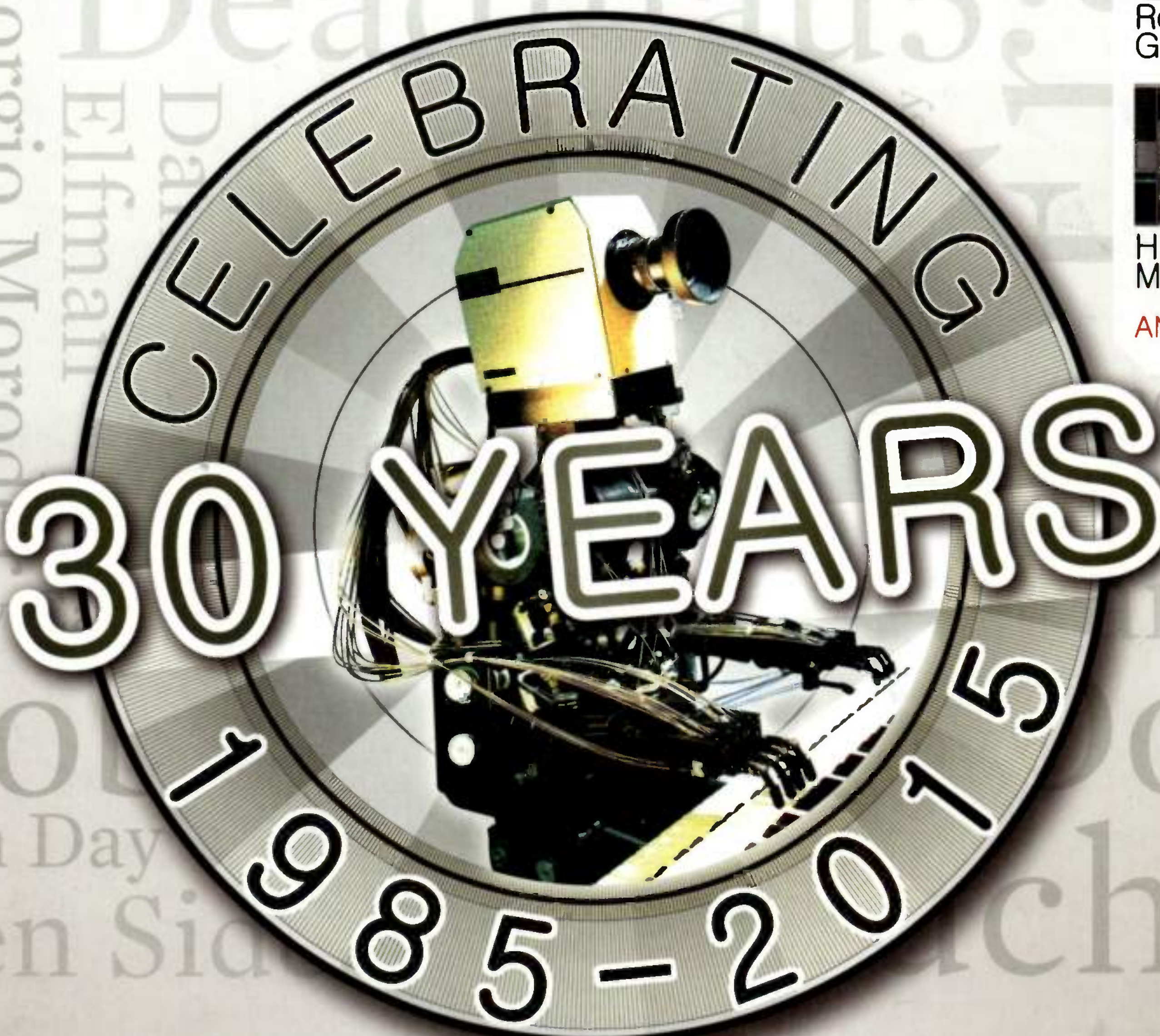
electronic
MUSICIAN

RECORD · PRODUCE · PERFORM



REVIEWS

MOTU Digital Performer 9

Roli Seaboard Grand

Harrison Mixbus 3

AND MORE!

OF INTERVIEWS

S —

N CONTROLLERS

E OF MIDI

USIC EARNINGS

Deadmau5 Giorgio Moroder Elfman Green Day Roger Linn Oberheim and more

$5.99

A MUSIC PLAYER PUBLICATION

Pioneer

PROFESSIONAL AUDIO

PIONEER XY SERIES

INCREDIBLE SOUND QUALITY, VERSATILITY, AND DURABILITY

The Pioneer Pro Audio XY Series is a versatile, passive PA and monitor speaker series that is compact in size and perfect for near-field monitoring – yet can deliver high-quality sound to all corners of a room. The XY Series boasts multiple installment options for easy set up and powered by Powersoft's high-performance K-Series amps with built-in DSP. Available in black or white options to match venue.

VISIT **WWW.PIONEERPROAUDIO.COM** TO LEARN MORE ABOUT THE XY SERIES AND THE ENTIRE PRO AUDIO PRODUCT LINE INCLUDING THE GS-WAVE SERIES AND STUDIO MONITOR SERIES.

PIONEERPROAUDIO.COM

PIONEERPROAUDIO

Korg Electribe and Electribe Sampler

These hot devices are primed for modern music production. With Electribe, you can construct 16-part arrangements, synchronize with other Korg instruments, and even export your productions as an Ableton Live set. The Electribe Sampler provides a powerful sequencing environment with cutting-edge effects and outstanding live performance potential. A collection of drum sounds and loops is included.

PreSonus Studio One 3 Pro + **UA** Apollo Twin DUO

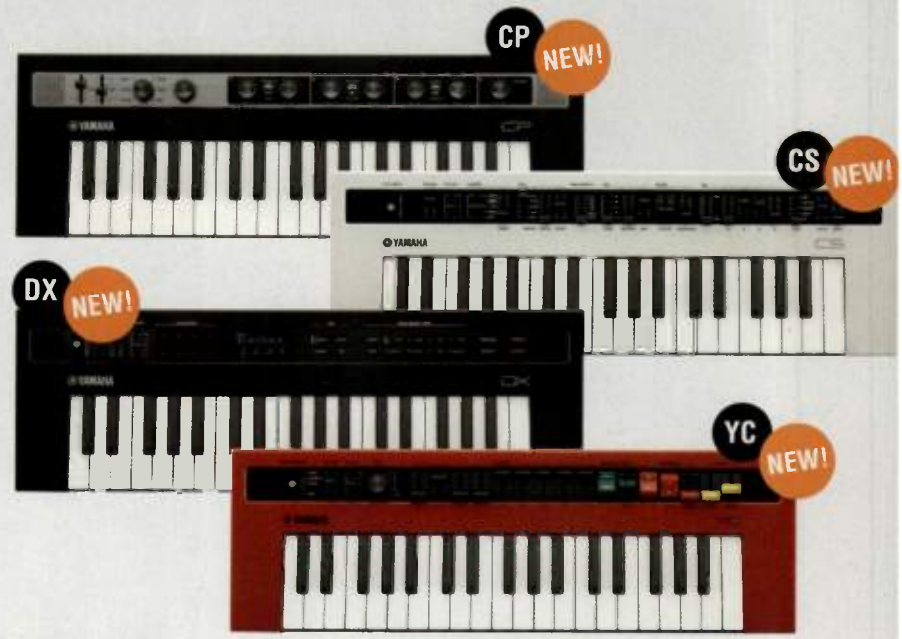
This potent combination will help you capture and polish your creations. Studio One 3 Professional presents an elegant single-window workspace with robust drag-and-drop functionality and smart, intuitive features. The Apollo Twin DUO is a world-class interface with built-in UAD processing that lets you take advantage of the rich, warm, analog sound of UAD Powered Plug-ins during mixdown.

Arturia BeatStep Pro

For anyone who prefers the hands-on experience of hardware sequencing, the BeatStep Pro is a dream come true. It offers two independent sequencers, each with 64 steps per sequence. An onboard 16-track drum sequencer allows real-time recording and old-school step sequencing available.

Novation Launchpad Pro

The Launchpad Pro offers a simple way to create dynamic, expressive performances in Ableton Live. Its velocity- and pressure-sensitive RGB pads light up to match the color of your clips, so you can easily control your performance. Drums spread across the whole grid, while instruments illuminate as a chromatic keyboard, making it easy to create beats and play notes, melodies, and chords.



Yamaha Reface

Based on Yamaha's most famous keyboards such as the DX-7, the CS-80, the YC organs, and the CP pianos, the Reface series brings classic electronic sounds to a new generation of musicians. Battery powered with built-in stereo speaker systems, you can take your sounds anywhere!

Pro Audio ■ Recording ■ Mixers ■ Monitors ■ Microphones ■ Guitars ■ Keyboards ■ Drums ■ Live Sound

0% INTEREST FOR 24 MONTHS*

On purchases of select manufacturers' products made with your Sweetwater Musician's All Access Platinum Card between now and November 30, 2015 – 24 equal monthly payments required.

*Offer applies only to single-receipt qualifying purchases. No interest will be charged on promo purchase and equal monthly payments are required equal to initial promo purchase amount divided equally by the number of months in promo period until promo is paid in full. The equal monthly payment will be rounded to the next highest whole dollar and may be higher than the minimum payment that would be required if the purchase was a non-promotional purchase. Regular account terms apply to non-promotional purchases. For new accounts: Purchase APR is 29.99%; Minimum Interest Charge is $2. Existing cardholders should see their credit card agreement for their applicable terms. Subject to credit approval.

Moog Sub 37 Tribute Edition

A stage performer's synth all the way, the Sub 37 Tribute Edition is also the first Moog synth in over 30 years that has more than one note of polyphony. Its all analog nature offers everything you love about Moog — fat bass, smooth leads, and undeniably rich and dimensional sound.

Toontrack EZdrummer 2 + EZX Packs

Toontrack EZdrummer 2 provides musicians, composers, and producers like you with the means to add realistic drums to your tracks. It's three tools in one: a phenomenal drum and percussion instrument with over two dozen available expansion packs, an extensive library of MIDI grooves, and an environment that lets you combine these elements to create perfect drum tracks for any style of music.

Roland JD-XA

The quest for a super-creative, no-compromise synth stops here! The JD-XA analog/digital crossover synthesizer gives you an all-analog synth engine with true analog filters and a direct dry output. On top of that, you have a digital engine powered by Roland's SuperNATURAL technology, along with a broad selection of incredible effects.

Native Instruments Komplete Kontrol S49

Take command of your Komplete instrument collection like never before with the Komplete Kontrol S49. This unique controller interfaces directly with your NI Komplete instruments, making it astonishingly easy to navigate through NI's tag-based preset system, find the sound you want, adjust parameters in real time, and create music in your favorite DAW.

11.15
electronic MUSICIAN

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ANNIVERSARY SPECIAL
30 YEARS OF INTERVIEWS

Highlights from three decades of conversations with artists, producers, and technology innovators.

DEPARTMENTS

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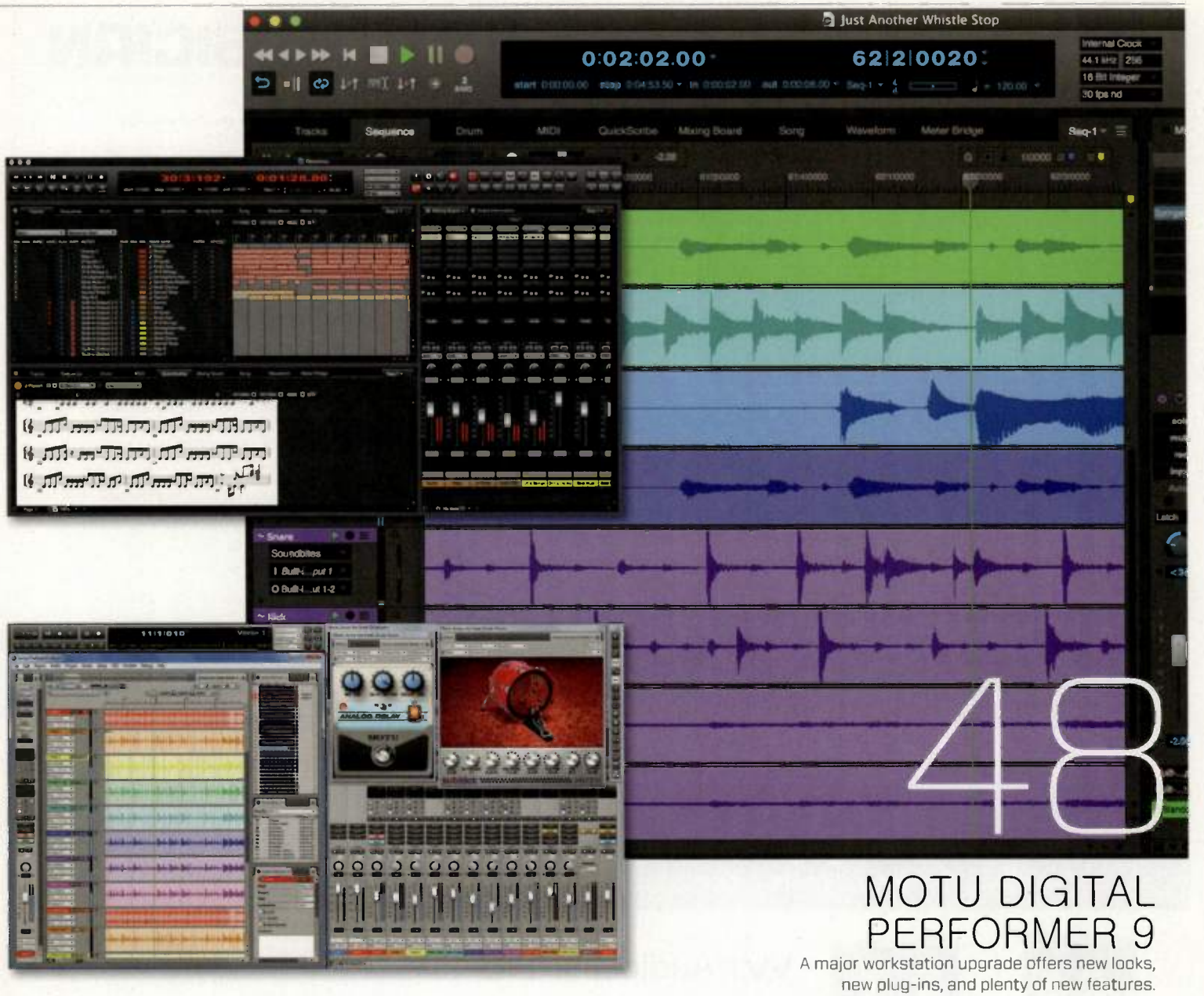
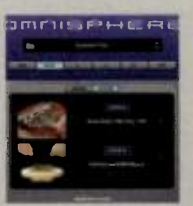
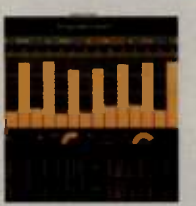


MOTU DIGITAL PERFORMER 9

A major workstation upgrade offers new looks, new plug-ins, and plenty of new features.

GEAR REVIEWS





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EDITORIAL DIRECTOR Michael Molenda
mmolenda@nbmedia.com

EDITOR Sarah Jones
sjones@nbmedia.com

TECHNICAL EDITOR Gino Robair
gino@ginorobair.com

MANAGING EDITOR Barbara Schultz
bschultz@nbmedia.com

CONTRIBUTORS
Michael Cooper, Marty Cutler, Steve La Cerra, Mike Levine, Emile Menasche, Ken Micallef, Lily Moayeri, Markkus Rovito, Tony Ware, Geary Yelton

FOUNDING EDITOR Craig Anderton

ART DIRECTOR Damien Castaneda
dcastaneda@nbmedia.com

ASSISTANT ART DIRECTOR Laura Nardoza

STAFF PHOTOGRAPHER
Paul Haggard phaggard@nbmedia.com

ADVERTISING DIRECTOR, EASTERN REGION, MIDWEST & EUROPE
Jeff Donnenwerth
jdonnenwerth@nbmedia.com, 212.378.0466

ADVERTISING DIRECTOR, WESTERN REGION & ASIA
Mari Deetz
mdeetz@nbmedia.com, 650.238.0344

ADVERTISING SALES, EASTERN ACCOUNTS
Anna Blumenthal
ablumenthal@nbmedia.com, 646.723.5404

SPECIALTY SALES ADVERTISING
Jon Brudner
jbrudner@nbmedia.com, 917.281.4721

PRODUCTION MANAGER Beatrice Kim

THE NEWBAY MUSIC GROUP
VICE PRESIDENT, PUBLISHING DIRECTOR Bill Amstutz
GROUP PUBLISHER Bob Ziltz
SENIOR FINANCIAL ANALYST Bob Jenkins
PRODUCTION DEPARTMENT MANAGER Beatrice Kim
GROUP MARKETING DIRECTOR Chris Campana
SENIOR MARKETING MANAGER Stacy Thomas
FULFILLMENT COORDINATOR Ulises Cabrera
OFFICES SERVICES COORDINATOR Mara Hampson

NEWBAY MEDIA CORPORATE
PRESIDENT & CEO Steve Palm
CHIEF FINANCIAL OFFICER Paul Mastronardi
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VICE PRESIDENT, DIGITAL MEDIA Robert Ames
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VICE PRESIDENT, CONTENT & MARKETING
Anothony Savona
IT DIRECTOR Anthony Verbanic
VICE PRESIDENT, HUMAN RESOURCES Ray Vollmer
DIRECTOR, DEVELOPMENT AND WEB OPERATIONS: Eric A. Baumes

LIST RENTAL 914.925.2449
danny.grubert@lakegroupmedia.com

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Electronic Musician, 1111 Bayhill Dr., Ste. 440, San Bruno, CA 94066
PHONE 650.238.0300
FAX 650.238.0262
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PART VINTAGE. PART MODERN. COMPLETELY CLASSIC.

If anybody knows analog synths, it's Grammy® winner and MIDI co-inventor **Dave Smith.** And nowhere is that clearer than in his latest creation, the **Prophet-6**. Much more than a tribute to the legendary instrument that revolutionized the synth world, it's quite possibly the fattest, punchiest, modern analog you've ever laid both hands on.

The **Prophet-6** : Genuine vintage tone in a modern classic.

prophet~6 | 6-Voice Analog Poly Synth

SEQUENTIAL
www.sequential.com

Designed and built in California by
Dave Smith
INSTRUMENTS
www.davesmithinstruments.com

insight

Celebrating Three Decades

ELECTRONIC MUSICIAN launched in September 1985 as a DIY resource for musicians navigating the evolving world of technology, which at the time centered around circuit mods, coding, synth programming, and the new MIDI protocol. Since then, we've witnessed an incredible transformation in music—from the way it is created to the way it is consumed. To celebrate our milestone, we're looking back and taking stock, but mostly looking forward:

Craig Anderton kicks things off with a crash course on the evolution of music technology over the past three decades.

Barbara Schultz and I leafed through 357 issues to find the most inspiring words from the thousands of artists and innovators who have appeared in these pages.

Geary Yelton (who incidentally has contributed to *EM* since our first issue) examines the state of MIDI. Gino Robair conducts a roundtable with radical thinkers who are pushing the boundaries of the electronic instrument interface. Randy Chertkow and Jason Feehan survey the current earnings landscape, and Roger Linn considers the cultural impact of instrument design.

We're still a DIY magazine, but our focus has expanded with yours to include live performance, DJ production, and career development. But our overarching goal remains simple: to help you make better music. We look forward to our next act together.

SARAH JONES
EDITOR
sjones@musicplayer.com

electronic MUSICIAN

WEB HIGHLIGHTS

This month on emusician.com

Anniversary Special!

30 Years of Interviews: Extras and Outtakes
Bob Moog's Guide to Building the EM Theremin
Vintage Gear Reviews
Classic Ad Galleries

...and lots more!

EM at AES

Electronic Musician is celebrating its 30th anniversary at the AES show (October 28 to November 1 in New York City) by hosting an "Evolution of Electronic Instruments" panel. Join technical editor Gino Robair and leading instrument innovators as they take stock of current and proposed directions in controller technology and investigate issues that keep users from making the most of these features. They'll examine historically significant examples as well as cutting-edge controller technology in order to explore how new resources affect users.

Visit aes.org/events/139 for details.

ahead of their time?

EM Technology Predictions, Decades Later

"I believe it will be possible to buy the components of an **all-digital multitrack home studio for under $10,000** before the end of the decade."

MARCUS RYLE, KEYBOARDIST (STREISAND, CHAKA KHAN) AND EQUIPMENT DESIGNER (ALESIS HR16/MMT-8, OBERHEIM XPANDER) | JANUARY 1990

"**Every musician in the world is going to own one of these things**; count on it. A truly user-friendly digital multitrack for under $4,000. No computer interface, no learning curve, and no bizarre connections. ADAT is more than a technological innovation; it's a social force."

EM EDITORS MICHAEL MOLENDA AND NEAL BRIGHTON, ALESIS ADAT REVIEW | OCTOBER 1992

"In these days of 16, 32, and more voices, it is impossible to build a cost-effective instrument with anything but digital electronics. So, **goodbye analog** (save those Prophets-5s and Minimoogs)."

DAVE SMITH, PRESIDENT, SEQUENTIAL CIRCUITS | JANUARY 1990

"Nowadays with the use of SMPTE, most new machines will play from wherever you start the tape. So only vocals and acoustic instruments really have to be on multitrack, and will pretty soon be recorded digitally into powerful sampling devices in full anyway. Actually, **I wouldn't give multitrack analog tape recorders more than a couple of years before they're junk**, like the old Mellotrons. Charles Darwin should be alive today, he'd have a lot to say about recording studios, and rock 'n' roll in general for that matter."

THOMAS DOLBY | JUNE 1986

EM: What ideas do you have for which the hardware does not yet exist to realize those ideas?
Christopher Franke: **Everything can be done.**

TANGERINE DREAM INTERVIEW | APRIL 1986

"With so many powerful new music programs available, **the Macintosh will probably become a common sight** in recording studios."

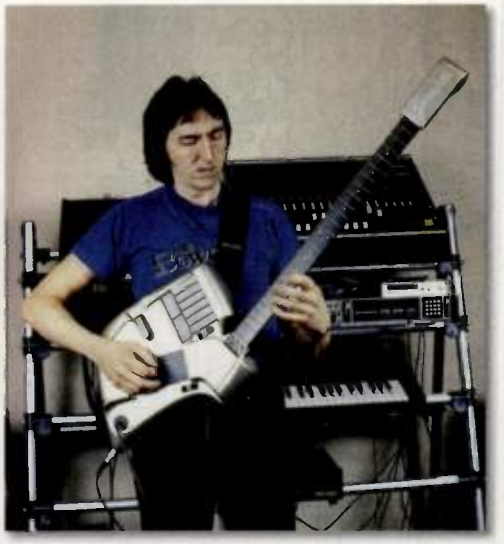
PETER GOTCHER, COFOUNDER, DIGIDESIGN | FEBRUARY 1986

"Just imagine a future in which **Web access is hundreds of times faster than it is today.** High-quality music will be easily available—and I suspect that we'll need it more than ever to soothe the savage beast in the social upheaval that will surely result from this quantum leap in information overload."

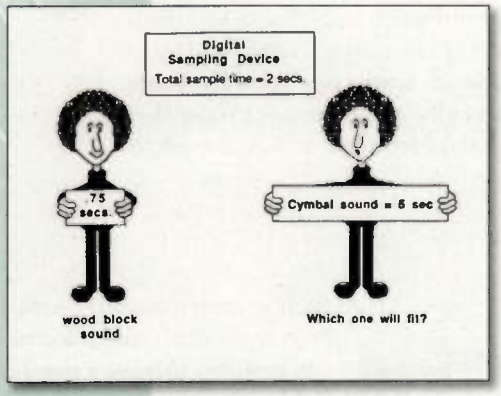
EM COLUMNIST SCOTT WILKINSON | MARCH 2000

snapshots
from the *EM* archives

MiniDisc vs. DCC: The bleeding edge of technology in 1992.



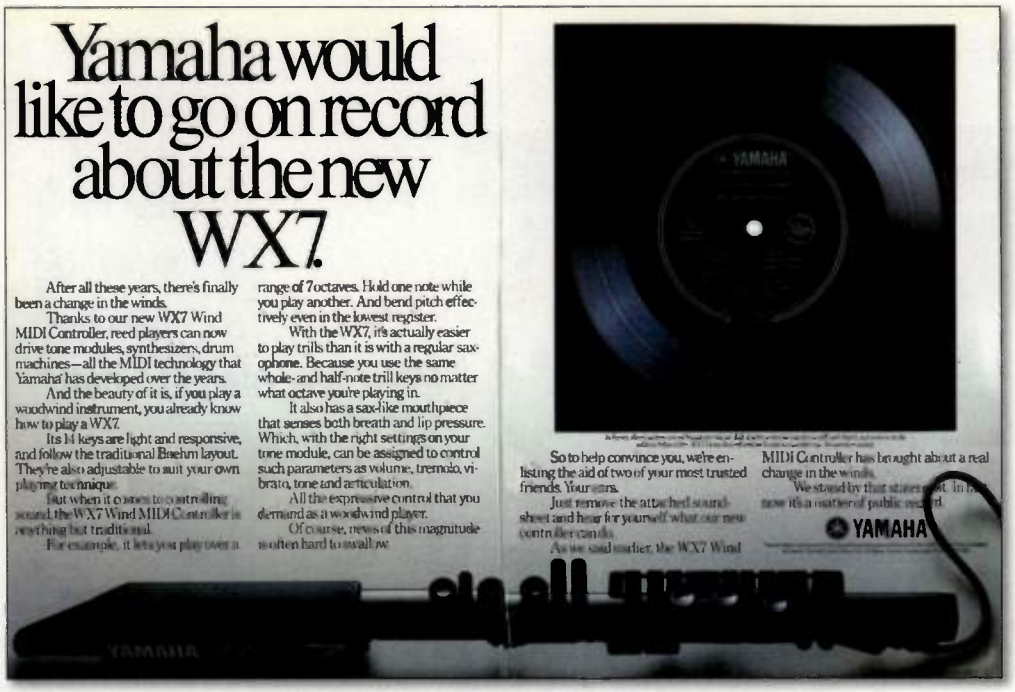
Allan Holdsworth demos a state-of-the-art guitar controller at Winter NAMM. Columnist Jim Wright predicted that "1986 will be the year of the guitar synthesizer."



