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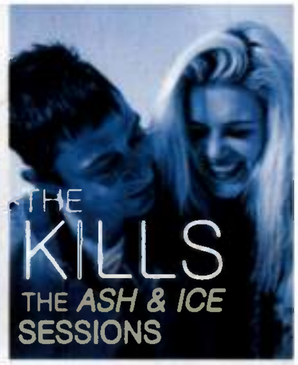

THE KILLS
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Reviews

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RADIAL TONEBONE MIX-BLENDER

ZOOM G5N

ELECTRO-HARMONIX MEL9

APPLIED ACOUSTIC SYSTEMS CHROMAPHONE 2

MIX WITH THE MASTERS

The Mix With The Masters Program offers the unique opportunity to work closely with the world's top music mixers, producers and engineers and to improve one's skills in music production. Since its successful debut in 2010, it has hosted over 900 participants and 70 seminars.

In addition to these seminars, Mix With The Masters has now launched an exclusive online community for Engineers and Producers, offering an incredible array of exclusive online services, enabling its members to discover the approaches and techniques of A-list music mixers and producers. You can now become a member to get an unlimited access to hundreds of videos, and to take advantage of our unique online services such as Webinars, One-Day Seminars and much more.

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Each weeklong seminar includes, among other activities, a series of discussions about production techniques, mental and philosophical approaches towards mixing, career advice, workshops, during which the guest speaker tracks a band, and mixes in front of the attendees, as well as giving them feedback on their own projects.

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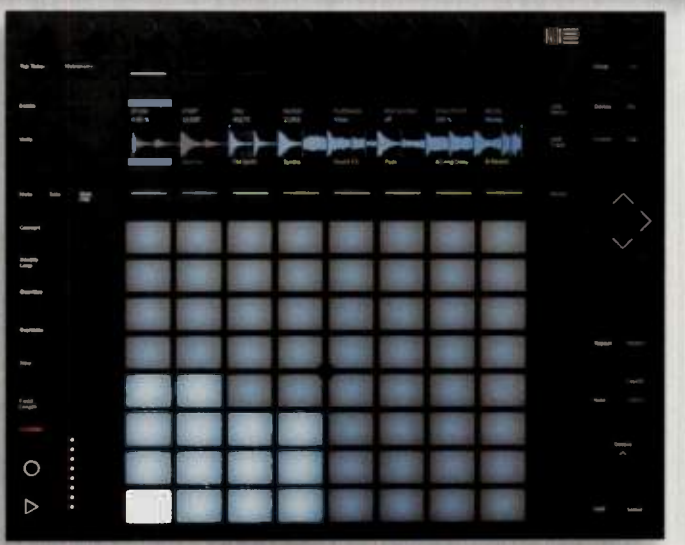
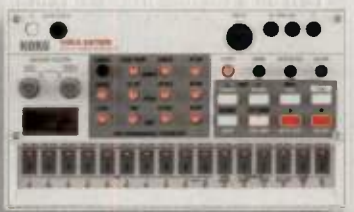


Ableton
Push 2 with Live 9.5 Suite



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CONTENTS

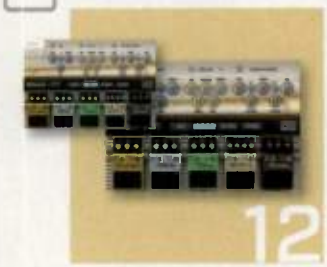
THUNDERBOLT INTERFACES

Thunderbolt technology brings blazing speed to your rig. Whether you're looking to spend a few hundred dollars on a budget interface or you're ready to splurge on the top of the line, we've got you covered with our comprehensive guide.

DEPARTMENTS

10
COMMUNITY

11
IN THE STUDIO
William Tyler



12
NEW GEAR
Products from Arturia, Native Instruments, PreSonus, and more!

48
MOD SQUAD
Malekko AD/LFO

74
FIVE QUESTIONS
DJ Shadow

HOW TO

60
MASTERCLASS
Learn Advanced UVI Falcon Techniques

64
MIXING
Supersize your drum tracks

66
EDITING
Optimize audio for spoken word

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30
RICKY REED
The producer and songwriter takes an artist-friendly approach to projects with Meghan Trainor, Pitbull, and more.

36
GORDON MUMMA
The composer, artist, and instrument innovator shares insights from five decades of experimentation in electronic music.

42
PLAYLIST
New releases from Jenny Hval, Cat's Eyes, Audion, and more!

24

THE KILLS

For their fifth album, *Ash & Ice*, Jamie Hince and Alison Mosshart rented a house in the Hollywood Hills and made a lot of electronic, bluesy noise. We take you inside the studio sessions.

GEAR REVIEWS

44
KORG NANOKONTROL STUDIO AND NANOKEY STUDIO
Portable MIDI controllers

50
RADIAL ENGINEERING TONEBONE MIX-BLENDER
Utility pedal

52
Zoom G5n
Multi-effects processor

56
ELECTRO-HARMONIX MEL9
Tape relay machine

58
APPLIED ACOUSTIC SYSTEMS CHROMAPHONE 2
Synthesizer plug-in

electronic MUSICIAN

www.emusician.com | VOL. 32 NO. 8. AUGUST 2016

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insight

Nice Guys Winning

STORIES ABOUT jerks in the music business have dominated the news cycle lately. So it's refreshing to share Ricky Reed's story.

During the past five years, the 33-year-old has become a go-to pop producer, helming blockbuster hits by the likes of Meghan Trainor, Jason Derulo, Pitbull, Bomba Estero, and Twenty One Pilots.

Reed has built a reputation for putting artists first, showing the utmost respect for their creative ideas and encouraging them to experiment rather than cash in on some kind of established hit formula.

Reed says that he launched his Atlantic Records imprint, Nice Life Recording Company, with the goal of building an ethical business that is "run by good people who make great records," and focusing on making a positive impact on both artists and his local community.

In our interview with Reed (beginning on page 30), he sums up his perspective on this sense of personal accountability: "There's a subconscious trickle-down effect of the way that we treat each other inside the industry. We export culture around the world. I think that we need to make sure that the culture is right here at home."

At the risk of sounding idealistic, this is a reminder that every choice we make, from songwriting to business decisions, makes an impact, and positivity is always an option.

SARAH JONES
EDITOR
sjones@musicplayer.com

electronic MUSICIAN

WEB HIGHLIGHTS

This month on emusician.com

Inside Tristan Perich's *Noise Patterns*

Plus...
DJ Shadow: Expanded Interview
The DIY Advisor: Choosing the Right Distributor

...and lots more!

gadget geek

Get Hands-On With The Muse Controller

Composer/professor Andrew Staniland was seeking a stronger visual connection between his actions and the sounds he was creating when performing his electro-acoustic compositions. So along with partner Scott Stevenson, he created the Muse controller, which combines the functionality of a MIDI controller with the expressiveness and simplicity of an acoustic instrument. The wireless, backlit device frees musicians and DJs from the confines of their laptops, letting them face the audience, further immersing them in their performances. A crowdfunding campaign will launch on Kickstarter in August; see Mune in action at munemusic.com.

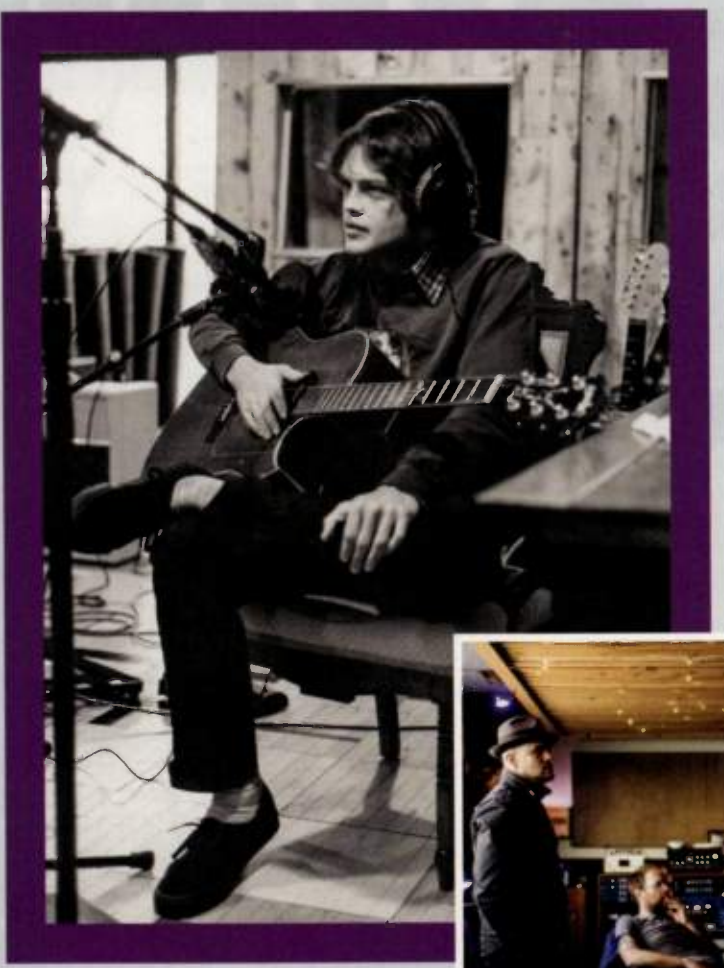
BY BARBARA SCHULTZ

>> William Tyler with Jon Ashley

GUITARIST WILLIAM Tyler's intricate and impressionistic instrumental albums transport the listener; the music is at once cinematic, orchestral, intimate, and emotional. On his latest, *Modern Country*, you'll hear synth sounds layered among the melodious strings, evoking impressions of a changing landscape to explore.

Describing the track "Kingdom of Jones," Tyler says, "[It] is dedicated to the memory of the people of Jones County, Mississippi, a small county in the southern portion of the state that seceded from the Confederacy during the Civil War." Have guitar, will travel.

Tyler is normally based in Nashville, but Modern Country was recorded in the dead of a Midwestern winter, in April Base (Eau Claire, Wisc.), the home studio of Bon Iver frontman Justin Vernon. Tyler and his producer, Dave Cook, invited an inventive ensemble to the sessions: bassist Darin Gray (Tweedy), drummer/percussionist Glenn Kotche (Wilco), multi-instrumentalist Phil Cook (Megafaun), producer Brad Cook on synths, and pedal steel player Luke Schneider.



William Tyler (left) recording in April Base. Below are bassist Darin Gray (standing) and producer Brad Cook. Bottom photo: Tyler looks on with engineer Jon Ashley.

Engineering the album was Jon Ashley, who traveled from his home base at Mixtown USA (L.A.) and settled into Vernon's house/studio with the band for five days.

"The core of the album was tracked live," Ashley says. "Everybody was set up in the same room. April Base has a large live room that once was an indoor swimming pool. I had the bass cab and Willie's guitar cab isolated in a small booth, but everything was cut live, and we spent quite a bit of time on the first day dialing in tones for everybody."

"There were no rehearsals beforehand, so the first day, we were feeling each other out, and it was good that we were in the middle of nowhere in the winter, so we had to all bond," Tyler observes. "It was the first time I had done a record outside of Nashville. It was the first time I had worked with somebody in a producer role, and it was the first time all of these musicians played together, but I had a lot of confidence and I knew once we got in a room, I just wanted these guys to play whatever their best first idea was."

The musicians had a lot of creative control, yet the pieces fit beautifully into Tyler's arrangements. Tyler played electric guitar on most of the live sessions, and Ashley miked up his '60s Fender Deluxe with a Royer RE20 and a Shure SM57; he used the mic pre's in the studio's Trident 80B console, judicious compression, and then into Pro Tools.

"Most of the guitar sound on the record is the sound Willie got live," Ashley says. "There's a handful of songs where we added reverb; there's some tape delay from an Echoplex, and I think there might be some Cooper Time Delay. But most of what you hear comes from his pedals."

Synths and keyboards were taken direct: "We got an amazing sound with a Yamaha CP-70, and we used a Roland Dimension D," Ashley says. "Any time we wanted to add organ or piano we would add that on top. It was the same thing with Glenn; he stacked a lot of percussion on this record, on top of the kit."

Tyler's acoustic parts were also added during overdubs. However, Ashley emphasizes the importance of the live sessions as the core of the album: "This record breathes a lot. It has a lot of space and it is really dynamic, and all of that comes from the performance."

