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MAY 2006

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Antares Avox 1.0.2
Roland SP-404
ToadWorks Enveloope
and 5 more

A New Look at
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BEATLES ENGINEER GEOFF EMERICK SPEAKS OUT

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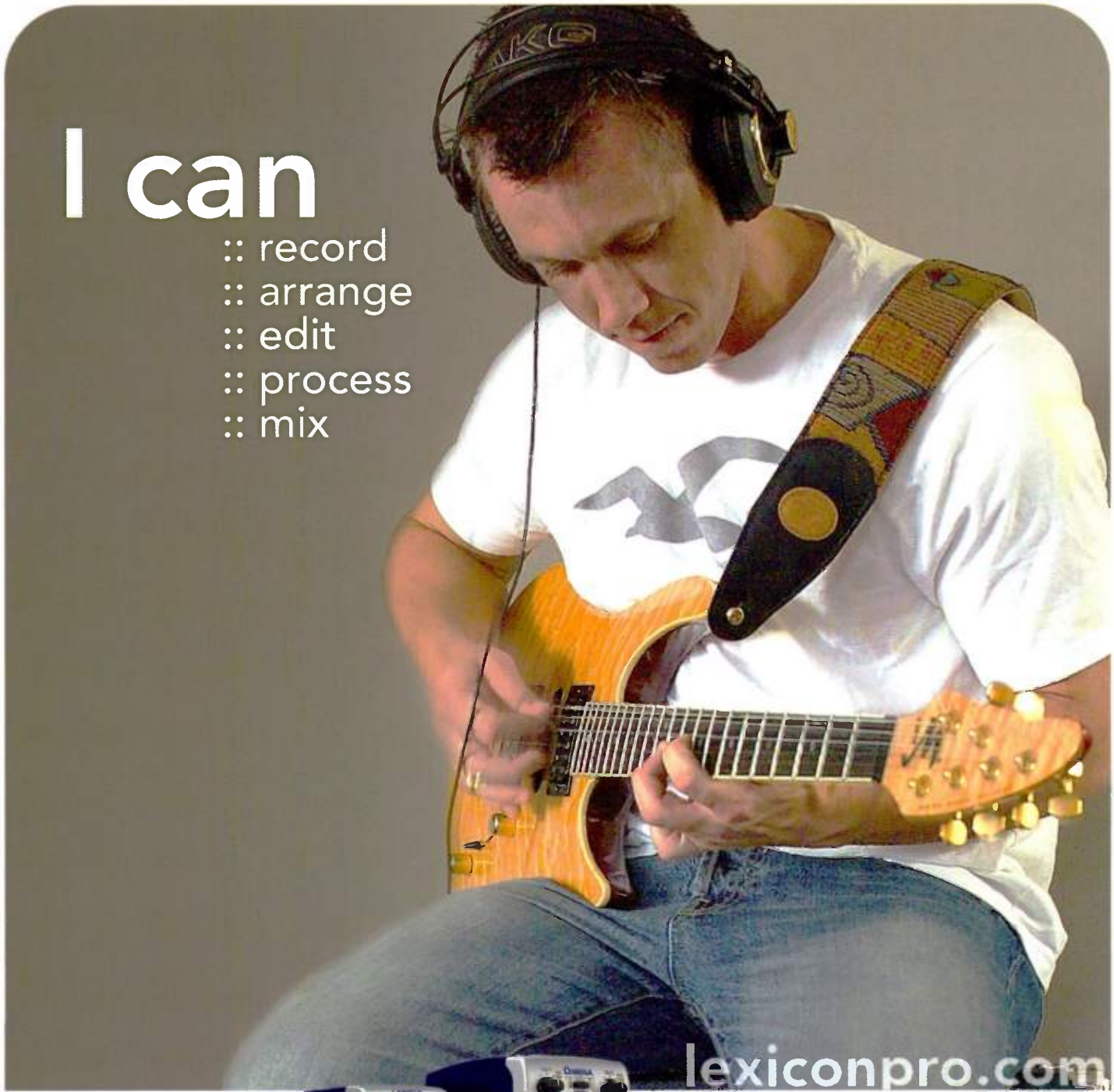

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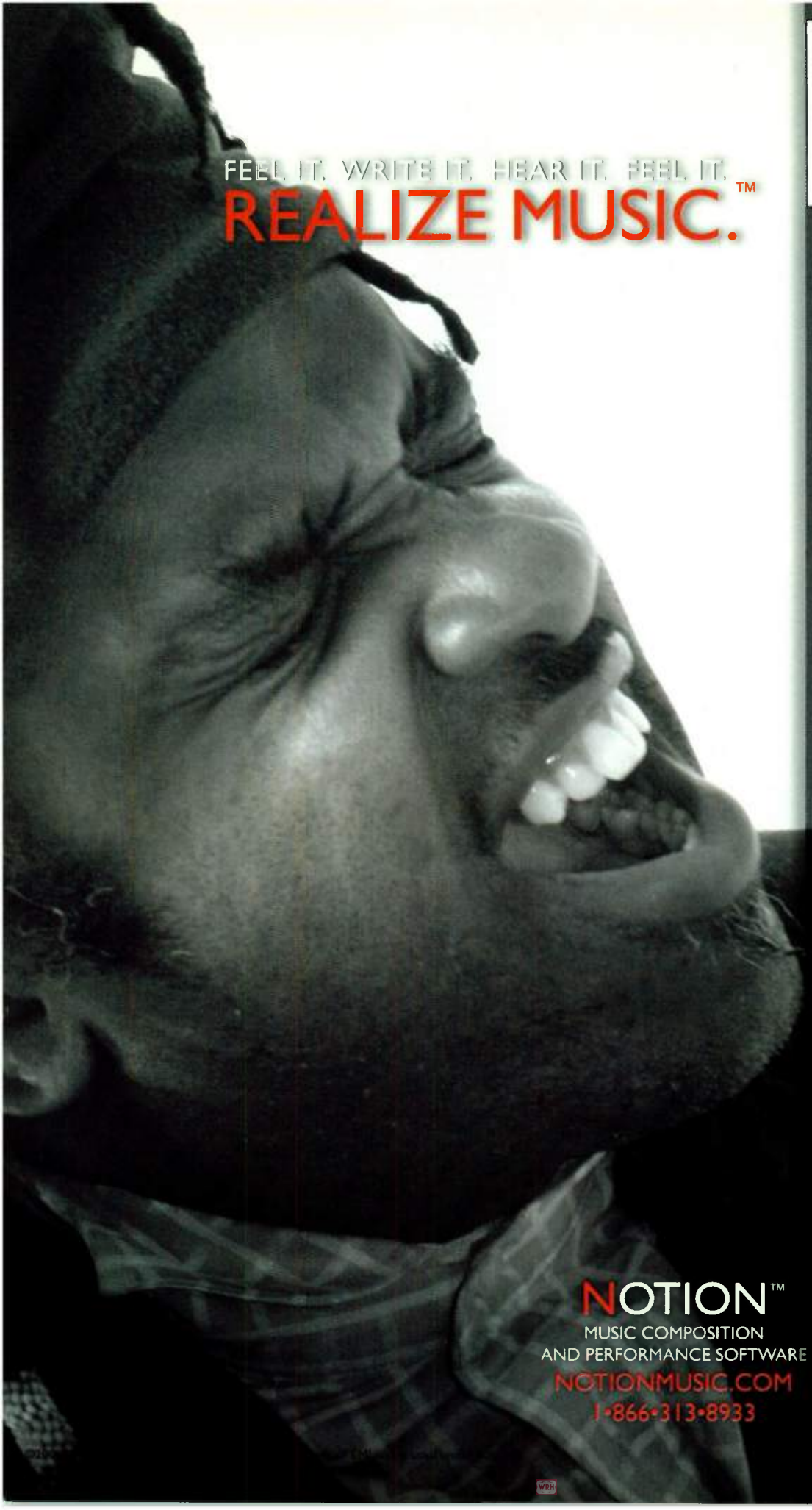

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Electronic Musician
May 2006

INSIDE

COVER STORY

COVER PHOTO BY ROBERT PERRY
SPECIAL THANKS TO JOHN RIGGS

FEATURES

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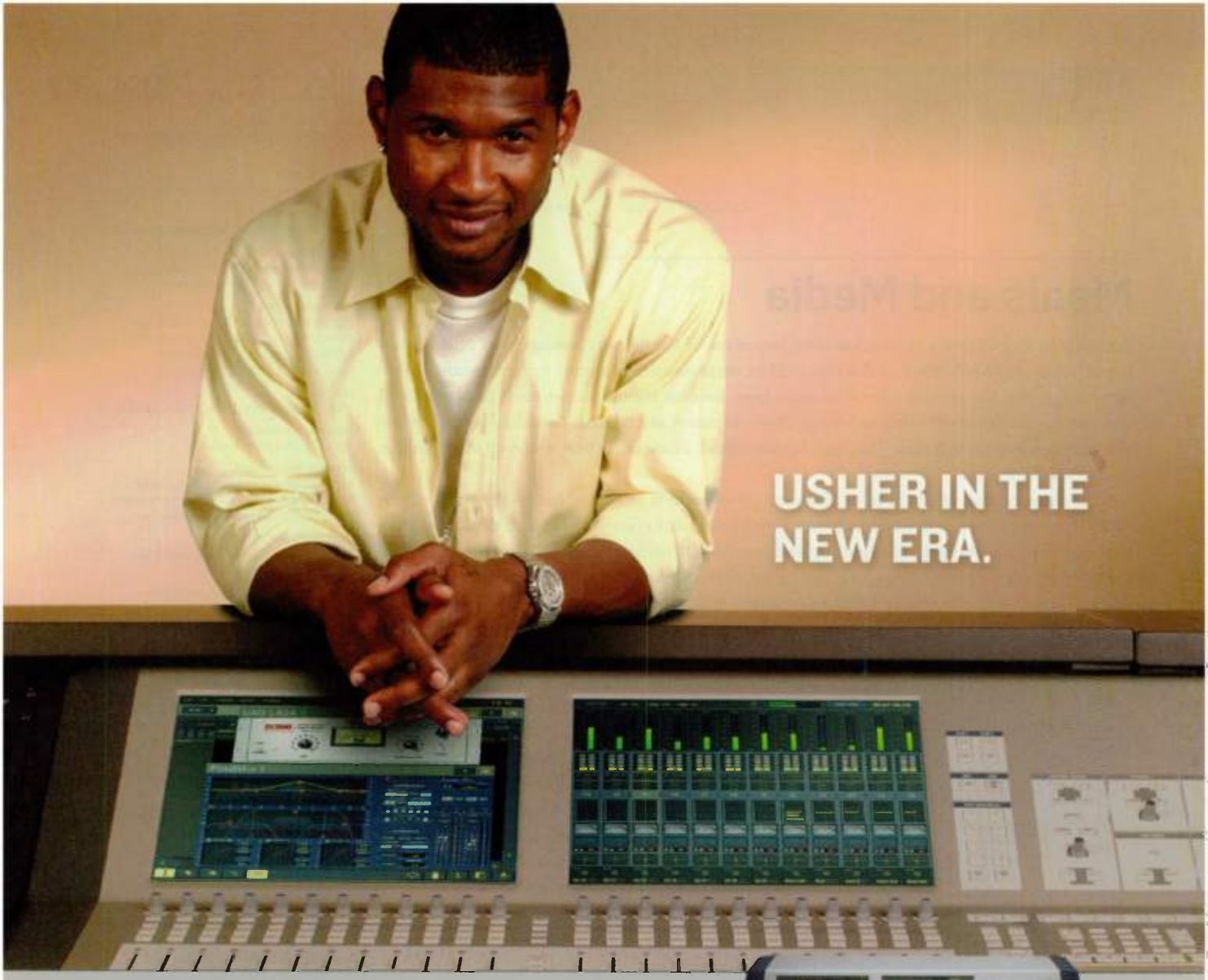
ToadWorks Enveloope dynamically controlled effects-loop pedal

FXpansion *BFD Deluxe Collection* drum library



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Meals and Media

Researching and writing a story takes time, regardless of the delivery medium, but once a story is written, it can be published on the Web or in an email newsletter almost instantaneously. With print magazines, the process takes a lot more time, because the magazines must be printed and shipped. But that's not entirely a bad thing. There are pluses and minuses to each medium. It's like choosing between great Italian, Thai, and Japanese food; all are nutritious, and each offers unique and wonderful flavors.

The print edition of EM is to us like what great pasta is to Italian food—the heart of the meal. The month we have in which to produce each print issue gives us time for in-depth research, thorough writing, and extensive editing and proofing. If necessary, we can postpone printing a story to further develop ideas, test and retest review products, and polish our prose until it shines. Graphics can be shown in high resolution without considering bandwidth. And while short items go over well online, most people prefer to read longer stories in a print magazine. In addition, they have the convenience of being able to carry the magazine around with them, rather than having to be near a computer in order to read.

MICHAEL COOPER

When timeliness is all-important, as with breaking news, online delivery is hands-down better. That's why we publish eMusician Xtra email newsletters, which have been so successful that we've sometimes even expanded the publication schedule to twice weekly. If you haven't checked them out, go to our Web site at www.emusician.com and sign up. Our newsletter subscriptions are free, and if you find that you don't want to continue to receive them, you can opt out.

Another advantage to online content is the ability to deliver rich media, such as video and audio. We've long published EM Web Clips on our site, which offer audio and application-specific examples that enhance our print stories. We also have started producing online instructional videos, more commonly known as "Webinars" or "Seminars on Demand." I promised that we'd have one or two featuring Korg USA sound designer Jack Hotop, and they are online now. To view them, follow the Seminars on Demand link from our home page. These seminars are a bit like sushi—the pieces are small but very tasty, and you feel great after consuming them.

Someday, many of the advantages of print will be subsumed by technological innovations. Flat-screen reading devices will be thinner, lighter, and at least equal in display resolution to print magazines. They will be so affordable and so well supported by publishers that they will be almost as ubiquitous as cell phones. Heck, they might also *be* cell phones. Products of this general type are already becoming available, although they're not ready to take over the world yet.

Meanwhile, the combination of print, Web, and e-newsletters offers huge potential. We have lots of ideas for nutritious content and flavorful new products in all three media for those with a hunger for music-production knowledge. Feel free to feed me your suggestions for ways we can better take advantage of the print/online combination.

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Editor in Chief

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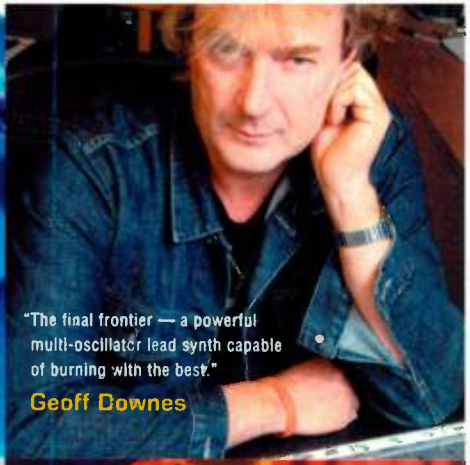

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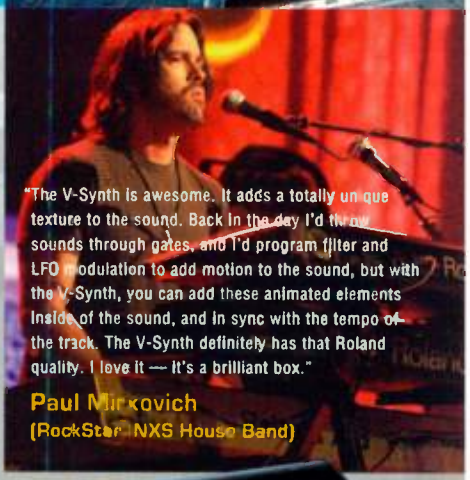

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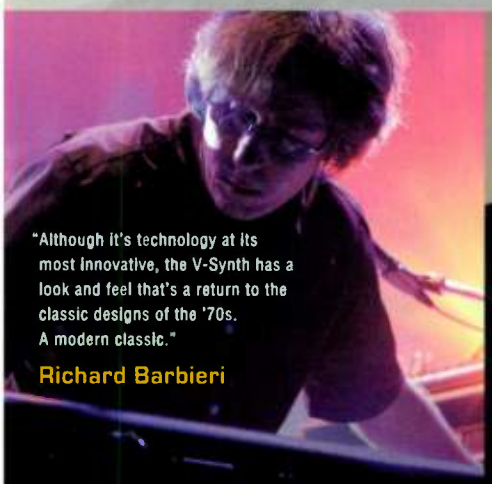

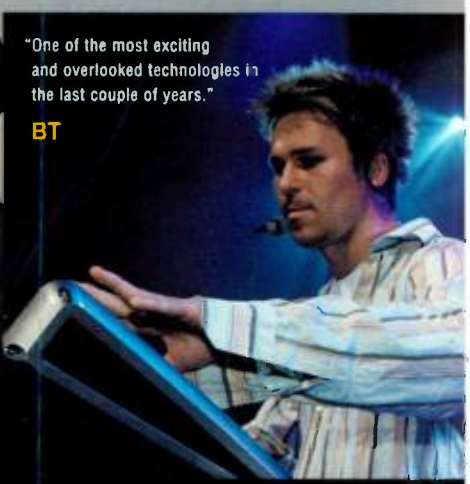

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LAURA WILLIAMS

Letters

The Upside to Mid-Side

Thanks to Brian Heller for his solid article on mid-side recording (see "Front and Center" in the March 2006 issue of EM). I've used M-S miking for the past several years to get high-quality, problem-free recordings of everything from solo artists to large choral groups. Not having to worry about using a matched stereo pair means that even my modestly equipped mic cabinet offers a wide variety of tonal options. EM readers interested in exploring this technique might want to look at the True Systems mic preamps. The P2 Analog and the Precision 8 both have built-in M-S matrices, making the process of getting a great-sounding, phase-coherent stereo recording a complete no-brainer. For those with deeper pockets, Millennia's MED-2 is about as good as it gets.

Steve Chiasson
Forest Audio Services
Wellington, Maine

Brian Heller's ultracool article on mid-side recording and processing holds the answer to a problem that has long plagued players of samplers and ROM-based synths. The topic of mono compatibility comes up often among tech-savvy keyboardists. The problem is that most commercially available stereo samples of grand piano (even those boasting phase-perfect samples) employ stereo recording techniques that demonstrate awful phase artifacts when summed to mono. And using either the left or the right channel alone doesn't capture the full sound in the way the combined stereo channels do.

Yet mono summing is quite common in everyday applications. How common? Well, how many keyboardists play live into a mono amp or P.A.? I've heard many musicians ask, "Why does my glorious stereo grand piano sound so bad in my amp?" Also, many composers and producers know that their final product will be played on a mono system: a radio, a small TV, a phone, a game box, or a synth.

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Jon Stubbs
Stubbsonic Music Services
Lafayette, Colorado

Performance Matters

I subscribe to your great magazine and love the days when EM shows up in the mailbox. I really appreciate your reviews and use them to aid me in my gear-buying decisions.

On that note, I was deeply disappointed with your review of the Korg D3200 portable digital recording studio (see the March 2006 issue of EM), as I am in the market for a standalone digital multitrack. There was no mention at all of the mic preamp's performance! What is the available gain? Can I use a ribbon mic with it successfully? Did the reviewer even plug a mic into the thing? And with regard to a studio-in-the-box—how are the preamps? How do the converters sound? What about the reverb?

I record acoustic jazz and world music and would greatly appreciate it if EM would consider my type of user when reviewing gear. I don't use synths or electric guitars. So please, when reviewing any product with mic preamps, use more words in describing their performance. Just saying the preamps sounded "fine" is not enough.

Jason Flores
Portland, Oregon
www.vagabondopera.com

Jason—Korg has packed an amazing number of features and a lot of recording capability into the D3200 for a very low price. Describing the unit's I/O capabilities, editing and navigation tools, and built-in drum programming and effects took up most of the available review space, and unfortunately, the mic preamps received short shrift. For the record, the eight mic preamps are serviceable and can handle an acceptable range of input levels with adequate headroom for ribbons as well as condenser mics. (You can peruse the D3200's mic-pre specs at www.korg.com.)

A vocal I recorded on the D3200 was acceptable in its reproduction of a female singer who was using the large-diaphragm condenser that I usually assign to her. As someone who

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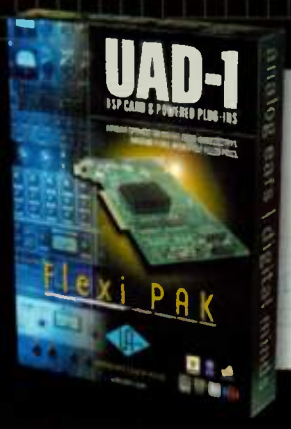

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Next Month in EM

Analog Modular Synth Roundup

EM tests and compares analog modular synths from new manufacturers as well as from established makers such as Synthesis Technology, Wiard, and Modcan.

COVER FEATURES COLUMNS

Creating Impulse Responses

We give an overview of techniques for creating impulse-response recordings, and cover the recommended hardware, software, and studio setups.

Production Values:
Terry Howard

Ray Charles's longtime engineer Terry Howard talks about working with Charles, including the latter's approach to recording, his personal studio, and his transition from analog to digital.

Making Tracks:
Effects Strategies

EM discusses various effects strategies, including using Ableton Live as an effects unit in Pro Tools and other environments.

Sound Design Workshop:
Fun with Formants

Use a synth's formant filter (or parallel resonant bandpass filters for synths that don't have a formant filter) for effects that go beyond mimicking vowel sounds.

Square One:
A Beginner's Guide to the Modulation Matrix

We explore modern techniques for using parameter modulation in today's synths and samplers.

. . . and much more

Letters

also records acoustic jazz, however, I strongly urge you to view the mic preamps in the D3200 (or any personal digital studio in its price range) as convenience items rather than as a feature that makes or breaks your buying decision. The D3200 mic preamps are usable if you need to record a live performance with limited gear or if you are otherwise restricted to a single unit for all your recording needs. On the other hand, an outboard analog mic preamp (some of which are very affordable these days) might be the way to go for the type of acoustic recording you do.
—Rusty Cutchin

Get Schooled

The article "Making Connections with ReWire" by Matt Donner (see the January 2006 issue of EM) was very insightful. Our students at MTSU use ReWire to connect Reason with Pro Tools and Digital Performer.

I'm writing because I am unsure of the accuracy of the following statement, which referred to Pro Tools and Reason: "If you want to access audio beyond audio ports L, R (3 through 64), use the Multi-Mono version rather than the Multi-Channel version" (p. 38).

I don't believe this is true. Perhaps it should read "If you want to route any single output of Reason to a mono aux track in Pro Tools, use the Multi-Mono version rather than the Multi-Channel version."

Dr. Joseph Akins
Asst. Professor of
Recording Industry
Middle Tennessee State Univ.

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Author Matt Donner replies: Joseph—Thank you for reading the article. Regarding the question of Multi-Mono versus Multi-Channel ReWire in Pro Tools, there is a small but important distinction in the understanding of the differences between the two.

Multi-Channel inserts in Pro Tools are those that apply a type of processing to all channels equally. In the case of an EQ, this means that a 2 dB boost at 1 kHz produces a 2 dB boost at 1 kHz for all channels (L, R, and beyond for surround sound). Multi-Mono inserts allow the user to set different settings for each channel—in this case, a 2 dB boost at 1 kHz for the left, and a 4 dB boost for the right, and so on.

This comes into play with ReWire and Pro Tools in certain versions prior to v. 7.0. In those versions, ReWire channels in stereo were available only in the Multi-Channel version. In fact, only the L, R channels were available. If you wanted stereo ReWire audio from ReWire audio ports 3, 4–63, 64, the secret was to insert Reason as a Multi-Mono insert. Then, in the upper right of the insert, deactivate the Link button (looks like an infinity symbol), choose the left channel, and assign it to ReWire 3 or any odd number for left. Then choose the right channel, and assign it to ReWire 4 or any even number for right. That will allow a single insert to accept stereo ReWire audio through a single insert.

The difference is that a Multi-Mono insert can certainly accept mono signals, but it can also accept stereo signals with discrete inputs by deactivating the Link button. The Multi-Channel insert could not accept stereo beyond the standard Mix L, R.

Of course, that is all moot now, because v. 7.0 fully supports the use of stereo inputs on Multi-Channel and Multi-Mono inserts. Had this been available when I wrote the article, I surely would have put it in. I hope this helps clarify the issue. EM

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EMspotlight

In the Kitsch-en with the Moog Cookbook

Selecting from its arsenal of vintage gear, the Moog Cookbook interprets popular songs in clever—and often campy—ways. In this interview from the EM archives, synth aficionados Meco Eno (aka Roger Manning of Jellyfish and Beck) and Uli Nomi (aka Brian Kehew) swap tech tips and offer advice about analog sound design. By Paul Myers.
emusician.com/em_spotlight

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The 2006 Winter NAMM show is the biggest annual musical-instrument expo in the United States. Visit emusician.com for our report on the exciting new recording gear, music software, and electronic musical instruments unveiled at this year's show.

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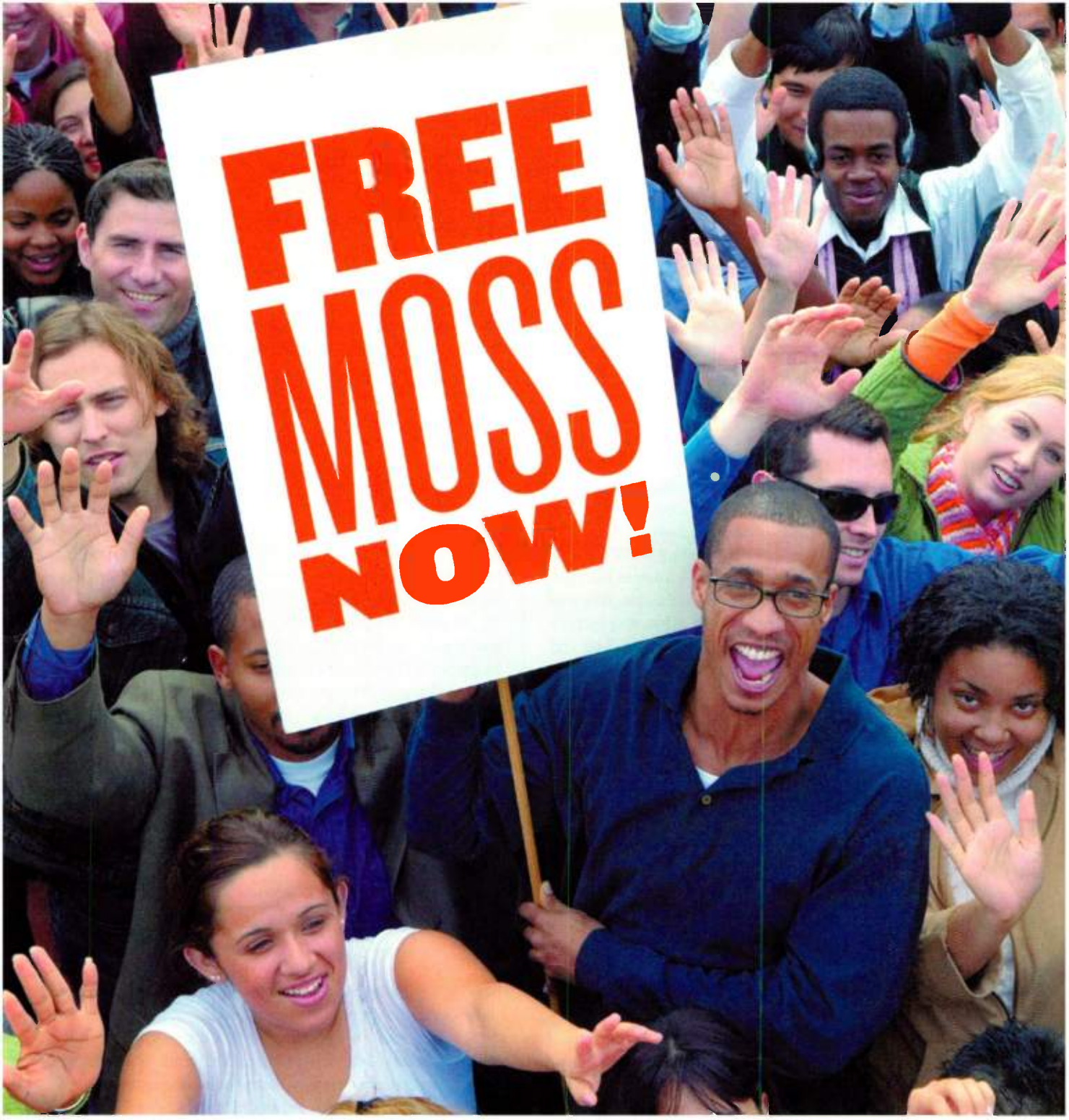

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By Geary Yelton

Røde D-PowerPlug and D-Power

Australian manufacturer Røde (www.rodemicrophones.com) has come up with a solution to the age-old problem of losing signal strength when you're using dynamic mics with long cable runs: turbocharge 'em! The D-PowerPlug ($129) is an in-line mic preamp that can boost your microphone's signal by 20 dB, enough to accommodate cables longer than 325 feet without any significant loss of quality or power.

The D-PowerPlug is 48V phantom powered and has a balanced XLR input and a balanced XLR output. According to specifications, its frequency response is from 20 Hz to 20 kHz, –3 dB, and it weighs less than 3 ounces. The D-PowerPlug can turn any dynamic mic into a high-gain, electronically balanced output device. Also available from Røde, the D-Power ($99) is a retrofit version that contains the same circuitry and replaces the XLR connector in your microphone.

Akai EWI4000S

Woodwind players who want a portal into the world of synthesizers and computers have reason to rejoice. Akai Professional (www.akaipro.com) has taken the wraps off the EWI4000S ($999), an electronic wind controller that improves on its predecessors in many ways. The instrument's onboard analog-modeling synth engine features two oscillators, two resonant multimode filters, a noise generator, and built-in chorus, delay, and reverb. Players can easily change programs with a dedicated button or use the note keys to select stored patches. And, of course, the EWI4000S can control external MIDI instruments and software.

The EWI4000S is designed for expressive performance. Send Expression, Aftertouch, and other controller messages using your breath, and control glide and Pitch Bend using the instrument's touch plates. Pressing the Octave key doubles the note you're playing in a lower octave. Hold mode sustains a selected note so that you can solo around that note. Using easily accessible controls for breath, vibrato, glide time, and bend range, you can tailor the EWI4000S's response preferences to your liking.

An editor-librarian program (Mac/Win) lets you customize sounds and store and recall your settings quickly. The EWI4000S weighs just 2.13 pounds and is powered by four AA batteries or an optional AC adapter. It has one MIDI In, one MIDI Out, an unbalanced ¼-inch TS audio output, and a ⅛-inch stereo headphone output.

Korg Radias

One of the biggest hits of January's NAMM show was Korg's (www.korg.com) new synthesizer, the Radias ($1,999), and its modular counterpart, the Radias-R ($1,899). A blend of synthesis technologies, the Radias offers 24-note polyphony, a new comb filter, and an innovative 16-band Formant Motion vocoder. Programs contain as many as four timbres that can be split, layered, or assigned to separate MIDI channels for sequencing.

Each timbre has two low-aliasing oscillators that generate modeled analog, formant, PCM, or Variable Phase Modulation (VPM) sounds. Two multimode filters—one switchable and one continuously variable—are paired with a waveshaper, three ADSR generators, two LFOs, three modulation sequencers, and six virtual patch cords. Each program has a 6-pattern arpeggiator and two 32-step, 8-note polyphonic step sequencers. Thirty-two editable drum kits each contain 16 sampled instruments. In addition to a master effect, two insert effects can be applied to each timbre.

The Radias features 49 Velocity-sensitive keys, pitch-bend and mod wheels, and a mounting rail that lets you pivot the front panel like a Minimoog's or slide it sideways to accommodate additional hardware. The control module can be detached for desktop or rackmount use and is available separately as the Radias-R. The Radias includes editor-librarian software (Mac/Win) that exchanges settings using a USB connection.

IRRESISTIBLE

ReMOTE SL

Now available in 25, 37 and 61 key formats

"The Automap function is what really sets the ReMOTE 25SL apart from other controllers... With Reason, Automap works brilliantly well... Reason is a knob-heavy program that works well enough with a mouse and keyboard, but it flies with a controller such as this."

"Even putting Automap aside, though, the ReMOTE SL is a great controller: it's well made and a pleasure to work with, and those extra-large displays improve the experience of interacting with software a great deal... returning to a smaller display will introduce feelings of claustrophobia."

Derek Johnson - SOS - Jan 06
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Superb semi-weighted, high-quality keyboard, velocity- and aftertouch-sensitive

"If the same control set were packaged with a larger keyboard, I think the draw would be **irresistible**"

Derek Johnson - Sound on Sound

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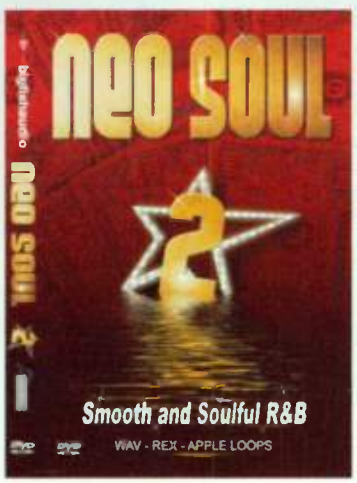
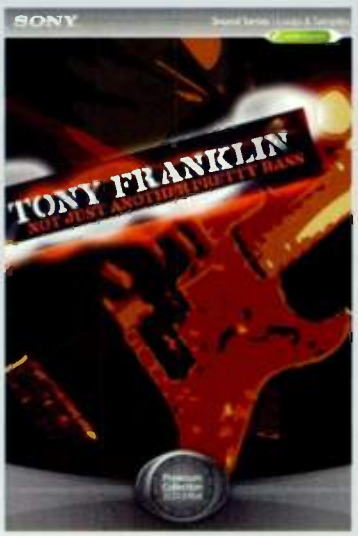
Sound Advice

FXpansion (www.fxpansion.com) created quite a stir with the release of BFD (a 2005 Editors' Choice Award winner), and the excitement continues with the release of massive content libraries for the virtual acoustic drummer. Most recent is *BFD Jazz & Funk Collection* ($249), a 55 GB collection that features three complete kits by Gretsch, Yamaha, and Slingerland. Snares include a '50s Luxor, a '60s Rogers Powertone, and a 1973 Ludwig Super Sensitive. The kick drums include a '70s 32-inch Slingerland and a restored '40s 26-inch Leedy. The set also has a comprehensive collection of Sabian, Wuhan, and Zildjian cymbals. Most instruments are played with sticks and brushes, and some are played with mallets, rods, and hands as well. *BFD Jazz & Funk Collection* provides a wide range of dynamic articulations recorded with high-end mics and preamps.