'80s problems. And '80s graphics.

Geek humor, 1986.

"DAW: Wave of the Future?"

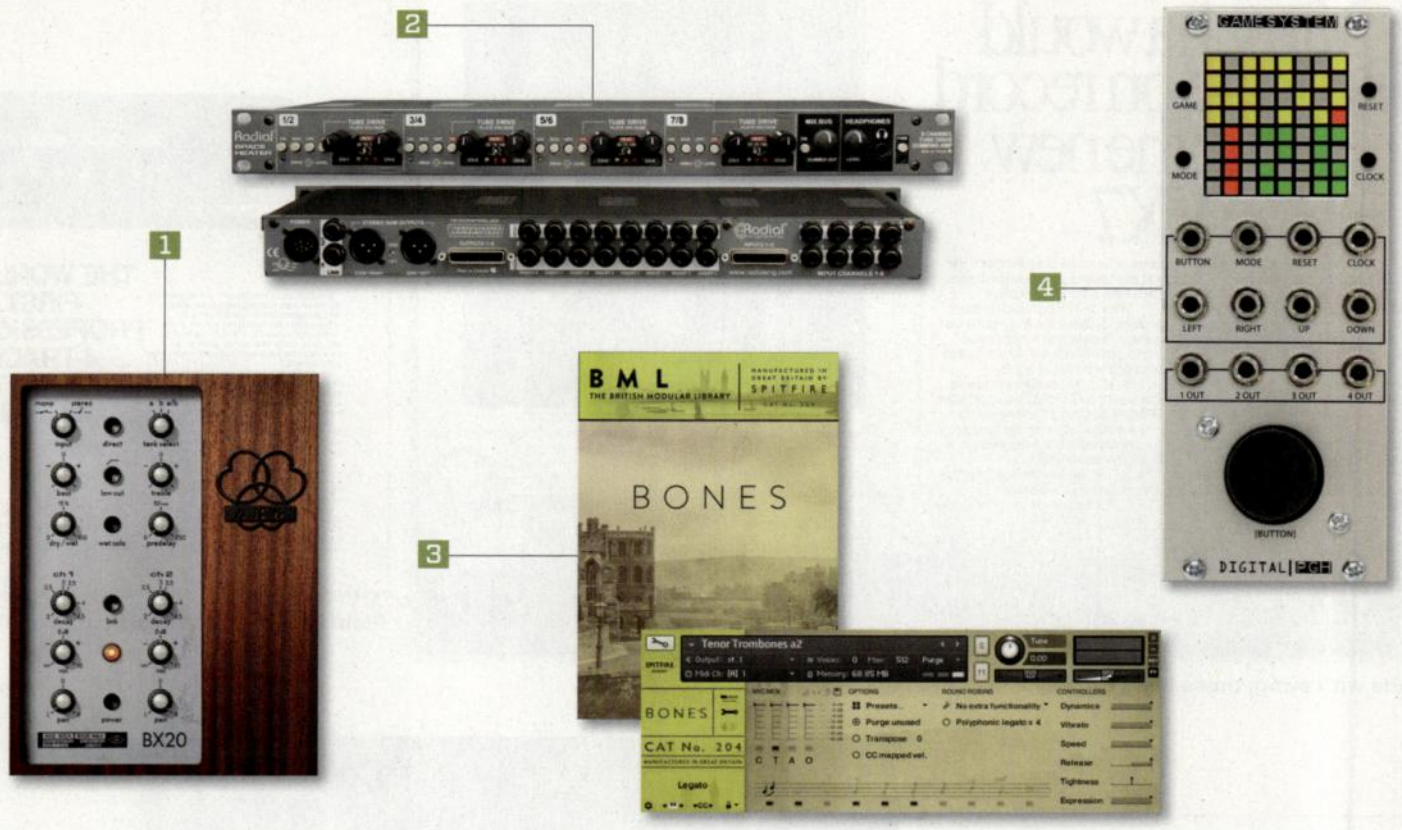


Ads with swag; those were the days.

Plenty of these are still in use today.

Brother: from typewriters to sewing machines to the MDI-30 Disk Composer, boasting 32K of RAM and 30-song-per-3.5"-disk capacity.

We're pretty sure he didn't replace his Martins.



1

UNIVERSAL AUDIO

AKG BX 20 SPRING REVERB

Plug-in for UAD-2 DSP platform

$199

HIGHLIGHTS Software emulation of a highly sought-after dual-tank spring reverb from the '60s • mono or stereo operation • select individual tanks (A or B) or use the two together • digital-only mode • treble and bass tone controls • Lowcut switch • Link button • Wet Solo button defeats the direct signal • includes artist-designed presets

TARGET MARKET Recording engineers, musicians, sound designers

ANALYSIS Licensed and endorsed by AKG; now's your chance to get classic, studio-quality spring-reverb sounds for your UAD-2 system.

uaudio.com

2

RADIAL

SPACE HEATER

Tube drive/summing mixer

$1,699

HIGHLIGHTS 8-channel tube drive and summing mixer that uses 12AX7 tubes • channels are available discretely or mixed to a stereo bus • highpass filter for each channel pair • Heat switch • XLR outputs for stereo bus • headphone output • balanced 1/4" TRS and D-Sub inputs • balanced D-Sub outputs • 8 balanced inserts on 1/4" TRS jacks • connect multiple units using the Link jacks

TARGET MARKET Studios and onstage

ANALYSIS Add color and character to DAW tracks, in-ear monitors, or instruments in a live or recording context.

radialeng.com

3

SPITFIRE AUDIO

BML210 BONE PHALANX

Virtual brass instrument

$230

HIGHLIGHTS A sample-based virtual instrument for Native Instruments Kontakt that provides a 6-piece trombone section made up of three tenors, two basses, and a contrabass • idiomatic articulations are included • recorded at AIR Studios in London • 8 mic perspectives and 3 Jake Jackson mixes • Ostinatum feature for creating complex patterns • round-robin playback • 17 GB of uncompressed WAV files

TARGET MARKET Composers, orchestrators, arrangers, musicians

ANALYSIS A software tool designed to help you create realistic low-brass parts.

spitfireaudio.com

4

PITTSBURGH MODULAR

VERBTRONIC

Digital reverb in Eurorack format

$199

HIGHLIGHTS Mode switch for selecting shorter, realistic-sounding reverb effects (Verb setting) or longer, more synthetic timbres (Tronic) • Mode Gate input for switching modes using a gate signal • wet/dry output mix knob • Mix CV input with associated Attenuverter knob • Feedback level control • Tonal Tilt for sculpting the tone from high to low • discrete wet output • 10hp wide

TARGET MARKET Eurorack modular-synth users

ANALYSIS A low-cost way to add a skiff-friendly digital reverb to your patches.

pittsburghmodular.com

All prices are MSRP except as noted

5

PLUGIN ALLIANCE

ACCUSONUS ERA-D

Noise and reverb removal plug-in

$299

HIGHLIGHTS Mono or stereo operation • Four processing modes: De-Noise, De-Reverb, Cascade, and Parallel • in Dual mode, it can analyze two sources to improve the processing results • individual high- and low-frequency controls for Reverb Time Constant • four adjustable frequency bands with Link button for grouping them • monitor the input, output, or the signal being removed • AAX native, VST, AU • 14-day demo available for download

TARGET MARKET Recording, mix, and mastering engineers

ANALYSIS A sophisticated audio restoration plug-in at an entry-level price.

plugin-alliance.com

6

IMPACT SOUNDWORKS

BRAVURA SCORING BRASS

Virtual instrument library

$349

HIGHLIGHTS Brass ensembles, soloists, and effects played using traditional and extended techniques for free Kontakt Player • recorded from three mic positions (Close, Room A, Room B) with tone controls • idiomatic articulations include marcato, tenuto, legato, trills, and double-tonguing • 20 instrument patches utilizing more than 55,000 samples • Chord Maker and Orchestrator patches for creating ensemble parts • reverb settings

TARGET MARKET Composers, arrangers, orchestrators, musicians

ANALYSIS A full brass library that is also available in smaller instrument subsets that start at $39.

impactsoundworks.com

7

NEAT MICROPHONES

KING BEE

Condenser microphone

$199 street

HIGHLIGHTS Large-diaphragm (1.3"), cardioid condenser mic • Class A discrete amplifier • works with phantom power levels as low as +35V (typical of USB interfaces) • 134dB dynamic range • 87.5dB signal-to-noise ratio • handles up to 140dB SPL • slight presence boost that peaks around 8kHz • metal parts throughout • includes shockmount and removable (snap-on) honeycomb-shaped pop filter

TARGET MARKET Musicians, recording engineers, houses of worship, broadcast

ANALYSIS A reasonably priced and solidly built mic that is suitable for nearly any application.

neatmic.com

8

WAVES

COBALT SAPHIRA

Harmonic enhancement plug-in

$149

HIGHLIGHTS Mono and stereo analog-style harmonic processing • Edge (even harmonics) and Warmth (odd harmonics) with Send and Return controls • 4-band EQ • seven harmonics modes that are graphically displayed • tape depth emulation with five different speed controls for adding wow-and-flutter-style modulation effects • Native/SoundGrid • AAX Native, AudioSuite, Audio Units, VST

TARGET MARKET Recording, mixing and live-sound engineers, musicians

ANALYSIS Designed to provide coloration effects similar to those you would get from hardware with solid-state, tube, and transformer components.

waves.com

Organ-like tones, morphing clouds of chords, percussive timbres—the six bandpass filters in the 4MS Spectral Multiband Resonator can be configured in a wide variety of ways for sophisticated filter-based processing, while remaining intuitive to use.

4MS

Spectral Multiband Resonator

SIX BANDPASS FILTERS THAT OFFER DEEP DYNAMIC FREQUENCY CONTROL

BY GINO ROBAIR

Even with so many new Eurorack modules being introduced each year, it's difficult to find products that are both innovative and useful. But with the Spectral Multiband Resonator ($475), 4ms has hit both marks by adding a wealth of exciting features to the classic voltage-controlled spectral filter concept, but with a UI designed for real-time performance control.

Although the module resembles a 6-band graphic EQ, each slider represents an arbitrarily assignable frequency channel: There are six resonant bandpass filters, each with an independently tunable center frequency (and output level controlled via CV and fader). Overall, filter resonance is introduced by increasing the Q using a CV or knob.

A corresponding CV output for each channel provides an envelope (tracking fast or slow) or trigger based on the input's frequency content and the channel setting. With the Pre/Post switch, you can determine whether the incoming signal is analyzed before or after the level sliders. CV slew can be used to smooth out transients.

With two inputs and outputs, the Spectral Multiband Resonator (SMR) can be used as a mono or stereo processor. In stereo, the Odds input and output correspond to the odd-numbered channels, while the Evens I/O is matched with the even-numbered channels. The built-in noise generator kicks in when nothing is patched into the Odds input, so you can use the SMR as a sound source on its own (or use the noise for the Odds while sending an external signal into the Evens input).

The Rotate function lets you move between 20 preset filter frequencies for each fader, manually or with a CV. As you increase the Morph amount (with the knob or via CV), the pitch changes become more gradual, softening the transitions. Additionally, you can create chordal sounds using Spread to put distance between the frequencies in each channel. You can then further alter the Odds and Evens pitches independently using the Nudge control and its CV, as well as lock the frequencies of any number of channels while the others change.

Eleven 20-note scales are available in each of the 16 scale banks. The scales range from common to exotic—diatonic and chromatic to 17-note equal temperament, just intonation, and Wendy Carlos' Gamma scale. An entire bank is available for user-designed scales, which you program using the module's sliders and buttons.

Moreover, each frequency channel can have its own scale. That means you can have up to six different scales available at once, or assign one scale to the odd-numbered channels and another to the even channels and pan them in stereo, and so forth. Also, a CV can be used to scan between each scale in a bank, while another CV scans through the pitches in that scale.

While all of this seems complex, the SMR is surprisingly easy to use; instant gratification is guaranteed. But if you want to get really tweaky, there are six Setting Slots, each of which can hold a complete setup of scales and parameters for easy recall.

But that's not all: In addition to creating gorgeous, chordal sound-clouds with its resonant spectral processing, the SMR can be used for beat-synched harmonizing or vocoding (if you have a second unit), and it can be used as a resonant percussion module. It's the kind of module that will continually surprise you as you dig deeper into it, and one that will end up in a lot of your patches. Highly recommended! ■

Create your sound
any place, any time

YC

Five unique organs with drawbars, rotary speaker, percussion and effects for a complete organ experience that fits under your arm.

CP

Get a van-full of iconic 70s stage keyboards and vintage effects in a portable retro-style package without sacrificing sound, playability or polyphony.

DX

Go from retro 80s to cutting-edge modern at the flick of a finger... literally! The multi-touch control panel puts powerful FM synthesis under your fingertips.

CS

Not just another monophonic analog clone, the 8-note polyphonic reface CS' five unique oscillator modules create a variety of sounds from analog to digital.

reface Capture
Save and recall reface Voices on iOS. FREE!

Soundmondo.com
Social Sound Sharing community for reface

YamahaSynth.com
Get the most out of your Yamaha Synth!

Keyboardists, songwriters and sound designers need great sound, feel and portability.

Meet **reface**: a Mobile Mini Keyboard series with a **re**-imagined inter**face** of classic Yamaha keyboards from the past 40 years.

Each model in the **reface** series has a unique sound and matched controls for immediate, interactive and inspirational music-making. The new HQ-mini keyboard raises the bar for playability, response and feel. And with battery operation and built-in speakers plus 1/4" line outs, USB and MIDI, **reface** is at home on stage, in the studio, on a plane, at the beach ... any place, anytime inspiration strikes.

YAMAHA

reface

Get to know reface here:

30 Years of *Electronic Musician*

BY CRAIG ANDERTON

Future historians will look back on the '70s as the end of the Industrial Age and the beginning of the Microprocessor Age. The music business was always too small (and still is) to generate much of its own technology, so it tends to ride the coattails of consumer electronics. When Commodore, Apple, IBM, and Atari took the microprocessor mainstream, it sparked a shift in the music industry that reached critical mass in the '80s—and is still being played out today.

When *EM* appeared, it had its roots in the DIY ethic because at that time, computer-based synthesis and recording was the domain of pioneers—not mainstream music industry companies. Magazines of that era were "vertical," like *Guitar Player*, *Modern Recording*, *Keyboard*, etc. *EM* deliberately chose to be a "horizontal" magazine for, say, the guitarist who doubled on keyboards and recorded in a home studio while playing to a drum machine. But as microprocessor-based musical tools went more mainstream, so did *EM*. Articles transitioned from how to make your own widgets, to reviews of the sophisticated widgets that were starting to become more commonplace, as well as techniques pieces on how to apply them.

And there was *plenty* to write about. The '80s were when sampling, drum machines, FM synthesis, ROMplers, and MIDI (which is even more relevant than ever today) hit escape velocity. Analog audio was transitioning into digital audio, at first with CDs and then with hard drives. To give an idea of how primitive technology was at the time, copy for early issues of *EM* was transferred from an MP/M-based, 8-bit S-100 bus computer running Wordstar to a Radio Shack Model 100 laptop, and transferred overnight via 300 baud (yes, *baud*) modem to the parent company's main offices. Seriously.

But then the '90s slammed down on the accelerator, and the rate of change went off the hook. Steinberg invented VST, which started hardware's extinction-level event clock. Massive consoles and recorders were reduced to pixels on a screen. Meanwhile, although the Alesis ADAT is generally considered the daddy of the digital home recording revolution, don't forget that the Mackie 1604 mixer—first shown on a card table at the Chicago Summer NAMM show in 1991—provided an economical way to mix those tracks. The first wave of the democratization of recording that started with the TEAC 3340 multitrack tape recorder gave way to the second wave, where analog waveforms represented by magnetic particles suspended in plastic ceded their reign to ones and zeros stored in memory.

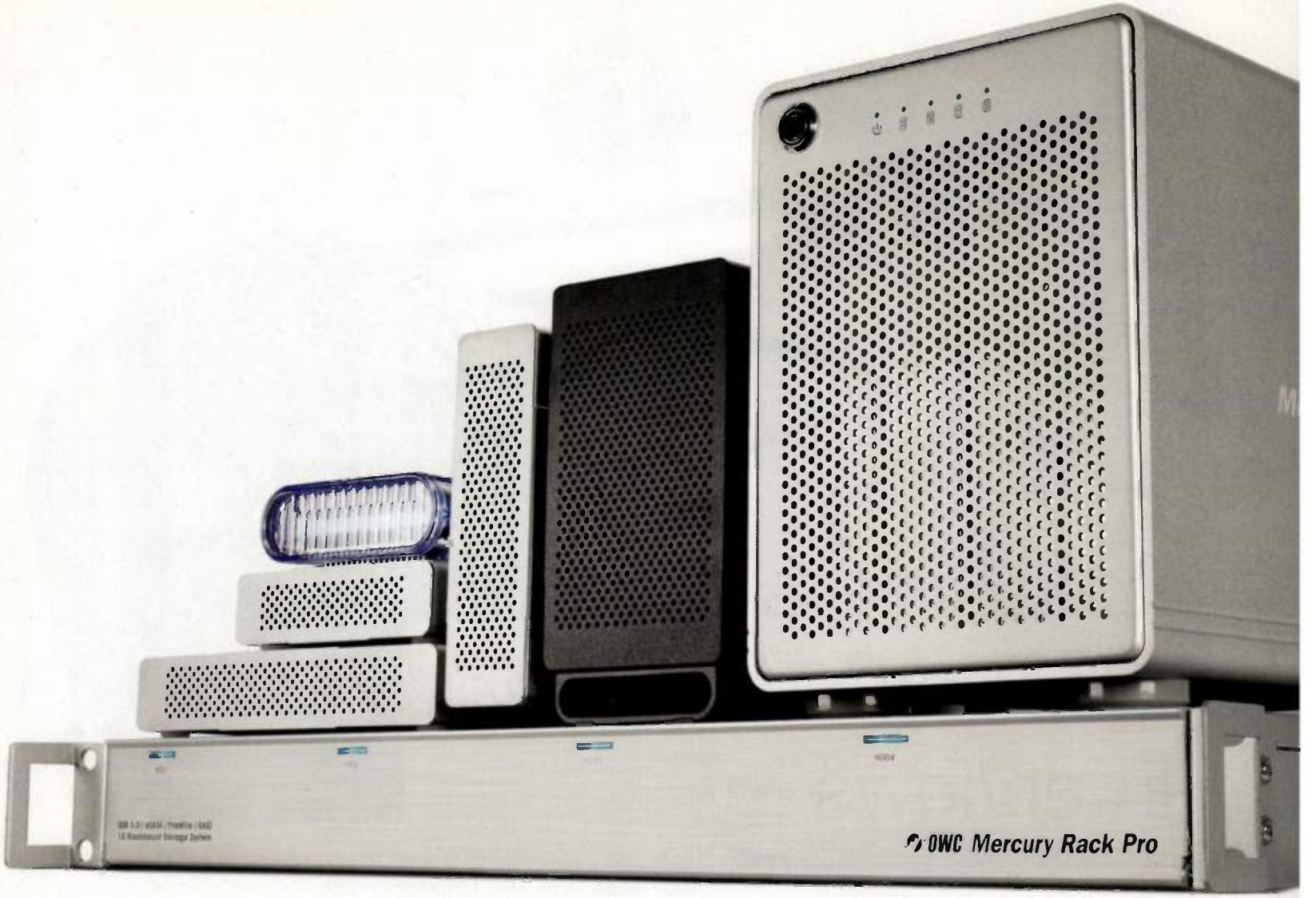
As more musicians had access to the means of producing their own music, *EM* turned more of its attention to recording, live performance, and a software-based world. This reached a tipping point in 2011, when *EQ* magazine—which had been dedicated to recording—was folded into *EM*. *EM*'s focus on gear broadened into adding *EQ*-style artist interviews, but also, *EQ* had found a sizeable following among Windows-based musicians, who had often felt abandoned by magazines with a Mac orientation. Features like Power App Alley, which had been a mainstay at *EQ*, now served both sides of the operating system divide. Meanwhile, the enduring popularity of EDM and hip-hop placed even more focus on musical electronics.

This was also when *EM* focused more on new elements that had been added to the modern musician's mix: do-it-yourself career building, DJ-style thinking, and the power of the Internet. With the former record industry power structure in ruins, more and more musicians took control of their careers—and what had been limited to recording your own material became about distributing it, promoting it, and building careers through the new tools of social media. First timidly, then with more assurance, *EM* and its sister publications started transitioning to a combination of the internet and print: With mobile and tablets coming on strong, more musicians were getting their information not from monthly doses of paper, but on-demand from pixels in a display.

Many of the companies and stars of the mid-'80s are no longer with us. Commodore computers flamed out when an upstart called Apple bet that the user experience was more important than technology. Pioneering digital systems like those from New England Digital, Fairlight, and E-Mu couldn't advance fast enough to keep up with the industry that spawned them. Ensoniq was acquired by Creative Labs, and is now just a fond memory for veterans of that era.

Yet others have continued to grow by adapting, mutating, and changing: MOTU developed a strong hardware business, Sound Tools morphed into Pro Tools, Akai rose like a phoenix from its own ashes, giants like Yamaha, Korg, and Roland continue to explore the boundaries of synthesis, and we even have an analog resurgence—often aided and abetted by digital control—thanks to the return of pioneers like Dave Smith.

What's next? Well, that's easy to answer: Keep reading *EM* for another 30 years, and find out. ■



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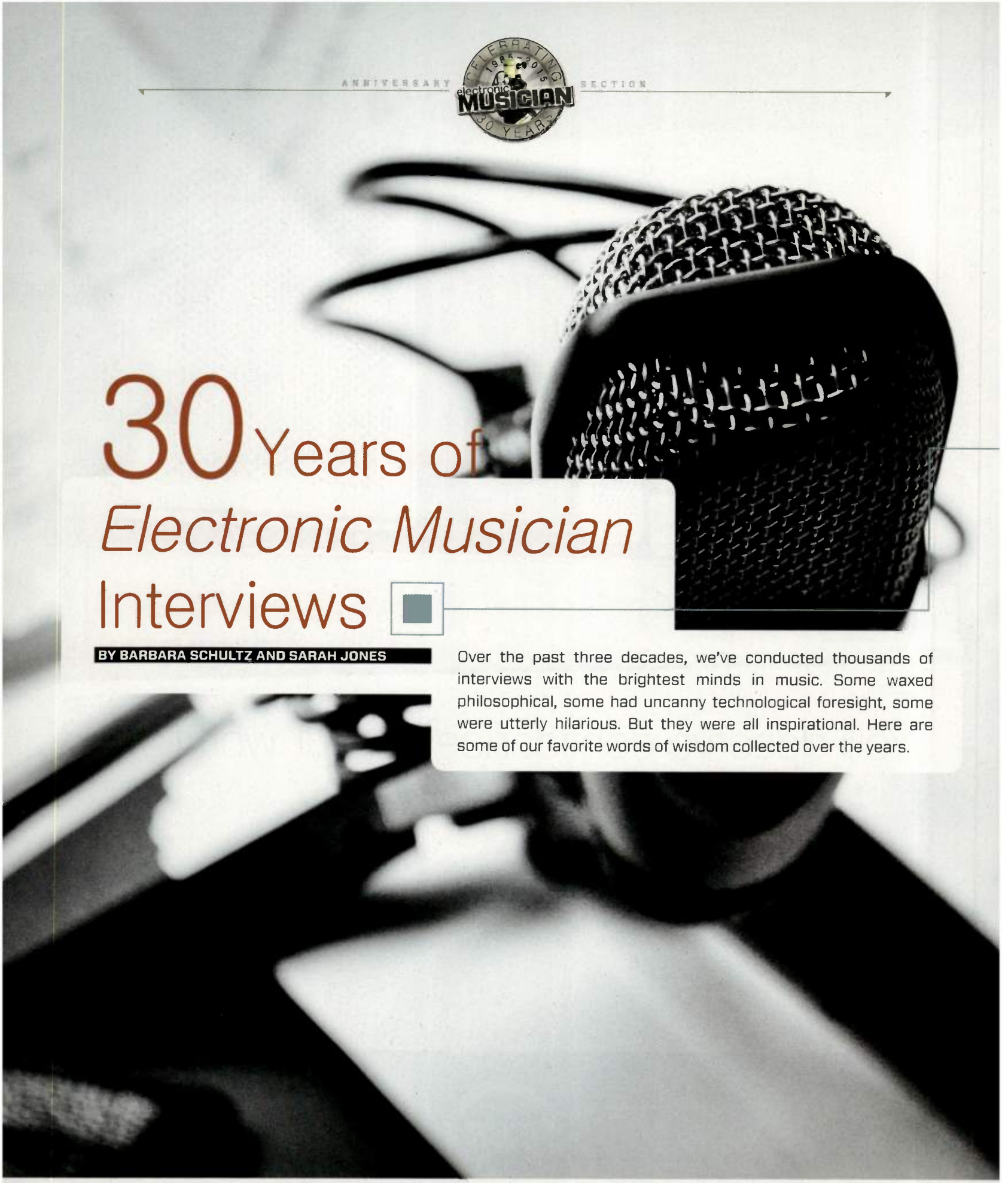

30 Years of *Electronic Musician* Interviews

BY BARBARA SCHULTZ AND SARAH JONES

Over the past three decades, we've conducted thousands of interviews with the brightest minds in music. Some waxed philosophical, some had uncanny technological foresight, some were utterly hilarious. But they were all inspirational. Here are some of our favorite words of wisdom collected over the years.

