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Photos: School of Music Production & Sound Design for Visual Media

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COVER FEATURE

18 **The 2014 Editors' Choice Awards** It's a tough job, but we love doing it. Each December, the *Electronic Musician* team takes on the enviable task of reviewing the year's most innovative product debuts and narrowing that list to 30 favorites. We've seen more amazing product debuts than we could ever fit here, so after much consideration—and some pretty heated debates—we present this year's winners.

FEATURES

34 **J. Cole** The Fayetteville, N.C.-bred MC/producer talks about the evolving hybrid production style that took him to Number One with *Born Sinner*.

42 **Anoushka Shankar** Pioneering sitarist Shankar talks about the unique challenges of recording her instrument while bridging the worlds of classical, pop, and electronic music on her seventh album, *Traces of You*.

50 **56th Annual Grammy Awards: The Nominees** Get acquainted with some of the artists and producers being honored at music's biggest night.

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NEW GEAR 12 Production tools to help you make better music

MOD SQUAD 16 **Pittsburgh Modular System 10** MIDI-controllable monosynth

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56 **Audio-Technica AT5040** Four-diaphragm condenser microphone

58 **iZotope RX3** Noise-reduction and audio-restoration suite

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02.2014 contents

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MASTER CLASS 62 **Scoring to Picture in Pro Tools** Are you ready to take the leap into composing for picture? In this step-by-step tutorial, we'll walk you through the entire process, from beginning a project in Pro Tools, to using MIDI to sketch out parts, to creating a score in Sibelius from the MIDI data.

TECHNIQUES 76 **Mixing** Specialized vocal processors

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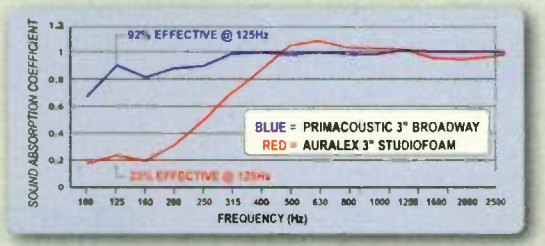

Tests performed by Riverbank Labs on 3" Primacoustic Broadway panels and common acoustic foam. Both absorb high frequencies, but as sound shifts to bass, the foam stops working.

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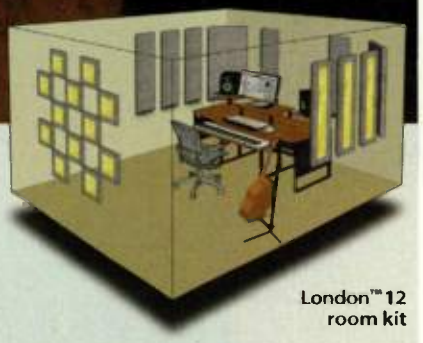

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insight

MAKING THE CUT

MUSIC MAKERS are a tough a bunch to please: They have an insatiable curiosity about sound and the tools that produce it, but they don't want to waste time and money on products that do not improve audio quality and workflow or inspire and enhance the act of music making. At the same time, the pro-audio industry, ostensibly out to address our needs, vies for our dollars by releasing new gear each year, but with mixed results when it comes to real innovation or bang for the buck.

The writers and editors at *Electronic Musician* sift through scores of new items annually to find the standouts among the me-too products and solutions in search of a problem. It is from these that we cull the Editors' Choice Award winners.

Let me be clear: The Editors' Choice Awards is not a beauty pageant or a way to scratch the backs of our advertisers. Rather, we take a hard look at the tools available to our readers and recognize only those that offer something truly useful or unique. If it is not something we would use in our own work, it doesn't make the cut.

It is in this spirit that I congratulate the men and women behind the winning products this year. Thank you for making our musical lives richer.

GINO ROBAIR
TECHNICAL EDITOR

COMMUNITY

"THE LABELS LOVED THE CONSOLIDATION OF RADIO BECAUSE RATHER THAN TRYING TO CONVINCE HUNDREDS OF STATIONS TO PLAY A SONG, YOU COULD GO TO ONE GUY AT CLEAR CHANNEL."

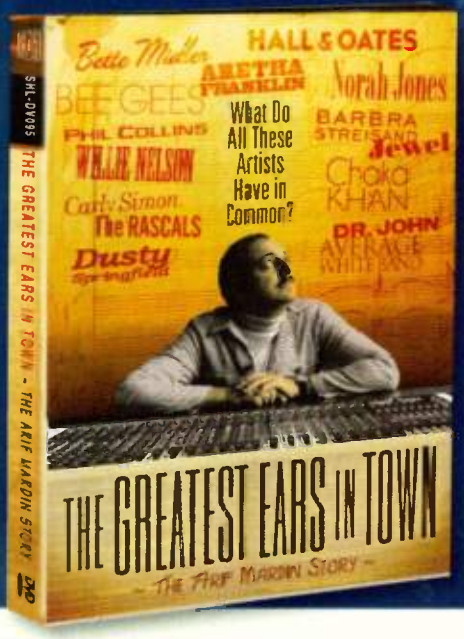
Veteran artist manager Michael Lustig on the decline of diversity in music in the '90s, on Vulture.com, November 21, 2013

The *Electronic Musician* Poll

World Radio History

Aretha Franklin. The Bee Gees. Whitney Houston. Willie Nelson. Norah Jones.

The Greatest Ears in Town: The Arif Mardin Story



The breadth and caliber of musical talent touched by the late, legendary producer Arif Mardin is awe-inspiring, as one learns in this celebration of the life and work of the man behind more than 50 Gold and Platinum Albums over his five-decade career.

Co-produced and co-directed by son Joe Mardin and Doug Biro, the film is full of rare studio footage and deeply personal conversations with artists and producers ranging from Chaka Khan to Phil Ramone to George Martin. Family archives and interviews complete an intimate portrait of the maestro musician and true gentlemen—uncommon qualitites during the cutthroat label wars that defined the industry's heyday.

Rather than rely on narration or complicated stucture to make its point, *The Greatest Ears in Town* weaves raw session clips with conversations to illustrate a simpe overarching theme: Mardin challenged artists, and brought out the best in them all. Perhaps Quincy Jones quoting French composer Nadia Boulanger, summed it up best: "Your music can never be more or less than you are as a human being." Mardin was the perfect example of that: He helped artists truly understand who they were, and find out what they wanted to be. This inspiring documentary is a must-see for any musician or aspiring producer.

ask!

I KNOW ABOUT PANNING TO PLACE SOUNDS IN A STEREO FIELD, BUT I'D LIKE MY MIXES TO HAVE MORE DEPTH AND A BIGGER SOUNDSTAGE. I KEEP READING THAT ANALOG CONSOLES CAN PROVIDE A MORE OPEN SOUNDSTAGE, AND WONDER IF MY PROBLEM IS FROM DOING IN-THE-BOX MIXES. WILL ADDING AN ANALOG CONSOLE REALLY MAKE THAT MUCH DIFFERENCE? IF SO, CAN YOU RECOMMEND A MODEL?

MATT SODERQUIST
PHILADELPHIA, PA
VIA EMAIL

Many techniques can help you create a bigger soundstage, whether you are working in the box or mixing on analog console. Begin by visualizing the space you want to create. If you want a "live" sound, then the drums will probably be further back, and you'll want to add some room ambience to them. If the drums were recorded without room mics, short delays or a reverb set to simulate a small space can help.

Trimming high frequencies ever so slightly will also place sounds more in the "back" of the mix. For example, if the mix includes background singers and a lead singer, make the lead singer a little brighter; in addition, using less reverb on a lead vocal brings it more "up front" in relation to other sounds. As another example, trimming a tiny bit of highs from rhythm-guitar parts and adding some subtle ambience will place them "behind" the lead guitar part. Centered, dry parts will be the closest to the listener.

Try a combination of panning, EQ, and ambience, and you should be able to create a more convincing soundstage no matter how you're mixing!

THE EDITORS

Applying this string of processors in Ableton Live 9 to a percussive shaker track places it more in the soundstage background.

>>> Got a question about recording, gigging, or technology? Ask us! Send it to ElectronicMusician@musicplayer.com.

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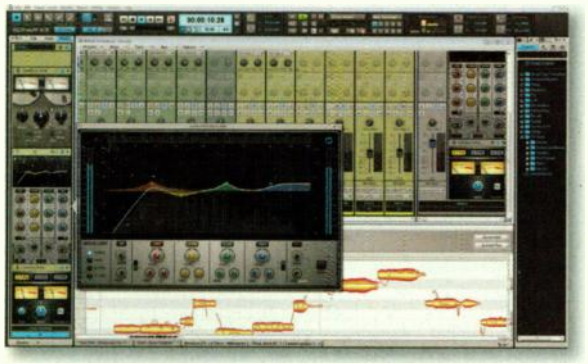
NEW GEAR



1

Cakewalk

Sonar X3 Producer

DAW (Windows)

$499 street

HIGHLIGHTS Professional-quality DAW with 64-bit audio engine and unlimited track and bus count • 23 virtual instruments • ProChannel Tape Emulator • pitch correction, spectrum analysis, and audio-to-MIDI conversion • includes plug-ins from Melodyne, XLN Audio, Nomad Factory, and AAS • Gobbler integration • YouTube export functionality

TARGET MARKET Composers, producers, and musicians who create music and sound for picture

ANALYSIS Cakewalk's top-of-the-line digital audio workstation offers an uncompromising set of features that can handle every type of production.

cakewalk.com

2

IK Multimedia

iLoud

Bluetooth-enabled stereo speaker system

$299.99

HIGHLIGHTS Biamped, 4-driver array • 40W RMS rating • 1/4" mono iRig input runs instrument- and mic-level signals to your connected iDevice for processing • stereo 1/8" line-level input • powered by a rechargeable battery or DC charger • built-in DSP

TARGET MARKET Singers and instrumentalists who want a portable audio playback system

ANALYSIS An extremely versatile design that not only offers wired or wireless playback, but serves as an interface between you and the apps on your mobile device.

ikmultimedia.com

3

Dave Smith Instruments

Mopho SE

Analog monosynth

$949 street

HIGHLIGHTS 44-note semi-weighted keyboard with velocity sensitivity and Aftertouch • two oscillators, each with a sub-oscillator • 2- and 4-pole lowpass filter (with resonance in 4-pole mode) • MIDI and USB I/O • expandable using DSI Poly Chain functionality • gated step sequencer • arpeggiator • internal feedback path

TARGET MARKET musicians looking for the Mopho sound but with an integrated keyboard

ANALYSIS For people who don't like using a generic MIDI keyboard to play a synth module, there's the Mopho SE.

davesmithinstruments.com

4

Peavey

PVM 44 and PVM 50

Dynamic microphones

$89.99 street each

HIGHLIGHTS The PVM 44's pattern has a cardioid; the PVM 50 is supercardioid • a Neodymium magnet in each capsule • transformer on the output • frequency response for each is 50Hz to 16kHz • includes mic clip and hard-shell case

TARGET MARKET Performing vocalists, studio and live-sound engineers

ANALYSIS Designed for use onstage and in the studio, these rugged mics are affordably priced and can handle a variety of recording and sound reinforcement duties.

peavey.com

All prices are MSRP except as noted

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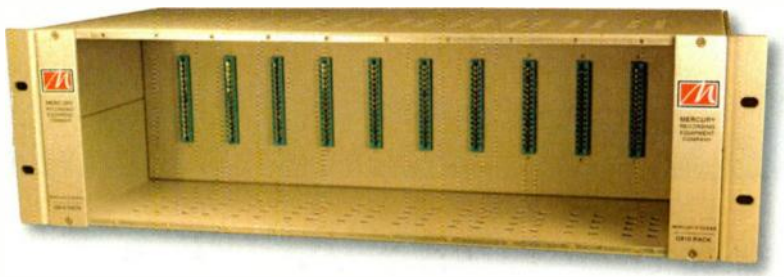

5

Arturia

MicroBrute

Analog monosynth

$299

HIGHLIGHTS Sub-oscillator • external audio input • step sequencer • envelope-controlled waveshaping • Brute Factor internal feedback path • Ultrasaw and Overtone controls • CV output • analog gate I/O • synchronizable LFO • MIDI and USB ports

TARGET MARKET Musicians who want an analog synth offering front-panel controls and real keys while retaining a small footprint

ANALYSIS An inexpensive monophonic instrument with flexible modulation routing and a Steiner-Parker multimode filter that provides vintage tone without sounding like an ARP, Moog, or Oberheim.

arturia.com

6

Mercury Recording Equipment Company

G810 Rack

Powered rack for 500 Series modules

$1,400

HIGHLIGHTS Powers 10 500 Series modules or 8 modules with the company's G8 module in slots 9 and 10 • Chain switch for adjacent modules • Link switch for modules that support linking • power-regulation circuit for each slot • steel and aluminum chassis • XLR I/O and DB25 connector • rackmountable • low-noise, external, linear power supply

TARGET MARKET Musicians with personal studios; professional engineers

ANALYSIS A rack that was designed to provide enough power to support any configuration of modules.

mercuryrecording equipment.com

7

Waves Audio

J37

Tape saturation plug-in

$249 Native; $375 SoundGrid

HIGHLIGHTS Developed in association with Abbey Road Studios, it models the characteristics of the historically important and sonically desirable Studer J37 analog 1", 4-track tape machine • includes models of three oxide tape formulas • delay effect with filter controls • parameters for Tape Speed, Bias, Wow, and Flutter

TARGET MARKET Engineers and musicians

ANALYSIS This is as close as you'll get to time travel when you want to add classic British tape timbres to your tracks.

waves.com

8

Native Instruments

Maschine Studio

Groove production studio

$999

HIGHLIGHTS Full-featured USB pad and DAW controller • Two high-res color displays • Edit module with jog wheel • Level section • monitors four input sources • Maschine 2.0 software includes new audio engine, updated mixer, 5 drum-synth plug-ins, and side-chaining abilities

TARGET MARKET Beat makers and DJs looking for a state-of-the-art production environment

ANALYSIS Combining a major software update with pro-level features in hardware makes this a powerful workstation for composing as well as performing.

native-instruments.com

Continued

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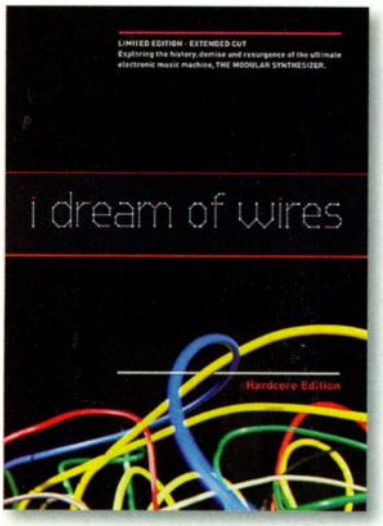
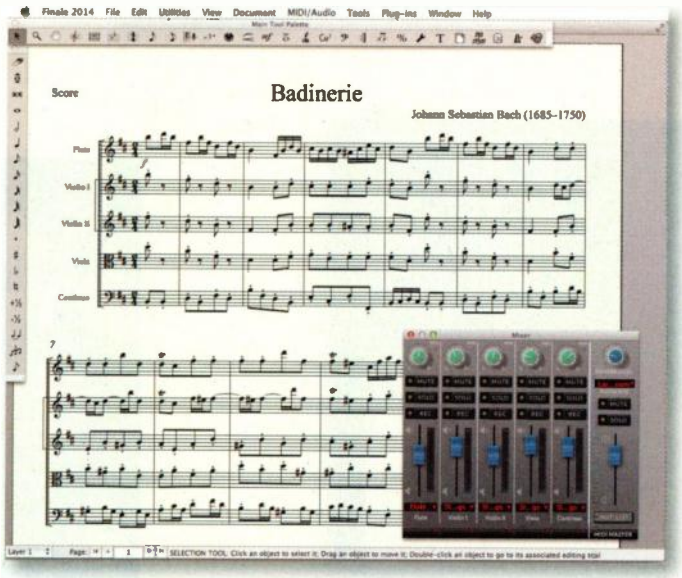
NEW GEAR





9

Scribble Media

I Dream of Wires: Hardcore Edition

Documentary DVD

$30 (DVD), $35 (Blu-ray)

HIGHLIGHTS The 4-hour cut of a documentary examining the remarkably crazy history of modular synthesis—from Moog and Buchla to its present-day renaissance • dozens of interviews with influential musicians and instrument designers, including plenty of footage from inside their personal studios

TARGET MARKET Fans and creators of electronic music

ANALYSIS Far more than just gear porn, this film provides an in-depth look at the historical context within which these wonderful instruments were designed and used. Essential.

idreamofwires.org

10

Moog Music

Minifooger

Line of analog effects pedals

$149–$209 each

HIGHLIGHTS Five pedals to choose from: drive, boost, tremolo, delay, and ring modulation •1/4" inputs and outputs • true bypass • 1/4" expression pedal/CV input • powered by 9V battery or AC adapter • cast aluminum enclosures • smaller than Moogerfooger • accepts line- and instrument-level signals

TARGET MARKET guitarists, bassists, keyboardists, and other instrumentalists

ANALYSIS An inexpensive way to add the Moog sound to your rig without taking up much space on your pedalboard.

moogmusic.com

11

Make Music

Finale 2014

Notation software

$600 ($350 academic/ house-of-worship price)

HIGHLIGHTS A new file format that ensures forward and backward compatibility • redesigned audio engine • new virtual instruments from Garritan • updated icons • snapable palettes and pinch zoom for Mac OS • percussion scoring and playback features

TARGET MARKET Composers, arrangers, and performers who want maximum flexibility when creating musical scores

ANALYSIS A full-featured notation program that continues to improve with the addition of features that make scoring quicker and easier than ever.

makemusic.com

12

Aphex

Microphone X

USB mic

$299 street

HIGHLIGHTS Cardioid condenser microphone • built-in analog effects include optical compressor and Aphex Aural Exciter and Big Bottom (with level controls) • input gain control • headphone output with level control

TARGET MARKET Podcasts, personal studios, and any application that benefits from direct-to-computer connectivity

ANALYSIS A channel strip is useful for processing vocals before the signal hits the A/D converter; the Microphone X has these features onboard.

aphex.com

All prices are MSRP except as noted

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PROFOUND SOUND

#1 MONITOR BRAND GLOBALLY

New! ROKIT Generation 3

For a quarter of a century KRK has been the professional's choice for mixing and mastering hit records around the globe. And KRK's ROKIT studio monitors have been the most popular choice for accurate monitoring, selling one million systems over the years. Now KRK introduces the new ROKIT Generation 3, continuing the legacy of performance ROKIT's have become known for. So whether you're just starting out in desktop recording, or you've already laid down a few thousand tracks, give a listen to the ROKIT Generation 3 line of monitors and experience a standard in performance and accuracy that raises the bar once again.

- Soft-dome tweeter provides clarity and extended response up to 35kHz
- Proprietary waveguide technology optimized for superior stereo imaging
- Lightweight, glass-aramid composite woofer delivers clear midrange and tight bass
- Bi-amped, class A/B amplifier offering maximum headroom with minimal distortion
- Low and high frequency adjustment gives you unprecedented voicing control for optimal room acoustics and mix translation

ROKIT POWERED

KRK SYSTEMS

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World Radio History

The System 10 is a complete analog synthesizer voice in a lightweight case. It integrates easily into your studio and live rig using MIDI or control voltages, and it's fun to use on its own.

Pittsburgh Modular System 10

Your gateway to the joys of analog synthesis

BY GINO ROBAIR

ASSEMBLING YOUR first modular can be a little confusing: Even if you're already familiar with subtractive synthesis, the variety of modules on the market is staggering, and it can be difficult to know where to start.

One of the easiest and most cost-effective ways to begin is with a preconfigured system, particularly one that is semi-modular. In a semi-modular synthesizer, the modules are internally connected, which allows to you make music without using patch cables, yet patch points are provided so you can override the normaled connections and make sounds of greater complexity. However, this kind of system is not just for newbies: A semi-modular synth is perfect for any musician interested in a portable and affordable instrument that can be set up quickly.

In addition to a full line of Eurorack modules, Pittsburgh Modular offers semi-modular synths in desktop-friendly sizes. This year, the company is refreshing its line with the System 10 ($599), a MIDI-controllable monosynth that retains the diminutive size (48HP) and price of its predecessor while adding significant new features. (HP, which stands for horizontal pitch, is the standard measurement used for panel width in a Eurorack system: 1 HP equals 5.08mm.) Built into a steel case with hardwood sides made of Pennsylvania cherry, the System 10 complements any stage or studio setup where space is a limiting factor.

The instrument begins with the Synthesizer Box, a new voice module that provides the basic tools needed for subtractive synthesis—a multi-waveform oscillator, LFO, filter, envelope generator (EG), and voltage controlled amplifier (VCA). Patch points let you access these features individually for cross modulation as well as external CV and audio input. Discrete outputs are available for the triangle and square waves, as well as the new sawtooth-like blade waveform, which can be modulated.

One of the significant changes to the synth-voice module is the addition of a Lopass Gate, a classic processor that combines the behavior of a lowpass filter and a VCA to alter frequency and amplitude at the same time. The circuit is based on a concept originally developed by Don Buchla for his 200 Series system to simulate the high-frequency rolloff of a sound heard at a distance through atmospheric humidity. As with Buchla's design, the Pittsburgh Modular Lopass Gate has three operational modes (lowpass filter, VCA, and a combo mode) and uses a series of vactrols in the circuit, the nonlinearities of which help create the characteristically woody, percussive timbres this type of filter is known for.

The System 10 also features the Mix Mult, a utility module that combines a 3-channel mixer with attenuators and a pair of passive mults for splitting signals that you want to send to several destinations.

The MIDI2 module accepts MIDI input and provides pairs of CV and gate outputs that can be configured in one of three ways: Monophonic mode, in which the same CV/gate signals come from both sets of outputs; Duophonic mode, in which a second MIDI note sends CV and gate signals through the second set of outputs; and Dual Monophonic mode, which provides independent CV and gate output derived from the data of two MIDI channels.

The final stage in the System 10 gives you two 1/4-inch outputs and a 1/4-inch stereo headphone jack—very handy. Five included patch cables will start you on your way to creating complex timbres.

Pittsburgh Modular instruments are well built and capable of rich, beefy sounds. The System 10 is a solid platform on which to build a larger voltage-controlled system and, if taken care of, it will provide years of fun and inspiration, easily outlasting the computers and soft synths you currently use. ■

World Radio History

CHANGE HOW YOU CONTROL

Whether you're a producer, performer or a DJ, Samson's all-new line of Graphite Mini USB MIDI Controllers gives you all the music production control you need for home studio and mobile applications in four ultra-portable designs.

With options for every level of performance and production, these controllers are constructed to withstand the demands of the "mobile musician" and feature a variety of presets and programmable features that allow for dynamic, easy-to-use integration into your music software.

Graphite MINI USB MIDI CONTROLLERS

SAMSON

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The 2014 *Electronic Musician* EDITORS' CHOICE AWARDS

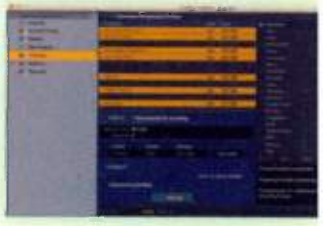
Another year, another 30 crazy-innovative products

BY MICHAEL COOPER, MARTY CUTLER, SARAH JONES, STEVE LACERRA, GINO ROBAIR, MARKKUS ROVITO, AND GEARY YELTON

IT'S A tough job, but it's one that we love. Each December, *Electronic Musician* staff and contributors take on the enviable task of reviewing the year's most innovative product debuts, and narrowing the hot list to 30 favorites for our Editors' Choice Awards.

Rather than wedging products into rigid, predefined award categories, we prefer to pick the winners first, then give each product a unique award that truly celebrates the things that make it special. We think doing it this way makes the awards more meaningful, and a lot more fun.

Picking 30 winners is never easy. Here at the magazine, we get to try out hundreds of new production tools throughout the year, and we've seen more amazing product debuts during this year's eligibility period (post-AES 2012 through AES 2013) than we could ever fit here. Innovation is everywhere, from the simplest of accessories to the most elaborate workstations. So after much consideration—and quite a few heated debates—we present this year's winners. Congratulations to all!



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RAPID TRANSIT

A Tasty Pixel Audiobus

DISCOVER THE MISSING LINK IN THE EVOLUTION OF iOS MUSIC

With the growing multitude of cool iPad music apps, very few can claim to be must-have products. However, we dub A Tasty Pixel Audiobus to be just that, because it strengthens the utility of every one of the several hundred compatible apps. Audiobus routes synths/samplers/microphones/etc. through effects and processors and into DAWs/loopers/DJ mixers/visualizers/etc. For making an iOS device a true music production/performance machine, Audiobus is the most important piece of the puzzle.

RIGHT ON THE BUTTON

Ableton Push

WHEN YOU WANT A CONTROLLER DONE RIGHT, DO IT YOURSELF

There are generic button-grid controllers, and then there is Ableton Push, the actual physical extension of Ableton Live software. Push rules over the entire Live domain, allowing you to play, perform, record, and mix, as well as access the Library and most settings, all on the Push's buttons, encoders, and display. With an innovative melodic step sequencer, automation, intelligent new uses for the touch strip, and much more, Push pushes keys aside and creates an almost entirely new writing/performing environment for Live—away from the computer screen.