If old-school R&B and '70s funk are your groove, *Neo Soul 2* ($99.95) is calling out your name. Featuring the talents of producers Josquin des Pres and Brett Michael Wiesman, the 3 GB DVD-ROM is a follow-up to 2003's *Neo Soul,* also released by **Big Fish Audio** (www.bigfishaudio.com). *Neo Soul 2* goes way beyond basic beats to furnish 55 complete song segments in construction-kit format. Titles range from Early 70s Ballad and Superfly to Midnight Jam and Deep Fried. Drums, bass, guitar, Rhodes, sax, and all other parts come in 16-bit Apple Loops and 24-bit REX2 and WAV formats. Tempos range from 51 bpm to 137 bpm. In addition to key and tempo data, each groove folder supplies one-shot drum and percussion samples.



Sony (www.sonymediasoftware.com) has introduced a concept called Artist Integration, matching artists to create complementary Acid Loop libraries. One-half of the debut pairing is *The Best of Siggi Baldursson* ($59.95), a compilation of the Sugarcube drummer's two previous titles in the Sony Sound Series, *Drumsugar* and *Zero-Gravity Beats. The Best of Siggi Baldursson* furnishes 650 MB of rock beats, breaks, and fills recorded at Butch Vig's Smart Studios. To accompany Baldursson's tracks, Tony Franklin of the Firm, Jimmy Page, and Whitesnake (among others) recorded *Tony Franklin: Not Just Another Pretty Bass* ($99.95), a 2-disc collection of fretless Fender Precision bass loops. His sound is definitely rock oriented, with varying degrees of distortion and drive. In both collections are numerous folders that each contain enough grooves and variations to construct an entire song for drums or bass. Put both libraries together, and you'll have a rocking rhythm section. All files, of course, are in Acidized WAV format, which means you can import them into practically any audio software. The Tony Franklin discs also contain video clips in which he discusses the library's production.



Once again, **Discovery Sound** (www.discoverysound.com) has traveled to the far-flung corners of the world to deliver unusual content for your audio productions. One of the company's newest sample discs is *Tuva: Khoomei* ($55), a CD-ROM with nearly 600 MB of 16-bit, 44.1 kHz and 24-bit, 96 kHz recordings in Acidized WAV and REX2 formats. The Asian republic of Tuva is in the Tannu Mountains, on Mongolia's northwestern border with Siberia. The indigenous music of the nomadic residents features a unique style of throat singing and two stringed instruments, the violin-like igil and the banjo-like doshpuluur. Files in all formats supply igil and doshpuluur loops, and male and female vocal loops are provided in Acidized WAV format. Conveniently, all the loops have tempos and keys in their names.

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propellerhead SOFTWARE

Arturia Prophet-V

Arturia (www.arturia.com) is shipping a new program that emulates not one but two breakthrough synthesizers from Sequential Circuits. Prophet-V (Mac/Win, $249) is a re-creation of the Prophet-5, the first polysynth with programmable memory, and the Prophet VS, the instrument that pioneered vector synthesis. Prophet-V has three graphical user interfaces, one for each synth and another that combines the two into a hybrid instrument, giving you modeled analog subtractive synthesis and digital wavetable synthesis under one roof. An onscreen audio matrix allows you to switch virtual circuits on and off, to connect the filters in series, and to combine modulation capabilities.

Like the original Prophet-5, Prophet-V's emulation has two analog oscillators, a resonant lowpass filter, two ADSR envelopes, and a Poly Mod section. The Prophet VS emulation has four wavetable oscillators, a multimode filter, three 5-point envelopes, and a 4-point mixer controlled by one of the envelopes or an onscreen joystick. Both are compatible with patches created for the original instruments, and more than 400 presets are included. Prophet-V runs standalone and as a VST, DirectX, RTAS, or Audio Units plug-in.

Download of the Month

TACTILE12000 (MAC/WIN)

Tactile12000, from Tactile Pictures (www.tactile12000.com), is a standalone software emulation of a 2-turntable DJ rig. The software is a free download for Mac OS X and Windows, but Tactile Pictures happily accepts donations.

Tactile can play files in WAV, AIFF, MP3, and other QuickTime-supported formats. The program lets you crossfade, change tempo, and cue samples. To some extent, you can also execute turntable techniques such as backspin and scratch, though the results are somewhat primitive. Tactile is more toy than tool, but it is fun to play with and will give you some feeling for the art of the DJ.

After you've loaded Tactile's playlist with audio files, you slap individual files onto the turntables and manipulate Tactile's controls during playback. Separate crossfaders for the cue and main outputs allow you to set up one turntable while playing the other. File selection and playlist maintenance are fast and simple. In addition, you can use Tactile's AutoMix mode to sequence the entire playlist, crossfading between tracks as it goes.

You access Tactile's documentation through a multipage help window; rollover text also describes the function of each control. The program has computer-keyboard shortcuts for each of its many controls, and the shortcuts are displayed on the graphical user interface when the help window's keyboard-shortcuts page is displayed. (Printing a screen shot of the shortcuts is very helpful for getting the gist of Tactile.) Some functions adapt well to keyboard shortcuts, whereas the mouse is the best choice for others. MIDI would be a preferable alternative but unfortunately is not an option.

Tactile's audio output is directed to Core Audio's default output in Mac OS X, but under Windows, you can assign it to any sound card with a DirectX driver. In the latter case, the main and cue outputs can be directed to different sound cards for more-realistic headphone cueing. When only one output is connected and cueing is turned on, the cue output is directed to the left channel and the main is directed to the right. On the Mac, an audio-routing utility such as Cycling '74 Soundflower can route Tactile's output to another audio application for recording as well as for splitting the cue and main outputs. (Tactile has no provision for recording its output.)

If you're feeling tactile, grab the download and start spinning. Even if you're not, the AutoMix function is well worth the free download.

—Len Sasso

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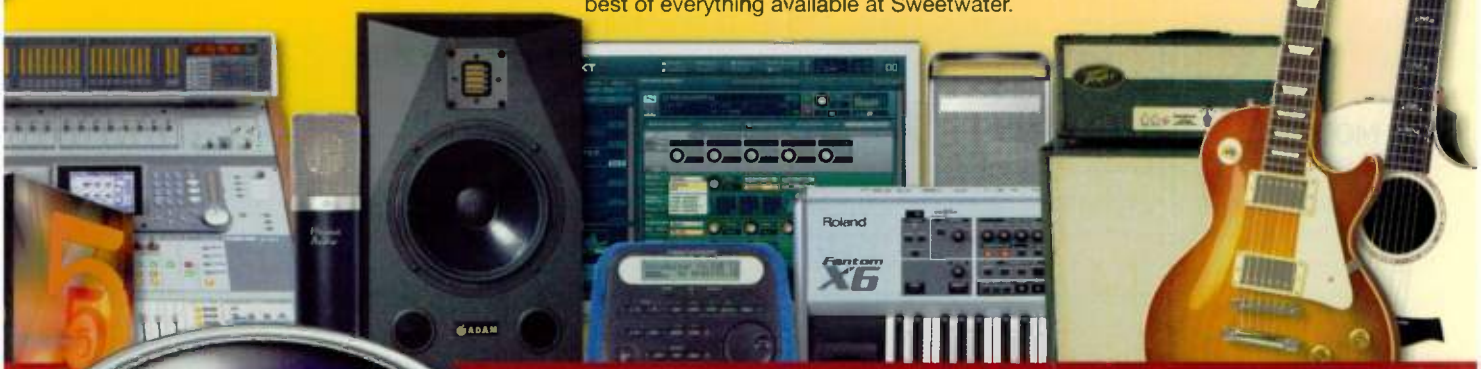

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M-Audio Oxygen Series

One of the first portable USB MIDI keyboards to really make a splash was the M-Audio (www.m-audio.com) Oxygen8. Recently the company unveiled three new keyboards in the Oxygen line: the 25-note Oxygen 8 v2 ($179.95), the 49-note Oxygen 49 ($229.95), and the 61-note Oxygen 61 ($279.95). All three share features such as front-panel buttons to access common MIDI parameters and dedicated buttons for making snapshots of the current settings. You can use the keys in combination with the Advanced Function button to program controller assignments and perform additional setup functions. You can save presets to ten nonvolatile memory locations and manage the preset library using the free, downloadable software editor-librarian Enigma (Mac/Win).

The 4-pound Oxygen 8 v2 has eight MIDI-assignable knobs and six programmable transport buttons. The Oxygen 49 and Oxygen 61 (7.5 and 9 pounds, respectively) each have 8 knobs, 9 sliders, and 15 buttons—all of them MIDI assignable. All of the keyboards are Velocity sensitive and sport a MIDI Out port and an assignable sustain-pedal input. All three devices are class compliant under Windows XP and Mac OS X, and each includes a free download of Ableton Live Lite 5.

IK Multimedia Classik Studio Reverb

The latest pro recording software from IK Multimedia (www.ikmultimedia.com) is Classik Studio Reverb (Mac/Win, $399), a suite of four plug-ins modeled after high-end hardware. Each CSR plug-in—Hall, Room, Ambience, and Inverse—has a sound, look, and controllability similar to those of its rackmount counterpart, without the CPU demands of convolution reverbs. CSR lets you choose between Easy and Advanced operating modes. In Advanced mode, macros give you front-panel sliders that can morph between settings. All of CSR's controls can be automated in your host application. With more than 100 user parameters to choose from, you can manually or automatically control reverb time, size, diffusion, color, early reflection, and more.

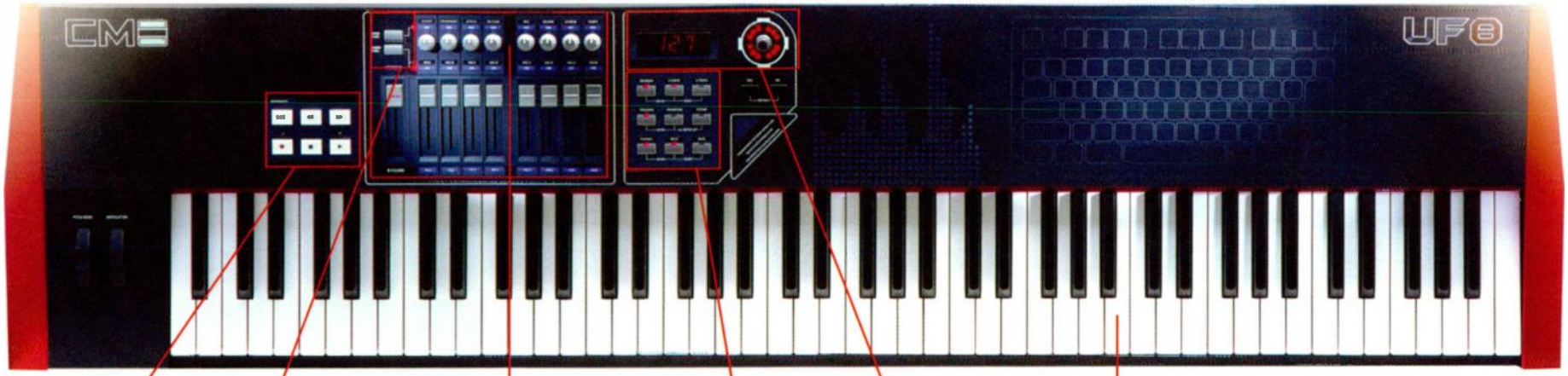
Each CSR plug-in has a separate modulation matrix with four sources that include LFOs and envelope generators, and eight destinations that can be almost any parameter. The software includes an assortment of presets that show off its capabilities. CSR supports RTAS and VST formats in Windows XP, and Audio Units, RTAS, and VST in Mac OS X. If you own another IK Multimedia product, you can cross-grade to Classik Studio Reverb for $249.

Stop the Presses!

MOOG MUSIC LITTLE PHATTY

How many synthesizers have been introduced by Moog Music (www.moogmusic.com) since 1982? Until now, the answer was only one—the Minimoog Voyager. The newest and most affordable Moog synthesizer to debut in decades was recently unveiled at Musikmesse 2006. The Little Phatty (Bob Moog Tribute Edition, $1,475) is a monophonic instrument with a 37-note keyboard, an authentic Moog lowpass ladder filter, and a totally analog signal path.

Conceived by legendary synth designer Bob Moog, the Little Phatty features two voltage-controlled oscillators with continuously variable waveforms, two ADSR generators, and memory locations for 100 user presets. Moog's exclusive Real Analog Control (RAC) lets you access the analog circuitry using multipurpose knobs with no digital processing. In addition to pitch-bend and mod wheels, the Little Phatty has side-panel connections that furnish MIDI I/O, analog audio I/O, and control-voltage inputs to modulate the filter, pitch, and volume. The Bob Moog Tribute Edition will be available in a limited run of 1,200 numbered instruments.



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Plenty of front panel switches to instantly control splits, transposition, layer, etc.

Large LCD & data entry wheel make the UF series a breeze to program

The most important feature on a controller keyboard is the keyboard feel—and the CME keyboards not only feel great, they all feature aftertouch for more expressive control

In a world of me-too, copycat controllers, the CME UF series MIDI Master controllers stand out with features that you can't find anywhere else. The rugged dura-aluminum design, extensive expressive control via aftertouch and breath control, and professional quality keyboard action are all unique in their price range. The UF8 features a patented hammer-action weighted keyboard for a true piano touch. The UF5, 6, 7 all feature a semi-weighted synth action that feels better than anything else on the market. So if you're looking for a MIDI controller—it's time to start looking at the world a little differently. It's time to look at the new leader in MIDI controllers—CME Pro, the computer music experts.

The UF Series 411...

- 49/61/76-key keyboards with aftertouch (UF5 / 6 / 7)
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UF5 $229 UF6 $299 UF7 $399 UF8 $599 UF400e FireWire option $199
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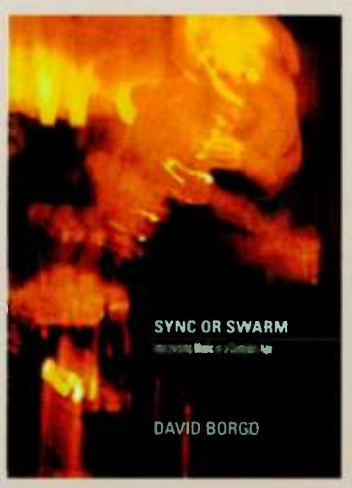
Get Smart

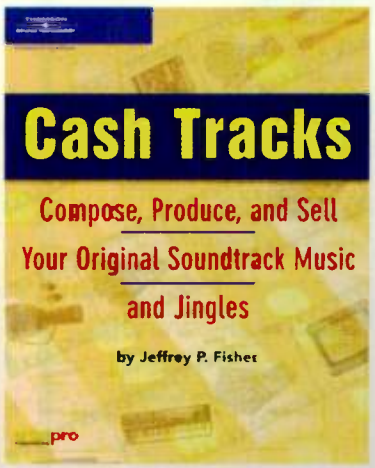
The book *Strange Sounds* ($24.95), written by Mark Brend and published by **Backbeat Books** (www.backbeatbooks.com), explores the bizarre history of musical instruments and devices that barely grazed the public consciousness. Subtitled *Offbeat Instruments and Sonic Experiments in Pop*, the volume examines the influence of instrument design on popular music, from the theremin to the sitar. Brend devotes entire chapters to the pioneering Ondes Martenot and Ondioline; almost-forgotten keyboards such as the Novachord and Clavioline; tape-based analog samplers such as the Phonogène and Chamberlin; early drum machines such as the Korg Donca Matic; odd acoustic instruments such as the washboard, kazoo, and musical saw; and electronic curiosities such as the Stylophone and Optigan. Along the way, he offers plenty of anecdotes about the musicians who used them and the chart-topping hits that resulted. An audio CD filled with examples accompanies the 192-page book.

Rarely does anyone attempt such a scientific approach to musical improvisation as you'll find in *Sync or Swarm: Improvising Music in a Complex Age* ($29.95), from **Continuum** (www.continuumbooks.com). Author David Borgo is an award-winning saxophonist, ethnomusicologist, and assistant professor of music at the University of California, San Diego. By integrating his understanding of music, chaos theory, cognition, and consciousness, Borgo has created a portrait of improvised performance as a swarmlike experience that evolves with a collective purpose. Taking a systems approach and using sax players Evan Parker and Sam Rivers as case studies, Borgo examines the network dynamics that bind together players, listeners, and community members in the musical process.

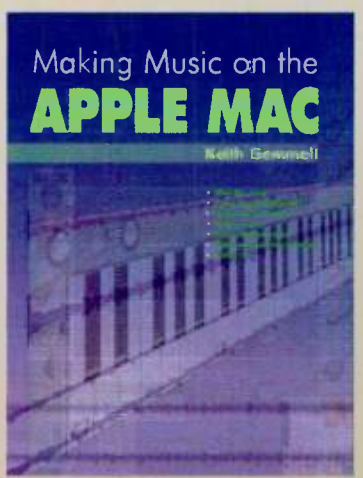


Accompanying the 300-page hardbound book is an audio CD of improvised performances.

Musicians are always interested in finding new ways to support themselves, and producing soundtracks and jingles has an obvious attraction to many. Unless you already have industry contacts willing to help you break into the field, however, getting started can prove a daunting challenge. *Cash Tracks* ($24.99), written by audio and video producer Jeffrey P. Fisher and published by **Thomson Course Technology PTR** (www.courseptr.com), is a practical guide that explains how the media business works, how to build a personal studio, how to record and pitch demos, and how to turn prospects into paying clients. You'll learn about promoting your music, setting and collecting fees, keeping books, and growing your business. Filled with useful tips and step-by-step advice, *Cash Tracks* teaches you what you need to know to make media music profitable.



Although Mac OS X is a popular platform for audio production, most introductory books on computer-based recording tend to focus on the Windows platform. For the rest of us, there's *Making Music on the Apple Mac* ($14.95), from **PC Publishing** (distributed by O'Reilly, www.oreilly.com). Author Keith Gemmell offers suggestions on selecting an Apple computer, purchasing peripherals, and setting up your studio. He shows you how to work with Apple GarageBand and what to do when you exceed its limitations. You'll learn about instrument and effects plug-ins, music transcription programs, and marketing your music online. Profusely illustrated, the 108-page book is a source of useful information for the beginning computer musician.



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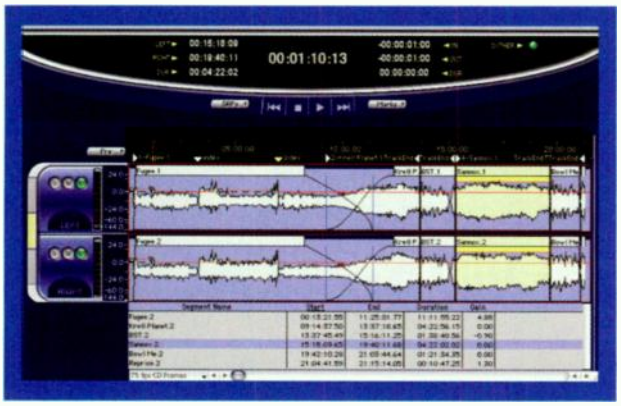
Sonic Studio PreMaster CD

Sonic Studio (www.sonicstudio.com) has begun shipping PreMaster CD (Mac, $795), an application that lets you edit and create Disc Description Protocol (DDP) image files from AIFF, WAV, Broadcast WAV, and Sound Designer II files. DDP is sanctioned by most record labels and pressing plants as the preferred means of delivery for disc manufacturing. The software serves as the link between your final mix and the creation of a finished compact disc. PreMaster CD is an entry-level version of Sonic Studio-DDP and combines the latter's editing capabilities and marking engine with a simplified user interface.

PreMaster CD offers cost-effective CD-R replication and ensures that the audio data and metadata describing a replicated disc are free from errors. With PreMaster CD, you can use breakpoints and fades to adjust gain, edit PQ (including ISR codes, UPC codes, and CD Text), and save the assembled programs to disk as a DDP 2.0–compliant image for electronic delivery or for burning a reference CD.



Earthworks Periscope HDM Series

Earthworks (www.earthworksaudio.com) has introduced three models in its Periscope High Definition Microphone (HDM) series of back-electret condenser mics. The P30 ($995), P30/C ($995), and P30/HC ($995) are designed for extreme sensitivity and will accurately capture frequencies as high as 30 kHz, according to the manufacturer. Each has a flexible 4-inch neck, allowing you to reposition the mic head without moving the stand or boom, and is small enough to fit into difficult places, such as beneath strings. All three have a fast impulse response to accurately capture transients and a short diaphragm-settling time to hear subtle details. The Periscopes also have low self-noise and low handling noise.

The P30 has an omnidirectional polar pattern with a specified range from 9 Hz to 30 kHz, and it handles levels as high as 142 dB without distortion. The P30/C is a cardioid condenser mic, and the P30/HC has a hypercardioid polar pattern; Earthworks' specifications state their frequency response as 30 Hz to 30 kHz, ±2 dB, with a maximum undistorted input of 145 dB SPL. Each weighs less than a quarter pound and is available in either a black or white finish. You can request a free demo CD on Earthworks' Web site.

Art Vista Virtual Grand Piano

Seemingly every month, new sample-based software replicates acoustic instruments with a more realistic sound, a more natural response, and a more affordable price tag. Case in point: Virtual Grand Piano (Mac/Win, $119), from soundware developer Art Vista (www.artvista.net), captures an enormous variety of nuanced tones produced by a Hamburg-built Steinway Model B concert grand piano. Using Native Instruments' popular Kontakt Player as a vehicle, the software furnishes 5.75 GB of very playable content.

Virtual Grand Piano supplies dozens of variations specifically tailored to rock, jazz, gospel, pop, and other musical styles. Every preset comes in Soft, Medium, Hard, and Extended versions, as well as Wet (with natural room reverb) and Dry versions. Of special note are the 22 Recording Styles presets; most supply piano tones associated with particular artists, such as Aretha Franklin, Elton John, Bill Evans, John Legend, and Keith Jarrett. To supplement the front-panel controls, numerous parameters can be mapped to MIDI Control Changes. Virtual Grand Piano runs standalone and as a VST, RTAS, Audio Units, or DirectX plug-in. **EM**

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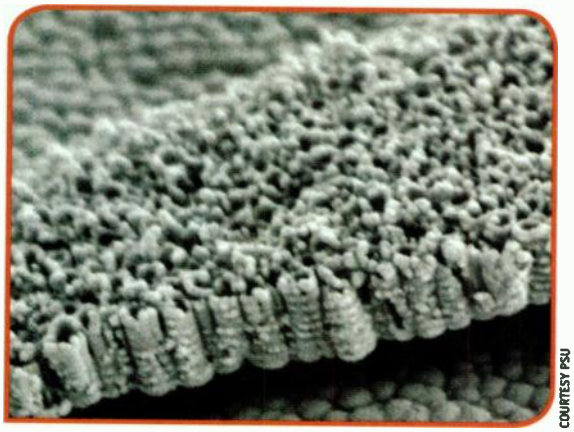
Catching the Sun

By Scott Wilkinson

Nanotechnology brings solar cells down to earth.

No matter what type of technology they use, all electronic musicians depend on one thing: electric power. That power comes mostly from burning fossil fuels, but environmental issues aside, the supply will eventually run out. Until then, it will continue to increase in cost until it becomes prohibitively expensive. Nuclear power is also a common power source, but its critics cite lack of safety and negative impact on the environment as potential risks.

Among the alternatives are solar cells, which convert sunlight directly into electricity with no polluting by-products. Solar cells have been around for decades, but the high energy cost of manufacturing has kept them from becoming widespread. By many estimates, it takes 2 to 5 gigajoules per square meter to make silicon-based solar cells, which is arguably more energy than they can ever generate. (One joule is defined as the work done when one ampere of electric current passes through a resistance of one ohm for one second. It is also equivalent to 0.2389 calories.)



COURTESY PSU

FIG. 1: Titanium dioxide nanotubes could dramatically decrease the energy cost of fabricating solar cells, and their efficiency will increase if the nanotubes can be grown longer than the 360 nm structures shown here.

New research that is currently being conducted by a team at Pennsylvania State University (www.psu.edu) under the direction of Craig Grimes, professor of electrical engineering and materials science and engineering, could decrease that energy cost dramatically. Up until now, solar cells have been fabricated from silicon-based semiconductor material. A more recent approach uses nanoparticles and photosensitive dyes. However, Grimes notes, "Nanoparticle solar cells are the gold standard of this new approach, but because of certain limitations, it appears they have gotten as good as they are going to get." So he and his team decided to modify the idea by using highly ordered arrays of nanotubes instead of particles to act as a substrate for the dye.

The fabrication process begins with a piece of glass that has first been coated with fluorine-doped tin oxide, which is then followed by a layer of titanium that is 500 nanometers thick. Placing the layer in an acidic bath undergoing a mild electric current causes parallel nanotubes of titanium dioxide to form and grow to a length of about 360 nm. The tubes are then heated in an oxygen-rich environment to crystallize them. The process transforms the opaque titanium coating into a highly ordered array of transparent titanium dioxide nanotubes (see **Fig. 1**). Finally, the nanotube array is coated with a commercially available photosensitive dye, forming the negative electrode of the cell.

When light strikes the dye, electrons are knocked free of its molecules. Many of these electrons recombine before passing out of the cell. But the tube structure of the titanium dioxide allows ten times more electrons to make it out than with particulate coatings. Initial experiments have yielded an efficiency of only 3 percent because of the length of the nanotubes. (Silicon solar cells are around 21 percent efficient at converting sunlight into electricity.) Grimes expects to do much better when they are able to apply a thicker coat of titanium and thus grow longer tubes, which would allow more electrons to escape.

"There is still a great deal of optimization of the design that needs to be done," says Grimes. "If we get about 3 percent conversion with 360 nanometers, what we could get with 4 microns [4,000 nm] is an exciting question we hope to answer soon. I think we can reach a 15 percent conversion rate with these cells, using a relatively easy fabrication system that is commercially viable." Grimes expects to decrease the energy required for fabrication by a factor of at least 100, compared with silicon solar cells.

The new solar-cell technology could be a big boon for electronic musicians, especially those who take their equipment into the field, where there are few if any electrical outlets. Even homebound musicians could benefit from reduced dependence on the power company. Commercialization of this technology is still years away, but the future looks bright. EM

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Dynamic Duo

By David Weiss

Goldfrapp's sizzling synth pop.

Spectacular vocals, exploratory synth work, and a dark, alluring image define the British synth-pop duo Goldfrapp. The pair, Alison Goldfrapp and Will Gregory, recently released their third CD, *Supernature* (Mute, 2005), which further refines their sexy, catchy, electronic sound. The band's musical development has been aided by their growing confidence in what they can produce in their studio, which is located just outside the historic English town of Bath.

"Before Goldfrapp, I did soundtrack work for TV productions and films, so I had a setup in an old pottery studio downstairs in my house," Gregory says. "It was just a mixing desk, some outboard synths—a computer-based thing. When Alison and I got a record deal, the philosophy was the same: some monitoring, a desk, some musical instruments, and Alison's voice."

The heart of the studio is a Yamaha 02R digital mixer and an Apple Power Mac G5 running Apple Logic Pro. Vintage synth hardware abounds, including a Roland Jupiter 6, a Roland SH09, a Roland Paraphonic 505 string synth, a Korg MS20, a Polyvox, a Farfisa compact mono, an ARP 2600, and four Oberheim SEM modules.

The Oberheim provides the thick, oscillator-driven buzz of "Ooh La La," *Supernature*'s opener. "We don't find computers very musical," explains Gregory. "You can't jam on a computer. You'd rather have knobs than a mouse and a computer keyboard. We take the expressions of the performance instruments—a synth or vocals—and see what we can create. The more we go on, the more I'm a fan of getting the sound you want, rather than throwing down a bunch of sounds and fixing it afterwards."

The stripped-down beat programming on *Supernature* helps push their songs to energetic heights. "Often we put up a basic kick-snare, and then try to write from there," Gregory says. "We like the robotic sound of old drum machines, and we're never trying to reproduce some type of performed drum playing. There are certain records I love, like Stevie Wonder's 'Superstition,' where the drums just go *boom kaa*, and it's absolutely perfect. Often you don't need hi-hat, which sometimes actually slows things down, overanalyzing time and breaking it up into smaller and smaller chunks. And I get annoyed by mixes where the drums are this huge monolithic thing, repeating over and over again."

ILLUSTRATION BOX

Supernature/Goldfrapp

The coup de grâce on each song is Goldfrapp's distinctive and rich voice, which Gregory captures with a Percy Bear mic (with an AKG C 12 capsule) and an Audix preamp. "That mic is particularly suited to higher-register things—it has a lovely, natural, three-dimensional sound," notes Gregory. "On *Supernature*, we started layering the vocals up more. I tend to put them through a chorus, although you've got to be careful, because what you get in thickness and lushness, you lose in character. We try all sorts of different things: a vocoder, pitch-shifting, a cheap effect. We love when the voice becomes slightly dehumanized, but sometimes you want a very plain, intimate sound."

A listen to *Supernature* confirms that the duo's comfort in their studio is at an all-time high. "We're getting a bit more confident about what we're putting in there," says Gregory. "The two philosophies about music are that it requires a certain amount of things and no more to get it across, or it requires a maximum amount of things and no less. We're on the former side, because all the time we're saying, 'Isn't that enough? Does it need anything else? Maybe not.'" EM

For more information, go to www.goldfrapp.co.uk.

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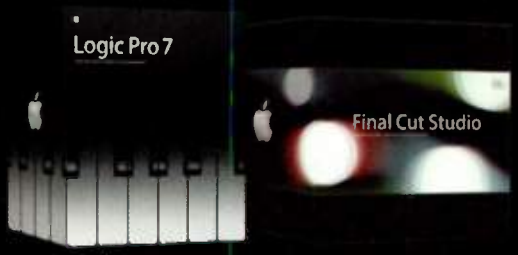

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Better Safe Than Sorry

By Mike Levine

Back up your precious recording data before it's too late.

Imagine spending an entire week working on a critically important music project. You toil day and night orchestrating, programming, and recording. You bring in other musicians and singers to overdub, and everything is sounding killer. Then, on the day before your deadline, when you're getting ready to mix, the external drive that you record your audio to from your DAW doesn't show up when you start your computer. You try rebooting, but no luck. With a growing sense of dread, you try running your disk utility software, but still no sign of your drive. It's now clear that your drive has suffered a major crash. Your deadline is looming, and you're back to square one. "If only I'd backed up!" you cry, as you pound the desk in frustration.

Most computer users don't think about backing up until after they've suffered a catastrophic data loss. If you're serious about protecting your recording data, you need to develop a systematic backup strategy and stick to it. If you don't, chances are the data-loss gremlin will eventually get you.

To help shed light on the subject of backup, I spoke with a number of working pro musicians and engineers to find out how they safeguard their data. I also interviewed data-recovery specialists and disc manufacturers to get their opinions and advice on the subject.

Data Dangers

One of the most common hazards that your recording data can face is hard-drive failure. Hard drives are precision devices filled with moving parts, and they are vulnerable to both mechanical and electrical failure.

"Every drive has a Mean Time Between Failure [MTBF] rating that is given to it by the manufacturer," says John Christopher, a data-recovery engineer at DriveSavers (www.drivesavers.com), one of the largest hard-drive-recovery firms in the United States. "And it's anything from 50 to 100 years, or something absurd like that. But it's not a real number; it doesn't apply in the real world."

So what's a more realistic life expectancy for a hard drive? Jay Vilanova, a data-recovery expert at a large Macintosh repair and retail outfit called Tekserve (www.tekserve.com) in New York City, says, "You should expect several years. But as with any curve, you'll have some that drop out earlier, and some that last way longer. We see drives from vintage machines that are still running. We also see drives from machines that shipped yesterday that are bad. Every drive inherently will fail."

In other words, each time you trust your data to your hard drive, you are engaging in a crapshoot. There are, however, some steps you can take to lessen the possibility of a drive failure. One is to keep your drive away from extreme temperatures and direct sunlight. Another is to handle it gingerly, because a drive has a relatively delicate mechanism inside. Finally, never move your hard drive while it's powered up.

Drive crashes can be brought on by software-related causes as well as through hardware failure (although software problems are often symptoms of hardware problems). You might also experience a situation in which your drive keeps working but individual files become damaged. "Typically, files get damaged because the directory on the drive is messed up," says Christopher. "The pointers in the directory are incorrect to the file fragments, and then a file fragment overwrites or overlaps another file fragment, and you get corruption."

FIG. 1: Hard-drive recovery is a complicated and expensive process, requiring clean rooms, skilled technicians, and lots of spare parts.

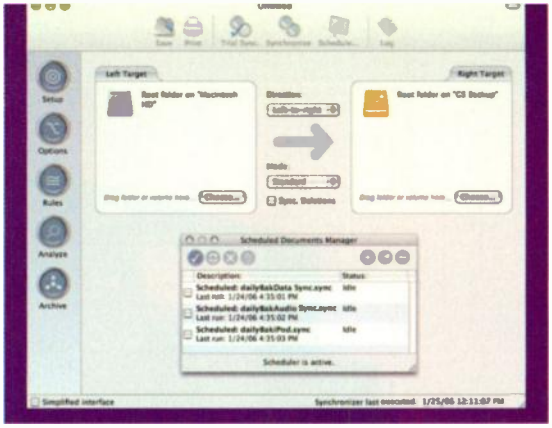

FIG. 2: The Mac application ChronoSync, from Econ Technologies, is one of a number of full-featured, inexpensive backup programs available.

Oops, Wrong Button

Human error is also a major cause of data loss. Christopher recalls a case involving a well-known Bay Area band, which he declines to identify. "They finished doing their final mixdown and everything was mastered, and I guess a second engineer came in after the session and mistakenly wiped out the drive. So they brought it in to us and fortunately we were able to get everything back."

Fires, floods, or other natural disasters are also potential dangers to your drive. For that reason, experts recommend keeping off-site backups of crucial data. "Stow them in different locations, like a safety-deposit box at a bank," suggests Christopher.

If your drive does fail, or if a really important file gets erased and you don't have a backup, chances are good that a firm such as DriveSavers or Tekserve (or others around the country) can recover your data. It's likely to be quite expensive, though, because data recovery is a specialized, labor-intensive process (see Fig. 1). According to Christopher, the average price for recovering a failed drive at DriveSavers is about $1,000.

Audio files can be particularly tricky to recover, says Christopher. "If the files are large, like AIFF files, then they can be *fragmented* on the drive—that is, broken up into pieces and scattered around on the media. And that can make for a challenging recovery, because sometimes we can get complete files, and sometimes we can't." He suggests defragmenting your drives periodically.

Another potential cause of data loss is a computer virus. Luckily, viruses are less likely to infect dedicated recording drives because they're usually designed to go after files on your system drive. Mac users are less likely to face virus threats than PC users are.

Finally, you can lose data as a result of theft or loss. If you have a laptop-based rig that you travel with, backing up is especially critical, because you always run the risk that your computer will be stolen or lost while you're on the road. Even a home-based personal studio can be broken into and have a computer stolen.