LAURIE ANDERSON SEPTEMBER 1985

"The more sophisticated technology gets, like the Synclavier, the simpler the sound gets... the second that technology becomes the most salient feature of music is the point I think the music begins to fail. Then you're at a trade fair listening to the latest in modern technology. Now that's very interesting, but it has nothing to do with art, nothing."

FRANK ZAPPA | SEPTEMBER 1986

My music has never been very collaborative. It's been accommodative, because when you hire a musician, you can't always get that musician to play what you thought up because musicians are not uniformly expert in different fields. You put together a band, you have to average out the assets and liabilities of each musician and then find what the style of that band is going to be. So you have to compromise the pieces because you might have a drummer who can play anything, but a rhythm guitar player who might sing great but can't count and couldn't play any parts. Or a piano player who has a certain amount of technical expertise but doesn't know what it means to play a whole note rest and leave some space in the music. So everything gets adjusted for the personnel. But with [the Synclavier], the only thing I have to adjust for is how much RAM I've got in the machine.

WENDY CARLOS | NOVEMBER 1986

Quite probably my earlier records were aided greatly by the fact that they were done while working within very narrow regions of possibility. But in late 1984, I found myself swamped by the anarchy of total possibility, so I began making choices. I chose to limit myself to some small, selected regions of the palette of "everything." In timbre, I decided to see what would happen if I took orchestral instruments that I understood and began combining selected properties of two or three, creating hybrids. That's a fairly small cast of the line; it's not nearly what the hardware allows, but it's a good way to learn the limits in a disciplined manner.

I was mainly concerned with learning what rich things could be developed from models of past good instruments: the best Stradivarius overtone structure merged with the best Steinway action. What does that do? Does it sound good? And the answer is yes, it does, it sounds delightful. There are in fact several ways of doing it, and they all sound wonderful. You find a lot of fascinating sounds this way, because you are standing on the shoulders of giants of the past of timbre, and yet they are genuinely new sounds, subtly or wildly unlike anything ever heard before.

JOHN CAGE | MARCH 1988

Electronics, of course, is very much a part of our music physically and of our lives generally and it is what [media analyst Marshall] McLuhan said, an extension of the central nervous system rather than an extension of our ability to walk. It's not like the wheel. Electronics brings about a situation in which our lives are concentrated on the interconnectedness of everything.

I remember, for instance, giving an electronic concert with David Tudor in which one of the machines that I had to play with was not turned on, yet sounds came from it and I said, "Isn't that strange, David. It is producing sounds without being turned on." And he said, "Well, it would be strange if it didn't," because it was in a situation that was so turned on. Maybe that's what's meant by totally wired [laughs]—that we're even wired when we aren't wired.

BRENDAN O'BRIEN MARCH 1993

I believe that the best records have been made by engineers who were also musicians, or who had a lot of musical knowledge. Technique is secondary. On [The Red Hot Chili Peppers' *Blood Sugar Sex Magik*], I learned that getting a great performance is the key to producing a great record.

For example, if you're recording a guitar track, and the amp sounds good, and the guitarist is playing well, it probably won't matter what microphone you use. Whatever records the performance cleanly onto tape is usually good enough. We even had what we called the "magic mic," a Shure SM57 that sounded great on everything. I'd say 75 percent of the overdubs were tracked with that single microphone.

SYLVIA MASSY | DECEMBER 1994

The records I do are representations of what the band is about. To achieve this, I'll see the band play live and try to recapture on tape the energy they put out in performance. Usually that live energy gets lost in the recording studio. Then I may throw weird ideas at them to get the band thinking about developing their sound further.

For example, during the Skunk Anansie sessions, I wanted to experiment with the cheapest second-hand store electric guitar they could find. By a fluke, I happened to hear the drums through the guitar's pickups. The drummer was warming up and the guitar was just sitting on the floor facing the kit. It made the weirdest noise because the strings resonated with the kick drum and produced a sitar-like sound. So for one song, we set the guitar on a stand directly in front of the kick drum, tuned all the strings to the song's key, and recorded the drums through the guitar pickups.

TONY VISCONTI | OCTOBER 1995

Bowie usually managed to make arranging very difficult, because he'd seldom bring a finished lyric or melody to the sessions. He'd only have a basic idea, based on a book he'd just read or a recent conversation. Even the key of the song would be arbitrary. For example, the song "Fashion" was conceived as nothing more than a riff while the band was rehearsing in a house in Jamaica. The song was called "Jamaica" even after all the music was recorded. All the little musical "tastes" were recorded simply because they sounded good; they weren't embellishing the vocal melody, because there wasn't one. Months later, back in London, Bowie admitted he couldn't come up with a lyric or melody line and suggested we abandoned the track. I vaguely remember pleading with him to come up with something, and the next afternoon he arrived with most of the song finished. Some lines were written on the spot as we recorded the vocal. Bowie is the only artist I've worked with who actually writes on mic!

DANNY ELFMAN FEBRUARY 1997

When I'm starting a film, I make sure I compose a primary theme and at least two secondary ones that can be turned a number of different ways. I'll take the theme and figure out whether I can play half of it and still recognize it. Then, does it work in a major and a minor key? Can I turn it from funny to spooky? Can I cut it down to just three notes and still make it recognizable? These are some of the acid tests I put a theme through while I'm composing.

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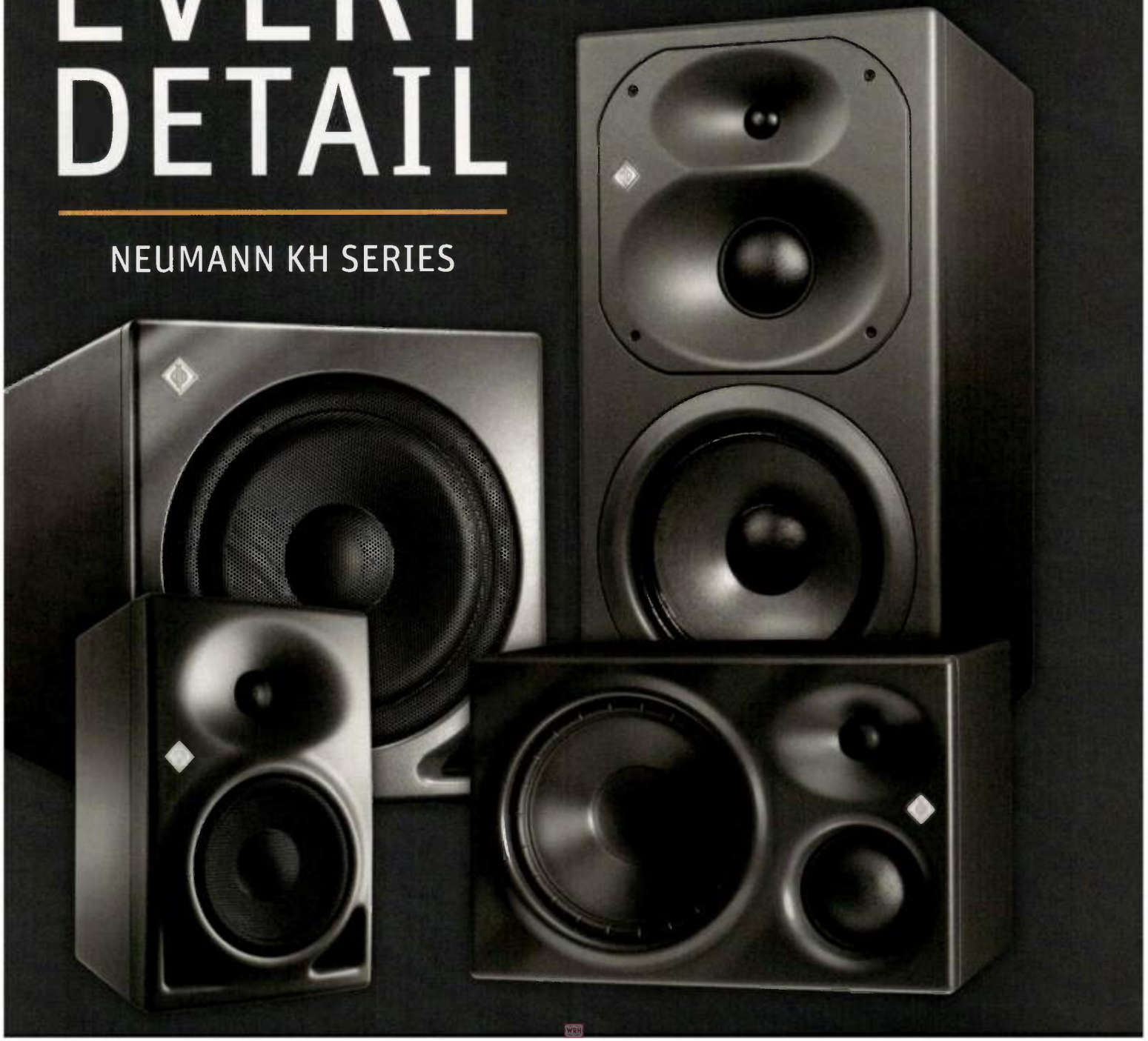
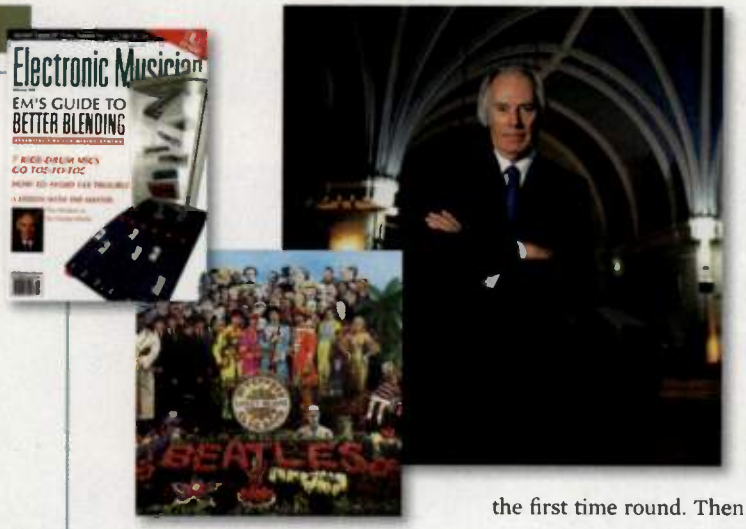




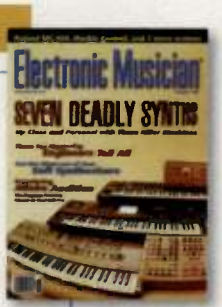
GEORGE MARTIN | FEBRUARY 1999

On the [Beatles] song "She's Leaving Home," I recorded the orchestra on all four tracks. I put violins on two tracks and violas and cellos on the other two tracks because I wanted to be sure I got it so I could really handle it. Then I bounced that down to a stereo pair, which left me with only two tracks for the voices. I knew that I wasn't requiring anything else besides the voices, but I also wanted to double-track them. So I said to John and Paul, "You've got to do this live, both of you singing at the same time." As you know, the song has answering things and there's more echo [reverb] on one voice than the other, that kind of thing.

We put them on two separate mics so when they got to "she is leaving...what did we do with our lives," the "what did we do with our lives" had less echo than the "she is leaving." We got that balance right and got them singing it right the first time round. Then all we had to do was duplicate it—exactly. This is where the Beatles were so good, because they did duplicate it and we got a really good double track, with the same perspective that we needed in the voices, so we didn't have to go to another generation.

ARIF MARDIN | SEPTEMBER 1999

There really isn't anything to tell someone like Aretha or Patti LaBelle or Barbra Streisand. At the most, you might give a general idea of what you think, if you're presumptuous enough to speak, and say, "Maybe you could do something like this here, but you know best, darling." She'll do her take and you'll say, "Aretha, this sounds great. We all love it." But she will say, "No, I have to do it again." For us mortals, that was a great take, but she hears something that's even better.



BOB LUDWIG | SEPTEMBER 2003

This horrible trend [of compressing mixes heavily to achieve hot levels] started about eight years ago, with the invention of digital-domain "look-ahead" compressors." First was the German Junger compressor, then the Waves stuff, and the most infamous of all, the TC Electronic Finalizer, a great piece of gear that's often misused. I'm so glad these devices didn't exist when the Beatles were making their music. Never in the history of the human race have people been exposed to sounds as compressed as in the past few years. It's a losing battle for musicality.

JERRY HARRISON | APRIL 2007

When working with bands, I always encourage them to go for the final sounds that they want. Sometimes when working in DAWs, people leave everything half-finished, thinking they can always change it later. But it's really nice when you put a song up and all the sounds are exactly as you want them to be. And if you're working on a less powerful system, the fewer channels and tracks that are playing, the better. If you have a lot of stuff playing, it may slow down the computer and you may start to get delays, which you can start to hear on some effects. Like suddenly the attack on the compressor doesn't quite work the way it should.

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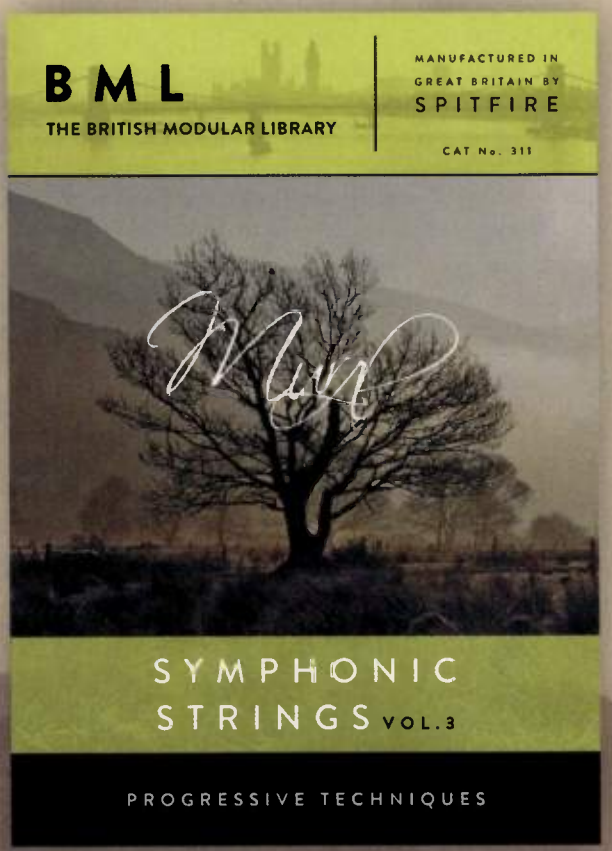

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IMOGEN HEAP | OCTOBER 2009

I like creating something with lots of personality, lots of depth, and lots of things you can hear over and over—things that you don't notice at all until the 50th listen, that most would say, "Why are you still in the studio working on that damn song?" I want to get the detail that you couldn't possibly take in on your first, second, third, fourth listen.

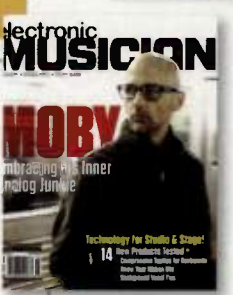
DAVE SMITH | APRIL 2010

I saw an ad a couple of weeks ago for some soft synth that said, "It's going to take you a lifetime to figure out everything that this instrument can do." And I kind of scratched my head: If I'm playing a musical instrument, do I want to spend a lifetime just learning what it can do? Or do I want to be able to play it, and play it the same way tomorrow, and the day after, and the day after that? A lot of people are getting analog instruments now because they want something that they can touch—turn knobs—and it always does the same thing. They're not clicking through menus. They're not bothering with software and having to update it every couple months.

DON BUCHLA | APRIL 2010

I've developed a great number of controllers and control techniques, and so on. The breakdown is that the ones that are accepted and used and developed further are those that are most closely linked to the thought. It's amazingly illustrated [by this story]: I work a lot with bionics, usually with amputees. I was impressed by what a woman said to me just three days ago. She no longer has to think about picking something up. She no longer has to think about a movement. She just moves—that is the word she used.

If you play an instrument, you don't want to think about it. The things that contribute to thinking about it and then playing are, one, latency, obviously, and two, non-familiarity with the process and the outcome of the process.



DAVE GROHL | MAY 2011

You know that scene in *The Wall* where the faceless people are falling into the machine that's grinding them into paste? Digital editing has robbed drummers of their identity, just like that. I'm heartbroken by what heavy-handed producers have done with drummers over the last 10 years.

A drummer walks into a studio; he says, "This is how I play the drums," and the producer says, "That's not good enough. I am going to make you sound like a machine." That's fucking lame! I am not the greatest drummer in the world, but when I record drums, it doesn't sound perfect and I am all over the place and the cymbals wash a little hard, but that's how I play the drums. If you don't like it, don't call me back. I wish that every drummer would tell their producer, "That fucking machine doesn't make me sound like me. It makes me sound like you, and you're not the drummer, motherfucker." We've got Taylor Hawkins—who is the greatest fucking rock drummer I've ever played with—why not let Taylor sound like Taylor? So that's why we used tape and no computers [to record *Wasting Light*].

MOBY | JUNE 2011

Years and years and years ago, I realized I loved big, rich analog string sounds, and they've appeared somewhere on almost every record I've made. I saw an interview with Bob Moog quite a while ago, and he's talking about analog circuitry in an almost spiritual way, and I think I'm the same in that I almost anthropomorphize the physicality of it, whereas digital is just a re-creation of what happens in the analog world. So I do have a lot more respect for analog, but I'm equally, increasingly obsessed with processing and layering these pristine sounds until they take on a granular texture, which is equally beautiful.

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SKRILLEX | MARCH 2012

Any trait that you see in a popular art form always has its roots in a strong underground movement. Everything I have created and everything people in this scene have created, it's completely organic. When I was making music in my bedroom, there wasn't a dubstep wave to ride. It wasn't cool when I started doing it.

I didn't learn my production and synthesis overnight. It takes time—a lot of trial and error. The coolest part about the Grammy nominations is that it proves something real is happening culturally. And even though the mainstream is trying to latch onto it, they don't even know what to really latch onto yet.

JACK WHITE | AUGUST 2012

If somebody asked me, "We're going to record a guitar part in a hotel room: What do you want in the room?" I'd say, "I want a 15-watt amp with a reverb, that Supro guitar, a ribbon microphone, and a reel-to-reel. Somebody else would say, "Why don't you bring down ten of my Les Pauls, three Stratocasters, a Tele, four of the Silvertones, the Marshall, a Twin Reverb, six other amps, and we'll record 45 guitar tracks. And then I'm going to go on vacation and you engineers pick the best one."

BILLIE JOE ARMSTRONG NOVEMBER 2012

I've always been quick at recording vocals. It's about warming up, getting my throat and chest in the right position, and then emotionally preparing to go for it. When you go through the demo process, you know what kind of emotion the song will need, and when to scream and when to whisper. This is why I like to take time and really get all the arrangements done and know what kind of vocal take I am going to end up doing before I start recording the album tracks. At the vocal session, I start softly and try not to overdo it, so I don't ruin myself for the day. I get myself in the zone, and eventually, my voice just starts to happen. I sing about eight inches from the mic, and throw down around three takes. We'll comp performances if necessary, but, most of the time, it's all pretty much live takes.

DEADMAU5 JANUARY 2013

I don't think [DAWs] will ever come to a solution that's perfect for everyone; everyone will always have some obscure, weighted thing. I've never seen a "live electronic music" setup that didn't have some weird fucking workaround or some weird ingenious way of combining different things. It's always been that way and it always be that way, or we'll all just end up using [High End Systems'] Road Hog [consoles] and Ableton, and show technology won't advance. Any developer that sees someone is using this-and-this for a task can come up with something new to deal with those chores specifically, but of course you're going to have a new problem, and then a new solution, and then another problem.

SCOTT KIRKLAND | JULY 3013

When I saw *Star Wars*, everything changed. It has a lot of antagonizing sounds; a sound would stick its head up, and another sound would come, and then, this drop. I envision sounds antagonizing each other or communicating with each other and working their way through. Sounds have to get in there and fight for their space within the song. I like sounds that are aggressive and have a place. And another sound shakes that sound out of its place for a second. [The Crystal Method has] been accused of being too bombastic with our sounds, and I am guilty as charged. That's what we do.

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QUESTLOVE | OCTOBER 2013

I laugh when certain rappers and MCs have all these gargantuan, Van Halen, brown-M&Ms-only demands on their rider. I once saw someone cancel a session because they didn't have the proper gouda cheese and Merlot. I'm dead serious. There's no gouda cheese and Merlot? I'm outta here. Personally, I'm more comfortable creating albums in uncomfortable circumstances. Our dressing room [on *Late Night With Jimmy Fallon*] is only made for six people, and on average there's always eight to ten people here. It's like the size of a closet. I fit my drums inside a changing closet, and Elvis [Costello] just sang his vocals in the break room. It's a very unromantic, unglamorous atmosphere, but I work harder when I don't have any distractions. I'm one of those people who can't really record in a lavish environment, or I'll just get too comfortable.

ALLEN SIDES NOVEMBER 2014

When setting the gain on a microphone, I usually start with no compressor in line and then set the peak level at about 4 dB from clipping or hitting the red on the Pro Tools channel meter. Once a singer gets rolling, she almost always sings louder than she does on the first run-through. Give yourself some headroom so you don't clip a great vocal. I also find that Pro Tools tends to sound better and more natural, particularly on vocals, when you're not right on the edge of clipping.

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~ TapeOp

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~ Resolution

"Using the EXTC, I was surprised at how quietly most pedals can perform, and this got me digging out some neglected curios which sounded stunningly clean and juicy."
~ Resolution

jensen transformers INSIDE

DANIEL LANOIS
JANUARY 2015

This is the technique that I've embraced over the years. It started when I worked with Brian Eno in the early '80s; we made a lot of ambient records. You build your music according to plan, and then strip away the spine or the central character of your plan; the you're left with the ornaments, the overdubs, the garnishings, the effects. By removing the center, I'm left with the garnishings and the ornaments as my center.

GIORGIO MORODER | AUGUST 2015

I notice—contrary to say 20 to 30 years ago—all the singers are so busy right now. And most of the singers now have their own engineer who knows which mic the singers use. A lot of them have a vocal producer, so they are quite independent; they can do a lot of stuff by themselves. So like David Guetta and Aviici and those guys, I don't think they are sitting in the studio with the acts present all the time. It's a new way of working. I think if I would have to go find the studio, the singer, the arranger and all that with some of those singers who are traveling the world, an album would take quite some time.

With Donna Summer, David Bowie, or Blondie, I was more in control. You were in the studio, you record, you finish the recording and you start to work on the tracks and mix. It was more in my hands. Today, if a singer gives you a great vocal, it's there and it's great, but the control is a little less. ■

Expressive MIDI

Multidimensional Polyphonic Expression is ready when you are

BY GINO ROBAIR

Over a span of three decades, MIDI has changed the course of the entertainment industry in a profound way by providing a communication protocol that could be applied not only to musical instruments but also to any device. Consequently, MIDI is being used in nearly every way imaginable, from coordinating sound, lighting, rigging, and pyrotechnics in concerts to controlling sculptural objects in galleries and animatronics at Walt Disney World. The specification's adaptability remains surprisingly robust after 30-plus years.

Eigenlabs Eigenharp Tau

Since the beginning, however, a contingent of developers and users has felt that the speed, resolution, and bandwidth of MIDI limit the level of expressive control over electronic instruments that acoustic instrumentalists enjoy.

To address this, a group of manufacturers have developed an addition to the MIDI spec formally called Multidimensional Polyphonic Expression (MPE), often referred to as Expressive MIDI, which is intended to provide complete per-note expressivity in hardware and software sound generators. The list of manufacturers involved in the development of the protocol includes Apple, Bigwig, Keith McMillen Instruments, and Moog Music, as well as companies building Polyphonic Multidimensional Controllers (PMCs), such as Eigenlabs, Haken Audio, Madrona Labs, Roger Linn Design, and Roli.