THE DREAM WEAVER

Air Music Technologies Loom

ADDITIVE SYNTHESIS MEETS LEGO

Loom's hybrid of additive synthesis and modular design encourages experimentation and the creation of vivid, animated synthesizer tones. You can quickly generate the harmonic and overtone content, and shape sounds from there with a choice of up to four envelope generators, three LFOs, and freely scatter the signal path with slots for as many as ten modules, each of which offers a multitude of options ranging from additional oscillators to all sorts of time and frequency warpage to filters and rhythmic components, all governed by a rich modulation matrix. Loom is a sound designer's dream come true.

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UNDENIABLE LOGIC

Apple Logic Pro X

THE MOST DAW YOU CAN GET FOR THE LEAST AMOUNT OF MONEY

While Apple's long-awaited Logic update added a ton of great features, the redesigned interface made it easier than ever to use—without sacrificing functionality. For example, the Drummer track provides a musical way to create organic drum parts while drawing from the world-class sample library included with the program. Other notable additions are the new MIDI effects and virtual instruments, the track stack feature, and the ability to control the whole kit and caboodle from your iPad. But the thing that sealed the award was the price: At $199, Logic Pro X makes perfect sense for every studio.

THE FAB FOUR

Audio-Technica AT5040 Microphone

A-T SHOWS WHY IT'S HIP TO BE SQUARE

Audio-Tehnica's AT5040 is definitely not another "me too" microphone. Boasting a revolutionary capsule that employs four rectangular diaphragms behaving as a single transducer, the AT5040 has a noise floor that's in the sub-basement. Though it excels as a vocal microphone, the AT5040's smooth frequency response and wide dynamic range (137dB!) make it a natural for acoustic instruments as well. If your studio is quiet enough, you'll wonder, *is this thing on*?

REPEAT AFTER ME: WINNER

Boss RC-505

SPANNING THE GAP BETWEEN MUSICAL INSTRUMENT AND AUDIO PROCESSOR

Roland has been making digital loopers longer than just about anyone, steadily improving them with each generation. The latest Loopstation is the RC-505, a one-of-a-kind looper designed for hands-on control. Singers, recording engineers, or anyone who plays an instrument can endlessly overdub on five separate tracks and control them in real time. With three hours of onboard memory, you can take your sweet time recording all the parts in your next looping masterpiece.

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THIS ONE GOES TO 12

Dave Smith Instruments Prophet 12

GREAT SOUNDS AND MAXIMUM PROGRAMMABILITY MAKE THIS A WINNER

The Prophet 12 is definitely a player's instrument. With 61 velocity-sensitive keys and channel Aftertouch, it provides 12-voice polyphony built around digital oscillators running through analog effects, filters, and VCAs. Sound shaping is a snap, thanks to the dedicated front-panel controls. The intuitive interface helps you take full advantage of the wealth of modulation options. On top of that, you can internally route the VCA outputs back into the synth for tuned feedback, and add some attitude to the patches using the Character effects. The result is a keyboard that defines the term "polysynth" for the 21st century.

ROLLING THUNDER

East West *StormDrum 3*

A CINEMATIC PERCUSSION LIBRARY THAT DEFIES THE GODZILLA PARADIGM

StormDrum 3 favors organic-sounding, ethnic percussion over processed, larger-than-life drums. An 89GB library holds loops that extend beyond the typical 4-bar patterns, many percussion pieces have generous velocity layers, plenty of special performance techniques, and round-robin articulations—and frequently let you mix up to five additional mic positions. Most of the organic vibe comes from the grooving loops, which are soaked in the real dynamics of musical interaction rarely found in quantized performances. Many of the instruments and loops come from percussionist Mickey Hart's extensive and exotic percussion collection. EastWest has sent this collection spinning out of the park.

World Radio History

EASY RIDER

Electro-Voice ZLX Powered Speaker

A SPEAKER FOR LIVE SOUND THAT YOU CAN LIFT WITHOUT A CRANE

Electro-Voice has packed a lot of technology into the ZLX Series of powered sound-reinforcement speakers, including features like Class-D amplification, dual inputs, onboard crossover for easy integration with a subwoofer, and an XLR output for system expansion. The fact that they can do it in a box that really can be moved by one person is fantastic. My chiropractor is not happy.

ONE-KNOB WONDER

Eventide H9

ONCE YOU TRY IT, WE PROMISE YOU'LL WANT ONE

Everyone who's used them knows that Eventide's stompboxes are best in class. Based on rackmount Harmonizers and built like bricks, these pedals deliver unique effects, and they sound amazing. Now Eventide has stepped up the game with the H9, a stompbox that can do everything the award-winning PitchFactor, TimeFactor, ModFactor, and Space can. Paired with an app that supplies loads of onscreen knobs and switches, the H9 offers the best integration of stompbox and iOS that we've seen.

Without the right mic

nothing else matters.

Magneto in limited edition colour now shipping – buy yours now!

With MAGNETO you can rest assured that every nuance of your passion will be captured perfectly whatever it is you want to say. And at less than £99 / €99 / $119 you have no excuse not to say it.

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FINGERPRINT AUDIO

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CONTROL (VOLTAGE) FREAK

Expert Sleepers ES-3 Mk3

HIGH-RESOLUTION CVs WITHOUT SACRIFICING AUDIO OUTPUTS

Although the ability to send control voltages from a DAW to a modular synth is not new, there are often issues to deal with—loss of audio outputs, special cable requirements, and non-standardized output levels, among them. Expert Sleepers has addressed these issues by introducing Eurorack modules that simplify the task of interfacing the digital and analog worlds, providing consistent, high-resolution signals that your audio interface cannot produce. The ES-3 Mk3 frees up your interface's audio outs by using its ADAT Lightpipe port to send eight channels of CV (or audio) to your synth. And it's easily expandable for additional outputs, as well as inputs. Whether you use Max/MSP, NI Reaktor, or the company's own Silent Way plug-in, the ES-3 Mk3 is an essential tool for any serious modular-synth user.

TRACKS LIKE A BLOODHOUND

Fishman TriplePlay

FINALLY, YOU CAN PLAY YOUR SOFTWARE INSTRUMENTS LIKE A GUITAR

Far from MIDI guitar's awkward debut, Fishman's TriplePlay deftly integrates with virtual and hardware instruments alike. The package—a divided pickup and control unit/transmitter, mounting hardware, and a thumb drive-size USB receiver—includes TriplePlay's app, which hosts a custom library, courtesy of IK Multimedia and Native Instruments, and sweetens the pot with Presonus Studio One Artist for recording, and Notion for tablature and notation. The guitarist's bottom line is responsiveness and accuracy: a tall order for a wireless system playing virtual instruments, but TriplePlay tackles the challenge with ease for a tactile experience that truly feels like playing a guitar with benefits.

UN-BEAT-ABLE

FXpansion BFD 3

LIVE DRUMS IN YOUR COMPUTER!

There are tons of great drum sounds out there; the things that bring BFD back to the top are attention to detail, encompassing sound design, expressive power, and a customizable feature set. The generous supply of swappable kits and pieces—some recorded with brushes and mallets—maintain the sweet ambience of their recorded environment, thanks to several prominent engineers. Along with a revamped, drum-machine-style Groove Editor, Version 3 adds a boatload of new effects: reverbs, delays, modulation, bit-reduction, and dynamics processors including FXpansion's DCAMS Envelope Shaper. The resulting sounds jump out of the speakers with a lifelike dynamism other drum libraries just can't beat.

World Radio History

EPOCH WIN

Heavyocity *Aeon* Collection

CINEMATIC SOUND DESIGN WITH DRAMATIC RANGE

Dynamic range is as important in film as it is in music. Heavyocity *Aeon*'s expressive sound library breaks down to a rhythmic and a melodic library, with plenty of overlap, as both have useful and complementary rhythmic engines. Instead of industrial, clangorous tones, the collection leans heavily on organic-sounding samples, ranging from guitars, dobro, and banjo, to odd, convolved combinations of synthesizer tones; cello and bass drum; upright bass, oil can, and guitar—with inspiringly musical results. Add a killer arpeggiator, triggered effects, and the ability to alter loops on the fly, and you have a sound library for the ages.

THE MISSING LINK

iConnectivity iConnectMIDI2+

USE iOS APPS AS IF THEY WERE REAL INSTRUMENTS

If you've ever tried to integrate iPads or iPhones with computer-based DAWs, you've probably found that most solutions are too chunky, too clunky, or too expensive—until now. iConnectMIDI2+ is a solid metal box that fits in your hand and works as a conduit for sending stereo audio and multichannel MIDI in both directions between your iOS device and your computer. It's a MIDI interface for almost anything connected to it, too. For anyone making music with iOS, the iConnectMIDI2+ is a real problem solver.

DEEP CLEANING FOR NOISY TRACKS

iZotope RX3 Advanced

EVEN BAD ROOM TONE HAS NO PLACE TO HIDE ANYMORE

RX2 Advanced gave sullied recordings a complete overhaul in personal hygiene, skillfully washing away hiss, hum, clicks, pops, crackle, and even unwanted overdubs by the neighbor's barking schnauzer. RX3 Advanced ups sonic sanitation with a new Dereverb module that sponges up ugly room tone, a timesaving Dialogue Denoiser, and more. And now that the Insight metering suite has also been added to its powerwashing facilities, it's no contest: RX3 Advanced is the most comprehensive software bundle for scrubbing and wiping your way to pristine sound.

World Radio History

EVERYTHING'S UNDER CONTROL

Keith McMillen Instruments QuNexus

FOR ONE SO SMALL AND SENSITIVE, THIS PUPPY KNOWS HOW TO TAKE COMMAND

QuNexus offers the seldom-heard-of combination of portability, compatibility, sensitivity, and near-indestructibility. Want to use it with an iPad? Check. Your CV and MIDI gear including CV/MIDI conversion? Check. String them all together with a laptop? You guessed it. Playing the QuNexus adds another layer of wonder as you explore the Tilt sensitivity, a new expression innovation of the controller's button keys, in addition to standard velocity and pressure sensitivity. This much power never fit in your pocket before.

TWEAKER'S TRINITY

Korg Volca

ANALOG SOUNDS THAT GO ANYWHERE

Korg continues to strike gold as it mines the creative potential of analog synthesis. The Volca line provides three instruments that, together, cover every aspect of modern music production—drums, bass, and melody/chords. Volca Keys, Volca Beats, and Volca Bass each include a sequencer, a ribbon controller, MIDI and Sync I/O, built-in speakers, and the ability to power from batteries or AC. The synths easily connect together or interface with other instruments. And with their low price and small footprint, they allow you to add analog timbres to your rig no matter if you're onstage or in the studio. With such big sounds coming from small instruments, we couldn't help but give the entire line the award.

THE WHOLE NINE YARDS

Native Instruments Komplete 9 Ultimate

BIGGER IS UNQUESTIONABLY BETTER HERE

Komplete Ultimate stuffs 370GB of virtual instruments, plug-ins, and sound libraries into a compact USB hard drive. The package orbits around the company's flagship product line: Absynth 5, Battery 4, FM8, Guitar Rig 5, Kontakt 5, Massive, Reaktor 5, and a tasty handful of audio-processing effects modeled after vintage analog gear. A huge number of libraries support Kontakt well beyond the factory issue. Reaktor hosts an astounding studio full of unique instruments, including the amazing Prism, Razor, and Monark, a powerful analog-modeling monosynth. When it comes to bang for the buck, Komplete 9 is an indisputable champ.

World Radio History

SONY
make.believe

digital wireless for all

Epic digital wireless technology, now amazingly affordable.

Introducing the DWZ Series with affordable 2.4 GHz technology. You get solid-gold 24-bit linear PCM digital audio to keep you sounding your best. You get robust transmission and easy channel selection. Even automatic feedback reduction, encryption and battery charging are available. And Sony has pre-assembled DWZ packages for guitar, vocals, presentation and speech. Sony's DWZ Series. Sound like a million bucks without spending it.

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DOES THIS SYNTH MAKE MY BASS LOOK FAT?

Novation Bass Station II

YOU CAN HEAR AND FEEL THE THICKNESS

A complete reworking of the early-'90s classic, the Novation Bass Station II checks off the wishlist of modern all-analog monosynths: USB and MIDI ports, audio input, patch memories, monster filters, generous programmability, arpeggiator, and plenty more. But of course, sound is still king. With two oscillators as well as a sub-oscillator, this beast blasts and belches out the kind of wobbly and dirty bass that shakes you to the foundation, as well as spiky and shrill lead tones far beyond the bass realm.

DEALING WITH A FULL DECK

Pioneer DDJ-SX with Serato DJ

BREAKTHROUGH PERFORMANCE SOFTWARE COMES OUT TO PLAY

It's hard to fathom a better controller to debut the Serato DJ software. The durably built Pioneer DDJ-SX packs in a near 1-to-1 ratio of software-to-hardware controls, including a full 4-deck mixer and amazing drum pad banks that unlocked exclusive features to the new creative performance-oriented Serato DJ. With a professional soundcard built-in, the DDJ-SX can input turntables and CD players, and it gives full control over Serato DJ's beefed up sampler and iZotope-powered effects.

NOW YOU HEAR IT, NOW YOU DON'T

Shure SE846 Sound Isolating Earphones

CUSTOMIZABLE FREQUENCY RESPONSE FOR STELLAR SOUND IN YOUR EARS

Shure SE846 ear monitors shut out what you don't want to hear by blocking up to 37dB of ambient sound. Of course they let in what you do want to hear, with a response that extends from 15Hz to 20kHz. The SE846 ships with three sets of interchangeable inserts, allowing a user to customize the frequency response curve between flat, or +/-2.5dB from 1kHz to 8kHz.

World Radio History

NAILING THE AUDITION

Sonnox Codec Toolbox

THIS TOOLBOX DEFINITELY MAKES CONSTRUCTING YOUR MIX EASIER!

The Sonnox Codec Toolbox features two applications. The Toolbox Plug-in allows you to audition the effects of encoding your mix to mp3, AAC, iTunes, and other web formats *in real time*. The Toolbox Manager facilitates batch encoding of files, and easy addition of metadata such as artist or track name, while also providing a Clip-Safe feature that automatically compensates for any clipped samples during the encoding process.

UNPLUG AND PLAY

Sony DWZ Wireless

ANYONE CAN CUT THE CORD WITH THESE AFFORDABLE SYSTEMS

Sony wireless systems have traditionally toured only with the rich and famous, but the DWZ system brings Sony digital wireless to a price point that musicians can afford. Operating in the 2.4GHz band, the DWZ Series includes an assortment of guitar, instrument, and handheld microphone components. RF scanning and auto-channel selection make the DWZ system easy to use, while smart features such as compatibility with 9-volt guitar pedal board power and a Cable Tone control will endear it to working musicians.

THE RINGLEADER

Source Audio Hot Hand USB

GREATER CONTROL THROUGH WIRELESS LIVING

Modulation and pitch-bend wheels are useful in performance, but remain limited when it comes to parameter manipulation. Yet electronic instruments require a high degree of control in order to attain the level of expressivity that music demands. That's where the Hot Hand USB comes in. This lightweight ring contains an accelerometer that tracks three-dimensional movement and sends it in real time to a USB receiver. The included software editor lets you assign the gestural information from the x, y, and z axes to any set of MIDI controllers. The result is greater expressivity, no matter where you map the output. Now you really *can* put your hands in the air like you just don't care.

World Radio History

TOO COOL FOR SCHOOL

Syntorial

TRAIN YOUR EARS TO PROGRAM SYNTHESIZERS

Syntorial is the most direct route between hearing a sound in your head and knowing how to bring it to life. Lesson-by-lesson, module-by-module, Syntorial shows you almost everything that synths can do without getting bogged down in theory. Learn to aurally recognize VCO waveforms, filter bandwidths, LFO rates, ADSR parameters, effects types, and more. Get the edge on sound design by educating yourself with this new approach to tutorial software.

THE NEXT WAVE

Waldorf Nave

THE BEST EXCUSE YET FOR OWNING AN IPAD

From the company that invented wavetable synthesis, Waldorf Nave puts a uniquely powerful synthesizer in your iPad for less than a Jackson. Use Nave to create your own wavetables by synthesizing speech or resynthesizing anything you can record. Turn text into wavetables, view sound in three colorful dimensions, and control playback with MIDI and an assortment of modulation sources. Record music within Nave and use Audiobus to route its output to other apps. All this on your iPad? Outstanding!

PowerTools for Studio

Gold Digger™ mic selector

Instantly select and compare your four favorite microphones to find the one that best suits a particular vocal or instrument track. The Gold Digger features built-in 48V phantom power generator, trim controls for a fair comparison and solid wire connection to ensure the pure mic signal arrives without coloration.

QR VIDEO LINK

Cherry Picker™ preamp selector

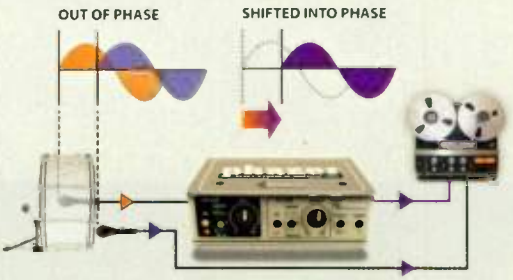
Plug in your favorite mic and instantly compare between four mic preamps to find the one that best suits the instrument or vocal track. The Cherry Picker features 100% pure copper signal path with gold contact relays for absolute signal integrity. You'll love the way it improves your workflow and efficiency!

QR VIDEO LINK

Phazer® phase alignment tool

Add realism and depth to every instrument! The Phazer is an analog tool that let's you adjust the phase relationship between two sources such as two mics in a room so that the fundamentals arrive at the same time. Think inside and outside the kick drum, top and bottom of a snare, or near and far with an acoustic guitar.

QR VIDEO LINK



World Radio History

TRUTH IN MIXING
Yamaha HS5

IF YOU CAN'T HEAR EVERY DETAIL USING THESE MONITORS, YOU'RE DEAF!

Most inexpensive near-fields sound, well, like dime-store boxes when placed where they belong: on shelves above a mixer or DAW controller. Park them there, and their response in the upper-bass and low-midrange bands becomes cloudier than a Pacific Northwest winter. But with the HS5, the outlook is always clear. You can stick this pint-sized performer just about anywhere and it'll dish out an open and focused sound, letting you hear every detail of your mix with pinpoint precision. And the best part? The HS5 costs less than most any other pro monitor. We call that a win-win.

SHOW OFF YOUR SIX PACK
Zoom H6 Handy Recorder

EXTRA TRACKS ON THE GO

The Zoom H6 picks up where most handheld 4-track recorders leave off. Loaded with six inputs direct-patched to six audio tracks, the H6 records MP3 or WAV files up to 24-bit/96kHz onto SD, SDHC, and SDXC cards up to 128GB. The H6 ships with two detachable stereo microphone "heads" (X/Y and Mid-Side) plus four side-mounted, balanced Combo inputs. Imagine our delight when we found hardware buttons for arming each track, no menu required.

Professionals...

EXTC™ guitar effects interface

Add excitement and uniqueness to every track by incorporating funky sounding guitar pedals to your signal chain. Imagine... adding a wah to a kick drum, distortion to a vocal or a jet flanger to the keyboards. The EXTC makes it easy by unbalancing the signal, adjusting the impedance and then re-balancing it for you.

QR VIDEO LINK

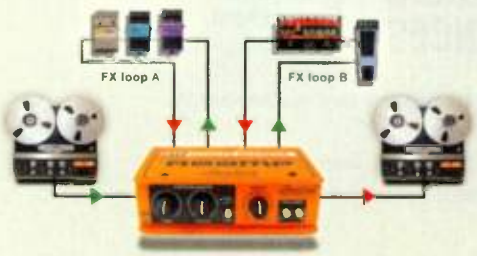
MC3™ monitor controller

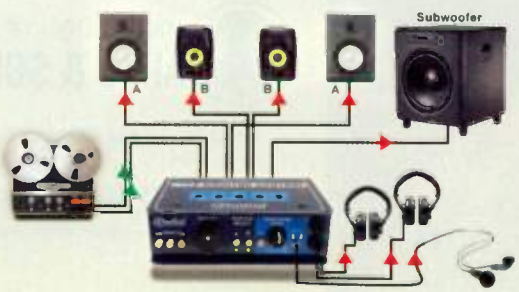
Select between two sets of monitors without adding any form of buffering electronics in between your recording system and monitors. The MC3 features a pure copper connection to eliminate distortion. Turn on or off a sub and adjust the level, collapse the mix to mono and monitor your mix using headphones or ear buds.

QR VIDEO LINK

Radial's new 'Studio Essentials'

. . . are made for making great music. Five unique PowerTools that help you streamline your music production, improve productivity and enhance recording quality. Each tool is carefully designed to optimize the signal path for minimal coloration where it matters and maximize your tonal universe when following that creative spark.





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* Specifications and apperance subject to change without notice.

World Radio History

More Online
Read reviews of many products profiled here, including:

Apple Logic Pro X
Audio-Technica AT5040
Boss RC-505
Dave Smith Instruments Prophet 12
Electro-Voice ZLX
Heavyocity Aeon
iConnectivity iConnectMIDI2+
iZotope RX3 Advanced
KMI QuNexus
Novation Bass Station
Sonnox Codec Toolbox
Source Audio Hot Hand USB
Sony DWZ Wireless
Yamaha HS5
Waldorf Nave

Emusician.com/February2014

PITCHER PERFECT

Zynaptiq PitchMap 1.5

THANK YOU AUDIO FILES, YOUR SUGGESTIONS ARE NOTED

Zynaptiq has cracked the code of the inscrutable stereo master file. PitchMap 1.5 fans out the individual parts of a mixed audio signal across the screen and lets you play new melodies and harmonies from a MIDI keyboard in real time. PitchMap can also silence individual sound parts in a mix and do the whole auto-pitch-correct thing. However, it was the deconstruction of stereo audio into individual, playable parts that we had to see and hear to believe. So we did; now we're believers. ■

FOLLOW
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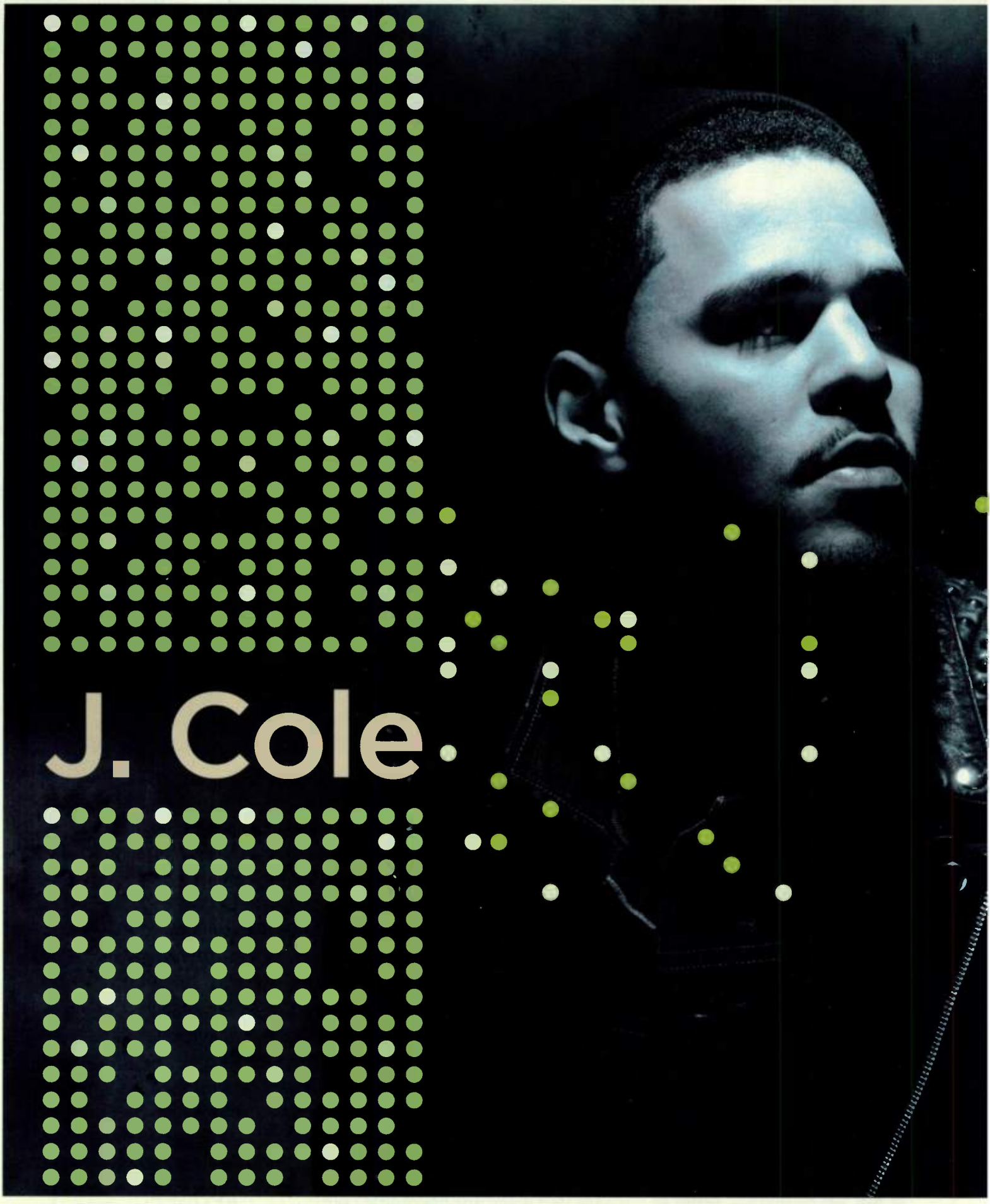