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Get Backup

Although there are numerous ways to approach the backup conundrum, it's crucial to come up with a system that's affordable and easy to implement and maintain. If it requires too much work, you'll be less likely to stick with it over the long run.

All the pros I interviewed for this story have a backup routine that they execute regularly. Their systems generally involve secondary hard drives upon which recording data is copied at the end of every session.

"I have another drive on my system, which is a 250 GB drive that I use as a working backup drive," says Jeremiah Moore (www.jeremiahmoore.com), a sound designer from the Bay Area. "I drag folders over to it at the end of the day. Whatever was done that day gets dragged over. That's the running backup," he says.

Kathie Talbot (www.kathietalbot.com), a Los Angeles–based film and TV composer, follows a similar routine. "Every day, at the end of the day, I back up everything I've done on another hard drive," she says. "I have learned from terrible past mistakes. I lost stuff that I'll never be able to retrieve."

Gil Morales is a busy freelance engineer and project-studio owner, also in the L.A. area, who has worked with artists such as Little Feat and Linda Ronstadt. "It's part of the rhythm of how I do sessions. That last half hour that I'm in front of the computer is spent backing up data," he says. "I make it part of the flow of my work."

So the first part of your backup strategy should involve a daily or postsession backup of your recording drive to a dedicated backup drive. That can be done either manually or automatically with backup software (see the section "Soft Solutions"). If, however, you really want to safeguard your data, you need to do more.

Safety in Numbers

"You want to have multiple copies of critical data," says Vilanova. Although that might seem like overkill, there are plenty of scenarios in which having only one backup could be problematic. "If you have, say, a synchronized backup that happens periodically," explains Moore, "that can carry a corrupt file into an uncorrupt copy, and that can propagate corruption."

COURTESY BLU-RAY DISC ASSOCIATION

FIG. 3: This year will see the emergence of two new competing storage technologies: Blu-ray (pictured here) and HD-DVD. They will offer rewritable discs that can hold 25 GB and 15 GB, respectively.

A power surge could knock out your recording drive and your backup drive at the same time. Or your primary drive could fail while the copy is being made, thus rendering both copies useless.

The most economical way to ensure against most of those problems is to make an additional backup to a recordable DVD (see the section "Noah's Archive"). Ideally, you'd make one after every session, but if that's too time-consuming or expensive, at least make sure to burn a DVD after any session in which critical audio has been recorded or mixed.

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In his work recovering hard drives for DriveSavers, John Christopher has seen many musicians and groups who needed to retrieve irreplaceable data from crashed or accidentally erased recording drives that weren't backed up.

Snazzy Work-arounds

One technique that will make a single backup safer is to partition your backup drive and rotate your regular backups between different partitions. That will be possible, however, only if your backup drive has enough space to accommodate multiple versions of the data on your recording drive. If a file becomes corrupt and gets backed up over the backup copy on one of the partitions, you can restore from one of the other partitions. If your recording drive dies, you can restore from the partition that has been backed up most recently. In most cases (save for the catastrophic power-surge scenario that affects both drives), you're covered.

Another way to protect your files is to Save As your work multiple times throughout a session. "I constantly save versions of a file," says Moore. He saves "any time I reach a certain milestone, be it finishing the sound design on a certain section, finishing the dialog edit, setting up the basic mix, or importing an OMF."

Such multiversion saving has two major benefits. First, if your current file becomes damaged and then gets backed up (thus erasing the previous good backup of that file) or accidentally gets erased before you've backed it up, you can go to a previous version from that same day's session. Second, you can go back to an earlier version if you've made musical changes that, on later reflection, you or your client don't like.

One caveat regarding the Save As method if you're saving copies of only your session file and not of your audio files: if an audio file gets damaged and is then backed up over the good one, it's history. Although it takes a lot more disk space, occasionally duplicating the audio files when you invoke the Save As command is a wise thing to do.

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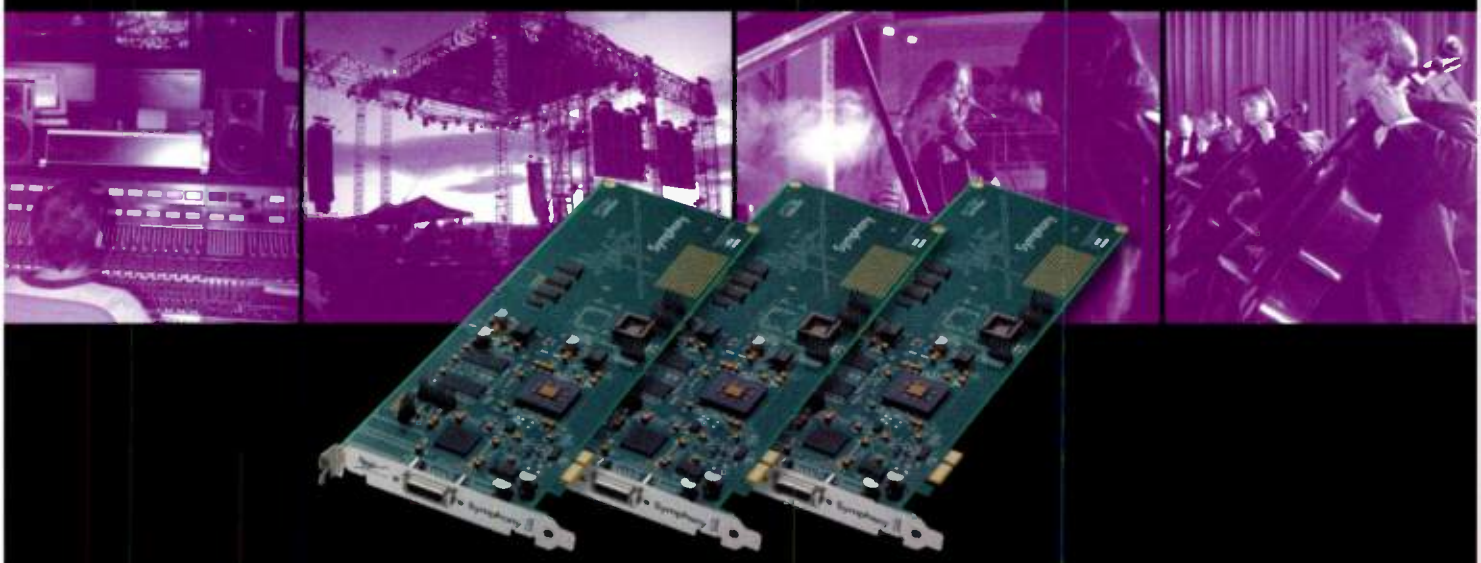

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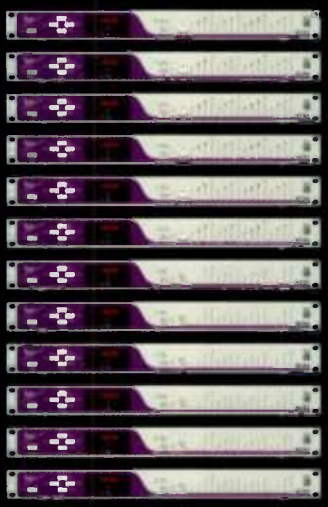

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Soft Solutions

If you're manually backing up (dragging files) from one drive to another, be careful that you're copying to the backup drive, not from it. If you get mixed up, you'll wipe away everything except your last backup. Talbot recalls such an occurrence. "I was working on a song for the movie *Halloween Resurrection*," she says. "My cowriter and I had finished the session, and I was exhausted. So I said, 'Okay, I'm now going to back everything up.' And I backed up the old file over the new file, and we had to start over." Fortunately for Talbot, there was a silver lining to redoing the song. "The new version turned into a better song than we ever imagined," she says.

Running scheduled, automated backups using backup software removes the possibility of backing up in the wrong direction. It also makes it easy to back up only newly created files, while leaving unchanged files alone. And since the backup is scheduled, you don't have to remember to initiate it.

Backup software lets you automate what gets backed up and when, and lets you compress your backup. Such programs are typically inexpensive. Some Mac examples include shareware programs such as Shirt Pocket SuperDuper and Econ Technologies ChronoSync (see Fig. 2), and Bombich Software Carbon Copy Cloner, which is freeware. EMC Dantz's cross-platform program Retrospect Express is often bundled with hard drives for Mac and PC. For PC, Symantec Norton Ghost gives you robust backup capabilities at a low price, and even WinZip Computing's WinZip Pro 10, a compression utility, offers backup features. There are lots of options, so look around for the program that best meets your backup and budget needs.

KATHIE TALBOT

After losing some important data earlier in her career, film and TV composer Kathie Talbot now believes firmly in backing up regularly.

Depending on how much data is on your drive, backing up could take several hours the first time you do it, due to the sheer volume of files to be copied. But once that's done, set your backup software so that the only files from the source drive that get backed up are the ones that have been altered since the previous backup (that is sometimes called an *incremental backup* or a *one-way synchronization*). Because the other files on the backup drive remain unchanged, the backup process goes much faster. Furthermore, incremental backups ensure that files that have already been successfully backed up won't get overwritten by damaged files.

Should you choose to compress your files upon backup, you'll save space on your backup drive. The downside is that you'll need the backup software to restore the files. I keep the compression off so that I can easily retrieve files without having to expand them first.

One important point about automated backups: periodically check the logs that the software generates to see that the backups have been done successfully. "I also recommend occasionally restoring a few critical files

HARDWARE DESIGNED FOR BACKUP

There are hardware solutions available beyond simple hard drives that can help facilitate the backup process. One example is the One Touch series of hard drives by Maxtor. These drives come in a variety of sizes and have backup software and a single hardware button that you push to initiate the backup process.

The Mirra Personal Server (see Fig. A) is available now for PC and soon for the Mac (perhaps by the time you read this). The device plugs into your network and automatically replicates selected files whenever you save them, providing you with an instant backup that requires no user initiation. It saves up to eight versions of a file, offering you additional flexibility and redundancy.

FIG. A: You can set the Mirra Personal Server to mirror your recording drive, automatically backing up anything you record.

"It's not addressable by typical mapping of the network drive or by browsing to it through the Finder," says Mirra's Peter Radsliff. "It only interacts on the network with computers that it's attached to through software we provide."

What's more, the files stored on it can be accessed through the Web. According to Radsliff, the Mirra is impervious to viruses and other Internet shenanigans. "It's got a complex underneath security scheme to prevent any kind of intrusion. So, you can't get any virus attacks on it, spyware won't do anything to it, and nobody can hack into it," he says.

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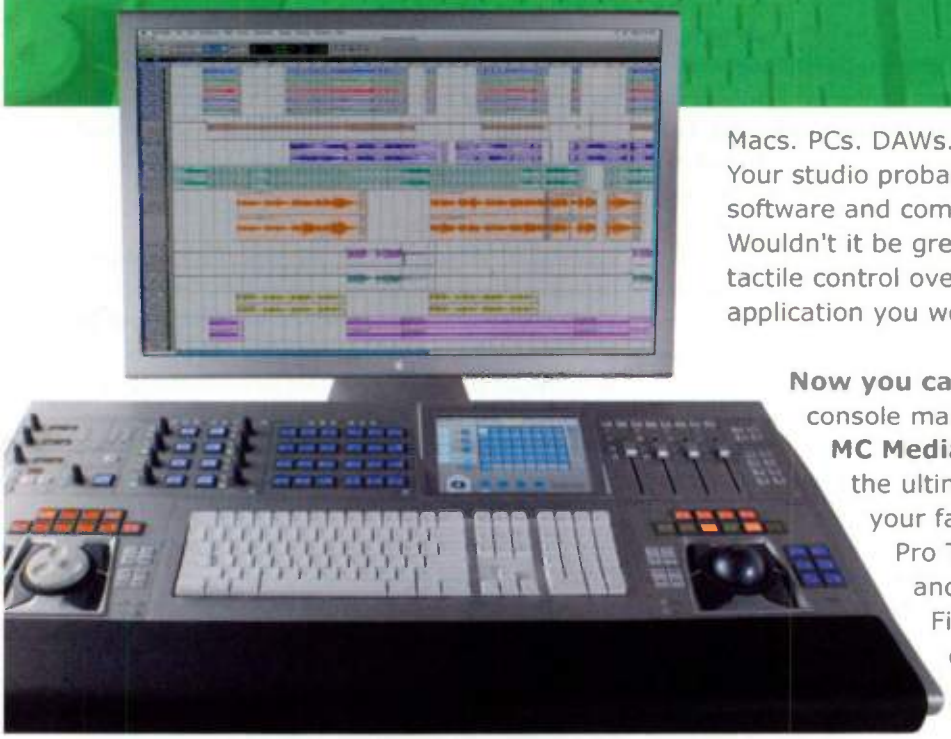

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as a test to ensure the backup is working properly," recommends Christopher. "Sometimes log files only reveal that the backup software ran but don't truly confirm that the data was written to the device."

Not everyone has complete faith in backup software. "I just don't trust backup programs," says Morales. "I've lost Pro Tools sessions. Stuff didn't get backed up for some reason—that one file that was needed. I use backup software when necessary, like at the end of a tracking date when there are so many files to back up."

Keep It Together

The success of your backup strategy depends on your ability to organize your files so that you can easily find and back up the desired files. It's helpful to make a folder for each song, within which reside the folders for your audio files and for the other file types your sequencer produces (fade files, for example).

Be systematic about how you name your projects and the audio files created with them. Make sure your audio files have specific file names that reference each particular instrument and take. For example, label the second take of a guitar track "Guitar 1, tk 2," rather than just the generic "Audio 1."

Film and TV composer Josh Mobley (www.joshmobley.com) tells of a musician he knew who used a very risky method to store his audio and session files. "He had all of his songs in the same folder and put all the audio files in that folder as well, so he had about 100 songs with all of the audio in there. I said to this guy, 'You're insane. If something happens, you're done for.'"

Moore, who records to Digidesign Pro Tools, concurs on the need for file organization. "You have to be really on top of it all the time and know where your files are being recorded to. When you're importing audio, be careful to know where it's going. Or, if you know that it's gotten messy and you've lost control of it, you can use the Save Session Copy command [in Pro Tools], which basically collects all the media to a new location. And that can be a godsend."

Any full-featured digital audio sequencer will have a similar command that collects all of your audio files for a given song in a single folder. It's a very useful feature, because if your audio is scattered all over your hard drive, it might not all get backed up.

Noah's Archive

Recordable DVDs can be a key component in a musician's backup strategy. The discs come in many formats, and depending on what type of computer you have, you might be using DVD-R or DVD+R for write-once discs, and DVD-RW, DVD+RW, or DVD-RAM for rewritable discs.

A DVD's ability to store a lot of data, and its relatively low cost, make it ideal for creating secondary backups of ongoing work and for archiving finished projects. Most musicians and engineers that I talked to use DVD recordables for archiving. One big advantage DVDs have is their ready availability.

Brian Foraker, a mastering engineer in Nashville and a former tracking and mix engineer for acts such as Yes, .38 Special, Night Ranger, and John Paul Jones, uses DVDs as his primary daily backup. "At the end of each working day, I always back up to a DVD rewritable," he says. "At the end of the project, I back up to a data DVD. I also back up using WaveLab 5 with its DVD-Audio capability; I make a 24-bit [audio] version at the highest sampling rate [used on the project] (I always EQ at the highest resolution). I'll make a DVD of, say, 24-bit, 96 kHz [audio] files, so basically I'm making two backups. And then I always make a safety copy of the final CD version."

Moore explains his reasoning for using DVDs to archive his projects. "If I started to get into tape drives or some other format that's two stages removed from what everybody has on their desktop, there's a danger of it being unreadable. That's why I went with a commodity format, even though it's a pain because a typical project for me is 10 or 20 or 30 GB."

So what does Moore do when archiving a large project? "I end up having to break it up into several DVDs. I do it painstakingly by hand, which I can't say I recommend, but I haven't found a better way that works for me." He splits the files up using a simple system. "I usually just go 'Audio files A through F,' 'Audio files G through M,' or whatever." You can also use backup software to automate the splitting of files, a process called *data spanning*.

Get in the habit of checking your DVD backups to make sure that they were successfully executed. "Be certain that a particular burned DVD can be read by another computer," advises Vilanova. "On occasion, optical drives fail in such a way that they read

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Nathaniel Kunkel is one of today's hottest producer/engineers. It's his job to know good mics when he hears them. A few of Nathaniel's credits include: Robert Altman, Billy Joel, Little Feat, Lyle Lovett, Graham Nash, Aaron Neville, James Taylor, Anna Vissi, and dozens more.

Legendary studio drummer **Russ Kunkel** is Nathaniel's father. Russ's credits span four decades of illustrious session work for artists that range from A-to-Z – Herb Alpert to Warren Zevon. And as a successful producer of Jimmy Buffett, Graham Nash and many others, Russ also knows a good mic when he hears one.

"A-T's 40 Series are my 'go to' mics, without hesitation," says Nathaniel. "When I first heard the **AT4050**, I was very impressed. It was transparent, open and predictable. It is a stunning acoustic instrument microphone with the ability to handle extreme dynamic range very musically."

Take a professional tip from the Kunkels and hear what a 40 Series mic can do for your next session. Who knows? You might just be making musical history – like they have.

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A Blu-ray of Light

Many music projects, especially those using multitrack audio, exceed the 4.7 GB limit of conventional DVD recordables. But there are alternatives to splitting up your files. You can get Double Layer (aka Dual-Layer) recordable DVD drives that offer two-sided DVD writing, which gives you up to 8.5 GB on a single disc.

Before you buy such a drive, however, you should know that two new recordable-disc formats will debut this year: Blu-ray (see **Fig. 3**) and HD-DVD. These formats offer substantially larger storage capacities than even a Double Layer DVD. Blu-ray and HD-DVD are competing to become the market standard.

Blu-ray discs (so named because they use a blue laser to write their data, as does HD-DVD) will be able to store up to 25 GB of data, whereas HD-DVD will hold about 15 GB. You would think that Blu-ray's capacity advantage would make it the clear choice, but both formats were designed primarily for playing high-definition movies, and there are many other economic and political factors involved. An array of technology manufacturers, movie studios, and entertainment conglomerates have lined up behind each format. Which one will win out is an open question.

What is clear is that either format will allow musicians to back up or archive much larger projects than before to a single disc, thus minimizing the need for data spanning. When choosing between the two formats, remember that the superior technology doesn't always win out. Remember VHS versus Beta?

How Long?

If you're archiving completed projects, it's useful to know how long your storage format will last. Data discs do not last forever. Rich D'Ambrise of Maxell, a leading maker of media including DVDs, says that the average life span of a recorded DVD is about 50 years.

Of course, the DVDs need to be stored correctly in order to last that long. "Store them in a jewel case," says D'Ambrise, "store them away from direct sunlight, and store them in a cool, dark place."

Almost everyone I talked to about archiving to DVD and CD stressed that using quality discs is key to avoiding problems. The general consensus is to stick with name brands. Avoid the urge to buy some off-brand just because you can get it for less. "Get a name brand that says it's safe for backup or long-term storage," suggests Mobley.

There are even discs available made specifically for archiving purposes (several musicians I spoke with mentioned MAM-A/Mitsui Gold Archival DVDs). The few extra cents per disc that you spend could mean the difference between a disc that lasts and one that doesn't. "It will be worth it," says

A SIMPLE BACKUP STRATEGY

There are many backup strategies you can employ; here's one that doesn't require a large time investment on your part:

- Save As several times during each session to create multiple files.
- Program backup software to make an incremental copy of your data automatically at the end of each day.
- Make a DVD-R backup of your project after each significant session. Store one copy off-site.
- Archive finished projects to recordable DVD. Make multiple copies. Store one copy off-site.

Vilanova. "The minor savings are simply not worth it in the long run."

Systemic Problems

Another part of your strategy should be to have a backup of your main system drive, where all your applications and plug-ins are stored. Although it will require yet another hard drive, doing a periodic system backup will ensure that if your main drive goes down, you won't have to completely rebuild it to get back up and running.

If you use a backup program such as SuperDuper or Carbon Copy Cloner, you can make a backup of your system that allows you to recover from a crashed system drive. Should your main drive go down, you can boot from that drive or copy it back to your main drive. In many cases, you won't need to reinstall all of your software or get new authorizations for your copy-protected music software, which can be a real time drain. If you work on deadlines or have clients coming into your studio, the ability to get up and running quickly after a major crash is essential.

Back and Forth

Although I have by no means exhausted all the aspects of data backup, the information provided here should help you to get started with your own backup strategy or to modify your existing one so it is more comprehensive. Without spending a lot of money or time, you can safeguard your data and gain peace of mind. Remember, the next time your hard drive turns on could be its last. EM

Mike Levine is an EM senior editor. He wishes to thank John Christopher, Rich D'Ambrise, Brian Foraker, Josh Mobley, Jeremiah Moore, Gil Morales, Peter Radsliff, Kathie Talbot, Marsha Vdovin, Jay Vilanova, and Scott Wilkinson for their assistance.

Mics of Many Colors

By Myles Boisen

It's no secret that cardioid microphones are preferred for the vast majority of studio recording applications, particularly when tracking instrumental and vocal soloists. But recording becomes a lot more interesting if you have a variety of pickup patterns at your fingertips, including omnidirectional and figure-8, especially when it comes to drums, orchestral instruments, amplifiers, and vocal groups. Fortunately for recordists on a tight budget, there are multipurpose mics on the market that offer three or more polar patterns, letting you maximize the timbral palette of your mic closet with a minimum outlay of cash.

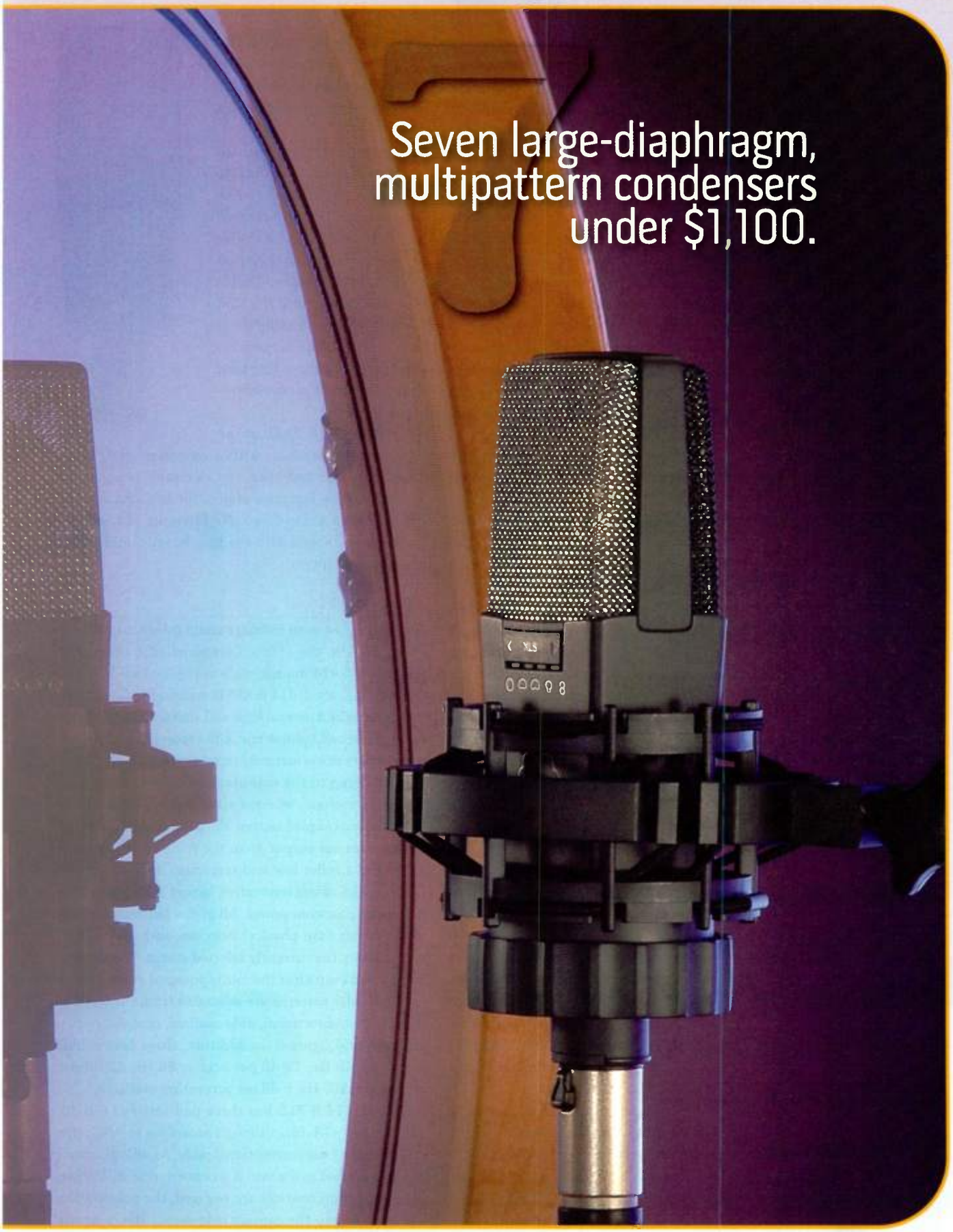
The seven microphones in this roundup are solid-state, side-address, large-diaphragm, multipattern condensers within a price range of $599 to $1,080. The mics were compared in a number of everyday recording situations—such as on vocals, electric and acoustic guitars, and drums—so I could learn their strengths and weaknesses and figure out where they would excel. The results should allow you to determine whether a particular microphone is right for you.

What's in a Pattern?

Each of the three main polar patterns—cardioid, omnidirectional, and figure-8—has advantages and disadvantages, and it's useful when a mic allows you to easily overcome a recording problem at the flick of a switch. By their nature, directional mics, such as the cardioid, capture the sound in front and reject sound in their null points. It's the mic to choose when you don't want a lot of room sound in your recording. However, an inherent problem in some directional mics is sonic coloration as a sound source moves off-axis.

Directional microphones also give you the proximity effect, which is a boost in bass frequencies as the mic gets closer to the sound source. This can be used to your advantage in some applications, such as vocal recording, but it can be a problem when you're tracking

Seven large-diaphragm, multipattern condensers under $1,100.



ROBERT PERRY

instruments that have a complex lower midrange.

Figure-8 and omnidirectional mics capture the room ambience that cardioid mics reject, often resulting in a more lifelike recording. When used with a cardioid mic, these mics open up a new world of timbres. One common technique is to position a cardioid mic close to a sound source and use an omni or figure-8 mic farther away as a room mic. Another technique is to combine a cardioid or omni mic in a coincident pair with a figure-8 mic for mid-side (M-S) stereo recording. (See the article "Front and Center" about M-S miking techniques in the March 2006 issue online at www.emusician.com.)

On its own, a figure-8, or bidirectional, microphone can be used to record two instruments or vocalists at a time: the front of the mic is pointed at one person, while the other person is positioned directly behind the mic, at 180 degrees. Bidirectional mics offer superior rejection of sounds arriving at the sides of the mic (90 degrees and 270 degrees).

As the name suggests, omnidirectional mics pick up sound from all sides, producing a unique sonic signature and capturing the maximum amount of room ambience. And because there is little or no proximity effect, omni mics are an interesting alternative for close-miking instruments such as acoustic guitar and bass drum.

FIG. 1: Designed for orchestral recording, the ADK A-51TL offers four patterns—omnidirectional, cardioid, hypercardioid, and figure-8—but has no pad or rolloff switches.

Except where noted in the table, all of the mics in this article offer at least cardioid, omnidirectional, and figure-8 patterns. The switches for the polar patterns and other features, such as attenuation pads and bass rolloff filters, are located on the mics themselves rather than on a separate box. The mics require 48V phantom power and are designed for studio and live recording.

ADK A-51TL

The ADK A-51TL has a conventional cylindrical shape and silver satin finish. A 4-position pattern switch (omnidirectional, cardioid, hypercardioid, and figure-8) is located on the rear-address side of the body (see **Fig. 1**). The A-51TL was designed for use as an orchestral recording mic, and there are no bass rolloff or pad controls.

The A-51TL kit comes in a latching briefcase, with a thick foam windscreen and a shockmount. The shockmount is the ubiquitous Chinese design used by many manufacturers; it has a thin metal outer ring with an inner collar that widens to accept the microphone when the two handles are squeezed together. When the handles are released, the collar clamps around the mic body and holds it in place by friction. The ADK T-Super mount ($149.99)—a heavy-duty metal suspension shockmount with a threaded ring that the mic screws into—is also available.

FIG. 2: The AKG C 414 B-XLS has electronic "smart switches" on the front and back for choosing polar pattern, pad level, and rolloff position.

The ADK A-51TL is an international product, with a European designer, a Chinese capsule and body, and electronic components of European or Japanese origin. The mic and accessories are assembled in China. No literature or frequency traces were shipped with the mic, but it comes with a five-year warranty.

AKG C 414 B-XLS

The AKG C 414 is an industry standard with a pedigree dating back to the 1960s. Compared with other contemporary C 414 models, such as the C 414 B-XLII and C 414 B-TLII, the C 414 B-XLS is designed to have a flatter response and neutral high-end characteristics. This is the smallest and lightest mic in the roundup, and its flat, trapezoidal body is instantly recognizable (see **Fig. 2**).

According to the manufacturer, the C 414 B-XLS is transformerless, whereas all of its predecessors had transformer-coupled output electronics. AKG says the transformerless output gives the mic a wider dynamic range and a fuller low-end response. In addition, the C 414 B-XLS offers innovative "smart switching" once it receives phantom power. All of the buttons are electronic rather than physical switches, with green LEDs that indicate the currently selected status. The settings are recalled even after the mic is powered down.

Five polar patterns are selectable from the front of the mic: omnidirectional, wide cardioid, cardioid, hypercardioid, and figure-8. In addition, three bass rolloff positions (40 Hz, 12 dB per octave; 80 Hz, 12 dB per octave; and 160 Hz, 6 dB per octave) are available.

The C 414 B-XLS has three pad settings (–6 dB, –12 dB, and –18 dB), although according to AKG, this model doesn't use conventional pads. As 48V phantom power is applied to the mic, it is converted to 96V. When the attenuation controls are engaged, the polarization voltage going to the capsule is lowered. The company

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adds that this system keeps the noise and distortion specs the same in all settings.

The C 414 B-XLS has a thin stem that holds its XLR jack and fits in a number of small-diaphragm mic holders. The supplied suspension shockmount is made of black plastic, with a collar that twists to lock around the stem of any mic measuring 0.75 to 1.02 inches in diameter. Other accessories shipped in AKG's deluxe briefcase include a form-fitting foam windscreen, a dual-layer pop screen with gooseneck and stand clamp, and a thorough manual with useful recording tips and applications.

An enclosed laboratory frequency graph shows the frequency response of the mic in all five polar patterns. Wide cardioid appears to yield the flattest response, at ±2 dB from 40 Hz to roughly 15 kHz. All patterns on the C 414 B-XLS exhibit a fairly flat response below 3 kHz and bumps in response at 3 kHz, 6 kHz, and 15 kHz. The capsules, electronics, and all significant parts are made in AKG's factory in Vienna, Austria. The mic comes with a three-year warranty.

I was surprised again and again at how big the Røde NT2000 sounded.

Audio-Technica AT4050

The Audio-Technica AT4050 has a stealthy, matte black look (see **Fig. 3**). The multipattern selector is located on the front of the mic beneath the silver logo, and the bass rolloff and pad switches are on the back. The AT4050's body is slim, and as with the AKG C 414 B-XLS, its thin stem fits into many small-diaphragm mic holders.

FIG. 3: The Audio-Technica AT4050's pattern selector is on the front of the mic. The pad and rolloff switches are on the back.

A black metal AT8449 shockmount is shipped with the mic. Unlike with most of the shockmounts in this roundup, the AT4050 does not attach physically to an inner cage assembly within the mount. Rather, it is held by friction within two rubber bands. Initially this arrangement took a minute to figure out and did not inspire confidence. But the mic does stay in place once it is pushed fully into the inner collar, and it will hang upside down without slipping. All switches are easily accessible once the shockmount is in place.

The AT4050 comes in a black vinyl-covered storage box with foam lining, with a cloth dustcover to fit over the mic when it's left mounted on a stand. A spec sheet and deluxe Audio-Technica catalog poster are the only literature included. Audio-Technica's AT40-series mics, including all the parts, are manufactured in the company's Japanese factory and are covered by a one-year warranty.

CAD Equitek e300-2

The CAD Equitek e300-2 has a unique appearance, with a short, stocky body and a larger-than-average metal grille. Switches and a brilliant gold mesh screen adorn the on-axis address side of this mic (see **Fig. 4**). One special feature of the e300-2 is its use of rechargeable nicad batteries (included) to provide the higher current required by the mic's op-amp-based circuitry. However, the e300-2 can also operate on batteries alone, without external phantom power.

