.com

Metasonix
www.metasonix.com

ToadWorks
www.virtualtoad.com

Enveloope ($264.99). In this case, the envelope of the input signal determines the amount of processing added into the signal path. (The kind of processing depends on which effects you have in the loop.) The Sensitivity knob sets the input-signal threshold when you use dynamics to control the effects loop, while the Release control sets the length of the effect remaining after the input signal drops below the input threshold.

You can reverse the envelope effect by pulling up on the Release knob: signal processing will be heard when you play at a level that is below the input-sensitivity setting, and the unprocessed signal will appear as you play harder. This takes the term *playing with dynamics* to a new level. To defeat the dynamic control altogether and use the Enveloope as a high-quality, buffered effects loop, simply pull up on the Sensitivity knob.

To get the most out of the Enveloope with line-level sources, such as drum machines or recorded tracks, you will want to use a device such as the Reamp (www.reamp.com) to lower the level enough for the Sensitivity control to react properly. For an in-depth review of the Enveloope, as well as audio examples, visit www.emusician.com.

All Together Now

With all of the babbling electronics, squealing tubes, and feeding back you'll experience when using these crafty products, don't forget to keep your DAW in Record mode. Sometimes the most inspiring raw material appears as you explore an instrument or effect configuration for the first time. EM

EM WEB CLIPS

Gino Robair is the editor of EM. Special thanks to Analogue Haven (www.analoguehaven.com).

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Comping Tracks in Live 6

By Jim Aikin

Assemble the perfect take in six easy steps.

Ableton Live 6 provides lots of user-friendly tools for solving production problems quickly. When it comes to comping (compositing) a final audio track out of several takes, though, you'll have to resort to one or two old-fashioned manual methods. But with a little patience, you can comp vocals or other audio tracks and achieve fully professional results.

Recording the raw material is easy. If you're working in Session view, the first step is to record your session into the arrangement. Next, set the arrangement loop markers to define the region where you want to do multiple takes, and turn on the Punch-In, Punch-Out, and Loop Switches. Now create an audio track, arm it for recording (see **Fig. 1**), check your audio input levels, put on the headphones, and record.

After recording several takes in Loop mode, stop the transport. You'll see an audio clip in the track. Only your last take will be visible in the clip, but never fear: Live has recorded all of the takes as one long chunk of audio. Now for the comping process (see "Step-by-Step Instructions" on p. 76).

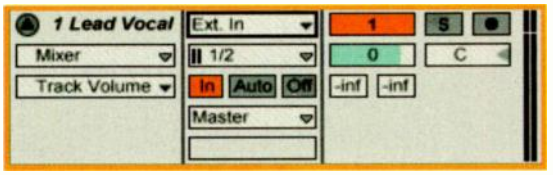

FIG. 1: The track input is set to channel 1 (for mono recording) and the red Record button is armed.

Duplicate and Zone

Create an audio track to hold each take. With the mouse, grab the clip in the recorded track and drag-copy it down into each of the other tracks, being careful to drag vertically so that all of the duplicate clips start on the same bar line. Mute all but one of the tracks; you'll want to listen to only one at a time. You may also want to expand each track vertically to view the waveform.

Select the clip in the first track. The Sample Display will show the entire audio recording. Your last take will be highlighted by the Start and End Markers. To get a separate take on each track, drag these markers manually to different points in the various clips. To ensure that the various takes don't get out of sync with one another, go to the Options menu and make sure Snap To 16th is active.

If your take is 16 bars long, for example, you may want to put the Start Marker at bar 1 and the End Marker at bar 17 in the clip in the first track; the Start Marker at bar 17 and the End Marker at bar 33 in the second track; and so on. If the takes start in an odd spot, such as bar 19, you may find it easier to use a pencil and paper to keep track of the start and end points while you work. At the end of this process, each clip will be assigned a separate zone within the audio.

Spotting Session

Next, set the Arrangement Loop to enclose the first phrase that you have recorded. Mute and unmute the takes one at a time, listen to each take, and jot down a few notes on which phrases you might want to keep. Then move on to the next phrase and repeat the process.

If your song is divided into neat phrases, and if you want each chunk in the composite to comprise an entire phrase (often a good idea for musical reasons), it may save time to split each take apart now. This is done by selecting the clip, clicking on the waveform in the track (not on the clip rectangle itself) to move the transport to the right spot, and then using the Edit menu's Split command. You can split multiple clips at the same spot by Shift-clicking on their waveforms and then using the Split command.

Mute the clip segments you don't want by right-clicking on each of them and choosing Deactivate Clip(s) from the pop-up menu. Now unmute all of the tracks, and you can listen to your composite take from end to end.

Some Assembly Required

If the takes were somewhat free rhythmically, you may find that no matter where you split them apart, you'll hear an abrupt butt joint when one clip transitions into the next. The solution is to program crossfades using track automation.

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STEP-BY-STEP INSTRUCTIONS

1

After loop-recording several takes, only the last take will be visible in the track. Drag-copy this clip to as many additional audio tracks as needed.

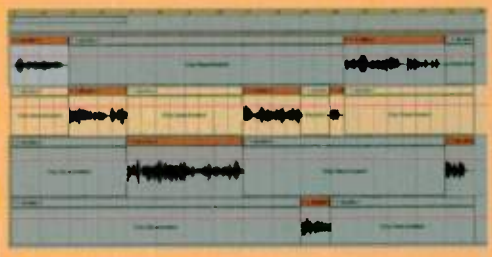
2

The Start and End Markers within each of the copied clips will be set to the final take.

3

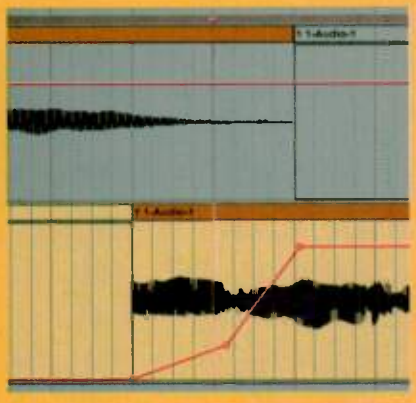
Zoom in and move the Start and End Markers within the copies so that each copy plays a separate take. Make sure the Markers snap to bar lines.

4



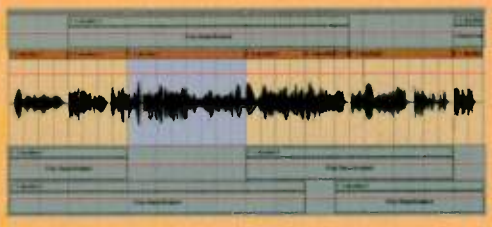
After the unwanted portions of the takes are muted using the Deactivate Clip(s) command, you'll have a composite.

5



To smooth abrupt transitions, crossfades between clips can be created manually using the Track Volume envelope.

6



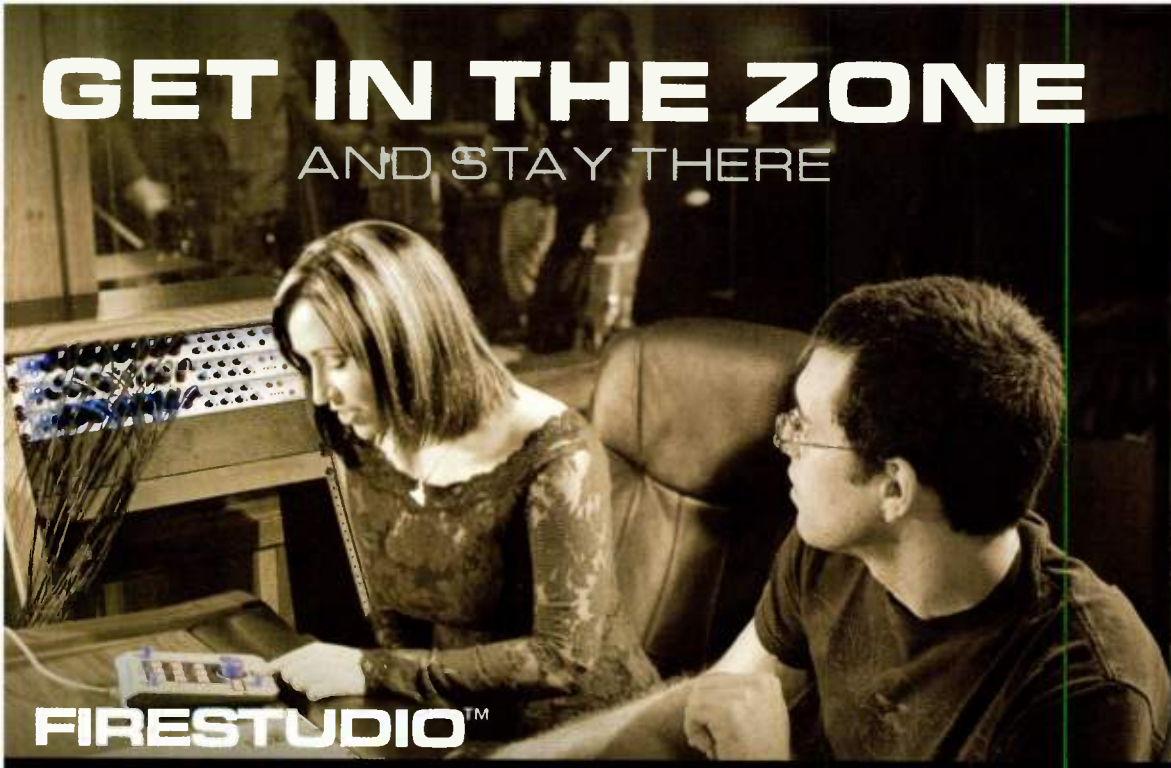
If you don't need crossfades, you can combine the clips you want to keep by dragging them up or down to the same track.

method is to drag the active clips up or down so that they all reside on a single track. This is practical only if you haven't done any crossfading, however. Alternatively, you can mute everything else and bounce the mix to a new audio track. This is done by setting the various comp tracks' outputs to the new track's input and then arming it for recording. If the goal is to apply effects to the comp track, you may prefer to route the existing tracks through a new effects track. EM

Jim Aikin is a music-technology guru, a cello teacher, and a hobbyist computer programmer. Visit him online at www.musicwords.net.

GET IN THE ZONE

AND STAY THERE



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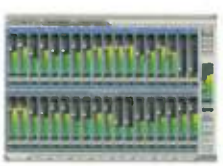

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Notcher Daddy's Flanger

By Len Sasso

Moving notch filters take flanging to a new level.

In the November 2006 "Sound Design Workshop: Sounds in Motion" (available online at www.emusician.com), Jim Aikin showed several creative ways to use multiple filters to add motion to your sounds. One of my favorite uses for multiple filters is to create a cascade of moving notch filters. That produces an effect reminiscent of phasing and flanging, but it is both subtler and more flexible.

I'll use multiple instances of FabFilter Volcano (www.fabfilter.com) for my examples, but any effects plug-in or virtual instrument that can process audio and has lowpass and highpass filters that you can arrange in parallel will do the trick. Volcano consists of a pair of filters in series or parallel, and you can modulate the filters' parameters independently.