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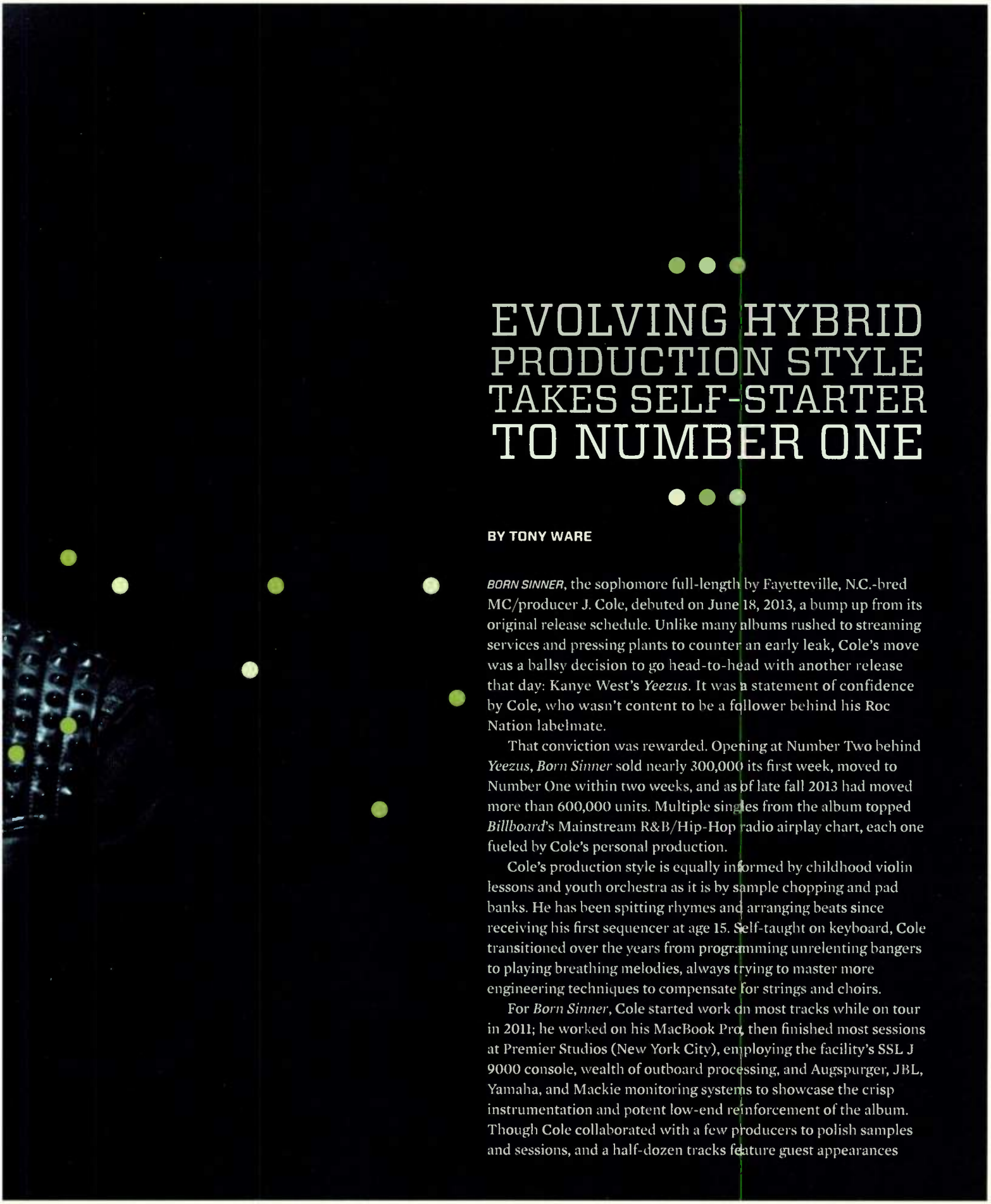

EVOLVING HYBRID PRODUCTION STYLE TAKES SELF-STARTER TO NUMBER ONE

BY TONY WARE

BORN SINNER, the sophomore full-length by Fayetteville, N.C.-bred MC/producer J. Cole, debuted on June 18, 2013, a bump up from its original release schedule. Unlike many albums rushed to streaming services and pressing plants to counter an early leak, Cole's move was a ballsy decision to go head-to-head with another release that day: Kanye West's *Yeezus*. It was a statement of confidence by Cole, who wasn't content to be a follower behind his Roc Nation labelmate.

That conviction was rewarded. Opening at Number Two behind *Yeezus*, *Born Sinner* sold nearly 300,000 its first week, moved to Number One within two weeks, and as of late fall 2013 had moved more than 600,000 units. Multiple singles from the album topped *Billboard*'s Mainstream R&B/Hip-Hop radio airplay chart, each one fueled by Cole's personal production.

Cole's production style is equally informed by childhood violin lessons and youth orchestra as it is by sample chopping and pad banks. He has been spitting rhymes and arranging beats since receiving his first sequencer at age 15. Self-taught on keyboard, Cole transitioned over the years from programming unrelenting bangers to playing breathing melodies, always trying to master more engineering techniques to compensate for strings and choirs.

For *Born Sinner*, Cole started work on most tracks while on tour in 2011; he worked on his MacBook Pro, then finished most sessions at Premier Studios (New York City), employing the facility's SSL J 9000 console, wealth of outboard processing, and Augspurger, JBL, Yamaha, and Mackie monitoring systems to showcase the crisp instrumentation and potent low-end reinforcement of the album. Though Cole collaborated with a few producers to polish samples and sessions, and a half-dozen tracks feature guest appearances

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plug-in that can mimic that analog boost, add some width. Just sampling a kick into that ASR would give it a different sound than loading it in Logic.

Walk me through a song, explaining how you stacked the beat.

Cole: The song "Power Trip" [featuring Miguel], I started that beat real simply. That 808 you hear, it's coming out of Logic with filters and into distortion I added to destroy the sound a little, because that's what those analog samplers were doing. That's the vibe I try to mimic, adding distortion or compression to an 808 or kick to give it some body and presence. A lot of it was on the digital side, but then me and my engineer Mez ran that sound through the SSL board and tweaked it because of how you can push the low-end extension on that board without peaking.

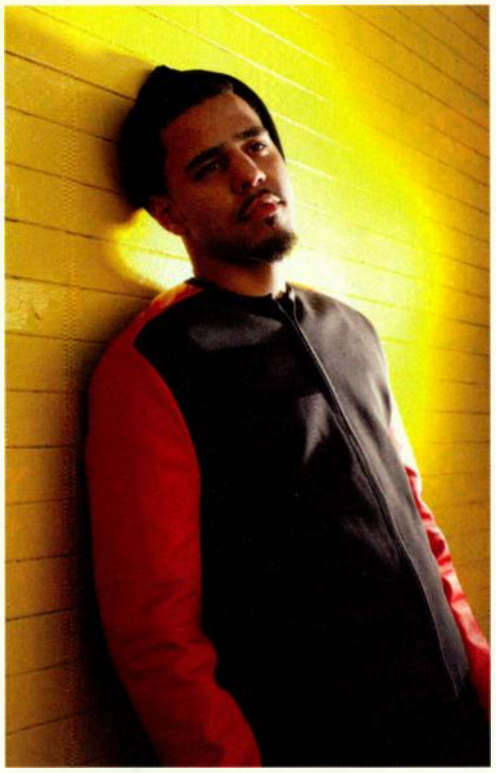
Mez: For most of the reverbs and delays we keep it in the box, using stuff like the Lexicon plug-ins and maybe [Audio Ease] Altiverb. Then we'd go out to the board where I'd make a lot of tweaks with the [Empirical Labs] Distressors and [Teletronix] LA-2A [Leveling Amplifier]. Sometimes I'll over-compress stuff, or a lot of times I'll take a dry sound and a distorted sound, compress the shit out of the one, and blend the two together. Then we printed it all back in through the SSL board to get a real analog sound, that drive that goes far without sounding cut off—one where we're still able to do even more tweaks.

Cole: Then on the hook we wanted to make it sound like I was literally listening to a love song on the radio, so we threw effects on there.

Mez: On Miguel's vocals we used a Distressor, a Pultec EQH-2 [passive tube EQ] and a Neve 1073 [mic preamp & EQ], crunching them pretty hard to make it sound a little more tube, a little older than it was. We went extreme with it at first, but then it seemed too much, so there ended up just being a slight frequency cut at the top and bottom to get that FM squash. We distorted things a bit, and then added a reverb that's also on the drums; that was actually done in L.A. at Record Plant and was a vintage EMT 140 plate [reverb].

Cole: Kick, snare, hi-hat, 808, bass line, sample, keys, strings, etc.—I dug deeper into Logic for getting the levels of effects on the parts right, then I bounced it all out and sent it to Pro Tools for Mez to mix.

All the drums were right, balances were already good, so it was a little EQ, automation, and reverb at first, not so much a worry about levels or underprocessing and overprocessing. I did most of the heavy shifting left and right, working on making the album real wide.



"I REALLY FOUND A GROOVE AS A PRODUCER AROUND THE TIME I DID 'LIGHTS PLEASE.' I DIDN'T HAVE TO TRY AS HARD; I TRUSTED MY INSTINCTS, AND I DIDN'T HAVE TO ADD 100 DRUM SOUNDS OR SAMPLES ON TOP OF EACH OTHER."

—J. COLE

Once you've established the beat and effects and it's time to add vocals, do you look for a mic that's neutral so you can work with it in the box or do you pick one that will add color to the track up front?

Cole: I prefer for the mic, or at least the compressor, to give me more presence. It didn't used to be that way—it was more under the beat, but now I need more width. I don't need to dominate the beat, but I need a healthy presence over it.

Have you found a preferred signal chain?

Cole: I kind of freestyle every time. The Avalon [VT-737sp tube microphone/instrument preamplifier] is great, but sometimes I don't have that and just have the Duet so that will do. And for the mic, the [Neumann] U87 is usually what we use. There's also a Sony mic, the C800G, that's great.

Mez: An Avalon and U87 is a classic combination. It's hard to mess up. But we also used the Sony C800G through the Neve 1073 and Tube-Tech CL1B [tube-based vocal compressor], and sometimes the Avalon or the [Universal Audio] 1176LN [Classic Limiting Amplifier] to stop his voice from sitting under the beat. I think the C800G is a little more present because it has a great top end, which makes you stick out more. And something like the Avalon is more midrange, so it's giving depth, girth. The Avalon I usually set at attack-fast release, and then I'll ease off the attack till no matter how he's rapping, a little bit of the initial transient is coming through. Then from there I'll set the release depending on what the style of vocal is, making it slower or faster till it sits well with the track.

So once you have all the parts together, where do you have to work the hardest to make it all sit comfortably?

Cole: It's definitely the balance between the low end. "Power Trip" is a perfect example again. There's an 808 there that needs to live, needs to be heard. But there's a bass line going at the same time that's just as important. They're in each other's way but both need to be there, so it's about carving the space, finding the right ratio of taking from the 808 without taking too much of its life, and the same with the bass line. That's where we had to spend the most time. And also the vocal mix is something I'm trying to master.

Have you found any personal tricks that allow you to tweak the parts without compromising the idea?

Cole: When we're mixing, Mez would split one sound into two or three set parts. A perfect example is that percussion part in "Power Trip," where there's a channel with only the

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high end, a channel with mids and one that's only the sub, and we adjust from there.

Mez: On that track there's a kick, an 808, and a bass line, which is real hard to put together. The kick is mostly punch, the 808 is mostly sub, and the bass is everywhere, upfront, with a lot of low-mids and high-mids. I'd split it up in the box with filters, and then from there put it on the board. On the high-mids or the very highs, I used an actual [Roland] Dimension D [stereo chorus] to make it wider, then it was just about making sure the sub and the 808 didn't kill each other. In my mind a lot of what makes it work is left and right panning, and the perception of things being in different places.

I experimented awhile to find how to deal with the percussion taking up so much space. Everything was supposed to be loud at once, so I split the percussion, used two EQs, and panned it differently; the drums are more to the left and the hat more to the right. There's a drum filter going through all of it that's heavy affected. There's a Mellotron, and I flipped phase on each side so they have opposite polarities and it's really wide-sounding. I use SoundToys PanMan and Waves MondoMod, which is a little more flange-y, to do a lot of automation, unless I want something super-specific and then I'll draw it in the box. For example, I automated the Waves Kramer Master Tape emulator and a Waves Doubler [vocal doubling and harmonizer plug-in] on intro and outro vocals on "Power Trip." There's one vocal track in the "love songs" part that gets more wide every other line and one with more extreme tape distortion that comes up every time it reaches the "all night" part, making those phrases really pop.

Cole: It took a lot of going back and forth, tweaking little parts in Mez's initial mix, but we got it just right. Having the option to balance things because you split them up and pan them out like that gives you another weapon in your arsenal, another tool to fix problems. For me it's all about learning new tricks, because I want to do more sound design and engineer more action in my beats in the future. ■

Tony Ware is a writer and editor based in Washington, D.C., who thinks overly compressed audio is the true sin. When not championing other self-producers, he likes to use his own gear to make reverb symphonies and granular requiems.

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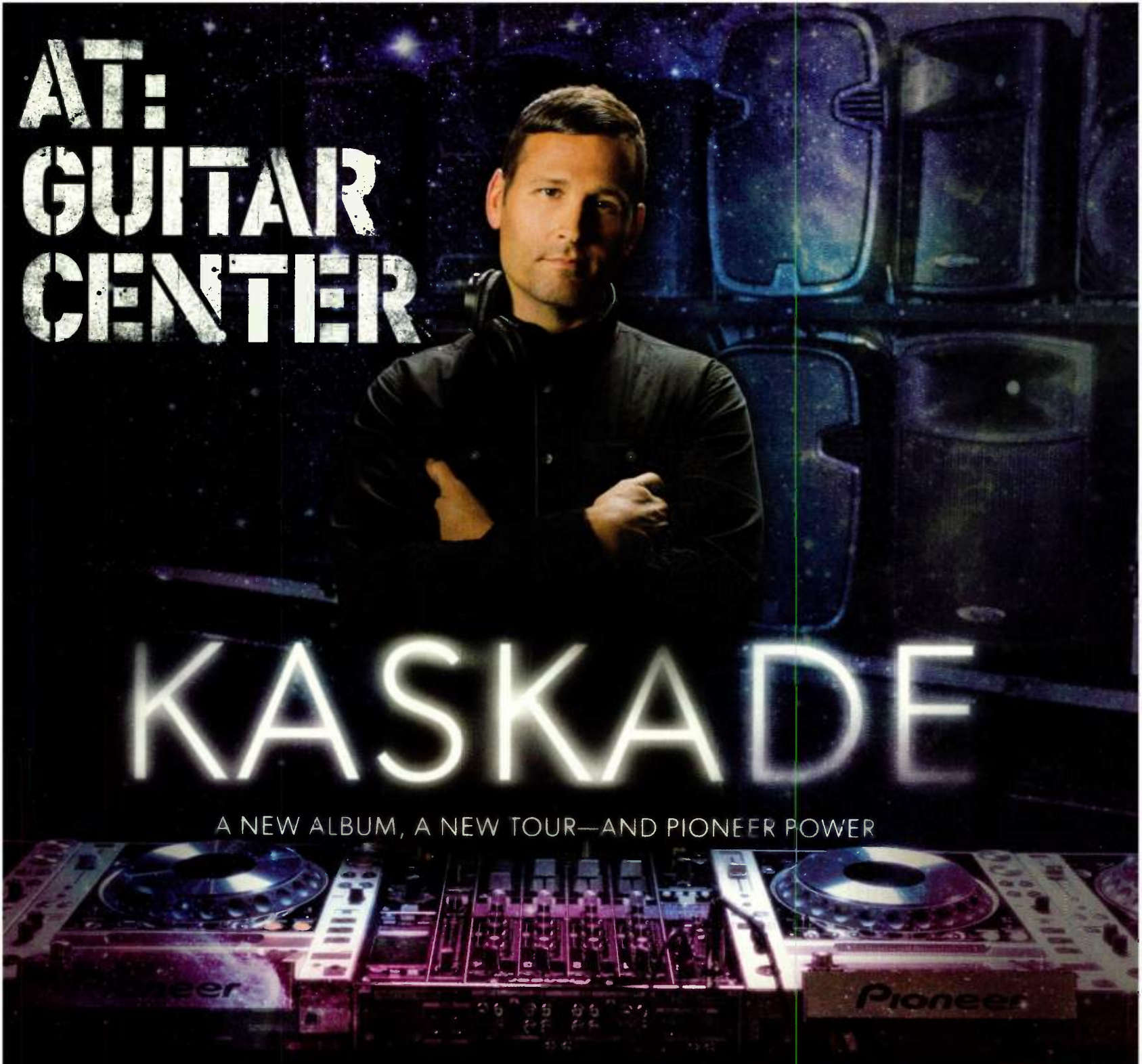

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One of the major advantages of going digital is how much it's simplified life on the road. "Now, this is my preference because it's very quick and easy—I put stuff on an SD card, I load it up, and I know how to move. It's similar to digging through a crate of vinyl and throwing it down," Kaskade says, "[but] this is a lot quicker and easier. I used to have to carry around two 80-pound crates of records. Now it's just a little SD card. I feel very comfortable on this setup."

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Anoushka Shankar

Recording an amalgam of sitar styles and sounds on *Traces of You*

BY KEN MICALLEF

REMEMBER THE catch-all nomenclature "world music"? Similarly, if your idea of Indian music is reserved to cheesy trance CDs designed to put you in a Goa state of mind, or George Harrison's 1968 sitar symphony "Within You Without You," well, it's time to join the 21st century. Perhaps the greatest sitar player in the world under the age of 35, and known to be the first to internally mic the sitar in concert, Anoushka Shankar is a pioneer bridging the worlds of classical, pop, and electronic music. Like her father, Ravi Shankar, who indirectly popularized Eastern religions and Eastern thought in the West (not to mention your new yoga mat), Anoushka Shankar similarly challenges preconceptions about contemporary Indian music on her seventh album, *Traces of You* (Deutsche Grammophon).

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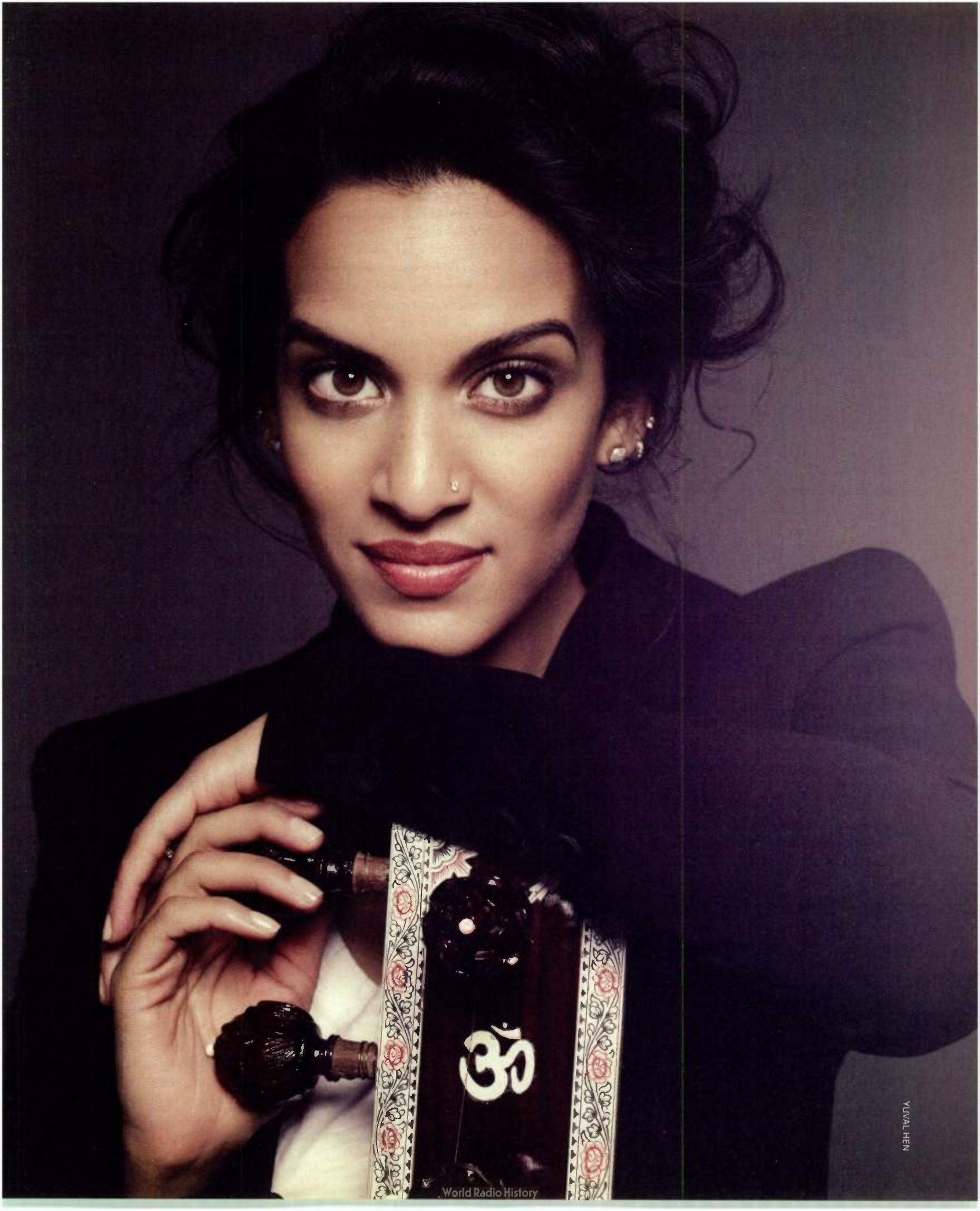

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Tracking in Brooklyn

Engineer Matt Marinelli shared the signal chains used to track piano, Nitin Sawhney's acoustic guitar, and Norah Jones' vocal at Brooklyn Recording:

Piano: Inside, a stereo pair of Lomo 19A4 tube mics with 221b-style capsules (m934b copies) went into Neve 31102 Channel Amplifiers (mic pre/EQ); outside the lid, an AKG C24 stereo tube microphone went into Neve 31102 Channel Amplifiers; for the room, a pair of RCA 44BX ribbon microphones went into Purple Audio Biz Mk II preamps.
Guitar: A Neumann KM54a tube microphone went into a Neve 31102 Channel Amplifier.
Vocal: A Neumann M49b was fed into a Neve 31102 Channel Amplifier (mic pre/EQ). Vocals were recorded without compression, on one track, and compressed through a vintage Universal Audio 175b onto another track.

Half steel drum, half flying saucer, The Hang sounds like both a melodic and a percussive instrument.

Joined by her half sister Norah Jones on three tracks, and producer (and blazing flamenco guitarist) Nitin Sawhney throughout, Shankar creates a whirling amalgam of styles and sounds on *Traces of You*, music she is happy to call "crossover."

"In a context like this, where we are going into so many different sounds and worlds of music it can become a pastiche," Shankar explains from her label's offices in Manhattan. "So to have really strong emotional content in every song was important to create a story that people can follow. That helps them buy into sounds that don't necessarily go together normally; because they are following the emotional journey more than listening with their technical brain."

From the Western pop-meets-Indian sitar drone of the tracks with Jones, to blazing and evocative Indian classical pieces performed on sitar, piano, guitar, tabla, Ghatham, Udu, Mridangam, and Tanpura, to liberal improvisations stoked by Sawhney's programmed rhythms and a unique new instrument, The Hang, *Traces of You* was a challenge to realize, both musically and technically. Recorded at The Dairy in London, Big Fish Recording in Encinitas, California, Brooklyn Recording in Brooklyn, New York, and The Village Studio in New Delhi, the album's challenges began with finding the best way to record Shankar's sitar.

"The sitar is not standard when it comes to miking," Shankar explains. "In a traditional setting the sitar is played with the tanpura and the tabla so it really stands alone in its range of sound. It's a very distinctive, resonant sound, but it's also a very quiet instrument. When you put it against a drum kit or piano, or other instruments that blanket a lot of space, it can be really hard to make the sitar cut through. In the studio, to make sure the sitar was front and center yet not dominating, was challenging. Nitin and I spent a lot of time just playing with the piano and guitar and seeing how the sitar sounded with different instruments to make sure we were happy with the sound."

Jones' engineer, Matt Marinelli, shared the nitty-gritty details of recording Anoushka's sitar at Brooklyn Recording, where the vocalist's three songs were tracked.

"Sitar poses a specific set of challenges because the sound is a rich combination of tones emanating from multiple locations on the instrument," Marinelli explains. "A combination of close miking and room miking was required. I relied on the close mics for the body and resonance of the sitar, while the more distant mics captured the air and shimmer

YUVAL HEN

of the sympathetic strings, and captured the overall sound of the instrument that developed in the room at some distance from the source. Since close mics on the sitar have the potential to be harsh and pick up unwanted finger noise, I used a ribbon mic [Samara MF65 or Royer 121 Ribbon mic into a Grace Design 201] in this position, coupled with the Purple Audio Biz Mk preamp because it has the clean gain necessary without being sterile or lifeless."