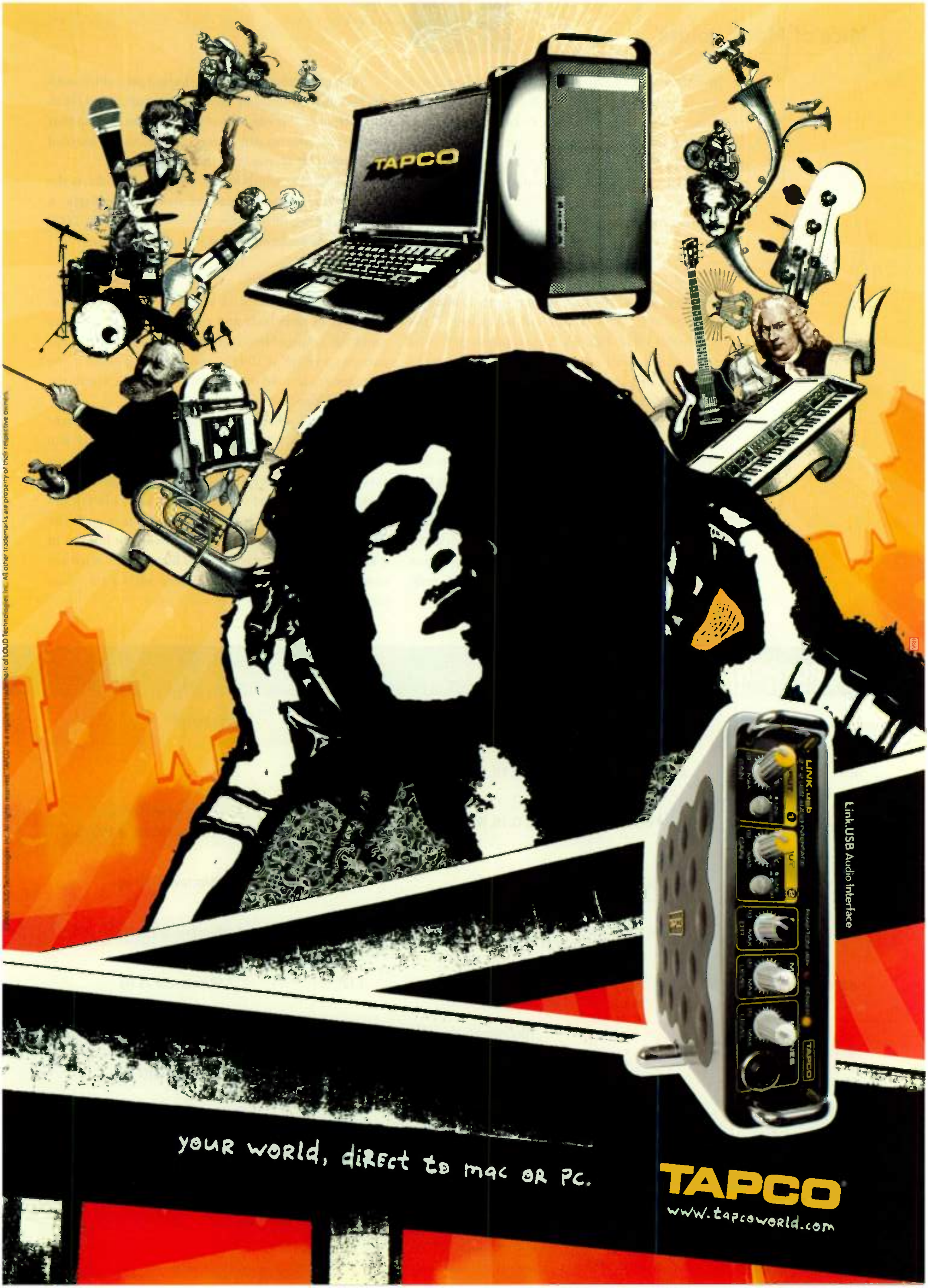
One aspect that is slightly confusing is the battery switch itself, which is marked 1/0 on the mic but is referred to as On/Off in the manual. An individual frequency response graph of the test mic revealed a basically flat response in cardioid mode from 40 Hz to 5 kHz, with a sharp dip of –6 dB at 6 kHz, and a broad peak of about 4 dB between 9 and 14 kHz. The published frequency chart in the brief CAD manual shows no dip at 6 kHz, but does indicate that the flattest response for this mic occurs in figure-8 mode.

The mic comes with a sturdy metal suspension shockmount, which screws securely onto threads encircling the mic's XLR connector. The e300-2 is shipped in a black molded-plastic carrying case. The mic is made in CAD's U.S. factory and comes with a two-year warranty.

Groove Tubes GT-57

The Groove Tubes GT-57 has a classy gray logo and model number engraved over a matte black finish (see **Fig. 5**). The grille is fine satin mesh on both sides and not as see-through as that of most mics. The bass rolloff and pad switches are located on the front of the mic, and the 3-position pattern selector is on the rear. Groove Tubes' large-diaphragm capsules are made of ultrathin 3-micron Mylar, with a special Disk Resonator design that the company says enhances high-frequency reproduction.

The GT-57 is the only mic in this roundup that does not include a suspension shockmount: the SM4 ($49) basket-type shockmount is available as an optional accessory. An all-metal swivelmount is provided, and the set comes in a small latching storage case without a carrying handle.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In addition to a basic manual, a very informative 40-page booklet titled *Choosing & Using Microphones* by Groove Tubes founder Aspen Pittman is included. This booklet goes into scholarly depth about microphone types, technical issues, tips and applications, and a number of other topics related to microphone usage. The GT-57 is made in China from Chinese and American components, and it carries a one-year warranty.

Røde NT2000

Besides being one of the largest mics in this roundup, the Røde NT2000 also stands out by virtue of the rotary controls located on the front-address side of its silver satin-finish body (see **Fig. 6**). All settings on the NT2000 are continuously adjustable throughout their range, which is a unique and very attractive feature on a multipattern solid-state microphone.

The polar patterns range from omnidirectional at one extreme to figure-8 at the other. The bass rolloff goes from 20 to 150 Hz, and the pad ranges from 0 to –10 dB. The silver thumbwheel controls are a bit smaller than a dime and not easy to grip, especially for a person with large fingers. The pattern selector is particularly stiff and difficult to adjust. However, the calibration notch in each knob acts as a catch for a fingernail, making the controls easier to manipulate.

A large plastic suspension shockmount ships with the NT2000. The base of the mic slips through a hole in the bottom of this rugged mount's inner basket, so that it can be securely attached using the removable threaded metal ring that screws onto the mic stem.

The mic case, which includes a molded handle, is the size of a briefcase and is made of molded black plastic. A manual with helpful recording tips is provided. The NT2000 is made in Australia and comes with a ten-year warranty.

SE Electronics Z3300A

The SE Electronics Z3300A is a hefty mic, with a cylindrical, silver satin body and a large grille that brings to mind the vintage Neumann U 47. It offers three polar patterns, a rolloff at 100 Hz, and a –10 dB pad. All of the switches are located on the front of the mic above the bright red logo (see **Fig. 7**).

A large all-metal suspension shockmount is standard equipment. This well-made shockmount is also reminiscent of a vintage German design, and the mic screws securely into a threaded ring mounted on a base at the bottom of the inner basket. SE Electronics included no literature or frequency traces with the Z3300A, but the mic and shockmount are housed in a square latching briefcase. SE Electronics mics are manufactured in China and come with a two-year warranty.

MICROPHONE FEATURES COMPARED

Company	Model	Patterns*	Diaphragm	Bass Rolloff
ADK	A-51TL	C, O, F8, HC	1"	none
AKG	C 414 B-XLS	C, O, F8, WC, HC	1"	12 dB/octave @ 40 Hz and 80 Hz; 6 dB/octave @ 160 Hz
Audio-Technica	AT4050	C, O, F8	1"	12 dB/octave @ 80 Hz
CAD	Equitek e300-2	C, O, F8	1.1"	6 dB/octave @ 135 Hz
Groove Tubes	GT-57	C, O, F8	1.12"	12 dB/octave @ 75 Hz
Røde	NT2000	continuously variable from O to F8	1"	6 dB/octave, continuously variable from 20 to 150 Hz
SE Electronics	Z3300A	C, O, F8	1.07"	6 dB/octave @ 100 Hz

*C = cardioid; O = omnidirectional; F8 = figure-8; WC = wide cardioid; HC = hypercardioid.

Getting to Know You

To get an idea of the similarities and differences between the mics, I set up a controlled comparison test and recorded the results using Digidesign Pro Tools LE. The mics were set up in pairs, side by side, 13 inches from an E-Mu PM5 powered monitor, using Blue Kiwi mic cables and Monster speaker cables for the connections.

I used calibration tones to set comparable microphone gain levels, and all mics required 35 to 40 dB of gain through a Focusrite Green 1 stereo preamp. A variety of mixes and solo instrumental tracks were played through the speaker, and all of the mics were tested in cardioid, omnidirectional, and figure-8 patterns. Besides the loudspeaker trials with music mixes, I conducted tests for self-noise, rumble, housing resonance, and switching noise.

The results were evaluated in the Headless Buddha Mastering Lab, through Dynaudio BM 15 monitors. Additional steps were taken to carefully match track levels during playback, both by ear and using the meters. The following tests were conducted in cardioid mode only.

On an acoustic rock mix the Røde NT2000 was robust and dynamic, rendering kick drum and acoustic bass with remarkable clarity. The AKG C 414 B-XLS and ADK A-51TL treated kick and bass elements favorably, while the Groove Tubes GT-57 sounded full but unfocused and sometimes boomy in the bass around 150 Hz. In general, the other mics seemed to lose low-end definition and warmth across a variety of mixes.

The NT2000 and C 414 B-XLS transducers offered a strong midrange with lots of tone, sounding full and smoothest overall. The Audio-Technica AT4050 was also smooth in high-end response, but comparatively it lacked punch and upper-bass warmth. The A-51TL and GT-57 also conveyed good midrange and upper bass, but their incisive highs diminished smoothness. In contrast, the CAD Equitek e300-2 and SE Electronics Z3300A often seemed a bit hollow and lacking in midrange detail, and they skimped on upper-bass fullness.

FIG. 4: The CAD Equitek e300-2 can be powered by the included rechargeable nicad batteries.

The GT-57, e300-2, and Z3300A were quite bright, bringing acoustic guitar and hi-hat to the fore, and emphasizing vocal sibilance in pop mixes. High-end harshness was of particular concern with these mics on a hard-rock mix with a very bright drum sound. Alternatively, the AT4050 brought a smooth clarity

Attenuation Pad	Frequency Response	Maximum SPL Without Pad	Self-Noise	Weight Without Shockmount	Price
none	20 Hz–20 kHz	125 dB	15 dBA	15 oz.	$795
–6 dB, –12 dB, –18 dB	20 Hz–20 kHz	140 dB	6 dBA	10.6 oz.	$1,080
–10 dB	20 Hz–18 kHz	149 dB	17 dBA	18 oz.	$895
–20 dB	10 Hz–20 kHz	125 dB	12 dBA	18 oz.	$599
–10 dB	20 Hz–18 kHz	134 dB	22 dBA	12 oz.	$599
continuously variable from 0 to –10 dB	20 Hz–20 kHz	147 dB	7 dBA	24 oz.	$899
–10 dB	20 Hz–20 kHz	125 dB	20 dBA	24 oz.	$599

to the percussive highs that I found quite listenable. The C 414 B-XLS was also flatter in the treble response, almost to the point of sounding muffled. In this test the NT2000 was comparable with the brighter mics, but managed to balance prominent highs with its trademark solid bass.

Interestingly, it was on a mellow jazz instrumental with brushes on snare that I heard how different all these mics truly are. Because of subtle variations in treble and midrange response, the swirling brushes brought out different characters in each mic, and no two sounded alike in this test.

The C 414 B-XLS came across as darkest with its soft highs and full lows. The AT4050, NT2000, and A-51TL models were fairly well balanced, with the NT2000 and A-51TL having the advantage of bigger bass response. The GT-57 and Z3300A sounded similarly bright and pingy on acoustic guitar and cymbals. And the e300-2 was again very bright, emphasizing a sandy character in the brushes and downplaying the rich midrange of this mix.

FIG. 5: Besides having three polar patterns, the Groove Tubes GT-57 has a switchable –10 dB pad and a 75 Hz low-frequency rolloff.

Switches and Noise

Self-noise was not a problem with any of these mics during testing or sessions. In auditions, when inching playback gain up to higher-than-average listening levels, the Z3300A was the first to display an audible noise floor. This observation seems to be in keeping with the mic's relatively high 20 dB self-noise rating.

In testing, all the mics except the e300-2 and NT2000 (which is continuously adjustable) emitted a transient click or pop when switched from one pattern to another. The C 414 B-XLS had the gentlest pop, but it was still audible. When switched, the other mics sounded sufficiently nasty to warrant a cautionary note: always turn the preamp gain down when switching from one pattern to another.

When tapped with a pen, the AT4050 produced a noticeable midrange note that did not sustain. The body of the GT-57 did ring on a high, chiming note when mounted in its supplied swivelmount. When clamped inside the multipurpose ADK shockmount, the GT-57 resonated subtly on a low, unpitched tone when tapped.

The remaining mics issued only a dull thump, indicating good body damping and a lack of housing resonance. None of the mics demonstrated stand-borne vibration when shockmounted.

Voiced Opinions

My studio partner, Bart Thurber, and I used the test mics often on various recording sessions over the period of a month. Although such observations are perhaps more subjective than those made during controlled testing, they do serve to establish a real-world impression of each microphone.

FIG. 6: Key features on the Røde NT2000 are the continuously adjustable controls for polar pattern, bass rolloff, and pad.

Thurber tested the A-51TL on a male rock vocalist, commenting that he found the mic to be of above-average audio quality, yet a little too bright and bass-lean for his taste. On female vocals the Z3300A was warm and accurate. The singer and I both noticed a fuzziness with the e300-2, due at least in part to its prominent high end.

On a different female vocalist, I was very impressed with the AT4050 and would happily use this mic for final vocal tracks. Though a touch sibilant at times, Audio-Technica's condenser was well balanced tonally, exhibiting nice presence and loads of detail. The AT4050 also did a very good job in various pickup modes on two different violinists, never sounding too bright or scratchy.

On another male vocal session, the NT2000 was roughly comparable to the Lawson L47MP tube mic I usually use. Like the Lawson, the Røde had lots of warmth in the lower registers, and a good balance of highs to lows. The overall timbre pleased everyone in the control room.

At a different session, again with a male singer, the C 414 B-XLS worked well to deliver an authoritative, chesty sound. This mic is not overly bright, and may not have enough presence for some vocalists. But in this session, it was the perfect choice to downplay some scratchiness in the vocal that was emphasized by the NT2000.

Drums and More

Although the Z3300A sounded a bit thin in comparative testing, it was still able to transform a rock kick drum into a thunderous marching bass drum with close placement in omni mode. The C 414 B-XLS was always a reliable performer for kick drum, especially on double-headed jazz drums.

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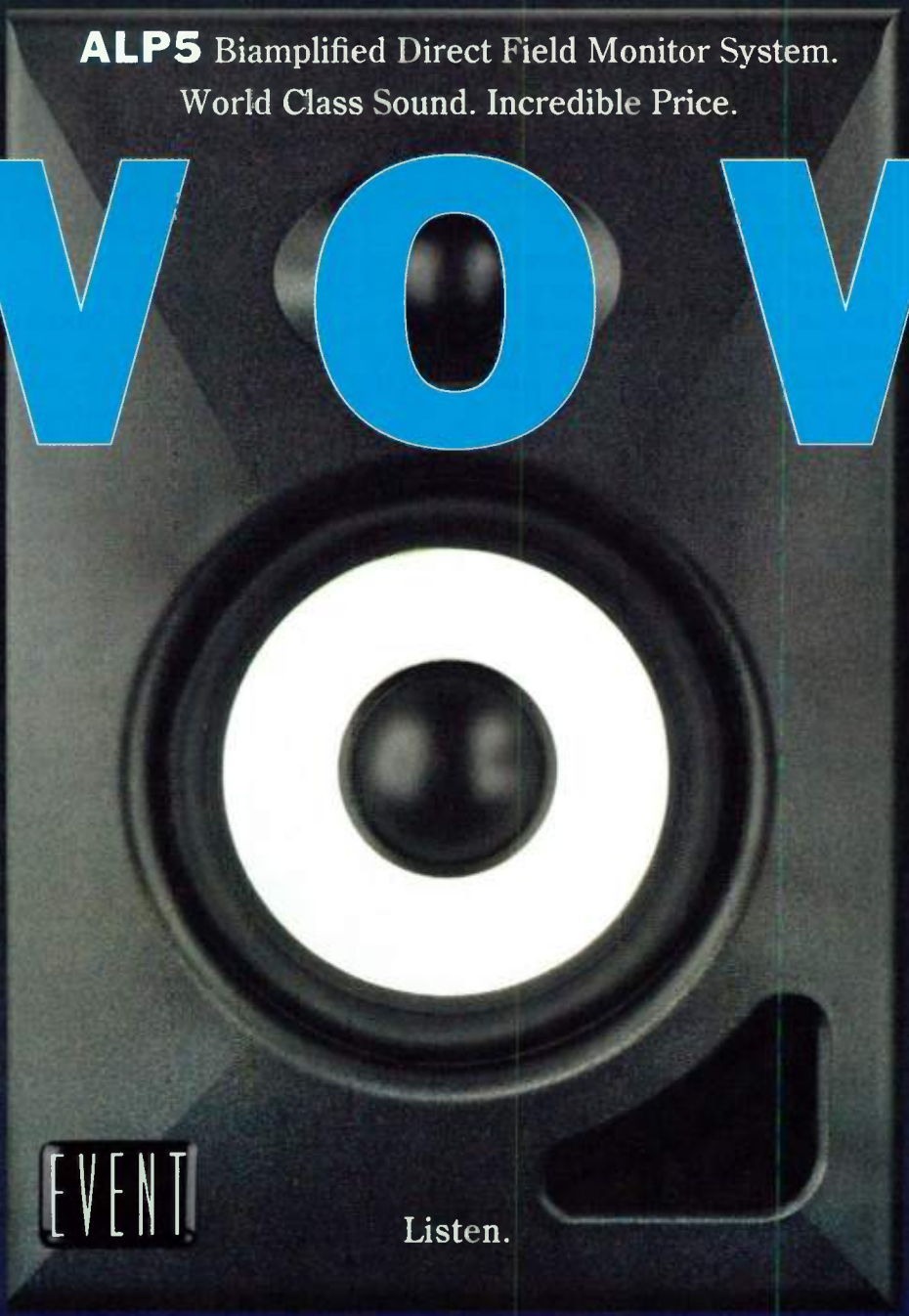

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The C 414 B-XLS was also great for snare brushes, and I preferred it over the GT-57 for this application. But AKG's mic was too dark and thick with sticks on the snare, especially during rock-style playing. I found the AT4050 to be always pleasing and more versatile for a range of snare drumming styles.

Thurber does primarily rock recording at the studio, and he really took a liking to the Røde NT2000. For drum overheads, Thurber praised the NT2000 as well balanced and "not too crispy," and he used a pair on several of his sessions. He also rated the NT2000 and A-51TL highly as drum-room mics in omni mode, and gave the thumbs-up to the AT4050 as an overhead pair.

In a close-mic placement on cello, the NT2000 was rich, though a bit dark and lacking upper harmonics. However, the mic did offer good, uncolored off-axis pickup in cardioid mode.

For an accordion track, I paired up the A-51TL on the keyboard side with the Z3300A in omni over the chord buttons. Both mics worked well and complemented the high harmonics of the instrument, with the Z3300A being a bit brighter.

After trying the GT-57 on acoustic guitar, Thurber decided not to use it for tracking, citing its brittle highs and tubby low end. On the other hand, the microphone worked well for creating an airy background group-vocal part in omnidirectional mode, and I also found its brightness well suited to a variety of hand-percussion instruments.

Track Record

After several weeks of recording, the individual characteristics of each microphone began to reveal themselves. For example, the ADK A-51TL is a big-sounding mic with a pleasing tonality. Sometimes, though not always, it exhibited more high-end presence than I like. In figure-8 mode, the A-51TL's high end softened in an interesting and potentially beneficial way. The low end also filled out appreciably, highlighting the versatility of this mic while

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maintaining its basic tonal character. The mic's omnidirectional pattern was consistently full and bright, but less penetrating in the upper mids.

On the other hand, AKG's venerable C 414 B-XLS conveyed neutral highs, a dependably flat low end, and plenty of midrange tone. This mic kept its signature sound in omni mode without brightening to the degree that other microphones in the roundup did. However, its figure-8 pattern was thicker in the mids and upper bass, sometimes to the point of being slightly muddy.

With its latching briefcase, shockmount, windscreen, and pop filter as standard accessories, the C 414 B-XLS wins the prize for having the most features. In addition, it offers five switchable patterns instead of the conventional three, and a variety of pad and bass rolloff choices. However, it's the most expensive mic in the roundup.

The Audio-Technica AT4050 presents a nice middle-of-the-road character with its well-balanced and always pleasant tonality. This mic was never as bright as the GT-57, e300-2, or Z3300A, nor as full in the low end as the A-51TL, C 414 B-XLS, or NT2000. Timbral changes through the patterns were subtle and predictable: a bit thinner and brighter in omni; a darker and thicker bass in figure-8.

By comparison, the CAD Equitek e300-2 always sounded overly bright to me, and often strangely filtered in cardioid mode. The omni pattern delivered even less low end, more exaggerated highs around 10 kHz, and significantly lower gain. I was surprised to find that the mic's figure-8 pattern offered the best fidelity. In this pattern, the e300-2 came close to the fairly neutral sound of the C 414 B-XLS's cardioid pattern, with a rounder low end and smoother highs.

I would describe the basic quality of the Groove Tubes GT-57 as a classic "smile curve." It has abundant lows and highs

FIG. 7: The SE Z3300A puts all three switches—pattern, pad, and rolloff—on the front of the mic.

along with a slightly attenuated midrange. The high-end response was sometimes too edgy, both in testing and session work. However, this mic maintained its tonal character in all patterns, with only minor variations in response between cardioid and figure-8. In omni mode, it was about 1.5 dB lower in gain, predictably brighter, and less focused in the lows.

I was surprised again and again at how big the Røde NT2000 sounded. It has a low end that is fuller and flatter than the rest of the mics, but one that is never exaggerated.

The NT2000 tested well and was a favorite around the studio. It became darker and more midrangy in figure-8 mode, and smaller and brighter, though not at all grating, in omni mode. Although its timbral shifts between polar patterns are more dramatic than those of some of the other mics, the NT2000 always maintains its tonal balance and musical sound quality, making it a truly exciting recording tool.

Like the GT-57, the SE Electronics Z3300A was often too edgy for me in testing. But it was a solid performer in the studio. The Z3300A showed lots of tonal variation when changing patterns: its bidirectional pickup exhibited a hot sound with pronounced upper mids, and the omni pattern was notably brighter above 10 kHz and lacking in midrange tone. However, of the mics residing at the low end of the price scale, the Z3300A offered the best fidelity during sessions and trials, as well as the most impressive set of accessories in its class.

Flying Colors

All of the mics in this roundup offer good- to high-quality audio, appealing features, state-of-the-art specs, and solid value for the money. Although some of the mics varied noticeably in frequency response through their range of polar patterns, that could be seen as a bonus if you have a limited mic closet: it's like getting two or three different mic timbres for your money.

On the other hand, you may prefer a mic that holds more of a consistent or reliable tone through its pickup patterns. Your aesthetic tastes will determine which mic you select, whether it's one with some extra color and high-end zip, such as the ADK A-51TL, the CAD Equitek e300-2, the Groove Tubes GT-57, or the SE Electronics Z3300A, or one with a smoother high end and flatter response overall, such as the AKG C 414 B-XLS, the Audio-Technica AT4050, or the Røde NT2000. **EM**

Myles Boisen is the head engineer at Guerrilla Recording and the Headless Buddha Mastering Lab in Oakland, California.

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The Long and Winding Road

By Larry the O

Geoff Emerick talks about the Beatles and the state of contemporary recording.

Even if Geoff Emerick's career as a full-fledged recording engineer had lasted only three years, he would nevertheless have been assured a prominent spot as one of audio recording's greats. If all he had done was to engineer the Beatles' LPs *Revolver* and *Sgt. Pepper's Lonely Hearts Club Band*, he would still be known for pioneering a staggering number of recording techniques that have long since become standard.

For Emerick, who still engineers and produces, those albums were just the beginning. He did a lot more work with the Beatles, including *Abbey Road* (which had the original working title of *Everest*, after the brand of Emerick's cigarettes)—an album that won him his second Grammy Award for Best Engineered Recording (he won his first for *Sgt. Pepper*). In the 1990s, he produced, engineered, and mixed the fascinating and instructional, if raw, *Anthology 1*, *Anthology 2*, and *Anthology 3*.

In addition to his work with the Beatles, Emerick engineered or produced more than his share of landmark rock recordings, including Robin Trower's *Bridge of Sighs*, Elvis Costello's *Imperial Bedroom* and *All This Useless Beauty*, and a solid handful of Paul McCartney albums, including *Band on the Run*, which garnered Emerick his third Grammy Award for engineering. Throw in the Zombies, Art Garfunkel, several albums with America (produced by Beatles producer George Martin), Nazareth, and more, and it is clear that Emerick has kept busy.

Emerick was inducted into the TEC Hall of Fame in 2002 and was awarded a Technical Grammy in 2003. In 2004 he produced the two-CD debut album *Get Away from Me* by 21-year-old singer-songwriter phenom Nellie McKay.

Emerick was just 15 when, on September 3, 1962, he walked into EMI Studios on Abbey Road (later called Abbey Road Studios) in London to begin training as an assistant engineer. On the evening of his second day on the job, he observed what was the first session of a hot new band from Liverpool. The Beatles would do many more sessions in that studio (see **Fig. 1**), and Geoff Emerick would play a key role in lots of them, eventually breaking a number of the same EMI rules he'd learned starting on his first day.

After *Rubber Soul* was produced, the Beatles' original engineer, Norman Smith, moved on to become the producer for a band he'd discovered by the name of Pink Floyd. Emerick, then 19 years old, was offered the job of engineering the Beatles. He had worked a number of Beatles sessions as an assistant engineer, but from his first session as the Beatles' *balance engineer* (an EMI Studios term referring to the top-of-the-totem-pole engineers who worked the console and did the mixing), it was clear that the band was going somewhere new and had picked up an able coconspirator in Emerick.

On the second day of sessions for *Revolver*, also his second day as a balance engineer for the Beatles, Emerick had five tape decks running loops, which he artfully mixed down in real time to construct the psychedelic effects on "Tomorrow Never Knows." That was a vastly new and different way to make a pop album in 1966.

His stories, recently captured in his memoirs cowritten with Howard Massey, called *Here, There and Everywhere: My Life Recording the Music of the Beatles* (Gotham Books, 2006), are those of legend (see **Fig. 2**). For instance, he describes the session for "A Day in the Life" that featured an orchestra in formal dress. As the orchestra began tuning up, roadie Mal Evans circulated among them, handing out gorilla paws, rubber noses, and clown wigs to the bemused musicians, courtesy of the Beatles. John, Paul, George, and Ringo had agreed to dress formally for the occasion, but instead they showed up clothed in psychedelic finery.

Emerick also tells of the time he and the band raided EMI's sound-effects library and gathered tapes of a calliope and a steam organ, which were then cut up, thrown in the air, and spliced back together for "Being for the Benefit of Mr. Kite." His commentary about the Beatles and others is bracingly frank. He discloses that the reason he quit as the Beatles' engineer in 1968 (during the recording of *The White Album*) was that he was tired of dealing with what had become constant infighting and tension between the band members.

Although Emerick's work was considered cutting-edge when he was recording the Beatles, these days he's regarded as old-school. In his opinion, much of the spontaneity and emphasis on performance has been lost from the recording process since the advent of computer-based multitracking. He feels that the group interaction and flow of a recording session—which was so important, for example, during the Beatles' days—has been lost in today's studio world.

Affable and easygoing, Emerick has a great appreciation for the rare and fortuitous chain of events that enabled him to contribute to a revolution in recording and music making. He has definite ideas about what he likes, and he often uses visual metaphors when talking about sound. I caught up with him as he was nearing the end of recording an automobile association ad in England that had a budget substantial enough to hire an orchestra and a choir—and Emerick.

COURTESY ABBEY ROAD STUDIOS

FIG. 1: The live room of Studio 2 at Abbey Road Studios in 2005. The studio is relatively unchanged from the days when the Beatles recorded their classic albums in it.

Chemistry and More

The phenomenon of the Beatles in the studio was an amazing confluence of a number of entities. One was the availability of EMI's resources; another, the contributions of the Beatles themselves; yet another, those made by Emerick, the kid who was willing to try anything and break the rules; and lastly, the contributions of Martin, who had a background of scoring and orchestrating, as well as of producing records with crazy comedians.

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How did all those different personalities come together to create?

If you're talking about the chemistry—the way people work together—Martin had a great sense of humor. I had a good sense of humor, too, and the Beatles, when they started, had a good sense of humor, and it all kind of jelled. When we got to *Revolver*, they wanted to progress and got a little more serious. But it worked, because we all had a good sense of humor, which is lacking on sessions now because it's all about the technology.

On your first session as a full balance engineer, on *Revolver*, you stuffed a sweater into Ringo's kick drum and moved the mic right up to the drum. You were the first at EMI to do close-miking. How did that go over with your co-workers?

I upset a lot of engineers who'd been doing things the "standard" way. They didn't want a harder life, I guess. I was used to distance-miking because that was the way people recorded everything. With close-miking, it was just a question of putting your ear near the instrument and finding the tonalities. When you close-mic something, it's like putting a close-up lens on. You have to start thinking in terms like "depth of field." I try to apply all of that to the way I think all of the time. If you mic a cymbal at the edge, you get a lot of low end. No one thinks there's low end on a cymbal, but there is if you place a mic on the edge.

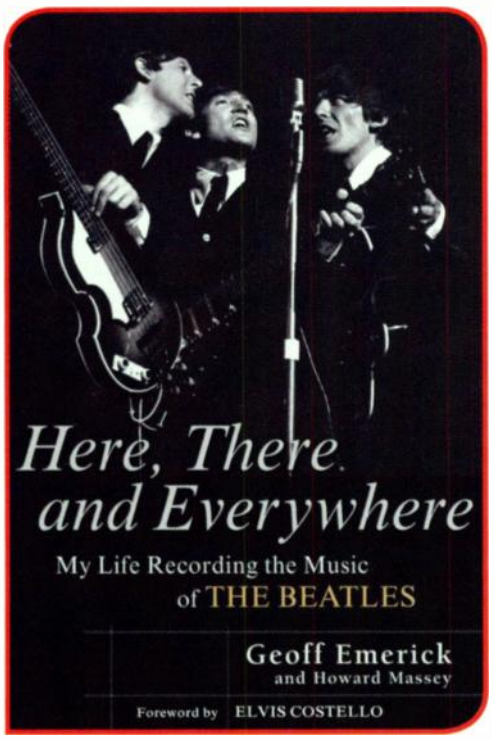

FIG. 2: Emerick's recently released book, *Here, There and Everywhere: My Life Recording the Music of the Beatles*, describes those early, groundbreaking sessions with the Fab Four.

It seems as though you enabled the Beatles to push the boundaries of sound.

If they started on a new song and there were drums, piano, bass, guitar, whatever, and then we'd have a playback, I knew that if it sounded ordinary, I'd be glared at. So I had to do something—be it overloading equalization or amplifiers, using a mic you'd never think of using, muffling something up, putting equalizer boxes in series. It's all I could do, you know? What did we have to grab? Rolls of sticky tape and some tape

DAVID RUBIN

Emerick feels that computer-based recording's capabilities for after-the-fact correction have had a negative impact on recording by deemphasizing the importance of a good performance in the studio.

machines. No phase boxes; there was nothing! But we were trying for new sounds all the time, and we had the luxury of time to do it, because the Beatles spent so much time in the studio running through their rhythm tracks and writing and rehearsing the songs.

Experimenting

Emerick's experiments had very few boundaries. Everything came to a head one day when the Beatles wanted an underwater vocal sound for "Yellow Submarine," and Emerick submerged a condom-covered microphone in a bottle of water (that technique was later made famous by sound designer Gary Rydstrom, using a Neumann and a bowl of oatmeal for the gooey sounds in *Terminator 2: Judgment Day* [Columbia Tristar, 1991]).

EMI's crusty studio manager, E. H. Fowler, chose that moment, when his still-new engineer was engaging in a bit of imprudent, potentially expensive, and decidedly improper youthful folly, to make an entrance. A quick but discreet scramble hid the bottle, and Emerick relaxed when the studio manager finally left, thinking that he was past the danger. Then it struck Emerick that the mic sitting in that bottle of water was phantom powered, and that someone could easily have gotten electrocuted if something had gone wrong. Oops.

I was at Abbey Road several years back and was struck by how dreary Studio 2 was. All that creativity happened in such unbelievably drab rooms.

Yes, and it helped destroy the Beatles. When I left them in '68, John was the band's spokesman when I went down into the studio to tell them I was leaving. He gestured with his arms in the air, pointing at the walls of Number 2 and said, "We've been stuck in here for three years, you know? It's like I've been in prison for three years!"

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It's not a very comfortable room.
No, not to have to try to create in for three years.

One thing that amazes me is, with all of those experiments, the degree to which the lack of tracks forced you to commit yourself during the process. You'd get lots of weird new sounds laid down, and then the Beatles would want to layer in more. It must have been hard to make a sonic space for each track.
Overdubs were really overdubs to the finished track: the track up to the point of an overdub was finished in terms of EQ and echo. Therefore, the overdub had to fit in, and if that meant putting four EQ boxes in series to get a sound through, that's what I did.

I thought you had only top and bottom EQ.
There was just top and bottom on the [mixing] desk, but we had other boxes that had 10 kHz, 2.7 kHz, 3.5 kHz, and the like. You could put 10 dB of those frequencies in, and sometimes I'd put those boxes in series. We did have another thing called a curve bender, and that was a little more subtle. I was just using that and trebly mics or ribbon mics to get the sound a little rounder. That's all I really had.

Solid-State Sessions

By the end of the '60s, the Beatles had had enough of each other. Sessions for *The White Album* had become so tense that Emerick temporarily quit working on Beatles records. He returned, however, to do *Abbey Road*.

When *Abbey Road* was being recorded, did the Beatles still not want to have a guitar sound like a guitar?
They were a bit more subdued in that area. Martin went and talked to Paul, and Paul promised it would be like it was in the old days—that there would be a sense of, well, honor, for lack of a better word, on the sessions. The group thing wasn't there anymore, really. That's why, on *Abbey Road*, there's lots of harmony work: because it was slanted toward Martin to help out on the harmony parts like it was in the early days.

It turned out to be a beautiful-sounding album. But it was sonically quite different for you, wasn't it?
I talk in the book about how we used the first transistorized mixing console and the drums didn't have the same power and impact, especially the snare. It gets a slightly softer texture, and so all the overdubs that went on the first rhythm tracks were more subtle.

After the Beatles, transistorized consoles became more widespread, and you engineered albums such as *Bridge of Sighs* on them. Did you change your opinion about them?
Oh, not really.

Here Comes Elvis C.

In 1982 Emerick found another creative coconspirator in Elvis Costello. Costello hired Emerick to produce his *Imperial Bedroom* album, a turning point in Costello's musical development.

It seems you worked well with Elvis Costello on *Imperial Bedroom*.

GEOFF EMERICK: A SELECTED DISCOGRAPHY

Geoff Emerick's discography comprises more than 170 albums. Listed below are just some of the highlights:

Engineer
America, *Holiday* (Warner Bros., 1974)
The Beatles, *Sgt. Pepper's Lonely Hearts Club Band* (Capitol, 1967)
The Beatles, "Strawberry Fields Forever"/"Penny Lane" (Capitol, 1967)
The Beatles, "Paperback Writer"/"Rain" (Capitol, 1966)
The Beatles, *Revolver* (Capitol, 1966)
The Mahavishnu Orchestra, *Apocalypse* (Columbia, 1974)
Paul McCartney, *Flaming Pie* (Capitol, 1997)
Paul McCartney and Wings, *London Town* (Capitol, 1978)
Paul McCartney and Wings, *Band on the Run* (Capitol, 1974)
Robin Trower, *Bridge of Sighs* (Chrysalis, 1974)

Engineer and Mixer
The Beatles, *Anthology 3* (Capitol, 1996)
The Beatles, *Anthology 2* (Capitol, 1996)
The Beatles, *Anthology 1* (Capitol, 1995)

Coengineer
The Beatles, *Abbey Road* (Capitol, 1969)
The Beatles, *The White Album* (Capitol, 1968)
The Beatles, *Magical Mystery Tour* (Capitol, 1967)

Producer
Elvis Costello and the Attractions, *All This Useless Beauty* (Warner Bros., 1996)
Elvis Costello and the Attractions, *Imperial Bedroom* (Rykodisk, 1982)
Art Garfunkel, *Lefty* (Sony, 1988)
Nellie McKay, *Get Away from Me* (Sony, 2004)

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I was a great admirer of Elvis and had always wanted to work with him, and it was great when he asked me to work on the album. He hired me because he wanted his voice to come through more on the recording, something that he had seemed afraid to do in the past. At first, he had a hard time coming to terms with how loud his voice was on *Imperial Bedroom*, but he came around.