The Setup

Each notch in the cascade requires one instance of Volcano. In each Volcano, arrange the filters in parallel with one in lowpass mode and the other in highpass mode. In that case, any frequency passed by either filter appears at the output, so the cutoff frequency (labeled FREQ) of the lowpass filter should be the same or slightly lower than that of the highpass filter. The result is a band of frequencies, called a notch, that is reduced in level by the combined filters. You don't want the notch to be very wide because that will carve out too much of the signal when you place several of the filters in series to form the cascade. Even using equal cutoff frequencies produces a notch because the signal is attenuated 3 dB at a filter's cutoff frequency.

The slope of the filters (12, 24, or 48 dB per octave in Volcano), which indicates how sharply the level falls after the cutoff frequency, controls the depth of the notch. Any of these slopes works well when the cutoff frequencies are equal, and the slopes don't need to match. The resonance setting (labeled Peak) will also have an effect, with high settings producing an audible ringing near the cutoff frequency. As with the slope, the Peak settings need not match.

FIG. 1: Four instances of Volcano are set up as modulated notch filters, then arranged in series for a simulated flanging effect.

In Volcano, you can pan the filters independently, but it's not a good idea to do that because it defeats the notch effect. However, it is useful to pan both filters to the same position when using several Volcanos in series. Modulating the pan with one of Volcano's LFOs adds motion to the effect.

It's About Time

Volcano has two LFOs and an ADSR envelope generator for modulation. The LFOs have ramp and pulse waveforms with variable width and can be free-running or synced to tempo. You set whether MIDI Note messages or audio above a certain threshold triggers the envelope generator. Bipolar modulation knobs set the amount of each modulator applied to cutoff, resonance, and pan for each filter. As with flangers and phasers, motion is key, but a little modulation goes a long way.

If your source material is percussive, the threshold-triggered envelope makes a great modulator. For pads and ambient tracks, use a MIDI drum part to trigger the envelope. Kick drum parts work well for imposing a little rhythm on a pad. Setting the envelope to modulate the two filter cutoffs a small amount in opposite directions makes the notch width pulsate with the kick drum rhythm.

I like to use a moderate-rate triangle-wave LFO to modulate both cutoffs by a small amount with the same polarity. I simultaneously use a long automation envelope to sweep both cutoffs slowly across a wider frequency range. The same trick works well with pan modulation.

As an alternative to automation envelopes, I often assign the same MIDI controller to both Freq or both Pan knobs. Volcano's MIDI Learn implementation doesn't allow that, but many plug-in hosts do.

With modulation, a single Volcano imparts significant motion, but arranging several in series, with their notches at different frequencies and with different modulation setups, magnifies the effect (see **Fig. 1** and **Web Clip 1**). That uses more CPU, so you may need to freeze the track after setting up the effect. EM

EM WEB CLIPS

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

Add It Up

By Jim Aikin

The latest additive synth tools for the desktop studio.

Additive synthesis may be the ultimate synthesis technique. Any conceivable sound can be generated using additive synthesis, at least in theory. Two factors have pushed additive out to the fringe, however. First, designing musically useful or expressive sounds with additive is harder than with other, simpler technologies. Second, additive synthesis requires so much number crunching that until a few years ago, it couldn't be done in real time.

However, the picture is changing. Today's desktop computers can do additive synthesis in real time, although it's still more CPU intensive than most other types of synthesis. And several commercially available software synthesizers now use additive synthesis in one form or another. In this column, I'll provide a quick refresher course for those who are unfamiliar with the concepts of additive, and then take a quick look at a couple of the more interesting software instruments that use it.

E Pluribus Unum

As most electronic musicians know, the simplest possible sound is a sine wave. A sine wave contains energy at only one frequency. If you listen to a pure sine wave by selecting one in a synth oscillator and playing a MIDI note, then the sine wave will sound completely muted and colorless. (For more on sine waves and the basics of additive synthesis, see the article "All About Additive Synthesis" by Scott R. Garrigus, available online at www.emusician.com.)

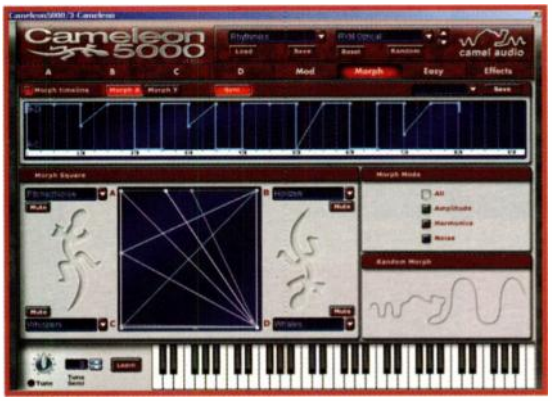

FIG. 1: An additive-based software synth might provide a two-dimensional vector envelope, such as this one in Camel Audio Cameleon 5000. The envelope is used to morph among four separate additive spectra.

Most sounds, both natural and synthesized, contain energy at many different frequencies. Without getting into the math, which is fairly dense, we can say that any sound can be described mathematically as the sum of one or more sine waves. Looking at the makeup of sound is known as Fourier analysis; if you want to learn more about it, a quick Web search will get you started. Each of the sine waves in a complex sound will have its own amplitude (loudness) envelope, frequency, and phase.

Classic analog-style synthesis is called *subtractive synthesis*. In subtractive synthesis, we start with a complex tone (such as a sawtooth wave coming from an oscillator) and use a filter to get rid of the portion of the frequency spectrum that we don't want.

Additive synthesis is just the opposite; in fact, additive synthesizers may not have any filters. With this approach, we build up a complex, musically interesting tone by mixing (adding) a bunch of sine waves, each of which is called a *partial*. Though you'll sometimes hear sine waves described as "overtones" or "harmonics," these terms refer only to partials that are *harmonically* related to one another. That means their frequencies are in simple mathematical ratios to each other, such as 2:1, 3:1, and so on. In additive synthesis, each sine wave can have any arbitrary frequency you want, in which case the term *partial* is more accurate. (Partials can be harmonic, but they don't have to be.)

Defining the sound of a musical instrument using raw additive synthesis is difficult because the sound will likely have dozens of partials, each with its own amplitude envelope. And these aren't simple ADSR envelopes, either: the amplitude of a given sine wave may rise and fall several times within a few milliseconds.

To use additive synthesis in a practical, musical way, we need to take a few shortcuts. Additive synthesis programs offer different ways of doing this, but they all typically offer macro controls of one sort or another that provide high-level control over the partials. Some synths allow the user to load the partial data for a sound (a trumpet note, for example) and then massage that data using controls such as knobs or sliders. A single control would typically adjust the amplitudes of many high partials simultaneously or could speed up or slow down multiple envelope segments per partial during some portion of the sound.

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The Monster Morph

Two soft synths, VirSyn Cube (www.virsyn.com) and Camel Audio Cameleon 5000 (www.camelaudio.com), use similar approaches to additive synthesis (see each manufacturer's Web site for free downloadable demo versions). In either program, you can load up to four additive templates at once. These templates are positioned at the four corners of a square and contain the analysis data of either real-world or artificial sounds. To synthesize an entirely original sound, create a two-dimensional vector envelope that morphs among them (see Fig. 1).

Morphing is quite different from mixing. In mixing, two or more source sounds are added together in their original form. When a synth morphs between templates, however, it interpolates between the mathematical values that define the separate sounds. For instance, if it morphs from a short, plucked sound such as a string pizzicato to a more sustained sound such as an organ note, the amplitude envelopes of individual partials will gradually get longer as the morphing envelope moves toward the organ template.

The details of how the synthesis algorithms do this can be complex and are not too interesting for most musicians. For the most part, you interact with the program by loading some templates and playing with the controls until you get something you like. The results can be hard to predict, but they're often quite striking.

In Cameleon, you can morph the harmonic spectrum, the noise contour, and the amplitude envelopes separately. Exotic breathy sounds, unusual plucked tones, swirling pads, and throbbing rhythms are easy to create (see **Web Clip 1**). The blending of partials can be modulated in real time using MIDI Control Change messages.

Picture Perfect

Synesthesia is a mental faculty in which the sensations coming from different senses are combined in the brain. For example, a sound might evoke the feeling of sandpaper or oil on the skin. Some additive synthesizers allow a form of reverse synesthesia: you load a graphics file (such as a BMP or JPEG) and then convert the visual data into sound. The results tend to be unpredictable, but once in a while you'll find a gorgeous texture that would have been impossible to arrive at any other way.

FIG. 2: The spectrum editor in VirSyn Cube 2 provides graphic tools with which you can warp the spectrum. Each horizontal line represents a different sine wave partial.

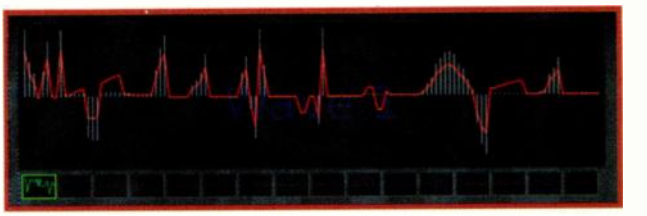

FIG. 3: Each oscillator in u-he Zebra2 has 16 user-defined additive spectra, which are selectable with the small boxes along the bottom. The waveform knob blends smoothly from one spectrum to another.

The first well-known program to use this image-to-sound model was U&I's Mac-only MetaSynth (www.uisoftware.com). MetaSynth is not a real-time instrument; it's a graphic-based sound-editing and rendering platform with several unique capabilities. You can "paint" sounds additively: each horizontal line of pixels is a separate partial, and the brightness of the color corresponds to the amplitude of the sound. You can also use mouse tools to create rhythms, cut and paste, transform preexisting images, and more.

VirSyn includes graphical editing of additive sound spectra as part of its Cube 2 and Poseidon programs (see Fig. 2). Image-Line FL Studio (www.flstudio.com) has a built-in soft synth called BeepMap that can load graphics files (but not edit them) and use them for additive synthesis.

It All Adds Up

A number of software synths allow you to create your own oscillator waves using a simplified form of additive synthesis. Usually, the sine wave partials will all be harmonically related. Instruments in this category include Image-Line Sytrus and u-he Zebra2 (www.u-he.com; see Fig. 3). Both can combine additive synthesis with other techniques, such as frequency modulation (FM).

When the partials are all whole-number multiples of the fundamental, the waveform will sound pure. You can add color and animation in these hybrid synths by mixing two or more oscillator tones that are detuned from one another. When each oscillator has its own amplitude envelope and the harmonic spectrum of each oscillator is morphing, the tone will have movement and life.

Thanks to fast computers, additive synthesis has taken its place alongside sample playback, subtractive, FM, waveshaping, and other synthesis techniques in a musician's palette of electronic tones. EM

EM WEB CLIPS

Jim Aikin writes about electronic music for various magazines, plays electric cello, and writes interactive fiction. You can visit him at www.musicwords.net.

Who needs the H2 Handy Recorder?

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SIMPLICITY IS A BEAUTIFUL THING.