Although a new protocol providing increased expressivity is a dream-come-true for many musicians, others may view the concept of MPE as esoteric, or see the increase in the complexity of MIDI controllers as daunting.

Do musicians want, or even need, these added capabilities? Doesn't the MIDI spec already provide more expressive capabilities than a musician could ever use?

To answer these questions, I spoke with three leading instrument designers: Lippold Haken, who has been developing the Continuum Fingerboard since the '80s and introduced it to the market in 2000; Roland Lamb, designer of the Roli Seaboard Grand (see our review on page 62); and electronic instrument pioneer Roger Linn, whose LinnStrument controller was reviewed in our October issue (available at emusician.com).

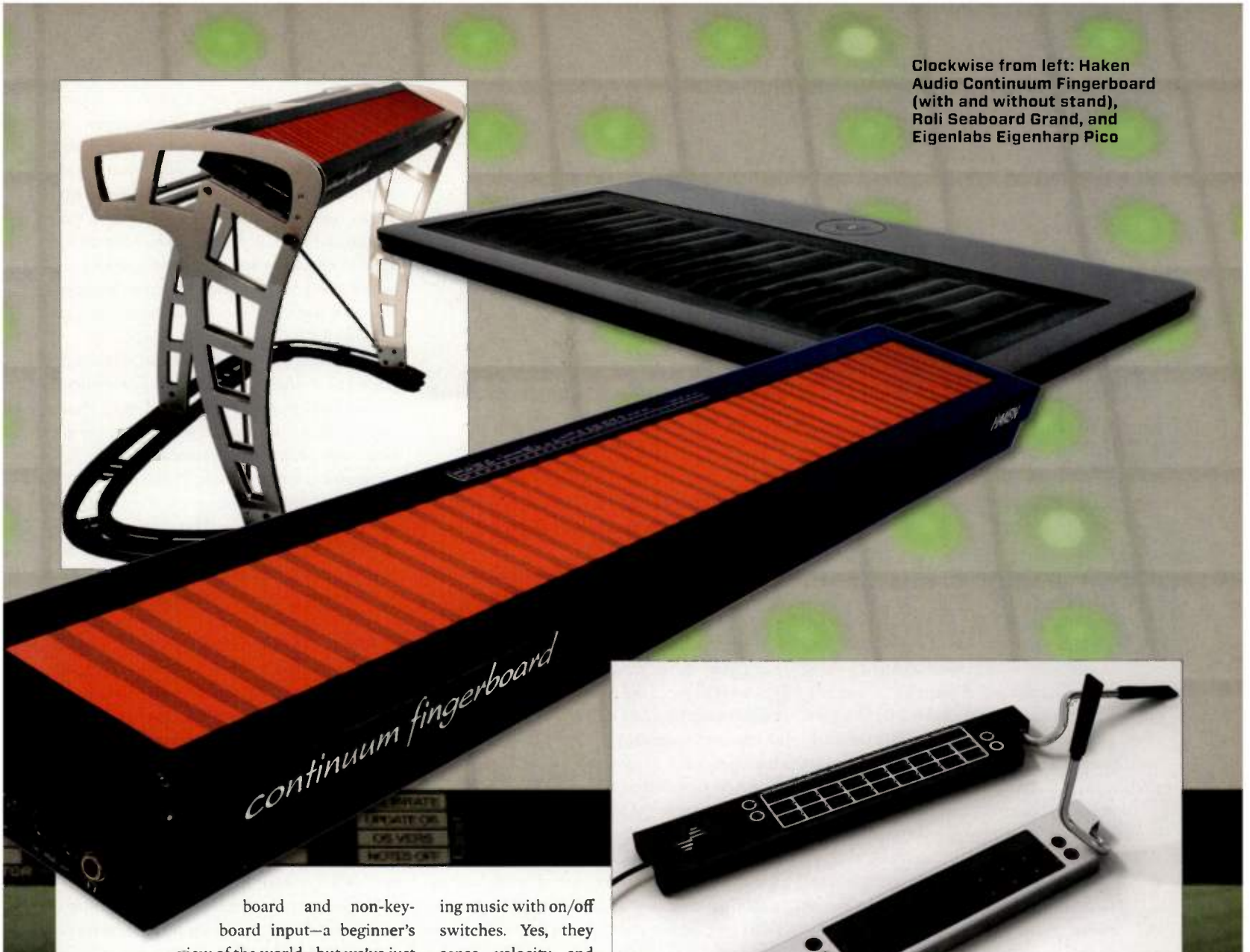
How do you get the public to buy into Expressive MIDI if they don't know what they're missing?

Lamb: Henry Ford said that if you asked people what they wanted, they would've said faster horses. I think people sometimes work within a given modality, such as the modality of a keyboard, and it can be hard to imagine what the other possibilities are without experiencing something new.

We're calling the new protocol Expressive MIDI because that gets to the heart of what it's trying to do. And users can understand that. We all know what MIDI controllers are. There are great Expressive MIDI controllers like the LinnStrument, which I love; the Continuum, which helped to inspire the Seaboard; and the Eigenharp and SoundPlane, among others.

But these new instruments have not yet become truly accessible—in terms of the ease of use of the software, the software integration, and the design—or affordable.

Haken: Up until now, we've done so little with continuous controllers. People think of the world as being divided between key-



Clockwise from left: Haken Audio Continuum Fingerboard (with and without stand), Roli Seaboard Grand, and Eigenlabs Eigenharp Pico

board and non-keyboard input—a beginner's view of the world—but we've just barely scratched the surface. That's because keyboards are generally interchangeable, in terms of what you can do with them: They all just start and stop the same sound libraries or the same synths.

Continuous controllers are very different from each other and not interchangeable at all. People have this perception that a continuous controller is merely a keyboard with pitch bend. That's an oversimplified interpretation. I think it's much deeper than that, and we're going to find a lot to explore in the next 100 years of synthesizer development.

Linn: The biggest problem is that there is not a widespread perception of anything being wrong with the MIDI keyboard. But once people see the limitation and see what is possible beyond it, then they can't go back. And the main limitation is that they're playing music with on/off switches. Yes, they sense velocity and pressure after the key is fully depressed, but they are still on/off switches.

By comparison, the pressure sensing on controllers such as the LinnStrument, Continuum, and Seaboard starts when you lightly touch the note, and then it continues as you add pressure. That way, you can emulate a wind or bowed-string instrument, controlling the loudness of the note all the way from silence to full loudness. And pitch bends on a LinnStrument or Continuum are much more natural and intuitive than a pitch-bend wheel: If you want to bend a note, you just place your finger on one note and slide it up to the other note at exactly the rate and movement you desire.

Using a wheel for vibrato doesn't really sound natural. A modulation wheel adds mathematically perfect vibrato to a signal. By comparison, if you perform vibrato on a LinnStrument, Continuum, or a Seaboard, it sounds very natural because your finger continuously controls the speed, shape, and width of the vibrato, just as violinists have done for centuries but without that tiny neck that is so difficult to play in tune.

Once you're able to add all of these performance nuances into your music, playing with on/off switches feels like going back in time.

Lippold Haken, developer of the Continuum Fingerboard.

Roger Linn, playing the LinnStrument controller.

Roland Lamb, playing the Roli Seaboard Grand.

How will adding Expressive MIDI to the MIDI Spec change things?

Linn: Synthesizers need to have presets that work with polyphonic expressive controllers. Right now, the presets in popular synths are optimized for the on/off switches of MIDI keyboards. When you connect a LinnStrument over a single MIDI channel to most synths and use these standard presets, you'll get the advantages of pitch slides and wiggling your finger to hear vibrato, but these presets won't use your finger pressure or forward/backward movement, nor will they permit polyphonic pitch bends or polyphonic expression.

To get polyphonic pitch bends or polyphonic expression over MIDI, you need to send each touch over a separate MIDI channel, rotating through the MIDI channels. This gets around MIDI's limitation of Pitch Bend, Control Change, and Channel Pressure messages applying to all notes on the channel.

MPE, Expressive MIDI, is merely a formalization of this voice-per-channel method, where each note is sent on its own MIDI channel, rotating through defined channels with each new note you play.

There are a number of synths that already implement voice-per-channel and a number of controllers that implement channel-per-note. When these are used together, you can already perform polyphonic expression. But to do it now, you have to define the range of per-note channels in both the controller and the synthesizer, define the main channel over which the messages that are common to all voices are sent, define the pitch-bend range in both instruments, define the controller numbers and more, which is confusing to most players.

Once the synthesizers and controllers start adding MPE compatibility, you'll merely select MPE mode on the controller and instantly the sound generator will respond—polyphonically to velocity, pressure, and pitch as well as y-axis timbre control in instruments that offer it.

Haken: MPE is important because it's Step Number 1 in getting these things to talk to each other. The next step is to have different synthesis-algorithm designs for particular controllers. I'm not saying that it should all be exclusive. But if you want to get to the point where it's worth your time to practice eight hours a day on a particular instrument, to really play something that would approach what an acoustic performance would be in terms of expressivity and really shaping the sound and such, the sounds will need to be very particular to that controller and the things it does, how it responds, and so forth.

I think the idea that the controller is totally separate from the synthesis method is a mistake: They really go together. So, while MPE is really important, I think it's also important to keep in mind that, in the end, you really do want to customize the synthesis to be appropriate for the controller.

Lamb: The great thing with Expressive MIDI is that it is really just an implementation of MIDI. It uses the conventions of MIDI, so it's not a huge step. However difficult it is, eventually we will need to layer new standards on top of MIDI because it will become a gating item for what instruments can do. I think the industry will come around that in time, and the MMA [MIDI Manufacturers Association] is doing a great job of leading that charge and working with stakeholders across the industry.

Is there room for improvement within your current controller design or Expressive MIDI itself?

Lamb: There is room for improvement absolutely everywhere. I believe in constant improvement of everything.

Think about the pianoforte—especially the pianos that were made around the 1930s, sort of when instruments like the Steinway concert grand started to peak: If you have a piano from that period and it has been well maintained, you could arguably have one of the best pianos in the world. Obviously, Fazioli and others have continued to push things forward, but there was a point where pianos reached the apex of their modern sound and development. But it took a few hundred years of innovation from the birth of that new idea to get to that point. The Seaboard is a new instrument and we're just at the very beginning of a long journey with it.

In terms of the Expressive MIDI specification, while there might be room for improvement, a protocol is a very different sort of thing than an instrument. An instrument, you just want to make better and better. But a protocol is more like an agreement or a compromise. That is because there are a lot of different people involved—hardware manufacturers, synth makers, and others—who might use a protocol in different ways. It's more like a multipurpose tool, in a way. But I think we've come up with a great next step.

Haken: There are a huge variety of things that can be improved. The most fundamental thing is how you interact with the sound. In the Continuum, you're pressing something that has a nice mechanical feel to it, and I'm very proud of it. But there are so many different things you could do where, if you look at the details—for example, the difference between a $100 violin and a $30,000 violin—it involves tiny details and huge improvements. And in many cases, those are improvements that only a very skilled violinist would even notice.

We are very much in an age where people expect their iPhone to be their musical instrument as well as their day planner, their telephone, and everything else. So to some extent we have this idea that there is this generic x, y, z controller that will do everything. But I think there are a huge variety of possibilities, such as how you interact with an instrument.

Look at the difference between, say, a theremin and an Ondes Martenot. In many ways, they're quite similar in terms of sound generation. But the kind of music that has been made on those two instruments, which are from the 1920s, is very, very different. And it has to do with how you interact with each one; exactly how the instrument is set up and how a person works with it, and the skill set that people learn—it is a big deal.

The main way people purchase synthesizers nowadays is that they go to a store, try all the keyboards, and the one they sound best on is the one they buy. But that's not how anyone buys an acoustic instrument. This whole idea of instant gratification is nice, but I think there is a very important part about being incredibly proud of the skills you

have worked on for years in order to do amazing things on your instrument.

But the initial thing for MPE is to introduce these simple things that add a new dimension to the sound. Then, over time, people will explore that more and more and get to the point where synthesizer manufacturers really invest in it; technologies that are not just imitative but new instruments, maybe that borrow ideas from existing instruments, but much more complicated systems that a performer, when they first play a sound, might not sound so good on; where it might take a few years to get really good at it, as it would if you were learning a new acoustic instrument.

Linn: One problem is that human beings take a long time to learn the new physical gestures required to master a new instrument. This presents a chicken-and-egg problem: The musician is wondering if he should buy the new instrument and commit the time to becoming proficient on it, because he's wondering if the instrument will still be around next year. But if nobody buys the instrument, it *may not* be around next year.

I believe that expressive controllers are not going away, but, rather, are the next big thing in electronic instruments. In my view, sometime in the future—20, 30, or 50 years from now—people will look back at the period between around 1970 and 2020 as the period of transition between the expressive acoustic instruments that came before, and the expressive electronic instruments that came after.

And during those 50 years of transition, most of the electronic instrument makers took the easy path for human interface elements, using inexpensive switches, knobs, and sliders, elements designed not for music but for data entry. "Let's make a music keyboard out of 61 on/off switches. We'll add velocity sensitivity to the switches, let them sense a little pressure after a key is fully depressed, and we'll add a couple of knobs mounted sideways to bend pitch and add vibrato. That's all people need."

Over time, electronically-generated music lost much of its dynamics, subtlety, performance nuance, and other elements of musical expression, largely because it is difficult to play expressive music with on/off switches. Eventually, electronically-generated popular music stopped including instrumental solos because solos played with on/off switches aren't very interesting.

Then, around 1999, you begin to see polyphonic expression instruments using new sensor technologies, permitting levels of musical expression approaching that of acoustic instruments, but with the benefit of polyphony. The first of these was the Haken Continuum. And people gradually started to appreciate this improvement in expressiveness, and forward-thinking musicians developed skills on the new instruments and became the instrumental stars of their era. And by around 2020, the era of electronically generated music started to embrace the musical expression, virtuosity and instrumental solos of the previous era of acoustic instruments.

And the electronic musicians of 2020 will wonder in amazement how the electronic musicians of the previous 50 years were able to make music with such limited tools as on/off switches, knobs and sliders. ■

PMC Resources

Expressiveness in Electronic Music	expressiveness.org
Eigenlabs	eigenlabs.com
Haken Audio	hakenaudio.com
Madrona Labs	madronalabs.com
Roger Linn Design	rogerlinndesign.com
Roli	roli.com

The Story of MIDI

A look at the protocol's past, present, and future

BY GEARY YELTON

Maybe it goes without saying, but electronic musicians' lives would be radically different without MIDI. Alongside synthesizers and digital audio, MIDI is the technology that has had the greatest impact on how we create electronic music. Its influence on the instruments we play and the software and peripherals we use can't be overstated.

Before MIDI became a standard more than 30 years ago, most electronic musicians lived in a sort of pre-digital Dark Ages, waiting for something to sweep them into the music industry's mainstream. Since then, it has given us sophisticated, affordable tools essential to modern music production and performance. MIDI makes software possible that every component in an integrated system can understand on its own level. It is the bridge between musical instruments and computers.

Because all MIDI gear is inherently compatible, you can start with a modest system and build onto it gradually while minimizing obsolescence. At the 2013 NAMM Show, as part of celebrating MIDI's 30th anniversary, members of the MIDI Manufacturers Association (MMA) connected a sequencer running on a Commodore 64 computer to Moog Music's Animoog app running on an iPad and guess what? It just worked.

WHAT IS MIDI?

You probably know that MIDI is an acronym for Musical Instrument Digital Interface. It is a communications protocol that comprises both a set of instructions and the physical connections between compatible devices.

The language and rules of MIDI were precisely defined in a document called the MIDI Specification 1.0 and published by the MMA, a consortium of synth manufacturers who agreed to make products that adhere to the standard. Now comprising hardware and software companies that include the likes of Apple, Microsoft, and Google, the MMA defines, extends, and enforces the standard, ensuring that MIDI-compatible software and hardware are interoperable, meaning that they work together in a system as seamlessly as possible.

At its most basic level, MIDI is a collection of messages or commands that transmit information such as when a sound plays and at what pitch. Some of the most important messages for music include data about what notes are played, for how long, and at what velocity, but the role of Control Change (CC) messages has become more critical in recent years because it's used for so many purposes.

All of these commands were originally intended for synthesizers, but because MIDI is a cheap and ubiquitous standard, today it's used in all manner of technology, musical and otherwise. DJ controllers use MIDI messages to trigger clips and control their playback speed, for example. MIDI is an in-

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tegral part of stage lighting consoles, and it even controls rides in theme parks and choreographed fountains outside of Las Vegas casinos.

In the early days, MIDI was inseparable from the 5-pin DIN connectors that you see on many instruments. When MIDI became a standard, the companies that ratified the specification chose that particular connector because it was inexpensive and readily available. Since then, the MMA has specified alternate hardware for MIDI transmission, most often because USB, FireWire, and Ethernet offer much faster transmission speeds allowing much greater bandwidth (see Figure 1). Most newer instruments sport single USB ports rather than a trio of DIN connectors. Although you can't connect two MIDI devices using USB unless you have a computer between them, USB connections offer enough advantages that they've become the preferred choice for most manufacturers.

HAMMERING OUT A STANDARD

In the late 1970s and early 1980s, companies that built electronic musical instruments were transitioning from designing instruments based entirely on analog technology to instruments with microprocessors at their cores. As the price of digital electronics fell, they sought to augment and replace the discrete circuitry in their products with affordable computer chips. To realize the potential of these new instruments fully, however, many realized that the microprocessors in their machines would need to communicate with each other.

Companies such as Oberheim, Roland, and Sequential Circuits introduced proprietary communications buses that allowed a synth, a drum machine, and a sequencer to record, store, and play thousands of notes in an integrated performance, revolutionizing music production by radically advancing the concept of a one-man band. Unfortunately, all the components in a system had to come from the same manufacturer to be compatible. The obvious solution to the problem was to convince manufacturers to agree to some sort of standard.

Fig 1. Because it furnishes MIDI connections via Spin DIN, USB, and Ethernet, iConnectivity's iConnectMIDI4+ is well-equipped for advances in MIDI hardware.

At the 1981 AES convention, Dave Smith, president of Sequential Circuits, presented a proposal inviting other synth makers to create a standard for digital communication, but most of his competitors had no interest in cooperating. The major exception was Roland founder Ikutaro Kakehashi, who had earlier suggested the same kind of standardization to synth designer Tom Oberheim.

A few months later, at the NAMM Show in January 1982, Smith and Kakehashi met with other synth makers and proposed the basic elements of what became MIDI. Yamaha, Korg, and Kawai agreed to the standard, and along with Sequential Circuits and Roland, they announced ratification of the MIDI Specification at the 1983 NAMM Show and published the spec in August of that year.

New extensions to the MIDI spec are ongoing, with various working groups ensuring that MIDI 1.0 remains a viable document today and into the future. Even if the MMA finally approves the HD Protocol and new products begin to appear, MIDI is here to stay.

During the year that followed, practically every electronic musical instrument maker began building products that conformed to the MIDI standard, and synthesizer sales increased dramatically. Since then, the MIDI Specification has been a continually evolving document subject to extensions that keep it up with the times. A few extensions approved since 1983 are Standard MIDI Files (1990), General MIDI (1991), MIDI over FireWire (2000), and Downloadable Sounds (2004). Other extensions to MIDI 1.0 currently under consideration by the MMA include Polyphonic Expression Controllers, Web MIDI, and MIDI over Bluetooth.

HERE COMES TOMORROW

Looking to the future, the MMA's members imagine a time when they may want to go beyond MIDI's inherent constraints. To that end, they've been discussing the HD Protocol, which some have erroneously called MIDI 2.0 or MIDI HD. First proposed in 2006, development of the specification has continued for almost a decade. The official position, according to MMA president Tom White, is that "HD Protocol is just a proposal until it is ratified by the industry, and we don't know if and when that will happen."

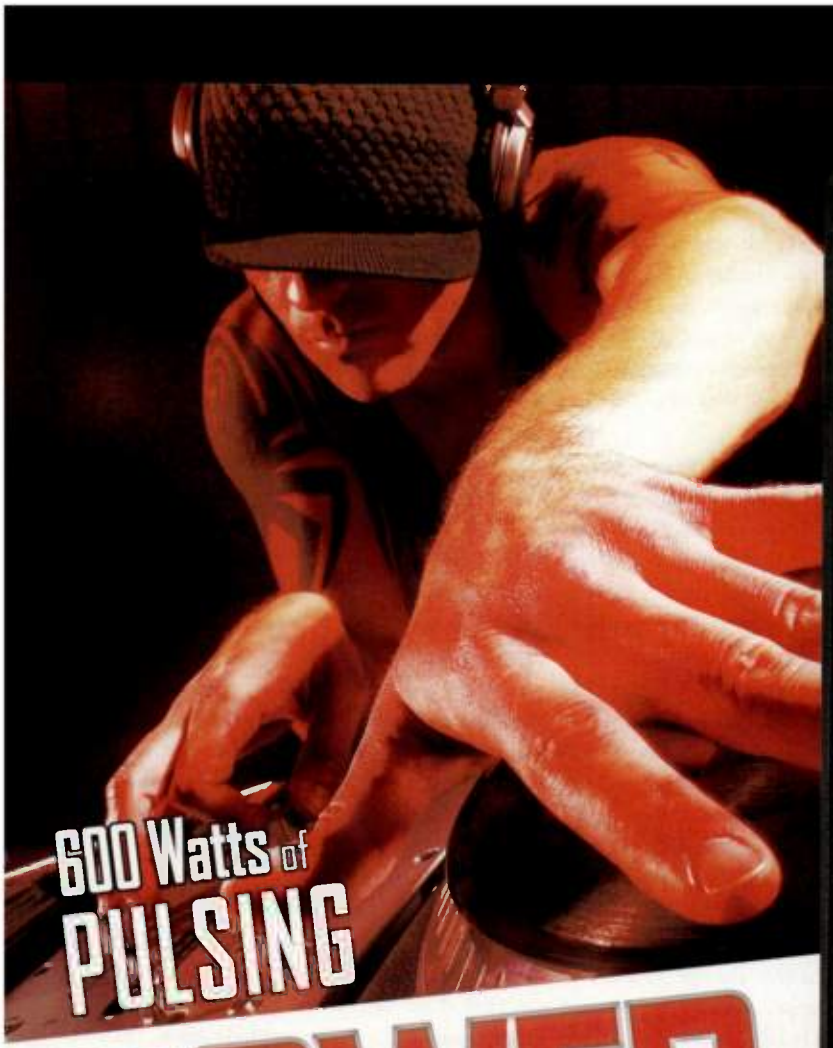
HD's most crucial aspect is that it must be completely interoperable with MIDI 1.0. All your MIDI hardware and software must operate exactly as it does now, but with extended capabilities for products that support the new protocol. Because HD would be backward compatible and recognize current MIDI messages, all MIDI devices would function as they always have. Although Ethernet is HD's preferred hardware connection, USB is an acceptable alternative, with options for any additional hardware standards that arise in the future.

A few of the protocol's most outstanding improvements would include thousands of channels and controllers, massively high resolution, and Direct Pitch control. Whereas now you need to specify a MIDI Note Number and a Pitch Bend message to achieve a non-standard pitch, Direct Pitch specifies any possible pitch, regardless of tuning. Because Direct Pitch could alter pitch at any instant, you'd no longer need to offset the current pitch with Pitch Bend. In addition, a new Note Update message would modify controllers or other parameters over the duration of a single note, allowing more precise articulation than is currently possible.

In the meantime, new extensions to the MIDI spec are ongoing, with various working groups ensuring that MIDI 1.0 remains a viable document today and into the future. Even if the MMA finally approves the HD Protocol and new products begin to appear, MIDI is here to stay.

Multidimensional Polyphonic Expression: Polyphonic multidimensional controllers (PMCs) such as the Roli Labs Seaboard, Roger Linn Design LinnStrument, and Haken Continuum Fingerboard expand the limits of real-time MIDI performance. PMCs can generate data that most MIDI software doesn't understand, putting unnecessary restrictions on what you can do with them. Because PMC manufacturers have a vested interest in extending MIDI 1.0 so that it supports the new capabilities their products offer, they have joined together to create standards for Multidimensional Polyphonic Expression (MPE).

One of MPE's most significant features is per-note expression. When it's turned on, you'll be able to address as many as 15 notes on their own channels and apply Aftertouch to each channel individually, while still retaining a single channel for



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controlling parameters globally—sustain, in particular. You'll also be able to apply Pitch Bend to individual notes and gain direct, continuous control over their timbre. In addition, MPE will allow you to extend Pitch Bend to a default range of 48 semitones and a maximum 96 semitones.

MPE-compatible hardware and software will offer an MPE mode you can toggle on and off. When it's on, controllers will automatically reconfigure themselves for it. The MME's MPE working group expects to have a finished version of the MPE proposal by the time you read this.

MIDI over Bluetooth LE: Developed and implemented by Apple, Bluetooth LE (Low Energy—BTLE for short) is a wireless connection specification designed to extend the battery life of mobile accessories that don't stream data continuously, including MIDI keyboards and controllers. Minimizing latency and jitter are just two of the challenges to any kind of wireless MIDI, but Microsoft and Google have already expressed their support for MIDI over BTLE.