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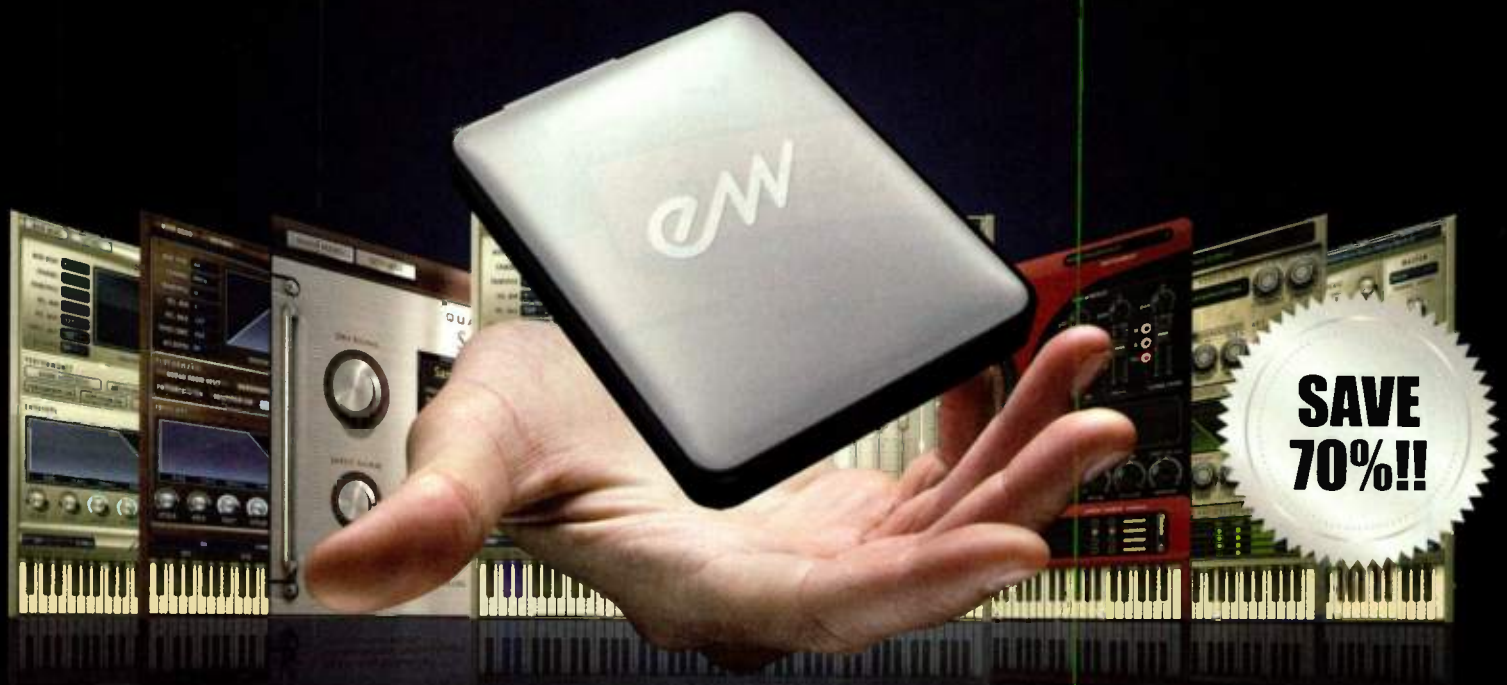

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Other mics were small-diaphragm condensers in a stereo configuration: "I placed a pair of Schoeps CMC6 microphones with cardiod MK4 capsules (into Neve 31102 Channel Amplifiers) several feet in front of and slightly above the sitar, arranged as a near-coincident pair. The Schoeps are extremely-well-detailed mics with plenty of air and they blend well with the darker, more midrange-forward sound of the close ribbon mic."

Standard or traditional sitar miking includes one mic aimed at the bridge, positioned about a foot away, and another single mic, an equal distance overhead. At least that's what Shankar prefers. But even an Indian classical star of royal lineage can't always get what she wants.

"At one of the studios, we recorded with five mics on the sitar," Shankar recalled. "That drives me nuts! I like to play really softly in the studio because then my tone comes through sweetly. I can play softly and mic it very close and capture the whole body of the instrument. But the second I begin playing faster pieces, I end up playing a lot louder. Then it's good to have five mics so we can play with what we have. On a song like 'Indian Summer' or 'Monsoon,' where I play faster, we used only the room or distant mics because the resonance can become too much otherwise. Whereas on 'Flight,' where I play very delicately, we used all mics in the mix. We found a setup we liked and took pictures and marked tape on the carpet."

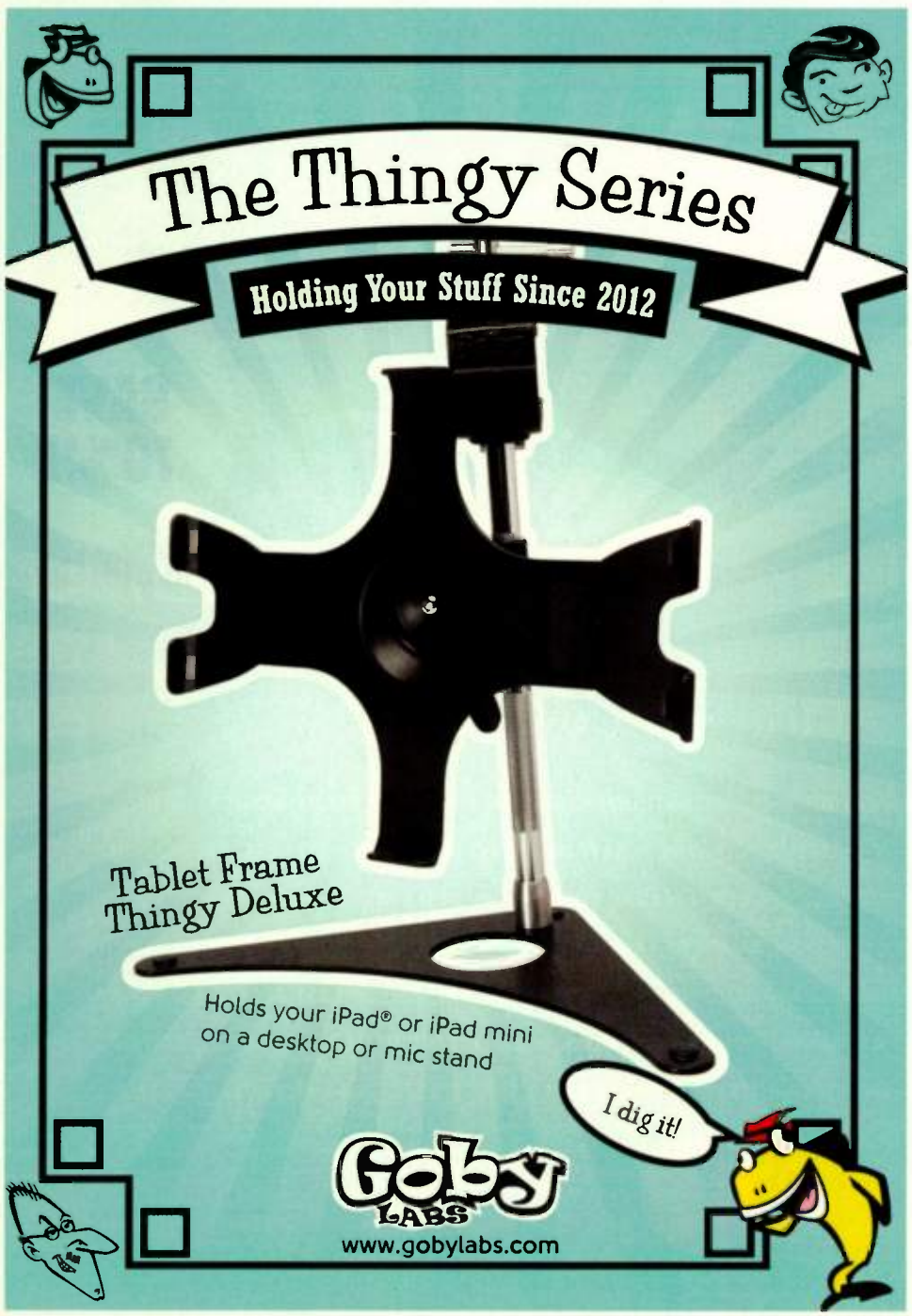
On the songs where the entire group tracked live in the studio, the Indian musicians sat on the floor in traditional formation, while the piano, cello, drums, and The Hang were recorded at the musician's usual sitting heights. This too caused everyone involved to rethink notions of conventional setup.

"In the case of recording Anoushka, Norah, and Nitin," Marinelli says, "everything was recorded live as a duo or trio. My main concern was that everyone was comfortable, that there were good sight lines between musicians, and that the recording properly translated the warmth, nuance, and depth of what was being performed. With musicians of their calibre, there may not be multiple takes to sort things out, so I worked hard to plan ahead and be responsive to everyone's feedback and needs during setup. Once you press Record, it has to be right. I think these songs all ended up being the second or third take, including the live vocals!"

Though much of the album was recorded live, and certainly most Westerners believe that music as challenging to perform as Indian classical would require that all the musicians involved record live in the same space, that wasn't necessarily the case for *Traces of You*.

"It was my plan to record live," Shankar says, "but it didn't work out what way. 'The Sun Won't Set' was recorded completely live with Norah in Brooklyn. But for '*Traces of You*,' I recorded my sitar in one take live over a bed of sounds that Nitin had created on guitar in Pro Tools. Then the tabla was recorded in India. Things happened in pieces all over the world. On 'In Jyoti's Name,' a rough track was recorded live, then I redid some sitar parts and added more percussion. The percussion was overdubbed because it's all Pirashanna Thevaraja; he played three different instruments. There's no click on that song, but sometimes we did use a click on the slower songs. Some of the fast stuff had a click track, like 'Chasing Shadows.' That's one of the more live-sounding pieces on the record. The whole question-and-answer part at the end was recorded individually in different studios and cities.

"Life informed the music," she continues. I got everyone in a room in Delhi to record 'Chasing Shadows' originally, but I didn't like that version. We recorded the sitar in London



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and sent the track to the percussionists in India, where they added their parts. There is a different energy to songs recorded live and I always prefer that, but in a song like 'Chasing Shadows,' that group of musicians has played that song with me live for seven years. So I knew the energy would still be there."

And as for miking the rest of the classic Indian ensemble? After four classical albums and three non-classical albums, Anoushka Shankar is well versed in production techniques.

"For the tanpura," she explains, "we used a combination of one mic near the bridge then something further away to get the string sound close up and the bigger drone. For tabla, it depends, but one central mic from above usually. If you close-mic the two tabla drums, they will sound separate and not as one. You'll hear the high and low drum, when you want one unified drum sound with a high and low pitch. You can use a room mic to capture the resonance of the bass drum, and the ring of the high drum with the center higher mic.

> "At one of the studios, we recorded with five mics on the sitar . . . we found a setup we liked and took pictures and marked tape on the carpet."
>
> —ANOUSHKA SHANKAR

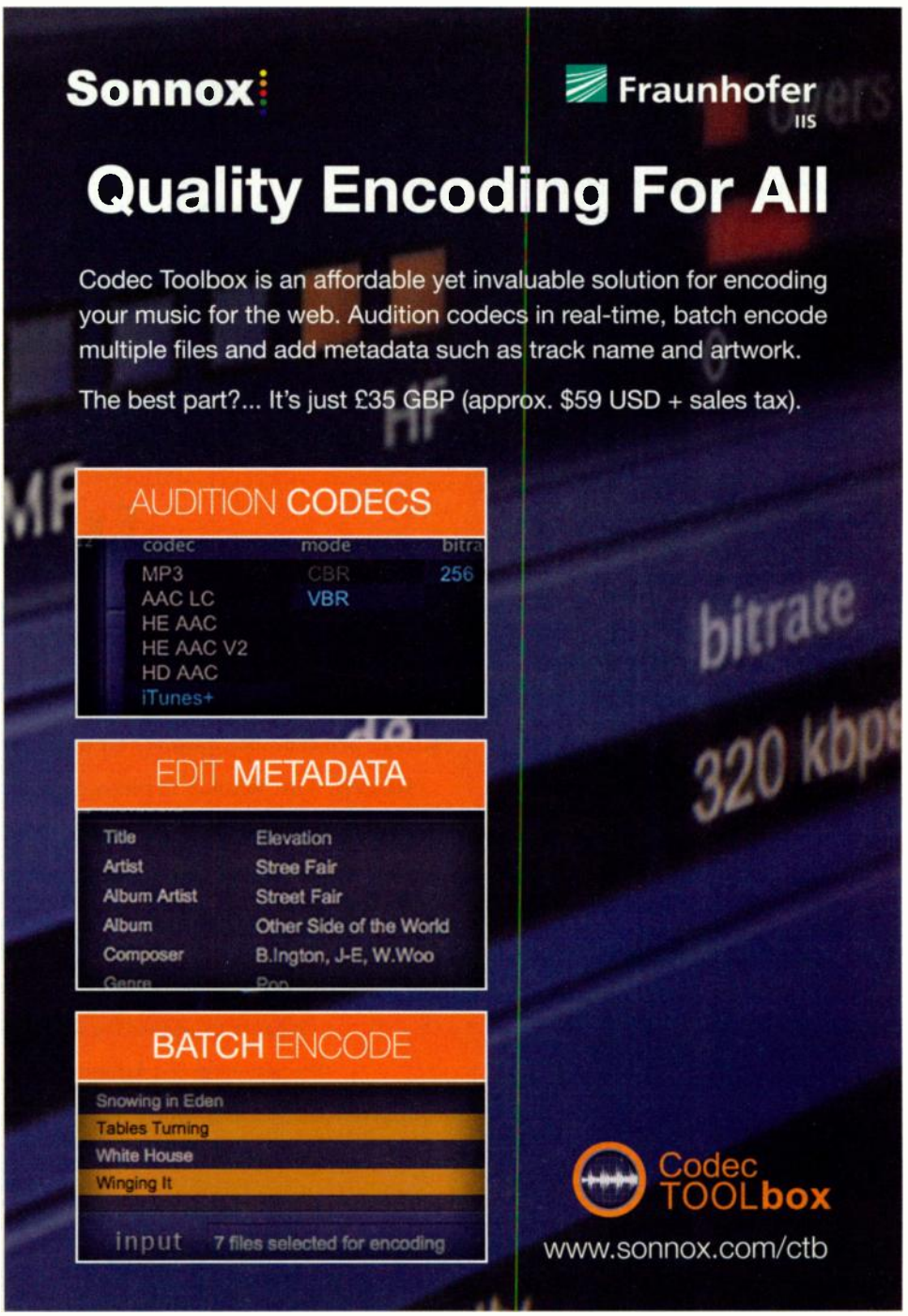
"Indian music was originally performed for parlor courts and for the king," Shankar continues. "All very intimate settings. We didn't have a concert-hall culture until the 20th century. These instruments are not built like cellos or violins to project out into a concert hall. That's why Indian instruments used amplification as soon as the technology was available."

The main recording sound of the sitar comes from the bottom of the instrument, and a detachable gourd sits at the top of the neck, which amplifies the sound further. "My dad always had a second gourd," Shankar recalls. "That was his secondary amplification in an acoustic, non-amplified, non-room-miked environment. The gourd adds weight to the sound but also to the instrument." Shankar began playing on a custom-made half-size sitar when she was seven. She still plays custom sitars with a neck of smaller-than-traditional length, and a lower gourd.

"On a song like 'River Pulse,' which was written for guitar," she says, "Nitin plays the really fast guitar all across strings in one range. When we trade lines then play in unison in that song, there are moments when I have to get all over the sitar neck very, very fast. It's nuts!"

Another instrument that added to *Traces of You*'s genre-bending qualities is The Hang. Half steel drum, half flying saucer, The Hang sounds like both a melodic and a percussive instrument. Over bubbling electronic rhythms and the droning sitar of "Maya," The Hang elucidates a gentle melody that rings as gently as a lullaby, but as conversationally as a marimba.

"It's a steel drum and a flying saucer!" Shankar laughs. "It looks like a steel drum with nodules sticking out of it that are the tuning knobs. I fell I love with it years ago. I heard it first at a trance party on a hill in Portugal. It's very hypnotic and beautiful sounding. And it's limited because it's tuned and hammered to a certain scale and pitch. I found it beautiful but it wasn't until I heard



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Manu Delago playing The Hang that I was deeply sold on using it in my music. He is the best Hang player in the word and he plays three instead of just one with a combination of tuning that gives him a full range of notes, so he can play in any scale. He's Björk's drummer and he plays drums with me too now. The Hang produces a resonant sound and has a delicate quality that fits with the sitar. And it looks like a UFO."

A professional since the age of ten with seven solo albums to her credit, including *Anoushka*, *Anourag*, *Rise*, *Rise Remixes*, *Breathing Under Water*, *Traveller*, and *Traces of You*, Shankar has also taken part in four live albums: *Full Circle: Carnegie Hall 2000*, *Live at Carnegie Hall*, *Concert for George*, *Healing the Divide: A Concert for Peace and Reconciliation*, and *Live in Concert at the Nehru Park, New Delhi*. She excels at music that is primarily of an oral tradition, handed down from student to teacher for hundreds, if not thousands, of years. Yet with all her experience, Shankar is like anyone else when it comes to marketing her music.

"I struggle with that," she admits. "I am better at making music than marketing it. Because I contest the need for labeling, it's hard to then explain it. I would say that mine is music for people who want something that isn't limited by those kinds of constraints. Again, a part of me feels that it's a dirty word, but on this record there are things that are more accessible than they normally would be. So for people who aren't used to the sound of a sitar, it's presented in a way that is more accessible. And with shorter song structures that don't tamper with the musical quality. To have a voice like Norah's helps to ground the music in a place of familiarity for some listeners.

"It's music that is genre-blind, in a way," Shankar summarizes. "It's about making beauty whether it's a cello or a sitar, and not having any limitations." ■

"Indian music was originally performed for parlor courts and for the king . . . we didn't have a concert-hall culture until the 20th century. These instruments are not built like cellos or violins to project out into a concert hall."
—ANOUSHKA SHANKAR

Ken Micallef lives in New York City, where he contributes to a variety of musical, technical, and financial publications when not shooting craps in Chinatown.

More Online
Read interview outtakes.

Emusician.com/February2014

Expert Sleepers
Audio plug-ins and analogue synthesizer hardware

Silent Way v2.0 & the ES-3 mk3 module

What the users are saying:

"My ES-3 is one of the only modules I will never even begin under any circumstance to consider getting rid of."

"Silent Way is INCREDIBLE and offers doors into new realms of synthesis ... just immensely powerful."

"It's such a fantastic idea and works like a charm. My VCOs are perfectly tuned, I can send all the gates/trigs I need..."

"Every modular system user that uses a DAW should have one, no question about it."

"Silent Way is the center of my entire system. I even use it for most of my MIDI gear and drum machines. Couldn't imagine life without it."

"They make the modular a true extension of your computer, and vice-versa."

"It has revolutionized the way my modular setup integrates with my DAW."

"The best things that happened to my modular and my music making in general."

and what the reviewers thought:

"The ultimate computer integration solution for analogue synthesizer fanatics just keeps getting better and better" - Computer Music (10/10)

"Silent Way is a no-brainer" - Future Music (4½ stars)

"... the potential world of sound that Silent Way opens up is amazing" - Tape Op

"Silent Way is a genuine alternative to a MIDI-to-CV interface, and capable of a greater level of sophistication" - Sound On Sound

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www.expert-sleepers.co.uk

World Radio History

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OF AEON, DAMAGE, AND EVOLVE

DM-307

MODERN GROOVE DESIGNER

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If You Have Ghost

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BARBARA SCHULTZ

The Notwist

Close to the Glass

SUB POP

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TONY WARE

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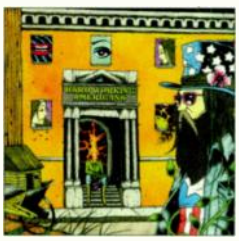

Hard Working Americans

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The 2014 Grammy Awards

The year of the newbie—plus Jay Z and Daft Punk

COMPILED BY BARBARA SCHULTZ

THIS YEAR'S list of Grammy nominees honors an impressive number of new artists. Macklemore and Ryan Lewis, and Kendrick Lamar, are contenders for Best New Artist *and* Album of the year; and the Record of the Year category includes three first-time nominees: Imagine Dragons and Lorde, as well as older timer Robin Thicke.

But the rich get richer as well—at least in terms of nominations. Jay Z has nine this year—even more than Justin Timberlake, Taylor Swift, or Daft Punk, all of whom were recognized several times over.

Here, *Electronic Musician* takes a look at the production of nominated projects in a handful of categories. Note that these aren't necessarily our picks, and by the time this issue comes out, the votes will have already been counted. But all of these records are well worth a listen.

Thanks to Ken Micallef, Blair Jackson, and Mix magazine for contributing material for this feature.

More Online
Read about more 2014 Grammy nominees.
Emusician.com/February2014

BEST ALTERNATIVE MUSIC ALBUM

The meaning of the "Alternative" title is harder to pin down than other categories, but that's the nature of the beast: What do Neko Case, The National, Nine Inch Nails, Tame Impala, and Vampire Weekend have in common? They all made strong, inventive albums that aren't easily categorized.

Vampire Weekend
Modern Vampires of the City

Sonically eclectic, quirky and adventurous, *Modern Vampires* was engineered and co-produced by bandmember Rostam Batmanglij with co-producer Ariel Rechtshaid, and recorded at Batmanglij's Brooklyn loft, Slow Death Studios (Burbank), Downtown Studios (NYC), Echo Park "Back House" (L.A.), and Vox Recording (Hollywood).

Drum sounds are extra compelling on this album; many are effected and/or distorted, but all started with a solid foundation: "Much of the overall sound and approach was being able to record the drums to tape on an old Ampex machine at Vox Recording Studios," Batmanglij says. "That put us in a different world. There's a quality that happens with tape; it lets you really crunch and compress the drums and they don't get harsh or painful. It has to do with the transients hitting the tape; something changes. Once the drums have been passed through tape to Pro Tools, you can really mangle them and go crazy with them."

BEST DANCE/ ELECTRONICA ALBUM

Daft Punk's Top Ten hit *Random Access Memories* is likely best known in a category that also includes Disclosure's Settle, Calvin Harris' 18 Months, Kaskade's *Atmosphere*, and Pretty Lights' *A Color Map of the Sun*.

Pretty Lights
A Color Map of the Sun

DJ Derek Vincent Smith wrote, manipulated, and arranged all of the songs for his latest Pretty Lights album—the first that doesn't sample other artists. Smith says he did a lot of sampling in the past to capture the sonics/vibe of a particular period, like 1940s jazz vocals, '70s soul, or '90s rap. Working with Joel Hamilton, co-owner of Studio G in Brooklyn, N.Y., Smith set out to create those various vibes from scratch this time.

"When I called Studio G and said I wanted to do it to tape, they had their 2-inch 24-track Studer tape machine ready to go," Smith recalls. "I was like, 'No, I must have miscommunicated. I want to use the [Otari MTR-15] quarter-inch stereo tape machine and run it on 7.5 ips so we're really getting into emulating a garage recording studio in the '60s in Detroit or Cleveland or some place like that.'"

Vampire Weekend

Pretty Lights

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BEST R&B ALBUM

This year's R&B nominees include the Faith Evans-led album made on reality TV show *R&B Divas*, as well as smash releases from John Legend, Chrisette Michele, TGT, and Alicia Keys.

Alicia Keys
Girl on Fire

"I'd been playing this little motif on a guitar part in Logic and Alicia started singing to it," producer Salaam Remi says about this album's anthemic title track. "Jeff [Bhasker] was like, 'I think a [Yamaha] CP70 might sound good playing those chords.' So just at the beginning of the record, the sounds start on CP70. Then as we started getting into the song, toward the chorus, Alicia was like, 'Now I want it to take off,' so we started to get the chorus going where it was going.

"That's when I thought of the Billy Squier 'Big Beat' [drum sound]. I thought, since she wanted to go up and loud with the hook, let's put the "Big Beat" under there. And then Ann Mincieli, Alicia's engineer, took that and put it through many different changes—plug-ins and amps and different stuff—to make it spread out like it was growing."

BEST ROCK ALBUM

Rock 'n' roll royalty like Led Zeppelin, David Bowie, and Neil Young make stars Kings of Leon and Queens of the Stone Age look like relative newcomers in this category.

Neil Young with Crazy Horse
Psychedelic Pill

Engineer/co-producer John Hanlon built a homey studio into a house on Young's property, turning the master bedroom into his control room and wiring up comfortable spaces for the bandmembers to play. *Pill* comprises original songs fashioned from long, glorious, electric jams.

The first track on the album, "Drifting Back," for example, started as a 32-minute take. "That performance happened on a Saturday," Hanlon recalls. "I got up early Sunday morning and called Neil and said, 'I think you have something here,' and went over and played it for him on a CD. We mapped all this stuff out in terms of structure—identifiable choruses and verses and B sections—while listening to these parts on a little blaster, sitting in the entranceway of his home, and marveled at what he had." "Drifting Back" got edited down for the release, but only by about six minutes.

BEST COMPILATION SOUNDTRACK FOR VISUAL MEDIA

All of the nominated albums are inextricable from the films, yet different from each other, as the "western" music from *Django Unchained* goes up against the anthemic *Les Miserables*, R&B on *Gatsby*, pure soul of *Muscle Shoals*, and hard-rocking *Sound City*.

Dave Grohl & Various Artists
Sound City: Real to Reel

Individual songs were tracked with different guest stars, mainly live through the original Sound City Studios Neve console in Grohl's personal facility (Studio 606) with producer Butch Vig and engineer James Brown.