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

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musicians, with potentially an artist intro and a song name intro—really whatever they want. But make a very short intro and allow as much of the song to play as possible—about 45 seconds or so—and then put an end tag on there that will make the FCC happy, announce it as a paid showcase, and direct the listeners back to the site where the artist can be found. [For an example of an AirSpun ad, see **Web Clip 1.**]

And the stations are okay with running these showcase ads?

Yes. We weren't sure what kind of resistance we might meet by doing something that nobody was really doing at the time. So far, the response has been really good. We had initial support early on from two significant networks in the U.S.: one was Clear Channel and the other one was Entercom. When we went to Entercom, we had to go through their corporate attorney because this was the same time they were all getting slammed with payola lawsuits. So we did a lot of due diligence ourselves to make sure that what we were doing was in fact fair and legal.

When did you actually start the service?

I believe it was in July of '06, in what was a limited test-market capacity. Since then, we've added some stations, we've added some markets, and we've added partners. We continue to develop the business around the concept of technology-enabled music marketing and promotion. For example, this month we've added mobile-phone music placements through a partnership with VoiceIndigo.

Heidi Elgaard, AirSpun's CEO.

TANYA NIGH

So if a band comes to you and wants to get on the radio in, say, Austin, Texas, what would it cost them?

Right now it's pretty different per market. We're bound by the realities of what radio airtime costs in each market. Basically, artists come to our site and they go into the section called Get Discovered. Then if they click Get Started, they can browse our station options, including broadcast, Internet radio, and now mobile phone placements. If they select broadcast, then they get the most options right now. You can search by your genre or you can search by location (see **Fig. 1**). You mentioned Austin, so if I select Austin and submit, I can see there's three radio stations in Austin and can see their price ranges. Austin is not one of the cheapest; it's $75 to $200 or so for a one-minute spot. Our cheapest option is Internet radio placement bundles for as little as $1 per spot.

Do you get to choose the time of day it will air?

You do; once you select the range, it breaks it out. And that's where the prices vary, between "Weekend" or "Monday through Friday Evening" or "Best Available." Each station decides which options they're willing to do, but so far, most of them are providing a few different "dayparts," which is radio lingo for time of day.

Can the band specify the date that their spot will air?

It varies per station. But for the most part right now, the artist doesn't have a ton of control over that.

So it's a little harder to use the service for tour support because you're not sure when the ad will run—it might run after you've played in the town.

Right. I would say that with the "no-touch" version [self-serve on the Web site], that's going to be hard. But what we are also starting to do is to really push that info@airspun email and our phone number and everything else there to say to the artists, "Contact us if you have questions." And we are willing to do a lot more things at this stage [for example, manually purchasing and producing spots], as we're getting up and ramped to do some custom programs. So if someone says, "On this day, what are my odds I can do this?" we'd be happy to call the station and put in a special request.

What kind of results have the bands and artists that have used your service gotten?

That is a very good question. One of the biggest challenges of broadcast radio is doing a direct tie to how much return on investment you're getting. So we are starting to do a couple of things to make that connection more clear. One, we're showing people the number of hits they're getting for their profile pages. And then the other thing is that we're tracking our version of "spins," which will be the number of times a track plays in the AirSpun online audio player. Those things are going to help artists see how many people actually came and checked them out from the ad. We've seen the most positive results in terms of page views and AirSpun player spins from the artists we've featured in our AirGods new-music polls each month. Our ultimate goal is to show our artist clients how many song sales are tied to their AirSpun promotional efforts. Right now we're working with partners such as Broadjam, E-junkie, and others to do that. EM

EM WEB CLIPS

Mike Levine is an EM senior editor.

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NOVATION XioSynth 25

See Product Specs @emusician.com

Three treats in a tiny box.

By David Battino

Jamming three devices into a tiny case is usually a recipe for frustration, but Novation has done something remarkable. For a few hundred bucks more than a standard USB MIDI controller, the XioSynth 25 gives you rich-sounding virtual analog synthesis, fistfuls of MIDI knobs and buttons, and a 24-bit audio interface—all in a compact keyboard that runs off AC, batteries, or USB power.

The XioSynth (pronounced *zy'-oh-synth*) contains the same basic synthesis engine as Novation's flagship X-Station but adds sound-shaping features such as filter overdrive and the X-Gator, a rhythmic sound slicer. Of course, Novation did make some adjustments to reach the XioSynth's friendly price point (see the **online bonus material** at www.emusician.com). Having reviewed two previous Novation synths for EM (the K-Station and KS4; see www.emusician.com) and owning a third (the original BassStation), I was excited to try out the company's latest marvel of miniaturization.

ONLINE BONUS MATERIAL

FIG. 1: Combining analog-modeling synthesis, a computer audio interface, and dozens of MIDI controllers, the Novation XioSynth 25 is a terrific value.

Xio, Silver!

Novation packed a lot of features into the XioSynth's compact plastic body (see Fig. 1). An attractive, 4-page *Getting Started* guide gets you going quickly, and there's a lot more detail and some handy shortcuts in the nicely illustrated 82-page PDF manual. In between, I highly recommend watching the included DVD tutorials, which walk you through the XioSynth's functions and

GUIDE TO EM METERS

5 = Amazing; as good as it gets with current technology
4 = Clearly above average; very desirable
3 = Good; meets expectations
2 = Somewhat disappointing but usable
1 = Unacceptably flawed

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Another big annoyance is the white-on-gray labels, which are impossible to read unless the lighting is just right.

Xio I/O

For a tiny keyboard, the XioSynth has a surprisingly well-endowed jack panel (see **Fig. 2**). In addition to the expected stereo line output and headphone jack, you get a sustain pedal jack (sadly missing on the K-Station), and an XLR mic input with switchable phantom power. If your mic supports it, you can set the phantom voltage to values lower than the standard 48V to save battery drain and USB draw. The XLR jack is bolted to the back panel, unlike the jacks on some competing keyboards that attach only to the circuit board. You get dedicated knobs for line and headphone output level.

Because the XioSynth sounds so good, I wanted a MIDI In jack so I could play it as a sound module without a computer. A cord lock for the USB cable would have been reassuring for live use. I also wish the XioSynth had stereo line inputs instead of just a mono one (if that's important for you too, consider the X-Station instead).

Audio routing is flexible, with dedicated preamp and pan knobs for each input channel. The mic input provides a heroic 70 dB of gain, although hiss starts to creep in around +35 dB or so. You can crank the line input up to +48 dB, which is more than enough to support recording guitar.

For latency-free monitoring, a Monitor knob adjusts the balance between input signal and output from your computer. One of the XioSynth's coolest features is its ability to stream the synth output and the incoming audio over USB simultaneously. Three more knobs control the local synth level, the level sent out over USB, and the panning of the USB synth output. That design made it simple to record a MIDI performance into my sequencer, route the MIDI track back into the XioSynth, and then record the synth's output back into the sequencer as an audio clip.

Architecture 101

The XioSynth's voice architecture is very similar to the K-Station's, which I covered in detail in the November 2002 issue of EM, so I'll hit the highlights here. It has 3 oscillators, each with 17 waveforms—saw, sine, triangle, square/pulse, 4 kinds of noise, and some single-cycle sampled waves such as electric pianos, which are great for adding bell-like harmonics. I did notice some aliasing, though.

The XioSynth is monotimbral and 8-voice polyphonic. Oscillator-warping options include pulse-width, ring, sync, and frequency modulation, giving you scads of ways to animate the sound (see **Web Clip 3**). The 2 LFOs are fantastically flexible; each offers 32 waveforms and can run in one-shot mode, becoming an extra envelope to complement the amplitude and filter ADSRs (alas, you still can't modulate envelope attack time with Velocity). A Preglide function creates a rudimentary pitch envelope that can punch up note attacks.

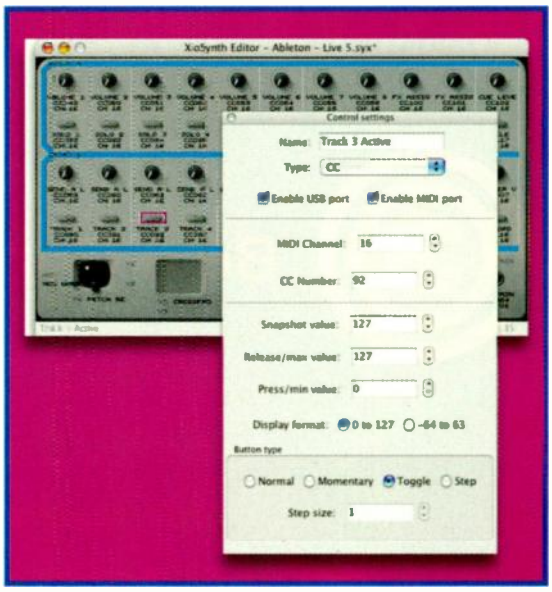


FIG. 3: The tiny labels on the template editor are almost as hard to read as those on the XioSynth itself.

The all-important filter section offers lowpass, bandpass, or highpass modes with 2- or 4-pole slopes. Its new Shape and Overdrive parameters add a pleasing distortion (see **Web Clip 4**). From subtle swirling to throaty leads and booming basses, the XioSynth filter delivers.

Novation is strong on tempo-synced effects, and the new X-Gator supplies a fresh twist. It's a tempo-controlled gate that can mute or attenuate the synthesizer up to 32 times per bar, producing rhythmic pulses (see **Web Clip 5**). You can change the level of each slice, set the attack and decay of all slices, and even route alternate slices to the left and right outputs. The effect is lighter than arpeggiation, although you can run the XioSynth's multipattern arpeggiator simultaneously for more pizzazz. I was disappointed that the XioSynth doesn't have an LED to indicate when the X-Gator and arpeggiator are running.

Six effects processors round out the sound, and you can run them all at once. The reverb sounds metallic and the phaser is too subtle, but being able to apply all six effects at once is excellent.

Two Novation reps told me they thought the onboard patches were the instrument's highlight. Five dozen patches came from celebrity artists (none of whom I knew). Many patches seemed designed to show off the various distortions, which I found harsh and tiring after a while. Fortunately, the XioSynth is so hands-on that tweaking the sound into something personal is almost automatic.

The factory sound bank offers a hearty helping of synth basses (definitely a strength for the XioSynth), some sawtoothy pads and leads, a side dish of arpeggios and X-Gator effects, and lots of sound effects. You can audition all the sounds online with Novation's XioSynth simulator (see **Web Clip 6**). I started to like the instrument a lot more after I downloaded and installed some

X-Station banks, which showed more variety, including acoustic instrument emulations and the Novation smoothness I'd missed in the parade of fuzz.

Templates in a Teapot

In MIDI controller mode, the XioSynth provides 16 sets of knob and button assignments called templates. The Ableton Live template, for example, maps the first eight knobs on the XioSynth to the first eight volume faders in Live's mixer. Press the Group B button, and the knobs control the effects-send levels for those channels instead. The adjacent buttons mute or solo the channels. In mode B, the last three buttons map to Live's Start, Stop, and Record buttons. I loved the knob control, but I found the XioSynth buttons too small and wiggly to make comfortable transport controls.