As with all Bluetooth devices, you'll need to pair MIDI devices before they can communicate their MIDI capabilities to each other and transfer data between them. Although MIDI over BTLE is designed for use with mobile devices, you should be able to use the same accessories with your computer, just as you may already use a Bluetooth QWERTY keyboard and mouse. By the time you read this, MMA members will have voted on making MIDI over BTLE part of the MIDI Spec, meaning that someday you could be using wireless MIDI devices both onstage and in your studio.

Web MIDI: A few months ago, Google announced that the latest update to its Chrome browser offered built-in support for MIDI, allowing Web apps to communicate with MIDI devices. A Web-based synth emulation soon appeared, enabling anyone with a MIDI keyboard connected to a computer to play it online. Soon after that came a Web-based drum machine with MIDI I/O capabilities. If you have Chrome, you can access compatible apps at webaudiodemos.appspot.com.

Browser-based MIDI applications rely on the Web MIDI API and Web Audio API, both supplied by the World Wide Web Consortium (W3C), whose members include Google, Mozilla, Apple, and Microsoft. The MIDI API lets you select MIDI devices connected to your computer, tablet, or phone and use them to change parameters and play music on Web apps. A generally accepted standard for Web MIDI is still a work in progress, but once approved, support for MIDI devices will become a standard feature for browsers and operating systems across hardware platforms.

Android MIDI: Demand for MIDI apps on mobile devices is exploding. Unlike iOS users, Android users have been limited by the platform's lack of standards for connecting MIDI devices and handling MIDI data. When it's released, however, the latest update to Google's mobile OS, Android 6.0 Marshmallow, will offer built-in support for a MIDI API that helps programmers write new MIDI apps and modify existing ones.

Android users will be able to use MIDI keyboards and peripherals to control apps and use the apps to control external instruments and devices, either via BTLE or a USB connection. You'll also be able to generate MIDI data in one Android app and route it to another. What's more, the MIDI API makes it possible to write apps that use your Android device as a multi-touch controller for controlling MIDI software running on your laptop or desktop computer.

Windows 10: One reason that Apple computers and devices have been so popular with musicians is that their operating systems integrate Core MIDI and Core Audio, making music software and hardware peripherals inherently compatible

with minimal hassle for both product developers and users. Windows users have often relied on third-party solutions to make everything in their studios play well together, leading to inevitable incompatibilities because software that works with one product might not work with another. Microsoft seeks to remedy this situation by addressing compatibility at the system level in Windows 10.

Pete Brown, Microsoft's principal program manager working with music and audio hardware and software developers, expects to see Windows 10 installed on as many as a billion devices in the next three years. That's because the same operating system will run on smartphones, notebooks, desktops, tablets, and Xboxes, and even on a Raspberry Pi or Microsoft's augmented-reality headset HoloLens. In fact, the next version of the Akai MPC will run an embedded version of Windows 10 under the hood.

To take full advantage of all this newfound compatibility, software must adhere to the Universal Windows Platform (UWP) model, a set of design guidelines that ensure software will run on a range of devices. Once it is implemented, you should be able to run the same DAW on all your Windows gear. Several developers are already updating their software for UWP. Bitwig has a UWP version of Bitwig Studio in the works, and Propellerhead has demonstrated a UWP version of Figure.

To enable compatibility for music applications across hardware platforms, Microsoft has introduced a new MIDI API for software developers. This modern, multiclient set of development tools, routines, and protocols allows multiple applications running in Windows 10 to share multiple MIDI interfaces—something you couldn't do with previous APIs. In addition, Microsoft is providing new APIs for audio that improve performance by reducing buffer sizes for lower latency and preventing spikes caused by external processes, for example. In future APIs, Microsoft plans to address capabilities such as wireless MIDI, MIDI routing, and time stamping.

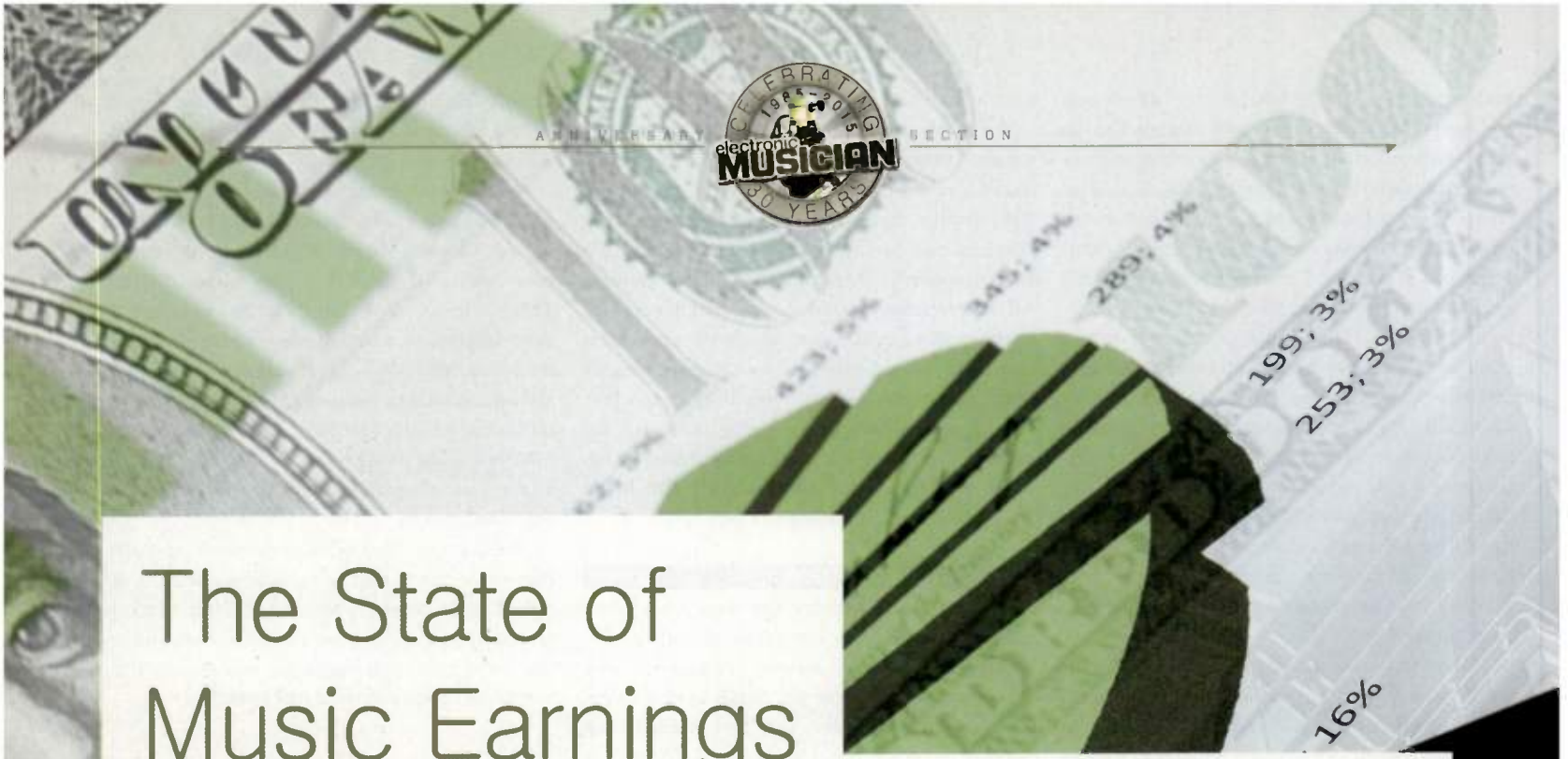
THE MIDI ASSOCIATION

The MIDI Manufacturers Association is a group of product developers, engineers, and other technology leaders from member companies who implement and enforce the MIDI Specification, ensuring interoperability now and in the future. Because of budget constraints, the MMA's role in promoting MIDI and educating users has been mostly limited to publishing the specification and hosting a website that disseminates information about MIDI. But all that's about to change with the creation of The MIDI Association (TMA), a spinoff that aims to create a global community of people who create music and companies that create products using MIDI.

Recent developments—particularly the growth of MIDI's potential audience thanks to Windows 10 and Android—suggest a greater need to make users aware of what they can do with MIDI. TMA's role is to appeal to all MIDI users, including musicians, sound designers, audio engineers, hobbyists, retailers, manufacturers, developers, and educators. The focus of TMA's online community is the website MIDI.org, which has been the MMA's domain until now. For end-users, it will be a source of information about anything related to MIDI technology.

These are exciting times in the world of MIDI. Almost 33 years after it became a standard, its influence on music, creativity and commerce is greater than ever, and you can fully expect its influence to grow. You have more opportunity than ever to be an active part of that growth. ■

Thanks to his embracing MIDI networking, synth programming, sample editing, and sequencing software well before most other musicians in Atlanta in the 1980s, former *EM* senior editor Geary Yelton enjoyed a studio career that lasted only until better players caught on to what he was doing.



The State of Music Earnings

How musicians, producers, and engineers make money in the digital landscape

BY RANDY CHERTKOW AND JASON FEEHAN

If you choose any point in the 30-year history of *Electronic Musician*, it's a safe bet that the way musicians, engineers, producers, and performers make money from music was in a stage of flux. This evolution of music earnings has essentially been dictated by two forces: the law—legislation and a long series of court cases—and technology.

The sheer number of ways to monetize music today is incredible. These opportunities are within reach of most music creators—especially when they realize that today, they're the music label. If they spend a weekend or two registering their music in all of the places that generate royalties and revenue like music labels do, they can participate in the same income streams.

This is also an important time for music makers to pay close attention to the *future* state of income. A major piece of legislation currently making its way through Congress has the potential to shake up royalty structures that have been in place for more than 60 years.

We'll survey today's income streams—some of which didn't even exist a few years ago—examining how they've changed and how music creators can take advantage of them today. And then we'll look at proposed legislation that could change the lives of musicians, producers, and engineers in the near future.

MUSIC DISTRIBUTION AND SALES

In 1999, music sales hit their highest peak. Then came the internet and Napster: Music fans found themselves in a world of nearly unlimited music that they could explore, share, and download from their home computers. The music industry was slow to adapt, partly because they weren't nimble compared to the speed of change in the computer world (where companies like Apple were able to step in). Plus, they were encumbered by the contracts of previous business models, which limited their options. In the intervening time, digital distribution platforms such as Apple's iTunes took hold and became a key way that fans bought and experienced music.

Today any musician can inexpensively and easily put their music up for sale worldwide on digital music platforms. Some services are even free, since the distributor takes their cut from the sales on the back end rather than charge an upfront fee. Major digital aggregators include CD Baby, TuneCore, Nimbit, ReverbNation, and DistroKid. (Free options include RouteNote or Loudr.)

MUSIC STREAMING

Streaming services such as Spotify have remained controversial because of their small payments to artists. Though music streaming revenue tends to be very low—it takes many streams to equal one sale of a single on digital music services—artists have options for improving their revenues, including getting songs into popular playlists. To get your music on streaming services, use the same platforms in the Music Distribution and Sales category and choose the streaming options they provide. Then use the playlists and social features of the streaming sites to market and improve your income from them.

PERFORMING LIVE

Playing live is still the most straightforward way for musicians to make money. That said,

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the variety of entertainment options available on computers, video game systems, and phones have created a war for attention; to compete, musicians must work harder at building "experiences" beyond just playing their songs onstage.

Today, musicians can put that live experience within reach of all fans, no matter where in the world they're located—whether they're broadcasting from their basement or streaming from a venue where they're already playing. To monetize a streaming show, use platforms such as Stageit or Giggee.

CROWDFUNDING AND PATRONAGE

In the past, music labels were the only investors willing to risk money on music artists because of the high failure rate. Now, some artists are successfully going direct and getting bank loans—especially if they can prove that they are making a stable income.

Some even go direct to their fans to raise money through crowdfunding. If you can sell your fans a piece of your dream, they will pledge to help you realize you. In 2014, on Kickstarter, people pledged over $34 million to music projects. (Read "Money Masterclass: How To Fund Your Music Project," "Setting Crowdfunding Goals," and "Sequencing Crowdfunding to Get More Funding" at emusician.com to learn more.)

But that's not the only way to raise money directly from fans. Artists who put out a lot of material on a regular basis often benefit from subscription models on sites like Patreon or Patronism.

SYNC LICENSING

Sync fees are based on licensing music to movies, TV, and video. In the past, this process was dominated by major media companies. Today, there are more productions and channels, which puts sync revenues within reach of regular musicians, but these opportunities are still tough to get without connecting with music supervisors for these projects.

Today, the easiest way to earn sync revenues is via YouTube revenue sharing, in which videos broadcasted on an artist's channel generate revenue streams based on advertising. Artists can connect other income sources to their videos by linking to patronage platforms, music sales, merch sales, etc., generating subscriber fanbase in the process.

Artists can also monetize videos from other creators who use their music and video content using the YouTube ContentID system, which will recognize when material is being used so that artists can get a cut of advertising revenues.

NON-INTERACTIVE STREAMING

Every time sound recordings are played on non-interactive streaming services such as Pandora, Last.FM, or Live365, royalties are generated. These royalties were established with the Digital Performance Right in Sound Recordings Act in 1995 and refined by the Digital Millennium Copyright Act of 1998. These acts granted a performance right for sound recordings that was separate from royalties generated by the performance of the composition. As a result, the SoundExchange digital performance rights organization was founded in 2003 to collect and distribute these royalties to sound recording owners, performers, engineers, and producers.

In general, labels own the copyrights to sound recording masters. But today, most independent musicians own their recordings, and thus, might be missing out on royalties if they haven't signed up for collecting them. And if a musician is also a featured performer on a recording, he or she gets a cut for this role as well—if they've signed up to collect it.

Note that SoundExchange is currently the only PRO that collects money for engineers, producers, and performers. If you fall into any of these roles, make sure that the artist you work with is taking care of these registrations, and follow the instructions in the Income for Producers and Engineers Section below.

COMPOSITION PERFORMANCE ROYALTIES

When a composition is played on terrestrial radio at a restaurant, music venue, or inside an office, it generates a performance royalty. PROs collect royalties from radio stations, and subscription fees from venues, and distribute 50 percent to the songwriter and 50% to the publisher.

Independent musicians usually fall into the roles of both songwriter and publisher. So if the songwriter doesn't register with the PRO as the publisher, they won't get paid for the publisher's credit, leaving half of the money on the table. Any artist that fills both of these roles should register with the organization as a songwriter, and then as a second time as a publisher. After doing this, they

Howard Benson

Maureen Droney

Cult of Personality: Merch and Affiliate Programs

MERCHANDISE REVENUES

The branded t-shirt is still a reliable revenue source for musicians, but merch has expanded in ways that were unimaginable thirty years ago: Print-on-demand technologies allow musicians to upload their logo and set up a merch store for free, letting them make money on their very first sale (albeit with the print-on-demand shop taking a large cut.) And there is no reason to stop at t-shirts. Just about any item that can be imagined can be printed, such as clocks, mugs, and even underwear. Print-on-demand services include Spreadshirt, Zazzle, or CaféPress. Artists who would rather create their own inventory can benefit from online fulfillment services such as Amazon Fulfillment or Nimbit.

AFFILIATE PROGRAMS

It used to be that only label-represented artists could parlay their popularity into its own revenue stream. Today, even musicians with just a handful of fans can generate additional income from their fanbase.

Affiliate platforms let musicians turn blog entries, tweets, and even track links into income. It's a simple technique: Online vendors create links with a tracking code so that the vendors know who sent the customer. As a result, the vendor gives a percentage of whatever the customer buys. You can even link to your own music, which allows you to make an extra cut on each sale.

The best part is that you get a cut of whatever the customer buys while shopping on the site. This means if someone purchases a flat-screen TV, you'll get a bigger check. You can make affiliate links by just linking to products that you like or discuss. Some of the most natural bigger-ticket items to talk about and link to are your own musical instruments and gear. Try out affiliate programs from Amazon Associates, Commission Junction, Rakuten, and eBay.

will need to register each song under each of these roles as well. To collect these royalties, sign up at ASCAP or BMI, or get invited to SESAC.

PRODUCER AND ENGINEER ROYALTIES

Historically, producers and engineers only received money from music labels or artists. While they could get a cut of royalties from music sales, they would need to arrange royalty splits with the artist or label (and get official sales statistics). This structure changed when SoundExchange was formed in 2003 and engineers and producers were compensated from sound recording performance royalties; in order to earn those, however, producers had to be added to the royalty agreements via a "Letter of Direction." In recent years, The Recording Academy and its Producers and Engineers Wing have been working with SoundExchange to streamline the LOD process.

Producer Howard Benson, who has worked on albums with Motörhead, Less Than Jake, My Chemical Romance, Kelly Clarkson, and others, says "SoundExchange has been a huge benefit to producers, since SoundExchange is direct-deposit. You can see exactly how much each artist pays you. It's far more transparent and a lot more fair because of the transparency."

Benson suggests producers follow these three steps in order to ensure payment: (1) get an artist-signed Letter of Direction to the label that assigns a percentage directly to the producer, (2) get an artist-signed Letter of Direction to SoundExchange (see examples at SoundExchange.com) to pay the producer directly, and (3) register for neighboring rights at organizations such as ACTRA.

Since payment depends on accurate data, it's important to get these forms filled out properly. As Jonathan Bender, Chief Operating Officer of SoundExchange said, "Letters of Direction must list each track title and version of a recording to be included, so we encourage producers and engineers to be diligent in filling out the LOD forms. (Often, only one version will be listed, when many should be included.) Finally, the LOD must be signed by the Artist or the Artist's Registered Representative to be honored." Demos should also be included, in case they become a YouTube hit, for example, and each sound recording counts as a separate revenue-generating entity.

THE FUTURE STATE OF INCOME

While there are more ways to monetize music than ever before, not every music creator has access to every type of income. Producers, engineers, and performers are left out—except for noninteractive streams. And that's where a proposed new law comes in.

A bill being considered by Congress called the Fair Play Fair Pay Act of 2015 (H.R. 1733) aims at addressing four issues. It would:

- Create a performance right for artists on terrestrial radio—something today's musicians don't earn in the US (but their European counterparts do).
- Establish a process for setting fair-market royalty rates.
- Close a pre-1972 loophole so veteran performers could receive royalties.
- Codify royalty payments to producers.

This legislation is aimed at the larger commercial radio stations. Public, college, and noncommercial stations either have special exemptions or pay a smaller administrative fee. As Maureen Droney, the Managing Director of the Producers and Engineers Wing of The Recording Academy said, an example of the problem with royalties is that "when you hear the song 'Respect' on the radio, Aretha Franklin doesn't get paid, only Otis Redding does." And as Benson noted, neither does the producer or engineer: "[It would be] better if the songs stopped playing on the radio altogether because we'd get paid more often, because there would be more plays on streaming platforms where producers get paid from SoundExchange."

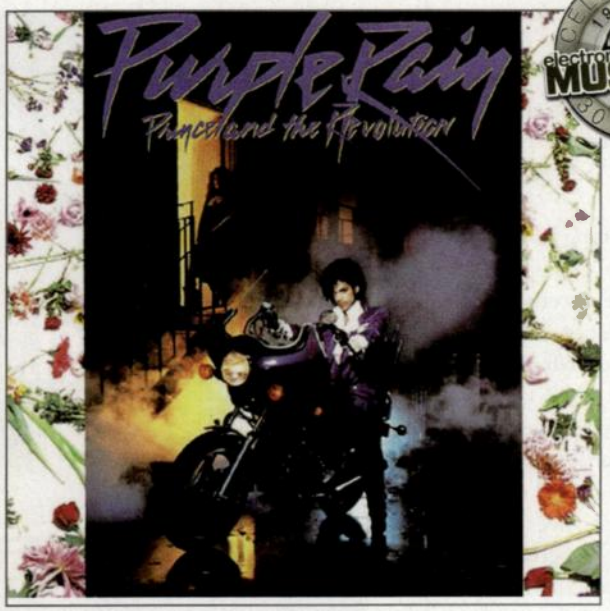
You can see the text of the Fair Play Fair Pay Act at emusician.com; and to learn how you can get involved and to contact your legislator regarding this proposed legislation, visit The Recording Academy's Website at www.grammy.com/action.

FOCUS ON THE POSITIVE

Although sales numbers are nowhere near the figures of 30 years ago, today, unlike in 1985, musicians benefit immensely from direct access to fans. As Clay Shirky wrote in his book *Cognitive Surplus*, the internet is now the media—it's a connector that allows people to collaborate and participate. Social media, blogs, YouTube, and a host of other ways fans can interact have dropped barriers to fans. This direct relationship impacts income: Artists can sell music and merch to fans directly worldwide, and tools like crowdfunding and patronage sites allow fans to break out of the consumer role and directly fund the artists they love.

The key is to participate in as many sources of income as you can, and be informed about upcoming legislation to take control of your music income and the future of music. ■

Randy Chertkow and Jason Feehan are authors of *The Indie Band Survival Guide* (St. Martin's Griffin), now in its second edition.



NOTABLE ALBUMS FROM 1985

BY BARBARA SCHULTZ

PRINCE
PURPLE RAIN
WARNER BROS.

At the astronomical height of his popularity, the artist formerly, and again, known as Prince was a movie star as well as a rockstar in the year that *Electronic Musician* debuted. Guitarist, composer, arranger, producer... His Purpleness deftly blended the synthy and snare-heavy sounds of the day with rock guitars, soul singing, and tasteful orchestration to create an unforgettable soundtrack to his film of the same name. The album yielded two Number One singles ("When Doves Cry," "Let's Go Crazy") as well as the Number 2 title track. *Purple Rain* regularly rates high on any list of greatest albums of the '80s, and it's on the Library of Congress's National Recording Registry of culturally and historically important sound recordings.

BRUCE SPRINGSTEEN
BORN IN THE USA
COLUMBIA

The Boss followed his acoustic masterpiece *Nebraska* with his most commercial album ever. Though the songwriting was just as arty-everyman as on earlier classics, the bright sounds of *BITUSA* seemed to pander to then-current trends, and the look of the album and associated videos (inseparable from music at the time) had longtime fans kinda worried. However, the artist's refusal to perform the anti-war title anthem in Reagan's White House reassured the faithful, who just needed to wait out the rest of the '80s for their hero's return to form.

ARETHA FRANKLIN
WHO'S ZOOMIN' WHO
ARISTA

Speaking of Springsteen, E Street Band saxophonist Clarence Clemens played a trademark raunchy solo on the Queen of Soul's Number One and Grammy-winning R&B single "Freeway of Love." With production by Narada Michael Walden, the Clemens solo serves to bridge the gap between classic '60s soul and '80s pop. But the coolest song that Franklin put out during this period was not originally on *WZW*: Her inspiring duet with Annie Lennox, "Sisters Are Doin' It for Themselves" was added to later versions of the album.

PHIL COLLINS
NO JACKET REQUIRED
ATLANTIC

The 1986 Album of the Year Grammy winner was released in 1985 to critical acclaim, impressing listeners with its unique synth- and horn-centric production by Collins and Hugh Padgham. The singer/drummer composed some of the songs, including the hit "Sussudio," using beats that he developed while experimenting with a drum machine. But some of the drier and more subtle drumming, and some vocal harmonies on the album (with guests Sting and Peter Gabriel), more closely resemble Collins' prog-rock days with Genesis.

DIRE STRAITS
BROTHERS IN ARMS
WARNER BROS.

One of the first albums to be geared toward CD (vs. vinyl) sales, *Brothers in Arms* was a massive, surprising hit—one of those albums that makes a huge impact because it *doesn't* sound like other records of the time. Old-school organ, smooth-jazz horns, and virtuosic but laid-back guitar work provided the perfect framework for Mark Knopfler's warm, timeless voice. And, of course, the guitar sound on the iconic MTV-era smash "Money for Nothing" made an indelible impression on a generation of fans and guitar players.

MADONNA
LIKE A VIRGIN
SIRE/WARNER BROS.

Disproving the sophomore slump rule, Madonna's second album was her big breakthrough, thanks to its infectious, groove-driven production by Nile Rodgers and hit music videos that played up the pop star's style and sensuality. Decked out one minute in sort of punk lingerie ("Like a Virgin"), and the next in Marilyn Monroe's iconic form-fitting pink satin ("Material Girl"), Madonna proved herself a fashion chameleon with great moves—so compelling to watch that her lovely voice quickly became beside the point.

USA FOR AFRICA
WE ARE THE WORLD
COLUMBIA

Michael Jackson, Stevie Wonder, Paul Simon, Tina Turner, Diana Ross, Billy Joel, Dionne Warwick, Willie Nelson, Cyndi Lauper, Ray freaking Charles, etc., etc.... The biggest pop stars of the day united to record one benefit song, to feed the hungry in Africa. This brilliant collection of voices turned a pretty average song into the fastest-selling single of all time. Further tracks on the Number One *WATW* album were donated by the artists, who proved that a song doesn't need Dylan-esque eloquence to change lives.

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~ Butch Walker
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"I love the way the control and tracking rooms sound now... and so does everyone that records here!" ***~ Butch Walker***

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~ Daniel Adair
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It ended up costing less than 25% of the custom solution and it turned out very cool."
~ Keb' Mo'
Roots music legend

"Not only does my room sound amazing, it's also really beautiful!!!" ***~ John Rzeznik***
Performer/artist/producer - Goo Goo Dolls.