"On 'If I Were Me' [featuring Grohl, Jessy Greene, Rami Jaffee, Jim Keltner], we kept everyone situated really close together. If you listen closely you can hear Rami Jaffee's fingers scraping across the Hammond keys during the re-intro. We added piano, a little dash of Omnichord, and a violin harmony. Then Jim Keltner went back in to do a shaker overdub that was so beautifully rendered that he reduced several of the grown men in the room, myself included, to tears. Dave's lead vocal was recorded on the morning we mixed. He'd played in New York the night before at the Global Citizen/World Poverty Festival in Central Park, so his voice had this fantastic weary, blown-out quality that I love."

John Hanlon mixes Neil Young's *Psychedelic Pill*.

The Sound City Sessions.

World Radio History

PLAYLIST

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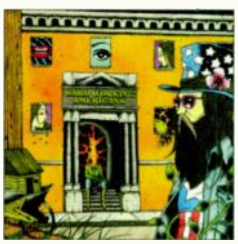

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World Radio History

Eventide H9 Harmonizer

Five killer stompboxes in one compact package

BY GEARY YELTON

The Eventide H9 stuffs all the processing power of the PitchFactor, ModFactor, TimeFactor, and Space into a smaller package and duplicates their controls in an app.

SUMMARY

STRENGTHS Studio-quality effects. Extremely versatile. Easy to upgrade. Syncs to MIDI Clock. Terrific iOS integration.

LIMITATIONS No power switch. No balanced I/O.

$579 MSRP
$499 street
eventide.com

IT'S BEEN almost four decades since Eventide began making rackmount Harmonizers, from the first H910 to the current flagship, the H8000W. Along the way, the company has spun off numerous products that harness Harmonizer technology, most notably the PitchFactor, ModFactor, TimeFactor, and Space.

Now you can add a fifth stompbox to that line, the H9 Harmonizer, which offers a new approach to stereo effects for stage and studio use. Although it is smaller and lighter than its predecessors, the H9 does just about everything those four stompboxes do, and more.

White: The New Black Clad in a rugged white-and-black steel case, the H9 strips its front panel down to essentials. It sports a single rotary encoder knob surrounded by an LED ring, two footswitches, five illuminated buttons, six indicator LEDs, and a six-character LED display—just enough to use when you're performing. The back panel has two 1/4-inch inputs, two 1/4-inch outputs, an expression pedal input, a mini USB port to connect to your computer, and a connector for the included 9V wall wart. Two jacks for MIDI I/O are on the side, and Bluetooth connects to iOS devices. The audio jacks are unbalanced, but unlike on other Eventide stompboxes, the input and output levels are continuously variable.

Although you can use the H9's front panel to select and edit presets (if you have the patience), a free editor/librarian app for iOS, Windows, and Mac OS X makes editing much easier. H9 Control graphically duplicates all the front-panel controls found on the PitchFactor, ModFactor, TimeFactor, and Space and includes a GUI for H9 Harmonizer as well (see Figure 1). The app has some functions the hardware lacks, including an onscreen ribbon controller and an X/Y pad that offer better realtime control than onscreen knobs. H9 Control also lets you save and organize presets, purchase new algorithms, and access help files, among other things.

Effects Aplenty An Eventide algorithm is a collection of signal-processing elements and the parameters that control them. Those elements may be pitch shifters, delays, reverb, ring modulation, or even step sequencers, and a single algorithm may combine multiple elements. A preset is based on a single algorithm and contains the specific parameter settings that define the effect it produces.

The H9 comes standard with 99 internal factory presets based on ten included algorithms. Thirty-three additional algorithms are available for purchase, and H9 owners can choose one for free. If you want more, you can download them from H9 Control's Store screen for $19.99 each, either by making an in-app purchase in iOS or using Amazon Payments on your computer. Preview any algorithm by loading its presets into your H9 for five minutes or by listening to recorded demos.

The H9 accurately reproduces all of Eventide's stompbox effects except one; an improved version of TimeFactor's looping algorithm should be available soon. Four years ago, I bought a PitchFactor because its complex effects are exclusive to Eventide, and I love the way it sounds. I compared its presets to the same presets on the H9. Parameter for parameter, they matched up perfectly and sounded identical, though the H9 was slightly quieter.

Pedal to the Metal The H9 delivers tremendous multi-processing power at a reasonable price. It sounds fantastic, and it improves on its award-winning predecessors in so many ways: It's more compact, convenient, versatile, expandable, and cost-effective. What's not to like? ■

Former Electronic Musician *senior editor Geary Yelton lives near the top of a mountain in Asheville, NC.*

Fig. 1. H9 Control reproduces the front panels of every Eventide stompbox it emulates, with ten knobs and six switches per screen, as well as a ribbon controller. On a computer or iPad, every control appears almost exactly as it does on the original device. On an iPhone, the same controls are split into two vertical screens that you can switch between.

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World Radio History

Audio-Technica AT5040

Extreme realism from an innovative microphone design

BY STEVE LA CERRA

"Innovative" and "microphone" are words that are not used together often, so it's news when a manufacturer creates a microphone that's different from the pack. The AT5040 from Audio-Technica fits that description, employing four rectangular diaphragms (each two microns thick) functioning as one very large membrane. One of the tradeoffs of microphone capsule design is that smaller diaphragms tend to have better transient response and increased self-noise. By electronically summing the output of the four diaphragms, Audio-Technica has developed a cardioid capsule with the transient response of a small diaphragm but the low noise level (5dB) of a large diaphragm—one of the lowest-noise mics on the market.

The AT5040 is an electret condenser requiring 48-volt phantom power. Maximum SPL for 1% distortion is 142dB, yielding a dynamic range of 137dB. While the AT5040 was designed with vocal recording in mind, it can also be used for acoustic instruments. Unlike many contemporary condenser mics intended for vocal use, the AT5040 does not possess a "presence peak"; its frequency response falls within a few dB of flat from below 40Hz out to 20kHz.

Audio-Technica ships the AT5040 in a hard plastic case with a very-well-designed AT8480 shock mount and an individual frequency response printout. The AT5040 is assembled by hand and features a five-year warranty.

Hands On When I connected the AT5040 to a Grace 201 microphone preamp (an extremely quiet and transparent preamp), my first reaction was, *is this thing working?* It's that quiet. Suffice to say, any noise you may hear through the AT5040 is not coming from the microphone. My first recording with the AT5040 was a steel-string acoustic guitar. "Realistic" doesn't do the AT5040 justice. The snap of fingers on strings was reproduced with uncanny accuracy and when the player listened back, he commented that the recording sounded very close to what he heard while playing.

I used the AT5040 through a Vintech X73 preamp and a DeMaria Labs ADL1000 compressor to record several male vocalists. First up was a singer with a whispery voice, similar to John Mayer. The AT5040 captured all the airy, soft phrases without letting them get lost. With another vocalist whom I'd describe as more of a hard-rock screamer, the AT5040 was just as effective at handling the opposite extreme. When that singer moved close and got loud, the mic did not sound like it was running out of headroom.

The AT5040 has a gentle proximity effect. This is not a microphone that will produce a bloated lower midrange when the vocalist gets close. At a distance of around four inches, there's this sweet spot where the mic sounds amazing: immediate, articulate, and realistically in-your-face, without sounding artificial or EQ'd—a refreshing contrast to mics that simply sound like you've turned up the equalizer. It sounds like the vocalist is getting closer to you, rather than getting closer to the microphone. Low-frequency response is extended enough that you'll need a highpass filter, either in the preamp or mixer/DAW. The shock mount is effective at isolating the AT5040 from most mechanically-transmitted noise, but I found that some did work its way through the mic stand.

Audio-Technica has clearly achieved their goal of creating a first-class vocal/instrument microphone. The AT5040 somehow maintains accuracy while adding just the right amount of enhancement to vocals. Its ability to produce stunning realism sets it apart from the pack, and even if you can't afford it, you really should make a point of hearing it. ■

Steve La Cerra is an independent audio engineer based in New York. In addition to being an Electronic Musician *contributor, he mixes front-of-house for Blue Öyster Cult and teaches audio at Mercy College, Dobbs Ferry campus.*

SUMMARY

STRENGTHS Accurate, transparent sound; extremely quiet operation.

LIMITATIONS Hot output may overload some preamp inputs (no pad).

$2,999 MSRP/STREET
audio-technica.com

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plus our new analog to digital converter.

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Booth #6204

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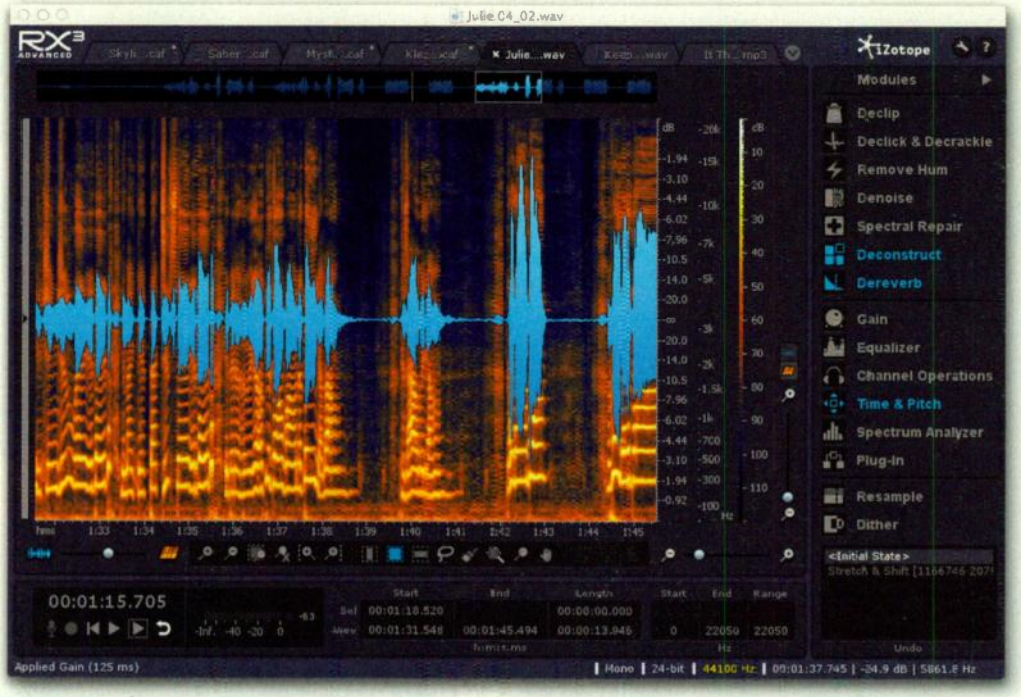
iZotope RX 3 Advanced

A dream toolkit for audio restoration that sound designers will love

BY MICHAEL DUKE



iZotope RX 3 Advanced debuts a spiffy new UI, along with some amazing new sound-manipulation modules.

SUMMARY

STRENGTHS Comprehensive collection of noise-reduction and audio-restoration tools in a single, well-designed application. Dereverb and Deconstruct are unique and powerful. Excellent new UI design. Conveniently tabbed files. Most modules can be opened as plug-ins. Spectral Repair and Time and Pitch modules are superb.

LIMITATIONS Advanced version is expensive. Dereverb is processor-intensive.

RX 3 Advanced, $1,199 MSRP
RX 3, $349 MSRP
izotope.com

IZOTOPE RX 3 Advanced is the latest incarnation of a versatile noise-reduction and audio-restoration suite that offers a comprehensive set of tools inside a waveform/spectral-editing interface. The update features a top-to-bottom UI redesign and adds powerful new modules for fixing audio problems as well as creatively manipulating sound. Most of the modules can also be opened as plug-ins in a DAW or other host.

The most significant aspect of the new UI is that you can now have up to 16 tabbed files open at the top of RX's interface, and conveniently switch between them with a single click. Otherwise, the interface is conceptually similar to the previous version. It's based around an editing window (mono or stereo) that lets you work with waveform and spectral data, and easily adjust the visual balance between the two. You also get a flexible set of selection tools, which let you grab and process anything from a full-length file to a tiny frequency range in a sample-level slice. You can also open third-party plug-ins from within RX 3, though they cannot be applied to frequency-specific selections. The standalone version supports AU and VST plug-ins, while the RX 3 plug-in supports AU, VST, RTAS/AudioSuite, and AAX formats.

A standard version of RX 3 has the same interface and all the essential audio-restoration tools from the Advanced version (Declick, Declip, Remove Hum, Denoise, and the amazing interpolation-based Spectral Repair), but with fewer adjustable parameters. This review focuses on the new features found in RX 3 Advanced.

Who Needs Reverb, Anyway? Probably the most talked-about module in RX 3 Advanced is Dereverb, which does just what its name says: removes reverb from audio (see Figure 1 on page 59). Its operation is based on algorithms that detect the ratio of reverberant-to-direct signal in the audio. First, you train Dereverb, letting it analyze the audio and suggest settings. It features a master control and four band-specific sliders that allow you to tailor the reduction based on the reverb's frequency content. Pushing the main reduction slider in the opposite direction increases the reverb content detected in the signal.

As with any noise-reduction processor, overdoing it will make your audio sound unnatural, so the trick with Dereverb is to find the setting that removes as much of the reverb content as possible, without noticeably impacting audio quality. In my tests, it worked quickly and performed well in most cases, although when the reverb was really heavy, it was harder to remove it all. According to iZotope, some Dereverb jobs require several passes, and they suggest performing light denoising first to prep the file for Dereverb's algorithms to work at their best.

While undoubtedly a useful tool for post-production dialog editing (matching ambience among disparate dialog sections), you can also use Dereverb creatively to get some otherwise unattainable effects. I used it to boost the natural reverb on a percussion track, which gave me dramatically different results from what I'd get by simply adding reverb from a processor.

Dereverb requires a lot of computing power. As a 32-bit plug-in within Pro Tools 10, it was unable to cleanly process the audio and it used up a lot of CPU. When I opened it in 64-bit Pro Tools 11, however, it worked fine. Interestingly, it also worked fine in 32-bit Digital Performer 7.

Tear Down that Audio The Deconstruct module also provides unusual control over your audio: It separates the tonal and noise aspects by analyzing the harmonic structure (as opposed to Denoiser, which uses frequency magnitude). Its key controls are sliders for tonal content and noise content, which can be boosted or cut to give you control over the

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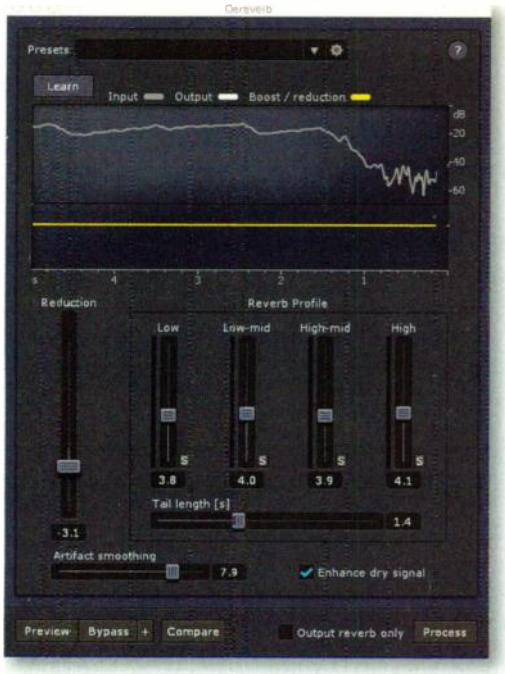


Fig. 1. The Dereverb module makes it possible to remove or accentuate the reverb in an audio signal.

balance of the two components. Deconstruct has obvious noise-reduction uses, but it's also great for subtly adjusting instruments that have significant noise components (such as changing the amount of breathiness on a flute).

Dialogue Denoiser works in real time to remove steady background noise from dialog. I found it to be fast and effective. The processor can be run in Auto or Manual mode; in Manual mode, you can adjust the noise threshold for six different frequency bands.

One of the coolest modules in RX 2 Advanced is the Time and Pitch tool: In version 3, iZotope added BPM as an adjustable parameter for setting time stretches—in addition to percentage—making this tool much more musical. I was blown away by the quality of its tempo and pitch changes. For instance, I increased the tempo of a sax loop by 20 BPM and it still sounded natural. Pitch changes sounded great, too.

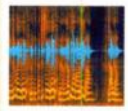
Pitch Contour makes it possible to set up pitch changes that happen over time. Designed with vinyl and tape restoration in mind, it allows you to correct for drifting pitch, which is often an issue in those applications. Its interface resembles a graph, with pitch (in semitones) on the vertical axis and time on the horizontal axis. You click in the graph to create a Node, which can be dragged up, down, and sideways and controls when and how much pitch change is applied at that point.

Unlike the pitch change in main Stretch and Shift mode, the audio slows down or speeds up, depending on the direction it's shifted. That makes it possible to perform some amazing effects in which you speed up or slow down an entire mix at a precise point in time. At extreme settings, the Pitch Contour module allows for some super-creative audio mangling.

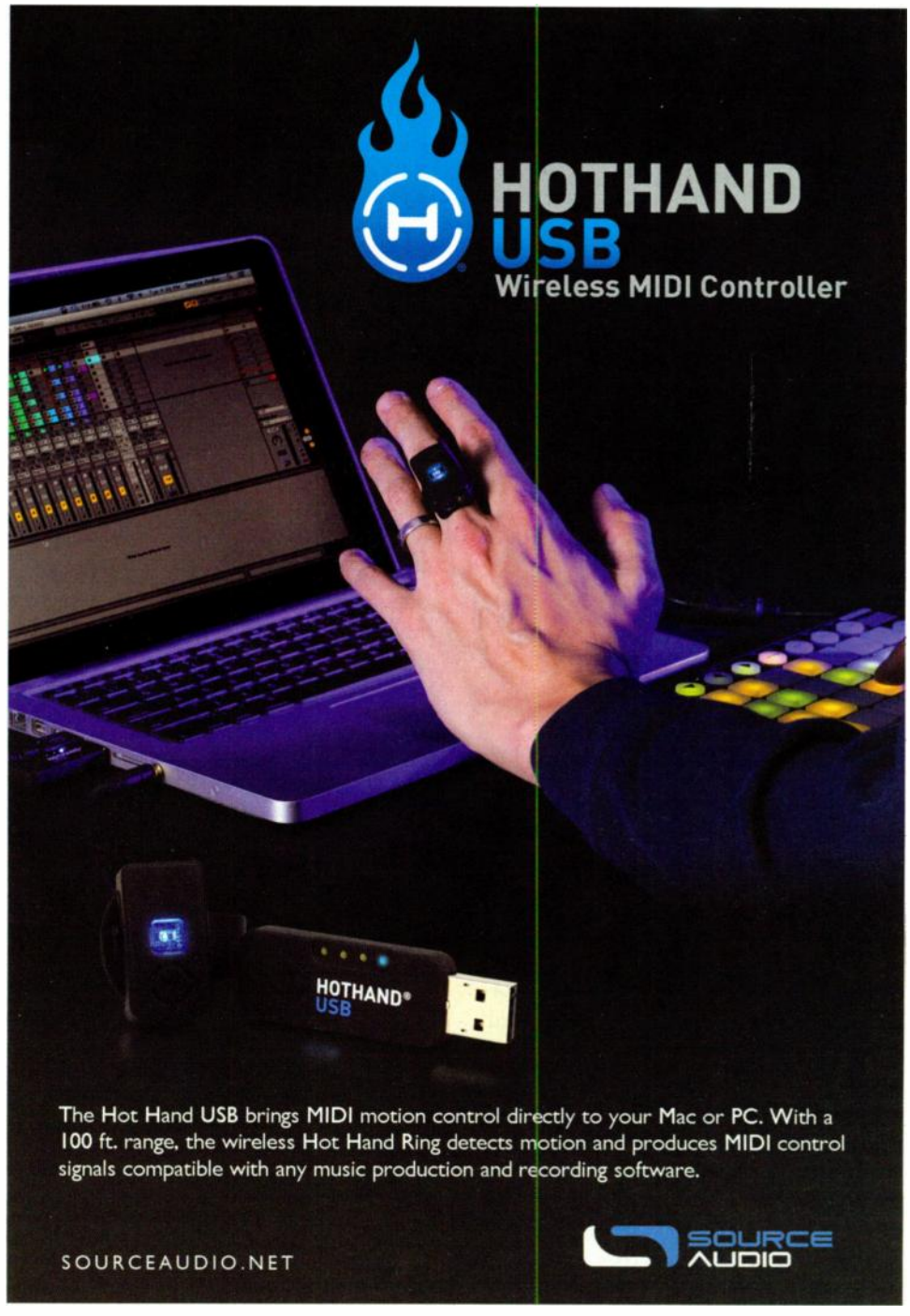
Other new features in RX 3 Advanced include a serious beefing up of the Spectrum Analyzer module and the addition of center-channel extraction to the Channel Operations module.

Prescription Filled All told, RX 3 Advanced gives you a deep and powerful collection of noise-reduction and audio-restoration tools, with some amazing sound design capabilities, several of which are unique to this product. Although RX 3 Advanced is an investment at $1,199, it's one that is likely to pay dividends for a long time to come. ■

Michael Duke is a New York City-based music journalist and producer.



More Online
Watch a video of the author demonstrating RX3's features.
Emusician.com/February2014



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Toontrack EZmix 2 provides a wealth of processing presets designed to simplify the task of mixing while giving you professional-level results.

Toontrack EZmix 2

One app to mix them all

BY MARTY CUTLER

SUMMARY

STRENGTHS Wide range of great-sounding processing chains. Easy to navigate.

LIMITATIONS Not user configurable. Minimal patch editing.

$179 MSRP; Expansion Packs, $49 each
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WHEN IT comes to mixing a song, musicians often don't know how to assemble and use basic signal processing tools in order to achieve pro-level results. Although many plug-ins provide helpful presets, they are rarely gathered together in an organized way based on how they are meant to be used.

Toontrack EZmix 2 provides a suite of effects designed to simplify a wide range of mixing tasks, from processing instrumental and vocal tracks to bass and guitar-amp simulation. Available as a standalone application that comes with AU, VST, and RTAS plug-ins, EZmix 2 provides useful, application-specific libraries of effects chains, many of which were designed by luminaries such as Chuck Ainlay and Mark Needham.

The user interface comprises a browser, a control section, and a panel that displays the patch-chain components. A model of clarity, the browser starts with an Instrumental Group, then lets you select an Instrument followed by an Effect, such as a chorus or an exciter.

The Type column groups patches by function: Amplifier shows cabinets, heads, stomp boxes, and anything else you might find in a bass or guitar rig; Aux holds effects—primarily reverb and delay—that are suitable for auxiliary channels; and Group Bus concentrates mostly on dynamics processing, tape saturation, and the like for drum kits and percussion. Insert handles individual tracks and generally draws from modulation effects, reverbs, delays, dynamics, and tape saturation, with presets that range from single-processor to elaborate effects chains. Master hosts multiband compression and limiting, EQ and tape-saturation effects, as well as reverbs—anything you would use on the master bus of a mix. Additional filters sort presets by musical genre and expansion pack.

The Control section is basic. Knobs for input and output levels flank the preset title. The functions of the larger knobs depend on the preset you select. For example, choosing a wah-wah guitar preset could assign a sensitivity control, with the second knob controlling drive on a virtual amp. Tweaking those knobs is the extent of EZmix 2 patch editing: You cannot, for instance, change the wah-wah's center frequency or add a chorus to a patch where none exists. You can save your tweaks as favorites, and even rename your favorite, but that's about it. Additionally, there is no option to swap out processors or choose, for instance, between a tweed guitar amp and a modern boutique model; what you hear is what you get. I understand the intent of protecting the end user from a sea of knobs and faders, but my wish list for a future update would include a Professional mode, which would let users unlock the innards of the patches to create their own preset chains.

Nonetheless, I found it refreshing the way EZmix 2 sets up the more mundane aspects of a mix so I could get them out of the way quickly. I appreciated the way the effects chains sounded excellent and enabled tracks to sit effectively in a mix with a minimum of "showcase" patches, which often dominate and distract from their surroundings. Even experienced recordists will enjoy using this product for accomplishing what is often an overwhelming task. Overall, EZmix 2 sounds great and lays out a quick, simplified path from your DAW to your audience. ■

Marty Cutler likes playing drums with a five-string banjo neck and strings attached.