When you twist a knob or press a button, the XioSynth displays the target function in its LCD. The knobs have a pickup mode that prevents them from sending data until you rotate them through the current value. Holding down both Effect-select buttons for one second puts the XioSynth in Preview mode, in which the 11 knobs and buttons stop transmitting MIDI completely so you can see what they do. However, the keyboard and left-hand controllers remain active; I could tell that the designers put a lot of thought into how the XioSynth would be used live.

Some of the templates, like the one for Propellerhead Reason (a separate download), require configuration on your computer, dragging files to various places, and enabling checkboxes. The manual does a clear job of walking you through that setup process, but I found that the MIDI mappings for Reason were not useful. Novation provides a downloadable template editor that makes it fairly easy to create new assignments and transmit them to the XioSynth for storage (see Fig. 3). The editor's screen could be much bigger; the labels are cramped and tiny.

It's Off to Work We Go

Five years ago, I praised the compact Novation K-Station in EM, and my ears still perk up whenever its demo songs shuffle around on my stereo. I really like Novation's signature palette of crisp attacks, swirly textures, and juicy filtering. In the XioSynth, the company addressed almost all my wish-list items for the K-Station, added an audio interface and extensive MIDI control, beefed up the bass and filter, and shaved $350 off the price.

The XioSynth is a triple hit, combining three key tools for the computer musician in a flexible, portable instrument with an equally compact price. With a little less miniaturization—simplifying the intertwining modes and restoring the X-Station's input features—it would be a giant home run, even if it cost a couple of hundred bucks more.

EM WEB CLIPS

David Battino (www.batmosphere.com) is the coauthor of The Art of Digital Music *(Backbeat Books, 2004) and the audio and digital music editor for O'Reilly's Digital Media site (http://digitalmedia.oreilly.com).*

FIG. 1: Among the 8pre's many features are eight mic-pre/instrument channels, each with individual phantom-power and pad switches.

MOTU 8pre

See Product Specs @emusician.com

A FireWire interface with eight mic preamps, optical I/O, and more.

By Rusty Cutchin

MOTU's 8pre is a FireWire audio interface and 8-channel mic pre–to–optical converter designed to let you conveniently add eight mic-preamp/instrument inputs to your computer-based recording setup. You can use the 8pre as your primary audio interface or connect it to an ADAT port on another interface or digital mixer. The 8pre uses the SMUX extension of the ADAT protocol, which allows for transfers of up to eight channels of audio at rates as high as 96 kHz.

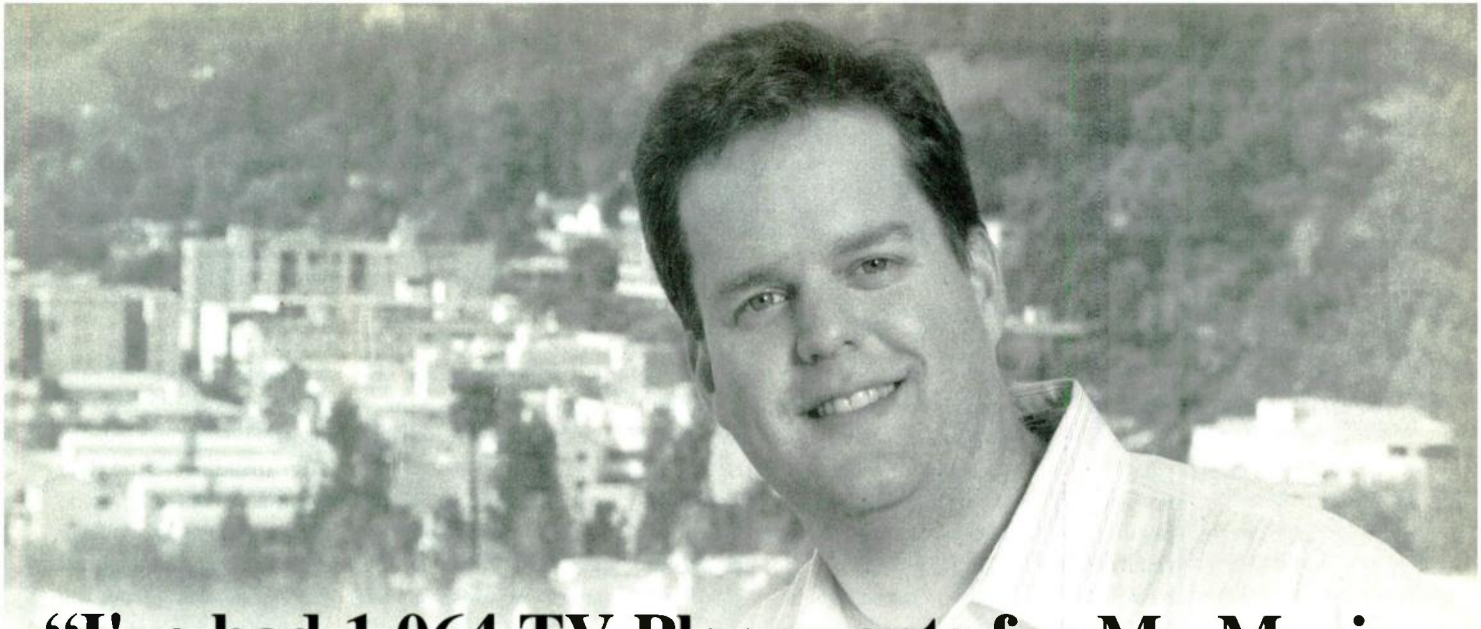
Using the unit's FireWire ports, you can connect up to four 8pres to your computer, which would provide 32 channels of mic/instrument inputs into your recording application. You can monitor all these sources using the supplied MOTU CueMix Console software, which also gives you talkback and listenback functionality.

The 8pre's converters were transparent sounding.

The 8pre works with Power Macs and Intel Macs running Mac OS X 10.3.9 or later. Windows users need XP or Vista and software that supports standard WDM, ASIO, and GSIF drivers. Mac OS X users get the added benefit of MOTU's AudioDesk 2 digital recording software, which makes the package a high-quality all-in-one solution for those who are new to Mac-based recording or who are interested in setting up a mobile Mac-audio system.

Up Front

Each channel of the 1U 8pre (see Fig. 1) sports a trim pot, a switch for 48V phantom power, and a –20 dB pad switch. The controls for all eight channels, as well as a headphone jack and main volume pot, take up only three-quarters of the front panel. The rightmost quarter holds eight five-step LED meters (labeled Analog In) for the channels, along with a vertical bank of LEDs (labeled Mode) that indicate the unit's status as interface or converter, the current sampling rate, and ADAT port status.



"I've had 1,064 TV Placements for My Music Because I Joined TAXI"

Stuart Ridgway - TAXI Member

www.pyramidmusic.com

I'd seen the TAXI ads (just like this!) hundreds of times over the years and I was very skeptical. But when I got their free information kit and saw that the money back guarantee was for a full-year, I decided to make the leap.

Within weeks of joining, my music was in the hands of some A-list people in the film and TV industry. In less than a year I got the call from the music supervisor at one of LA's hottest TV production companies.

Reality TV and Royalty Checks

We struck up a good working relationship, and when the supervisor needed music for a new daytime reality show, she asked me if I would like to join her team. For the next two years, I wrote music for an Emmy Award winning show, which aired every weekday on NBC. My first royalty check *alone* covered 10 years of TAXI memberships! All in all, those two seasons netted me more than $50,000, and the company TAXI hooked me up with has hired me to write for two other shows as well.

Being "Great" Wasn't Enough

After making more than 1,000 cold calls, it dawned on me that music supervisors didn't care *how* great I was as a composer. How could they? They don't know me and that's that! I could only get so far on my own.

I realized I needed someone or something to be my champion - somebody to connect the dots. TAXI worked for me, and if you're really good at what you do, it just might do the same for you. If your music is up to snuff and you pitch it at the right targets, belonging to TAXI *can* change your life.

TAXI®

Get Paid for Making Music

Actually, I may have the greatest job on the planet because I can work in my studio all day, playing piano, writing string lines, recording guitar parts, and the hours easily slip by. I get paid to do what I love, and much of the credit for that goes to TAXI.

They don't blow smoke, and they don't promise miracles. But they *do* keep you focused, on track, and energized about your music. TAXI's expert feedback is priceless, and their free convention, the Road Rally, is worth more than the membership fee.

I *Volunteered* to Write This Ad!

There are tons of companies that *imitate* TAXI, but how many have you seen that can run ads like this? TAXI is the world's *leading* independent A&R company because it's the one that really works.

Take my word for it. Call for their information kit now.

The World's Leading Independent A&R Company

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FIG. 2: The 8pre's rear panel includes four optical ports for high-resolution digital connections and two FireWire ports for connecting to a computer and daisy-chaining other FireWire devices.

There's also a circular rocker switch for power. It's about twice as big as any of the individual trim pots, which are somewhat hard to turn without grazing the adjacent phantom-power switches. In practice there's no danger of accidentally switching the power status, because the phantom-power toggle switches, though small, are sturdy and stay put once set. However, I would have preferred larger knobs and switches. According to MOTU, this design was necessary in order to fit all the circuitry without increasing the unit's price point.

The Analog In LEDs can function as meters or indicate status changes. Channel-volume changes are indicated vertically. The LEDs' horizontal readout indicates level or status for whichever function the main volume knob is set to control. Out of the box, the knob controls headphone volume. Press the knob twice, and it controls master output volume. The knob is a push pot that changes functions when you press it or hold it down for a few seconds. It maintains the selected function until you press it again.

Hold the knob down for five seconds, and it becomes a selector for the two types of high-sampling-rate optical I/O that the unit supports: SMUX or MOTU's proprietary version, which you would use with other MOTU hardware. These two schemes, which support 88.2 or 96 kHz sampling rates, are referred to as 2x on the front panel. Standard ADAT I/O is labeled 1x. You can tell which 2x mode you're selecting by a single flashing LED in either the first or second column of LEDs.

If you're using the unit as a converter only, with no FireWire connection, then holding the volume knob down for three seconds lets you change the clock source. The current setting will flash in the Mode LEDs under Clock. Turn the volume knob to change the setting, and then press it again to exit the mode.

Using the volume knob as a mode selector and different arrangements of LEDs to indicate status is not very intuitive. (None of the nonmeter functions of the meter LEDs are labeled on the front panel—you just have to learn them.) Nevertheless, after spending a little time with the unit, you'll find its front-panel operation to be easy. With the unit rackmounted, you will most likely use the MOTU Audio Setup program for changing settings (on a Mac, all selections are available from the program's icon in the Dock) and the CueMix software for monitoring functions.

PRODUCT SUMMARY

MOTU 8pre

FireWire audio interface
$595

FEATURES	4
EASE OF USE	4
AUDIO QUALITY	4
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Good-sounding converters and mic preamps. Supports high sampling rates. Expandable. Individual phantom-power switches. High-quality software.

CONS: Small knobs. Unintuitive front-panel controls.