NEW GEAR

1

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TARGET MARKET Performers, producers, composers

ANALYSIS A classic software bundle gets an updated browser and interface, plus five new and highly desirable instruments. What's not to like?

arturia.com

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TARGET MARKET Recording engineers in the field, journalists, podcasters

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TARGET MARKET Composers, performers, sound designers

ANALYSIS Cinematic percussion for film/TV work and performance.

heavyocity.com

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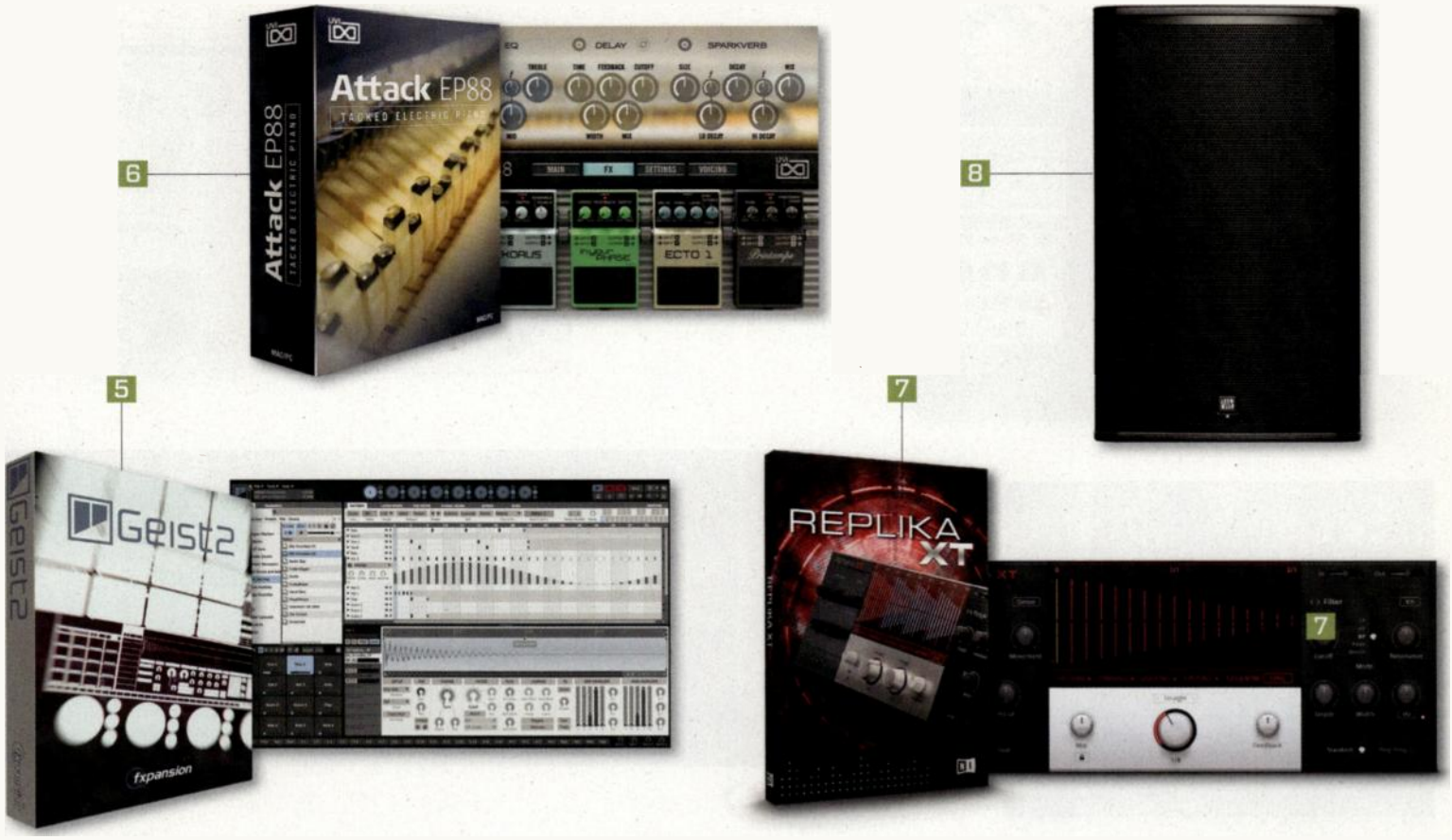
TARGET MARKET Sound designers, musicians, producers, DJs

ANALYSIS Output injects its sophisticated and feature-rich rhythmic aesthetic into a unique effects plug-in.

output.com

All prices are MSRP except as noted



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TARGET MARKET Musicians, producers, composers

ANALYSIS A significant upgrade to a software rhythm machine designed for studio and stage use.

fxpansion.com

6

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TARGET MARKET Keyboardists, composers, producers

ANALYSIS A unique take on a classic electro-acoustic keyboard with surprisingly rich editing capabilities.

uvi.net

7

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ANALYSIS Provides a wide range of delays, from clean and precise to hazy and swirly.

native-instruments.com

8

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TARGET MARKET Bands, houses of worship, education, performance venues

ANALYSIS Lightweight active speakers for mobile use or install.

presonus.com

9

ZOOM

H4N PRO

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TARGET MARKET Musicians, sound for picture, students, teachers

ANALYSIS A significant upgrade that puts Zoom's latest technologies into one of its most popular recorders.

zoom-na.com

10

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TARGET MARKET Musicians, recording engineers, producers, DJs

ANALYSIS A variety of classic and modern vocal-processing effects in one affordable plug-in.

izotope.com

11

FOCUSRITE

SCARLETT (2ND GENERATION)

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TARGET MARKET Musicians, producers, students

ANALYSIS Improved specs across the line, with additional features on the larger models, such as MIDI and digital I/O, word clock, and 1/4" outputs.

focusrite.com

12

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TARGET MARKET Singer/guitarists

ANALYSIS An all-in-one preamp and effects processor for stage use.

bossus.com

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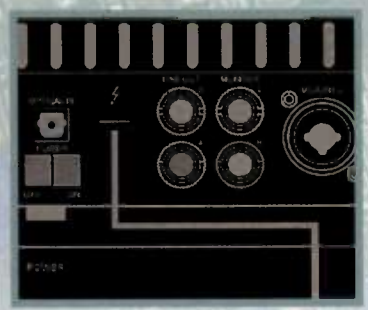
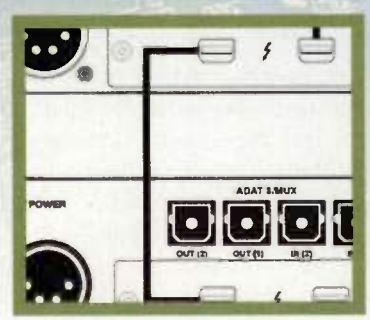
Clash of the Thunderbolts

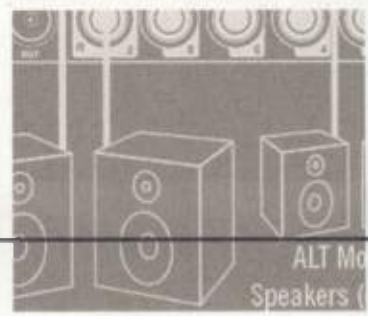
>> Our guide to interfaces for any studio rig, from budget to top-of-the-line

BY GEARY YELTON

If you've purchased a Mac in the past few years, you've probably noticed it has a new type of connector. Every Apple computer made since 2011 sports at least one Thunderbolt port, which has recently replaced the once ubiquitous FireWire ports that graced previous generations. The reason is that Thunderbolt is much, much faster than any of its predecessors. USB connectors are still onboard because USB is so universal, but Thunderbolt transports audio and other data with speedier throughput, resulting in greatly reduced latency, more numerous DAW tracks, smoother operation, and a better experience all around.







With Apple's participation, Intel Labs developed Thunderbolt as a high-speed interface for connecting computers to external devices. It lets you connect the PCI Express bus directly to peripherals, supplying them with DC power and providing the fastest access to your computer's main logic board that modern technology can muster. The original Thunderbolt, now called Thunderbolt 1, has a transfer rate of 10Gbps—20 times faster than USB 2.0 and 12 times faster than FireWire 800. Thunderbolt 2 is twice as fast as the first version, and the latest Thunderbolt 3 is a blazing 40Gbps.

Thunderbolt enables daisy-chaining of as many as six devices if at least five of them have two ports and any single-port device is the last in the chain. That makes the number of ports a consideration when choosing any Thunderbolt device, including an audio interface. Cables can each be almost 10 feet long. If you own any pricey FireWire gear, don't fret; Apple's Thunderbolt-to-FireWire adapters work like a charm.

FROM A HUM TO A ROAR

Typically, an audio interface is an AD/DA converter that converts analog audio signals to digital and digital signals to analog. It's what you use to get high-quality audio into and out of your computer. Audio sources are connected to the inputs, and the outputs are usually connected to amplified monitor speakers or mixing boards. Most audio interfaces also house two or more microphone preamps and a clock generator for synchronization, and the whole shebang is packaged in a tabletop or rackmount unit with various jacks, ports, and sockets to connect it to the outside world. Most have individual jacks for each analog input and output, and some have D-sub sockets that require an audio snake with a 25-pin plug at one end and numerous XLR or TRS jacks or plugs at the other. Most also have some sort of digital audio connectivity, usually stereo S/PDIF or ADAT Lightpipe, which carries a maximum of eight channels, depending on the sampling rate.

Many audio interfaces come bundled with software that lets you adjust parameters, route inputs to outputs, apply effects processing, and control mixes from the comfort of your computer screen. Because Thunderbolt offers such lightning-fast throughput, all of the interfaces mentioned in this roundup claim near-zero latency, and all have the numbers to back up their claims.

RESIDENT AUDIO T2

It can't be easy to design and build a studio-quality Thunderbolt audio interface practically any musician could afford, but that's exactly what relative newcomer Resident Audio has done. Holding down the budget end of the Thunderbolt spectrum, the T2 (Mac, $150) provides two channels of 24-bit, 96kHz AD/DA conversion at an unbeatable price.

The T2 is housed in a 1/3U chassis that you can rackmount, but it doesn't come with any mounting hardware. Two combo XLR/TRS jacks on the front panel are the only audio inputs. They accept signals from microphones, line-level sources, or high-impedance instruments like guitars. A switch sets both inputs to instrument or line-level impedances, and another enables phantom power for both inputs. Two knobs for controlling input gain are encircled by wraparound LEDs that indicate signal level in three colors. A large knob determines the main output and headphone levels, and a smaller knob determines the mix between the two inputs and any audio streaming from your computer.

The back panel comprises two line outputs on TRS jacks, a 1/4-inch stereo headphone jack, MIDI In and Out on DIN connectors, and a single Thunderbolt port. During playback, you can switch the outputs from stereo to mono, which may be helpful for singers or DJs who want to hear the entire mix through one side of their headphones. Unlike most of the other interfaces in this roundup, the T2 is bus-powered, which means it has no power supply of its own but draws enough current to operate from your computer through the Thunderbolt cable.

ZOOM TAC-8

Next up is the multichannel TAC-8 (Mac, $650) from a company best known for multi-effects pedals and handheld multitrack recorders. Only $250 more than the 2-channel TAC-2 launched in 2014 (TAC stands for Thunderbolt Audio Converter), the TAC-8 is a 1U rackmount unit with eight analog inputs, ten analog outputs, and up to ten channels of digital audio I/O—up to 18 inputs and 20 outputs in all, not including two 1/4-inch stereo headphone jacks with independent level knobs. A switch enables standalone mode, in which you can use the TAC-8 as an 8-channel mic pre and AD/DA converter without connecting it to a computer. According to the manufacturer, the TAC-8 can eliminate aliasing noise by internally upsampling 44.1 or 48kHz audio to 176.4 or 192 kHz.

Eight combo XLR/TRS inputs are on the front panel, each with its own individual gain knob and LED to indicate signal and clipping. Handy hi-Z switches on the first two inputs mean you can plug an electric guitar or bass into either of them. A large output knob controls levels for all outputs simultaneously, and two 48V switches enable phantom power for four inputs at a time. Around back, you'll find eight individual channel outputs on TRS jacks and a separate pair for the main output, as well as 8-channel ADAT I/O on optical ports, stereo S/PDIF on coaxial jacks, word clock I/O on BNC connectors, and MIDI In and Out on 5-pin DIN connectors.

TAC-8 MixEfx is the bundled application for controlling the TAC-8 from your Mac. It provides access to parameters such as sampling rate, clock source, and so on, and it also functions as a signal router and mixer. In addition, MixEfx lets you use the included effects plug-ins—three reverb algorithms and delay—but only if upsampling is disabled.

Windows Compatibility and Expense

Despite its obvious speed advantages, Thunderbolt hasn't been broadly accepted by the Windows community. Although Windows 10 supports it and Thunderbolt cards are available for PCs, the protocol hasn't really caught on, and only a few models come standard with Thunderbolt ports. Consequently, not a lot of products specifically support Thunderbolt in Windows, but that's beginning to change.