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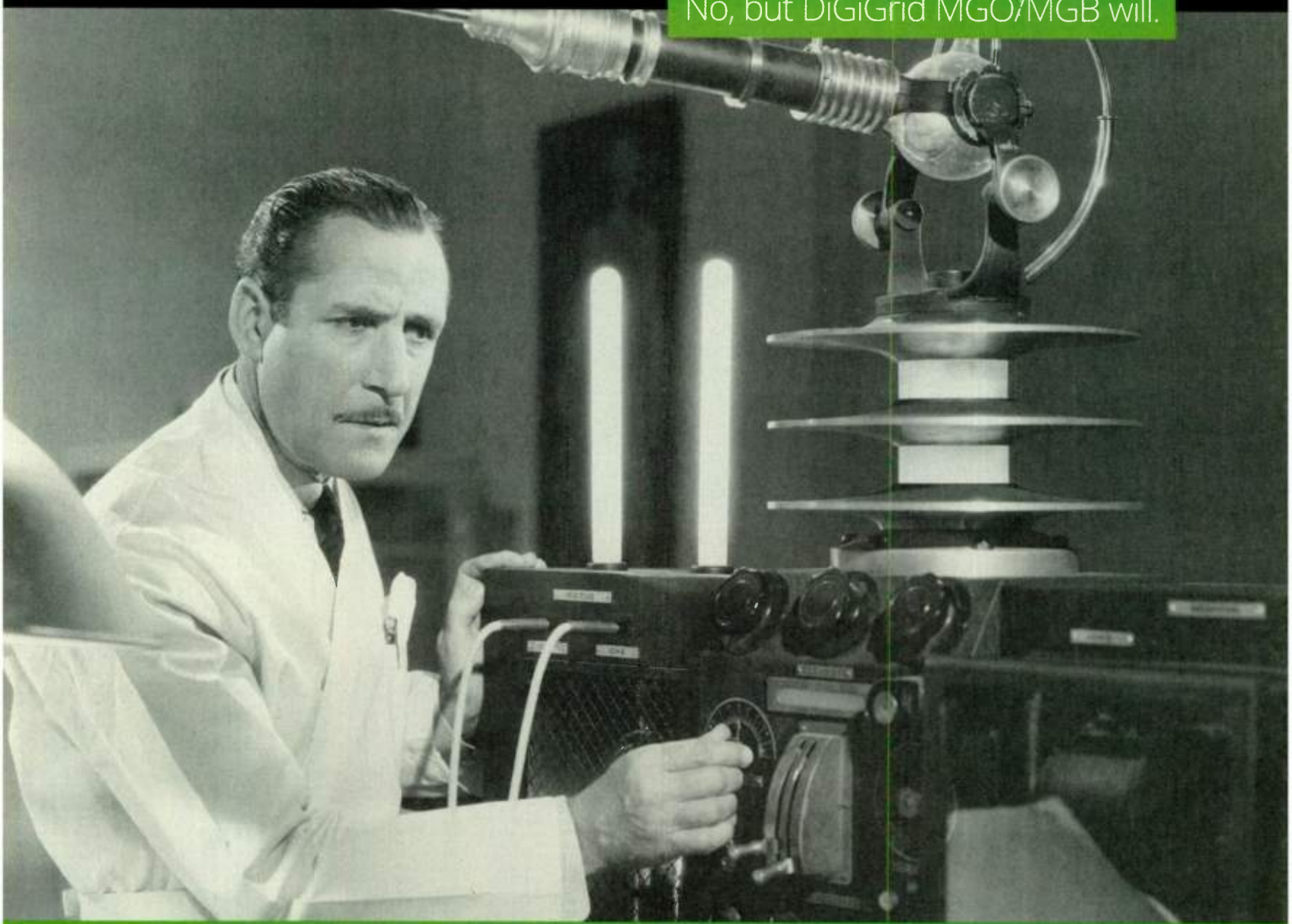

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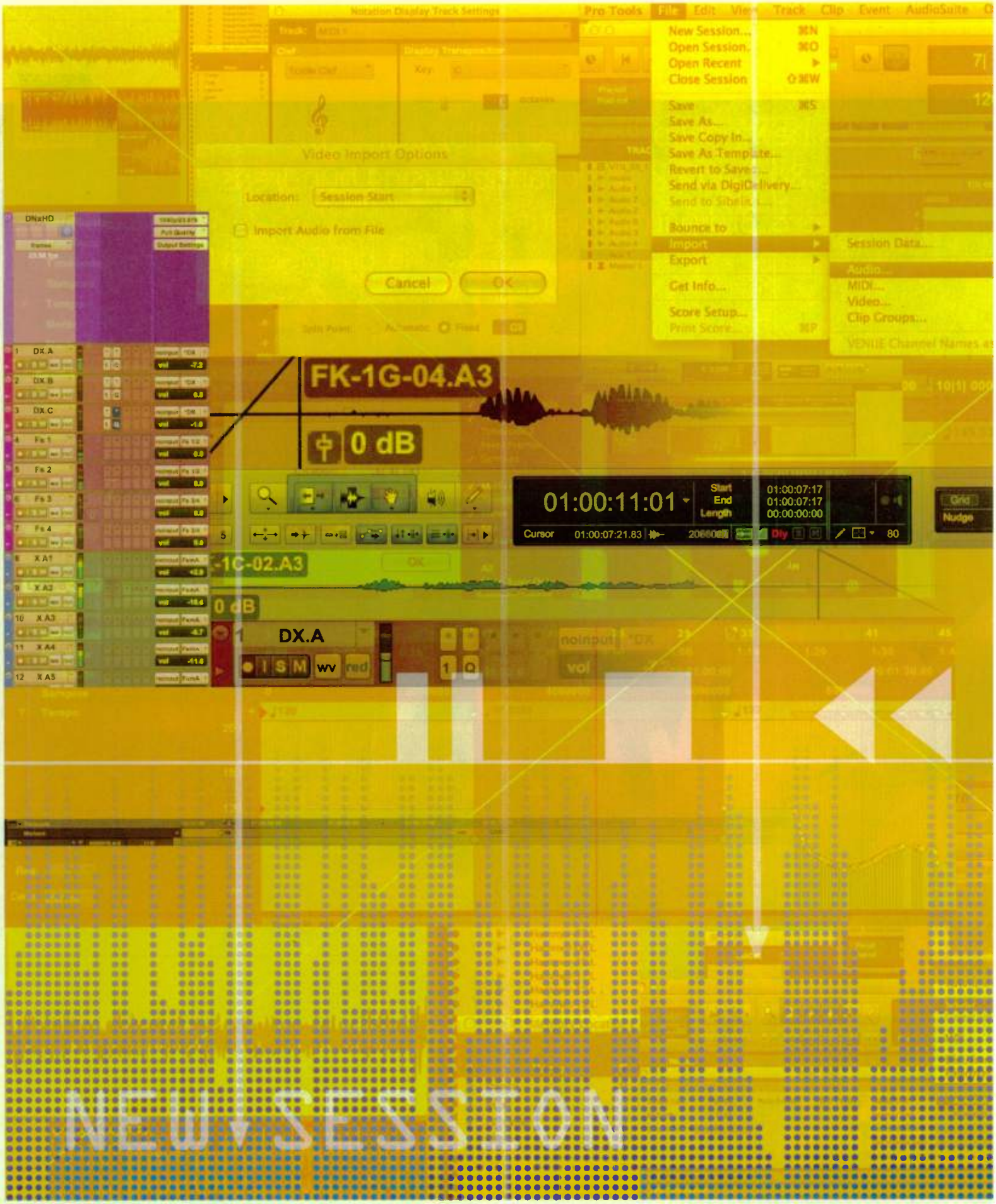

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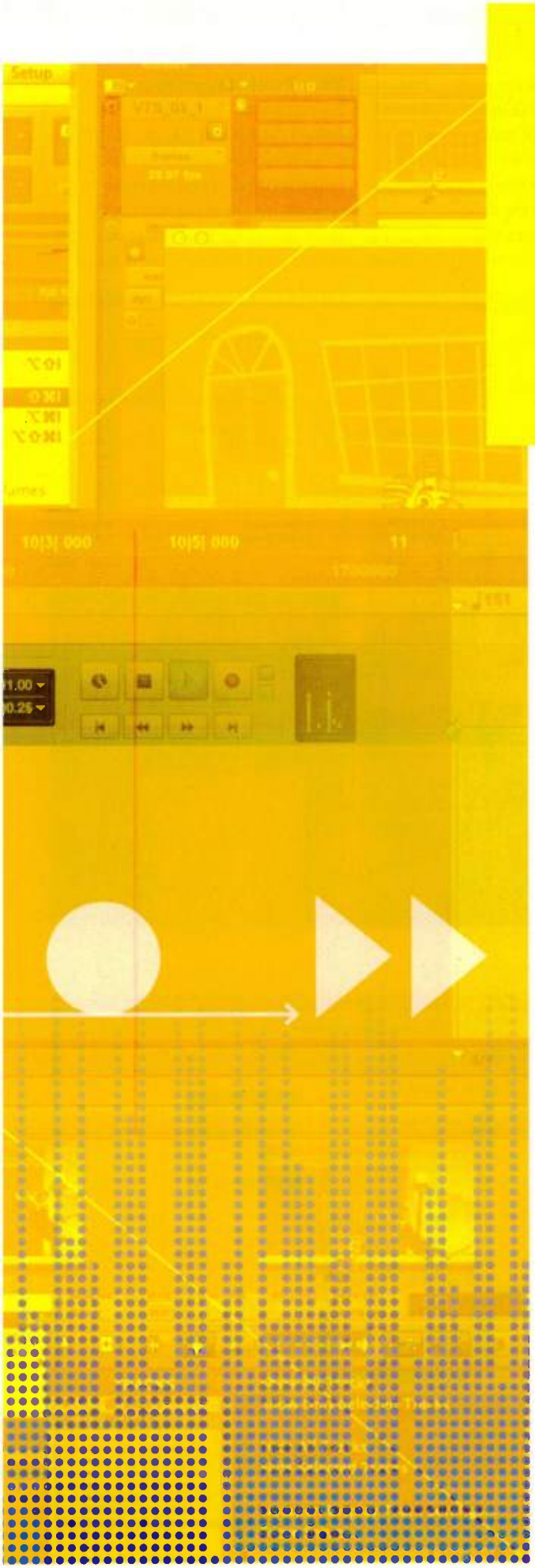

HOW TO

Scoring to Picture in Pro Tools

A step-by-step tutorial

BY STEVE KIRK

THE PROCESS of scoring music to picture is an exciting challenge. Whether you're using a broad approach based on mood or underscoring every available movement, you are defining your new work within the formal restrictions of the movie itself. It becomes your timeline—your beginning, middle, and end.

One can view this process as either constraining or liberating. However, I find it to be liberating in the sense that, once a formal structure is defined, there is one less thing to worry about. The timeline ahead of you can help inspire musical ideas or themes. You can use the onscreen action to dictate tempo and activity, or not. It all depends on the mood you're trying to create or underscore.

One of the main advantages of scoring to video within a DAW is the ability to accurately match a musical cue's tempo to the action. For example, it allows you to place the musical downbeat on the exact frame of a new scene. Even if the music you compose ends up being played by live musicians, they can record to the click track (or metronome) within the session, and then you can line up the tracks with your video reference as closely as desired. This process is now an industry standard for film, commercials, animation, and video games, and it is the best way to work quickly and efficiently.

Of course, nothing can replace a sharpened No. 2 pencil and manuscript paper for some things—notes, ideas, condensed, or even full scores. And using those tools as a starting point can often be the best approach. But the usefulness of a DAW is undeniable.

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HOW TO master class

In this article, I will show you how to begin a project in Pro Tools, sketch out the musical parts to fit the action using MIDI, then create a score in Sibelius from the MIDI data, which I use when I replace the virtual instruments with live musicians. As a demonstration, I will use a video of Voodoo Vince, the creation of game designer Clayton Kauzlaric for Microsoft's original Xbox. This scene shows Vince the Voodoo Doll as a young man, drawn in the style of early 20th century animation. (Watch a video demonstrating these steps at emusician.com.)

Building Your Project Begin by creating a new Pro Tools session. I typically run my sessions at 96kHz/24-bit, but it is possible that for video compatibility concerns a 48kHz/24-bit session might be used. If you are creating content for clients, it's always best to check with them and export your final bounced movie at the sample rate and bit depth they request

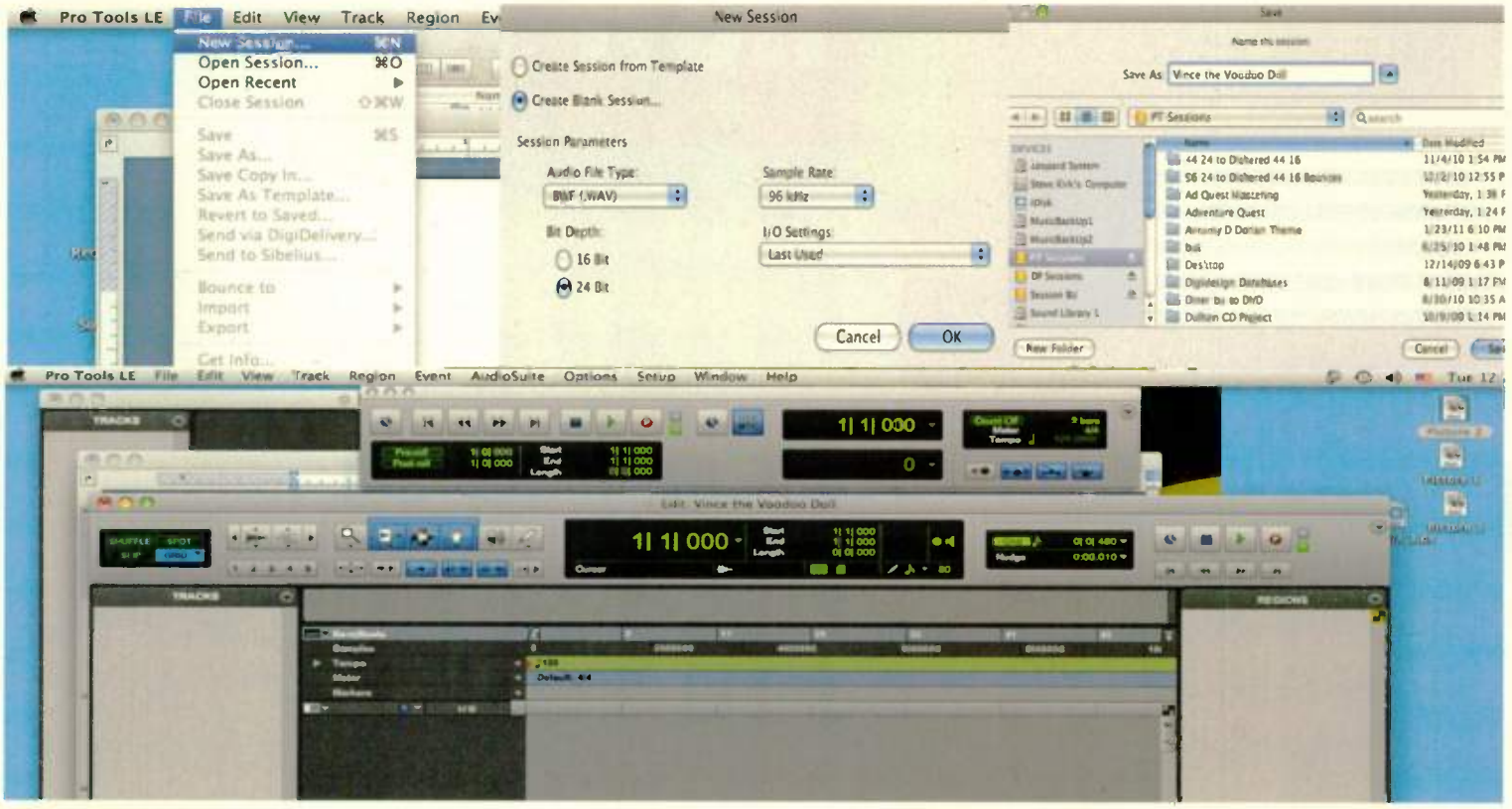

Fig. 1. First steps.

Fig. 2. Importing video.

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(see first steps, Figure 1). Next, import the video you intend to score. Use the pull-down menu File>Import >Video (see Figure 2).

Then, locate and select the video. A pop-up window will ask you where you want to locate

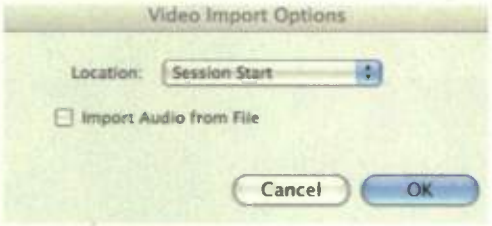

Fig. 3. Session Start.

the imported video. Choose Session Start to have it begin at the beginning of the session timeline (see Figure 3).

At this point, the video you've selected will appear both as a track on your edit window and as a moveable, floating video window. The

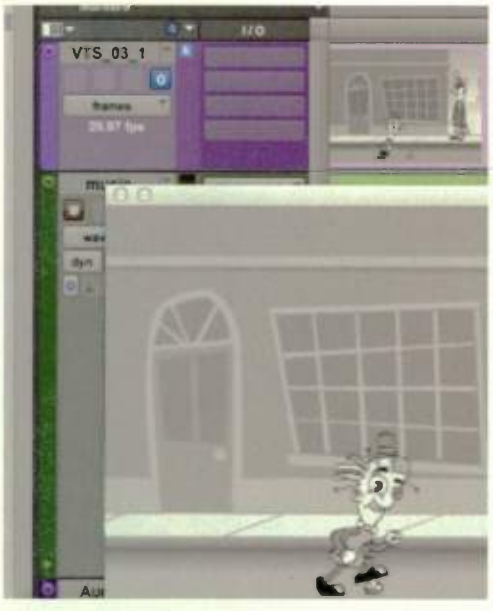

Fig. 4. Frame rate after import.

frame rate for this video is at 29.97 frames per second. (The frame rate shows up in the movie track window after it is imported; see Figure 4.)

I will change the frame rate from 30 fps to 27.97 to match the video by going to Setup>Session, and then selecting the proper frame rate (see Figure 5).

Once the movie has been imported and the session is playing the movie at the correct frame rate, the image in the movie window will

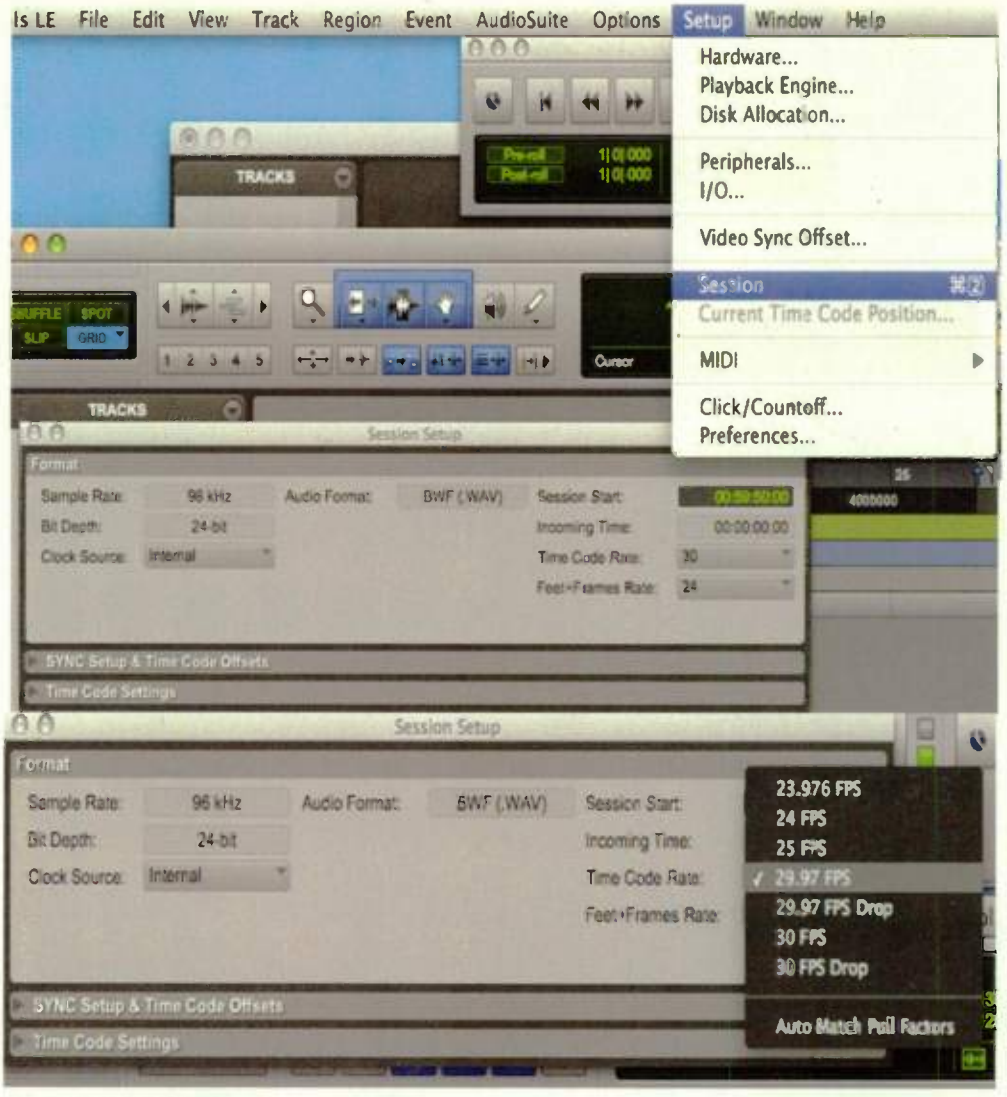

Fig. 5. Setting frame rate.

Fig. 6. Image at cursor.

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reflect where the cursor is set in the timeline of the video when you drag the cursor over the movie track (see Figure 6).

Tempos and Hits Now I'm ready to develop an overview for the tempos that I'll use for various sections of the video, by creating a timeline with markers for quick reference. I will also insert MIDI instruments into the session in order to sketch out some musical themes and ideas that underscore the action and enhance the mood and intent of the video.

For this part, I made sure to have the conductor icon lit in the Transport window so that the session's tempo will follow the tempo track in the ruler above the edit window.

Starting with the default tempo of 120 BPM, I view the opening credits with an audible click track. Once the main character enters, I change the tempo in order to match his footsteps, by opening the Tempo Change dialog box on the top of the track window of the Edit Window (see Figure 7).

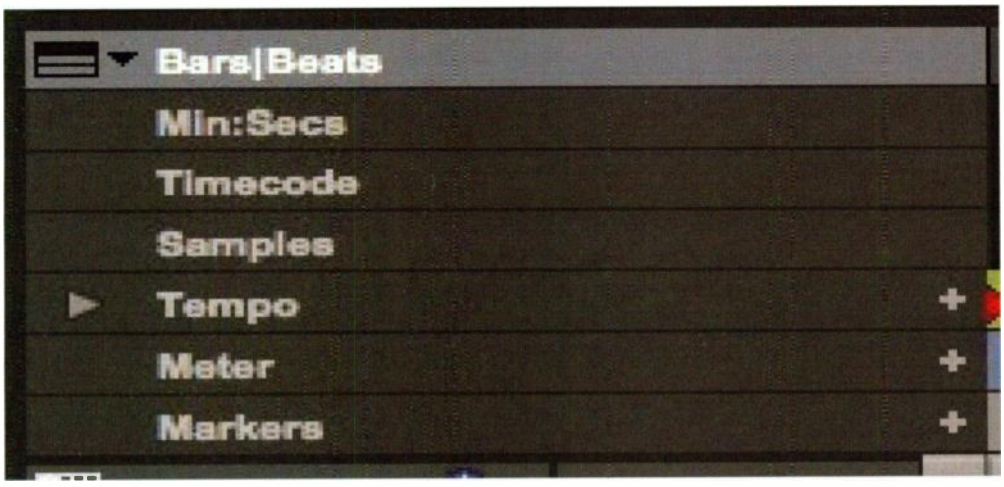

Fig. 7. Changing the tempo.

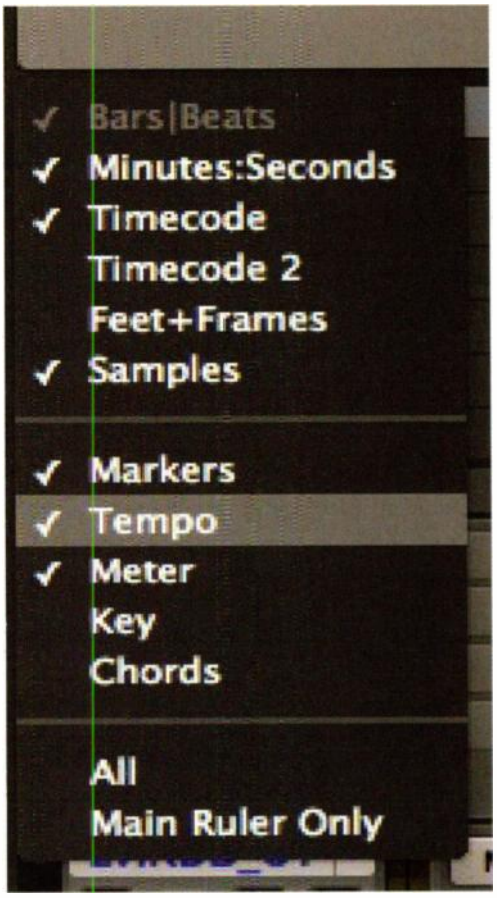

Fig. 8. Checking the Tempo window.

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Depending on your setup preferences from previous sessions, this dialog window may or may not show up. If not, you'll need to select the drop-down window next to the Bars/Beats header and check the tempo window (see Figure 8).

Clicking on the arrow sign next to Tempo will open up the Tempo Window timeline window, which allows a variety of ways to manipulate tempo; using the pencil tool for accelerandos and decelerandos, using the trim tool to select and change the tempo of an entire region, etc. (see Figure 9).

Clicking the plus sign to the right of the tempo bar will open a dialog box that will allow you to change tempo from any selected point in your timeline (see Figure 10).

I type in various BPM values until I find the one that works best.

In this case, I want to have the downbeat hit when Vince takes his first step on the ground. To do this, I click on the Meter Bar in the ruler above the Edit window's timeline to open the Meter Change dialog box. Instead of changing the meter, I deselect the box that

Fig. 9. Tempo window timeline.

Fig. 10. Changing tempo from timeline.