MANUFACTURER
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www.motu.com

Round Back and Inside

The 8pre's rear panel (see Fig. 2) supplies eight combination XLR/TRS connectors, dual ¼-inch Main Out jacks, two FireWire ports, MIDI In and Out, and four digital optical ports. The top two optical ports are for standard 8-channel ADAT in and out or channels 1 through 4 of SMUX or MOTU 2x operation. The bottom two optical ports are for channels 5 through 8 of SMUX or MOTU 2x operation. A jack for the AC cable (the unit has an internal power supply) is also on the rear panel.

Enabling MIDI in my system (a dual-processor Apple Power Mac G5 running MOTU Digital Performer 5 under Mac OS X 10.4.9) was a simple matter of clicking on the 8pre's icon in the Audio MIDI Setup utility and drawing lines to and from my keyboard controller. With that I had full communication with the few outboard MIDI devices I still use (a couple of sound modules and multi-effects boxes). The 8pre's seamless integration with OS X's Core Audio and MIDI over FireWire made that communication trouble-free.

For Mac users, the supplied CD-ROM includes the required FireWire and MIDI drivers for the 8pre, along with the MOTU Audio Setup and CueMix Console programs, which let you control the unit from a Mac. (Optionally, you can install the AudioDesk recording application.) For Windows users, there are versions of MOTU's MIDI Driver, Audio Setup, and CueMix Console, along with ASIO, WDM, and GSIF drivers for the 8pre.

Cue It Up

The CueMix Console window gives you access to the 8pre's mixing features, which let you monitor the mic inputs with zero latency and no drag on your CPU. You can route any combination of inputs to any stereo output pair and set up four completely independent mix configurations, which can be saved and loaded according to

your needs. Each mix can support all 16 inputs (8 XLR/TRS analog and 8 ADAT optical digital). These CueMix functions can be used in tandem with your recording software or independently.

You can record any of the four CueMix DSP mixes back to the computer. The program's Talkback and Listenback buttons let you temporarily dim all audio and talk to musicians in the live room or listen to them. You'll need to set up dedicated mics and allocate inputs for these features, though.

When the 8pre operates as an optical expander (no FireWire connected), CueMix Console automatically routes each analog input to its corresponding optical output channel—analog in 1 to optical out 1, analog in 2 to optical out 2, and so on. If you use the 8pre's 1x sampling rate (either 44.1 or 48 kHz), the analog input signals are duplicated and sent to both optical output banks. This lets you send the analog input signals to two separate digital destinations.

Sounding Good

After I learned the 8pre's basic functions, I had little else to do except plug in mics and start recording. I set up a small session involving vocals, piano, bass, and acoustic and electric guitar. I connected three different mics: a large-diaphragm condenser for the vocalist, a "pencil" condenser mic for the acoustic guitar, and a dynamic mic on a combo amp for the electric guitar. I plugged an electric bass and synth into channels 4 and 5. With 40 dB of gain, the 8pre's TRS inputs had plenty of juice for instrument inputs and plenty of headroom as well. I padded down the guitar amp's mic because the amp sounded best turned up loud in another room.

I was impressed with the unit's mic preamps. Although I generally prefer all-analog circuitry and tube mic preamps, the 8pre's sound was excellent, and of course the convenience of multiple channels was perfect for a quick band demo. I can't keep eight high-end tube mic pres in my home studio for these situations, and I wouldn't hesitate to employ the 8pre on any kind of ensemble session. Its converters were transparent sounding, allowing the color and clarity of my various mics to come through.

Expandable Gem

For anyone who needs multiple mic or instrument inputs to record a band in a studio or even a live setting, the 8pre is a handy box to have. It can work fine as your main audio interface, and will provide you with eight high-quality preamps for mics or instruments and eight additional channels of optical/digital I/O. It offers pristine high-resolution recording through excellent converters, as well as plenty of expandability. In short, it's a box that does just about everything except play and sing for you.

Rusty Cutchin is a former editor of EM and a producer, engineer, and music journalist in the New York City area.

FIG. 1: One of FM8's two Browser interfaces. You select attributes and see matching patches, or view patches with a file-tree display.

NATIVE INSTRUMENTS FM8 1.0.1 (Mac/Win)

FM synthesis just got a whole lot easier.

By Marty Cutler

The Yamaha DX7 and DX9 frequency modulation (FM) synthesizers stood in sharp contrast to the prevailing subtractive, analog instruments of their day. FM promised crisp, bell-like tones; razor-sharp, punchy attacks; and, in some instances, almost sample-quality realism—difficult tasks for subtractive instruments. FM synthesis is now a staple in every electronic musician's cookbook, as evidenced by the inclusion of a free FM soft synth in a number of DAWs.

FM simply does things no other synthesis method can do.

Native Instruments FM7 was a high-water mark among FM synths. The new FM8 sports a redesigned user interface, new effects, a hybrid pairing of step sequencer and arpeggiator, and much more. I will focus on what's new in FM8. (For a full review of FM7, see the July 2003 issue of EM, available online at www.emusician.com.)

FM8 comes in standalone, AU, VST, DXi, and RTAS versions. It takes only minutes to install and authorize. Immediately after you type in a serial number and install the software, a dialog box pops up to install NI Service Center, a Web-based authorization application. I tested FM8 as a standalone instrument and in Ableton Live 6 and Cakewalk Sonar Producer 6 on my 3.06 GHz Windows XP notebook with 1.5 GB of RAM. On the Mac side, I used

SD2
ORCHESTRAL WIZARD

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USB to Midi cable (optional)

pc and midi sound module

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Live 6, MOTU Digital Performer 5.11, and Steinberg Cubase 4 on my dual-processor 1.42 GHz Power Mac running Mac OS X 10.4.2 with 2 GB of RAM.

Below the Surface

FM8 discards the predominantly dark green and yellow, DX7-influenced user interface in favor of cooler shades of pale blue and gray. The new color scheme is easier on the eye, but some parameters set in white against a pale blue backdrop are a bit tough to decipher. I would prefer a choice of color scheme, but the redesign of the interface goes way beyond cosmetic changes—it is immensely more efficient in every way. The Navigator section, located on the left side of the instrument, is a significant enhancement; clicking on any of the square buttons instantly reveals a new window to its right.

FIG. 3: The Easy/Morph page greatly simplifies the FM sound-design process. The large Morph controller on the right is replicated in a smaller one at the top of all pages.

The Browser button opens FM8's patch browser. You can toggle between a typical file-tree display and a list of attributes that filter patches by category. Selecting additional attributes such as piano, synthetic, wooden, and percussive refines your search. Matching patches appear in the far right column (see Fig. 1). You click on the Attributes button to edit the current patch's attributes as well as to add search criteria such as authorship, ratings, color coding, and comments.

You click on the Master button for global instrument settings. These include output and input gain (you can process external signals through the effects as well as use inputs as carriers and modulators), polyphony, the number of unison voices (with dynamic voice allocation), panning, and detuning. The global parameters will be familiar to FM7 users, but the layout is more intuitive and consolidates a few controls from other pages, such as pitch-bend settings.

In Full Effect

Effects have a dedicated page in FM8 (see Fig. 2), and justifiably so—there are many more effects on tap. You click on an effect's name in the Effects Navigator to activate it. Its programming controls then appear in the effects rack to the right of the Navigator. You can save multi-effect settings; they, along with a hefty batch of factory presets, are selected from a pull-down menu. FM8 effects range from straightforward reverb, delay, and chorus to guitar-amp modeling and vowel simulations, and you can pile on effects until your CPU starts to smoke.

The arpeggiator implementation is one of the most musical I have seen. It resembles a step sequencer, but instead of playing preordained notes, it draws its pattern from the currently held MIDI notes. Strictly speaking, the arpeggiator is more of a motif generator than a simple repeater of note patterns. It's very easy to create split points with one part of the keyboard arpeggiated and the other not. The Pattern Editor is very flexible, letting you specify durations, ties, accents, and note selection and transposition. You can dial in the amount of swing on the fly as well as set up playback to latch or to stop with each keypress.

FIG. 2: The Effects page lets you apply any of FM8's 12 effects. You can create your own multi-effects templates or choose from a generous list of presets.

Naturally, you can load preset patterns or create your own, which can then be saved for use in other patches. Some of the preset patterns are so musical and self-contained that holding down a single note is

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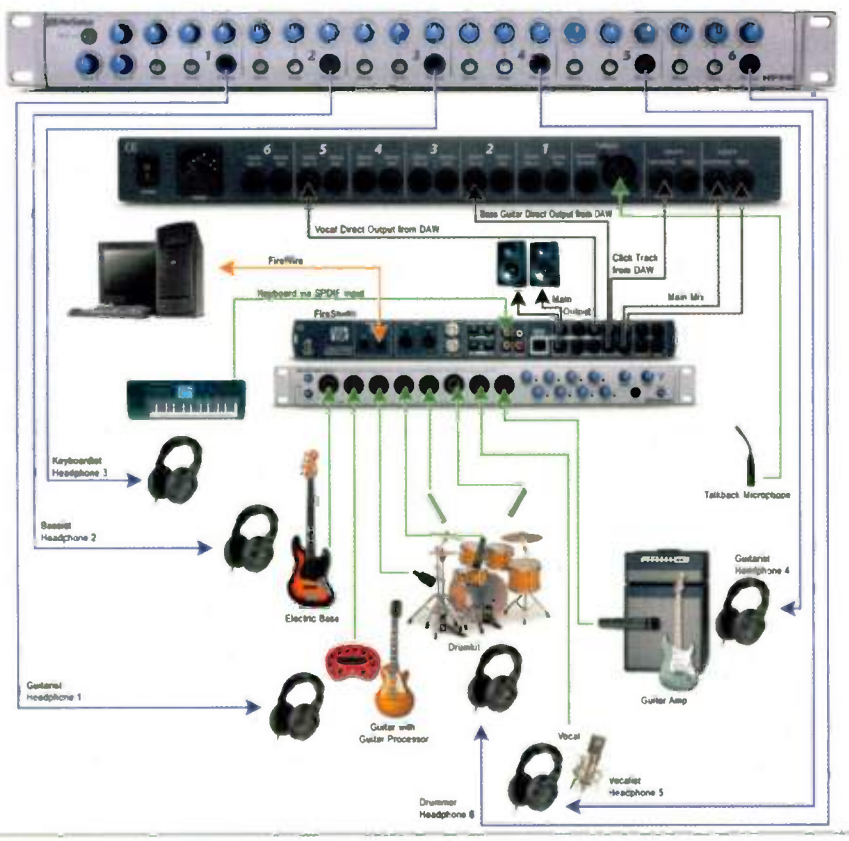

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- Talkback with external XLR microphone
- Direct stereo line output on each channel
- Mono and mute on each channel
- **$299 (estimated USA street price)**

sufficient to generate a song-starter motif (see **Web Clip 1**).

Morphy's Law

The Easy/Morph section exemplifies the remarkable ease-of-use advances in FM8 (see **Fig. 3**). Sound designers will find plenty here to keep them busy without fiddling with carrier-to-modulator ratios or indexes. The Timbre knob controls overall brightness by increasing the output level of all modulators. To change harmonic content, you get a Harmonic knob. That produced results somewhat less predictable than a more focused adjustment of relative operator frequencies would, but the results were usually useful and interesting. Similarly, you get master ADSR timbre and amplitude envelopes as an alternative to tweaking the considerably more complex breakpoint envelopes of individual carrier-and-modulator systems.