"Not only does my room sound amazing, it's also really beautiful!!!"
~ John Rzeznik

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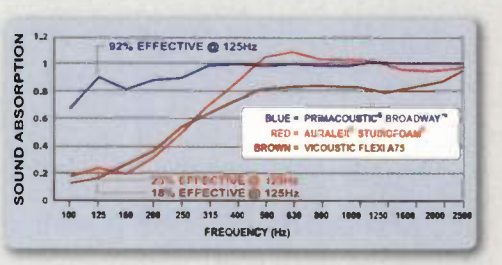

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Fig. 1. Digital Performer 9 features selectable visual themes and an optional Spectrogram display for audio tracks.

MOTU

Digital Performer 9

A MAJOR MAKEOVER OFFERS PLENTY OF NEW FEATURES

BY MIKE LEVINE

Mike Levine is a multi-instrumentalist, producer, and music journalist from the New York area.

STRENGTHS

Updated look. New plug-ins. Create Tracks command. Automation Lanes. Music XML export. Spectrogram view. Fully functional 30-day demo available.

LIMITATIONS

MegaSynth GUI is complicated. No frequency-specific editing tools or frequency indicators in Spectrogram view.

$499; upgrades start at $129
motu.com

The latest Digital Performer upgrade is a significant one, introducing a number of workflow enhancements, a new visual theme, and five new plug-ins (see Figure 1). MOTU has even added its flagship virtual synth, MX4, which until now required a separate purchase.

For this review, I tested Digital Performer Version 9.0 on both a Mac Pro (2.66GHz Quad-Core) and MacBook Pro (2.6GHz Intel Core i5), each with 16 GB of RAM.

PLUG-IN PARTY

Digital Performer's collection of plug-ins was already expansive, but these five new additions—MegaSynth, Micro G, Micro B, MultiFuzz, and MasterWorks FET-76—make it even more comprehensive.

MegaSynth. This subtractive-synth-based processor is designed for guitar or bass, but provides good results on a wide range of instruments (see Figure 2). You'll find controls for dialing in square wave, octave, and sub-octave generators, which can be routed through two filters and an amplification stage by connecting the various sections using virtual patch cables.

Refine the sound further using the modulation section, which provides two ADSR envelopes, an envelope follower, two LFOs (offering four different waveforms), and a Pattern Modulator. The latter has sixteen steps and can be set to numerous rhythmic values based on your session's tempo setting.

MegaSynth lets you create a wide range of effects from simple tremolo and autowah to more complex effects with square waves, sub-octaves, and rhythmic modulation mixed with the original audio. I also used MegaSynth on drums, pianos, and synths and was pleased with the variety of sounds I could get.

For me, MegaSynth's only drawback is its complex user interface. Plan to read the section on MegaSynth in the Plug-in Guide to understand it fully. Sixteen presets offer examples of the types of effects MegaSynth can create, but I wish there were more. That said, I don't know of another DAW that offers this kind of plug-in, so kudos to MOTU for including MegaSynth.

Fig. 2. MegaSynth is one of three new subtractive-synth processing plug-ins included in Digital Performer 9.

SamAsh

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Fig. 3. Automation Lanes, such as these two for Pitch and Volume, can be opened underneath a track's main lane.

Micro G and Micro B. Designed for guitar and bass respectively, these two plug-ins are also polyphonic effects that let you add synth-style tones to your guitar or bass in the form of added octaves, sub-octave, and square wave tones. You can also add filter sweeps. What's more, Micro G and Micro B are presented in a stompbox format and, therefore, have simpler GUIs than MegaSynth.

Although they're not as deeply programmable as MegaSynth, Micro G and Micro B sound great and are fun to tweak.

MultiFuzz. Like a fuzzbox on steroids, this new effect is based on Craig Anderton's famous QuadraFuzz, a hardware-based multiband distortion kit. MultiFuzz splits the input signal into four frequency bands (Lo, Mid 1, Mid 2 and Hi) and applies the effect to each band individually.

In addition to individual gain controls for each of the four bands, MultiFuzz has boost switches for each to accentuate the frequency content. The Attack knob doesn't control attack in the conventional (time-constant) sense; rather, it changes the intensity and character of the fuzz effect. Tone and Output controls are also included.

The resulting sounds are bigger and more present than your typical fuzz effect (including Digital Performer's Delta Fuzz). MultiFuzz is versatile and easy to control, and it sounds great on electric guitar and synth leads, among other sources.

MasterWorks FET-76. There's a reason why so many 1176 emulations exist: The original hardware was a classic compressor that sounded great on almost everything. And sonically, the MasterWorks FET-76 does a great job of capturing the performance and sonic vibe of its namesake.

This release adds an entire bank of EDM sounds to MX4. It includes 120 impressive, well-programmed patches that are both energetic and crisp sounding, including powerful basses and leads, sequenced and arpeggiated instruments and lots more.

The MasterWorks FET-76's GUI differs a bit in layout from the original, thanks to a VU meter that's in the middle rather than on the far right. Controlwise, it offers everything from the original hardware, including knobs for Input, Output, Attack, and Release, and buttons for meter modes and for ratio. Digital Performer 9's version adds a Compression Combination button under the ratio buttons, which, when pressed, allows you to select more than one ratio button at a time, so you can create ratio settings not possible with the standard 1176. When Compression Combination is de-selected, you can have only one ratio at a time, or all four (All Buttons Down mode).

MX4 IN THE HOUSE

The inclusion of the MX4 hybrid synth plug-in strengthens Digital Performer vis à vis its competitors when it comes to virtual instruments. MX4 joins a synth lineup that includes Bassline, a monophonic analog emulation; Proton, for creating FM synth timbres; PolySynth, a polyphonic analog-modeled synth; and Modulo, a two-oscillator digital synth.

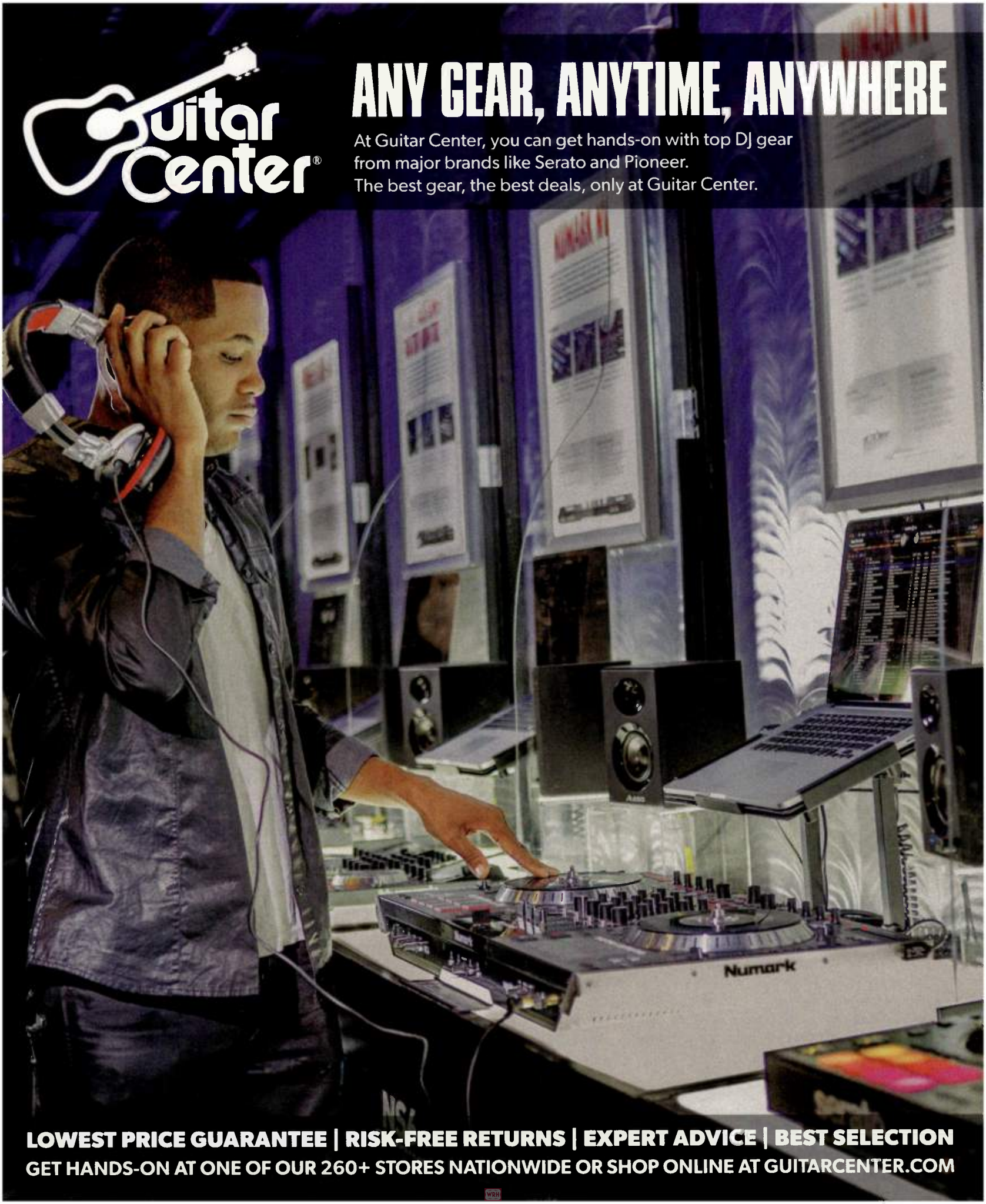
MX4 is a three-oscillator synth that lets you combine a wide range of synthesis types including FM, analog-modeling, subtractive, and wavetable. (Read our complete MX4 review at emusician.com.)

MX4 is highly programmable, but if you prefer to just use presets, or to use them as a starting point for creating your own sounds, it offers a wide selection of factory patches in a large number of categories—from pads, leads, and basses to sequenced instruments, ambiences, effects, and even a bank of old-school videogame sounds called Glitch.

This release adds an entire bank of EDM sounds to MX4, programmed by synth wizard Eric Norlander. It includes 120 impressive, well-programmed patches that are both energetic and crisp sounding, including powerful basses and leads, sequenced and arpeggiated instruments, and lots more. Suffice it to say, MX4 is a powerful and modern-sounding synth that adds serious punch to this DAW's instrument collection.

CHANGING LANES

MOTU has also added a number of workflow enhancements in Version 9. Perhaps the most significant is the Automation Lane, which can be opened beneath each track (see Figure 3).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In previous versions, when you needed to edit automation data, you'd select the parameter you wanted in the Sequence Editor and it would show as an overlay in the track lane. Then, you would use the Audio Edit Layer pull-down menu to select it as the active layer so you could edit it. But the problem was that you would still see grayed-out breakpoint lines for any other automation parameters that were written to the track, which could create a cluttered look.

In Digital Performer 9, you can open up a separate automation lane (or multiple automation lanes) below the track so that you can access automation data while the main track lane is still showing Soundbites or whichever edit layer you want. Also available for MIDI and Instrument tracks, you can open as many automation lanes as you like. Overall, these enhancements make the GUI even more user-friendly.

SEEING FREQUENCIES

Automation Lanes aren't the only new way to look at data: Now you can view audio in a Spectrogram format. Open the Track Settings Menu and change the Soundbites view to Spectrogram view, which shows frequency content as well as amplitude and duration. You also get 11 different choices for the color scheme of the Spectrogram, such as the track color on a white background, black on white, blue on black, and a multicolored rainbow look on black.

You can edit in the Spectrogram layer as you do in the Soundbites layer. That is, you can make a time selection and apply all the same edit processes. You have the option to show both the Spectrogram and Soundbites layers together, in which case the former will be on top, and any selection you make will affect them both. The Spectrogram doesn't allow you to make frequency-specific edit selections, so you can't process specific frequency ranges (à la iZotope RX). Digital Performer's Spectrogram view is really more of a reference feature that gives you an at-a-glance look at the frequency content of your audio.

Furthermore, the display doesn't give you any numeric indication for the frequencies it shows, but it does give you a sense of where the energy is in the frequency spectrum at any given point in your sequence. I would guess that the more you work with the Spectrogram display, and the more it becomes part of the way you look at audio data, the more useful it will be to you.

HERE'S LOOKING AT YOU

Version 9 brings visual improvements including a groovy multicolored splash screen and, more importantly, a new default theme that adheres to the current DAW trend of dark gray, futuristic-looking GUIs.

Version 9 brings visual improvements including a groovy multicolored splash screen and, more importantly, a new default theme that adheres to the current DAW trend of dark gray, futuristic-looking GUIs. If you've got a Mac with a Retina Display, Digital Performer 9 adds full support for it, giving the graphics an even crisper and cleaner look.

Whether you prefer the old-style Digital Performer vibe or something different, no worries: As with other recent versions, you can choose from a large selection of themes and further customize them. I like that the program gives you so much control over the look of its GUI. After all, you're going to spend hours staring at it, so it should have an interface you're comfortable with. More DAWs should offer this level of control.

Plug-in windows can now float on the top layer of the GUI. In previous versions, they would move to the back a little too easily, requiring you to have to search for them on occasion. Now you can specify which windows will float, globally in preferences or individually.

ALL THAT AND MORE

The noteworthy new Create Tracks command lets you bring up a dialog box to configure the tracks for an entire session. You can specify track types, quantity, and input/output assignments, all from the window. Once you have things set up the way you'd like, hit OK and your session is populated with the tracks you specified. It's another smart feature that will undoubtedly streamline the track setup process.

MOTU added MIDI Learn for assigning audio plug-in and mixer parameters to your external MIDI controller. Set Digital Performer 9 to Learn Controller mode, adjust the plug-in parameter you want to control in order to make it active, and then just touch the knob, slider, or button on your MIDI controller: The connection is automatically set up.

The Mute Tool for MIDI-editing is another welcome new feature. Use the X-shaped tool to click on individual notes in the MIDI editor or Sequence editor window to mute them. If you want to mute groups of notes, select a group with the Pointer tool, and then click on one of the notes with the Mute Tool—handy for temporarily muting notes to find out how a part would sound without them.

Although Digital Performer has always included a comments field for individual tracks, now you can create a global comments field for each project, as well. Called Project Notes, it can be opened like any other sidebar window, and it gives you a blank text editor into which you can write or paste as much text as you want.

If you have projects with lots of Markers or Chunks, you'll be pleased to know that there are now search bars in both of those windows, which will make it a lot easier to find specific items in large sessions.

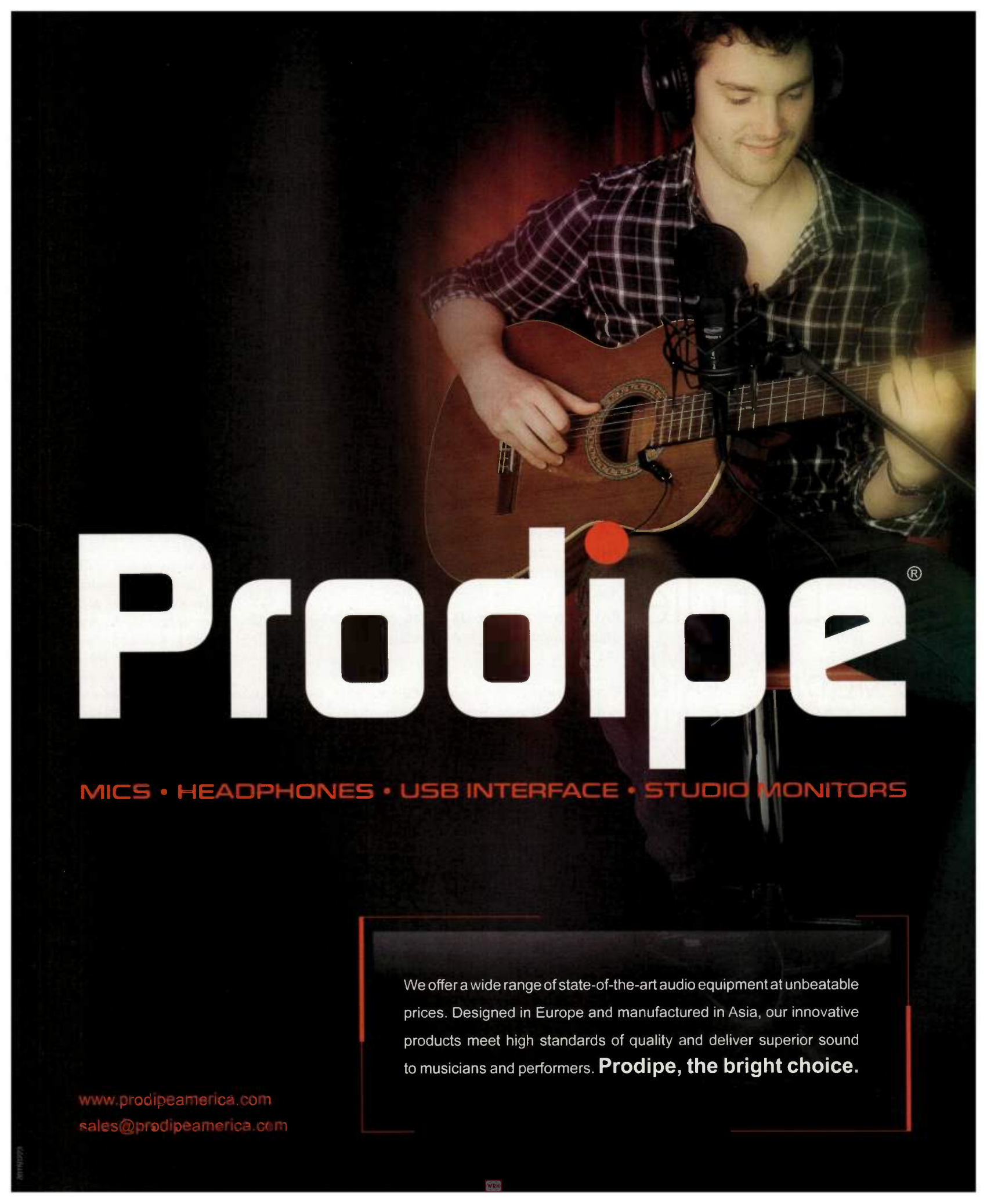
Another improvement: You can now export your QuickScribe files in the Music XML format, which can be opened by other notation applications that support it, such as Finale and Sibelius. I imagine this feature will be particularly useful for users who do film and video scoring with orchestral instrumentation, as they will be able to export their QuickScribe files to dedicated notation programs for further tweaking, or to send to arrangers or other composers.

NUMBER 9. NUMBER 9.

Overall, Digital Performer continues to be a capable and powerful cross-platform DAW that provides deep audio and MIDI recording and editing features, as well as the most comprehensive film-and-video scoring toolset on the market. What's more, I've found it to be rock solid from a performance standpoint and not at all buggy. Considering I was using Version 9.0, that's particularly impressive.

The addition of MX4 significantly strengthens Digital Performer's instrument collection, which is an area where it lagged behind some of its competitors. The five additional processing plug-ins make this already strong collection even better. What's more, MegaSynth, Micro G, and Micro B offer synth-style audio processing that you won't find in other DAWs.

The bottom line is that Version 9 is a worthwhile upgrade if you're already a Digital Performer user, and something you should definitely check out if you're looking for a new DAW. ■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The E646 VS, with FX Rack revealed, offers four channels for maximum realism.

The dual-channel E765 Retro Tube 100 model includes Bright and Tone switches.

PLUGIN ALLIANCE

Brainworx ENGL Amp Bundle

TWO AMP MODELS TAKE YOUR GAIN TO THE NEXT STAGE

BY MIKE LEVINE

STRENGTHS
Excellent-sounding models. Recording Chains. Digital delay. Automatable parameters. Power Soak and Input Gain. BX Tuner.

LIMITATIONS
Lacks MIDI learn for external controllers. Expensive.

$229
plugin-alliance.com

The Brainworx ENGL Amp Bundle 1.0 models two high-gain guitar amplifiers from German boutique manufacturer ENGL—the E765 Retro Tube 100 and the E646 Victor Smolski. Previously available in slightly different versions for the Universal Audio UAD platform, these are the first ENGL models to be released in native format, supporting VST, AU, and AAX. The Brainworx BX tuner, a well-designed and stable tuner plug-in, is also included.

The simpler of the two amps, the E765 Retro Tube 100, is a 2-channel unit offering clean, crunch, and high-gain sounds. (Channel 2 offers significantly higher gain.) Each channel has independent Bass, Middle, Treble, Volume, and Gain controls. For additional tone control, Channel 1 has a Bright switch and Channel 2 a midrange-boost called Tone. A global Gain Boost lets you add more crunch or distortion.

The E646 Victor Smolski plug-in is designed primarily for metal. (Until recently, Smolski was the guitarist in the band Rage.) It provides even more gain than the E765 and offers four channels—Clean, Crunch, Lead 1, and Lead 2. In addition to EQ, Gain, and Volume controls for each channel, it features global controls for Presence and Depth Punch.

Cabinet models are automatically paired with both amps and can be changed using the Recording Chains feature (described below).

For both the E646 VS and the E765 RT, the front panel knobs and switches are only part of the story. Additional parameters and effects can be revealed by pressing the FX Rack button, such as a Noise Gate with Threshold and Range controls, and two filters—Tight, which cuts lows, and Smooth, which cuts highs. Both can be switched to pre or post signal. The included Digital Delay offers up to 1000 ms of delay with Tap or BPM-synced tempo and a Low-Fi control for analog-delay-like tone.

The FX Rack includes an Input Gain knob to adjust the level going into the amp, and Power Soak to reduce the virtual wattage. With the Input Gain cranked and the Power Soak turned down, you can drive the amps even harder.

Perhaps most impressive about the FX Rack is the Recording Chains feature. It lets you choose from 64 modeled signal chains that offer combinations of cabinets, mics, mic preamps, and miking techniques; all were originally recorded through a Neve VXS 72 console. The chains offer tons of variety and significantly expand your sonic options. Brainworx even included an Auto feature for auditioning the chains one after another at user-specified time intervals.

All parameters can be automated, making it possible to switch or alter sounds during a song. MIDI Learn is not supported, however, so plug-ins can't be controlled from an outboard MIDI switcher or controller, which limits their possibilities for live use.

The ENGL Amp Bundle offers stunning sound quality and plenty of parameter control. Each model can cover clean, crunchy, or high-gain tone, with the E646 VS providing enough gain for the most extreme modern-metal sounds. The ability to switch recording chains gives you way more sonic variety than you might expect out of just two amp models.

Although the ENGL bundle is expensive compared to many other amp modelers, you get what you pay for. It's first class all the way. ■

The largest 500 Series selection anywhere.

VINTAGE KING AUDIO

ELYSIA NVELOPE 500
Gain full control over attack and sustain to forge new sonic ground

COLEMAN AUDIO PH1
From mobile device to monitors via Coleman's new 500 Series module

RETRO DOUBLEWIDE
Single-channel tube compression amplifier

MERCURY AM16D
Beautiful, musical classic 60s American transistor-type pre

Fig. 1. The Mixer window in Mixbus 3: Tracks are on the left, while buses are located on the right.

HARRISON CONSOLES

Mixbus 3

MAJOR UPGRADE ADDS MIDI SUPPORT, A NEW LOOK, AND MORE

BY MIKE LEVINE

Plug-ins designed to imbue your music with the sound of analog are everywhere, but did you know there is an entire DAW built around that concept? The Harrison Mixbus 3, made by Harrison Consoles—a major manufacturer of large-format analog mixers—offers a complete production environment based around the analog mixer paradigm. In its latest incarnation, Mixbus adds important features such as MIDI and virtual instrument support, as well as an upgrade of its sound engine, a new look, and more.

STRENGTHS

Low price. Compressor and EQ on every track. Simulates analog-mixer workflow. Tape saturation. MIDI tracks and virtual instruments. 64-bit engine. 32-bit floating point processing. Buses assigned with a single click.

LIMITATIONS

Lacks MIDI learn for external controllers. Expensive.

$79
Upgrade from previous versions: $40
harrisonconsoles.com

Mixbus 3, which is based around open-source programming, supports AU plug-ins on the Mac, VST on Windows, and LV2 on Linux. It is very deep from a feature standpoint, but with the exception of its slick-looking Edit and Mixer windows, it's not as graphically sophisticated as most major DAWs. Contextual edit and plug-in windows have a barebones look to them.

CONCEPTUALLY SPEAKING

Mixbus 3 is designed to make your DAW mixer's workflow feel more like that of a hardware console, while its Edit window features track lanes that will be instantly familiar to any DAW user. In addition to channel strips for individual audio and MIDI tracks, the mixer has eight built-in buses that are easy to configure (see Figure 1). Like a real analog mixer, each channel strip has its own compressor and EQ. Each of the buses and the master bus offer adjustable tape saturation called Drive. The master bus also has a built-in limiter.

The input channels feature standard bar graph meters, but the buses have VU-style meters to indicate the level of tape saturation. The master bus has its own tape saturation meter as well as a VU-like level meter. Sonically, the tape saturation in Mixbus 3 adds warmth that is both smooth and natural-sounding. It's handy to be able to dial it in from a bus or the master bus.

The Compressor, which is available on the channel strips, buses and master bus, has been revamped to include a number of different modes. Leveler, which is the default, has a low, fixed ratio. It's designed to help keep the track levels under control in a transparent fashion, and it works really well. I found it handy when mixing and used it liberally.