Compounding the problem is the unfortunate fact that Thunderbolt drives and cables cost a lot more than they should, no matter what your platform. Fortunately, studio-quality Thunderbolt interfaces don't cost much more than comparable USB interfaces, making it easier for the audio industry to embrace it as the data bus of choice for professional work.


WELCOME TO THE NEW ERA
DX7
1983
MOTIF
2001
MONTAGE
MUSIC IN MOTION

FOCUSRITE CLARETT 4PRE

Founded by legendary studio hardware designer Rupert Neve, Focusrite first made its mark building outboard audio processing modules beginning in 1985. Although Mr. Neve sold the company four years later, its current products carry over that heritage. For decades, Focusrite's product lines have been distinguished by colors—Red, Blue, Green, Platinum, Saffire, and Clarett—indicating their target market and cost. The Clarett line comprises four relatively affordable Thunderbolt interfaces. As the name indicates, the Clarett 4Pre (Mac, $700) has four mic preamps and sits smack between the dual-preamp Clarett 2Pre and 8-preamp Clarett 8Pre. (The top of the line is the 8PreX, which has additional I/O functionality.)

Not to be confused with the $2,500 Red 4Pre, the Clarett 4Pre boasts 24/96 conversion with up to 18 simultaneous inputs—8 analog and 10 digital—and 8 outputs. The front panel has four combo XLR/TRS inputs that accommodate mic or line-level signals, with another four 1/4-inch line inputs on the back. An optical input furnishes either 2-channel S/PDIF or up to 8-channel ADAT, and a pair of coaxial jacks furnish stereo S/PDIF in and out. Four balanced TRS outputs are in back, and two 1/4-inch headphone outputs up front have independent level knobs. The interface also has two 48V phantom power switches (one for each pair of front-panel mic inputs), along with MIDI In and Out on DIN connectors and a single Thunderbolt port.

The Clarett 4Pre's low-noise mic preamps are equipped with Focusrite's exclusive Air effect. Air models the classic Focusrite ISA mic pre by duplicating the interaction between preamp input and microphone impedance, which has a substantial influence on a mic's clarity and character. All Clarett interfaces come with Focusrite Control software for controlling the 4Pre's internal audio mixer and parameters such as S/PDIF source and sampling rate, which affect the number of digital audio channels available.

UNIVERSAL AUDIO APOLLO TWIN

In 1999, recording pioneer Bill Putnam's sons resurrected their late father's company to design and market software emulations of classic studio gear. Universal Audio still makes analog hardware, but its real bread-and-butter products are the UAD plug-ins that model studio hardware with jaw-dropping accuracy. However, you can't use any of them unless they're hosted on UA's DSP accelerator hardware. The Apollo line of audio interfaces combines internal SHARC DSP processors serving as accelerator cores with superb mic preamps, pristine AD/DA converters, and analog and digital I/O.

The priciest model is the Apollo 16, a rackmount interface that supports Thunderbolt 2 and sells for $3,000. If that's more than you need or can afford, the Apollo Twin Solo (Mac, $699) and Twin Duo (Mac, $899) are much more affordable. (A USB Twin Duo for Windows is also available.) The difference between the Solo and Duo is that the Duo has two SHARC DSP chips; the Solo has one. Either way, the solidly built desktop unit oozes quality. It offers as many as ten simultaneous inputs on the back panel, two analog channels via a pair of combo XLR/TRS jacks and eight digital channels via ADAT Lightpipe I/O. The Apollo can handle sampling rates as high as 192kHz if you can get by with fewer ADAT channels. Alternately, the optical port can carry two channels of S/PDIF I/O, and an instrument jack on the front is suitable for guitar or bass. Two pairs of TRS jacks labeled Monitor and Line Out are on the back, and a 1/4-inch stereo headphone jack is on the front, giving you six channels of digital-to-analog conversion.

A large knob on the top panel controls whichever inputs and outputs you select, and LEDs encircling it indicate input and output levels. Below that, a row of buttons enables the low-cut filter, phantom power, and other functions. The accompanying Console software affords access to all parameters, channels, plug-ins, and signal routing. (Read a review of the Apollo Twin at emusician.com.)

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K72 K92

CLOSED-BACK HEADPHONES

ANTELOPE AUDIO ZEN TOUR

The Zen Tour (Mac/Windows, $1,495) is the latest audio interface from Antelope Audio, a company that established itself over a decade ago by producing high-end AD/DA converters and clocking devices. The Zen Tour is a rugged, portable tabletop model that features both Thunderbolt and USB 2.0 connectivity on the back panel. Despite its compact size, it maxes out at 8 analog inputs, 16 analog outputs (depending on how you count them), and 18 digital inputs and outputs.

On the top panel, a bright, colorful touch screen displays all parameter values, channel levels, onscreen buttons, and menus. A large knob alongside the display changes selected parameters, and a talkback button is on hand when you need it. On the back panel, four inputs on combo XLR/TRS jacks can be switched to accommodate mic or line-level audio sources. On the front, four more inputs are on 1/4-inch jacks, and they're switchable between high-impedance instruments and line-level sources. A pair of 1/4-inch reamp outputs on the front sits alongside two independent 1/4-inch stereo headphone jacks. Around back, you get four TRS outputs for separate monitor pairs and S/PDIF digital I/O on coaxial jacks. Another eight analog outputs on a 25-pin D-sub connector require an optional 8-cable snake if you want to use them. Four optical jacks mounted on the side accommodate ADAT I/O.

One particular feature that stands out is the Zen Tour's onboard suite of effects. Taking advantage of the onboard 64-bit field-programmable gate array (FPGA) for algorithm processing, the Zen Tour offers amplifier and cabinet simulation, Pultec EQ emulation, and Antelope's algorithmic reverb Auraverb. In addition, control apps for piloting the Zen Tour from your Mac, PC, iPhone, or Android supply onscreen parameter controls, an onscreen mixer, and a routing matrix.

MOTU 112D

Unlike the other products in this roundup, the single-rackspace 112D (Mac/Windows, $1,495) has no analog inputs or outputs nor any AD/DA conversion, but it excels at converting between various digital formats. If you need to connect microphones, instruments, line-level sources, or monitor speakers, then first you'll need at least one external device to convert audio signals from analog to digital and back.

The 112D connects to your computer via Thunderbolt 1 and 2, USB 2.0, or Ethernet. According to MOTU, the 112D is the first interface to combine Thunderbolt, AVB (Audio Video Bridging), and MADI (Multichannel Audio Digital Interface) networking in a single device. Over Thunderbolt, it gives you a maximum 112 simultaneous channels of digital I/O—24-channel AES3 (aka AES/EBU), up to 24-channel ADAT optical (depending on the sampling rate), and 64-channel MADI.

A large LCD on the front displays clock parameters and signal levels for all inputs and outputs simultaneously, and it can display hardware settings and status information at the push of a button or two. All external connections are on the back panel, where you'll find three 25-pin D-sub sockets for AES3 connections, six pairs of optical I/O ports for ADAT connections, MADI in and out on coax connectors, an Ethernet port for ABV, word clock in and out on BNC connectors, a USB connector, and a single Thunderbolt port.

The 112D pairs with bundled AudioDesk software for controlling all parameters remotely. AudioDesk also furnishes an onscreen mixer with 48 channels and 12 stereo buses. Onboard effects include reverb, British analog EQ emulation, and Teletronix LA-2A compression modeling. Because it's class compliant, the interface is plug-and-play compatible with Mac OS X, Windows, and iOS. As long as your audio stays in the digital domain, the 112D is an extremely versatile connection between your computer and digital audio devices.

LYNX AURORA 8TB

Lynx Audio Technology has been designing and building AD/DA converters and sound cards for audio professionals, musicians, and recording studios since 1998. The Aurora 8 is a single-rackspace converter that supports 16- and 24-bit audio at sampling rates as high as 192kHz. Although Lynx calls it an 8-channel interface, it can stream eight channels of analog audio at the same time as eight channels of digital AES3 audio. Any other manufacturer might call that a 16-channel interface, but all the analog inputs must be routed to either the analog or digital outputs. You can double the number of channels with a hardware upgrade; if you need more to start with, though, check out the Aurora 16.

The Aurora has an LSlot port on the back panel that accommodates expansion cards for connecting to other devices in a variety of formats. In addition to cards for USB, Pro Tools|HD, and MADI (an ADAT Lightpipe card was discontinued in 2014), Lynx's LT-TB card makes the Aurora 8 a Thunderbolt audio interface, and the model with that card preinstalled is the Aurora 8TB (Mac, $2,195).

The 8TB's back panel has three 25-pin D-sub sockets: one for analog in, one for analog out, and one for AES3 in and out. (Optional 16.4-foot snakes with XLR connectors at one end are available from Lynx.) The only other connections are MIDI In and Out on DIN connectors and word clock on BNC connectors. Lynx's SynchroLock word clock is reputed to be particularly stable and resistant to jitter. Buttons of the front panel afford access to parameters you'd change most often, including sampling rate, sync source, and so on, and peak LED meters indicate signal strength for either the analog or digital inputs. You can control parameters in greater detail using Aurora Remote, as well as route signals and view levels for all ins and outs.

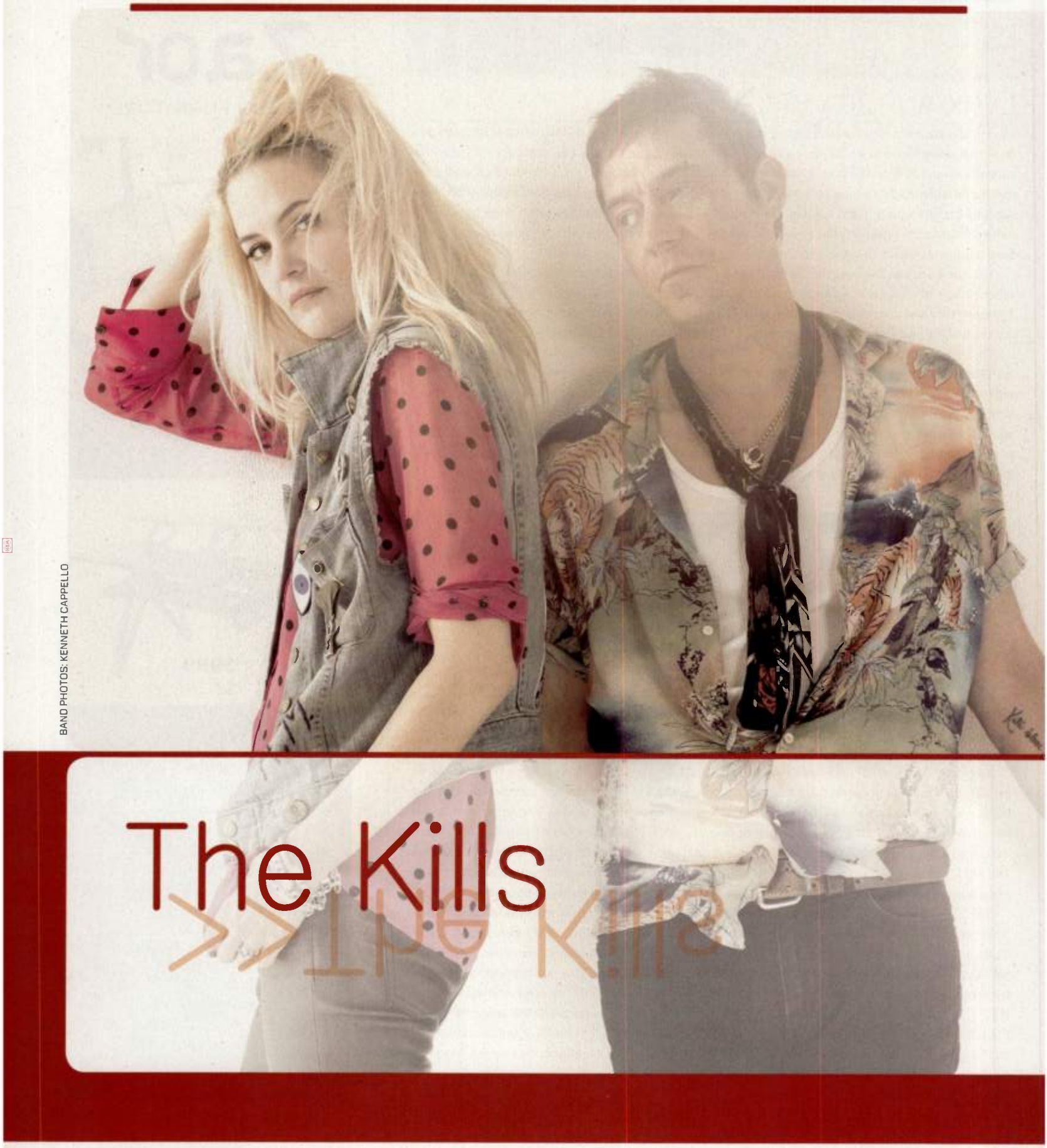
APOGEE SYMPHONY I/O MK II

Beginning with anti-aliasing filters more than 30 years ago, Apogee has evolved into a well-respected manufacturer of AD/DA converters, audio interfaces, and high-definition clock generators. One of Apogee's newest products is a revision of its highly respected Symphony I/O converter.