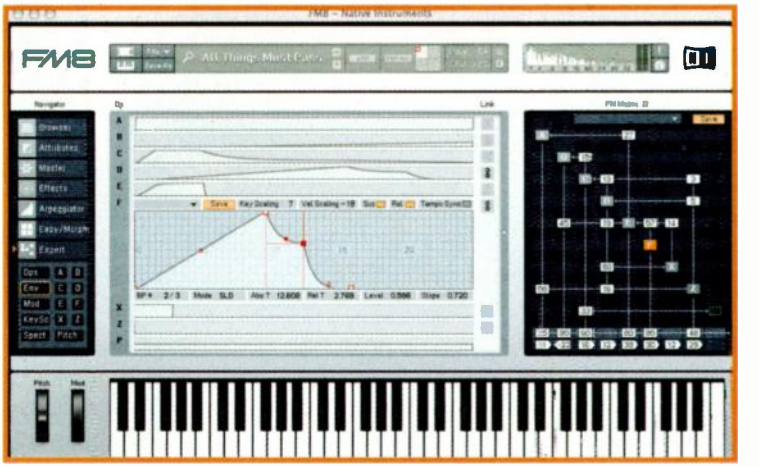

FIG. 4: The Envelopes page lets you edit any envelope as well as link it to other envelopes. The FM Matrix section at the right shows the arrangement of carriers and modulators.

You can access FM8's morphing capabilities from any page by using a small Morph controller in the Application Control Bar at the top of the interface. The current morph position is indicated by a red square, which you can click-drag to change the morph. You drag-and-drop patches from the browser to quadrants of the Morph controller to set up morphing. Morphing applies to timbral parameters only: FM Matrix and FM Operator settings along with overall effects amount. Morphable controls are indicated by a small Morph controller icon next to the control. All non-morphable settings are taken from the first patch dragged to the Morph controller.

The larger Morph controller on the Morph page allows more-accurate onscreen morphing and shows the names of each quadrant's preset. Sliders along the top and right of the Morph controller introduce a random element to each morphed parameter; that is depicted by a cloud of dots surrounding the morphing handle. A Normalize Timbres button captures the current morph and applies it to all four quadrants, effectively creating a new patch in case you've found a sweet spot you'd like to keep.

PRODUCT SUMMARY

NATIVE INSTRUMENTS FM8 1.0.1

software synthesizer
$339
update from FM7, $119

FEATURES	5
EASE OF USE	4
QUALITY OF SOUNDS	5
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Elegant redesign of user interface. Browser and attributes make patch selection easy. Musical and sophisticated arpeggiator section. Patch morphing. Generous library of great-sounding presets.

CONS: Color scheme can make certain parameters difficult to read.

MANUFACTURER
Native Instruments
www.native-instruments.com

Everyone's an Expert

The Expert section contains multiple pages, and you can jump directly to any page by clicking on a small button in the Navigator. This section is streamlined and informative, with all of the instrument's deeper features available to the experienced FM programmer. The Envelopes page is a particularly fine example. That is where you set up FM8's multistage, breakpoint envelope generators. These resemble the envelopes in Native Instruments Absynth; you can insert breakpoints anywhere between the attack and release stages and loop the sustain portion. It's easy to alter the slopes between breakpoints—just grab the small circle on the line connecting them. You can adjust breakpoints independently (Fix mode) or have all subsequent breakpoints adjust as you move a breakpoint in time (Slide mode).

All envelopes (one for each operator and one for pitch contour) are stacked vertically on the Envelopes page. Clicking on any operator expands its envelope for editing (see **Fig. 4**). You create envelope groups by clicking on link buttons to the right of the envelopes—linked envelopes have identical shapes.

In the Operator window, a drop-down menu presents the familiar DX7 sine-wave fodder along with 31 additional waveforms. You can invert any of the waveforms, multiplying your sonic options. The Spectrum and Waveform windows now have a dedicated page. Although you cannot edit them directly, the expanded visuals are much more useful than those of FM7, especially when morphing.

One of the most difficult aspects of programming FM sounds is maintaining context. Because the Expert section always displays the arrangement of operators in the FM Matrix window, it's easier to keep track of the signal flow. The only exception is the Modulation Matrix section,

which simultaneously displays MIDI and LFO modulation routings for all operators.

Sine Qua Non

Kudos to the FM8 preset programmers—they have provided a broad representation of the instrument's new capabilities as well as FM-synthesis mainstays. You'll find plenty of the more conventional presets: sweet or clangorous bells; electric pianos; and hard, punchy basses. More interesting, however, are sounds that are characteristically FM in origin but much more animated and livelier than earlier FM instruments could achieve. I auditioned creamy, evolving pads; wave-sequence-style percussive patterns; smoky, cinematic-sounding backdrops with skittering harmonics in the upper frequencies; gritty leads; and some very thick analog-type timbres. The preset collection is generous, encompassing the new FM8 sounds, the original FM7 factory library, and the FM7 Sounds Volumes 1 and 2 aftermarket libraries. FM8 is backward compatible with the vast library of DX and TX (including the TX 81Z) SysEx data floating around the Internet.

At its core, FM synthesis will probably never be completely intuitive. That said, Native Instruments has created an outstanding user interface that greatly facilitates FM's most important sound-design tools. FM8 gives more-experienced FM mavens an unobstructed path to more-abstruse parameters. The *FM8 Operation Manual* (provided in hard copy and PDF) is an excellent reference and manages to explain the basics of FM synthesis in the context of a guided tour of the instrument.

FM simply does things no other synthesis method can do. FM8's enhanced sonic capabilities combined with real-time control are tremendous. I can't think of a gentler introduction to FM synthesis. You'll find a downloadable demo on the Native Instruments Web site that functions for half an hour at a time without unexpected noise or dips in output. FM8 is an easy choice, and I recommend it highly for FM novices and experts alike. EM WEB CLIPS

Marty Cutler learned FM programming with a Yamaha TX7, a Commodore 64 Editor-Librarian, and a huge book of patches from Valhalla. That was probably before your time, youngsters.

FIG. 1: Gofriller Solo Cello ships with Kontakt Player 2, a playback-only sampler. Effects can be added in the mixer panel (lower right).

GARRITAN Gofriller Solo Cello 3.02 (Mac/Win)

Do you really need the big wooden box?

By Jim Aikin

As a cellist, I'm keenly aware of the limitations of most sample libraries dedicated to solo strings. Even with an extensive library containing multiple articulations (types of bowing), a given sample is a static entity. Expressive nuances that are easy and natural on a bowed instrument simply can't be achieved by triggering samples.

That's why I was eager to learn about the technology behind the Garritan Stradivari Solo Violin and Gofriller Solo Cello libraries. Though these libraries are based on samples of real instruments, advanced signal processing is used to give electronic musicians greater freedom of expression and to reproduce details of string performance that would be difficult or impossible to achieve using standard sample-playback techniques.

We reviewed the Garritan Stradivari violin library in the August 2006 issue of EM (available online at www.emusician.com). Many of the features discussed in that review are carried over to Gofriller Solo Cello, though several minor enhancements have been added.

The End Pin

Gofriller Solo Cello occupies 509 MB of disk space and is played through Native Instruments Kontakt Player 2, which is installed along with the library (see Fig. 1). Online authorization through Native Instruments Service Center is required but painless. Gofriller Cello and Kontakt Player 2 are closely tied together via the latter's MIDI script feature, which allows developers to craft unique responses to incoming MIDI messages. Because of this, Gofriller Cello presumably won't be released for other platforms. This is not a big stumbling block, though, as Kontakt Player 2 can operate in standalone mode or in any of the major plug-in formats.

I used Gofriller Solo Cello on a 3 GHz Pentium 4 PC with 1 GB of RAM and Windows XP SP2, running it both as a plug-in in Steinberg Cubase 4 and as a standalone. I encountered no operational anomalies of any kind: the software was rock solid.

For this review, I beefed up my M-Audio Axiom 61 keyboard controller with an M-Audio EX-P Expression pedal. Although it would technically be possible to record tracks using Gofriller Cello with a plain MIDI

keyboard and then add Expression (Control Change 11) and Channel Pressure data after the fact using a pencil tool, the spark of musical spontaneity would be lost. For practical purposes, an Expression pedal and a keyboard that transmits Channel Pressure should be considered necessities with the Garritan solo string libraries.

Gofriller Cello uses MIDI keys in the bottom octave to switch among a dozen different sound sets, modes, and articulations, such as pizzicato and harmonics. Tapping these keys and using MIDI Expression inputs are the extent of your control over Gofriller Cello—Kontakt Player 2 does not allow user editing of synthesis parameters such as filtering and envelope, though it does have some insert effects. Nor can you edit the MIDI script yourself.

The Fingerboard

Each note played on Gofriller Solo Cello (other than pizzicato) is assembled on the fly using several distinct sample layers. The attack layer contains only the initial sound of the bow addressing the string. This layer responds to Key Velocity, with low Velocities producing little or no attack noise and high Velocities producing a short and rather pronounced gritty noise. Repeated notes automatically alternate between two attack samples, which helps prevent the machine-gun effect and helps coax the ear into believing that the notes were played by alternating up- and down-bow strokes.

Note attacks blend seamlessly into the sustain layer. This layer crossfades between soft and loud samples under control of the Expression pedal. Ordinarily, crossfading between two sustaining pitched samples would produce phase cancellation artifacts, which would make the composite tone extremely unrealistic. One of the innovations in the Garritan solo string libraries is that the soft and loud samples in the sustain layer are phase aligned, allowing them to be crossfaded seamlessly (this technology was developed by Georgio Tommasini and Stefano Lucato). The phase alignment seems to work perfectly: I could detect no phase cancellation when I pumped the pedal.

That said, the difference in timbre between a cello bowed lightly and a cello bowed strongly is not great. Running a strongly bowed sample through a gentle 6 dB-per-octave nonresonant lowpass filter and closing the filter slightly to simulate soft bow strokes would give a very similar type of response.

The Gofriller Cello sustains are not looped. If you sustain a note for about six seconds, it will stop. Because a real cello runs out of bow after a few seconds, this makes sense. If you lift your finger before the end of the sustain, the sound transitions seamlessly to a release sample layer. But if you let the sustain run out while still holding the key, the release sample won't be triggered automatically; it will happen only when you lift your finger, which is very unrealistic.

The release samples add a couple of subtle touches of realism, however. First, notes that would resonate with the cello's open strings have slightly longer releases—not as long as on a real cello, but the difference is audible. Second, if you play a series of short notes that would be played on the same string on a cello, only the last note will have a release sample. But if you play two short notes that would be on different strings, both will be given release samples. No one but a string player would be likely to notice, but it does make a subliminal difference.

Listeners are more likely to notice the brief shifting noises that can be added to legato phrases. The amount of shift glissando between notes is controlled by overlap and Velocity. If the first note ends before the second begins, no glissando occurs. (On a real cello, of course, one can easily glissando into the first note in a phrase.) If

one note is still sounding when the next begins, a high Velocity on the new note will produce little or no audible glissando, while a low Velocity will produce a realistic slide up or down to the new note. This effect is more complex acoustically than adding a pitch envelope; it really does sound to my ears like samples of positional shifts played on the fingerboard.