What was your strategy in producing Elvis's vocals?
You have to capture Elvis's spontaneity, and you can't mess around spending ten, or even five, minutes trying to get a vocal sound. So I always had the vocal sound there. At any given moment that he wanted to sing into the mic, we could take it. He's an artist in the true sense, and if you leave something for ten minutes, any inflections in the words or the way he was going to sing it might have changed. He's got an idea, and he wants to do it right away—otherwise he'll lose it.

Well, that sounds like something you were used to with John Lennon. In your book, you talk a lot about his impatience.
He was impatient, yes. But he was impatient to get it finished, rather than impatient to get it down. He was never sure about his vocals, and his vocals were always fine.

Recording Paul

Near the end of the Beatles, Emerick left EMI and worked for Apple, the Beatles' studio and organization. McCartney was estranged from the scene by then and rarely went or called over to Apple. Finally, Emerick accepted a long-standing offer from Martin and became an engineer at Martin's AIR Studios, a complex located in a building above Oxford Circus in London. That change led him to reconnect with McCartney and to engineer a number of his albums, among them *Band on the Run*, *Tug of War* (Capitol, 1982), and *London Town*.

Tell me how you made albums with McCartney.
It depends on which album you're asking about. *Band on the Run* is a whole story on its own. At the time, it didn't seem like that much fun, but looking back on it, it was fun. [*Band on the Run* was recorded in Nigeria, and its creation is a long and fantastic tale told by Emerick in his book.] We did *Tug of War* in London at Oxford Circus, and it took a long time. *London Town* was done on a boat in the Caribbean. Every McCartney album has been an adventure in a way.

Did you work on his first few solo albums?
No, because I was at Apple at that time, and he never made any contact. Within a couple of weeks of when I left Apple and joined AIR Studios, I got the phone call asking if I wanted to do *Band on the Run*.

Sifting Through

In the mid-1990s, Emerick was suddenly thrown into his past when he helped create the Beatles' *Anthology* albums. The discs featured outtakes, demos, unfinished bits, and raw tracks—sometimes assembled into elaborate edit pieces. These albums provided a revealing look at the recording process behind the masterpieces, but they exposed a lot of material that had never been released because its quality had been deemed inferior.

It must have been exciting as well as spooky to work on the *Anthology* albums.
It was, because when it started, I was sort of against it. I wondered if I was doing the right thing. I felt as though I was going into Tutankhamen's tomb and destroying it. Beatles fans know every nuance in any of those songs, and to start dissecting them like that didn't feel good to me. I came to terms with it in the end, though.

Was it difficult editing the bits and pieces you had to assemble for the *Anthology* discs?
Some of the crossfading was tricky. To get closer to the original sound quality, I found an old EMI transistorized desk. I couldn't find the tube desk, obviously. The great thing was that those tapes hadn't been out of their boxes for years, but the tones went up to zero. [The tapes] didn't shed. It was the "Emmytape" [EMI-manufactured tape], and whatever they did making that, it was like working with new tape.

Did you transfer all the tapes to digital?
Abbey Road had already transferred all the tapes to digital, but I worked off of the analog masters.

That was done upstairs at Abbey Road, right?
Yeah, in the studio they call the Penthouse.

Engineer vs. Producer

Nowadays, Emerick is as likely to produce an album as engineer one.

When you produce, do you ever work with another engineer?
Well, that depends. On the Nellie McKay album, I worked with a guy named Stuart Breed, who lives in Woodstock. He

"I felt as though I was going into Tutankhamen's tomb and destroying it."

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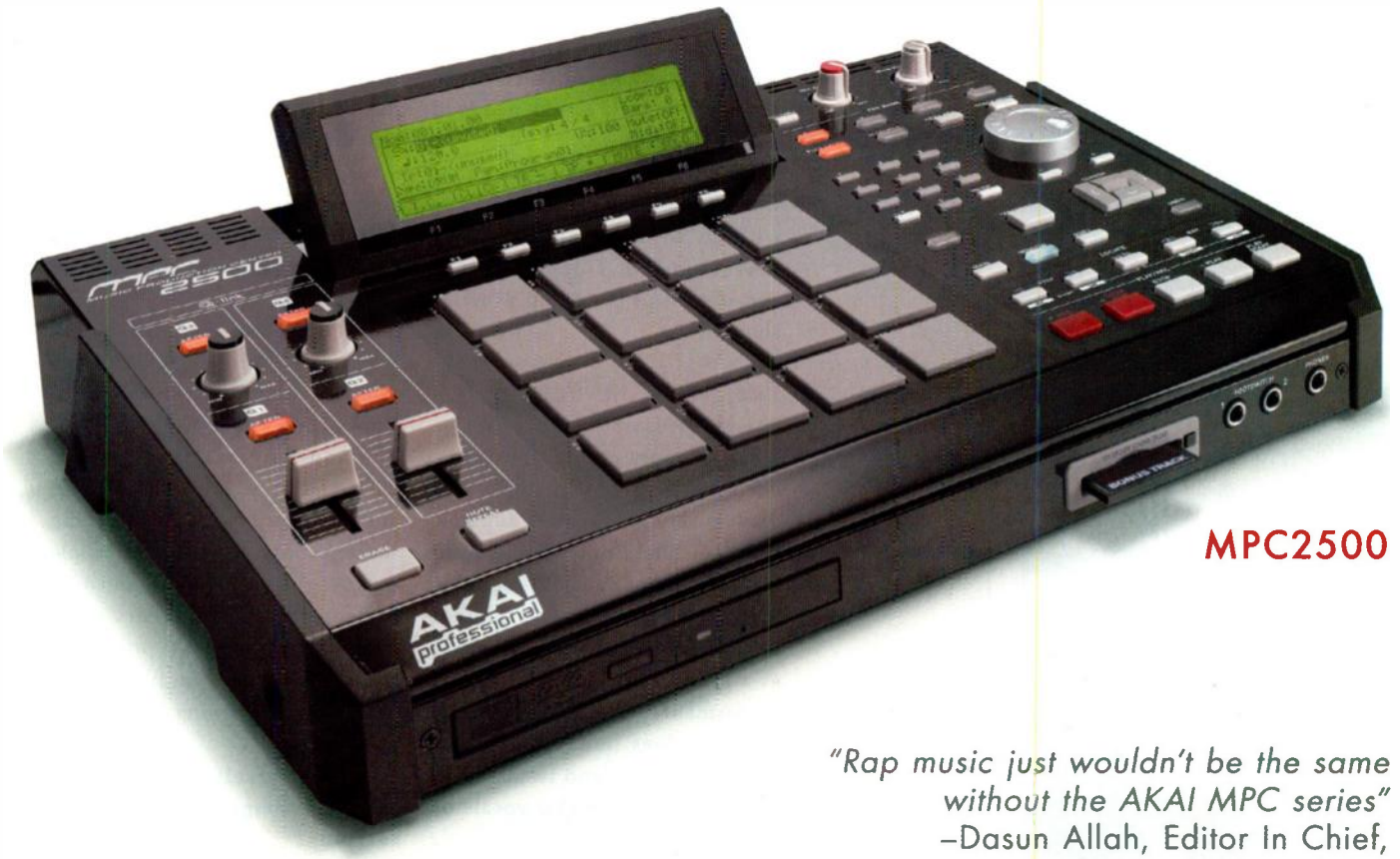

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was originally from England and does all of the Art Garfunkel stuff on the road. I set it up, and then Stuart takes over as engineer, because you can't give 100 percent to engineering and producing simultaneously.

There's just too much to do to focus adequately on the needs of each role.

Yeah, there were times that that was happening on *Imperial Bedroom* with Elvis. Elvis would say, "Was that in tune?" and I wouldn't know because I was watching a meter shoot over.

Positively Old-School

Emerick still works today, but he feels strongly about the differences between how records were made earlier in his career and how they are made now. The way in which he seems most old-school—besides the fact that he still likes to record to analog tape—is that as a producer he captures strong performances that stand on their own. He does not rely on computer correcting and tweaking to compensate for subpar vocals or musicianship.

How did the sessions you did with the Beatles, America, Elvis Costello, and Robin Trower differ from the ones you do now?

I still do my sessions in the same way. I'm working on a big commercial over here in England, and some of it is being done in Pro Tools. But we're recording a big orchestra and choir next week, and I'm going to do that analog; I'm going to have two 24-tracks in lock [two synchronized 24-track tape machines].

Some techniques are harder to do with digital technology than with analog—doing off-speed recording, for instance. Do you still use analog for that?

I go to analog, yeah. Even on the Nellie McKay album, we ran three 24s in lock.

It seems as though while you recognize the new capabilities that current technology gives you, you feel it can lead people astray and confuse priorities.

Yes, it can lead you down the garden path. I'm coming from a different time, I know, but it's too easy to think you made a nice bass sound just by having a subwoofer in, and that's not the point.

Do you feel that all of the computer work in sessions now takes away some of the fun and spontaneity?

Sure it does, because the hard work used to be done away from the studio, which was the rehearsal time. Then you'd go in the studio, and that was the fun time with the orchestra, the singer, and the band. It was fun making those records. Now it's just people watching a lot of screens, and a lot of people don't have "ears" anymore. Sometimes if I point out something that's audible, they haven't been listening.

Do you yourself ever do work with the computer during your sessions?

I won't get involved with it—I find it totally distracting. Normally, the assistant engineer does it all. I just have no interest in it; it's boring to me. I just want to get on with the session. The last good album I felt I did was the Nellie McKay album, and there was no autotuning used on that album; if she was out of tune, she resang it. Now it seems that everyone wants to retune everything and change all of the drumbeats to make sure everything's in time, so that everything is boring and flat and up front in your face. There's no human soul or heart in it; it's just gone. EM

Larry the O has thoroughly digested Mark Lewisohn's magnificent book The Complete Beatles Recording Sessions *(Hamlyn, 2005).*

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The Art of the Pad

By Steve Skinner

How to give sustained chords life and motion.

What's the question that musicians hear the least? No, it isn't "Is that the trombone player's Porsche?" It's "How'd you get that nice pad?"

One of the most popular uses of synthesizers is to play sustained chords, or pads. Pads can be brilliant and inspired or boring and static. A prime element of the inspired pad is motion. Whether or not the notes of the pad change, its sound should constantly change in subtle or not-so-subtle ways to keep the ear interested. Depending on the sound you choose for the pad, there are many ways to create motion within the pad. Here are some techniques for making your pads sound better, along with some tips on when (and when not) to use them.

The One-Sound Pad

The basic analog pad, the most common type, has been around since the early '80s, when the polyphonic analog synthesizer was introduced. The Sequential Circuits Prophet-5 and Oberheim OB series were the two most prevalent instruments then. A pad is usually produced by setting the oscillators to saw or pulse waves, setting the amp envelope to a gentle attack and release, and detuning the oscillators or adding some chorus effect. A good example of this sound is used on Bruce Hornsby's "The Way It Is." The pad nicely fills in the spaces around the piano. You can add more interest and motion to the analog pad by riding the filter cutoff frequency as you play. I use a Novation Supernova for this type of pad, although most synths can produce this sound.

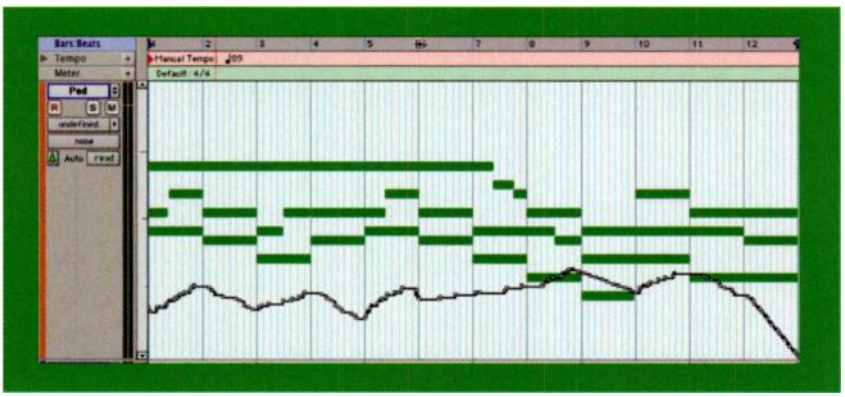

FIG. 1: In this MIDI track of a synth pad, the notes of the pad appear in piano-roll format, with the controller data in black.

For example, on the Supernova I programmed two patches with almost identical sounds. They both have a slow panning effect but with slightly different LFO rates. One patch has a slight vibrato; the other doesn't. I put the two sounds on the same MIDI channel in the synth's Performance mode. The result is a rich stereo pad whose sound moves around in a seemingly random pattern. I keep the second mod wheel on my controller set to CC 105, which is the filter cutoff frequency on the Supernova. I then record a MIDI track of the pad with one hand playing the part and one hand always on the mod wheel. (You could also use a pedal or data slider.) In Digidesign Pro Tools the notes of the pad appear in piano-roll format, with the controller data superimposed (see **Fig. 1**). The audio example of this pad (see **Web Clip 1**) uses the Supernova sound just described.

Controlling the cutoff frequency manually while recording creates a more interesting pad. Many factory presets on synthesizers include a slow LFO or an envelope generator modulating the filter frequency. This creates motion, but you have limited control over that motion. Sometimes that lack of control results in interesting movements that you would not have created otherwise. Other times the preset modulation can be annoying. Controlled manually, the pad can "breathe," instead of sounding like a bland collection of static tones.

Other Waves

Pads are not just for analog synths. FM and wavetable synths and sample-playback instruments can all be used for interesting pads. Wavetable synths are great for large, breathy pads. Filter control on this type of sound can be dramatic. FM synths, like Native Instruments' FM7, can create very interesting pads. The overall sound tends to be thin, but that can be good if you don't want the pad to take up a lot of space in the mix. And by varying the volume of one or more of the operators, you can get tonal changes that are more complex than simple filter changes. Although I enjoy coming up with FM sounds from scratch, the downside of FM synths is that they are hard to program. You may have to tweak even presets extensively to get satisfactory results.

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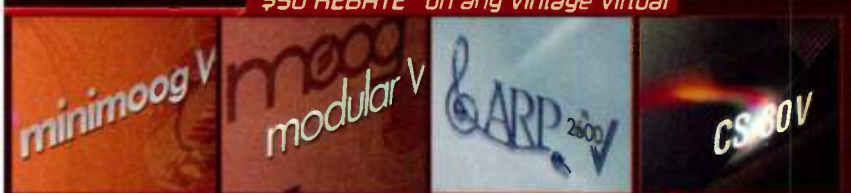

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choices. Organ simulators, like Ultimate Sound Bank's Charlie and Native Instruments' B4, can be useful alternatives to synth pads. You can manipulate the drawbars as you're playing to create interesting motion, even simulated filter sweeps. And string samples, either direct or processed though a filter, envelope, and effects section, can make a great pad.

The Multi-Mono Pad

On his 1972 album, *Talking Book* (Motown/Pgd), Stevie Wonder multitracked a monophonic synthesizer to create a stunning pad effect. He played each part with a lot of expressive portamento and vibrato, so we hear multiple melodies, not chords. I find this principle to be very useful in creating rich pads. I will set up three or four different synths with different types of pad sounds. I'll generally use an analog pad sound, some sort of FM sound, and a wavetable sound. I'll make sure I can control the timbre of each as I'm playing, usually with one of the mod wheels. Then with each synth I record separate MIDI tracks for each monophonic part. The first pass is usually easy, but successive passes get harder as I try to create an interesting counterpoint to the first part, avoiding unisons and octaves. I use the mod wheel to make different instruments pop out at different times. If the song warrants it, I may start or end the process with a pedal track (a track with an instrument that plays the same note or open fifth all or most of the way through the song).

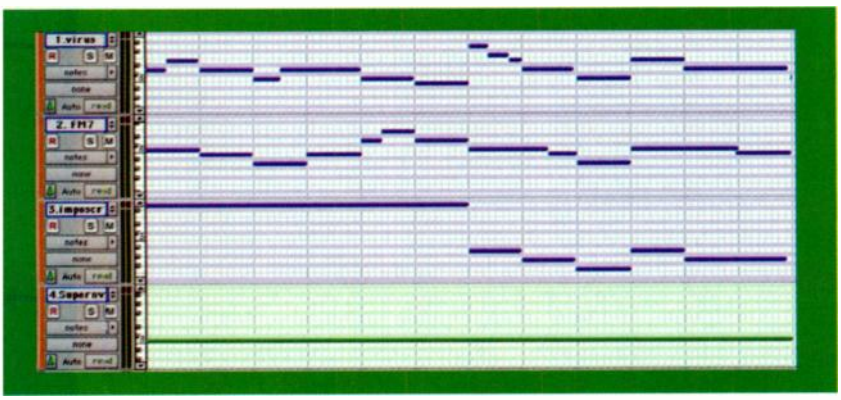

FIG. 2: Each of these four MIDI tracks will trigger a different pad sound. The crossing movements of the notes and the varied sounds add texture and interest to the pad.

This technique can make the harmonies quite rich, and since the results are on separate tracks, I can decide just how many of the parts I want. I generally have to go back and edit them visually to fix passages that don't work. This process can also work with one multitimbral synth, but I find that if each sound comes from a different instrument with its own character, then there's more depth to the overall sound.

For example, I created four MIDI tracks (see **Fig. 2**), each played by a different pad sound (see **Web Clip 2**). Track 4 is a pedal part, holding middle C throughout. Notice how in bars 5 to 7 the voices cross. Synths 1 and 2 trade parts as the pattern repeats. Then in bar 9, synth 3 drops down from the high part and synth 1 takes over. These movements illustrate another way to change the texture of the pad.

Padogogies

One way to make your pads stand out is to play them in high or low ranges. In the Fine Young Cannibals' "She Drives Me Crazy," a low-pitched, slightly distorted pad gives a truly unique character to the verses. One of my favorite high pads is the high organ in the Cure's "Lovesong." (It's not in the recent remake.) This pad has very little textural motion, aside from a bit of vibrato. It's that starkness that pulls you in. (So the rule that motion is the most important element of a pad is one that can be learned and then ignored at will.)

In the late '80s I played with a British artist who would tell me, "No pads!" Instead, we would use shorter, splashier sounds that left more room in the mix. Eventually, more pads crept into the music, and I missed that open sound. Pads can fill the empty spaces, but they can also crowd a mix and generally make trouble for the other instruments. As counterintuitive as it might seem, as a song gets bigger toward the end, it's often better to pull the pad out of the mix, especially if there are strings or big guitars. It's also good to EQ a pad so that it takes up less sonic space; filter out the bottom end, say, below 100 Hz, and pull out a little around 350 Hz as well.

If I'm working on a hard-hitting, rhythmic song, either I don't want a pad at all, or I want a small one. A big, rich pad will detract from the rhythm parts by intruding on their sonic space. If I want a small pad, I like to use something different and quirky. I might use a single-oscillator, monaural sound from an edgy-sounding synth like FM7, Propellerhead Reason's Subtractor, or G-Force's ImpOscar. The edginess or quirkiness helps the pad stand out without getting in the way of the groove. I also may use a pad for just one section, like the climb, or prechorus, and then take it out when the chorus begins.

To Pad or Not to Pad

Pads are challenging. The timbres available to the modern synth player seem limitless, and it's hard to know which sound will fit in a particular track. It's worth it to put in the extra work, however, because every once in a while you'll hear that rare phrase, "Nice pad!" EM

EM WEB CLIPS

Steve Skinner has worked as an arranger-programmer for Bette Midler, Jewel, Celine Dion, R. Kelly, Diana Ross, the Bee Gees, and Chaka Khan. He arranged the musical Rent *and coproduced the cast album.*

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A New Look at Vocoding

By Len Sasso

Get unusual effects by vocoding a signal with itself.

You can think of a vocoder as a morphing multiband equalizer, in which the morphing is controlled by a spectral analyzer. Typically, speech (called the *modulator*) is analyzed and matching equalization is applied to a pitched, harmonically rich source (called the *carrier*). Lightning-fast personal computers have allowed the quality of analysis and the number of bands to increase radically, and the uses for vocoding have expanded accordingly. In this column, I'll discuss an unusual approach to vocoding that has broad application: using the same signal as modulator and carrier.

Using the same signal as modulator and carrier may seem pointless, but it can be very effective used with other signal processing, either inside the vocoder or applied prevocoder to the carrier or modulator. I'll use Propellerhead Reason's BV512 vocoder for my examples, but any high-end vocoder can produce similar results.

Plugging In

The BV512 gives you four ways to manipulate the relationship between the analyzer and the equalizer frequency bands: you can shift all equalizer bands up or down, emphasize the high- or the low-frequency bands, boost or attenuate individual bands, or completely remap the band dependencies (that is, change which analysis band controls which equalizer band). In each case, the frequencies that are prominent in the modulator control different frequency bands of the equalizer.

In addition to the BV512 vocoder, you'll need a sound source; for my examples, I've used Reason's Dr:rex. Use a Spider Audio module to route the stereo output of Dr:rex to the carrier inputs of the BV512 as well as to one of the Spider's merge channels. Then route the output of the merge channel to the modulator input of the BV512, which is mono (see Fig. 1).

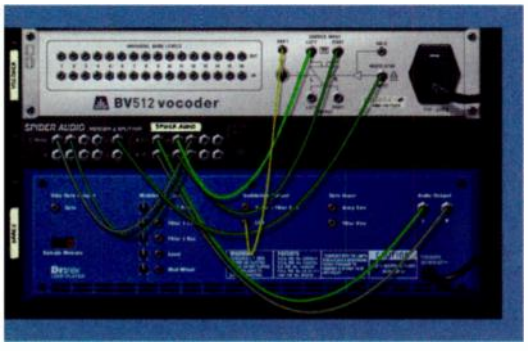

FIG. 1: This is the simplest routing for using the output of Dr:rex as both the modulator and carrier for the BV512 vocoder.

Shape Shifting

Load a harmonically interesting loop into Dr:rex, press the Preview button, and use the BV512's Dry/Wet knob to hear the difference between the raw loop (dry) and the vocoded loop (wet). With the default BV512 settings, the wet version will sound a little pinched, with the highs and lows rolled off a bit. Turning the Decay knob all the way up and the HF Emph knob to about 7 will produce the closest match, but the BV512's presence will always make itself known.

Start by manually adjusting some of the BV512 frequency band levels. Switch between Equalizer and Vocoder modes to hear the difference between fixed and dynamic equalization. Also experiment with the number of bands; more is not always better. I find 16 and 32 bands to be the most usable in this context, but even 4 and 8 bands produce interesting results.

Next, experiment with the other BV512 controls. The Shift control has the greatest impact, and you can automate it by cabling Dr:rex's LFO output to the BV512's Shift input. That produces an effect reminiscent of phasing or flanging (see **Web Clip 1**). Now flip to the back of the rack, disconnect the Shift automation, and draw some cables between different outputs and inputs in the Individual Band Levels section. You can use a Spider CV module to connect one output to several inputs, as well as to combine several outputs.

Betwixt and Between

Effects inserted in either the modulator or the carrier signal path often have a subtler impact than usual. Delay lines work especially well, and you can use high feedback in the modulator path. (Ensure that the delay is panned fully to the side that feeds the modulator's mono input.) Try a 16th-note delay in the modulator path, with a 10 to 50 ms delay in the carrier path. Try a delay of a few 16th notes in the modulator path, with a longer delay in the carrier path (see **Web Clip 2**). Modulator delay will have more impact with short BV512 decay settings.

The distortion and destruction effect Scream also works well in the modulator path. If you put Scream inside of a Combinator, you can automate its Damage and Body Type selectors by assigning them to Combinator rotaries and automating those. That works particularly well with percussion loops (see **Web Clip 3**). **Web Clip 4** is a Reason song that contains all the examples in this article. EM

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Timing Is Everything

By Brian Smithers

Synchronization standards for the modern studio.

Horticulturalist Luther Burbank is credited with defining a weed as any plant that is growing in the wrong place. In that same spirit, one could consider a wrong note as a right note played at an incorrect time. The appeal of such a perspective is that it recognizes that in music, as in life, timing is everything.

As musicians, we gauge our timing with a variety of clocks. We measure the number of beats in a minute, the number of ticks in a quarter note, and the number of frames of film that go by in a second. In this article, I'll discuss musical clocks, how they're used, and how they're connected.

Tempos Fugit

The first musical clock that most of us encounter is the metronome. Originally a mechanical device but now commonly electronic, it creates an audible pulse that is used to give a tempo reference. *Tempo* refers to a number that relates musical time to clock time, ordinarily cited as beats per minute (bpm). The metronome's function in aiding musicians when they practice scales and arpeggios is often an essential part of their daily regimen.

The metronome is also a critical part of any sequencing application, indicating the timing of MIDI data in terms of bars and beats. Each beat is further subdivided into arbitrary nonmusical subdivisions called *ticks*, and it has become standard to count 960 ticks in a quarter-note beat (see **Fig. 1**). An 8th note therefore consists of 480 ticks, a 16th note has 240, and so forth. The use of a metronome in sequencing enables grid-based logical operations such as quantizing. Recording to a metronome, or *click track*, in a DAW (even if no MIDI tracks are used) allows for grid-based editing, beat slicing, loop manipulation, and other common tempo-based operations.

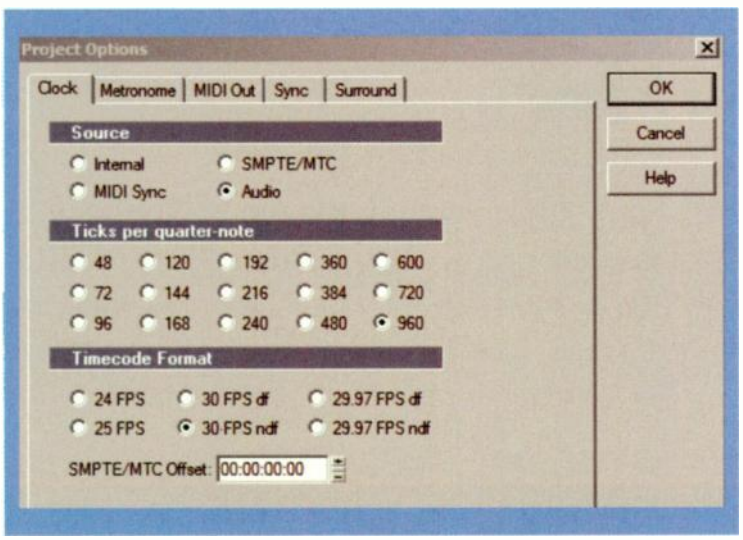

FIG. 1: Modern sequencers let you set the resolution of their timing signals. This screen from Cakewalk Sonar 5 shows you the options for the source of a timing signal, the number of ticks per quarter note, and the SMPTE frame rate.

A number of clock messages have been used to synchronize the internal sequencers of electronic instruments. Frequency-shift keying (FSK) encodes a clock pulse in an analog audio signal by alternating between two frequencies at regular intervals. FSK was superseded by DIN Sync, so named because it uses the 5-pin DIN connector subsequently adopted for MIDI. Like FSK, DIN Sync is an analog signal, and it transmits either 24 or 48 clock pulses per quarter note (ppqn), depending on whether the device at hand follows the Roland or the Korg standard, respectively. The Roland DIN Sync standard is also called Sync24.

One of the most recognizable devices to use DIN Sync is the classic Roland TR-808 drum machine. When Roland released the TR-808's successor, the TR-909, MIDI was the hot new thing, and the company designed the 909 so that it spoke DIN Sync and the new MIDI Timing Clock. Popularly known as Beat Clock, MIDI Timing Clock is digital, consisting of a 1-byte message sent at a rate of 24 ppqn.

All of these clocks, from metronomes to MIDI Timing Clock, are considered *relative references*, because their speed varies in direct relation to tempo. At a tempo of 100 bpm, 40 MIDI Timing Clock messages would be sent in the course of a second (24 × 100/60), whereas at a tempo of 120 bpm, those messages would be sent at the rate of 48 per second.

A Tock of the Chronos

By contrast, an *absolute reference* does not change with tempo. It ticks away like a clock on a wall, indifferent to musical concerns. The best-known example of an absolute reference is the timecode standardized by SMPTE (the Society of Motion Picture and Television Engineers). SMPTE timecode keeps track of the time using hours, minutes, seconds, and frames of film

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(HH:MM:SS:FF). Depending on the specific application, there may be as few as 24 frames in a second or as many as 30, so one must always specify the frame rate when using timecode.

You can think of SMPTE timecode as specifying a particular location or address on a reel of film or tape. In the film-production process, those addresses are logged by every camera and audio recorder so multiple camera angles and audio tracks can be aligned in the video and audio postproduction phases. In audio production, timecode allows multiple recorders to be synchronized for extended track count, as when using two 24-track tape machines or combining analog tape with a DAW.

There are three common ways of transmitting timecode, and a single device can often manage all three (see Fig. 2). Linear Time Code (LTC) is an analog audio signal, conceptually similar to FSK, that is striped, or recorded, to analog tape. When the signal is played back through a standard audio cable, a synchronizer can listen to the LTC track and keep a second recorder in sync with the first. LTC is customarily recorded to an edge track (track 24 on 2-inch tape) so that it has only one adjacent track that could potentially be affected by crosstalk.

FIG. 2: MOTU's MIDI Timepiece AV speaks all three varieties of timecode: VITC on BNC, MTC on DIN, and LTC on TRS. The spare BNC connector is for word clock.

Timecode can also be striped to an audio track of a videotape, or it can be embedded in the video signal as Vertical Interval Time Code (VITC). VITC is literally printed to a blank spot in the video signal—this spot being the point at which the scanning ray blanks so it can reset itself to the top of the screen to begin its next pass. VITC is transmitted on a standard video cable with a BNC connector.

LTC, an audio signal, changes pitch with playback speed and is too low to be reliably tracked at very low playback speeds. VITC, on the other hand, is read by the rotating video head and can be still-framed along with the image. A synchronizer that reads both types of SMPTE can switch between them as needed.

The third way of sending timecode is through MIDI Time Code, a digital implementation of SMPTE. It observes the same HH:MM:SS:FF format but is implemented as a pair of MIDI messages. The 10-byte full-frame message is sent when transport is started and stopped and includes the entire 8-digit address (as well as a transport command). The quarter-frame message is sent four times per frame during playback. Each 2-byte message carries one digit of the SMPTE address, updating the entire address every two frames (eight messages).

Another important video clock is *black burst*, so called because it is a video signal that has no image. A black burst generator provides a highly accurate and stable timing reference that can be distributed to all devices in a studio to ensure precise synchronization. Black burst, like VITC, is carried on a standard coaxial video cable with a BNC connector.

Take My Word

Once you enter the realm of digital audio, time starts being sliced up into smaller and smaller pieces, down to 1/96,000th of a second or smaller, necessitating clock signals of increasingly fine resolution. *Word clock* is a sample-by-sample timing reference. Its primary function is to coordinate the timing of a sending and a receiving device so that samples are not dropped. A secondary application of word clock is to slave the A/D and D/A converters of an audio interface to a highly accurate master clock in order to improve their sonic performance. Master clocks such as the Big Ben from Apogee Electronics are highly regarded for such use.

Word clock is ordinarily carried on a 75-ohm coaxial cable with BNC connectors, but it is also embedded in both S/PDIF and AES/EBU digital audio signals. Therefore, when sending signals via either of those protocols, you can slave the receiving device directly to the clock contained within the digital audio signal without the benefit of a separate word-clock connection. Consequently, you can use an AES/EBU connection without any actual audio signal instead of word clock. This technique is called *null clock*.

Digidesign created a special version of word clock for its Pro Tools systems that ticks off 256 pulses for every sample. *Superclock*, known generically as 256Fs, is transmitted over the same cable and connector as word clock and was eventually abandoned in favor of word clock in the latest generation of Pro Tools hardware.

Knowing what type of clocks your gear can use is an important part of keeping your studio running smoothly. Put another way, when using multiple devices, everybody better know what time it is. EM

Brian Smithers teaches audio workstations at Full Sail Real World Education and music technology at Stetson University. He is the author of Sonar 5 Ignite! *(Thomson Learning, 2005).*

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Jingles All the Way

By Steve Skinner

How to find work composing music for advertising.

If you're skilled at composing, arranging, and producing, there's money to be made writing music for advertising. As with television and film scoring, the field is highly competitive, and only the most talented make a consistent living at it.

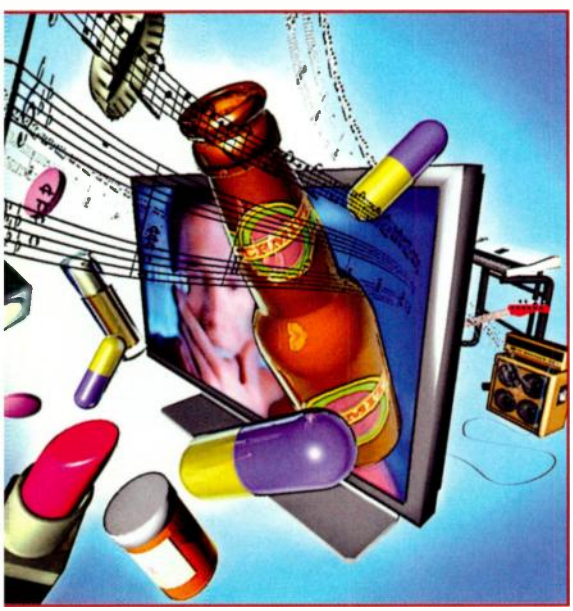
There are three basic ways to work as an ad-music composer-arranger. You can freelance; be a staff writer at a music-production company, or *music house;* or run your own music house.

Free, Not Easy

Ad-music writers often start out as freelancers. Although it's best to live in a major market area such as New York or Los Angeles to get that work, people can now work from anywhere given the ability of broadband Internet to transfer large audio and video files.

Here's a typical freelance scenario: An ad agency contacts one or more music houses and asks them to submit demos for a national commercial. Each music house typically submits four to six demos, some of which may be written by staff composers and some by freelancers.

Freelancers generally make $200 to $500 for such jobs, and are expected to turn in polished, finished-sounding tracks. Once all the demos have been submitted, the ad agency and its client listen and pick a winner.



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The winning music house and the winning composer make any revisions required by the agency; the house then submits its final version. Several months later (agencies are notorious for being slow payers), the music house gets paid a creative fee from the agency, of which the writer typically gets somewhere between 30 and 40 percent. (It's up to the freelancer to negotiate that.) Depending on the size of the creative fee and the percentage the composer negotiated, his or her cut is typically around $1,000 to $2,000.