You can choose from Thunderbolt, Avid Pro Tools|HD, or Waves SoundGrid versions of the Mk II, depending on what kind of connectivity your setup requires. The Thunderbolt model supplies two Thunderbolt ports. An option card slot on the back lets you expand connectivity, if needed. Two larger module slots let you configure the Mk II for however many inputs and outputs you need (or can afford). Standard features include a 1/4-inch stereo headphone jack on the front and word clock I/O on BNC connectors on the back. The Mk II's touch screen lets you access all its control functions, and the included Apogee Maestro software lets you set all parameters, create custom mixes, and route inputs and outputs using your computer.

The Mk II's base configuration (Mac, $2,495) comes with a module furnishing two analog inputs on XLRs, six analog outputs on a 25-pin D-sub socket (an optional snake is required), stereo AES3 I/O on XLRs, and stereo S/PDIF on coaxial jacks. Optical in and out connectors accommodate either 4- or 8-channel ADAT at rates up to 96kHz or 2-channel S/PDIF at rates up to 192kHz. The 8 x 8 configuration ($3,295) features a module with eight analog inputs and outputs on D-subs, AES3 I/O on another D-sub, stereo S/PDIF on coaxials, optical I/O dedicated to SMUX (high-rate ADAT), and optical I/O that accommodates S/PDIF, SMUX, or ADAT. The module in the 16-channel configuration ($4,295) has 16 channels of analog I/O on D-subs and S/PDIF on coaxials. You can mix and match these three modules in the two slots as needed and your budget allows. In addition, modules from the original Symphony I/O are compatible and available in a variety of configurations. ■

Writer and musician Geary Yelton lives in Asheville, North Carolina, surrounded by scenic mountains and wonderful toys.



BAND PHOTOS: KENNETH CAPPELLO

The Kills

Jamie Hince and Alison Mosshart holed up in the Hollywood Hills to channel studio noise and chaos into the "electric guitar music" of *Ash & Ice*

BY KEN MICALLEF

A ROCK 'N' ROLL life can be fraught with injury—from AC/DC's Brian Johnson's hearing damage to Tony Iommi's cauterized fingertips to ZZ Top bassist Dusty Hill's recent smashed shoulder. So what to do when the going gets tough? Schedule studio time and hit "record"!

That was the remedy for The Kills' guitarist and composer, Jamie Hince, who slammed his left hand in a car door and had to undergo six surgeries and countless cortisone shots, and has a permanently damaged middle finger to show for it all.

Following 2011's *Blood Pressures*, The Kills—Hince and composer/guitarist/vocalist Alison Mosshart—finally deliver *Ash & Ice*, a freakily great song collage of demonic rockabilly guitars, Mosshart's vampish vocals, and programmed beats amplified by Daptones drummer Howie Steinweiss.

Recorded in a rented house in the Hollywood Hills (with Keyclub Recording Co.'s Bill Skibbe manning Hince's Neve Germanium console) and Electric Lady in New York City, *Ash & Ice* documents The Kills' ongoing love affair with the road, with punk rock, and most importantly, with rock 'n' roll.

"It's always been a journey for me to join together what I love about drum machines and dancehall, hip-hop, R&B and electronic music," Hince says. "But my heart is in rock 'n' roll. I grew up with post-punk and the guitar is part of my body now. When I feel angry my guitar shouts. When I'm sad, my guitar cries. We call it 'electric guitar music.' If you're going to have electronic dance music, then we are electric guitar music."

Ash & Ice is of one mind. From the album's blazing singles, "Doing It to Death" and "Heart of a Dog," to such atmospheric summer scorchers as dead-eyed highway growler "Let It Drop," The Clash-worthy "Siberian Nights," and reverb-rattling "Impossible Tracks," *Ash & Ice* is rock 'n' roll devoid of sentiment and commercial avarice. In an era bordered by plastic hip-hop and preening pop stars using AutoTune like eyeliner, The Kills grab contemporary music by the throat and shake it back to life.

THE RECORDING

Co-produced by Hince and John O'Mahony; mixed by Tom Elmhirst at Electric Lady and Tchad Blake at Full Mongrel Studios; mastered by Brian Lucey at Magic Garden Mastering, *Ash & Ice* spears your heart and keeps your soul on ice.

Proclaiming that he's into both PJ Harvey *and* Cabaret Voltaire, Hince says "production values have become more important, especially since I mucked my hand up. I started thinking more as a producer than as a bash-bash-bash guitar player. I'd had surgeries and my hand in a brace and couldn't move it.

"Then I saw a Les Paul documentary and it felt like he was talking to me," he continues. "He had a car crash and it nearly ripped his arm off. There was Les Paul on the TV screen with his arm in a cast. And me sitting there watching him with my arm in a cast. He said his accident made him stop and consider what he was doing with music. Without getting too grandiose about it, that really spoke to me. I thought, 'This is a really a chance to change what I'm doing.' I was never the most orthodox guitar player anyway. It's always been ideas over ability for me."

Hince and Mosshart tracked previous Kills records almost exclusively at Bill Skibbe's Keyclub Recording near Chicago. The pair envisioned *Ash & Ice* as their own *Exile on Main Street*, inspiring them to take over a trashed house in the Hollywood Hills and fill it with recording gear.

"I felt like we should embrace more noise and chaos like we do when we're touring," Hince recalled. "We rented a big house in the Hollywood Hills. It's like our California Nellcôte. It was falling down. I shipped my Neve Germanium console and tons of reverb/dub units and echo boxes and we set up there. Bill Skibbe brought all of his fantastic equipment and we made a great studio in this Hollywood Hills house. We recorded the bulk of it there, for two and a half months."

"Keyclub West," as it was dubbed, became The Kills' home base for recording guitars, vocals, piano, and Hince's Pro Tool-ed drum patterns. The Daptones' Howie Steinweiss overdubbed live drums to a handful of songs.

The drum machine/live drummer interface is an integral part of The Kills' sound. Hince's clattering sci-fi guitars find their soulful expression in ancient amplifiers and minimal pedal processing, but the peculiar drum tracks are perhaps even more essential to The Kills' musical ethos. While the guitars' sonic atmosphere creates a bed for Mosshart's royal vocals, the drum rhythms—equally frigid and pushing forward—frame The Kills' eerie, timeless music on an urban block somewhere between Al Jackson and Depeche Mode.

"There is something really liberating about a drum machine," Hince said. "But it can be quite soulless and relentless. One thing we hadn't really ever dealt with was groove. So I started making loops sampling old gospel records or rare punk, anything that had a weird soul groove or a spazzy feel. I looped that and then programmed really precisely to that groove. I always program drums to exactly the right groove then put the music over it so it's sounding right. Homer backed up the programmed rhythms. We don't break that tension of the [metronomic beat]. It's really important that I've got this electronic thing going on."

And Hince doesn't program beats exclusively on Pro Tools. Anything will do.

"On 'Heart of a Dog' I programmed this crappy iPod-MPC beat and put it through loads of compressors to make it sound like John Bonham," he says. "It sounded massive and I never thought a drummer could top it. Then Homer played over it and you could feel the way he pushes. He made it sound a *lot* more soulful. On 'Doing It to Death' I wanted the drums to sound like a human robot, that Roland TR-808 drum machine vibe. I didn't tell Homer I chopped him up there!"

Hince's collection of Hofner guitars and vintage amplifiers gives The Kills their '50s radiation vibe. *Ash & Ice* found him playing his trusty Hofner 176 with "shark fin" pickups, among other electric stringed instruments.

"Hofner only made the 176 for five or six years," Hince explained. "These 'shark fin' pickups are what I use on everything. They're amazing single-coil pickups, that breaking glass sound. My guitar playing is super rhythmical so I want it clean so I can hear all the strings."

Hince's *Ash & Ice* guitars—which included Hofner Galaxy and Telecaster, Gretsch Silver Duke, and Supro Ozark—go through a minimal pedal board employing two Electro-Harmonix Polyphonic Octave Generator POGs, two Boss DD-3 Delays, and one Fulltone Supa-Trem pedal which controlled a blended sound consisting of four amplifiers: 1961 Vox AC80/AC50 cabinet, Selmer Treble N' Bass Mk I, Selmer Zodiac, and Magnatone 280. (Hince writes on a 1921 Gibson L-1 acoustic guitar).

When it came to miking amps, "Bill Skibbe taught me that if you've got good mic preamps then ribbon microphones will give you a lot of

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Mastering engineer Brian Lucey

detail in the midrange," Hince explains, adding that they used Royers and Coles. "We spent a long time being perfectionists moving mics one inch or half an inch. Then checking the signal again and moving the mics a little bit more. We had three mics on every amp to make sure we had it all covered. It's overkill but the guitars on the album sound great."

During tracking, Hince and Mosshart could see each only by looking out neighboring windows into each other's recording space.

"We used different rooms in the house," Hince recalls. "The ceilings were high and there was a lot of marble so it was like reverb chambers wherever you looked." A Neumann U47 and RCA 44 were placed in different areas of the space to capture Mosshart's vocals. "'Hum for Your Buzz' was done in the bathroom of Alison's bedroom; we were recording on either sides of the house. She basically sang in the shower!

"We always need to play live to feel the vibe of the song," Hince adds. "That's partly why it takes us so long to record. When we try out a song we record lots of versions live. Then we generally break it down after that. But there are occasions when the song always sounds better performed live. 'Hum for Your Buzz' was like that, 'Black Tar,' 'Impossible Tracks' too."

While acoustic piano was tracked in the Hollywood Hills, sub bass sounds via a Korg MS20 and ARP modular synth were recorded at Electric Lady with Depeche Mode's Kurt Uenala. Hince recorded miscellaneous sounds using Native Instruments Maschine "Vintage Organ" plug-ins as well. Hince's latest acquisition, a 1950s Selmer Clavioline keyboard, was also used.

"It's got a whole sub section on it," Hince exclaimed. "It floored people when I told them it was made in 1952."

THE MIXING

"I loved the vibe of The Kills as soon as I heard their records," says Tchad Blake from his studio in the Welsh countryside. Mixing exclusively in the box using Pro Tools and an Icon D Control ("It impresses clients when they visit"), Blake relied on a wide array of plug-ins from UAD, SoundToys, Waves, PSP, Kush Audio, and McDSP.

"There's a big debate on which is better—analog or digital," Blake muses. "For me, they're simply different. I prefer digital. I had lots of trouble in the analog domain. I have no love affair with tape. I'm loving Pro Tools and how it works. I can do Peter Gabriel records in my home studio instead of going to a half-million-dollar pro studio."

When it came to mixing *Ash & Ice*, Blake went for a big low end, focusing on enhancing the kick. "I believe a bass instrument of some sort needs to be the real low *mutha* on every record," he says.

"I like crunchy," he continues. "I like contrasts. If it's too clean or too distorted it doesn't work for me. I will perhaps distort the drums and have a clean vocal. Or the other way around. But I never formulate things I my head. I figure out where the vibe is coming from in the band's rough mix. Then I try to bring it into my world. It's an unfolding process every time."

Blake's secret weapon is an arcane hardware piece originally developed in the 1980s by Howard Klayman of Hughes Aircraft, called the AK-100.

"It's a surround sound synthesizer," Blake explains. "Sony used it on the Trinitron SRS TVs. It's on everything I do. I don't put it on the mix. I put effects through it, like a vibrato or a rotating speaker sound or a modulating frequency filter. It doesn't have great frequency response; it doesn't go over 2k. But the curve is so great that everything that comes out of it sounds very warm instead of bright and sparkly."

THE MASTERING

At his Magic Garden Mastering studio in Los Angeles, Brian Lucey has brought a discerning ear to the recordings of Lucinda Williams, Chet Faker, and the Black Keys, to name a few.