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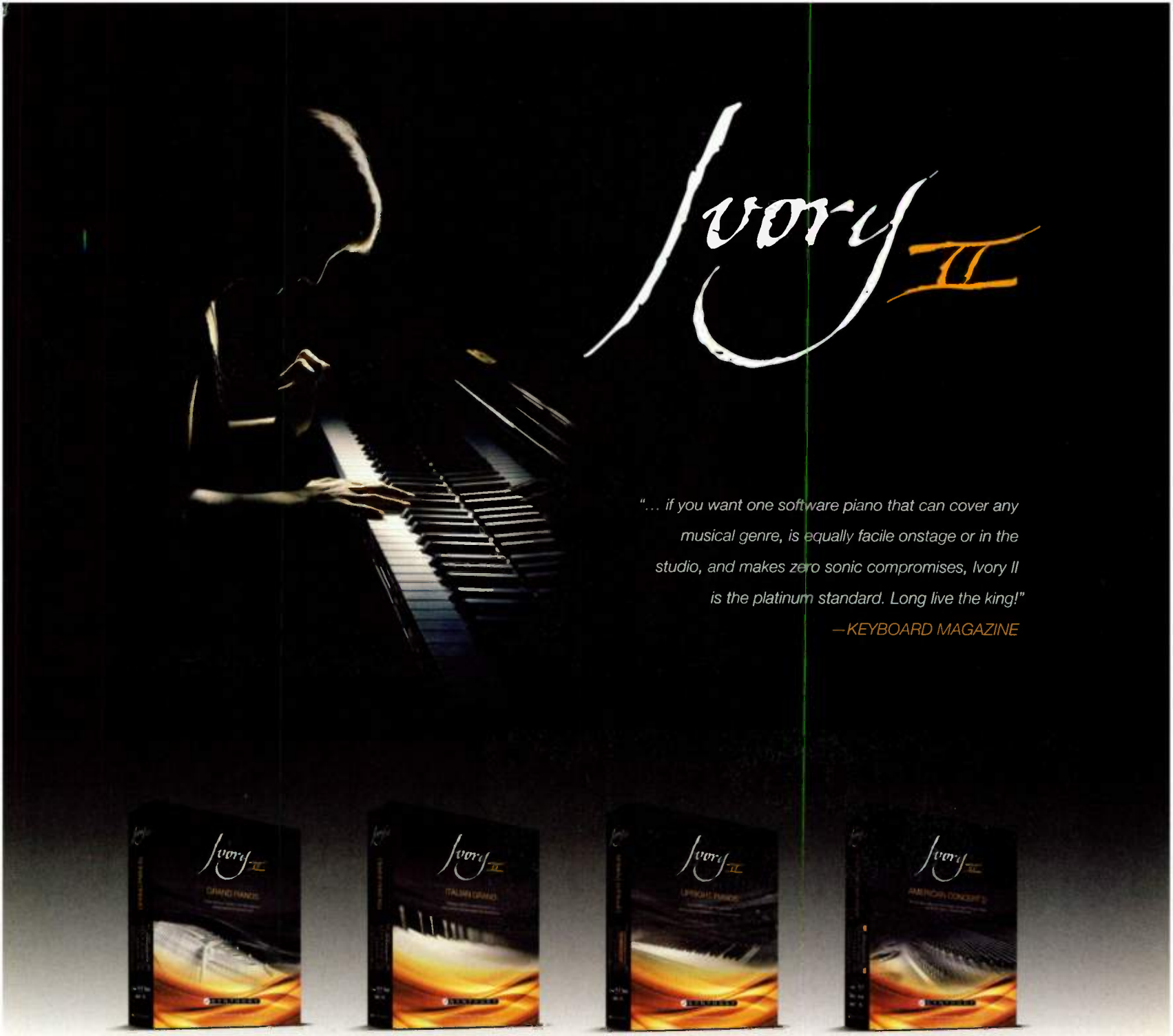

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says Snap to Bar. This creates a new measure exactly where I want the music to begin, which in this case is where Vince takes his first step. The time signature—in this case, 4/4—changes to italics because you are not in Snap to Grid mode. From here on out, the other measures follow from that starting point until I institute another change.

Now I can try different musical ideas against the tempo. In this case, to match his gait, I build a piano part that has the feel of a Raymond Scott piece.

As Vince slips on a banana peel, I determine that a bar of 7/16 in a slightly slower tempo covers his somersault. From there, I return to the original time signature and tempo once his foot hits the ground again. To make this transition work, I insert a 7/16 measure using the Meter Change dialog box within the Tempo Ruler, immediately followed by a change back to 4/4. To change the tempo, I select across the 7/16 section and use the Trimmer tool to slightly lower the level of the tempo line (see Figure 11).

Throughout the 4/4 part, I have added a jazzy swing to the piano part.

As I develop the rough piano part, I decide to add 3-note chordal stabs and melodic fills to underscore the humorous onscreen action (in this case, calamities taking place with the folks Vince passes on the street). To keep track of the hit points, I place Memory Location markers by placing the cursor when I want to set a marker, then hitting the Enter key on my numeric keypad. A dialog box opens, letting me name the marker. The name will appear next to the yellow triangluar Memory Location marker above the timeline.

Once I have placed and named the Memory Locations, I open the Memory Location window (under the Window tab or by typing command/control-5 on the numeric keypad). Now I can click on the name of a Memory Location in that window and the curser will jump to that marker so that I can play the session from that point.

After placing markers to determine the exact hit points, I can complete the sketch using MIDI sounds for the piano and percussion.

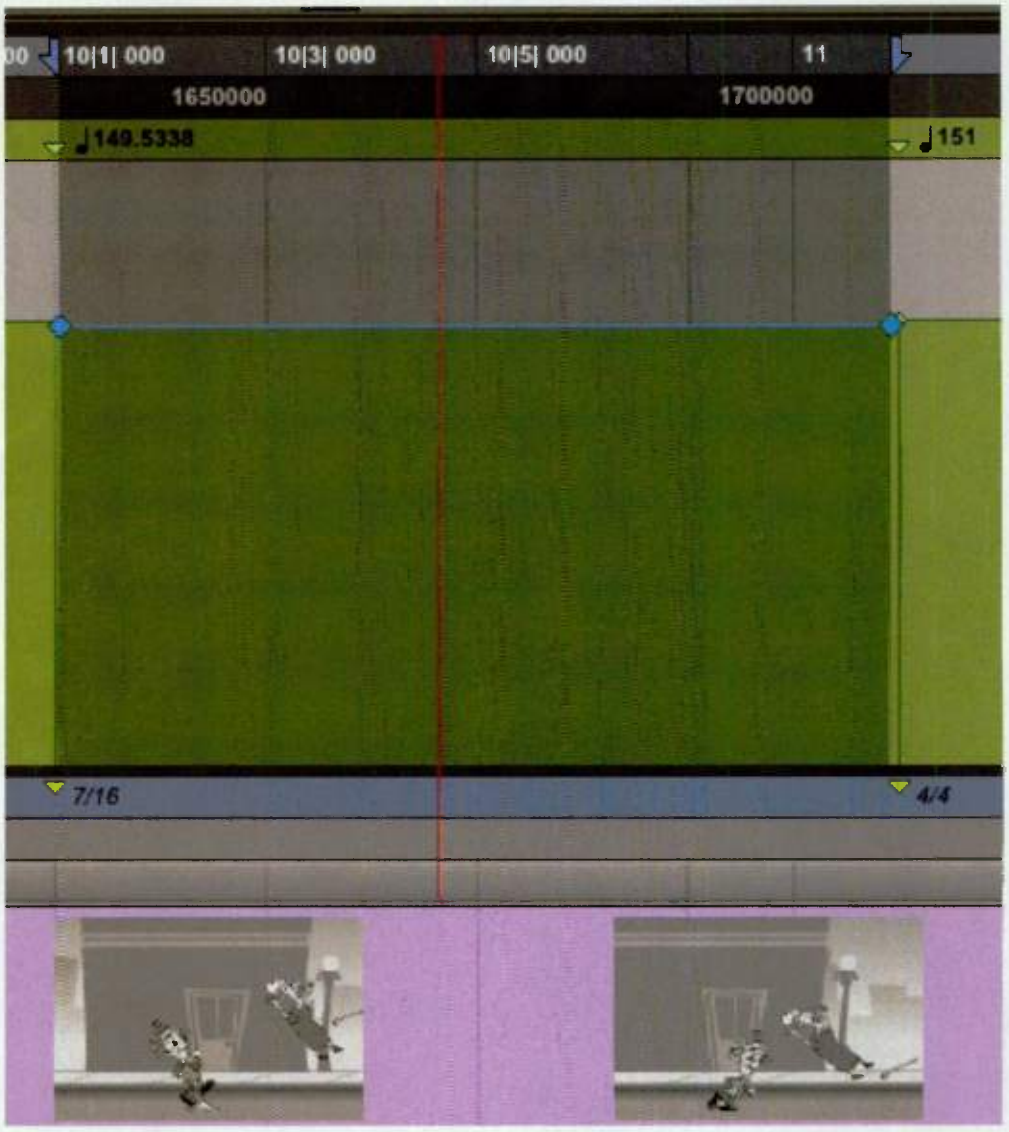

Fig. 11. Trimming tempo.

Ochestration Time Now it's time to expand the orchestration using virtual instruments, which I will later replace with live musicians. For this project, I used Propellerhead Reason as the source of the instruments for my virtual orchestra—violin, trumpet, alto saxophone, and trombone—using ReWire to slave the sounds to my Pro Tools session. In this case, a benefit to using Reason is that it isn't very CPU intensive, so my session plays back easily as I add musical parts to my sketch within Pro Tools.

Now I can take the 3-note chord stabs from my original MIDI piano part and re-distribute them among my virtual instruments. I begin by giving the top notes to the violin, and copying and pasting them to the violin's instrument track. Then I do the same with the middle notes of the chords, which go to the trumpet track. The bottom notes are copied to the alto sax part. Next, I re-quantize the orchestral part with 77% swing to match the piano part, and then delete those pitches from the piano part so that there are no doubled notes.

I decided to double the piano's left-hand part with an upright bass patch; to do this, I simply select the entire MIDI track from that part of the piano roll and paste it into the bass track. Then, I use the Trim tool to lengthen the MIDI notes of the bass so that they are more audible when combined with the percussive piano part. This adds to the Raymond Scott-like sound I'm looking for.

Export the MIDI Data Once the musical sketch is complete, I export the MIDI parts to Sibelius, the full-featured notation software where I can convert the raw notation into readable charts for the musicians.

Select the tracks you want to convert to notation, then open the Score Editor window (accessed by choosing Window>Score Editor). In this case, I have selected the violin and winds. By default, each MIDI track is displayed as a grand staff, as if it were a keyboard part, so I need to reconfigure the staves to fit each instrument: On the left hand side of your Score Window,

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go under the Tracks window (see Figure 12) and select Notation Display Track Settings (see Figure 13).

Select the proper clef and staff for each instrument, which will be reflected in the score. The score will reflect concert pitch for all instruments, and once the score is exported to Sibelius, instruments that need to be transposed will be transposed automatically.

Now I can export the data to Sibelius and clean it up further to make it presentable. Under File, I choose Export>Sibelius, then select a place to save the document where you will be able to easily find it.

Cleaning up the Score Because I deselected Snap to Bar in the Meter Change dialog earlier in the project, the exported score will have some truncated measures that don't accurately reflect what I want the musicians to see. To correct this, I create a duplicate score with accurate measures and time signatures, and then copy the data from the exported score.

I copy the first measure up to the point where a truncated measure appears. Once I paste it into the new document, I will change the rhythmic values of the last bar to fit into the time frame that I want for the musicians. I do this for each section of the score as needed.

Once that is done, I can place the tempo markings. To do this, go to Create>Text>Tempo, then control-click and select the tempo for each section. For the sections where I used a swing feel in the Pro Tools session, I need to alter the notation in order for the rhythmic values to be accurately portrayed. In Sibelius, this is referred to as a metric modulation.

Start by going to the Create menu>Text>Other System Text>Metric modulation. Now control-click to get the window of modulation options. In this case, I select the one showing a pair of barred eighth notes next to a quarter-note-plus-eighth-note triplet. Once that is positioned in the appropriate place, I manually clean up the notation. (An easier way to do this would be to duplicate the MIDI tracks with swing eighths in Pro Tools and straighten out the timings so that they appear as straight eighths when you export them.)

From there, I can check out the individual parts and see how they look before printing them.

Fig. 12. The Tracks window.

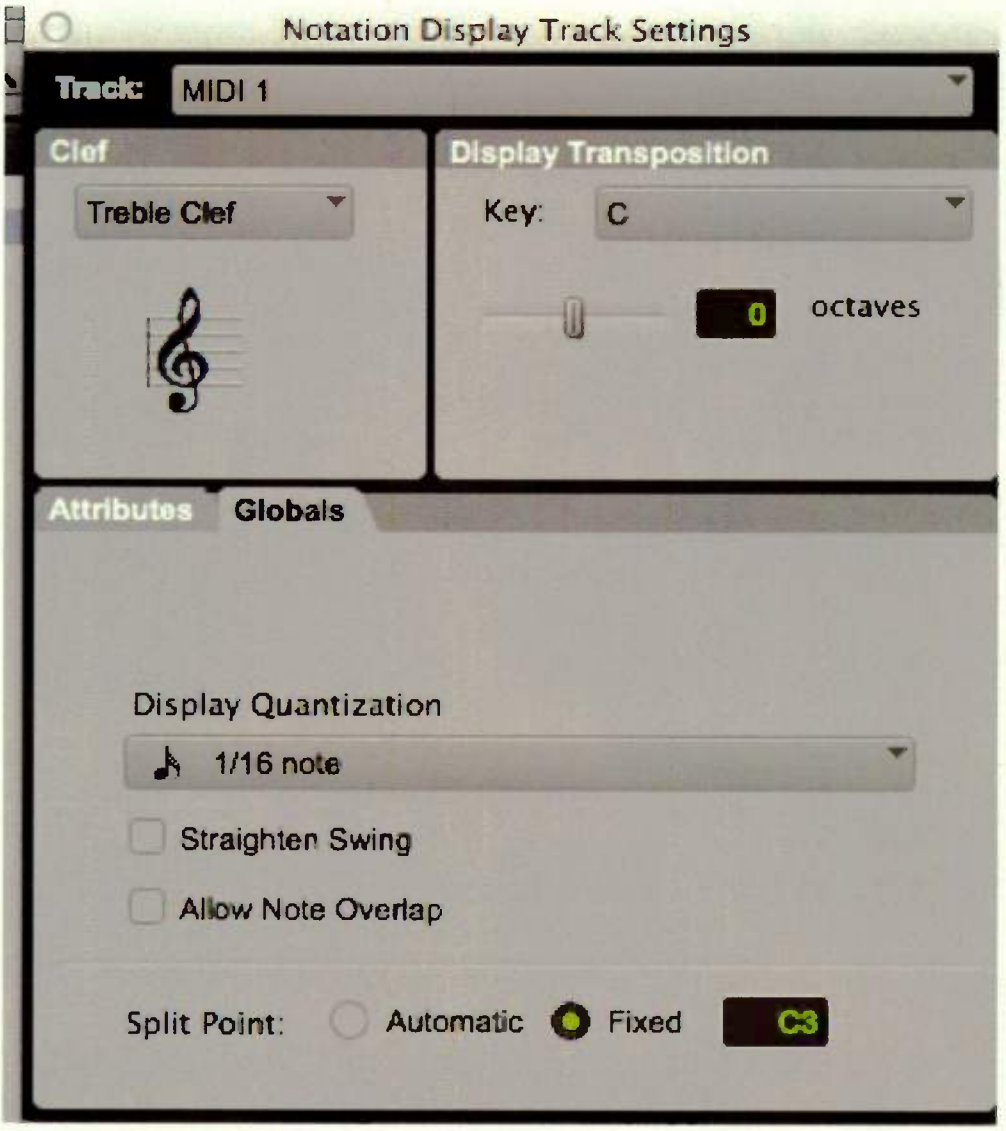

Fig. 13. Selecting Notation Display Track Settings.

Recording Parts, Mixing, and Exporting a Quicktime File I prepared and printed the parts that I've designated for recording with live musicians, and hired a violinist (Alisa Rose), a trumpet player (Chris Grady), an alto saxophonist (Sheldon Brown), a trombonist (Andy Strain), and a drummer (John Hanes) to replace their equivalent MIDI counterparts.

I had the horn players play most of their parts together; it really helps the final result

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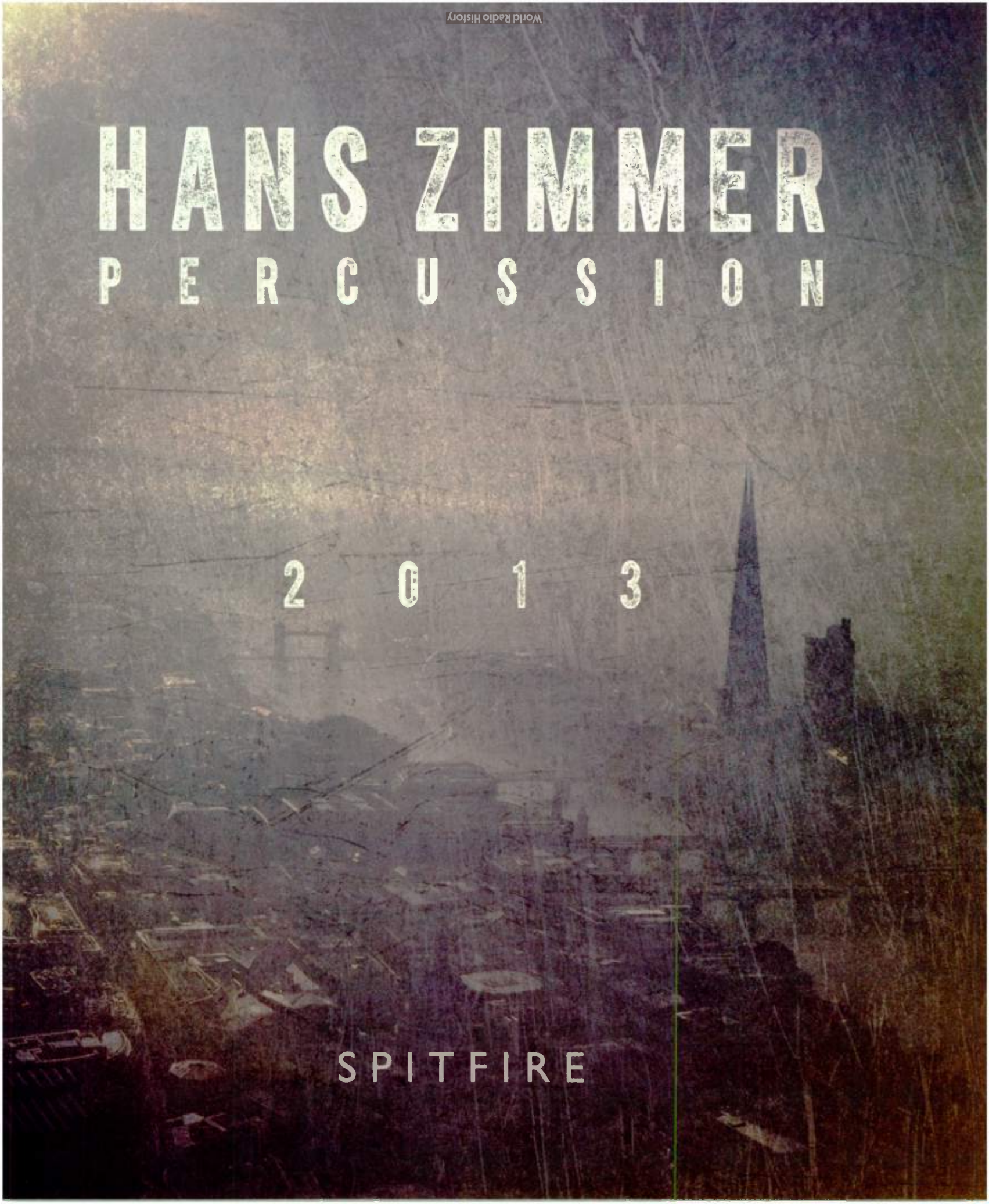

come off as a well-rehearsed ensemble when the musicians can practice articulations and dynamics together. Alisa and John came in seperately to record their parts.

Microphones are up, levels are set, and once I've played the arrangement for the musicians, we begin tracking. Sometimes players will want to hear their MIDI part in the headphones, but most of the time, they don't. Once they know what to play, they are usually better off listening to themselves and other live players. It's more musical, and that's the reason that I decided to use live musicians in the first place. For me, some MIDI instruments—the upright bass, the piano, etc.—will sound fine, and when combined with the magic touch of skilled human interpretation, these MIDI tracks take on a new life.

When everyone was done tracking, I began mixing. At this point, I made the decision to add sound effects to underscore some of the action of the video. Because I wanted to have a clean session with just the music, I mixed the audio first and opened up a new session with the final stereo mix and some extra tracks for sound design.

File>Import Audio (see Figure 14) will open up a browser window where you can navigate to your sound effects libraries and copy them to your session. (Do not just "add" them to your session unless you don't want them to show up the next time you open up your session.)

Then you can move your sound effcts along the timeline until they sync with the action you wish to underscore (see Figures 15 and 16).

Once you're done mixing the sound design with the track, the last step is exporting the movie to a QuickTime (.mov) file by selecting the region in your edit window that you wish to create your movie from, and going to File>BounceTo>QuickTime Movie. You may want to use QuickTime Pro to adjust the resolution of the movie to make it web ready, but in most cases, YouTube prefers the high-res version, and will compress it on that end. When delivering to clients, find out their requirements and accommodate them appropriately. You can check out the final result, in its entirety, at emusician.com.

This was a really fun scoring project, and the musicians had a great time working on it.

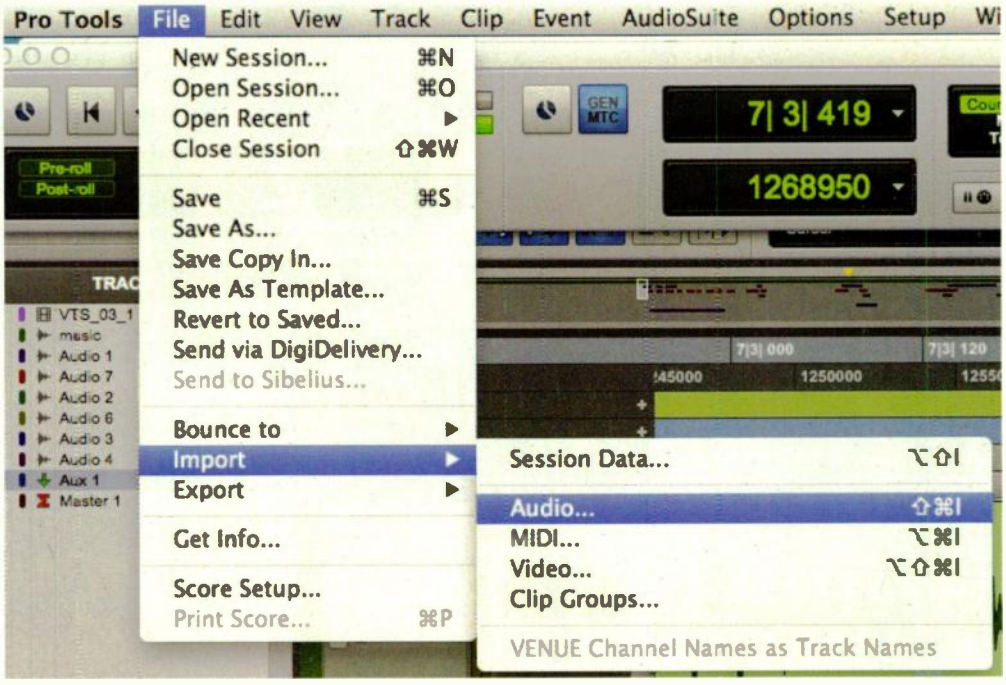

Fig. 14. Copying effects libraries into your session.

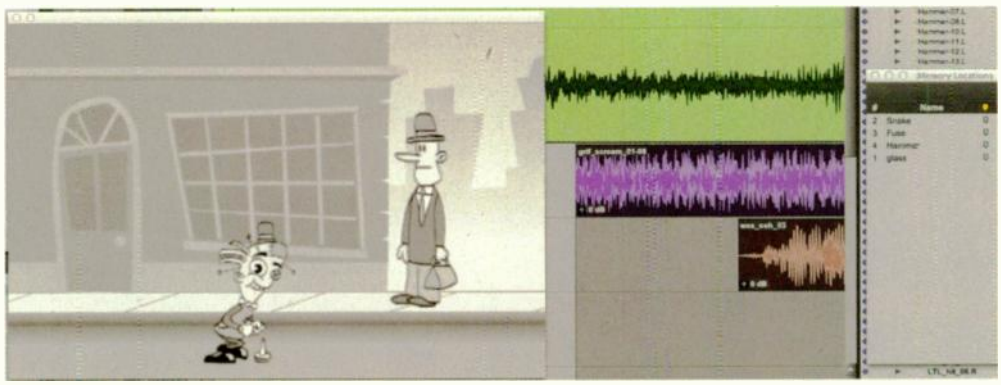

Fig. 15. Syncing sound effects.