On commercials produced with union talent (which most national spots in the major markets are), you can make good money from the session and, especially, from the residual payments for singing on the track. You can also make decent money, although considerably less, from session fees and residuals earned for playing an instrument or instruments (see the sidebar "Residual Benefits").

The Reel Thing

The best way to get your foot in the door with freelance work is to put together a demo reel, which consists of an audio CD featuring tightly edited musical pieces that show off your composition and production skills. If you've worked primarily on album projects, you can use song excerpts—but keep them short.

If you've composed music for picture, you might have enough material to make a DVD video reel. If you don't, consider recording commercials off the air and writing new music for them as a way to get more video-reel material. Whatever format your reel is in, it's crucial to put your best stuff first.

Once you have your reel together, start calling music houses and ask if you can submit it to them. Follow up with phone calls or emails, and be polite but persistent.

On the Payroll

If a music house is particularly impressed with your skills, it's possible to get a job as a staff composer. Those positions, however, are less common than they once were. I spoke with Fritz Doddy of Elias Arts (www.eliasarts.com), a major music house in New York. He told me that the staff writers there receive a salary and benefits, and they get residuals for the commercials they write, sing, and play on. Other music houses may have different types of compensation arrangements for their regular composers, such as paying them as independent contractors.

Those who have been successful as freelancers or staff writers often decide to form their own music companies. A case in point is Doug Hall, now the co-owner of and chief writer for Propeller Music and Sound Design in New York City (www.propellermusic.com). He got his start in ad music working as a studio assistant at one of New York's larger music houses. He says that to succeed with your own

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Here's how it happened: "We joined TAXI in 2001 and found that it was a great motivator for us. We were members for two years. We learned a lot, wrote a ton of songs, and got a few film and TV placements -- some through TAXI, and some on our own.

We submitted a song we wrote with Jenn Shepard called "You Make Me Feel" to one of TAXI's Industry Listings. We didn't hear anything back for a while and eventually our TAXI membership ran out. Thankfully, we began to get so busy with production and writing gigs that we decided to wait and renew our membership at a later date.

Little did we know that TAXI had sent our song to a production/management company that was looking for material for a young, male Pop artist they were developing.

Later that year, Jesse McCartney's managers called us saying they had just heard "You Make Me Feel" on a CD they got from TAXI and wanted to have him cut the song. Although Jesse decided not to record "You Make Me Feel", his managers asked us to write more songs for him. We wrote a handful and they ended up putting his vocal on two of the tracks we produced, "Take Your Sweet Time" and "Beautiful Soul".

"Beautiful Soul" got played on Radio Disney, and Jesse's management got the song to a label executive at Disney. Soon after, Jesse was signed to Hollywood Records. "Beautiful Soul" became his first single, and we both signed publishing deals with Disney Music Publishing.

Jesse McCartney's album (entitled "Beautiful Soul") has gone Platinum in the U.S. and Australia.

"Beautiful Soul" went to #3 on Radio and Records CHR Pop Chart, #5 on Billboard's Top 40 Chart, #19 on Billboard's Adult Top 40 chart, it's a Platinum Digital Single Download, it's on the Gold-selling 'Cinderella Story' Motion Picture Soundtrack, the Gold-selling 'That's So Raven' TV Soundtrack, and the video was nominated for Best Pop Video at a 2005 MTV Video Music Awards."

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music company, you have to present the right image; that is, you need a slick Web site and a nice office. Marketing is key: get a list of possible clients, figure out what your strengths are and who to target, and then hit the phones.

If you don't have a talent for marketing, get a partner who does. It's common for music companies to have one person who specializes in the business side and another in the music.

The smaller music houses or one-person shops are less likely to use freelancers or staff writers. The local and regional ads that they compose for are typically nonunion "buyouts," for which a creative fee is paid but residual fees are not. To get that type of work, you'll have to function as your own music house, marketing yourself directly to the agencies or clients.

What You Need

To compose and produce music, you'll need a professional-level, computer-based DAW system (Digidesign Pro Tools, Apple Logic Pro, Cakewalk Sonar, Steinberg Nuendo, MOTU Digital Performer, and so on). Because you'll frequently be working to picture, a standalone personal digital studio won't do. You will also need a wide variety of high-quality sounds; your competition will have all the cool sounds, so you'll need them, too. Make sure to keep up with the current trends in pop music.

If you're starting your own music house, set yourself up in a nice space. Ad agency personnel won't want to come to a dumpy studio, no matter how expensive your gear is. If possible, reserve an area for people to hang out in that has food, coffee, a TV, and so on.

Whether you're freelancing or starting your own company, you'll be competing with some of the finest talent in the country, and you'll need considerable chops in composing, playing, programming, arranging, and mixing. "Try to have a unique angle so that you can stand out from everyone else," says Hall. "Your writing needs to be both unusual and on a very high level."

Your ability to work with people is critical. You must be flexible. The best thing visually might not be the best thing musically. You won't always agree with the representatives from the agency, the client, or the music house about what is musically appropriate. Remember—this is work for hire; it's not about you as an artist. "Do your best work," advises Hall, "then don't be too attached to it."

Learning how ad agencies function also helps. Interning at an agency is an ideal first step. At a minimum, pick the brain of any ad person you know. Once you understand the process that the music goes through at an agency, and the many levels of approval it must pass through (creative director, producer, music producer, and client), you'll be better equipped to compose in the ad arena.

Just Do It

Commercial composers are often given very short turnaround times. You might have the weekend to compose and produce your demo, or you might be asked to do it overnight.

The reference materials you're provided with vary from job to job. If it's a jingle, you're usually given lyrics. You might also get a QuickTime video if it's a TV spot. However, you might get only a storyboard (preliminary drawings depicting the commercial) if the picture hasn't been shot yet. For a radio spot, you frequently get a copy of the script.

In almost all cases, you'll be given a description of the musical direction you're expected to follow. Adjectives like *edgy*, *upbeat*, *positive*, *warm*, and *organic* are typically used. Although those words are vague from a musical standpoint, you're often provided with a piece of reference music, which can help you figure out the direction the agency wants to go. If you're a freelancer, pay careful attention to the instructions given to you by your contact from the music house.

You can make a lot of money in the ad-music business, but it's not easy. To do it well, you must love your work, have the right instincts, and be prepared to work hard. If you do, then one of these days, you might just turn on the TV or the radio and hear your own music between the shows. **EM**

Steve Skinner has worked as an arranger-programmer for Bette Midler, Jewel, Celine Dion, R. Kelly, the Bee Gees, and Chaka Khan. He has been composing ad music for 20 years.

RESIDUAL BENEFITS

The real money in the ad-music business is in residuals. These are payments made to the talent that plays and sings on commercials produced with union musicians.

As the composer, you've presumably played instruments on the track, so you're entitled to receive union session payments and any residuals that are generated. The latter are a percentage of your initial session fee, paid every 13 weeks that the spot runs (also paid if it's reused later). Musician residuals are paid through your local chapter of the American Federation of Musicians (which you'll need to join to receive the payments) and can be a nice addition to your income. But unless you play on a huge number of spots, you won't be able to make a living from residuals alone.

The highest-paying residuals go to those who sing on commercials. Those payments are made through the Screen Actors Guild (SAG) or the American Federation of Television and Radio Artists (AFTRA), and can earn singers significant amounts of money.

If you sing on a network commercial, you get a healthy payment for every two weeks the spot runs—and you get health insurance. Those payments are in the same pay range as the ones that go to the actors who perform on the spots. Ad-music people always try to sing on their spots, even if just on the background vocals.

In the '60s and '70s, there were big vocal groups on almost every jingle, and a lot of singers and composers got rich from those residuals. Subsequently, agencies cut costs by limiting the opportunities for group vocals. You still hear spots with group vocals, but not nearly as often.

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DIGIDESIGN Pro Tools LE 7.0 (Mac/Win)

MIDI enhancements highlight this significant upgrade.

By Mike Levine

Thanks to its state-of-the-art audio-editing features, excellent plug-in support, and quality hardware, Digidesign Pro Tools has become the dominant DAW for multitrack audio recording. But one area in which it has consistently played catch-up with its rivals is MIDI features. It was late to join the MIDI game, and it hasn't been able to shake the reputation that its MIDI features are not quite on a par with those of its major competitors.

With the release of Pro Tools LE 7.0 (see Fig. 1), that should change. Digidesign has substantially improved the program's MIDI functionality and has added many other useful and substantive enhancements, including a redesign of the menu structure. Virtually all the new features in Pro Tools LE 7.0 can also be found in Pro Tools M-Powered 7.0 and Pro Tools|HD 7.0. Because EM has previously reviewed Pro Tools' pre-version-7 features (go to www.emusician.com to read archived reviews), the focus here will be on what's new.

Mac users who want to upgrade to Pro Tools 7 should be aware that it does not support Mac operating systems prior to OS X 10.4 (Tiger). Windows users will need XP with Service Pack 2 installed.

I tested Pro Tools LE 7.0 using a Digidesign Mbox and a dual 2.5 GHz Mac running OS X 10.4.4 (10.4.4 is not officially supported by Pro Tools as of this writing, but it should be for the upcoming 7.1 release, which should be out by the time you read this) as well as a Dell D610 laptop with a Pentium M processor running Windows

FIG. 1: Pro Tools LE 7.0 offers a host of improvements, including reorganized menus and souped-up MIDI editing commands.

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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XP Professional with Service Pack 2. The program ran fine on both systems and seemed very stable.

More of Everything

Pro Tools LE 7.0 gives you ten sends per track, as opposed to five in prior versions. The number of buses has been doubled from 16 to 32, which is a huge improvement. In the past, it was easy to run out of buses on a complex mix. The number of Memory Locations has also been increased from 200 to 999.

Another change is the new PTF session-file format. It's designed to delineate Pro Tools 7 files from those saved in earlier versions. The PTF files are not backward compatible, but Pro Tools gives you the option of "saving as" in formats going back to version 3.2.

The new session format is designed to open on both Macs and PCs. It eliminates the necessity of selecting the Mac/PC Compatibility option to make a file cross-platform capable. I tried opening several files alternately on the Mac and PC to see how seamless the cross-platform capabilities of the PTF file format really were. The files opened fine (and appeared identical) on both machines.

New Track City

Perhaps the most significant improvement to MIDI sequencing introduced in Pro Tools 7 is the Instrument Track feature, which gives you hybrid MIDI tracks with audio outputs. In previous versions, getting a MIDI instrument up and running required setting up a MIDI track and an aux track to bring its audio output into the mixer. Now, it's much easier. If you want to bring a soft instrument or external MIDI instrument into your session, you simply create an Instrument track and instantiate your instrument as an insert.

If you have effects that you want to insert directly into an Instrument track, you can do so by using one of the other insert slots on the track. If your plug-ins support multiple outputs, you can route a single instrument from an Instrument track to outputs on multiple aux or audio tracks.

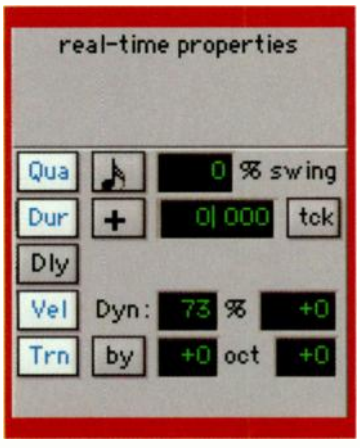

FIG. 2: The Real-Time Properties view provides nondestructive MIDI editing features and can be opened in the Edit window on any track.

I have one complaint about the implementation of the Instrument Track feature: when you create an Instrument track, its volume fader in the Mix window is turned all the way off. According to Digidesign, that was necessary to work around a bug in the pre–Pro Tools 7 software-development kit and will at some point be changed. The first few times I set up an Instrument track and inserted a soft instrument, I had a moment of frustration trying to figure out why I couldn't get any sound from it. Even subsequently, when I was aware of the issue, it still interrupted my creative flow. My solution was to create Instrument tracks in my Pro Tools session template, saved with their faders turned up to 0 dB.

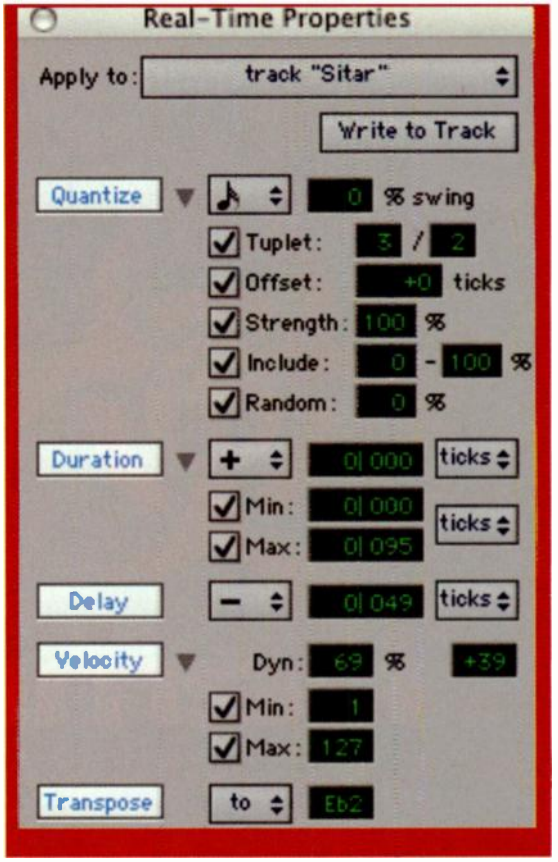

FIG. 3: The Real-Time Properties window gives you much greater control of nondestructive MIDI editing than the Real-Time Properties view does.

Get Real

Another major improvement is the MIDI Real-Time Properties feature, which lets you nondestructively apply or edit such parameters as Velocity, Duration, Quantization, Transposition, and Delay to MIDI tracks on playback. There are two ways to access Real-Time Properties. The first is through the individual tracks in the Edit window. If you enable the Real-Time Properties view (either in the Edit window View Selector, or by choosing View→Edit Window→Real-Time Properties), it appears in its own column (see Fig. 2). There are buttons that enable each of the five parameters.

When you click on one, it opens up one or two pull-down menus and one or two parameter boxes for each of the five. For instance, for Quantize you can choose the note value from a pull-down menu and enter the Swing percentage in a parameter box. (I wish that they'd also included a Strength parameter in this window, like the one in the Real-Time Properties window.)

For Transpose, the pull-down menu lets you choose either octaves or semitones, or even change data to a

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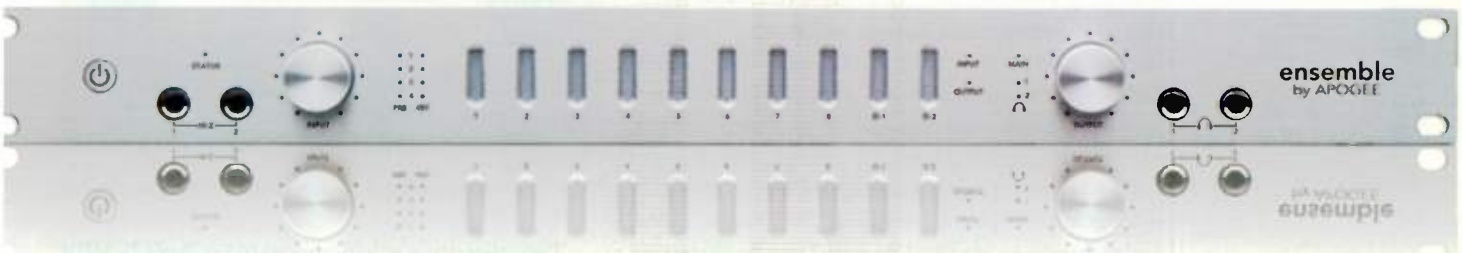

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particular key. If you choose the former, you get two parameter boxes: one for octaves and one for semitones. The latter gives you a parameter box to enter the key (for example, C2).

The second way to access nondestructive MIDI editing options is through the Real-Time Properties window (see Fig. 3) in the new Event menu. By doing so, you can access a deeper level of parameter control. For instance, when quantizing, you have five parameters to choose from: Tuplet, Offset, Strength, Include, and Random. In addition, the Real-Time Properties window lets you apply your nondestructive edits to individual regions within a track.

A related feature lets you choose whether or not the Real-Time Properties parameter changes you've made are reflected in the corresponding MIDI or Instrument track's graphic display or event list. This feature, called Display Events As Modified By Real-Time Properties, is turned off by default but can be switched on in the MIDI section of the Preferences page.

Lots More MIDI

The destructive MIDI editing features of the MIDI Operations window have been significantly upgraded from previous versions. As part of the general rearranging of the Pro Tools graphical user interface, several features have been combined into single windows, enhanced, or both.

The new Grid/Groove Quantize window consolidates what were two separate Quantize windows in previous versions. Support for randomization has been added to Groove templates.

The Select Notes and Split Notes windows have been consolidated, with additional criteria added. A new Remove Duplicates window has been included, and the Transpose window has been enhanced. You now have the option to transpose all selected notes to a specific pitch. Change Duration has been upgraded, too, with a new Legato option, a Remove Overlaps function, and more.

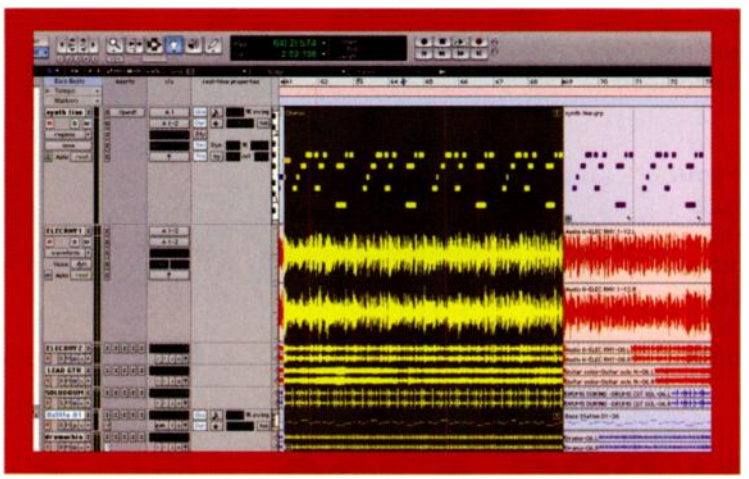

FIG. 4: Region Groups can contain both MIDI and audio tracks, and make it very convenient to move whole song sections around.

FIG. 5: The new Region Looping feature enables easy region copying.

Two other major enhancements to Pro Tools 7's MIDI functionality are Sample Based MIDI and Mirror MIDI Editing. The former allows you to assign the time base of MIDI and Instrument tracks to Samples rather than Ticks. This feature will be a boon to those scoring to picture, because it means that individual MIDI events can stay locked to a specific timecode location when you're experimenting with different tempos. It's also useful for creating tempo maps in songs recorded without a click.

The Mirror MIDI Editing option allows you to edit a single region that's been copied (or looped) to other parts of a song, and have your edits reflected in all the copied regions. That could be handy when working on looped parts.

Regionally Speaking

Pro Tools 7 also introduces several important ways to deal with Regions. Most notable is a feature called Region Groups (see Fig. 4), which lets you select two or more regions (from the same track or different tracks) and group them for editing.

The advantages are numerous. For instance, you can define multitrack song sections (including both MIDI and audio tracks) as Region Groups, and then arrange your song by cutting, pasting, and dragging these groups around the Edit window. You can also drag Region Groups into the Edit window from the Regions list, where they show up with their own listings.

Region Looping gives you new options for repeating regions. The Region Looping dialog box (see Fig. 5) lets you choose the number of loops, the loop length, and whether to enable crossfades. Once it's set, just click on OK, and the looped regions appear. This feature also works with Region Groups, so you can, in effect, turn grouped regions into loops (even combined MIDI/audio Region Groups). After a Region Group has been looped or duplicated, you can copy it as many times as you'd like by dragging its right-hand edge with the Trim tool, giving you capabilities reminiscent of loop-based production programs like Sony Acid and Apple GarageBand.

prophet~v

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Lyle Mays - Pat Metheny Group

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FIG. 6: The Dynamics III plug-ins feature an upgraded GUI and transparent sound quality. They'll be included from Pro Tools 7.1 forward, but users of version 7.0 can download them for free from the Digidesign site.

Pro Tools 7 introduces a couple of new options for splitting regions as well. Separate Regions On Grid lets you cut up your regions into grid-defined sections. Separate Regions At Transients cuts regions up at their transients, which is partly what the Beat Detective feature does. Because Beat Detective LE works on only one track at a time, this new command could come in handy when editing multitrack drum parts. You could make a Region Group of all your drum tracks, and then use the new Separate Regions commands to cut them all up in rhythmically appropriate places.

Seeing the regions in your song is easier, too, thanks to the new Consolidated Regions list. It lets you view both audio and MIDI regions (as well as Region Groups) together in the same list, should you so choose.

Imported Goods

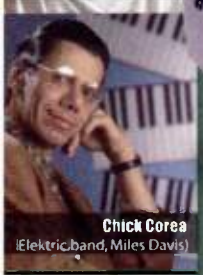
Pro Tools 7 adds drag-and-drop support of audio and MIDI files from non-DigiBase directories. It's also the first version of Pro Tools that supports Acid and REX files. You can drag them right into the Edit window, from either the DigiBase window or from the Windows Explorer or Mac Finder windows. If they have slice data in them (some Acid files don't), they snap to the tempo of the track.

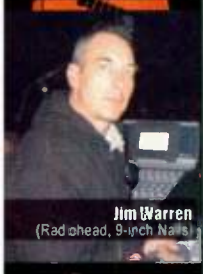
You can change tempo as much as you want after the tracks are in your session, and they'll continue to snap to the new tempo. I was a bit surprised to discover that the importation of Acid and REX files works only through dragging-and-dropping. If you try to import such files using the Import Audio command, they come into your session as conventional audio files with no slice data.

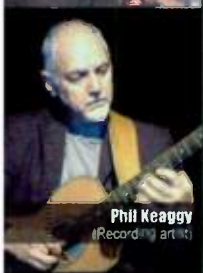
Order from the Menu

Finding all the new features is easy thanks to the new menu structure. Many of the menus have been renamed, moved around, and reorganized. Most are now shorter, with more pull-down submenus of nested items.

The File and Edit menus still handle most of the same functions, but the MIDI, Movie, and Operations menus have been replaced. There are six new menus: the Track menu allows for the creation, duplication, and grouping of tracks. The Region menu is dedicated to region-based commands such as Mute/Unmute, Bring To Front, Send To Back, and Quantize To







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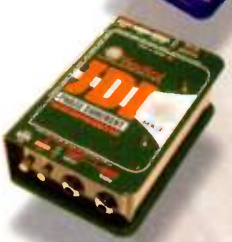

Radial JDI Passive DI - suggested list $199 US
Jensen Transformer equipped, the Radial JDI has become the standard passive DI in the business. Exceptional noise rejection eliminates troublesome ground loops and virtually zero phase distortion at any level makes the JDI a must have for studio and stage. Available in single, stereo or 6-pack. Magic.

Radial X-Amp Re-Amplifier - suggested list $199 US
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Radial JPC Stereo DI - suggested list $199 US
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Grid (called Quantize Regions in previous versions).

The Event menu handles many of the MIDI options formerly under the MIDI menu, as well as time functions and Beat Detective. The AudioSuite menu has been revamped to include several new effects categories. And the Setup and Window menus replace the Setups and Display menus, with a few changes.

Overall, the menus are more logically arranged and make it a lot easier to find the various functions. Naturally, you're much better off learning the key equivalents for the menu commands, because those will allow you to get around the program much faster.

Plug In and Turn On

The biggest news on the RTAS plug-in front is that all versions from Pro Tools 7.1 forward will include the new Dynamics III plug-in suite that Digidesign announced in November. Dynamics III plugs (a compressor/limiter and a de-esser; see **Fig. 6**) are transparent sounding and have a GUI that's much easier on the eye than the older Digi dynamics plugs. Pro Tools 7.0 users can download Dynamics III for free from the Digi site.

Xpand (see **Fig. 7**) is a soft instrument from the new Digidesign Advanced Instrument Research Group. Xpand is a versatile plug-in that gives you a variety of synthesis options, including analog modeling, FM, sample playback, and wavetable. It comes with a varied collection of presets and offers a dual effects processor. Although it's not included in version 7.0 and won't be in the 7.1 release, it's available for free. Version 7.0 users can pick it up on a disc at their local Digidesign dealer (it's too large for downloading) or order it from the Digidesign Web store (http://store.digidesign.com).

Digidesign also made several enhancements to the RTAS plug-in format, which includes improved support for multiprocessor computers and multicore processors.

PRODUCT SUMMARY

DIGIDESIGN Pro Tools LE 7.0

digital audio sequencer upgrade, $75

PROS: More buses, sends, and Memory Locations. New menu structure brings better organization. Instrument tracks make adding MIDI instruments easier. Real-Time Properties offer myriad nondestructive MIDI editing options. Sample-based MIDI. Region Groups and Region Loops streamline the arranging process.

CONS: No automatic delay compensation. Instrument tracks' volume must be turned up in the Mix window after they are created. No Strength parameter for quantization in the Real-Time Properties view.

FEATURES	
EASE OF USE	
AUDIO QUALITY	
VALUE	

MANUFACTURER
Digidesign
www.digidesign.com

FIG. 7: Xpand is a free sample playback and synthesis plug-in from Digidesign's new Advanced Instrument Research Group.

Additionally, there were a number of small upgrades to DigiRack plug-ins such as Normalize, Trim, and EQ III.

One plug-in–related feature not added in 7.0 is automatic delay compensation (ADC). Pro Tools LE and Pro Tools M-Powered are now the only major sequencers that don't have it. Especially for those using external hardware processors or accelerator-card–based DSP systems (such as Universal Audio UAD-1 and TC Electronic PowerCore), ADC would be a very handy addition.

Lucky Seven

Overall, Pro Tools LE 7.0 is more streamlined and powerful than previous versions, and it's a lot friendlier for MIDI sequencing. Although it still doesn't have the depth of MIDI features of some of its competitors (there's no notation window, for instance), it now has a powerful set of user-friendly MIDI tools that should be more than sufficient for many users.

The addition of Region Groups and Region Loops makes moving song sections around incredibly easy. Those features, in conjunction with the support of Acid and REX files, make arranging in the Edit window an even more powerful experience.

Other than the lack of an ADC feature, my complaints with Pro Tools LE 7.0 all fall in the "minor quibble" department. I hope that the Instrument tracks' fader issue gets resolved soon, so the faders on such tracks default to 0 dB instead of starting out all the way off. It would also be convenient to have the Strength parameter available for quantizing in the Real-Time Properties view in the Edit window.

But without question, Digidesign has substantially improved Pro Tools with this upgrade. Version 7 is sure to strengthen the program's already stellar reputation. Whether you're buying a new system or upgrading from a previous version, I highly recommend Pro Tools LE 7.0.

Mike Levine is an EM senior editor.

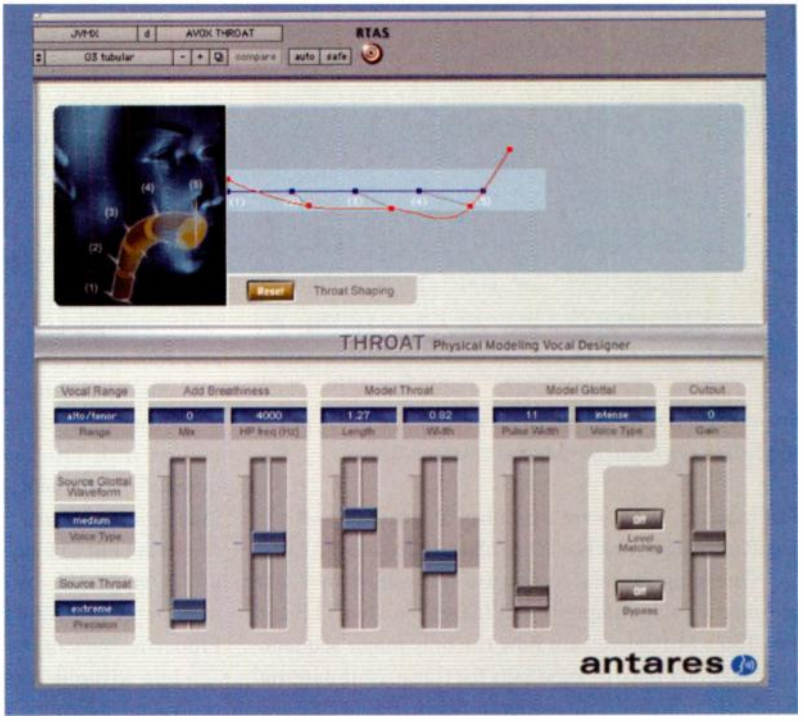

FIG. 1: Throat gives you the power to alter your singer's physique.

ANTARES Avox 1.0.2 (Mac/Win)

A vocal plug-in suite with deep throat.

By Eli Crews

The main goal when mixing is to make a vocal sit properly in the music so it doesn't sound overprocessed. That requires a person to have years of experience and the proper tools. Antares's new Avox 1.0.2 suite of plug-ins is a worthy contribution to the ever-expanding toolbox available to engineers seeking that perfect vocal track.

Installing Avox was easy and painless. The only slight drag was the authorization procedure, which requires you to have an Internet connection. But authorization uses an included iLok key, or dongle, and if your workstation isn't online, you can move the dongle to a computer that is. Avox runs for ten days without authorization, so you're not out of business in the meantime. Including the iLok and a printed manual are very nice touches.

I installed the AU, VST, and RTAS plug-ins, which require Mac OS X 10.2.8 or later, on my 2 GHz dual-G5 Power Mac. I used Digidesign Pro Tools LE 7, MOTU Digital Performer 4.6, and I3 Software DSP-Quattro 2 as hosts. The plug-ins worked flawlessly in each of those applications, and even with more than a dozen instances of the various plug-ins, I never ran out of processing power. I did not test Avox on a PC, but RTAS and VST versions are included for Windows as well.

Throat

The flagship Avox plug-in is a throat modeler, appropriately called Throat (see **Fig. 1**). It is designed to allow you to alter the characteristics of a singer's vocal tract virtually. Changing the formants and the spectral qualities of a sound is not new; what makes this plug-in unusual is how it goes about doing that. There are controls relating to

Punch sounded excellent on vocals, saxophone, snare drum, bass, and guitar.

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five points along a vocal tract, from vocal cords to lips.

There are controls for widening and lengthening each of the five areas, as well as for globally widening and lengthening the entire tract, adding breathiness to a performance, and altering the glottal waveform (the sound produced by the vocal cords). From a synthesist's standpoint, the glottal waveform is the waveform generator of a synthesizer, the throat width and length controls are the filters, and the breathiness is the noise generator. Avox even provides a graphical representation of the vocal tract at the top of the plug-in.

When I first applied Throat to some vocal performances, scrolling through its 42 included presets and playing with various parameters, it seemed a cool special effect but not particularly useful for producing natural-sounding vocals. After reading the manual, though, with the Throat section guiding me through setting the parameters for ultimate control, I began to see its power to subtly manipulate vocal tracks. However, I was aware of the processing even when used subtly on a lead vocal, and I would probably use Throat only on a background vocal or on a double of the original (see **Web Clip 1**).

Throat shines as a tonal modification tool for instruments. When pushed beyond the realistic voice settings, it gave me some surprisingly useful definition on an otherwise flat bass track, lent some borderline auto-wah qualities to a lead guitar, and made a rich alto saxophone sound like a child's toy. Moving the five dots (see Fig. 1) around on their two axes (one for width and one for length) will entertain you for hours, and most hosts will allow you to automate the axes and the other parameters.

PRODUCT SUMMARY

ANTARES Avox 1.0.2

vocal-processing software
Avox bundle $599
Choir $249
Duo $249
Punch $149
Sybil $149
Throat $399

PROS: USB iLok key included with packaged bundle. Good printed manual. Unusual special effects are easy to achieve. Punch sounds great on a variety of sources.

CONS: Metering is vague and choppy. No wet/dry mix controls on Throat and Choir. Sybil's sidechain has only highpass filtering and no independent monitoring.

FEATURES
EASE OF USE
AUDIO QUALITY
VALUE

MANUFACTURER
Antares Audio Technologies
www.antarestech.com

More Is More

The four additional plug-ins in the bundle are more-standard treatments for vocals. They include a doubler called Duo (see **Web Clip 2**), a multiplier called Choir (see **Fig. 2** and **Web Clips 3** and **4**), a compressor/limiter called Punch (see **Fig. 3** and **Web Clip 5**), and a de-esser called Sybil. Duo and Choir are somewhat similar. Although Antares intends them primarily as inserts, I preferred to use them as postfader send effects. Duo has separate faders for the original and doubled signals, whereas Choir's output is wet only.

FIG. 2: Choir can add interesting spatial effects to a track.

Duo gives a nice automatic double-tracking (ADT) style delay, but it also adds 3,200 samples of latency. When working in Pro Tools LE, one of the few digital audio sequencers that don't have automatic latency compensation, I allowed the latency to serve as a pronounced slapback effect.

Choir requires a clean mono signal. If you feed it a track that has bleed from other instruments, Choir fritzes out, trying to track the pitch of the unwanted material. Furthermore, because Choir creates tightly spaced multiple copies of the source material, untamed plosives and other vocal noises can become accentuated. In short, take care with the source material.

Choir is designed to create a large-ensemble sound from a few individual vocal tracks that have been processed separately. While it never sounded exactly like a room full of voices to me, I did enjoy using it for processing yelled gang vocals, as an alternative to reverb to give some air to a dry snare track, and as a crazy special effect on alto sax.

Sybil and Punch

De-essers are my passion, and so it was exciting to try out a new one. I use de-essers to get the harshness out of guitars, hi-hats, and saxes; to tame the high end on reverb sends; and, naturally, to control the sibilance on vocals. Unfortunately, Sybil's sidechain implementation comes up short in two ways: the only EQ option is a highpass filter, and there is no way to monitor the sidechain. If those things aren't issues for you, then Sybil will probably meet your de-essing needs. Sybil does add 882 samples of latency, so you'll need a digital audio sequencer that has automatic latency compensation.

FIG. 3: Punch can produce extreme effects and should be used with caution.

Punch has only three controls: Gain, Impact, and Ceiling. Gain sounds like a simple fattening when used in the lower range, and a pleasant tube distortion when pushed. Impact gives you heavy compression and limiting, and works best in moderation. Ceiling prevents overloading the output stage. Punch sounded excellent on vocals, saxophone, snare drum, bass, and guitar. The only issue I have with this plug-in is one that I have with the entire Avox suite: the meters are only mildly useful because they are low in resolution and lack decibel markings.