Lucey's mastering console essentially comprised six pieces: His chain includes a modified Focusrite Blue 315Mk2 mastering EQ, Elysia Alpha compressor, Fairman TEMQ Tube Master Equalizer, Mytek 192 DAC, and MAGIX Sequoia software, with conversion via a 1990s-era Pacific Microsonics HDCD converter "through the lowly Waves L2 hardware, then a Crane Song HEDD 192 for rounding off the square waves with a little bit of harmonic distortion," Lucey says.

The mastering engineer monitors mixes via a Bricasti Design M1 SE DAC, to a Crane Song Avocet as router to 70Wpc Class-A Cary Audio 211FE mono-blocks powering Canalis Allegra loudspeakers.

"The Kills record has big low end, and some really powerful qualities across the board. I was leaning into the limiter, leaning into the tube output," he explains. "The punchiness and balance of the drum electronics with the guitar, the song, and the vocal—all of those things had to be maximized. It's like juggling balls. You're trying to elevate the single tracks while tying them together into a whole that is greater than the sum of its parts."

Of mastering, Lucey says, "It begins with a great room and is part frequency balance, part transient-to-compression balance, part distortion balance, and then levels," he says. "Within those seemingly minimal areas of freedom, there is a lot of power that results in real differences from engineer to engineer.

"Mastering picks up where mixing leaves off, and brings a next-level perspective. We look first at the big picture—this record versus all music—and then we work back into the parts," Lucey adds. "We're making a whole where things tie together, while at the same time we're making each single song stronger. After mastering, you should have a cohesive artistic statement and each track should be up a level or three from where they came in as a mix." ■

ISAAC STERLING

L.A. Success Story

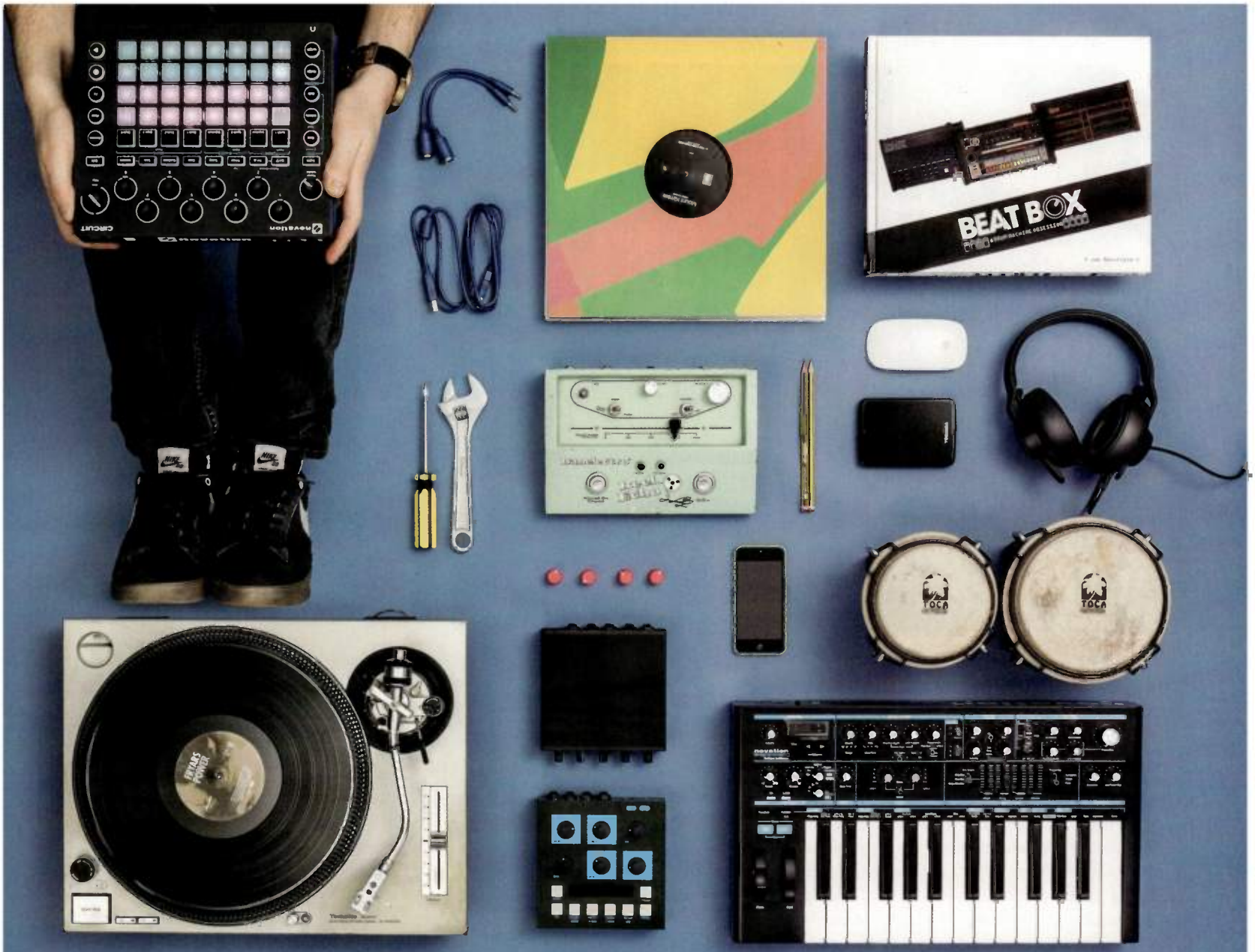
>> Producer and songwriter Ricky Reed takes an artist-friendly approach to his work, and the results speak for themselves

BY MIKE LEVINE

HANGING PLANTS, fruit trees, and even a hammock festoon Ricky Reed's studio compound in the Echo Park section of Los Angeles, creating an oasis-like vibe for the artists who record there. The studio itself features a collection of hardware synths, a large-format console, vintage mics, and high-end monitors, among its plentiful gear. For Reed, one of the most in-demand pop music producers in L.A., this dream setup is light years beyond what he had just a few years ago when he first moved down from the Bay Area. Back then, his "studio" consisted of a backpack full of gear and a bicycle.

"My operation was fairly hokey," he recalls. "I'd ride the bike or take the bus to different writing rooms and little production rooms and studios." Eventually he scored a couple of high-profile gigs, producing songs for Cee-Lo and Far East Movement, but it wasn't until he worked on the 2014 Jason Derulo hit "Talk Dirty"—a gig he says he got as a fluke—that things really started to pop. Now Reed is on everybody's radar, thanks to his work for high-profile artists like Meghan Trainor, Twenty One Pilots, Pitbull, and Bomba Estéreo.

As testament to how far he's come in a few years, Reed recently launched his own record label, Nice Life Recording Co., which he runs with an artist-friendly approach not usually found on the business side of the record industry. If that weren't enough to do, Reed still fronts his own pop/hip-hop band, Wallpaper, which he started back in his college days.



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How did you get into production? Did you study it at all?

No. When I was still in high school I started producing amateur local punk bands for a little cash on the side. I would come into the studio in the Bay Area, and would do these four-hour sessions and produce three or four songs for a band. I would record them, I'd have to edit all the drumming and clean up the performances. It was very, very tedious and intense, but it was sort of a crash course in engineering and production. So when I started making my own records, I would be at the helm, I would do long nights, stay up late and learn how to sample and how to use synthesizers and stuff like that.

How did you get started working in L.A.?

When I was still living in the Bay Area, I actually cold-called one of the representatives at BMI, who is now a dear friend of mine, Casey Robison. He was the guy that answered, and I said, "I want to write and produce for rappers and singers." And he said, "Okay, send me 10 CDs of your band or whatever." And I did that, and then just waited. About a month and a half later he said, "Somebody wants you to do a session. Can you fly down or rent a car and drive down?" I did, and that was what started it.

On most projects you do these days, are you producing the whole thing from start to finish? Do you ever get called in just for mixing?

I outsource my mixing when possible. I think I tend to get things to a pretty good-sounding place. A lot of what I do is trying to get a song to a place where a label is going to freak out about it and make it a priority, way before we even mix it. So I have to get things sounding pretty damn good. But I do most of my mixing with Manny Marroquin. We have an amazing workflow.

> Man, you're the artist, you have to put in so much work, and you feel vulnerable all the time and you feel exposed all the time...I just think that as a label it's really important to understand that's what your artists are going through and appreciate and tell them that you appreciate their time and their work and the heart they're putting into this.

Did he work with you on Meghan Trainor's "No"?

Yeah, he did. Manny mixed it.

I was really impressed with the mix of that. It was like so "in-your-face." It didn't have a lot of ambience, but yet it didn't feel dry. Was that the idea for the mix?

Yeah, we just love impactful and concise [mixes]. We don't use that many sounds but the sounds we do use [have to] matter and hit, and have their home. It doesn't sound anything like a Quincy Jones production, but I still think of him a lot in terms of how the writing and arranging of parts means so much when you get to mix stage. Like the choices you make of sounds and how many sounds or how few sounds is going to directly impact the sonic takeaway at the end of it. I have to reproduce tracks every now and then for people—every now and then I have to bring a production in and people are like, "We've been adding and adding and adding and we can't get the bass right. It's not big enough." And nine times out of ten I end up removing all the shit that they have going on down there. Taking the best sound. Cleaning it. Making sure the edit's right. Taking the compression off of it. Get your sounds right, and you don't have a lot left to do.

Right, it's like a good arrangement almost mixes itself. Not exactly, but a lot more easily.

Can you use that quote and just say that I said it? [Laughs]

[Laughs] So how did you get the vocals on "No" to sound so up-front?

We recorded all her vocals—most of the songs, anyway, and definitely that one—on an old Telefunken U47 through a Neve 1070 and a [TubeTech] CL1B. A thing about Meghan, it's performance, too—get right up on the mic, sing your ass off. I don't remember if it was that song or not, but one of them, on the ad lib, we gave her a glass of wine or something beforehand so she could stay loose and be comfortable in the booth. Performance comes first, and if you get the performance right, it can be loud and mono and dry and sound f*cking great.

Do you tend to do a lot of comping on vocals after you record a singer, or do you try to get them to sing straight through and overdub as you go?

I do some amount of comping but it's always about—and this is not new news—always about the feel, the excitement, the swagger. My thing is that you can get a singer to the point where they're like happy, confident, and feeling themselves. And once you get to that place, you get three or four takes tops, and from there it will only devolve. When you know what the singer's potential is, you hit that spot, get a couple, and then say, "Okay, great job." Have them go out feeling good, feeling on top of it. I love to have singers go out on a good note as opposed to beating them into the ground for perfection and having them feel defeated. Let there be a little bit of magic, a little bit of looseness, and a little bit of rock 'n' roll.

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Do you think some producers overdo it with the comping, the tuning, and the rhythmic adjustments?

Yeah, totally. But I do also think the rhythmic pocket is so important. And that's something that my ears are really sensitive to. Like when a vocalist is swinging in a different pocket than a percussion instrument or a hi-hat or something, it's like nails on a chalkboard for me. That's one thing I work really hard on when I'm cutting a singer, is getting the pocket right. A vocal that's right in the pocket is the best-feeling thing. It makes a track dance more than any good bass line or anything else. That's the key to dance music, I think.

Talk about your studio a little bit. What do you use for a DAW? Are you a Pro Tools guy?

Yes, I'm a Pro Tools guy.

Do you use a console or are you strictly in the box?

We have a Harrison 32C console, which we love. It allows us to have all of our keyboards firing at once. We have a bunch of those and we've done a couple of fairly complex miking setups—for our small studio—in the live room, where we have to run a good 8 to 10 channels at once. But it has a great sound and we also use the Harrison for—we'll sort of blow it out with that clip-fuzz sound. That's a great sound for blowing out direct-miked guitars and vocals and things like that.

So you're using it when tracking rather than mixing, right?

Right. We don't mix on it. But for production, we also do send sounds into it and use the EQ. It has incredible EQs. So we will sometimes send something into it to use for the low-pass or high-pass.

What do you monitor on?

Barefoot Micromains.

Those are pretty high-end.

Yeah, they're pretty expensive, but boy they sound amazing, and for their size they're just explosive in volume. They scream, but gosh, they sound so good.

Do you use a sub with them?

I don't. And that's something I've been meaning to get around to. I think I would listen at lower volumes if I had a sub.

Talk about your synth collection. Is it mostly hardware?

Yes. As of now my synths are an old Memory Moog, I think it's from 1981; a Korg Polysix; a Roland Juno 106; an Arp 2600, the crown jewel of the studio; a Sequential Circuits Prelude, which is great for layering; a Crumar Orchestrator, and an old Roland vocoder. And then we have the Steinway that was at Sound City for the last, whatever, 40-plus years. We have their Steinway, which brings all the magic, rock-and-roll history back to the studio.