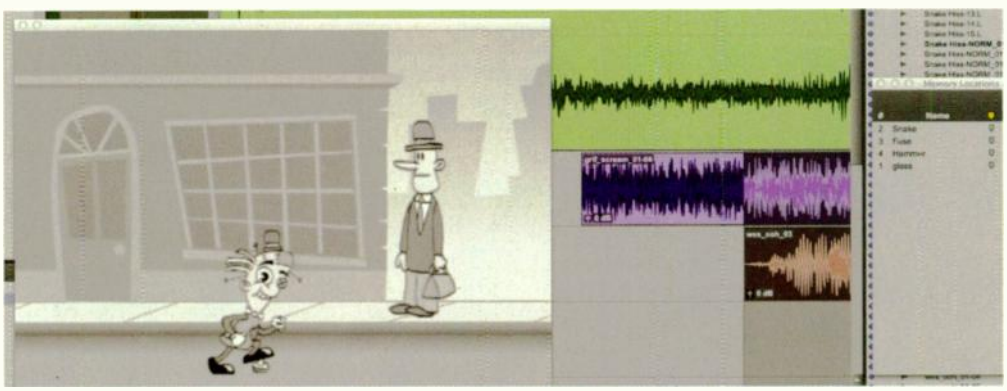

Fig. 16. Sound effects are now synced.

Adding real performers to music created in a MIDI environment can really breath life into your score. Now you're armed with the tools to try this yourself, so take the leap! ■

Steve Kirk is a composer whose work has been featured in TV, film, and video games. He owns and operates Steve Kirk Pop Studios in Oakland, CA, and teaches guitar and composition both privately and at the Blue Bear School of Music and Community Music Center, both in San Francisco.

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Fig. 1. The Waves Aphex Vintage Aural Exciter generates harmonics and alters the phase relationship of frequencies to produce a unique vocal sound.

Special Vocal Processors

Transform the money track by using unorthodox plug-ins

BY MICHAEL COOPER

EVERYDAY EQ and compression aren't always enough to bring a lead vocal track to life. When you need a special sauce that conventional processing can't cook up, here are a few specialized plug-ins that just might be up to the task.

Waves Aphex Vintage Aural Exciter

This gem emulates the now-rare Model 402 tube processor heard on so many hit records in the '70s. As one would expect given its name, it adds musically related harmonics to audio signals. But due to the way it alters phase relationships, it sounds very different from other exciters.

For a killer effect on hard-rock vocals, instantiate Vintage Aural Exciter on an insert slot for the track and set the plug-in to MIX2 mode (see Figure 1). As you turn up the AX MIX control, the vocal's midrange band will become increasingly more prominent and sibilance will take a nosedive. High amounts of processing (AX MIX set to 7 or above) will make it sound like the vocalist took several steps forward and is breathing down your neck. The sound's presence and color are unlike anything you can achieve using EQ.

Vintage Aural Exciter's AX mode is only supposed to be used when feeding the plug-in audio via an effects send, as that mode only passes wet signal. Break the rules: Instantiate the plug-in on an insert for the lead vocal track, switch to AX mode and crank the input control. The singer's track will sound like it's being squeezed out of a poorly tuned pocket radio!

Noveltech Vocal Enhancer

Vocal Enhancer uses signal modeling and intelligent adaptive filtering to accentuate flattering aspects of your vocal track that might otherwise be understated or completely buried. Unlike static EQ, the effect can vary highly over time. Easy to use, Vocal Enhancer lends crystalline clarity to a previously muddy-sounding vocal in the wink of an eye. Simply adjust the frequency range you want to enhance, and then boost the Enhancement control to add the effect. When cranking the Enhancement control to very high levels, I usually like to limit the high end of the range to around 4kHz in order to preclude intensifying sibilance (see Figure 2).

Fig. 2. Frequencies between 1Hz and 4.1kHz are dynamically enhanced to clarify a vocal track.

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Martin Buttrich, Grammy-Nominated Music Producer and Recording Artist

Martin's credits include remix- and production-work for Madonna, Muse, Fatboy Slim, Placebo, Tom Jones, Depeche Mode, Kelis, Josh Wink and more. He received a Grammy nomination in 2003 for a Tori Amos remix and is co-founder of German label Desolat.

electronic MUSICIAN EDITORS' CHOICE 2014

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Fig. 3. **SoundToys Radiator authentically emulates the sound of a tube mixer, producing tones ranging from subtle saturation to drastic overload.**

Because the plug-in's processing can boost the vocal's level, an automatic gain compensation (Gain Comp) function is provided. When activated, Gain Comp reduces the plug-in's output level back to unity gain and an associated gain reduction (GR) meter shows how much the plug-in's output level is reduced. (Despite the customary association with dynamics processing, level showing on the gain reduction meter does *not* indicate that compression is being applied.)

SoundToys Radiator EQ and compression can only take your sound so far when the lead vocal was recorded through a clinical, boring preamp. A good strategy here is to stop fighting your original sound and change the preamp—*after* the track has already been recorded. SoundToys Radiator makes your track sound like it was recorded through a '60s-era Altec 1567A tube mixer, which graced many early Motown hits. The effect is not subtle (unless you set it up to be)—Radiator heaps gobs of color and grit on vocal tracks.

Radiator's input and output controls each drive a separate virtual tube-saturation stage. (The Radiator bundle also includes the Little Radiator plug-in, which models the single-stage Altec 1566A tube preamp.) The two stages each add slightly different color, so I like to goose both controls a bit at once (see Figure 3). Lower the Mix control to add back a bit of the clean vocal and retain definition. For a male vocal that sounds too cloudy, try switching Radiator's mic/line switch to mic; doing so will cut the upper-bass and low-midrange frequencies up to 4dB. Then raise the Bass EQ control just a hair to dial a little low bass back in.

For a completely over-the-top vocal effect, crank Radiator's input and output controls to the max. The effect will genuinely sound like an abused mic pre overloading—great for industrial rock! ■

Michael Cooper is a recording, mix, mastering, and post-production engineer, a contributing editor for Mix *magazine, and the owner of Michael Cooper Recording in Sisters, Oregon (myspace.com/michaelcooperrecording).*

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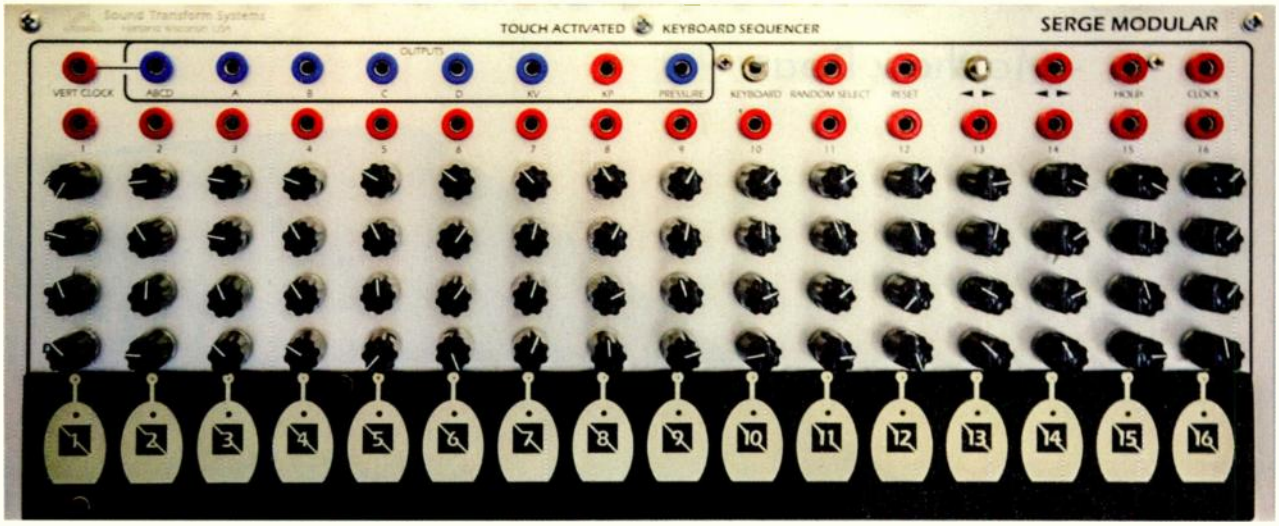

Fig. 1. The granddaddy of the modern step sequencer is the Serge TKB. Introduced in 1980 and still being built by Sound Transform Systems, the TKB has pressure-sensing touchpads and other advanced features.

Step Sequencing Basics

Vintage hardware leapfrogs into the 21st century

BY JIM AIKIN

MECHANICAL DEVICES that can play hands-free music have a long history—the player piano, for instance. When analog synthesizers took the music world by storm in the 1970s, the tool of choice for automating patterns of notes was the step sequencer.

Compared to MIDI sequencing, step sequencers may seem primitive. But today's models can do some surprisingly sophisticated tricks. In this article we'll introduce the concepts behind step sequencing and look at a few of the modern variations.

Some digital music systems, such as Propellerhead Reason, include step sequencers. Without getting into the pros and cons of software emulations, we'll concentrate on the real thing—hardware step sequencing as found in a modular analog synthesizer.

Baby Steps The frequency of an analog oscillator is increased or decreased by changing the level of the *control voltage* being sent to it. In most systems, increasing the voltage by one volt boosts the oscillator's pitch by an octave.

On a step sequencer, you'll find one or more rows of knobs (see Figure 1), usually with eight or 16 knobs per row. For each row, there's a voltage output. In use, the sequencer steps along the row or along the columns of knobs, one knob or column at a time. At each step, the voltage level set by a corresponding knob is sent to that row's output. The output can be patched to the CV input of an oscillator. Each time the sequencer selects a new knob, the frequency of the oscillator changes, producing a new musical pitch.

When the sequencer reaches the last knob in the row, it hops back to the other end, and the pattern of pitches repeats. If there are three rows, the three knobs in each column can be adjusted so that the oscillators receiving their voltages will play the notes of a chord. The voltages can be used for other purposes too, such as changing the filter cutoff frequency or the attack of a voltage-controlled envelope generator.

An incoming signal tells the sequencer when to step forward to the next knob. This signal is called a clock, trigger, or gate. Typically it's a sharply rising voltage, such as the leading edge of a square wave coming from an LFO (low-frequency oscillator). The sequencer senses the edge of the square wave and responds by moving to a new step.

Generally, the clock signal is also used to gate one or two envelope generators. These will control the filter cutoff frequency and/or the level of a VCA (voltage-controlled amplifier), thus giving a musical shape to the sequencer's series of pitches.

That description would fit the sequencers of the 1970s, as used by groups like Tangerine Dream to produce hypnotic soundscapes. But an endlessly looping set of eight or 16 notes can get boring pretty quickly. So let's spice things up.

Making it Musical Rather than let the LFO that is providing the clock signal cycle at one tempo, use one of the sequencer's row outputs to control the frequency of the LFO. The pattern of notes will still repeat endlessly, but now some of them can be longer or shorter than others, creating a rhythm. For irregular, non-repeating rhythms, the LFO frequency can be controlled by a different voltage source, such as another LFO.

Some sequencers have a CV input for up/down direction. When this input is receiving a high voltage, the sequencer will step backward rather than forward. By sending this input a signal from a different LFO, we can get a "two steps forward, one step back" pattern. This is more interesting than a static pattern, and the pattern will continue for more than eight or 16 steps before repeating.

Another CV input, when it receives a high voltage, will cause the sequencer to reset to step 1 on its next step. This can shorten the pattern sometimes, but not always, again producing a more interesting and varied phrase. If the sequencer has a touchpad for

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each step, it may be able to reset to the most-recently touched step rather than always jumping back to step 1. Touching and holding a pad will cause the sequencer to stop advancing and hold that step until you lift your finger.

When a sequencer with touchpads isn't receiving a clock signal, it becomes a rudimentary keyboard. Each time you touch a pad, the voltages from the knobs directly above that pad will be the ones sent from the row outputs. Because voltages are general-purpose control signals, the knobs can be used for whatever you like—changing the rate of an LFO or the speed of an envelope generator's attack or decay, for example. Such keyboards aren't velocity-sensitive, but even so, they can be used for expressive performances.

Fig. 2. The two Pressure Points modules in the lower row (built by Make Noise), together with the narrow Brains module to their left, form an eight-step sequencer with touchpads. Above the Pressure Points is a Trigger Riot from Tiptop Audio, a digital module that produces rhythmic trigger/gate signals for analog sequencing.

On some sequencers, each column of knobs is associated with its own gate output. When the sequencer is on a given step, it sends a high voltage to that step's gate output. This signal can trigger an envelope generator, so some of the steps can sound different from others. The envelope might open up a subsidiary VCA, for example, sending a modulation signal to the oscillator to change its tone.

Getting an analog sequencer to play in tune is a challenge, because the knobs can make fine adjustments: They're not stepped. A module called a quantizer makes it easier to produce standard musical scales. This receives the output of a sequencer's knob row and adjusts it up or down to the nearest 1/12 volt. With oscillators built to the one-volt-per-octave standard, the quantizer will ensure that the sequencer's output is in tune.

Giant Steps The future of analog modular synthesis looks good. Many small companies are building visionary new modules, including a few that interface with a computer in novel ways. Though step sequencers were once considered an obsolete technology, today it's clear they're here to stay. ■

Jim Aikin has written hundreds of product reviews and tutorials for Electronic Musician *and other magazines over the course of more than 30 years. His books on music technology include* Power Tools for Synthesizer Programming *(Hal Leonard Publishing) and* Csound Power! *(Cengage Learning).*

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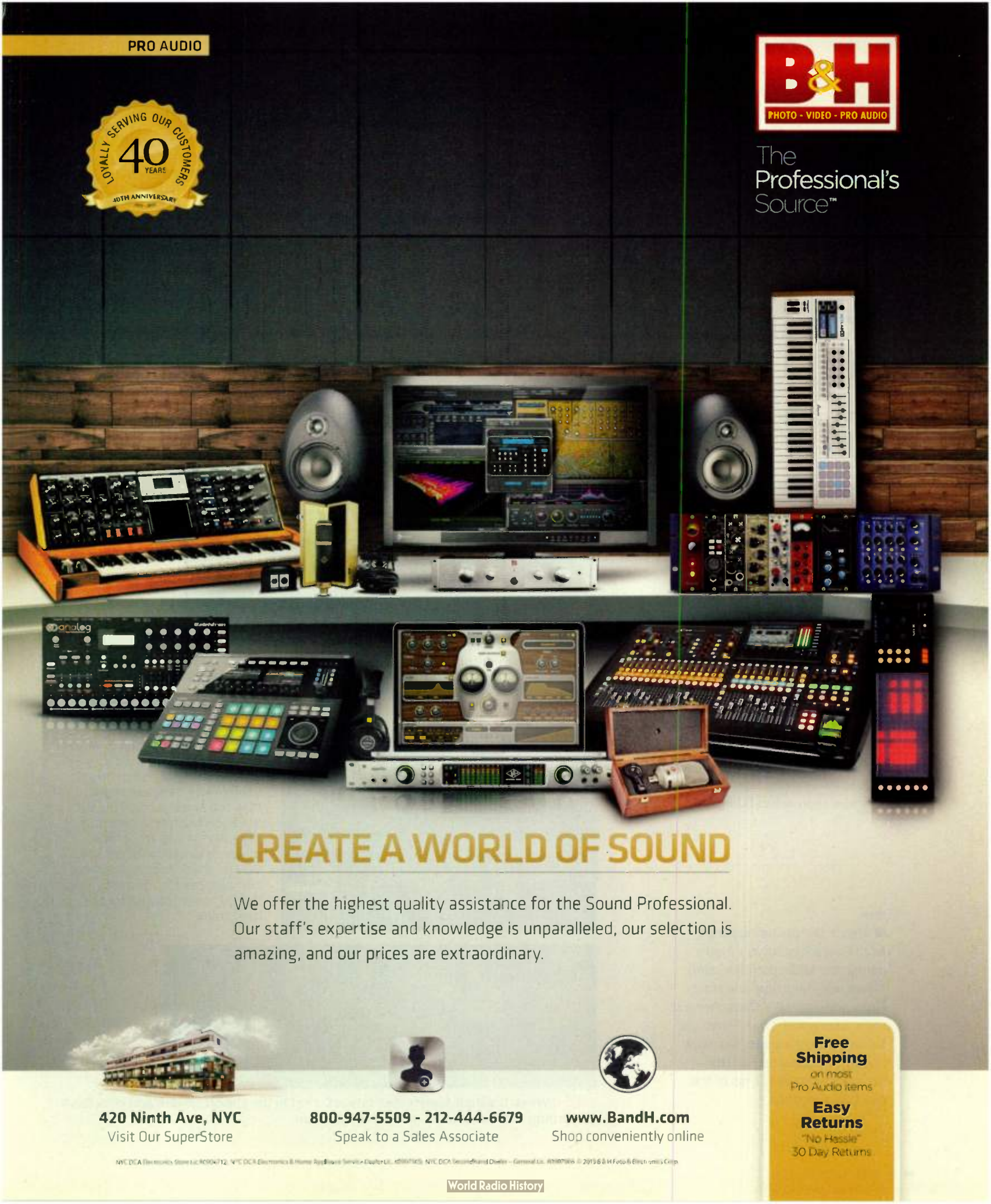
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Mixed In Key Flow 1.1

Mix and record a DJ set with little to no experience

BY MARKKUS ROVITO

OBJECTIVE

Record creative DJ sets for promotion, podcasts, or just for fun.

BACKGROUND

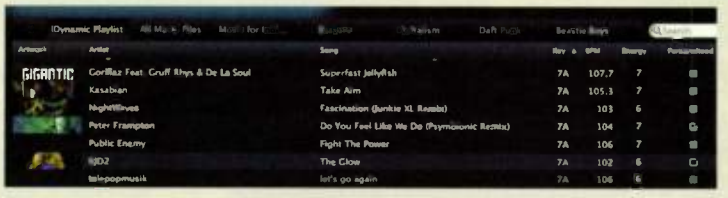
Mixed In Key made its name on track-analysis software that determined an audio file's key, so DJs could choose music that was harmonically compatible. The new Flow DJ software leverages that specialty, along with tempo and "Energy" analysis to suggest songs that would sound good mixed together. The simple software uses three screens—Preparation, Play, and Export—and breaks songs into Segments that you can easily string together seamlessly as a truly new approach to DJing.

TIPS

■ Step 3: Before mixing songs from Flow's Play screen, map a connected MIDI controller using Flow's easy MIDI map assistant. Go to Settings>MIDI Controller and click "Customize it now." Then just follow the instructions. You need about 12 knobs and 16 buttons on your controller to map all the available functions.

Step 1 In the Preparation screen, use import buttons to bring music into the Flow library from iTunes or your desktop. Flow analyzes songs for tempo, key, and energy level.

Step 2 Double-click a song in the browser to open it for preparation. Create, delete, or move markers to create Segments, which Flow uses to mix between tracks or within a single track. Mark a song as Personalized when finished.



Step 3 In the Play screen, double-click a track to load it to a deck. The Dynamic Playlist searches your library and shows songs that are the closest in key, tempo, and energy as suggestions for the next song. Double-click one to load it to the second deck.

Step 4 Start playback of one song, and click around the different Segments to mix seamlessly between them. Play the second track using the Sync button to keep it in time. Do simple crossfade mixes or experiment with the EQ and track volume for more complex blends. Repeat using the Dynamic Playlist for the next track.

Step 5 When finished, select your latest DJ set in the Export screen and click Save Recording to Disk to name and export your set.

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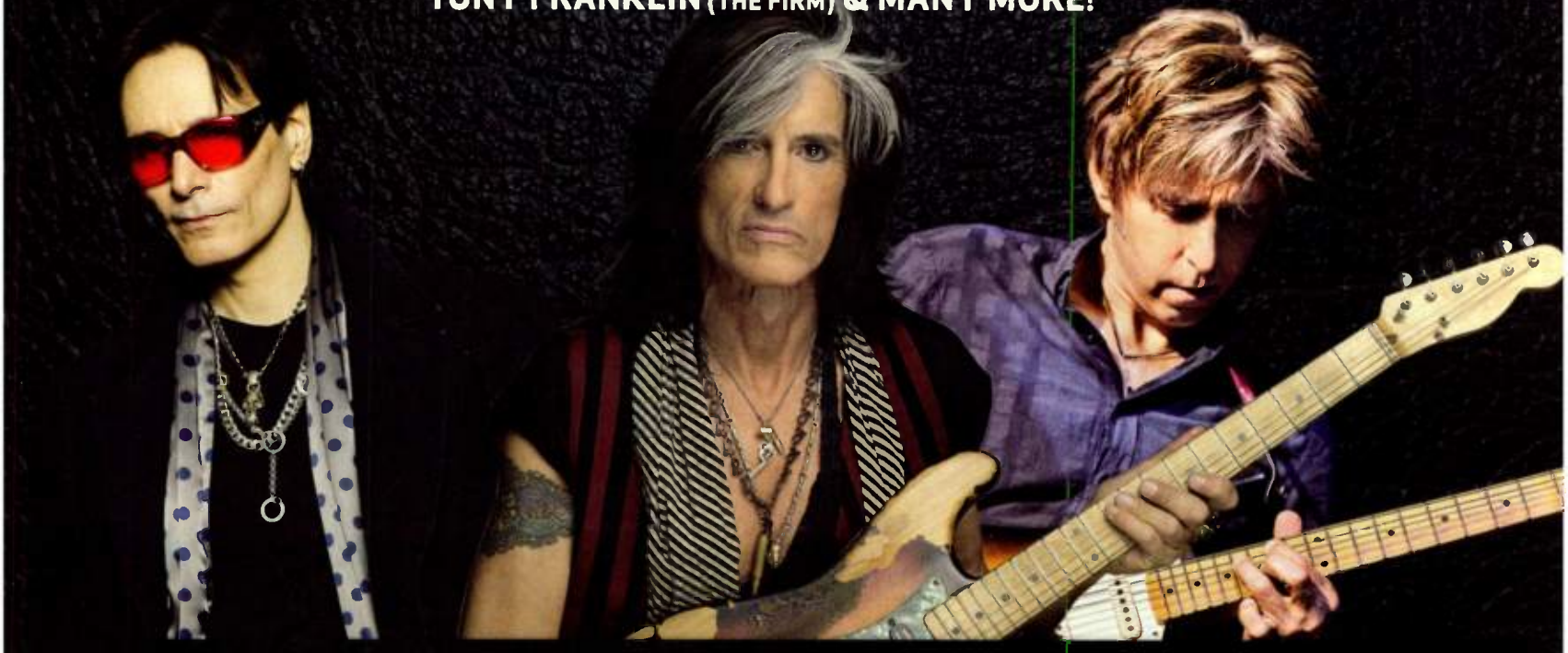

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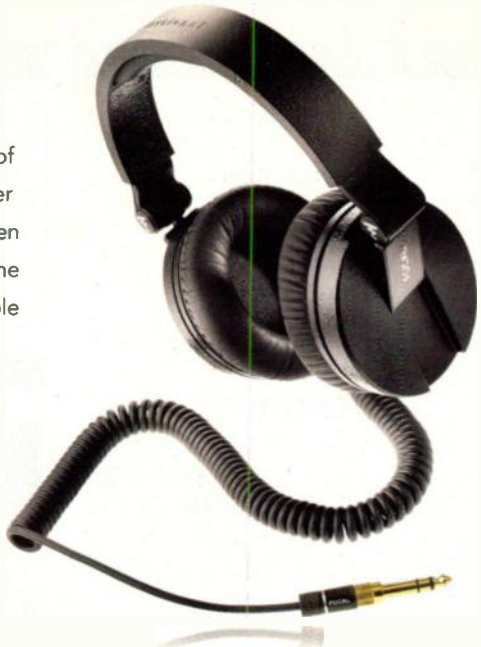

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Five (Belated) New Year's Resolutions for Musicians

The Times Square ball has dropped, the confetti's been swept up, and it's time to think seriously about New Year's Resolutions for 2014. But if a month has gone by and you're still too hung over to think, no problem—here are five "preset resolutions" that are ready to rock!

BY CRAIG ANDERTON

1

Don't say something is "da bomb." Especially when you're at an airport. You might not want to say it on the phone, either. Come to think of it, you probably don't want to say it at all—your laptop and TV are listening. So is your neighbor, who's always suspected your "musician" gig is just a cover for something involving North Korea or possibly, illegal dachshunds. Plus, "da bomb" is dorky.

2

Resolve to write better music. Note that this doesn't mean the same thing as it does in pop music, where writing "better" music means "steal from *more obscure* sources, preferably involving artists who are dead and therefore will not hire lawyers."

3

Clean your computer keyboard. Seriously. Turn your keyboard upside down and see what falls out—if you dare. You'll see the carcasses of small insects that may be extraterrestrial in origin, hair (hopefully yours), more dust variants than science can classify, moldy crumbs from the pizza that gave you food poisoning back in July . . . actually, on second thought *don't* clean your keyboard. Burn it and buy a new one.

4

Back up your data religiously. By "religiously," I don't mean praying to the Computer Gods. That's not enough! You need to perform *sacrifices* to the Computer Gods. If you don't, the Computer Gods will choose their own arbitrary sacrifices, like a hard drive or two. Nearby lightning strikes that take out motherboards are popular, too. The Computer Gods are not benevolent gods.

5

Finish your songs, dammit! Make a pledge to defeat "DAW's Syndrome," in which patients believe in the importance of making never-ending, inconsequential changes to music. As spokesman Axl Rose states, "It took 10 years and millions of dollars, but I finally beat DS. Sadly, Dr. Dre has succumbed, and we may never hear the album *Detox* that he started in 2001. Please, give generously to 'Artists Against DS.' And remember, *put down that damn mouse!*"

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