Vibrato is controlled in Gofriller Cello using a combination of Mod Wheel (for vibrato depth) and Channel Pressure (for speed). The vibrato sounds very good: it's not just a pitch change such as you'd get with a conventional pitch-modulation LFO, as there are realistic timbral changes as well.

To play music with Gofriller Cello, you'll need to learn some new techniques. Changes in bow pressure can be simulated using the Expression pedal, while vibrato is controlled with the left hand on the mod wheel and the right hand adding Channel Pressure. To add the sound of a shift between notes, you'll need to touch the new note lightly, even if the music is loud. Working the pedal and the mod wheel during every note will help maintain the illusion that an acoustic instrument is being played.

COURTESY GARY GARRITAN

FIG. 2: The Gofriller cello, circa 1705, made in Venice, Italy.

The Frog

My initial response to Gofriller Cello was lukewarm, for three reasons. First, I'm a cellist, so my hopes and expectations were unrealistically high. Second, I hadn't yet hooked up the Expression pedal, so I was hearing only the soft sustain tones, which naturally have a higher proportion of bow noise. Third, I was listening to Gofriller in an unaccompanied setting, with no backing tracks.

Fortunately, Joe Cavanagh, one of Garritan's artists, had already recorded a MIDI file of Gofriller Cello playing Saint-Saëns's well-known solo, "The Swan." I was already at work on a new synthesizer backing track for "The Swan," so I was able to compare Gofriller Cello directly against my own performance of the same piece (see **Web Clip 1**). After I did some MIDI editing to get Gofriller Cello to sit better with my backing tracks, I was very pleasantly surprised by the quality of the sound. An educated ear can hear the difference between Gofriller and the real thing. On the other hand, my semipro performance had some imperfections from which Gofriller didn't suffer.

When soloed, the tone of Gofriller Cello is not as warm or gracious as I'd like. Reducing the amount of bow noise (using Control Change 15 messages) helps a little, but I can't help feeling that my own cello, which cost a mere $8,000 and was made in a factory in China, sounds as good as this lavishly praised 300-year-old instrument (see **Fig. 2**). (Garritan claims that its virtual instruments are not intended to replace real musicians.)

A couple of the phase-aligned sustain tones have weird low-level

harmonic artifacts. Middle C is especially bad in this respect, as it includes some brief artifacts that are distinctly flat. Using vibrato tends to mask these problems, but when played without vibrato, the tone of Gofriller Cello is slightly less stable than my own. The instability of a bowed tone naturally increases as the bow is slowed; faster bowing gives a tone that's purer and less wobbly. I'd speculate that the Gofriller samples may have been produced with a slow bow stroke in order to provide longer sustains without looping.

The high-Velocity attack samples seem a bit drawn out and scratchy to me. They're not a sound that I usually produce on a cello, except in staccato playing. Conversely, the quick pop of an on-the-string attack, which is normal in assertive phrasing, is not provided.

The *con sordino* (muted) samples are not different enough from the unmuted samples. They don't sound muted, just gently filtered. And the con sordino sample set uses the same bright, scratchy attack samples as the normal cello, which is surely a mistake. Gofriller Cello has no *sul tasto* (over the end of the fingerboard) samples. Sul tasto is a useful solo timbre in soft passages.

You can play double-stops (two notes at once) with this instrument, but the common technique of sustaining a note on one string while playing a moving line on an adjacent string is not possible. Smooth bowing transitions between strings, which require a momentary double-stop sonority, are also not possible. The long, ringing release tones of the open strings are not included. On the plus side, sustains of midrange tones played on a lower string than normal are included. Such tones are often used in cello playing, so it's great to have them.

High Strung

Garritan's promotion for Gofriller Solo Cello promises "unprecedented control, unlimited variability, and extraordinary levels of realism, musicality, and expressiveness." The level of control is definitely unprecedented: this software instrument is far more responsive to MIDI playing techniques than a conventional sampled instrument, and to that extent, its expressiveness is definitely enhanced, though perhaps not to an extraordinary level. The technology is promising, and I look forward to seeing further refinements.

The tone of Gofriller Cello is not impressive when soloed, but it can sound realistic when properly mixed within an ensemble. If you're doing computer-based orchestrations and need solo string voices to blend with a sampled string section, you may feel that Gofriller and Stradivari are gems. I shouldn't say this, but if you normally hire a few string players, these plug-ins will quickly pay for themselves.

EM WEB CLIPS

Jim Aikin writes regularly about music technology for various magazines. In the mid-1960s, he studied privately with Laszlo Varga, who had been the principal cellist of the New York Philharmonic under Leonard Bernstein.

PRODUCT SUMMARY

GARRITAN Gofriller Solo Cello 3.02

intelligent sample library

$199

FEATURES	3
EASE OF USE	4
AUDIO QUALITY	3
VALUE	4

RATING PRODUCTS FROM 1 TO 5

PROS: Playable and expressive. Sounds very plausible in a mix.

CONS: Tone lacks certain subtleties, especially when soloed.

MANUFACTURER
Garritan
www.garritan.com

RØDE

NT55

By Rob Shrock

The Røde NT55 ($499) is a small-diaphragm condenser microphone that utilizes the same ½-inch, gold-sputtered transducer as the critically acclaimed Røde NT5. However, the NT55 offers interchangeable capsules (it ships with cardioid and omni patterns), a variable 3-position pad (0, –10, and –20 dB), and a highpass filter (flat, 75 Hz, or 150 Hz). Like other Røde microphones, the self-noise of the NT55 is very low. Yet it handles SPLs up to 156 dB, so it can stand up to just about anything that crosses its path.

Each NT55 comes in a tin case with a hard foam insert and a sturdy clip. (The foam has two extra slots, so hopefully additional capsules, such as figure-8 and supercardioid, are on the way.) The NT55 is also available in matched pairs.

A Familiar Face

The NT55 is somewhere between the AKG 451 and Neumann KM 84 in size and shape, so you can easily guess the applications it is best suited for—acoustic guitar, strings, percussion, hi-hat, and snare drum. The mic seems well built and the capsules easily screw onto the body.

My only problem with the mic was with its clip, which is made from hard plastic. Considerable force is required to snap the NT55 into place (it doesn't slide in, as you would expect). Once in the clip, the NT55 is very secure.

The NT55's pad and filter switches are recessed, so you will need a pointed object to adjust them. Although it requires a bit of effort to change the settings, their position mitigates any accidental switching.

Six-String Strut

The first test for the NT55 was on my prized Tacoma acoustic guitar. This instrument sounds like money when heard live in a room, but the only good recordings I've experienced were with a 451 or KM 84. I now have to add the NT55 to that list. At about 2.5 feet back, with one mic pointed at the 12th fret and another at the back of the sound hole, the guitar took on a natural and dry character with both cardioid capsules.

Swapping out the cardioid capsule of the neck-position mic for the omni capsule opened up the room sound a bit and gave the guitar more air, while yielding a brighter tone. Going back to the manual, I noticed that there is a fairly significant bump around 10 kHz on the omni capsule.

Moving the other mic closer to the guitar's body increased the cardioid-induced proximity effect. This created a different guitar sound, because the extreme top and bottom frequencies were now more pronounced. Engaging the highpass filter at 150 Hz removed some of the low-end buildup, and I was pleased with the resulting tone.

The highpass filter employs a gentle 12 dB-per-octave curve, which is a good thing, because the NT55 doesn't have an overblown bottom end to start with. I wouldn't call it thin, but it would not be my first choice for low-end instruments such as bass or a surdo drum.

The beauty of the NT55 is in its midrange detail, which I really loved. The sound of my fingerpicking was very clear, yet strumming with a pick did not result in a "splanky" sound, which can often happen with small-capsule condensers on acoustic guitar.

Swapping out the cardioid capsule of the sound-hole mic for the omni capsule allowed me to set the microphone closer without further low-end buildup. And lowering the highpass setting to 75 Hz resulted in a present and full-sounding guitar tone with a better sense of space around it.

On the Bright Side

The NT55 also excels on bright percussion such as hi-hats, shakers, and bongos. The diaphragm responds very quickly to transients, so any instrument with a sharp attack would be a good candidate for this mic. In particular, I got a great tambourine sound without that bizarre low-end aliasing that's common with large-diaphragm condensers.

On violin, I got a nice, intimate sound using the cardioid capsule. The omni capsule sounded too bright for my taste when it was positioned close to the instrument; it sounded better farther away, where the pronounced room sound was compensated for by the lift in the top end. However, both sounds would be useful, depending on the musical application.

The Røde to Glory

I really liked the fact that by changing the capsules and moving the microphones around, I was able to get noticeably different tones with just two NT55s. All the while, the midrange stayed constant and clear. Although no further EQ was required for a good guitar sound, I was able to drastically equalize the tracks without the tone falling apart—another sign of good detail in the midrange.

Coupled with a quiet microphone preamp, the NT55 is an excellent choice for the most critical of applications. With a street price of around $350, Røde has another winner in its stable. EM

The Røde NT55 has interchangeable capsules, as well as 3-position switches for pad and low cut.

Value (1 through 5): 4
Røde Microphones
www.rodemic.com

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Waves native processing

Waves has long been synonymous with quality plug-ins, and the Waves Platinum Bundle contains a huge range of top-quality Waves processing for your DP5 studio. The Platinum Bundle now includes Waves Tune LT, L3 Ultramaximizer, and IR-L Convolution Reverb as well as all the plug-ins found in the Waves Gold and Masters bundles. Platinum brings extraordinary signal processing power to DP5, for tracking, mixing, mastering, and sound design. From dynamics processing, equalization, and reverb to pitch correction, spatial imaging, and beyond, Waves Platinum Bundle is a must-have for every MOTU studio.

The MOTU experts at Sweetwater can build the perfect DP5 8-core studio for you. We'll help you select the right components, and we can even install, configure and test the entire system for you. Why shop anywhere else?

Jimi Hendrix Guitar Tones

IK Multimedia AmpliTube Jimi Hendrix™ is the first authentic software recreation of the complete Hendrix guitar amp and effects rig in a single product, offering all the rare vintage stomps, amps, cabinets and mics that contributed to make Hendrix's legendary sound. Based on IK's award-winning AmpliTube 2 and made in cooperation with Authentic Hendrix, the official family-owned company, AmpliTube Jimi Hendrix™ features 9 vintage stomp effects, 4 vintage amp models, 7 cabinets and 5 mics, putting a complete collection of extremely expensive and hard-to-find gear right at your fingertips, all carefully modeled with proprietary AmpliTube 2 BSM™ (Dynamic Saturation Modeling) technology and accurate craftsmanship from actual gear of the '60s. Get that classic Jimi Hendrix tone, plus the best vintage guitar effects and amp gear ever offered in software.