What do you think is the biggest difference between playing a software synth with a good controller keyboard and playing an actual hardware synthesizer? Is it the sound, the feel, the knobs?

Well, I love tactile knobs and sliders. It always feels really good to me as far as customizing a sound. I think it's also not being able to fly through presets—it feels a little bit more special and magical when you stumble onto something you love. And I think that soft synths can sound incredible and can definitely fool my ear. I would never say, "Wow, yeah, I can tell the analog from the soft synths any day!" But, I know the character of each one of my synths. I can go to them for a very specific thing, and I know it's a sound that no one else will have. There just aren't a lot of guys in this game that I'm playing—like in my lane—that are taking the time to make sounds on those kinds of instruments. I think that I can produce more unique recordings by using all my hardware.

Can you program sounds from scratch, or do you usually start from a certain point with a preset?

At this point I can definitely do it from scratch. In fact, on my Polysix, which I love, the presets are kind of busted and weird. So when I want something specific from that I'm like, "Okay, let's see: square wave, poly, attack, decay, cutoff. I actually have to think of the sound and go through and build it. But it's also just so much fun.

Do you also use a lot of software synths?

I do use software synths for some sounds that are just easier when you're going for a certain thing to just pull out of [Lennar Digital] Sylenth or [reFX] Nexus. I like some of the tacky sounds you can get out of the Digidesign synths like Xpand. And I'm a big, big, big fan of [Native Instruments] Kontakt.

When it comes to processors and effects, are you using mostly plug-ins, or do you also have hardware units?

Yeah, we have a decent amount of stuff. That's one part of our collection that we're trying to build up. We have a tape machine that we run a lot of stuff through for saturation. And also some vintage guitar pedals for chorus and flange and stuff. We are trying to get our hands on an EMT-250 [plate reverb]. We want to get a little deeper on that. Software plug-ins were sort of what I used to teach myself to produce, so I have no problem using them. But I find myself being more creative and doing more strange and unique things when I use outboard stuff, and I commit. I like finding a sound, loving it, printing it, and moving on.

Let's talk about your label [Nice Life Recording Co.]. You were quoted as saying that one of the things you wanted to do was treat people with respect. You talk about trying to undo the sexism in the business.

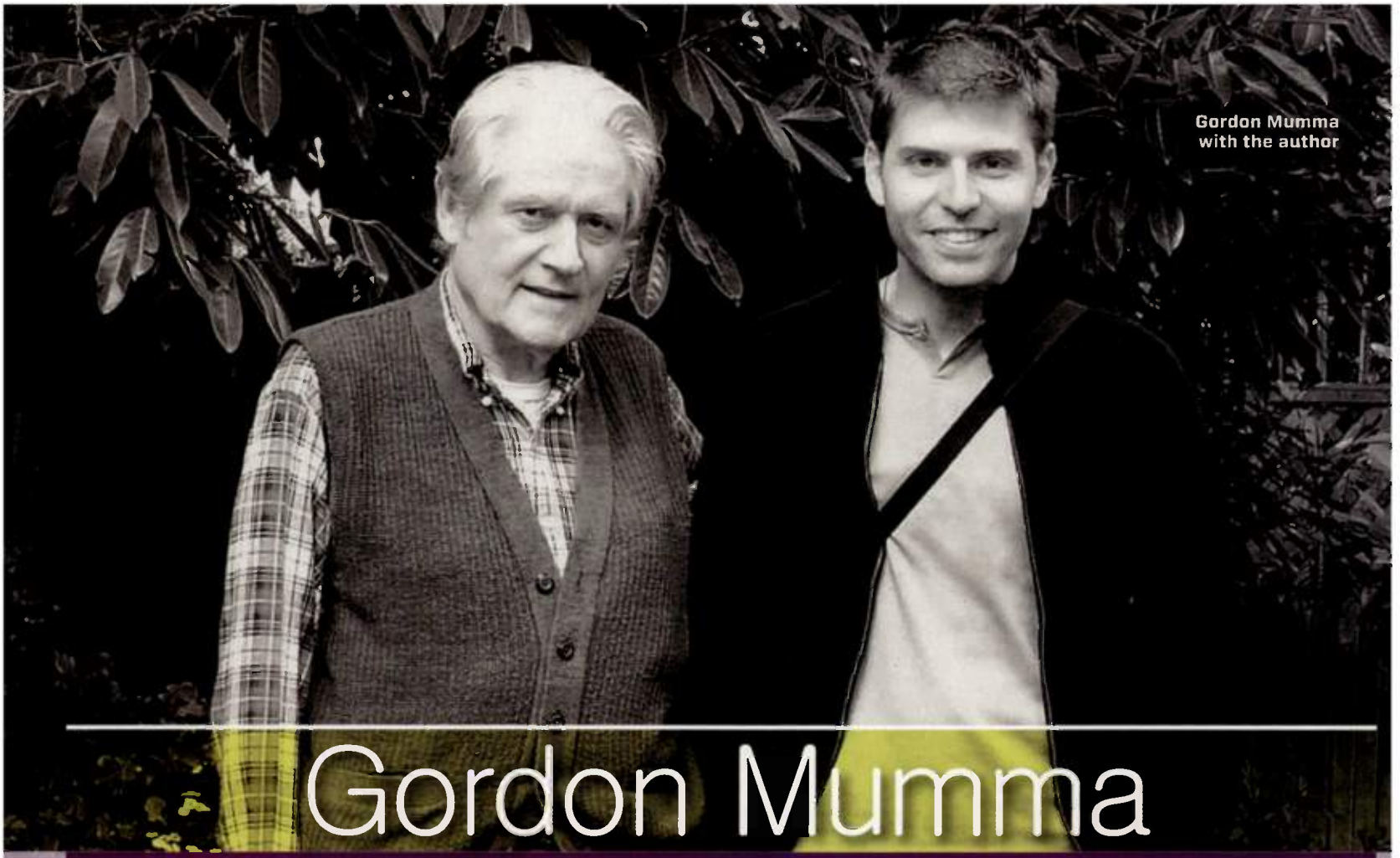
There's a lot of things that people have talked about for years: lyrics in songs and misogyny. I think aside from that, there's lots of behavior that goes on behind closed doors, not just between creatives, but also on the business side. I've seen people talk about other people in ways that they probably wouldn't want quoted. I think that behavior permeates behind the scenes, even if it's not exposed to the public. I think there's a subconscious trickle-down effect of the way that we treat each other, and treat women, inside the industry. We export culture around the world. I think that we need to make sure that the culture is right here at home.

Have you signed a lot of artists yet?

No, only a couple so far. Our main flagship artists so far are Imad Royal and Lizzo. We have some in process that I can't speak about yet.

Is Nice Life Recording Co. associated with a major label?

Yeah, we have a joint venture deal with Atlantic Records, who we love. Yeah, I think that for us, a lot of it comes down to not just the music and the messaging in the music that we put out, but also like how we treat our artists and how we listen to them. We're still small fry at this point, of course, but if one of our artists has like a problem, be it a personal problem or a business problem or a creative thing, there's already a culture in this still small company of like, "Come, sit down, talk to us about it. Tell us how you feel. Tell us what we can do." There's no scoffing. There's not like, "Oh, the artist is being crazy again." We want to work things out, keep everything amicable and stay humble, too. I know that from being an artist. Man, you're the artist, you have to put in so much work, and you feel vulnerable all the time and you feel exposed all the time. It's emotional. There are high highs but there are very low lows. And I just think that as a label it's really important to understand that's what your artists are going through and appreciate and tell them that you appreciate their time and their work and the heart they're putting into this. ■



Gordon Mumma with the author

Gordon Mumma

The American composer, artist, and instrument innovator reflects on a five-decade journey of experimentation in electronic music

GORDON MUMMA may be the most important innovator of electronic music you've never heard of. With any luck, that is changing with the recent publication of his book *Cybersonic Arts: Adventures in American New Music* (University of Illinois Press). Part memoir of a remarkable life at the center of 20th and 21st century American experimental music, and part a collection of Mumma's thoughtful, provocative, and influential essays, the book introduces this pioneer to a new generation of sonic explorers.

While his formative musical experiences were in acoustic chamber music as a classically trained French horn player with an abiding interest in jazz, Mumma first delved into electronic music while studying at the University of Michigan in Ann Arbor. It was there in 1958 that he teamed up with composer/performer Robert Ashley (himself an important pioneer of electronic music, new media art, and experimental opera) to create the Cooperative Studio for Electronic Music in Ann Arbor. The studio was completely independent, using shared equipment and employing a similar do-it-yourself philosophy as the contemporaneous San Francisco Tape Music Center on the West Coast, created by Morton Subotnick, Ramon Sender, and others (a group which, among other accomplishments, commissioned a new electronic musical instrument by a then little-known engineer named Donald Buchla).

Mumma's early work in Ann Arbor inspired him to write a 1964 how-to article for the AES journal that encouraged composers to build their own DIY electronic music studios. This essay is among those reprinted in *Cybersonic Arts*.

With Ashley and others, Mumma created the

Mumma editing a live performance recording at the Cooperative Studio for Electronic Music, Ann Arbor, Mich., 1965.

BY ANDREW RADFORD

Mumma (on reed-horn) and violinist Leroy Jenkins performing "Communication in a Noisy Environment," 1970.

influential Ann Arbor-based avant-garde arts festival known as ONCE; performers at the annual ONCE festivals read like a Who's Who of the American avant-garde: John Cage, David Tudor, Pauline Oliveros, Eric Dolphy, and Morton Feldman, among others.

After leaving Ann Arbor, Mumma became involved with two groundbreaking live-electronic music groups—the Sonic Arts Union (with Ashley, Alvin Lucier, and David Behrman), and the seminal Merce Cunningham Dance Company, with whom he toured, performed, and built many of the custom electronic instruments for from 1965 to 1976.

His mindblowing 1960s and '70s works, most of which used custom-built electronics, include *Hornpipe* (1967) for French horn and live electronics, and *Telepos* (1972) which used telemetry data from moving bodies to affect the electronic sounds produced by his custom instruments. An overview of this period of his work is available on the Tzadik compact disc release *Live Electronic Music*.

Mumma taught for two decades at Mills College in Oakland, Calif. and the University of California at Santa Cruz, before retiring and moving to Victoria, British Columbia, with his wife, musicologist Michelle Fillion, who masterfully edited this new and indispensible collection of Mumma's writings. I spoke with Mumma about his early work, evolution of synthesis, and the future of musical exploration.

Your early background was as a classically trained French horn player who was also interested in jazz. How did you end up becoming interested in electronic music?

I began singing, later playing horn and piano. My musical interests included everything available, particularly live performances of both "classical" music and jazz. The live performance aspect was the major stimulus of my developing as a composer and performer.

In my early years, radio broadcasts were mostly live performances; also disc recordings. But it was the living experience of performing, sometimes solo, but more important performing in ensembles, the ensemble-thrill of interacting with others.

My first connection with electronics was almost the same time as my acoustical instrument activities. Just after World War II, electronic developments were again underway, notably the evolution of transistor technology and magnetic-tape recording. In 1949 at the Interlochen summer music program, I worked with electronic audio-measuring equipment; the acoustician-teacher was Roderick Dean Gordon. Building things to make sound extended from my making a wooden cigar box banjo to soldering transistor oscillator circuits; things that resonate. My first audio recording machine was a magnetic wire recorder, then onto the more flexible magnetic tape recorders. It was what I found available.

You almost exclusively used electronics you built yourself, which was a necessity when you began working in the 1950s, but you did so even after your colleagues such as Bob Moog and Don Buchla were producing commercially-available electronic instruments. Do you believe interesting and groundbreaking work can be made using mass-market hardware and off-the-shelf software?

When Moog, Buchla, and others were active with their 1960s inventions, it was still the transition time from vacuum tube to transistor technology. Transistors made possible smaller-scale physical apparatus and could be powered by batteries if necessary. Because many of the early synthesizers were premised on the classic 12-note keyboard format—no matter how much the sonorities might be altered electronically—they were functioning somewhat as "substitutes" for conventional acoustical instruments. That was commercially positive for Moog's business because it attracted the attention of existing acoustical performers, particularly in the realms of innovative jazz and pop music, such as Sun Ra or Mother Mallard's Portable Masterpiece Co., etc.