The standout in the Avox suite for me is Punch, which is well worth its weight in code and is available on its own for $149. Throat is the most unusual offering in Avox, and the rest of the bundle is solid and fairly priced. EM WEB CLIPS

Eli Crews often gets punchy at New, Improved Recording, his studio in Oakland, California. He can be contacted through his Web site at www.newimprovedrecording.com.

FIG. 1: The Chameleon Labs 7602 features a 3-band EQ and a 4-position highpass filter that are closely related to those on a Neve 1073. The 7602 provides a DI input for high-impedance instrument sources.

CHAMELEON LABS 7602

A solid preamp that has powerful EQ.

By Rich Wells

Capitalizing on the cost-effectiveness of Chinese manufacturing, the first product that Chameleon Labs has brought to market is the 7602, a solid-state mic preamp with a 3-band EQ (see **Fig. 1**). If it were simply a matter of feature set and audio quality versus cost, the 7602 would be a perfectly acceptable mic preamp for $699 (although you should factor in another $100 for the required CPS-1 power supply, which can power two 7602s). However, in its advertisements, Chameleon states that the 7602 is designed to deliver the classic sound of a vintage Neve 1073 preamp/EQ module at a substantially lower cost than that of any competing product. That's a mighty big claim.

PRODUCT SUMMARY

CHAMELEON LABS 7602

mic preamp
$699
CPS-1 power supply
$100 (powers two 7602 units)

PROS: Plenty of gain. Versatile and helpful EQ section.

CONS: No meter or LEDs. Power supply must be purchased separately.

FEATURES
EASE OF USE
AUDIO QUALITY
VALUE

MANUFACTURER
Chameleon Labs
www.chameleonlabs.com

With many of the '70s-era Neve consoles gutted for their components, and most modules hoarded away by savvy engineers and collectors, several companies, including AMS Neve, are making products that emulate the various Neve modules of yesteryear. The 7602, however, is the first emulation made in China almost entirely with Chinese parts.

Clone Theory

The 7602's design is similar to that of a 1073 in several ways. Chameleon's preamp uses discrete Class A power and circuitry, and it includes input and output audio transformers. The 3-band EQ and the 4-position highpass filter are closely related to those of the 1073 in terms of frequency selection. The preamp's 20-position mic/line sensitivity switch has an Off position between 50 and 60 dB gain, just as the 1073's switch does, as well as an Off position between the +10 and +20 dB settings. That is because there are separate transformers for the mic-level and line-level sections, and a separate board for the higher gain levels.

The 7602 differs from a 1073 in several ways. The 1073 was a masterpiece of layout and PCB efficiency behind a narrow vertical panel, and it used dual concentric controls for its two multifrequency EQ bands. The 7602, on the other hand, takes up a full rackspace and uses single-function pots. And whereas the 1073's high-frequency EQ band was fixed at 12 kHz, the 7602 features five frequency selections, of which 12 kHz is one choice. The front panel of the 7602 offers a DI input and switches for the DI, +48V phantom power, phase reversal, and EQ bypass.

The CPS-1 is a half-rackspace unit power supply (rack ears included) that must be purchased with the 7602. The CPS-1 provides ±24 VDC for powering two 7602 units, and +48 VDC for phantom power (see **Fig. 2**). The

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CPS-1 contains an enormous toroidal power transformer and has a front-panel power switch.

FIG. 2: The 7602's rear panel includes balanced XLR mic and line inputs, an XLR output, and a connector for the required CPS-1 power supply.

Practice vs. Theory

The 7602 is straightforward to use, and I set up a number of tests to compare the preamp with others in my studio. I recorded some sound sources using pairs of mics placed as closely together as possible. For comparison, I used the Blue Robbie tube preamp, a preamp that has a similar amount of gain. To more accurately represent a 1073, I also used my Trident MTA A-Range reproduction, a solid-state preamp with more of the audio-transformer-imbued aggressive sound that characterizes the Neve preamp.

The 7602 performed nicely when used with a Sennheiser MD421 on a single-coil electric guitar that was amplified through a Fender Vibro Champ. The EQ section was great for quickly tuning out a fair amount of 60 Hz hum from the amp. The 7602 evened out the sound more than the Robbie, which was a good thing. Overall, the 7602 produced tones that were more similar to those of the Trident MTA.

While using a pair of Red mics to record male vocals for a San Francisco band called the Men, I noticed that the 7602 track was more sibilant but still very nice. The singer, Hugh Swarts, had a fairly quiet vocal delivery and preferred to stand a couple of feet from the mics. Here, the 7602's ample gain was helpful, and the preamp yielded results that were rich and natural.

EQ to the Rescue

The EQ section came in handy when on a couple of songs Swarts wasn't able to hit the vocals correctly while using headphones. In those instances, the natural sound caused problems. He couldn't tell when he was off pitch, because the fullness of the tone made up for slight pitch variations. In the past, he would set up a monitor mix that returned a thin, trashy version of his vocal to his phones, and the limited bandwidth enabled him to quickly pinpoint what was working and what wasn't. I used the 7602 EQ to alter the sound, and because the mid- and high-frequency sections have overlapping ranges, I could heavily boost one frequency and cut another close to it, effectively shredding the sound.

Furthermore, because all three bands of EQ feature 20 dB of boost/cut (versus the 1073's 16 dB), I could easily overload the 7602 internally to the point of distortion, which can be tailored somewhat by the chosen center frequencies. The effect was most apparent when using the unit with line-level signals. The line-level section incorporates variable gain and provides –20 to +10 dB to accommodate multiple line-level devices. Because I used the +4 dBu analog outputs of my Tascam MX-2424 to play various prerecorded tracks through the 7602, I could apply makeup gain to get the unit to function as if it were hooked up to a –10 dBV device. In this application I could generate wild, crackling artifacts while using the output-level knob as a fader to control the chaos.

The DI input is a useful addition. It has presence, plenty of low end, and more than enough power in the gain department (the best sound occurred when the input gain was turned up to about +70 dB, with the output-level knob fairly low). I tracked guitar and bass through it, and it did a fine job. The ease with which I could

7602 SPECIFICATIONS

Analog Inputs	(1) balanced XLR (mic), (1) balanced XLR (line), (1) unbalanced DI
Analog Outputs	(1) balanced XLR
Minimum Gain	20 dB
Highpass Filter	50, 80, 160, and 300 Hz (–3 db, 18 dB/octave cutoff)
Low EQ	35, 60, 110, 200 Hz
Mid EQ	360 Hz, 700 Hz, 1.6 kHz, 3.2 kHz, 4.8 kHz, 7.2 kHz
High EQ	3.4, 4.9, 7, 12, 16 kHz
Maximum Gain	80 dB
Frequency Response	11 Hz–77.65 kHz (–3 dB)
Noise	–129 dBu EIN @ 40 dB gain, –126 dBu EIN @ unity gain
Distortion	0.0245 @ 1 kHz
Maximum Output Level	+26 dBm
Input Impedance	mic 1.2 kΩ; line 10 kΩ; DI 100 kΩ
Output Impedance	600Ω
Dimensions	19" W × 1.75" H × 11" D
Weight	14 lbs.

manipulate the tone at the input stage using the EQ section was part of what made the DI section useful.

A quiet instrument can test the mettle of a preamplifier. Therefore, as one final test, I recorded a clavichord. Miking the instrument from beneath and at a sound hole using a pair of Neumann KM84s, I compared the 7602 again with the Robbie, which has plenty of gain and low self-noise, and there was no contest. The 7602 provided the gain necessary to capture the true sound of the clavichord, notwithstanding a substantial amount of hiss.

Reinventing a Classic

But does the 7602 sound like a Neve 1073? Senior Editor Gino Robair took the 7602 to Studio 880 to compare it to the real thing. Studio owner John Lucasey and his staff ran prerecorded vocals through both preamps, as well as recorded an acoustic nylon-string guitar. In addition, a variety of EQ settings—in particular the frequency extremes—were set up on the 1073 to see if the 7602 could match the tonal quality.

Despite the fact that the EQ markings on the two devices are different, the 7602 could closely match the 1073. The main sonic differences were subtle: the 1073 had a smoother quality overall, with a heartier lower midrange, a greater 3-D sense, and better resolution than the 7602. In addition, the sound of the distortion, especially when the EQ in either unit was pushed too far, was much more pleasing in the Neve device. After the tests were complete, however, Lucasey noted that the Chameleon 7602 was a great bargain for the price, adding that if it could sound that close to a 1073, it was well worth the money.

True Colors

Whether or not it performs like a Neve 1073, the Chameleon 7602 is an exceptional preamp with an EQ section that offers a wide tonal palette. Although the price may seem steep for a Chinese-made mic preamp, the hand-wound transformers and the amount of point-to-point wiring in the unit help justify the cost. Add to that the benefits of having a front-panel instrument input and an EQ bypass switch, and you get a versatile preamp with a vintage sound for well under a thousand bucks.

Rich Wells oversees the Supreme Reality, a recording studio and band based in Portland, Oregon. Special thanks to John Lucasey, Peter Krawiec, Doug Logan, and Joey Dunbom at Studio 880 (www.studio880.com) in Oakland, California.

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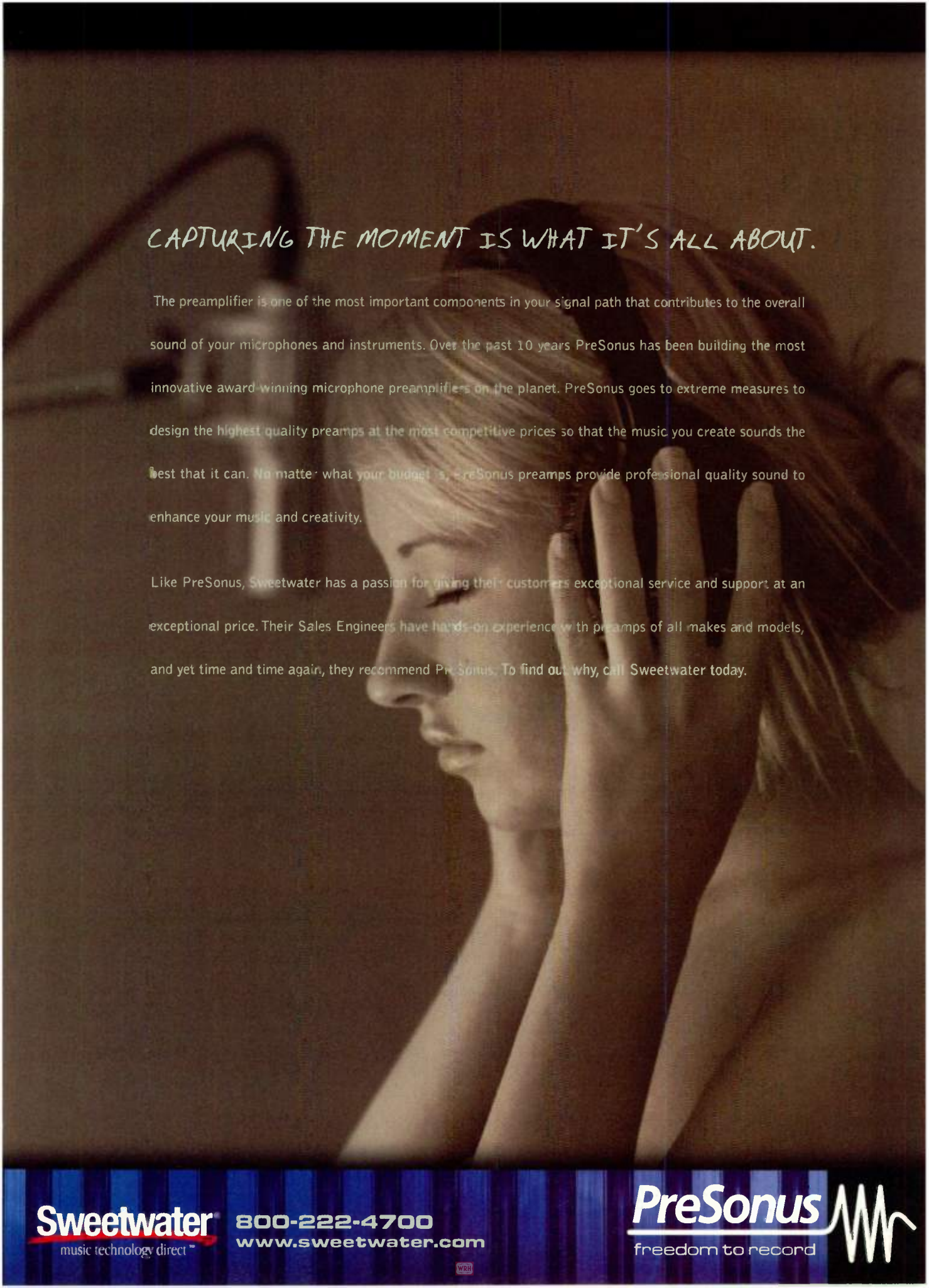
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FIG. 1: You choose your basic model and the parameters it will use in Brass's main screen. In Live mode, Brass plays monophonically.

ARTURIA Brass 1.0 (Mac/Win)

Physical modeling breaks new ground.

By Jim Aikin

The aim of physical-modeling synthesis is to produce realistic performance nuance in whole phrases, not just in single notes. Rather than simply playing samples back, a physical-modeling instrument relies on a painstakingly constructed mathematical model of the real instrument. The model typically factors in components such as, in the case of a wind instrument, a mouthpiece and the shape and length of the pipe. It can also respond to changes in parameters such as breath pressure by altering the tone in a way that replicates what happens in the physical instrument. At its best, physical-modeling technology can produce very realistic sounds.

Arturia's Brass software provides physical models of a trumpet, a saxophone, and a trombone (see Fig. 1). The program can run either as a standalone (with ASIO and Core Audio compatibility) or as a VST, DX, RTAS, or AU plug-in. It allows various MIDI messages to be routed to the modeling parameters in useful ways. In addition, a fully editable library of brass-section riffs is included, so you can cue riffs from different MIDI keys and sound like an expert arranger in a number of popular styles.

Installation and Setup

Brass uses a Syncrosoft USB dongle for copy protection, and though the manual doesn't mention the possibility, I had no trouble transferring the Brass license from Arturia's own dongle to my other Syncrosoft dongle, which contains my Steinberg licenses. Because Brass doesn't use samples, the installation is small—only 51 MB including the program and its presets and riffs.

Arturia's minimum system requirement of a 1.5 GHz CPU seems skimpy, at least on the Windows side. Running a 4-note Brass riff in my 3 GHz Pentium 4 machine took as much as 80 percent of my CPU, according to the Windows Task Manager's Performance meter. To

Crafting tracks with Brass isn't as easy as playing notes on a MIDI keyboard.

keep the sound from breaking up due to CPU underruns, I had to increase the ASIO buffer size of my M-Audio FireWire 410 interface to 1,024 samples at 44.1 kHz. A buffer of that size imposes a barely acceptable 23 ms latency on all MIDI soft synths, not just on Brass.

Sound Check

Several factors come into play when discussing how Brass sounds and whether it can produce tracks that are indistinguishable from those recorded by live players. First, crafting tracks with Brass isn't as easy as playing notes on a MIDI keyboard. Initially, you'll need to learn about the ways the various controllers affect the tone, and then shape each phrase, either with a pencil tool in your sequencer or by overdubbing MIDI mod wheel and slider moves. Second, no matter how well you master the technology, to get the best results, you'll need to understand the idioms of playing and arranging for horns. Third, the mix in which you use Brass will affect how realistic it sounds. In a busy, high-energy funk tune, Brass can sound like a real horn section. If it's playing an exposed trumpet solo from the classical repertoire (see **Web Clips 1 and 2**), however, it might sound a bit stiff.

Brass doesn't sound sampled. The variations from note to note are subtle but audible, even when Brass responds only to different MIDI Note On Velocities. Vibrato added with the mod wheel sounds much more realistic than do the simple pitch changes created in a conventional synthesizer using an LFO. Adding a pitch bend to the trumpet produces the effect of overblowing through the overtone series, which can be effective if deployed as a smear at the right moment in the music.

In general, however, Brass sounds somewhat thin. It lacks the presence or punch of a real horn player or horn section. That fact is due in part to the models' limited dynamic ranges. Applying Aftertouch to the pressure and timbre parameters and then pressing down on the keyboard causes a less ferocious swell than can easily be produced by a real horn player.

A more serious problem is that the trombone model lacks the low end of even a tenor trombone's range, to say nothing of the extended range of a bass trombone or the pedal tones on either instrument. The low end of the Brass trombone's range is only an octave below middle C, whereas a tenor trombone extends down an additional sixth to E2. According to Arturia, its trombone model became unstable between E2 and B2, with some notes not sounding, so those notes were removed from the trombone model. The company hopes to improve the trombone's performance in its next version. In the meantime, there are a few extra notes at the low end of the tenor sax model's range that can come in handy.

PRODUCT SUMMARY

ARTURIA Brass 1.0

software synthesizer
$349

PROS: Excellent physical models. One-finger riff triggering ideal for live use. Good starter library of stylish riffs.

CONS: Very CPU-intensive. Lacks low end of trombone range. Piano-roll editor needs more utilities.

FEATURES	■■■□□
EASE OF USE	■■■□□
QUALITY OF SOUNDS	■■■■□
VALUE	■■□□□

MANUFACTURER
Arturia
www.arturia.com

Feature Overview

Brass can produce up to 4-note polyphony, but only when playing its internal riffs. If you play it note by note using a MIDI controller or a sequencer track, it's monophonic. An ambience-type reverb is included on the Spacialization page, which is where you position your four performers to the left or right and front or rear.

The synthesis parameters available for real-time interaction are attack, pressure, pitch, timbre, noise, vibrato, vibrato frequency, and (on the trumpet and trombone but not the sax) the depth to which a mute is inserted into the bell. The non-real-time parameters include attack type, the material that the instrument is made of, the number of unison players, the amount of Humanization, and the choice of mute or (in the case of the sax) a choice of three mouthpieces. Wood and glass are included among the materials, and those selections can produce entirely unrealistic but expressive timbres.

The system by which MIDI messages are mapped to real-time parameters is quite flexible (see **Fig. 2**). You can route nine inputs (Velocity, Aftertouch, Modulation Wheel, Pitch Bend, Breath Controller, and four assignable Control Change messages) to any of the parameters. The depth and curve of the response are programmable, and several sources can drive one parameter—you aren't

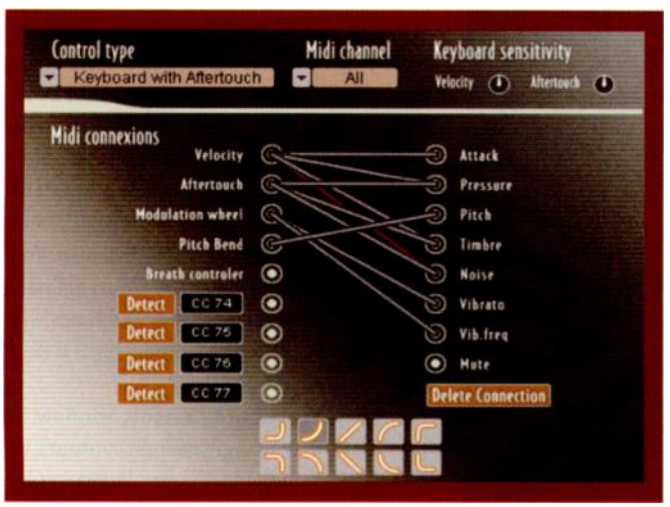


FIG. 2: Each Brass preset can have a custom mapping of MIDI control inputs to the parameters of the model. Response curves are selected using the icons at the bottom.

limited to one-to-one mappings. It is therefore easy to set up expressive effects such as having the mod wheel increase vibrato depth and rate while increasing pressure and opening up the mute.

An adjustment for fine-tuning is inexplicably missing from Brass's voicing parameters. According to Arturia, that was an oversight and will be corrected in the next update. In addition, the instruments in a section lack individual volume control. When a song file is loaded in the sequencer, Brass's sync-to-host setting isn't restored, but that should be an easy bug for Arturia to fix. On several occasions, when I loaded a song that included Brass into Steinberg Cubase SX3, sax and trumpet models failed to load properly, producing nasty crackles and strange pitch artifacts. But selecting a different preset and then going back to the one I wanted solved the problem.

A handy way to interact with Brass is to assign various riffs to different keys on a MIDI keyboard. By default, the bottom two octaves are used for triggering riffs and the upper three octaves for transposing the riff while it plays, but the split point is movable. The transposition takes effect at the beginning of any new note, so the horns can follow along in sections with intricate harmonies.

Piano-Roll Editor

Brass has its own piano-roll editor for creating and editing riffs that can be of unlimited length (see **Fig. 3**). The editor includes a strip chart in which you can draw controllers, a loop-playback button so you can listen while you work, and a quantization menu with basic choices. There's no support for groove quantization.

You can't record in real time into the piano roll, but that's a minor point because you'll probably want to record new horn riffs into your host sequencer. When you do so, you'll need to instantiate the program four times to play a 4-note riff. That isn't a big deal—it's just less convenient than if one instance of Brass were able to receive on four MIDI channels at once.

When quantization is applied in the Brass editor, you can't apply it to some of the notes; it affects all notes in the riff for the currently selected instrument. And though there's an undo/redo command for piano-roll edits, it doesn't work with quantizing. Further, there's no cut/copy/paste utility. There are, however, utilities for managing the saving and loading of both presets and riffs.

In spite of these issues, basic editing works well. You can import Standard MIDI Files, and Pitch Bend, Aftertouch, and Modulation Wheel data will be included. You can even transpose an entire riff to a different key using one command, and Brass will change major thirds into minor thirds if necessary to match the new key.

A separate controller-edit window is provided for drawing envelope contours to be applied to individual notes. For example, you might want a trumpet preset to have a lot of pressure at the beginning of each note and then back off. In general, adjusting parameters and adding envelopes in Brass is

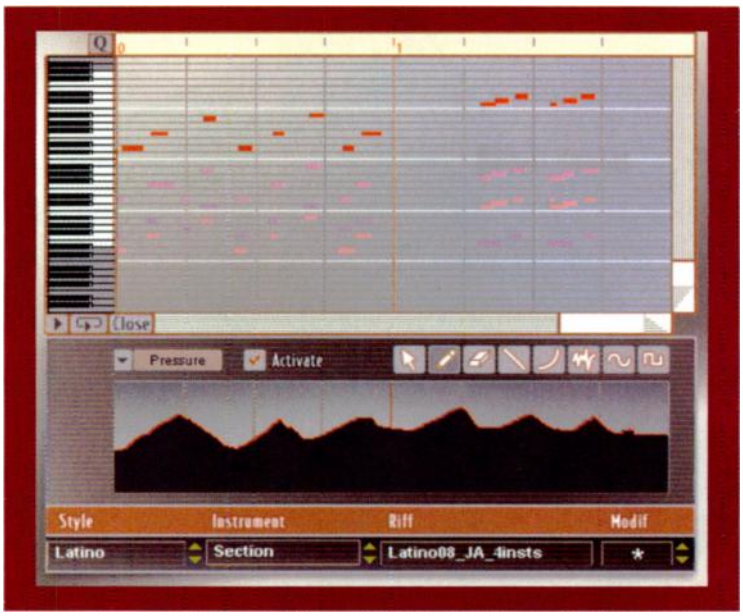


FIG. 3: The piano-roll editor in Brass has a strip chart for controller data, a variety of tools (above the strip chart), and zoom controls (the triangular handles below the piano roll). Notes for the instrument being edited are shown in a darker color.

a finicky business. A subtle touch is needed to achieve realistic results.

Riff Library

The library of riffs supplied with Brass is categorized by style: blues, disco, funk, hip-hop, jazz, Latino, military, miscellaneous, Motown, pop, R&B, reggae, salsa, soul, and zouk. Most of the styles contain fewer than a dozen riffs, but reggae has 41, pop 37, and funk 42. Most are two measures long. (Check out the demos at www.arturia.com/en/brass/samples.php to hear some of the riffs in action.)

The riffs are quite lively. Little splats (created with vibrato), breath noise, and sloppy section entrances add a lot to the sense of realism. In a few cases, I felt that these artifacts were overdone or just poorly programmed. The riffs are solid stylistically, so though you'll undoubtedly want to customize them for your own tunes, they provide good starting points if you're less than a Tower of Power–class arranger. In two or three of the riffs, I heard little sonic artifacts that I didn't care for, but overall I was impressed with the arranging and the programming.

Strike Up the Band

Brass provides resources for realism and user control that sampled brass libraries, no matter how good, simply can't match. The program is sure to be embraced by jingle producers who need quick access to high-energy pop arrangements, film-score composers who need to rough out convincing demos, and home-studio owners who want to spice up a funk or Latin track but aren't set up to record a real horn section.

Brass 1.0 suffers from some shortcomings, notably the missing low end of the trombone range and the lack of cut/copy/paste in the piano-roll riff editor. And though you can slam a finger down on a keyboard and hear a sparkling brass-section riff, getting the most out of Brass will require time and patience. Arturia has done a lot to make Brass easy to use, but as with any complex piece of software, those who are in search of instant gratification will miss out on much of the program's power.

EM WEB CLIPS

Jim Aikin writes regularly for EM, Mix, *and other music technology publications.*

FIG. 1: The SP-404 combines some of the best features of previous Boss and Roland SP-series phrase samplers in a sturdy, battery-powered box.

ROLAND SP-404

This sampling groove box weighs less than three pounds.

By David Battino

The SP-404 improves significantly on the popular SP-303 while picking up strong features from elsewhere in the SP line. Like the SP-202, it has a built-in microphone and can run on batteries; six AA cells can power the sampler for six hours. Like the SP-606, the SP-404 supports CompactFlash memory cards instead of the 303's flimsy SmartMedia format. Insert a 1 GB CompactFlash card, and the SP-404 will hold nearly six and a half hours of high-quality audio. According to Roland, it's the only sampler that can stream audio direct from flash media. That means you can play back entire songs from a single pad, or in a pinch use the SP-404 as a stereo field recorder (maximum stereo recording time is around three hours). The SP-404 could also be great for triggering sound bites in a theatrical production or in a live Podcast or radio broadcast.

Like its predecessors, the SP-404 is foremost a groove box—a cross between a sampler and a drum machine. You load up the pads with stereo or mono samples (either by recording them yourself or by importing them from the CompactFlash card), and then either sequence them into grooves using the pattern sequencer or twist them in real time with the device's dramatic, playable effects. Audio inputs let you apply the effects to external signals, too.

Big Box Value

The first thing you'll notice about the SP-404 is its strong metal top, a rarity in this era of lightweight plastic gear (see Fig. 1). The sense of quality is reinforced by the smooth-turning rubber knobs and sturdy trigger pads, which light up when you press them. I smiled when I saw the display, which is backlit by a blue light that fades in and out almost organically. When the sequencer is running, the light pulses at the current tempo.

The case is a tad smaller than this magazine—compact, yet substantial

Transform wimpy source sounds into monstrous rhythmic textures.

enough that it doesn't slide around when you're using it. A laptop-style security slot on the back and a screw-down CompactFlash cover on the front keep your SP-404 and optional memory card from walking away as well.

Stereo line inputs and outputs are on RCA jacks (see **Fig. 2**). The unit's monophonic mic input has a dedicated trim knob. The first thing I sampled was myself scraping a fingernail along the grooved edge of the case, producing a crisp guiro loop (see **Web Clip 1**). The only recording-level indicator is a clip LED, and it's easy to unintentionally pick up handling noise with the mic, but by accounting for those challenges, I made some useful recordings. MIDI input can trigger individual pad sounds and control the sequencer's playback and tempo.

FIG. 2: Powered by a line-lump adapter or AA batteries, the SP-404 features MIDI In, stereo line-level I/O, and an antitheft cable slot. The front side has a headphone jack, a CompactFlash slot, and a mono mic input with level trim.

At the bottom of the panel, 12 numbered pads trigger samples; in Sequencer mode, they trigger patterns. The pads are not touch sensitive, alas, but their samples do respond to MIDI Velocity, which is mapped to control volume. (I was also pleased to discover that the SP-404's sequencer records incoming MIDI Velocity data, something the pricier SP-505 does not do.) To the right are three more pads: Hold, which sustains a looped sample when you take your finger off the trigger pad; Ext Source, which unmutes an external audio signal; and Sub Pad, which retriggers the previously played pad, facilitating rolls. The pads are larger than those on competing groove boxes such as the Korg ES1mkII.

Above the pads are six Bank buttons. The four on the right address the CompactFlash memory; pressing them twice calls up an additional bank, for a total of ten banks of 12 pads. A row of five buttons above the Bank buttons controls Sample mode. The first two buttons, Lo-Fi and Stereo, set the recording format during sampling. The next three—Gate, Loop, and Reverse—affect playback. By pressing them, you can set a sample to play through once, loop indefinitely, play only while you're holding the trigger pad, or do any of the above while playing backward. Strangely, the 12 pads in each bank are mapped to successive octaves of MIDI notes beginning with B2 rather than C2. And although it isn't mentioned in the manual, you can toggle the Ext Source pad status by playing A#2. That could be handy for muting a remote mic during performance.

I would have liked a dedicated Roll button, as on the Korg. I also wished for a hi-hat cutoff option that mutes one pad when another is pressed. But as I discovered when I delved into its sequencer, the SP-404

SP-404 SPECIFICATIONS

Polyphony	(12) notes (6 stereo samples)
Audio Inputs	(1) unbalanced ¼" mic, (2) unbalanced RCA line
Audio Outputs	(2) unbalanced RCA line, (1) ¼" stereo headphone
Additional Ports	(1) MIDI In
Program Memory	(24) internal user locations, (96) optional external-card user locations
Maximum Sampling Time	11 min. (Lo-Fi)/2 min. (standard) with internal memory; 772 min. (Lo-Fi)/386 min. (standard) with optional 1 GB CompactFlash card
Sample Import Formats	WAV, AIFF (stereo/mono, 8/16-bit, 44.1 kHz); loop points ignored
Effects Processing	(29) types, (1) simultaneous; enabled per pad
Sequencer	(1) track; (8,000) notes internal (8,000 per card); (99) bars per pattern; (24) user patterns internal (96 per card); 96 ppqn resolution; basic quantization; MIDI Clock and Song Position Pointer sync
Controllers	(3) assignable effects knobs; (6) effects toggle buttons; (1) Tap Tempo button
Dimensions	7.0" (W) × 2.9" (H) × 10.1" (D)
Weight	2.9 lbs. (excluding adapter and batteries)

is really more of a phrase sampler than a drum machine, and it offers a few work-arounds.

Causing Effects

I had a blast playing with the SP-404's effects (see **Web Clip 2**). The six buttons flanking the display toggle different effects: filter, pitch-shift, delay, Isolator (a DJ-style EQ), vinyl simulation, and multi-effects (a gateway to 24 more). The three knobs farthest to the right control effects parameters; on the filter effect, for example, the knobs control cutoff frequency, resonance, and distortion, and on the Isolator, they control low, mid, and high EQ. The 7-segment LED attempts to identify the current parameters; turn the knobs in Filter mode, and it displays CoF, rES, and drU (drive), for example.

To call up one of the 24 multi-effects, you press the MFX button and then turn the rightmost knob (carefully, because it's not detented). You can also select one of the first 12 multi-effects by holding MFX and pressing a pad, or you can select effects 13 through 24 by simultaneously holding MFX and the Vinyl Sim button and pressing a pad.

You can apply an effect to one pad or multiple pads and then resample your knob-twisting, pad-bashing performance to a new pad. After a few iterations (only one effect can be active at a time), you can easily transform wimpy source sounds into monstrous rhythmic textures.

New multi-effects beyond those in the SP-303's collection are Subsonic, which triggers a low-frequency sine wave during peaks; BPM Looper, which generates wild stuttering; and DJFX Looper, which alters the playback direction and speed for record-scratching effects. A video clip on Roland's Web site shows how to create bass lines by resampling the Subsonic effect, which is handy if you're using the SP-404 by itself. I also discovered I could pan mono sounds by resampling them with the pan effect, which overcomes a limitation of the SP-404's architecture.

PRODUCT SUMMARY

ROLAND SP-404

portable phrase sampler
$449

PROS: Almost six and a half hours of sampling with optional 1 GB card. Battery-operable. Playable effects. Audio file import/export.

CONS: Can't resample sequences. No Roll button or variable swing quantize. Numerous unlabeled key combinations.

FEATURES
EASE OF USE
AUDIO QUALITY
VALUE

MANUFACTURER
Roland U.S.
www.rolandus.com

Sampling and Resampling

Sampling on the SP-404 is fast. As with many multistep operations on the instrument, the next pad you need to press will start flashing to guide you. To begin, you hit the Rec button; the available pads start flashing. Hit a pad to select it, and the Rec button starts flashing. Hit Rec again, and you're recording. Hit it once more to stop. You can then trim the start and end of the sample with the knobs.

Before sampling, you can choose to record in stereo or in Lo-Fi mode. Lo-Fi mode saves space, although with so much memory on hand, it's more useful as an effect. I preferred the dedicated lo-fi effect, however (see **Web Clip 3**).

Hidden key sequences let you activate other sampling modes, such as sampling with a count-off, level-activated recording, and sampling at a specific tempo. The latter truncates sampling at the mathematically perfect point to make a loop based on the tempo you specify before starting (you can use the Tap Tempo button for that). I sometimes had to adjust the end point manually, but overall, tempo sampling was a time-saver.

Remembering the necessary key sequences was a pain, though. There's a huge reference chart in the manual (available online), but to give you an idea of what's involved, here are some examples. To enter Import/Export mode, you hold Cancel and press Resample, and depending on whether you want to import or export, you then press Rec or Resample. To swap samples between pads, hold down Del, press Rec, and then press the two pads whose samples you want to exchange. To set the MIDI Sync mode, turn on the power while holding the Time/BPM button and then turn the Control 1 knob. I'm glad that the SP-404 has so many features, but you'll need to read the manual thoroughly to discover and remember them. Fortunately, the manual is concise and easy to follow.

My biggest disappointment with sampling was that you can't resample a sequence. Because the SP-404 disables MIDI input during resampling, you can't drive it from an external sequencer to capture a loop, either. And tempo sampling isn't available during resampling; you'll need to adjust the loop point manually, which slows the creative process.

On a happier note, the SP-404 offers much better data compression than the SP-505. The SP-404 sounds great, too: deep and crisp. Although its compression crunches files down to half their normal size, the effect is almost inaudible. Subtracting the original WAV file from a version that I'd imported and exported yielded a whisperlike version of the original—so quiet it was

FOURPLAY

Sometimes guessing wrong leads to a happy surprise. In my September 2002 review of the Boss SP-505 (online at www.emusician.com), I surmised that the Roland subsidiary had jumped from 303 to 505 because 4 is an unlucky number in Japan (think how few Roland products have a 4 in the name). But apparently those cautious days are gone, because the SP-404 is a bold new entry in the groove-sampling scene.

detectable only on headphones. It takes the SP-404 about as long as the imported sample's duration to convert it to the machine's native format. I was even able to import a pink-noise loop I'd made on a granular synthesizer, though I had to adjust the loop point slightly to prevent clicks.