Mastering at its finest

IK's Master Perfection Suite – Six stunning new audio plug-ins at a breakthrough price! Repli-Q provides unparalleled spectral matching for improving an improperly equalized track, mastering for different delivery formats, or applying the EQ of one mix or track to another. Squeez-3 and Squeez-5, two powerful multi-band compressor/limiter/expander plug-ins, feature advanced new linear phase equalization filters. PitchCraft offers super natural pitch correction/transposition and manipulation with minimal artifacts. Reveal integrates seven analysis tools in a single plug-in — Oscilloscope, Peak & RMS Power History, Spectrogram, Pan Power, Spectral Analysis, Lissajous Phase Scope and Peak & RMS Level Meters. SuperFreq offers ultimate 4, 6, 8 and 10-band paragraphic EQ. GateEx provides high-quality gating and downward expansion. Available separately, or with Peak Pro XT, the Master Perfection Suite is an indispensable addition to your Digital Performer desktop studio.

Vintage EQ/Compression

The Focusrite Liquid Mix is another Focusrite first and a true one-of-a-kind. Based on the award-winning Liquid Technology, the Liquid Mix provides 32 channels of simultaneous DSP powered vintage and modern EQ and Compression plug-ins into your DP5 mix without affecting your host computer's CPU. 40 classic compressors and 20 timeless EQs are included. Each EQ and Compressor emulation is painstakingly created though a process called Dynamic Convolution which is a huge step beyond modeling. Through Dynamic Convolution, every frequency at every possible combination of settings is perfectly sampled. That means that you get the true sound and feel of a vintage or modern classic. Tens of thousands of dollars of gear is now right at your fingertips! Think how great your Digital Performer tracks will sound with the Liquid Mix.

Komplete control

For DP5 users who want it all: Reaktor5, Kontakt2, Guitar Rig 2 software, Absynth4, Battery3, FM8, B4II, Akoustik Piano, Elektrik Piano, Vokator, Spektral Delay and Pro-53 in a unified interface with hands-on control — Native Instruments KOMPLETE 4 and KORE put an infinite universe of sound at your finger tips. Every preset included in NI KOMPLETE 4, more than 8,500 in total, has been preconfigured and categorized in KORE with searchable musical attributes and hands-on controller assignments. This seamless integration of software and hardware turns Native Instrument's award winning synthesizers and samplers into tactile instruments. If you purchase today, you'll receive the KORE 2 software update FREE when it ships later this year!

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88 Weighted Hammer-Action Keys

Digital Performer 5 gives you unprecedented control over your MIDI and audio tracks. And what better way to take advantage of this hands-on control than the M-Audio Keystation Pro 88. Regardless of whether you're a seasoned pro or just ready to take your music to the next level, these hammer action keys are so expressive that you just won't want to stop playing! The Pro 88 could easily become your sole keyboard in the studio or onstage. Yet the Keystation Pro 88 weighs only 47 lbs. — half of most weighted-action keyboards! And the Pro 88's extensive features make it the most comprehensive and competitive product of its kind!

Control room monitoring

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

Lexicon effects processing

With the Lexicon MX500 you can have, in a purely digital form, the rich Lexicon sound that has defined studio reverb for three decades, with the convenience of an automated plug-in right beside your Digital Performer studio environment. The new MX500 takes Lexicon's "Hardware Plug-in" feature to the next level by actually streaming dual stereo audio via FireWire. Like the MX200, MX300, and MX400, all parameters of every reverb, delay and dynamic effect can be controlled from a plug-in window in Digital Performer. The MX500 houses 17 classic Lexicon reverbs, delays, and modulation effects plus dbx compression and de-essing. Front-panel control is easy, too, with a generous LCD display and big comfy knobs you can get your hands around. A wealth of routing options from quad mono to dual stereo are possible. You get 99 Factory programs and 99 user programs for Stereo mode, another 99 Factory and user programs for Dual-Stereo mode, and 25 Factory/25 user surround programs. Also included is Lexicon's intuitive MX-Edit™ Editor/Librarian software, for convenient yet advanced programming.

Professional pad controller

The Akai Professional MPD24 is the velocity sensitive pad controller for musicians and DJs working with sampled sounds. The MPD24 features 16 MPC-style velocity and pressure-sensitive pads plus transport controls for interfacing with Digital Performer and your virtual instruments. You get Akai's exclusive feel: either MPC 16 Levels or Full Level features for ultimate pad control. Now add four selectable pad banks totaling 64 pads, six assignable faders and eight assignable and 360 degree knobs for transmitting MIDI Control Change data. Included editor/librarian software gives you complete, intuitive programming and control for DP5 all of your other software titles. The MPD24 provides unprecedented creative freedom for manipulating sampled material.

The MOTU experts at Sweetwater can build the perfect powerhouse DP5 8-core rig for you. We'll help you select the right components, and we can even install, configure and test the entire system for you. Why shop anywhere else?

New Mackie monitoring

The high-resolution Mackie HR824mk2 active studio reference monitor sounds as smooth as it looks. The new Zero Edge Baffle™ minimizes diffraction for a crystal clear image of your Digital Performer mix, and controls sound waves for wide, even dispersion. The rear-firing, mass-loaded passive radiator ensures tight, detailed bass extension, down to 35Hz. And thanks to remarkably linear frequency response, you always get accurate mix translation. Acoustic Space, LF roll-off and HF controls let you tailor the sound to suit your MOTU studio space—and your taste. With all this and more, the HR824mk2 turns your Digital Performer desktop studio's sweet spot into a full-on sweet zone.

New hands-on control for DP5

The new Mackie Control Universal Pro control surface gives you ultimate hands-on control of your Digital Performer desktop studio. Nine motorized, touch-sensitive Penny + Giles faders, eight V-Pots and more than 50 master buttons let you tweak parameters to your heart's content. Unlike generic MIDI controllers, the MCU Pro employs a sophisticated communication protocol that delivers ultra-precise control, makes setup easy - no mapping required - and enables you to see your mix in action with real-time visual feedback via the huge backlit LCD and eight LED rings. Apply the custom overlay for Digital Performer for dedicated labeling of DP-specific functions. The MCU Pro is the ultimate way to mix in DP5!

Multi-pattern condenser mic

The flagship of the KSM line — and the new must-have mic for any large multitrack studio, the Sure KSM 44 multi-pattern condenser microphone has an extended frequency response specially tailored for critical studio vocal tracking. Its ultra-thin, externally biased, large dual diaphragms provide precise articulation; extremely low self-noise (7 dBA) ensures that the KSM44 captures only the sound of the performance. Inside, the three polar patterns — Cardioid, Omnidirectional, and Bidirectional — offer greater flexibility and uniformity in a wide variety of critical recording applications. Class A, transformerless preamplifier circuitry provides extremely fast transient response and no crossover distortion for improved linearity across the full frequency range.

Without Shoes

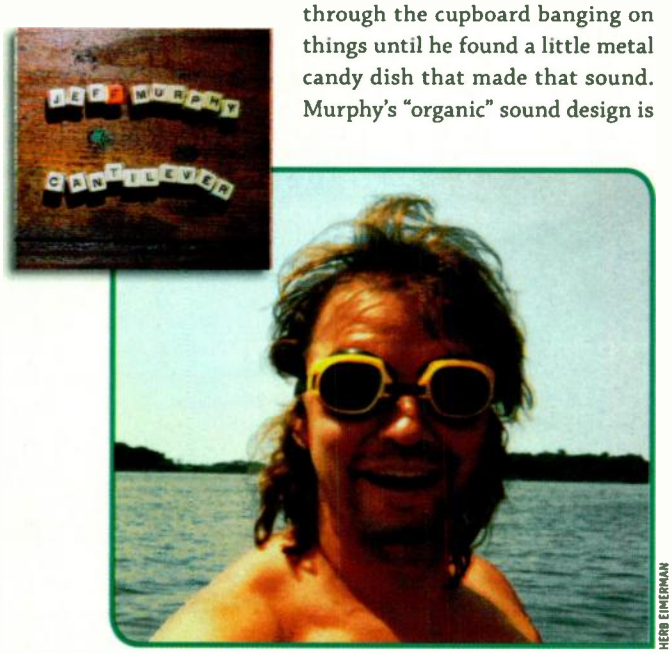
By Debbie Galante Block

Jeff Murphy's solo effort is strictly organic.

When Jeff Murphy describes his new solo album, *Cantilever* (Black Vinyl, 2007), he says it's all about the music and about being human. Murphy, who has been recording with his high school friends in the band Shoes for the past 30 years, wanted to re-create the euphoria he felt when listening to Paul McCartney's album *McCartney* (Capitol, 1970) when it was released. "I wanted to be just a guy with a recorder making music at home. It's so tempting nowadays to make tracks perfect by quantizing, looping, and pitch-correcting them into a highly polished, finished song. But I really miss the blemishes and hiccups that come from actually playing."

Murphy played every instrument on *Cantilever* and also produced and engineered the entire CD from his home. "That's one of the reasons it is called *Cantilever*. I felt like I was hanging it all out there," he says. "For this album, if I couldn't play the sound, I didn't include it."

Besides his Fender and Gibson guitars, Murphy used some unconventional "instruments" on the album. "I would get a sound in my head and I'd try to find an instrument that satisfied that thirst," he recalls. For example, in the song "A Couple of Words," he heard a percussive "ping" sound in his head, so he started going through the cupboard banging on things until he found a little metal candy dish that made that sound. Murphy's "organic" sound design is also evident on "I'm a Tool for You," the CD's opening cut. "I went out in the garage and got a pry bar and a hammer and experimented," he says. "I wanted that 'Working in a Coal Mine' clank. I could have gotten a sample of it, but I wanted to play it. It is so much more exciting to do that."



Cantilever/Jeff Murphy

RIFFS

Jeff Murphy

Home base: Zion, Illinois

Multitrack of choice: Korg D32XD

Favorite mic: Shure SM57

Web site: http://blackvinyl.com

Recording at home was a big step in achieving the organic sound Murphy wanted on this CD. He has come full circle. Back in the 1970s when Shoes was formed, he purchased one of the first home-recording tape machines, the Teac 3340. "That machine gave Shoes our career. On it, we learned how to write and sing, play, record, engineer, and produce," says Murphy.

But for the past 20 years, Murphy and his bandmates not only recorded in some of the best studios around the world, but also owned their own, Short Order Recorder, in Zion, Illinois. Eventually, Murphy and friends sold that studio, and it was then that Murphy began to set up at home. He based his home rig around a Korg D32XD personal digital studio, which he set up in a converted spare bedroom. "I'm an old-school guy, so I wanted something that felt like a tape recorder, that had faders you could grab and move along."

For monitoring, Murphy has both Event ASP8 and Tannoy PBM 6.5 monitors. "I've got a Hiwatt guitar amp and a Vox AC30. I don't have many mics because I'm recording myself. I only use one or two mics at a time." On this CD, Murphy used his "trusted old friend," a Shure SM57, as well as an AKG C 451 and C 3000B, a Sennheiser MD 421, and a beyerdynamic M69.

"While I was a studio owner, I engineered and produced other bands. Now I want to focus on being a musician and not getting bogged down in the technology." Did he achieve that? It's all pretty organic when the listener can hear Murphy's mother-in-law's phone call at the end of "She Don't Drive." EM

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