It's possible that innovative music can be made with commercially produced equipment, and history shows that some was, but when the primary reason for making music is to fill the easy realms of commerce-products, real musical innovation becomes limited. Exceptions are interesting, such as composers [Louis and] Bebe Barron, who set standards for electronic tape music in the 1956 film *Forbidden Planet*. The early success of such as [Wendy] Carlos's *Switched on Bach*, a clever achievement, really involved only "technical innovation." Carlos substituted a "new instrument"—electronics by Moog—rather than ensembles of kotos (e.g. the 1969 LP release *A New Sound from the Japanese Bach Scene*) or guitars for J.S. Bach's music, originally written for harpsichord or organ. It achieved a useful breakdown of limited definitions of "classical" from "pop" or "vernacular" music.

One of your earliest published pieces of writing was a guide for composers to build their own electronic music studios during a time that it was prohibitively expensive and difficult to do for most artists. How has the recent development of increased access to lower-cost electronics shaped and affected current music?

That article was not initially a "guide for composers," but was intended as a "nourishment for audio engineers." It was requested by Robert Moog for a 1964 Audio Engineering Society journal. That was the "technical aspect" of the article, but it also contributed to blurring the arbitrary definitions that separated composers/performers from electrical engineers. The engineer Bill Ribbens worked with me on new circuit designs in the early 1960s. In 1965, the two of us established a small company we named Cybersonics, for building custom circuits. That was an interaction between a composer and an engineer, a process which later flourished with Experiments in Art and Technology (E.A.T.) after 1967 in New York City.

Over the last half century since that article's publication, and many pirated copies, it has been one of the more nourishing sources of wonderful collaborations like the Composers Inside Electronics, Circuit Benders, and other related activities.

The lowering cost of electronics over the years has made electronic-instrument building much more democratically accessible. This has extended to the easy access of evolving computer technology, such that most of these so-called "high-tech toys" are soon accessible "folk instruments."

You have spoken and written at length about your understanding of electronic music as being part of a folkloric tradition—including in your 1975 essay "Witchcraft, Cybersonics, and Folkloric Virtuosity," which is reprinted in your book. Could you encapsulate how you see these technologies and musics as folkloric practices?

The musics—plural intentional—of the world evolve mostly with the creative activities of the performing musicians—the "folks"—rather than the industrial toy manufacturers. For example, the clarinetist who uses a shoelace for the ligature, the fiddler who designs a special bridge or mute, the drummers who build unique sticks, the double-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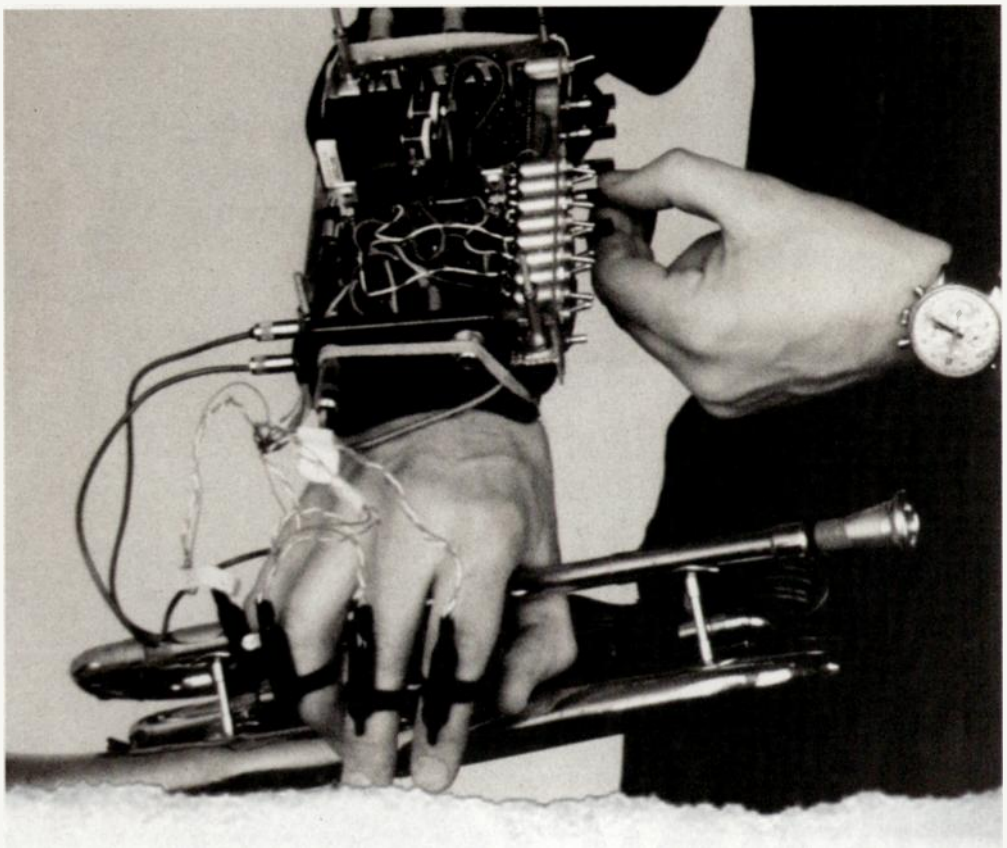


A performer-worn electronic sensor system for Mumma's 1975 work *Ambivex*.

reed players who carve their own reeds, etc.

Throughout your career you have supported, work with, and spread the word about artists from historically under-represented groups, in particular women, African American, and Latin American composer-performers. Do you think the field of electronic music has become more welcoming and diverse?

My interests have always been inclusive and creatively diverse. During the times when I was teaching in academia, I presented the diversity of my past and present historical perspectives, even though it often broke the institutional rules, such as the "conservatory" type definitions of music.

When academic curricular committees had to review and approve of my 20th Century survey class material, I sometimes got objections to including my brief history of jazz. A committee chair argued that "Beethoven didn't play the banjo." When approval was needed for me to include Ruth Crawford Seeger's 1931 *String Quartet*, Johanna Beyer's 1938 *Music of the Spheres*, and Pauline Oliveros' choral 1961 *Sound Patterns*, the question was why I included "chick composers" in a survey of serious music—and those are three 20th-century landmark compositions.

Perhaps the historically diverse cultural activities have become more welcoming to the "field of electronic music" and make fields plural. In the last half of the 20th century, the aggressive commercial (and military) dominance of the United States has had a damping impact on musical innovation south of the equator. These include production restrictions and severe tariffs on imports. Since the aggressive spread of that commerce now includes Japan, China, India, and Europe, there is less resistance by the "under-represented groups."

What is improving is the distribution of participatory information via Internet communications, except of course for government's censure or controlled access to the World Wide Web.

History is moving faster, and the under-represented are flowing to the surface. The work of creative women artists and musicians is now widely available. That diversity appears in the classic educational text books often as much as two generations later.

Your compositional output has always been split between acoustic chamber music and live electronic as well as electroacoustic works. What contributes to your decisions about which sonic resources to use in your work?

I always take advantage of nearby resources. On performance tours in the 1960s and 1970s I obtained my excellent musical saw, a bandoneon, and a violin. These were additions to my acoustical resources while I continued with the electronic components. As for the chamber music aspect, that's always been fundamental to my composing. It may account for half of my music that involves acoustical instruments. Another aspect of my chamber music is that it extended beyond my multiple-piano compositions and involved the diverse skilled instrumentalists available at the various places where I visited or worked. So the shifts in balance between my "acoustic" and "electronic" compositions was influenced primarily by existing resources.

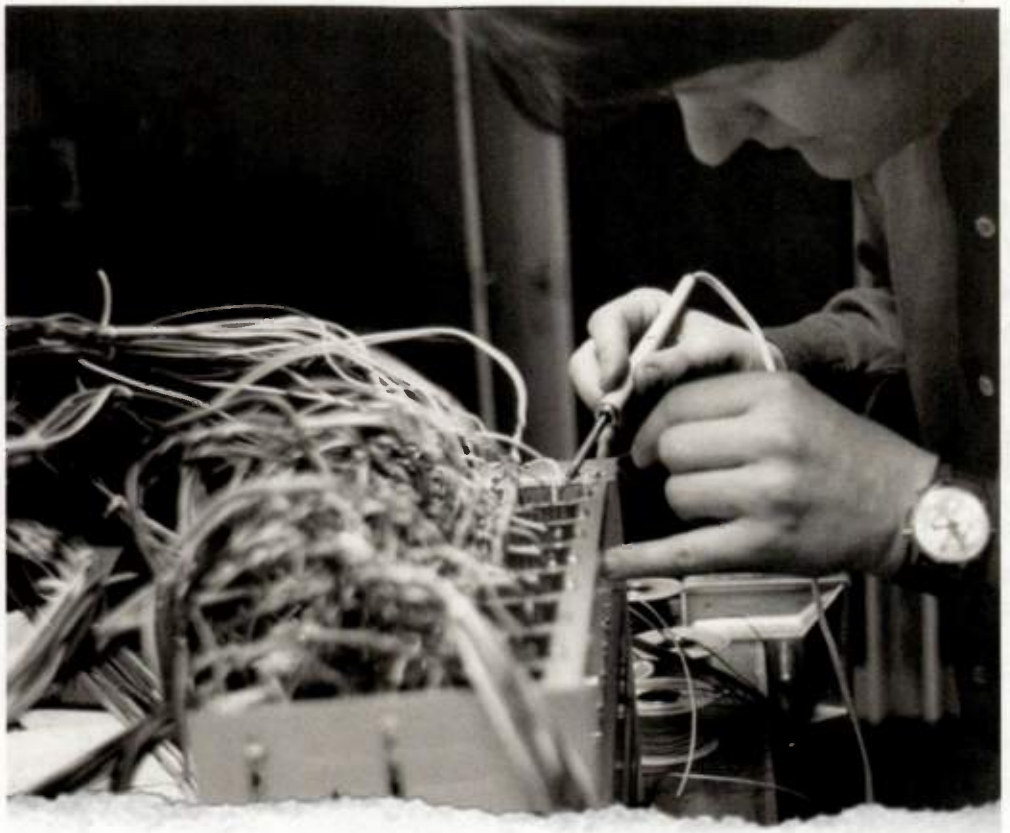
The appearance of so many piano solo works from the 1970s onward includes those from the 1960s into the 21st century. Some of those piano-composition "groups" were put together in the 1980s and 1990s because of requests from pianists, and partly to clean up my old archive storage. From 2000 onward, when the first of my CD recordings appeared, it was possible to issue both older and new piano recordings.

There is a huge resurgence in modular synthesizers, and a few recent modules have been explicitly inspired by you and your contemporaries' work—the Make Noise Erbe-verb, inspired by your 1977 composition *Stressed Space Palindromes*, and the Telharmonic, which has a tuned noise output inspired by James Tenney's *Noise Study* and a Shepard tone generator inspired by Tenney's *For Ann (rising)*, both with DSP coded by Tom Erbe. What do you think about this renewed interest in your generations' work?

Well, your "huge resurgence" is like the ongoing interest in "period instruments," some of which were and still are wonderful sounding. I'm a big period instrument fan, to the extent that I make recordings both with analog magnetic tape and with digital equipment. The sound quality differences are an important part of my musical spectra, and are related to the differences between the analog and digital realm. I'm delighted that others have recognized the special sonority/spatial characteristics of those compositions, and continue with their own explorations.

For my work the word "reverb" isn't sufficient to include all the aspects of "musical space"—the different venue audio characteristics in which music occurs, both indoors and outdoors. My early "spatial" work included the *Music from the Venezia Space Theatre* [1964], but more significant later work included as you mentioned the *Cybersonic Cantilevers* [1973] and *Stressed Space Palindromes* [1976-82].

They went way beyond the recent—and clever—Erbe-verb device, in that those compositions had uniquely different spatial-manipulation processes, both acoustical and electronic. Also part of my "spatial" music is the live electronic *Hornpipe* (1967), which resulted in "live spatial music," as did *Cybersonic Cantilevers*. Those last two works used the existing "analog" realms of real (not synthetic)



Mumma finalizing circuit assembly for his Osaka Pavilion audio processing system, in 1970.

sound spaces.

There's an interesting sub-history of my "spatial" work that connects with that of Luigi Nono, particularly in 1964 when he invited the ONCE Group to the 1964 Venice Biennale to perform our *Space Theatre*. We had extensive discussions about "sound space" then and subsequently during his developing "live sound space" work. The two of us had made a special trip to the Basilica di San Marco, where he told me of his childhood sound experiences with performances of Monteverdi's multiple-space choral music.

What explorations would you like to see in the electronic music of the future?

I don't worry about the future of the arts, including electronic music, except for how political powers interfere with their fears of subversions. I don't really have hopes for the future, though I'm optimistic about an expanding cultural diversity. My term "political power" includes not only pressures from governments but also oppressive religious institutions and war-mongering cultural tribes such as petrified/ossified conservatories. Some of the conservatories—beyond "conserving"—are actually broadening, with more windows open into the present.