If you want to add heavier compression with more character, the Compressor mode is for you. It provides compression with a fixed attack and release, but an adjustable ratio. The third mode is Limiter, which gives you the heaviest compression of the three, and is designed for squashing down transient peaks such as those on a drum track.

The fourth compressor option is Sidechain, which lets you set the compressor to respond to Mixbus 3's new Sidechain Bus. Each channel strip has a sidechain-send button, which makes configuring sidechain compression—something that can be confusing on some DAWs—really easy. The compressor is controlled with a Threshold slider, a parameter knob that differs depending on the Compressor mode set, and an LED-ladder-style gain-reduction meter.

Fig. 2. Expanding a MIDI track vertically reveals a piano-roll-style editor.

Fig. 3. Included with Mixbus 3 is setBfree Tone Wheel Organ.

The EQ on each channel strip consists of a highpass filter and 3-band semi-parametric operation. It lets you quickly sculpt the sound of each track without having to open a plug-in. The buses and the master bus all have a three-knob Tone section, providing some additional, although rather broad-brush, EQ options.

Although the end result may be the same, having the compressor and EQ right there and ready to go in each channel makes Mixbus 3's channels feel more console-like in comparison to most DAW mixers, where you'd have to open a plug-in for those kinds of processing tasks.

Four of the eight buses are visible when you create a new session using Mixbus 3's defaults, and the others can be easily opened. Signals can be routed from any input channel to any bus via individual bus on/off switches and volume knobs on each channel strip. You can turn off the channel's master bus routing if you're using the bus for a subgroup configuration rather than as an effects return.

THE WAY YOU LOOK TONIGHT

If you used Mixbus 2, you'll notice that the GUI has been redesigned for Mixbus 3. Following the latest trend in DAW design, the new look is dark and monochromatic. The graphics have been optimized for Retina Displays, where they look amazingly crisp.

My problem with the new design is that the channel EQ knobs are now smaller and harder to read than they were in Mixbus 2. What's more, the Record buttons on each channel don't get very bright when activated, making it harder than it should be to tell which ones are armed. (For obvious reasons, you don't want to have any doubt about which channels are armed for recording.)

These problems can be alleviated to some extent by adjusting the theme colors and mixer-strip scale. Harrison's developers say they are making some tweaks to accommodate different screen sizes and brightness. But as it stands now, the new look may be slicker, but it's less user-friendly.

CORE VALUES

Also new in Mixbus 3 is 64-bit compatibility and a multicore engine, which allows for larger track and plug-in counts. Mixbus 3 also offers 32-bit floating-point operation, so as long as you record

audio that's below 0 dBfs, it's not going to get clipped in the box, which is very helpful when dealing with gain-staging in a mix.

Previous versions of Mixbus required that you use the third-party utility called Jack to facilitate inter-application audio. That's no longer the case, although Mixbus 3 is still "Jack-aware," so you can still use Jack if you want to.

VENI VIDI VICI MIDI

One of the factors that impeded Mixbus as a full-service DAW in the past was its lack of MIDI support. Happily, that's no longer the case, as Mixbus 3 introduces MIDI recording and editing and virtual instrument support.

MIDI editing in Mixbus 3 takes place in the Edit window. There's no need to open a separate editor. When you enlarge a MIDI track's vertical size past a certain point, it turns into a piano-roll style editor (see Figure 2). You can move notes around, shorten and lengthen them, and change their velocity, among other editing functions. Increasing and decreasing velocity is most easily accomplished by way of your mouse's scroll wheel.

When you select a note and turn the scroll wheel, the velocity value of the note is shown in large letters next to it, and updates as you turn the wheel. If you don't have a scroll wheel you can right-click to open a dialog box, and numerically enter velocity values, but it's more cumbersome.

As an aside, I should mention that Harrison recommends a three-button mouse with a scroll wheel as the optimal pointing device for use with Mixbus 3. Many functions are accessed via right-clicks, and some with center-clicks that require the third button. (I got around just fine with a two-button mouse with a scroll wheel.)

Oddly, the program doesn't support control-clicking as a substitute for right-clicking, which is pretty standard on Macs. As a result, I found myself a bit hindered when trying to control Mixbus 3 from the trackpad on my MacBook Pro. The trackpad's preferences do let you select from a couple of different gestures to substitute for a right-click, but I didn't find either as convenient as control-clicking would have been.

You can move notes around, shorten and lengthen them, and change their velocity, among other editing functions. Increasing and decreasing velocity is most easily accomplished by way of your mouse's scroll wheel.

The MIDI implementation is easy to use once you get used to it: As with audio, editing options depend on which tool you've selected from the toolbar. Mixbus 3's editing tools, like many aspects of its GUI, do not necessarily stick to standard DAW conventions. In some ways, this is useful, as it allows the developers more flexibility, but the downside is that some aspects of Mixbus are not particularly intuitive, due to their unfamiliar structure.

A good example of this is the Quantize function, for which Mixbus substitutes unusual nomenclature in the place of standard rhythmic values found in most quantize features. Some are pretty easy to decipher: Beats/8 is an eighth-note value, and Beats/16 is a sixteenth-note. But to figure out Beats/10, you have to stop and think, and possibly pull out a calculator. Mixbus 3 does let you quantize to some unusual values such as Markers, Region Starts and Ends, and CD Frames.

A large selection of MIDI plug-ins come with the program, typically offering a single function each, such as channel filtering, velocity randomization, and chord creation, among many others. As for virtual instrument support, Mixbus 3 allows you to open your VST (Windows) AU (Mac) or LV2 (Linux) instruments. I had no problems opening any of my AU instruments.

Mixbus 3 comes with two instruments of its own. Reasonable Synth is essentially a placeholder that appears by default in a newly created MIDI channel. It has no controls and only one sound. The other, setBfree DSP Tonewheel Organ (see Fig. 3), is a warm-sounding and well-featured Hammond organ emulation. It sports virtual drawbars and a Leslie simulation, switchable Percussion, and Vibrato, Overdrive, and Reverb.

That's the extent of the included instruments. If this were a full-priced DAW I would complain about how few there are. However, considering Mixbus 3 costs $79, its lack of instruments is less of an issue, especially considering more people will use Mixbus 3 for audio recording and mixing rather than for MIDI production. That said, the lack of included plug-ins is more problematic when it comes to processors.

BYO PLUG-INS

Other than what you get in the channel strip, Mixbus doesn't give you any processor plug-ins. However, it does offer a bunch for sale from its online store. For example, you can buy the Harrison Plug-In Essentials bundle for $69, giving you the GVerb+ reverb and 3D Triple Delay. A number of other bundles and individual plug-ins are available; some cost more than Mixbus 3 itself.

Harrison also offers a plug-in membership plan called Plugged In, which costs $9 per month; the major attraction is a 50-percent discount on all the plug-ins and bundles in Harrison's store.

According to the Mixbus 3 manual (which could stand to be significantly beefed up, contentwise), "You may still add plug-ins if you wish, but it is no longer necessary to purchase and choose between multiple plug-ins each time you want to change your sound. You can make a great mix without any plug-ins at all!" I must humbly beg to differ, as, with very few exceptions, most mixes require ambient effects, and probably parametric EQ at the very least, none of which comes with Mixbus 3. If you already have a plug-in collection, then Mixbus 3's lack thereof won't be problematic for you. If not, expect to spend some additional funds, whether you get your plug-ins from Harrison or others.

BUS ME ON OVER

Mixbus 3 is a worthy update thanks to new features like the revamped compressor section, with its multiple modes and sidechain support, the 64-bit engine, and 32-bit floating-point processing. With the addition of MIDI functionality—albeit somewhat limited—and virtual instrument support, Mixbus is now more of a full-fledged DAW. Now you can do soup-to-nuts projects in it, rather than just audio recording and mixing.

Considering its minimal cost, one could also use it simply as a mixing platform, importing stems (and MIDI files, if you want) into it from another DAW, and taking advantage of its excellent sound, tape saturation effects, and analog-style workflow.

My wish list for future versions would include better visibility of the EQ controls on the channel strip, a more thorough manual, inclusion of reverb and delay in the basic plug-in set, and perhaps more standardized nomenclature and structure for some of its features, in order to make it more intuitive.

Overall, Mixbus 3 improves what was already an intriguing product. It's definitely worth a look, especially if you miss the workflow of a console-based studio. ■

Fig. 1. Omnisphere's GUI is slightly wider to accommodate the handy new mini-browser, which lets you select attributes on top and patches on the bottom.

SPECTRASONICS

Omnisphere 2

EVEN MORE POWERFUL SOFT SYNTH PUSHES THE ENVELOPE

BY GEARY YELTON

Spectrasonics' flagship plug-in is one of the most acclaimed synthesizers ever made, software or hardware. Previous versions have proven themselves to be deeply expressive, remarkably versatile, and genuinely inspiring in ways that other virtual instruments too often fall short. When the job calls for a soft synth, there's very little that Omnisphere can't do.

So, when Eric Persing and company announced a forthcoming upgrade in January, I began wondering how Omnisphere 2 could augment my musical and timbre-building capabilities. The list of updated features is tantalizing, including morphing wavetables, better granular synthesis, the ability to import user audio files, and literally thousands of new patches and Soundsources. Additional enhancements include new filter types, new effects, new modulation possibilities, an updated arpeggiator, and more realistic analog emulation.

The sheer volume of new content is downright awe-inspiring, and unsurprisingly, its quality is top-notch. New Soundsources include samples from circuit-bent toys to custom-built acoustic creations, as well as a collection of musical phrases derived from sources around the world. An entire library of new patches is devoted to the EDM (electronic dance music) genre. No matter whether your music is traditional, experimental, or anything in between, you'll find plenty of useable material, and the variations you can create are genuinely infinite.

Former senior editor Geary Yelton has been reviewing synthesizers since *Electronic Musician*'s very first issue. He lives in Asheville, North Carolina, and Nokomis, Florida.

STRENGTHS

More powerful synthesis engine. Unmatched sound palette. Useful browsers. Terrific effects processors. Imports user audio. Eight-part multitimbral.

LIMITATIONS

No general Undo function. No standalone version. Manual is online-only. Can't specify loop points without a separate sample editor.

$499 MSRP
$479 street
$229 upgrade
$199 VIP upgrade
spectrasonics.net

SPHERE OF INFLUENCE

Once I had downloaded and installed the software and patch library updates, I opened Omnisphere in Logic Pro X and began exploring the new sounds. More than 4,500 new patches and Soundsources (bringing the total to well over 12,000) kept me happily occupied well into the first night.

Updates to Omnisphere 2's graphical user interface are subtle enough that it's still familiar to previous users. The plug-in window is wider to accommodate the mini-browser, potentially speeding up your workflow while retaining most of the full browser's functionality (see Figure 1). Clicking on the magnifying glass icon opens the full browser, which is larger than before and affords access to additional functions. As with the previous version, you get separate browsers for Soundsources, patches, and multis.

Available in both the mini- and full browsers, Sound Match is a simple concept that's exceptionally useful. Whenever you find a sound you like in the library, invoking Sound Match displays a list of sounds with similar parameters and descriptive keywords. Sound Match can help locate patches that may be interchangeable or at least sound good together. I use this command a lot, and it's definitely a timesaver.

Sound Lock takes a different approach to helping locate sounds. Let's say you've found a patch with an

arpeggiator pattern you like; engaging Sound Lock applies the same parameters to any other patch you select. You can choose from 13 parameters that include filter settings, modulation matrix, and effects, selecting as many attributes as you like. Any parameters you choose will not change their values when you select a different patch. Spectrasonics points out that the Sound Lock process essentially creates a new patch (with all the parameters you've selected), which you can save and recall later. Omnisphere's browsers do everything you'd want a synth browser to do, and they do it more efficiently and thoroughly than any I've seen.

SOUND MAKING MACHINERY

I'm particularly excited about Omnisphere's enhanced synthesis capabilities. As with previous versions, each patch has two layers, and each layer has a single oscillator that lets you choose either synth or sample-playback engines. Previously, synth mode furnished just four basic waveforms and noise, but now you also get more than 400 DSP-generated wavetables divided into three types: classic (raw) waveforms, analog timbres, and digital wavetables. Many wavetables emulate waveforms produced by specific vintage and modern synths from Moog, Roland, and other manufacturers. You can manually select wave positions within each wavetable using the Shape slider and use modulators to sweep through them dynamically. Having so many choices provides tons of fodder for expanding your tonal vocabulary.

Engaging the synth engine's Analog knob causes random variations in pitch and phase resembling those of real analog oscillators. The Unison Drift slider produces similar variations when you're playing polyphonic voices in unison. The result is a dramatically more convincing emulation of voltage-controlled oscillators.

Switching to the sample-playback engine, at long last, you can import your own audio files. Simply select User Audio from the Utility menu and choose as many mono or stereo WAV or AIFF files as you want, or just drag-and-drop audio files into the Soundsource browser. Once imported, Omnisphere treats user audio like other Soundsources, and you can use them to create patches. Although a few audio files I tried failed to import, after I opened them in Adobe Audition and resaved them, Omnisphere imported them easily, no matter how large they were.

Spectrasonics emphasizes that Omnisphere is not a sampler, however. Unlike a sampler, it limits user-audio-based patches to one sample per layer, so you can't map samples to specific zones or create velocity layers within a patch. Most of the included Soundsources are multisampled, though. You can specify and even modulate the start points of user audio files, and although you can't specify loop points without an external audio editor, Omnisphere plays looped files correctly.

Despite Omnisphere's new granular synthesis algorithm, the Granular pane hasn't changed much in version 2 (see Figure 2). The sliders are identical to the previous version's, and the new Range menu lets you switch from Normal to Wild, boosting the Pitch Grains and Detuning values. You also get a Preset menu for saving and recalling Granular settings; four presets are included.

After seeing Spectrasonics' "Introducing Omnisphere 2" video, I wanted to import my own audio files and turn them into something strange and beautiful with granular synthesis. I spent a couple hours manipulating the controls and conjuring up sounds that were definitely twisted, but finding anything musically useful was akin to programming original sounds from scratch on an FM synthesizer—possible, but challenging. I had the best results starting with either simple source material or the included factory phrases.

Fig. 2. Omnisphere 2 lets you use your own recordings as source material and save and recall granular-synthesis presets.

One of Omnisphere's six unusually versatile LFOs can operate polyphonically, independently modulating every note. Eight new filters include resonator and formant types for emulating physical objects and vowel sounds. In addition, the filter's new Variant parameter shifts the cutoff in opposite directions on both sides of the stereo field.

Omnisphere 2 comes with 25 new effects types, including guitar-amp models, stompbox emulations, and quad resonators, bringing the total to 58 diverse processors. Some effects use technology licensed from Overloud, Nomad Factory, and other developers. One especially intriguing effect is Innerspace, a convolution processor that supplies hundreds of impulse responses sampled from unusual sources such as bowed cardboard, melting metals, and dry rice falling on glass. By superimposing impulses on the patch you're processing, Innerspace lets you generate unique timbres that would otherwise be difficult or impossible.

Omnisphere's arpeggiator more closely resembles a step sequencer than ever before, letting you trigger and transpose patterns or individual steps by pressing a single key. You can also modulate playback rate in multiples of the host tempo in real time—something I've never seen before.

THE RETURN OF THE KING

Whenever someone asks, I recommend Omnisphere because of its massive and unique sound library, flexible sound engine, and extensive programming possibilities. It's one of the few truly multitimbral plug-ins around, and real-time control options like the Orb and morphing modulation give it hands-on expressivity.

Version 2 delivers more of everything that makes Omnisphere so formidable and adds impressive features that include hundreds of wavetables and interesting new multisamples, as well as innovative ways to locate and process sounds. One of my favorite enhancements for live performance is progressive loading, which lets you begin playing a patch almost as soon as you select it, before it's fully loaded into memory. However, I've been hoping for a standalone version that wouldn't require a plug-in host. A plug-in is limited to a single window, and I'd rather view multiple windows at the same time. I often wish I could undo any edit, too.

When I reviewed Omnisphere in the January 2009 issue (online at emusician.com), I called it a bargain at the price. I own a dozen hardware synths that cost more than Omnisphere, and dollar for dollar, it outshines them all. If you're still using an older version, you should upgrade today. Because Omnisphere 2 is backward-compatible with the previous version, all your past projects will load exactly as before. The upgrade alone is worth more than it costs, and it will keep you happily exploring and creating for years to come. ■

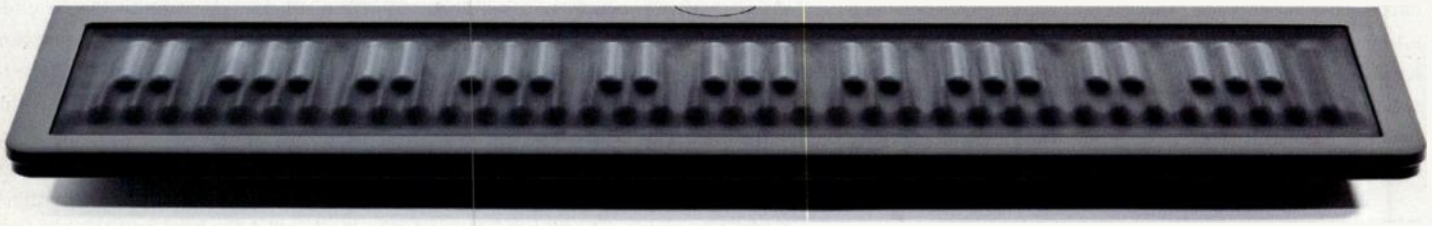

Fig. 1. The Roli Seaboard Grand is a keyboard-style controller capable of providing greater expressivity than traditional MIDI keyboards.

ROLI

Seaboard Grand

POLYPHONIC, MULTI-DIMENSIONAL CONTROLLER FOR THE KEYBOARDIST

BY PAUL D. LEHRMAN

Paul D. Lehrman PhD. is the director of the Music Engineering program at Tufts University in Massachusetts. His first article for *Electronic Musician*, on how not to go broke developing music software, was published in November 1986.

STRENGTHS

New dimensions of expression for keyboard players. Nice balance of familiar and the unfamiliar. Feels very good. Good-sounding, if limited, synthesis package.

LIMITATIONS

Takes practice to play it well. Expensive.

Studio: $1,999
Stage: $2,999
Limited First Edition: $8,888
roli.com

Ten years ago I interviewed John Chowning, the inventor of FM synthesis, for *Mix* magazine and he told me that, despite many advances in MIDI controllers, he still considered the keyboard—if it has velocity sensing and Aftertouch—the most expressive input device for electronic music.

That may still be true, but keyboard players are highly aware of their limitations, especially when it comes to expressive control over individual notes. That is because MIDI Pitchbend, the modulation wheel, and other controllers are applied to all of the notes on a channel equally. Polyphonic Aftertouch, or key pressure, which was part of the MIDI specification from the outset, was supposed to help players modify individual notes, but controllers that generate the command are few and usually expensive (the CME xKey being a notable exception), and many hardware and software synths don't even recognize it. Even when Polyphonic Aftertouch is implemented, it only can handle one parameter—for example pitch bend, vibrato depth, or filter cutoff—at a time.

Among the new generation of controllers that allow far more expressive capabilities, one may seem most friendly to traditional keyboardists—the Roli Seaboard Grand, the brainchild of Roland Lamb, an American inventor working in London.

Available in 37-, 61-, and 88-note versions, the Seaboard Grand's layout is similar to a conventional keyboard, but it has no moving parts (see Figure 3). Instead, the surface is a uniform rubberized silicone material, with bumps underneath the surface where you would expect the white and black keys to be, and valleys between them. Above and below the keys are seamless rubber strips.

The instrument is very thin and relatively light, but it feels quite solid. Power comes from an in-line DC converter. There is a USB (unpowered) jack and inputs for three switched or continuous pedals. There are no MIDI jacks, and no modulation or pitch wheels. The sole control is a continuous wheel at the center of the instrument called the Sound Dial, which has a button in the center to change its function.

The keys are velocity-sensitive, and you can play the Seaboard like an ordinary keyboard, but there is a lot more to it. The keys are also pressure-sensitive, not only in the vertical (Aftertouch) dimension, but also in the lateral dimension, meaning you can push on a key to the left and right and change its pitch.

The rubber strips above and below the raised keys are essentially ribbon controllers and provide continuous pitch control: When you put your finger down on a spot on a ribbon (or slide it there from a key), you can glide up and down an octave from your starting point. If you've ever seen the early electronic instrument called the Ondes Martenot, the Seaboard Grand uses a similar concept, except the Roli product is polyphonic and you can play multiple notes on the ribbons and slide them independently.

A NEW USE OF MIDI

If you know how MIDI works, you may be thinking that what the Seaboard Grand does is impossible—and you'd be almost right. The secret to the controller's flexibility is that it transmits not on a single MIDI channel, but on as many as 10, each one of which sends its own pitchbend and Aftertouch messages. Every time you hit a new note, the firmware sends it out on a new MIDI channel. Repetitions of the same note stay on the same channel, so you don't run out of polyphony too soon.

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Fig. 2. Equator provides powerful synthesis options, such as three wavetable oscillators, two sample playback modules, FM capabilities, and effects—all of which is playable directly from the Seaboard Grand through the balanced stereo outputs or headphone jack.

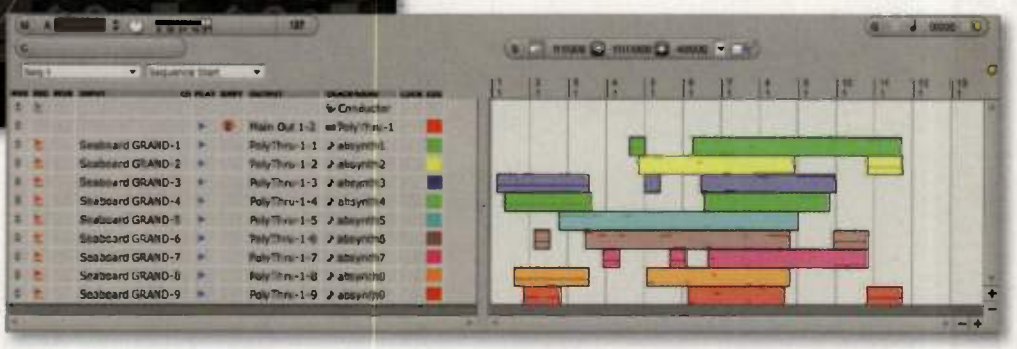

Fig. 3. In this screenshot, I set up the Roli Seaboard Grand Studio in MOTU Digital Performer, and used PolyThru.

You may recognize this as a variation on the old MIDI Mono mode, which was designed to allow a single synthesizer to play different sounds on different channels. Mono mode is more or less moribund, and it was limited to a single note per channel, whereas the Seaboard has no such limitation. In fact, Roli and a number of other manufacturers are proposing an addendum to the MIDI specification called Expressive MIDI (technically known as Multidimensional Polyphonic Expression), which is designed to standardize how instruments like the Seaboard Grand communicate. (It's worth pointing out that the original MIDI specification could never have accommodated the Seaboard: The amount of data it generates would swamp the old hardware spec of 31,250 bits per second. It's only since MIDI-over-USB has become common that an instrument like this could be practical.)

THE SOFTWARE SIDE

The Seaboard Grand can be played as a standalone synth, but you need a Mac or PC in order to do any customization. Using it in conjunction with a computer, however, opens many more possibilities. A USB stick containing several applications is provided.

The Roli Dashboard, which deals with the data coming from the Seaboard, lets you specify how many channels the instrument will send on, from one to ten, and whether you want it to generate polyphonic or monophonic Aftertouch. The latter is what you will normally use when you're addressing multiple channels. You can transpose the instrument up to two octaves and a major seventh in either direction, and a "pitch correction" switch makes the "dead zone" on each key—that is, the area where it generates no pitchbend—wider. The company says this is a good feature for beginners, but I would bet few people would turn it off. Last, you can map each of the three pedal inputs to any MIDI controller number.

Two software synths are included. SynthSquad Player is a customized version of FXpansion's analog-modeling softsynth. The far more interesting program is a Roli exclusive, called Equator. It installs both internally on the Seaboard and on your computer. Equator is a very versatile multimode synth, with two samples (from a small but useful bank) and three oscillators per voice, along with a noise generator, two filters, two LFOs, five assignable envelopes, FM, and several effects (reverb, chorus, delay, and 5-band parametric EQ). When you are running it on the computer, you can see live displays showing key velocity, pressure, and pitchbend (see Figure 2).

The software also has an extensive modulation matrix, which allows you to assign virtually any incoming or internal signal to any parameter. (At this writing, Equator does not recognize data from the assignable pedals, but the manufacturer says that will change in the next update.)

Equator also comes with 48 presets, but they can be modified and saved on the computer. To get them into the Seaboard's internal synth requires reprogramming the Sound Dial in the software and then loading the Sound Dial information into the instrument, where it will live in non-volatile memory.

Another included program is a simple utility called PolyThru. This enables the Seaboard to work with certain other software synthesizers, such as Native Instruments Kontakt and Spectrasonics Omnisphere. When you launch the synth in PolyThru, multiple instantiations of the synth are automatically (and invisibly) set up, each on its own channel, so that the Seaboard can play them the same way it plays its own synth (see Figure 1).