Sequencing Events

The SP-404's very basic sequencer offers drum machine–style recording of patterns as long as 99 bars. You can set input quantization from 32nd notes up to quarter notes, and although you can't swing quantize by a percentage, you can quantize to triplets for a swing effect. You can erase individual hits. During playback, you can cue up the next pattern by hitting a pad, and the SP-404 will switch on the downbeat. If you want to switch immediately, just hold the Sub Pad button and press the desired pad.

Unlike the Korg ES1mkII's sequencer, the SP-404's sequencer can't chain patterns into songs or record knob movements. And unlike the SP-505, the SP-404 doesn't have a single magic button that time-stretches all samples to fit a common tempo. You have to set each pad to Pattern mode individually. The time-stretching works best on sparse, percussive material.

Feelin' Groovy

Roland designed the SP-404 for beginners looking to get into sampling and groove making, but soon discovered that its battery-powered portability and extensive sampling time endeared it to traveling pros as well. The instrument has some frustrating limitations when viewed as a drum machine, including the lack of true swing quantization, hi-hat cutoff, pattern chaining, and an Accent button. If you want Velocity-sensitive pads, USB connectivity, and digital audio I/O, you'll need to step up to the SP-606. But load the SP-404 with songs, loops, and textures from a CD or a computer, and you'll have an inexpensive sampling partner that sounds great.

EM WEB CLIPS

David Battino (www.batmosphere.com) is the coauthor of The Art of Digital Music *(Backbeat Books, 2005) and the editor of the O'Reilly Digital Audio site (http://digitalmedia.oreilly.com).*

QUICK PICKS

ELECTRO-HARMONIX

Flanger Hoax

By Orren Merton

The unusually named Flanger Hoax ($298), or Flanging Phaser Modulator, from Electro-Harmonix is a completely new modulation effect that uses two separate analog phasers, each with its own delay line. The Flanger Hoax can create classic phase-shift effects along with unique modern phase shifts and modulations.

A New Phase

The rugged metal chassis of the Flanger Hoax is as wide as two standard guitar stompboxes. It offers a status LED at the top left and a power LED at the top right. The bypass footswitch is at the bottom left of the top panel. It is a true bypass footswitch; when the effect is bypassed, the input signal is sent directly to the outputs. The top surface also contains nine rotary knobs and three mini switches for adjusting the effect. To make adjusting the effect more intuitive, the related controls are grouped in colored areas of the case.

The Flanger Hoax requires double the power of a standard 9V stompbox and ships with a proprietary 18 VDC, 500 mA wall wart. Electro-Harmonix warns you to use only that power supply with the product.

The Flanger Hoax is a line-level mono effect, and the company recommends using it in the effects return of a mixer or amplifier. It offers a single unbalanced ¼-inch mono input but three ¼-inch mono outputs: a Direct Output for dry signal only; a Blended Output, for which the ratio of dry to wet signal is controlled by the Blend knob; and an Effect Output for processed output only. For this review, I plugged the Flanger Hoax into the serial effects loop of my Randall RM100 guitar amplifier and used the Blended Output.

The Electro-Harmonix Flanger Hoax, which combines two phasers with delay lines and a modulator in one effect, offers a unique take on flanging.

Just a Phase

The simpler of the two phaser sections is the Fixed Phaser, which will shift the phase of the input signal by a set amount of 240 degrees. The Fixed Phaser section also offers a Delay Amount knob, which varies the delay time from 1 to 11 ms. The Invert mini toggle switch inverts the phase of the postdelay output of the Fixed Phaser block by an additional 180 degrees. The Fixed/Bypass mini toggle switch either enables the Fixed Phaser circuit or reroutes the signal around the phaser circuit and directly into the delay line.

The Swept Phaser is modulated by a low-frequency sine wave called the Modulator. Like the Fixed Phaser, the Swept Phaser offers a mini toggle that lets the signal bypass the Swept Phaser circuit and directly enter the section's delay line. The Swept Phaser also offers a Delay Amount knob that adjusts the delay time between 1 and 11 ms.

The Swept Phaser offers a host of additional controls in the Swept Phaser Control section. Using the Response knob, you can determine how the Swept Phaser responds to the modulation waveform. In LIN (linear) mode, the circuit provides a relatively tame response, and in LOG (logarithmic) mode, the response is more pronounced. An Amount knob controls the amount of modulation that will sweep the Swept Phaser, within a phase-shift range of 240 degrees to 990 degrees.

The Modulator Mode rotary switch steps through four modulation waveform phases (270, 180, 90, and 0 degrees) and a DC Mode setting. In DC mode, the Swept Phaser becomes fixed, with the Amount knob controlling the phase-shift amount. This knob can create some wild effects when used in tandem with the Delay Mode rotary switch.

The Modulator section itself offers two controls. The first is the Rate knob, which sets the sine-wave frequency between 0.07 Hz and 220 Hz. The Delay Mode rotary switch selects between different phase-shift combinations for the modulator that sweeps both phasers' delay lines. There are five modes, each with a different combination of phases and DC mode for the two delay lines.

Finally, the Feedback section includes a knob to adjust the amount of feedback, and a three-way mini toggle switch to turn the feedback off, feed the entire wet signal back into the phaser circuits, or feed only the Swept Phaser signal back into the phaser circuits.

Phasers on Stun

Because of the breadth of controls and their interaction with each other, this is not a simple effect to master. I also found that when using the Blended Output, turning up the Blend knob resulted in a reduction in overall volume, which I could not find a way to defeat. Nevertheless, I did find that it could create rich phase effects and self-oscillations that I'd not heard with other phasers I've tried (see **Web Clip 1**). If you like powerful modulation effects and enjoy spending time tweaking, the Flanger Hoax could be just what you're looking for.

EM WEB CLIPS

Value (1 through 5): 4
Electro-Harmonix
www.ehx.com

SOUNDLABEL

Piano Attack

By Geary Yelton

EM ★★★★★ hot pick

When I was in college, my freshman music history teacher introduced the class to avant-garde by playing an excerpt from John Cage's "Bacchanale," a piece composed in 1938 for prepared piano. Half

the class was fascinated, and the other half was appalled—typical reactions from listeners first exposed to prepared piano. Although Cage wasn't the first to place foreign objects (called *preparations* or *treatments*) on or between piano strings, hammers, and dampers, he brought the technique to prominence. Since then, prepared piano has become an essential element in avant-garde's repertoire.

Creative composers and other progressive artists are always looking for ways to expand their palettes, and Dutch soundware developer Soundlabel aims to fulfill their desires. *Piano Attack* is a prepared-piano sample library that's available in two editions: a DVD-ROM supplying samples and patches for Apple EXS24 and Native Instruments Kontakt 2 ($279.95), and a CD-ROM supplying a ReFill for Propellerhead Reason ($229.95).

Sound the Attack

Piano Attack's creators went far beyond Cage's vision of inserting screws, paper clips, folded paper, chunks of wood, and various other muting materials into a piano to change its sound. They did things to acoustic pianos that Cage probably never considered—banging on them with hammers, slicing them with handsaws, hacking them with axes, and generally abusing them to the extent that one piano was completely destroyed. While it's true that traditional preparation significantly increases a piano's percussive qualities, the possibilities are so much greater when you're willing to risk permanent damage.

The end result of all that mayhem is 2.9 GB of data comprising 274 patches for Kontakt 2 and 1.18 GB of data comprising 210 EXS24 patches and 411 Apple Logic 7 channel strip presets. The EXS24 and Kontakt 2 edition also includes two folders full of REX files: Rex Beats, which is on the installation disc, and Rex Phrases, which you can download after you've registered your soundware. The 574 MB Reason ReFill (available on disc or as a download) has 207 NN-XT patches, 157 Dr:rex beats, and 21 Dr:rex phrases. Because the ReFill format uses lossless compression, the files are quite a bit smaller than the other versions. Registered owners of the Reason edition can also download additional material.

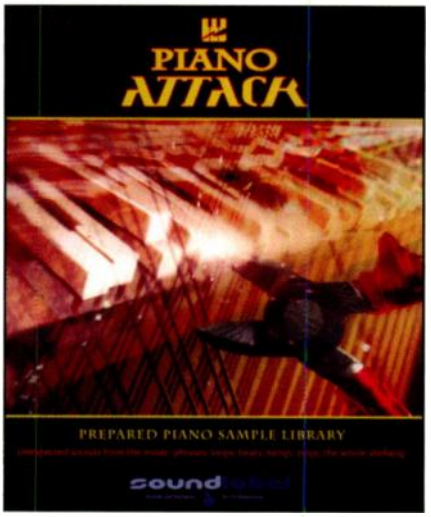
The Logic 7 and EXS24 version supplies data for Logic's channel strip as well as for the sampler. Along with the sampler data, the channel strip presets recall any assigned plug-ins and other settings. The difference between the same patch with and without plug-in processing can be quite remarkable (see **Web Clip 1**). Because Kontakt 2 furnishes its own effects, separate files aren't necessary. *Piano Attack* makes the most of its effects programming, which gives Logic 7 and Kontakt 2 users an advantage over anyone importing the content into samplers such as HALion and GigaStudio.

Sounds are divided into classifications such as Instruments, Drums, Bells, Chords, Atmospheres, and Melodic Elements. The Instruments directory contains leads, pads, and other sounds you might never guess came from a piano; some are quite playable (see **Web Clip 2**). Drums are divided into various kits, loops, and sounds with names like Hitchcockbeat and Go Ahead Wreck It! The drum loops are especially plentiful and are arranged by tempo, from 40 bpm to 320 bpm. Some are quite evocative and will likely inspire compositions on their own (see **Web Clip 3**). Many of the Drones are downright spooky. The Sound Effects directory contains lots of patches—Piano Crash, Ocean Side, and Blow Your Piano, for example—that don't fit well into other categories (see **Web Clip 4**).

Of special interest are the Menu Patches, which map as many as 30 different patches across the keyboard. If you're using Kontakt 2, a collection of nine Multis provides quick access to hundreds of strange and occasionally beautiful soundscapes. All in all, the programming is very well conceived and brilliantly executed.

Be Prepared

Piano Attack isn't the first sample library of prepared-piano sounds, but it's certainly the most extensive. Like avant-garde music itself, *Piano Attack* requires an open mind. Not all of the sounds are as challenging as John Cage's music, and many are quite lovely (you can hear examples of music produced with some of them at www.pianoattack.com). If you want to inject some truly original sounds into your music and you don't mind exploring experimental timbral materials, *Piano Attack* might be just what your music needs to get out of its rut. EM WEB CLIPS



Soundlabel's *Piano Attack* features samples of pianos that have been modified, scraped, hacked, and beaten. The collection is available in one edition for Reason and another for EXS24 and Kontakt 2.

Value (1 through 5): 5
Soundlabel (distributed by Big Fish Audio)
www.bigfishaudio.com

TOADWORKS

Enveloope

By Eli Crews

Until the day I received the ToadWorks Enveloope pedal ($264.99) for review, I was one of the many guitarists and bassists who didn't really "get" effects loops. I'm partial to old tube amps, which don't have effects loops, so I've always thought of them as superfluous.

After plugging in the Enveloope, my opinion changed dramatically. The pedal provides a mono effects loop, but that's just the beginning. The play on words in its name hints at its main feature: the amount of effect that returns into your signal path can be governed by the envelope of the input signal. In

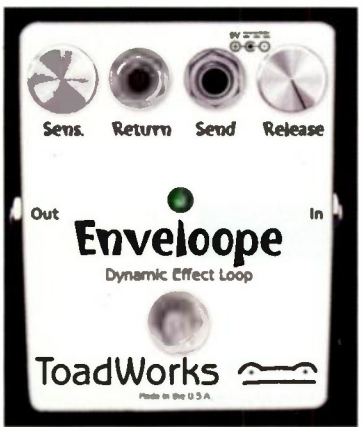
other words, you have dynamic control over the effects return.

Signed, Sealed, and Delivered

The Enveloope has a deceptively simple design featuring just two knobs. The input and output are on standard ¼-inch TS jacks, and the input jack also serves as a switch for the internal 9V battery. On top of the pedal are ¼-inch TS Send and Return jacks for the loop. There's also an input for an external power supply, which is not included but is recommended by ToadWorks for optimal operation.

The Sensitivity knob determines the threshold that the input signal must cross to turn on or off the audio coming into the Return jack. The knob doubles as a switch. When you pull it out, it defeats the dynamic component of the pedal, leaving you with a high-quality, buffered effects loop. It gives you the ability to switch on or off (in true bypass) a whole line of pedals with one very robust 3PDT (triple-pole, double-throw) switch.

The Release knob determines how fast the gate closes; that is, how long the effect stays on after the input signal falls below the threshold. Pulling this switch makes the gate function backward. The effect gets passed through when the input signal is below the threshold, and turns off when the signal gets louder, similar to how a "ducker" works.



The ToadWorks Enveloope gives you a dynamically controlled mono effects loop.

Pushing the Enveloope

I played around with this pedal for a few weeks, running bass, guitar, and synths through it into various distortion, delay, harmonizing, and other effects units. My main impression, other than that the Enveloope is a lot of fun to use, is that you need a large amount of control over your instrument, or "touch," to get maximum benefit from it (see **Web Clips 1 and 2**). I found it a little tricky to set the Sensitivity and Release knobs just right.

I noticed the Enveloope responded a little too slowly for sources that have fast attack transients, like drums and percussion. The unit has no adjustable attack parameter.

Off the Board

It's also cool to use the Enveloope on studio effects sends and inserts. For that application, you need a reamping tool or some other way to get line-level signals down to instrument level. Otherwise, no matter how high you set the Sensitivity knob, the signal is always above the threshold that triggers the gate. You'll also need a DI or other method of getting that instrument level back up to line level for returning it into your console or audio interface.

Once I had my signal levels properly configured, I had a blast running different tracks through the Enveloope to various effects units. For instance, I bused the vocal into a reverb unit through the Enveloope's effects loop. That gave me an effect where the reverb kicked in only on the loud phrases, a time-honored mixing trick. I ran drums, bass, and horns through the Enveloope into my Tech-21 SansAmp PSA-1, my preferred tool for gritting up a track. The Enveloope's dynamic control of the distortion yielded really interesting results (see **Web Clip 3**).

You can use the Enveloope just like a key trigger on a gate. Your input signal can control the envelope of a completely different source, with or without being blended in with it (see **Web Clip 4**).

Do Not Return to Sender

The Enveloope is a unique and useful device. Between its cost and the degree of instrument control you need to exploit all of its functions, it falls into the "boutique pedal" category. But considering its wealth of features, solid build quality (it's handmade in the United States), and two-year warranty, this pedal is actually quite a bargain.

EM WEB CLIPS

Value (1 through 5): 4
ToadWorks
www.toadworksusa.com

FXPANSION

BFD Deluxe Collection

By Babz

FXpansion *BFD Deluxe Collection* ($249) is the company's third expansion pack for its popular virtual-drum instrument, BFD. Boasting eight drum kits recorded by Steve Albini at Electrical Audio, *Deluxe Collection* includes additional drum kit pieces and articulations beyond the capabilities of the original BFD. As a result, the library requires BFD 1.5, and a free upgrade is available for registered users from the FXpansion Web site.

The upgrade contains other enhancements, including an Envelope Damping control, which allows you to scale back long, ringing decays on some of the drums (see **Web Clip 1**). This has been one of the program's most requested features, and I recommend the version 1.5 upgrade to all users for that feature alone.

Size Matters

When first introduced, BFD (for Big F---ing Drums) was one of the most ambitious drum-sampling projects to date, capturing 24-bit drums in meticulous detail with multiple microphones and up to 46 layers of Velocity. Massive amounts of data, with a drum-oriented mixing/editing environment and a MIDI groove engine, have helped BFD set new standards for the realistic emulation of acoustic drums. (Visit www.emusician.com to read the May 2004 review of BFD 1.07.)

BFD Deluxe Collection consists of a staggering 55 GB of new drum sounds, sampled with up to 128 layers of Velocity. This higher level of detail demands greater disk space and RAM resources, and the collection gives you three installation options for various systems: Small has 30 GB of data and 32 Velocity layers; Medium has 42.5 GB of data and 64 Velocity layers; and Deluxe has 55 GB of data with the full 128 Velocity layers. You'll need 2 GB of RAM to take advantage of the full 24-bit Deluxe resolution.

The Medium set, according to my tests, will work well on a PC with only 1 GB of RAM but may require that you work in 16-bit mode with less than 64 Velocity layers for the largest kit. Even in this configuration,

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the library was rich and expressive. The package comes on five DVDs, uses a serial number for authorization, and can take an hour or more to install.

Kits and Pieces

The collection includes three vintage Ludwig kits from the '60s and '70s, and a selection of modern-era kits from DW, Gretsch, Sonor, Yamaha, and Backyard Drums. The star attraction of the collection is the Ludwig Vistalite Deluxe kit, which is featured on the front of the box.

FXpansion *BFD Deluxe Collection* is a library of eight new drum kits for BFD, which were recorded by Steve Albini at Electrical Audio.

This classic clear-acrylic kit from the '70s is presented in all its glory, with six toms and double bass drums. Its dual kick drums are two sizes (22 and 24 inches), and while the 24-inch drum is lush and punchy, the smaller one was too boomy for my taste. That, however, is easily remedied thanks to the new Envelope Damping feature. The Vistalite snare is deep and beefy, with lots of snare buzz.

Snares with a tighter, crisper quality can be found in kits such as the Backyard, DW, and Gretsch sets, providing a well-balanced tonal palette. From the monster rock power drums of the Yamaha kit to the lively organic '60s sound of the Ludwig Mod Orange kit, the collection offers a variety of options well suited for straight-ahead and classic rock, as well as pop, funk, and fusion styles.

The pack's hi-hats and cymbals benefit from the added articulations and Velocity detail, and they are universally excellent. The hi-hats include ten articulations: struck with tip and shank of the stick while one-quarter, one-half, and three-quarters open or fully closed, as well as one articulation each for fully open and pedal closed. Ride cymbal sounds include hits on the shoulder and bell, and crashes include both shoulder and edge strikes. Snares include five articulations (hit, drag, flam, rim, and side stick), and kick drum samples are offered with a variety of beaters and with and without sympathetic snare resonance.

Luxurious

Overall, *BFD Deluxe Collection* is worthy of its name. Its emphasis on subtle detail can help impart the kind of nuance and living, breathing character that continues to blur the distinction between virtual instruments and the real deal. This kind of expressiveness and quality will make your BFD tracks a truly deluxe experience. EM

EM WEB CLIPS

Value (1 through 5): 4
FXpansion
www.fxpansion.com

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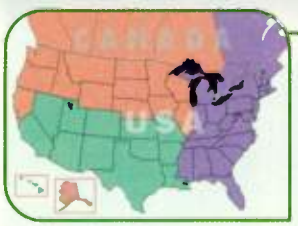

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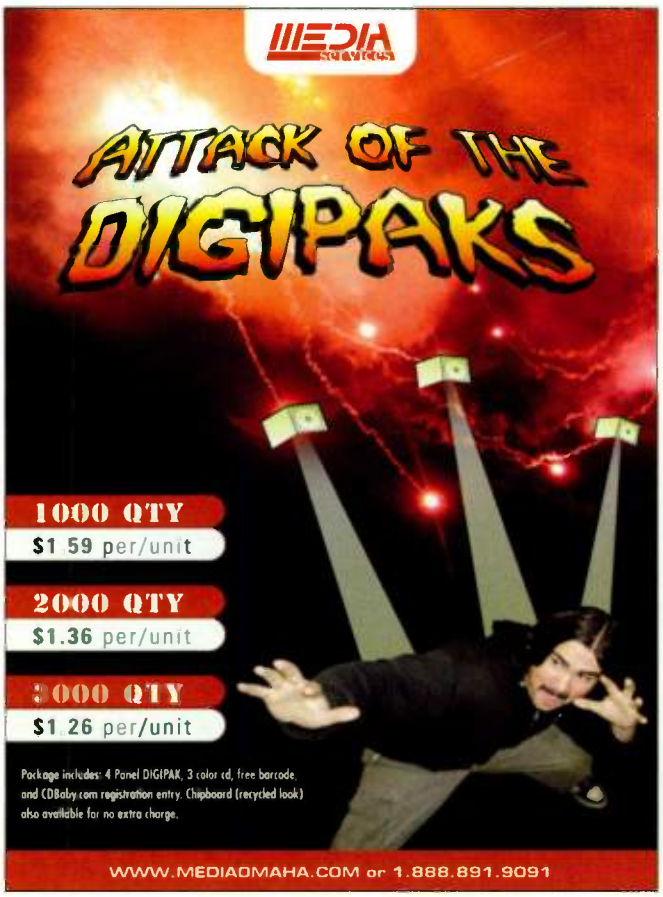

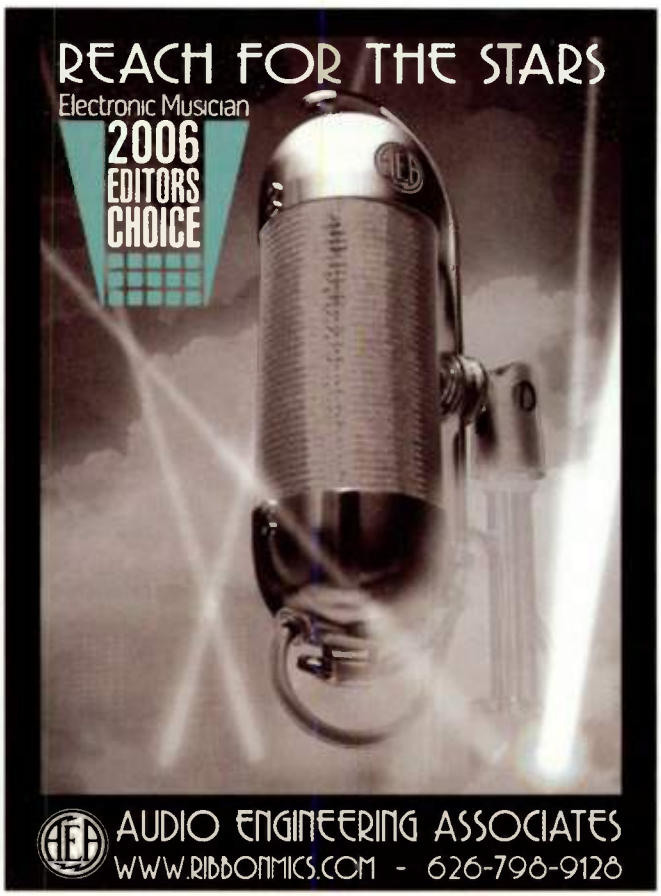

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Expand & Update Your MOTU Studio

Digital Performer 5 and the new UltraLite compact FireWire audio interface lead a wide range of new products to expand and update your MOTU desktop studio.

Quad processing

With two dual-core processors at speeds up to 2.5GHz per core, the Apple Power Mac G5 Quad doubles the punch of its dual-processor predecessor. Do the math: Quad-core processing means four Velocity Engines and eight double-precision floating-point units for blistering performance of up to 76.6 gigaflops. What does that mean for your MOTU Digital Performer 5 studio? Run MachFive, MX4, the Symphonic Instrument and dozens of other virtual instruments, processing plug-ins and disk tracks without even batting an eyelash. Blaze through your work, deliver ahead of schedule and astound your clients — because this baby really moves.

Compact FireWire Audio I/O

The new MOTU UltraLite compact bus-powered 10x14 FireWire audio interface is born from the innovative design, proven reliability and award-winning sound of the MOTU 828mkII and Traveler FireWire interfaces. You get 8 analog inputs, 10 analog outputs, S/PDIF digital I/O and 96kHz recording in a compact, bus-powered, fully portable half-rack I/O, complete with two mic/instrument inputs equipped with individual 48V phantom power and 60dB pad/trim preamp gain range, separate main outs and phones, front-panel LCD metering for all I/O, 8-bus CueMix DSP on-board mixing, front-panel programming, SMPTE sync and many other advanced features.

MIDI Control from KORG

Every MOTU studio needs capable and convenient MIDI control. The new KORG K-Series USB/MIDI controllers feature solid, full-sized keys and four velocity curves to perfectly match your playing style. Available in 25, 49 and 61-key versions, each provide easy access to the full range of notes thanks to dedicated octave shift buttons, plus a host of assignable controllers including KORG's innovative ClickPoint, which performs double duty as an X/Y joystick or a USB mouse. Plus they come with the M1 Le, a soft synth version of the legendary M1 to use within DP! Now add the sleek and portable padKONTROL, with 16 extremely responsive trigger pads that can be used to perform natural sounding drum parts, trigger audio loops or video clips, and send MIDI control change messages to take charge of your soft synths, samplers and effects. Its unique X/Y pad can be used to perform realistic rolls and flams with the touch of a finger.

Authentic SSL processing

Waves delivers the classic sound of the SSL 4000 Series to your Digital Performer mixes. To faithfully recreate the extraordinary SSL sound, Waves engineers spent more than a year analyzing and modeling the distinctive sonic characteristics of SL 4000 factory reference consoles and components provided by Solid State Logic. Extensive testing proves that the Waves SSL 4000 plug-ins sound virtually identical to their hardware counterparts. Developed under license from Solid State Logic, The Waves SSL 4000 Collection includes three meticulously modeled plug-ins based on the legendary SSL 4000 Series: the SSL E-Channel, the SSL G-Master Buss Compressor, and the SSL G-Equalizer.

Universal plug-in control

As a Universal Sound Platform, Native Instruments KORE operates not only as a plug-in within Digital Performer but also as an instrument host application. It allows you to integrate all your VST- and Audio Units-based software instruments and effects into a single, unified interface. KORE provides greatly increased control, overview and ease of use in all creative situations. Both Native Instrument's own range of instruments and effects as well as third-party products are supported. The seamless integration with KORE's advanced hardware controller gives hands-on control with unprecedented analog feel, finally turning today's software synthesizers and samplers from applications into true instruments.

Pro waveform editing & mastering

Your DP mastering and processing lab awaits you: BIAS Peak Pro 5 delivers award winning editing and sound design tools, plus the world's very best native mastering solution for Mac OS X. With advanced playlisting. Superb final-stage processing. Disc burning. Plus PQ subcodes, DDP export (optional add on), and other 100% Redbook-compliant features. Need even more power? Check out our Peak Pro XT 5 bundle with over $1,000 worth of additional tools, including our acclaimed SoundSoap Pro, SoundSoap 2 (noise reduction and restoration), Squeez-3 & 5 (linear phase multiband compression/ limiter/upward expander), Reveal (precision analysis suite), PitchCraft (super natural pitch correction/ transformation), Repli-Q (linear phase EQ matching), SuperFreq (4,6,8, & 10 band parametric EQ) and GateEx (advanced noise gate with downward expander) — all at an amazing price. So, when you're ready to master, Peak Pro 5 has everything you need. It's the perfect complement — and finishing touch — to Digital Performer 5.

The gold standard for groove

Spectrasonics Stylus RMX v1.5, the award–winning "groove standard", gets better and better with new features like "Chaos Designer™ Buzz" for stuttering edits, 500 incredible new categorized Multi grooves and 250 slamming new Kits. It's even easier to learn RMX now with the new Reference Guide/Help System and hours of brand new tutorial videos – including one specifically for Digital Performer users!

Expand & Update Your MOTU Studio

On-demand plug-in processing

How do you conserve precious CPU cycles for the demands of your Digital Performer based studio, but also run all of today's latest plug-ins and virtual instruments? The Muse Research Receptor is a dedicated hardware-based plug-in player for your favorite VST software. With 16 channels to run virtual instruments or effects, a built-in MIDI interface and a versatile complement of digital and analog I/O, Receptor is the ideal way to run plug-ins while keeping your host computer running smoothly. Control everything from the front panel, or simply connect a monitor to the back. Visit museresearch.com to view demos by Dream Theater's Jordan Rudess and to learn about Receptor's new UniWire™ technology, which provides MIDI, audio, and remote control between Receptor and your computer via a single Ethernet cable. Receptor provides the ultimate in performance, stability, and sonic performance.

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 dEu 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 process and ease mixing and music production.

Large capsule mic

The new RØDE NT2-A can be plugged directly into your 828mkII, Traveler or UltraLite interface. This professional large capsule (1") studio microphone incorporates three-position pick-up patterns, pad, and high pass filter switches conveniently located on the mic body. At the heart of the NT2-A is the Australian designed and manufactured HF1 dual diaphragm capsule. The frequency and transient response of this new transducer has been voiced to complement today's modern recording techniques, and yet still evoke the silky smooth character of the legendary microphones of the 50's and 60's. These features provide the flexibility and superlative audio characteristics that make the NT2-A one of the most versatile condenser mics available. The NT2-A's variable controls allow switching between Omni, Figure 8, and Cardioid polar patterns. The three position high-pass filter provides a flat response or an 80Hz and 40Hz high pass filter. The microphones Pad can be switched between 0 dB, -5dB and -10dB. The NT2-A comes in a soft pouch with an M2 stand mount.

Electronic Musician 2006 EDITORS CHOICE

Power conditioning

A large-scale MOTU-based multitrack studio is not only a finely-tuned instrument, it's an investment. Protect that investment — and get the best possible performance from it — with the Monster Pro 2500 and Pro 3500 PowerCenters. Many so-called "power conditioners" only protect against random power surges and/or voltage spikes. But AC power line noise and noise from other components is an equally harmful and constant threat to your gear's performance. To prevent this, Monster's patented Clean Power™ filter circuitry (U.S. Pat. No. 6,473,510 B1) provides separate noise isolation filtered outlets for digital, analog and high-current audio components. The result is high quality sound that's free from hums, buzzes and other power line artifacts, revealing all of the rich harmonics and tone in your recordings. Get All the Performance You Paid For™. Get Monster Pro Power.

Automated mixing and control

Imagine the feeling of touch-sensitive, automated Penny & Giles faders under your hands, and the fine-tuned twist of a V-Pot™ between your fingers. You adjust plug-in settings, automate filter sweeps in real-time, and trim individual track levels. Your hands fly over responsive controls, perfecting your mix — free from the solitary confinement of your mouse. Mackie Control delivers all this in an expandable, compact, desktop-style design forged by the combined talents of Mackie manufacturing and the MOTU Digital Performer engineering team. Mackie Control Universal brings large-console, StudioA prowess to your Digital Performer desktop studio, with a wide range of customized control features that go well beyond mixing. It's like putting your hands on DP itself.

Accurate monitoring

The Mackie HR-Series Active Studio Monitors are considered some of the most loved and trusted nearfield studio monitors of all time, and with good reason. These award-winning bi-amplified monitors offer a performance that rivals monitors costing two or three times their price. Namely, a stereo field that's wide, deep and incredibly detailed. Low frequencies that are no more or less than what you've recorded. High and mid-range frequencies that are clean and articulated. Plus the sweetest of sweet spots. Whether it's the 6-inch HR-624, 8-inch HR-824 or dual 6-inch 626, there's an HR Series monitor that will tell you the truth, the whole truth, and nothing but the truth.

MOTU system expert advice

When it comes to putting together MOTU recording systems, nobody does it better than Sweetwater. Whether you're building a simple portable recording rig with an UltraLite and a new MacBook Pro or a 128-track powerhouse Digital Performer studio centered around the latest Quad Core G5, Sweetwater can help you select the perfect components for your MOTU system, from the specific MOTU audio interface model, to control surfaces and hard drives, to plug-ins and studio monitors. Even better, we can install, configure, test and ship a turnkey system straight to your door — all you'll need to do is plug in the system and start making music. Why shop anywhere else? Call the experts at Sweetwater today!

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The Title

By Larry the O

What's in a job title? To some, it means more pay, to others, more power, and yet others, more status. In the audio and music fields, having a title means getting credit for your work, which is especially important in a field that rarely gives you more than credit for (and, hopefully, satisfaction from) your work.

Having a clearly defined title is important and gratifying. However, receiving credit for your work invokes an inherent issue: what title are you credited with? Given that this issue arises for every person who has a credit, it is no surprise that great weight can be placed on the exact title as well as on its relative placement.

In corporate settings, many human-resources implications come with titles containing hierarchical terms like *supervisor* and *manager*. This also happens with creative productions, in which the hierarchical titles are for positions such as *producer* and *director*. These titles are often highly charged politically and carry heavy budgetary responsibilities.

Sometimes the choice of a title is determined by the need to accurately reflect a person's full contribution. In the music world, there can be a fuzzy line between engineering and producing, and two people working on the same project may differ on where that line lies. Similarly, bands deal with the ever-present argument over writing credits.

> To be a sound designer, one must be involved with designing the content.

On the other hand, a credit can imply that a person does more work than is truly the case. Sometimes this is a matter of definition, as with a few of the above examples. Other times, it can be a matter of loosely applied terminology. One of the most egregious examples is the title *sound designer*. That title was first given to Walter Murch for his high-profile work on the film *Apocalypse Now* (United Artists, 1979). But sound titles are not controlled in the way that titles like *director* are in the film world, and so usage can be rather loose. Nowadays, any Joe or Jill who has a DAW and a sound-effects library can stack a couple of effects on top of each other and claim the title of sound designer, and no one is in a position to approve or deny it.

The title of sound designer has been used in theatrical circles for quite a while, but that situation changed when theatrical productions started using huge, extremely intricate audio systems. Theatrical sound designers often shape every aesthetic aspect of a production's sound: the system design and programming, the stylistic approach, key effects (usually created by the sound designer), and so on. But what if a person just designs and programs the system? Should that individual be called a sound designer? Lately, the title has even spread into system design for events and fixed installations, which seems obviously inappropriate.

Titles don't always matter, in which case the question is academic, but for those to whom title definitions could make some difference, I offer my opinion on this last example, since that is what I do in "Final Mix." To me, to be a sound designer, one must be directly involved with designing the content—that is, creating the sound. A person who designs and programs systems only is performing the worthwhile, noble, and purely technical task of sound-system design. Certainly, creativity, cleverness, and resourcefulness all come into play, but the essence of the job is to devise the means by which the sound is reproduced, not created.

Having said all that, the role that a person plays in a production can be multifaceted, making it difficult to find a single appropriate credit. But it is possible to have some definition in titles. The question is whether it is, as my father would often say, "a distinction without a difference." If a definition exists but no one conforms to it, does the title mean jack?

So once again we find ourselves in the muddy waters for which our field is so famous. Receiving credit is important in our business, so clear and appropriate titles are worth fighting for. EM

Larry the O has held many titles in his long and eclectic career, including musician, sound designer, recording engineer, technical writer, and contributing editor. Had all of these titles been clearly defined, he might not have written this column.

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Just like the award-winning 828mkII and Traveler interfaces, the UltraLite delivers two mic/instrument inputs, plenty of balanced quarter-inch analog I/O, on-board mixing, front-panel LCD programming and clean, detailed sound.