With soft synths like Propellerhead Reason, you need to set up individual instruments on each channel the Seaboard is addressing. The Seaboard's velocity response is not particularly linear, so you'll probably have to tweak your synth's response curve as well as its pitchbend and Aftertouch settings, and do the same on every channel. The Seaboard Grand works fine in a MIDI sequencer, provided you set up multiple MIDI input channels and assign them to individual instantiations of the target synth.

TIME TO PLAY

It's probably not a surprise that, for a keyboardist, the Seaboard Grand takes getting used to. The experience is similar to an electric bassist using a fretless instrument for the first time. You have to hit the keys pretty close to their centers, or you risk being out of tune. Using the pitch ribbons is not as easy as grabbing a pitch wheel. And due to a design compromise that is probably unavoidable, if you are holding a note and play another note a half-step away, the second note doesn't sound, the pitch slides.

Nonetheless, this is a very expressive controller that brings several exciting new dimensions to keyboard performance, and even inexperienced players will find a lot to explore. Being able to slide notes in a chord individually is a kick, as is the capacity to open a filter on just one note in a chord, or add vibrato to a single note, either through Aftertouch or by rocking the note, without affecting the notes underneath it.

I've had the Seaboard Grand now for two months and I'm still learning what it can do, and thoroughly enjoying the experience. With the included Equator software, it is very capable right out of the box. But where the real magic will happen is when players start experimenting with other programs and customizing them to take advantage of the control possibilities the Seaboard Grand presents. It's very playable, and if you're willing to put some time into it, the rewards are considerable. ■

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UVI Relayer is a multitap delay plug-in that provides a wealth of creative options, including an Input Gate button (on the left) for temporarily silencing its effects.

UVI

Relayer

TAPPING INTO THE POTENTIAL OF DELAY

BY MARKKUS ROVITO

Part multi-effects processor, part pattern generator, and 100 percent delay extraordinaire, Relayer (AAX, AU, VST) takes time-based plug-ins to a new level of creativity, in large part thanks to its powerful multitap editor. But before going wild with highly customized delay lines (replete with multi-effects and stylized panning, timing, and gain changes), Relayer can take care of your basic delay needs, as well.

Markkus Rovito drums, DJs, and contributes frequently to *DJ Tech Tools*.

STRENGTHS

Multitap editor. Flexible, yet not intimidating to use. Nice-sounding Color effects. Free 15-day demo.

LIMITATIONS

If you don't take full advantage of its capabilities, the price may seem high.

$129
uv.com

Just call up the Init preset, which starts off with a single delay tap. From there you can dial in the delay time from 32x (very slow) to 64th-note triplets (a fast, buzz delay) and adjust the feedback level. Then, save your custom presets to complement the 100+ factory patches that specialize in short and reverby ambiences, long and rhythmic effects, chorus-style delays, and dozens of special effects. For this review, I tested version 1.0.2 of the VST, and it was completely stable and used a negligible amount of processor load.

Relayer's multifaceted multi-tap editor sets it apart from most delay units. It's fairly simple to learn how to use it by experimenting on your own. However, if you want help, perusing the presets will clue you in, and the detailed PDF manual breaks down the wealth of options.

The Repeats knob sets the number of delay taps from one to 32. Say you set 16 taps with the Time set to sixteenth notes. You'll have essentially one bar of 16th-note repeats until you start editing the timing in the multi-tap editor. The colored bars in the editor work like faders, and you can increase or decrease the timing of the taps by changing the bar values (either by clicking or dragging with a mouse), choosing bar preset patterns, randomizing the bars, or by shifting the bar graph value with Transform buttons, which give you fine-tuned control over scale and positioning.

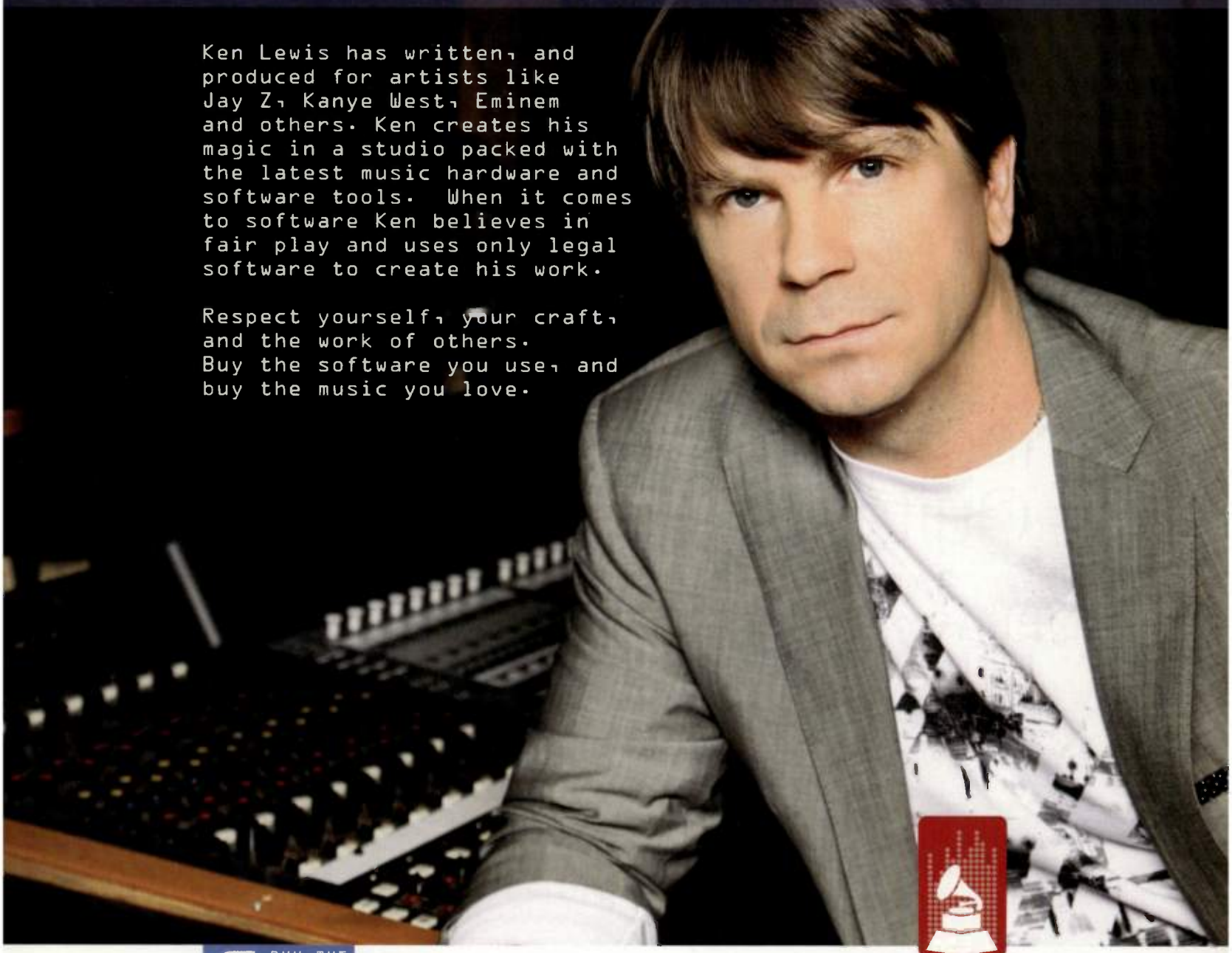
The same scheme holds true for all five parameters within the multi-tap editor: Time, Gain, Pan, FX1, and FX2. The six effects include various filters, bit reduction and modulation. In addition, an optional LFO with depth and rate controls applies to the FX1 and FX2 bar to modulate their values over time.

Relayer's editor presents endless possibilities for creating not just delay lines, but also highly stylized rhythmic effects with a vast sonic range. You can use it in a very deliberate manner to create delay patterns with specific timing and panning settings, leave it to serendipity by randomizing, set odd Time and Repeat values, or draw in wacky graph curves to see what kinds of chaos ensue.

Relayer doesn't stop with the multitap editor. There is another set of options for processing the wet signal of the plug-in. First, there's a global Modulation effect with Depth and Rate settings. A global Color section lets you set the amount of one of 66 impulse responses, which include many reverb settings; simulations of Devices such as a megaphone, radio, or tape; Speakers, such as British amp, metal amp, or vintage tube; and other effects. At the end, the Master Filter includes a global highpass and lowpass filter so you can restrict the frequency of the wet signal.

These days, with the quality of stock DAW plug-ins being higher than ever, developers have to go way out of their way to make an effect worth buying. UVI has done just that with Relayer. It uses delay as the basis for a creative multi-effect that feels almost like its own instrument. ■

FAIR USE IS FAIR PLAY



Ken Lewis has written, and produced for artists like Jay Z, Kanye West, Eminem and others. Ken creates his magic in a studio packed with the latest music hardware and software tools. When it comes to software Ken believes in fair play and uses only legal software to create his work.

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To personalize your processed sounds further, Vir2 Apollo Cinematic Guitars for Kontakt 5 includes a number of effects as well as modulation capabilities.

VIR2

Apollo Cinematic Guitars

SAMPLE LIBRARY FOR KONTAKT 5

BY MARTY CUTLER

Although many instruments can be forged into pads and other atmospheric sounds, it's hard to beat the chaotic behavior of guitar strings. Vir2's Apollo Cinematic Guitars is a new 22GB sample library for Native Instruments Kontakt 5.3 that takes advantage of the nonlinearities of strings to provide a wide range of sounds derived from processed acoustic and electric instruments.

You'll find numerous ways to build tracks in Apollo. In addition to top-level folders such as Swells, Pads, and Instruments, the Ambient Designer folder holds loops and one-shots arrayed in key maps, with a focus on processed sounds and chords, while Phrase Builder contains clips of guitar performances, focusing on licks and arpeggios.

Ambient Designer offers reversed sounds, bowed and sustained chords, white noise, and radio effects, among others. You can latch these while layering them for elaborate, animated, guitar-driven soundscapes, *a la* Boards of Canada. Each group has a mixer where you can set level and pan positions for individual key assignments or assign MIDI Control Change to automate them. Transpose parts by clicking in the upper octave of the instrument's keymap. Phrase Builder automatically syncs to tempo, and the parts are short and simple, so you can build complex elements by layering the sounds assigned to each key.

The Instruments folder holds conventionally mapped guitars, basses, harmonics, and even an electric sitar. The patches sound lively and realistic. My only quibble is that each instrument category uses the same sample set with different effects settings. The effects are easy to use and readily accessible, so it seems like an unnecessary duplication of effort. Swells and pads offer simple ADSR envelope controls, but you must use the full version of Kontakt to get top-level access to filters and filter envelopes. (Apollo ships with Kontakt 5 Player.)

Most of the swells and pads are derived from assorted pedals, bowing, e-bows, and similar techniques. Remarkably, individual notes sound and behave differently, with maybe one sample spitting out subtle amounts of feedback at a slightly different time and level from another.

Every pad and swell sounds breathtaking in unique ways. Some have organ-like overtones; others sound like warm bells and strings, or vocals emerging from the ocean depths. You will also hear subtle artifacts such as string or bowing noise, or a bit of manual vibrato—sounds that add the spark of life when you grab a chord. Pads have the added luxury of two sample channels, allowing you to mix and match sounds.

Swells benefits from a Chords and Notes subfolder, which divides the keyboard map into groups of major and minor chords in different inversions. The Single Note folder replicates sounds in a conventional keyboard layout. Swells also offers tempo-synced modulation with a choice of waveforms, and you can change the modulation pulse width for nice staccato effects.

With Apollo, Vir2's sound design team has released a focused, yet vast collection of guitar-driven beauty. The pads and swells are drenched in the human element and, alone, are easily worth the price of admission. The Ambient Designer and Phrase Builder folders provide great song starters, and you can create an even more personal touch with the guitars and other instruments. Any composer of electronic music, cinematic or otherwise will find Apollo an inspiring musical companion. I recommend it highly. ■

By the time you read this, Marty Cutler will be at work on a new book for electronic guitarists. Stay tuned.

STRENGTHS

Gorgeous, animated pads and swells. Ambient Designer makes it easy to create interesting soundscapes.

LIMITATIONS

No tempo sync for Ambient Designer. Instruments folder is somewhat redundant.

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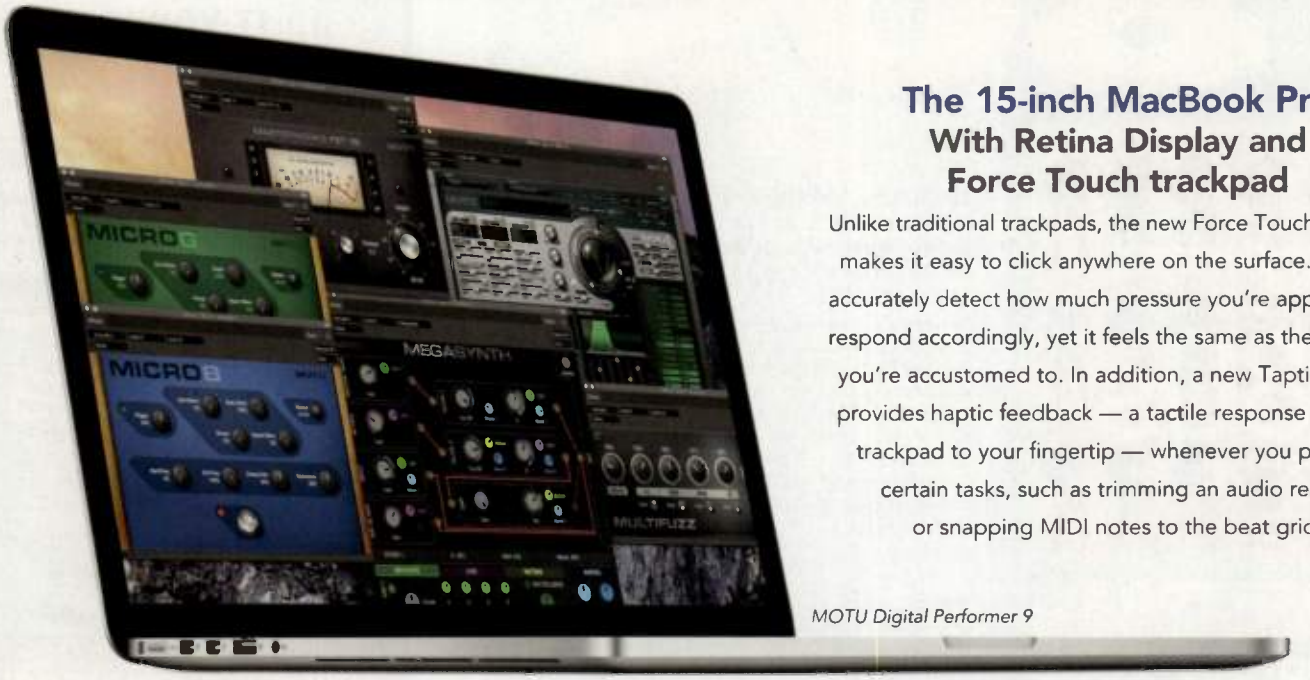

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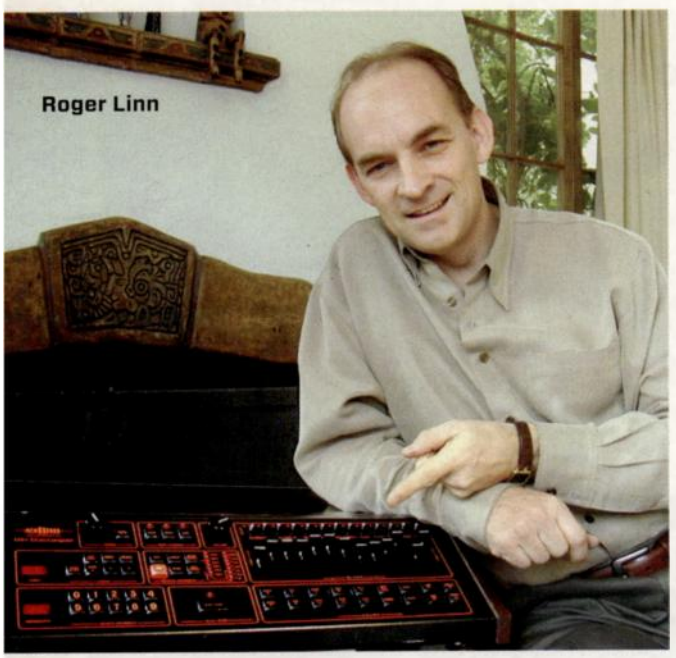
MARKETPLACE

The Effects of Control

Roger Linn on the cultural impact of MIDI instrument design

BY GINO ROBAIR

During our chat about Polyphonic Multidimensional Controllers for our special anniversary-issue roundtable feature on Expressive MIDI, Roger Linn gave me his take on the larger cultural issues surrounding electronic instrument interfaces and how they've shaped modern music. It's no surprise that Linn has very solid opinions on the subject, considering he invented two of the most influential interfaces in popular music: the modern sample-based drum machine and the MPC-style pad interface.


Roger Linn

Are musicians more likely to accept nontraditional and alternative controllers at this point because so many people have grown up using button-and-pad controllers rather than standard keyboards?

I think so. The trend has been away from playing individual notes and moving up toward a higher level of abstraction. I call this object-oriented composition, or OOC. Instead of playing all the notes yourself, you just take a loop from here, a sequence from here, a drum beat from there, and you combine them together. The same thing happens in visual arts with found objects, montage, and collage, where people take things and put them together, focusing more on concept than craft, with the creativity being in the arrangement of the existing objects.

One thing I hear a lot from these object-oriented musicians is that they become frustrated with the limited level of malleability of the objects. For example, if you grab a loop from an old recording that has a two-bar phrase of electric piano in a minor key, you can't change it into a major key or a different instrument sound, or certainly into different notes. You just have to take the things that are available, and that's your only choice. And though there are lots of loops available from a century of recordings, it doesn't mean you will find the loop that you want for the music you are trying to create.

So I think that many *controllerists* would like to develop more skills in playing notes, chords, and melodies, but have been turned off by the complexities of learning acoustic instruments or the lack of expression in the on/off switches of MIDI keyboards. The human-optimized interfaces and greater expressiveness of the new electronic music controllers like the Continuum, Seaboard, LinnStrument and others provide a very compelling alternative.

How has this object oriented composition affected popular music overall?

There's an interesting phenomenon in electronically generated pop music today: In large part, there are no instrumental solos. Years ago, every pop record had an instrumental solo—if it was a rock record, there was a guitar solo; country records had a violin or pedal-steel solo; and jazz records often a sax solo.

I think this lack of instrumental solos is in part because there are no electronic instrumental soloists that are widely perceived as great artists by the culture. Can you name any? I'm not talking about DJs or controllerists who very cleverly arrange loops and sequences, but rather instrumental soloists who excel at compelling and expressive arrangements of notes, chords and melodies. I think this is in part because the primary human interface to electronically generated music is a MIDI keyboard, which is essentially an array of on/off switches, and it's difficult to create a great solo performance with on/off switches.

The above said, there is evidence that people appreciate an expressive melody because recordings of very talented and expressive singers are still popular. This suggests that virtuosic instrumental solo performances would also be popular if performed on instruments that possessed the expressive qualities of the human voice instead of the on/off switches of MIDI keyboards.

What will change as a result of the increased availability and affordability of electronic controllers offering greater expressivity?

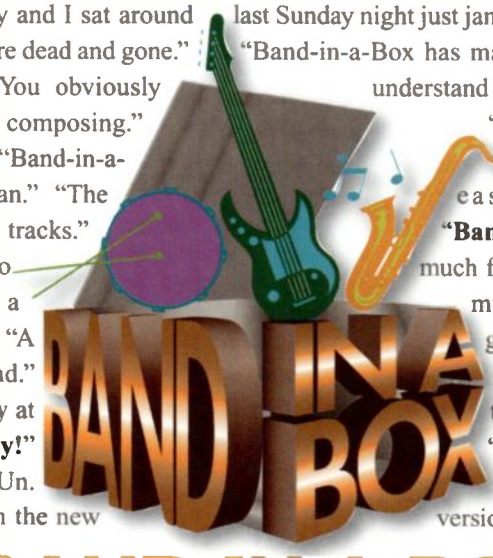
For the first time in history, instrument controllers have human interfaces that are optimized for the human hand. Now, you can optimize the sound generator for the sound you want, and optimize the interface for the player.

It's difficult to explain in words, but once a MIDI keyboard player spends some time with a Seaboard or Continuum or LinnStrument or Eigenharp or SoundPlane and finally sees what he's been missing for years, he simply can't go back to playing on/off switches. He finally realizes how useless his old bend and mod wheels were compared to intuitively wiggling a note to vibrato it, or sliding his finger between notes to bend pitch. He realizes how monotonous an envelope generator is compared to performing each note's envelope uniquely by varying finger pressure. Imagine telling a guitarist that he must play a guitar without any vibrato or string bends, or telling a sax player that he must hold the exact same wind pressure without change for the duration of each note?

So how will it change things? For most musicians, probably not at all because most people don't see the future. But a handful of talented, forward-thinking musicians will see the great opportunity that these new instruments provide and develop virtuosic skills on one of them. And I think they will become the instrumental virtuosos of the new electronic music era. ■

Can a music program create professional, real-sounding arrangements and solos for your songs from only a chord progression?

"Are you sure it is legal to have this much fun?" "I'm looking for those **perfect band mates** and I just discovered they live in a box." "The soloist sounds amazingly like **real people** improvising!" "The program **sounds so much better** with **RealTracks**... A thousand times, Thank You!" "Band-in-a-Box is some of the **most fun** you can have with a computer." "I can load my **MP3** in and see the chords play on the screen." "My buddy and I sat around last Sunday night just jammin' away..." "As an old BE-BOPPER circa late 40s, most of the cats I played with are dead and gone." "Band-in-a-Box has made me a **much better player.**" "Can't say enough good about your products. You obviously understand our needs exactly." "BB makes it so easy to quickly build an arrangement for composing." "Thanks to BB I can still swing with the help of the **fabulous cats** living inside BB." "Band-in-a-Box was the solution to an old fustration: being a musician. Now I am a musician." "The ease and "**RealTracks** is by far the easiest way to make **high-quality** background tracks." "**Band-in-a-Box** is the **holy grail** for accompaniment software." "This is so much fun." "I'm speechless." "Who says you can't buy happiness." "This is absolutely a must-have item." "**Band-in-a-Box** is now on a whole other level of sophistication." "A giant leap forward""Keep the **RealTracks** coming!" "It blows my mind." "**RealTracks** add a whole new dimension of realism." "I was absolutely **blown away** at the quality of **Band-in-a-Box**." "Your **Band-in-a-Box** program is **extraordinary!**" "Your product is **AWESOME! THANKS**" "A fantastic leap forward." "Un. Believable" "I can't believe how fast I can generate **RealTracks** and renders with the new version." "They've **outdone themselves** this time, and I'll be singing the praises of **Band-in-a-Box** every chance I get." "This new musical concept you have created is nothing short of evolutionary. If it were a living creature, it would be a whole new species." "I'm awestruck." "Just when you think **Band-in-a-Box** is as **"Brilliant!"** "All of the new instruments are just **smashing.**""I must say, the pedal steel is perhaps the greatest accomplishment in the history of this brilliant program.""The RealTracks are **fantastic** and provide **great inspiration** for creativity." "This is a great gift to jazz musicians, educators, and singers." "Oh, wow. **This changes everything.**" "It's **stunning.**" "Thanks for a superbly useful piece of software." "I tried with many audio files and the chord detection is **amazingly accurate!**" "This is absolutely a must-have item." "Wow, I'm learning tunes fast with help of your Audio Chord Wizard." "It finds the exact chords to the song... perfectly." "Wow!" **"I am blown away!** The jazz/swing RealTracks stuff is amazing." **"Awesome."** "Is this cool or what?" "I'm in seventh heaven" "You won't regret it (and if you do, there's the **30 day money back guarantee**)." "I never thought I'd see the day this was possible." "I know it's been said before, but you guys are **incredible**." "This is **gonna set the world on fire!**" "I'm so stoked about how good everything sounds I can hardly stand it." "This is just killer." "Amazing, simply amazing." "[RealDrums] is really awesome sounding. Good work!" "Many kudos all around." "You never cease to **amaze** me. You got it." **"Wow and Double Wow."** "The **RealTracks** and **RealDrums** sound awesome." "Long live PG Music!" "Mind bending." "I am frankly amazed at most of the styles." "I am absolutely ***Kudos*** to you and your team!" "First time I did a song with **Band-in-a-Box, I couldn't believe it!**" "I use it in the classroom and also in creating music in my studio. It is a fantastic piece of music software to own. I am greatly impressed." "I am very impressed with your fantasic ***Improvisational*** program." "It's a great educational tool." **"Awesome software at a fantastic price!"**



BAND-IN-A-BOX®

for Windows® & Mac®

with RealTracks

Type in the chords to any song using standard chord symbols like C, Fm7 or Gm7b5/Db; choose a style and Band-in-a-Box does the rest... Generating a professional sounding arrangement of bass, drums, piano, guitar, strings and more. NOW using RealTracks—actual recordings of professional studio musicians!

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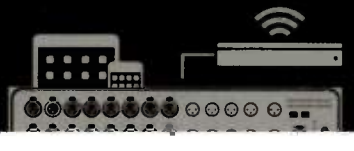

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