I celebrate creative individuals and their nourishing interactions with others. ■

AUDION
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Audion—the carnal machine-funk alter ego of tech-house producer Matthew Dear—has always been presented as the soundtrack to fervent dancefloor foreplay. Audion's sodden, pitch-shifting timbres, balancing between Detroit grit and Euro glint, are as much about circulation as perspiration. *Alpha*, Audion's first full-length in a decade, continues a legacy of vascular basslines, oxygenated white noise, and vacillating melody. Pulse-slaved modular synths dilate as samples pant, teasing parasympathetic response across 13 tracks.
TONY WARE

JENNY HVAL
BLOOD BITCH
SACRED BONES

"*Blood Bitch* is an investigation of blood... the purest and most powerful, yet most trivial, and most terrifying blood: *menstruation*," Jenny Hval states in the liner notes to her latest album, music of placid vocals, deep-space belches, freakish delays, and reverb. Produced by Lasse Marhaug, *Blood Bitch* combines bubbling rhythms and serene synthesizers in arrangements as beautiful/terrifying as a return to the womb. Hval retains her magical vision through it all.
KEN MICALLEF

PETER BJORN AND JOHN
BREAKIN' POINT
INGRID

On the first full-length from the Swedish indie-pop trio in five years, these 12 tracks show PB&J at their creamiest. Working with a committee of outside producers (including Paul Epworth, Greg Kurstin, Emile Haynie, and Pontus Winnberg), the three-piece has gone all-in on meticulous hook-driven radio pop. Gone are frayed choruses and martial percussion, replaced with modern contours of reverb, bouncy compression, and disco-meets-digital consonance. It's tidy but never stiff.
TONY WARE

CAT'S EYES
TREASURE HOUSE
RAF

Cat's Eyes, the project of The Horrors' Faris Badwan and Rachel Zeffira, is an exploration in understated sound. *Treasure House* revolves around subtle strings and spooky organs, turning the focus toward a complimentary vocal volley: Zeffira's soaring chimes and Badwan's smooth rumble. There are a couple of out-of-place songs: the handclap-driven "Be Careful Where You Park" and the strident "Standoff." The rest, however, are quiet and gentle; see the swinging "Drag" and the pulsing "Missing Hour."
LILY MOAYERI

RYLEY WALKER
GOLDEN SINGS THAT HAVE BEEN SUNG
DEAD OCEANS

Expanding beyond the Alice Coltrane-meets-John Martyn splendor of his previous album, *Primrose Green*, folk adventurer Ryley Walker returns with a more concise vision. His exceptional band still navigates serpentine melodic lines and harrowing arrangements, but Walker's songs are more succinct, his vocals better formed, the music's urgency more palatable. Produced by frequent Wilco multi-instrumentalist LeRoy Bach, *Golden Sings* blazes spiritual folk trails even Robert Plant could love.
KEN MICALLEF

JOHN DOE
THE WESTERNER
COOL ROCK/THIRTY TIGERS

The Westerner, the latest from punk legend John Doe, begins with a psychedelic train song called "Get on Board." And he only needs to ask once. *Westerner* fascinates with its lush roots arrangements, weird keyboards, and guitar-noir. The soaring beauty of Doe's voice is unmatched, and this particular collection of dreamy rockers and ballads are poetic in their lyric simplicity. There's even a bonus gift of punk treasure: Debbie Harry duets with Doe on "Go Baby Go."
BARBARA SCHULTZ

TOURIST
U
MONDAY

London-based producer William Phillips—a cowriter of Sam Smith's Grammy-winning "Stay With Me"—is a self-taught sound designer who transitioned from posting chopped 'n pitched indie-pop edits to sequencing fine-grained Balearic tracks throbbing with fluid melodies. His cathartic debut album focuses on the haunting longing of dubstep's treated vocals, a steam-valve swing hinting at two-step garage's pressurized insistency, and the resonant affectations of gently wobbling deep house bangers.
TONY WARE

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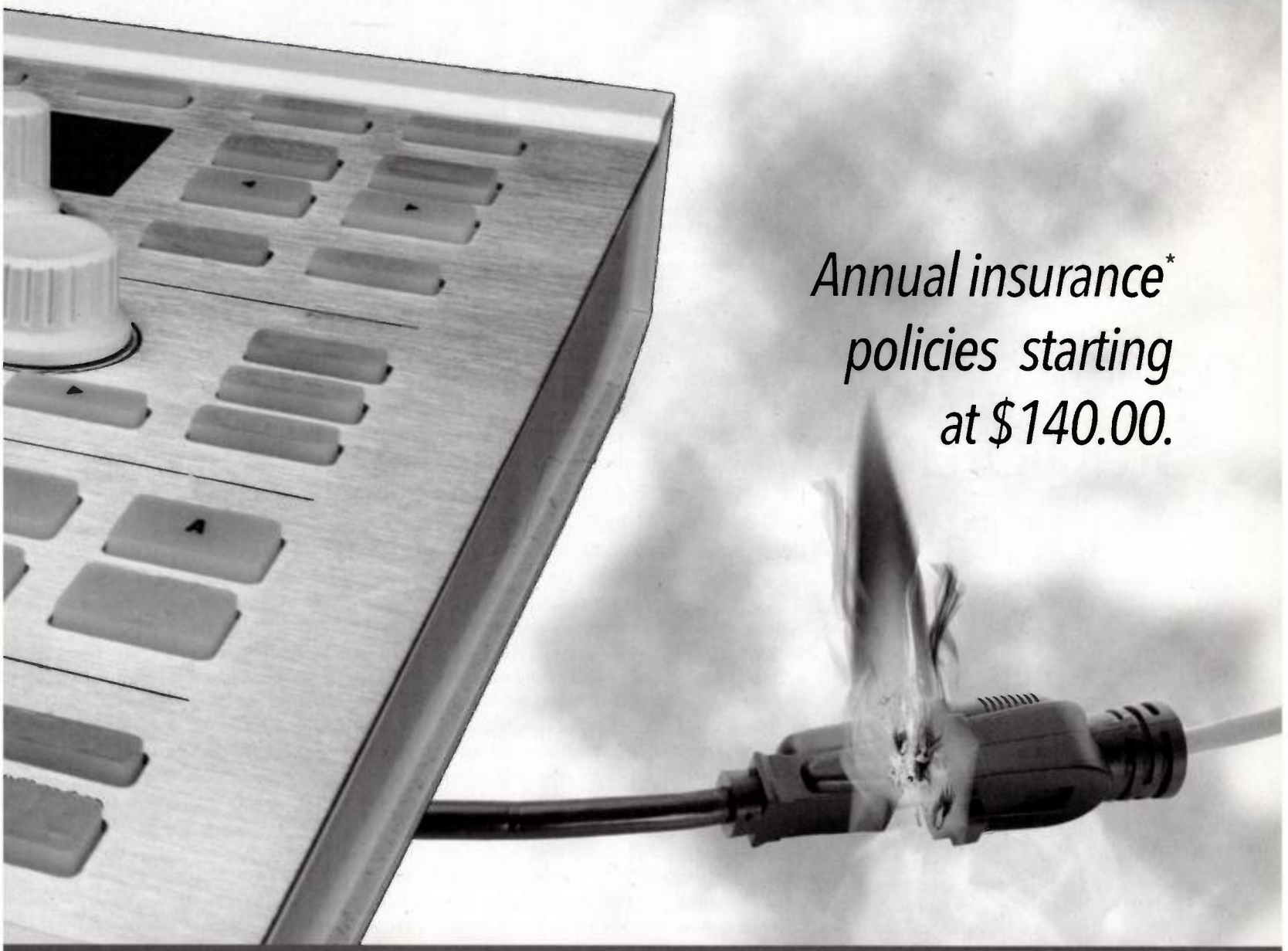

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Left: Features such as the three-function touchpad, arpeggiator and multifunction pads make the nanoKey Studio a deceptively versatile compact keyboard. Right: The nanoKontrol Studio combines a solid mixing surface with built-in DAW control and five Scene memories.

KORG

nanoKontrol Studio and nanoKey Studio

GOOD THINGS IN SMALL PACKAGES

BY MARKKUS ROVITO

STRENGTHS

Wireless Bluetooth MIDI. Multiple Scene memories. Backlit keys and buttons. Built-in control modes for eight DAWs (nanoKontrol). Chord Pad, Easy Scale functions (nanoKey).

LIMITATIONS

If plugged into USB, batteries drain when using Bluetooth. No clip-launching ability in Ableton Live (nanoKontrol Studio).

each product: $149 street
korg.com

MIDI controllers have always appealed to computer musicians, and we are always stoked when new innovations come along. Yet every few years, there seems to be a period of controller stagnation, where we see just rehash after rehash, me-too product after me-too product. But with Korg's two new releases—the nanoKontrol Studio and the nanoKey Studio—there is reason again to perk up about portable MIDI controllers.

The two models are blown up versions of the Korg nanoKey2 and nanoKontrol2, yet they remain portable, weigh about a pound each, and take up less surface area than a sheet of paper. Moreover, they have impressive feature sets for such compact controllers: They connect to Mac/Windows desktops and iOS mobile devices over a powered USB connection or via wireless Bluetooth MIDI using two AAA batteries for power. If you power the controllers with USB, you can still use the wireless MIDI. However, if batteries are installed, they will drain when you are in wireless mode whether the USB port is connected or not.

These Korg controllers are not race-to-the-bottom budget commodities either; you get what you pay for with these little dynamos. And although they do not have tank-like metal construction, they are by no means flimsy. They are made mostly of plastic with rubberized pads and buttons, so you'll want to treat them with care. Moreover, they are not universal connection hubs with DIN MIDI ports and CV/Gate jacks, like we've seen in other recent products. The Bluetooth MIDI comes in very handy, but the only hardware connection is a Micro USB port.

TAKE KONTROL, PLEASE

It can be surprisingly difficult these days to find a "MIDI mixer" that meets your needs, and even tougher to find a really portable one. The nanoKontrol2 is good for a tiny, barebones option at an afterthought price. The nanoKontrol Studio, on the other hand, fills an awfully sweet spot between small size and proper MIDI mixing features.

The eight channel strips have short-throw volume faders, panning knobs and buttons for track select, record, solo, and mute. There is a jog/shuttle wheel below the transport controls, as well as buttons for setting and navigating markers. The Cycle button is meant to toggle overdub or "cycle" recording mode—great for tapping in beats on a drum track.

As a nice bonus, the Scene button cycles through five control Scenes indicated by LEDs. To set up Scenes, you need the free Kontrol Editor software, where you can customize more than 50 MIDI CC, Note, Channel, and other values for each of the Scenes (see Figure 1). In this way you can setup the nanoKontrol Studio to work with your DAW, as well as several plug-ins with a simple Scene change.

But that's not all. The nanoKontrol Studio offers preconfigured DAW Mixer Control modes for Steinberg Cubase, MOTU Digital Performer, Apple GarageBand and Logic, Ableton Live, Avid Pro Tools, Cakewalk Sonar, and PreSonus Studio One. To launch a DAW Control mode, you simply need to power up the device while holding a particular two-key combination for each DAW. The excep-

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Fig. 1. From the Kontrol Editor software you can program the different Scene memories for each controller, as well as configure global settings such as auto power-off.

tions are GarageBand and Logic, which require that you install a free plug-in, first.

I mainly tested the Ableton Live control mode and it worked great. It uses the Mackie Control protocol and, with it, all the mixing functions of the controller worked flawlessly, including setting and navigating markers, and scrolling through track sets to mix more than eight tracks per session. The 4x8 grid of buttons in the channel strip section of the nanoKontrol Studio cries out to have some kind of clip-launching mode for Live's Session view, but maybe that will happen sometime down the line with an upgrade.

A KEY DIFFERENCE

The nanoKey Studio has several tricks up its sleeve that people familiar with the Korg Taktile controllers should recognize. These include a lot of more-than-meets-the-eye functionality that's accessible from mode buttons.

For example, the touchpad has three modes: pitch/modulation benders when playing notes; a Kaoss-style x/y pad for handling two MIDI parameters in tandem; and Touch Scale, where the touchpad plays two octaves of notes in a selected scale and key. You set the scale and key by holding Shift and using the Octave ± buttons (key) and the labeled Scale-/Scale+ pads. Yes, the pads pull double or triple duty along with the mode buttons.

With the Arp mode buttons, the labeled pads select the arpeggiator type, range, and gate. This is a powerful arpeggiator with 15 rhythms and six direction types. The Chord Pad mode lets you play eight chords from the pads, also within the selected scale and key. You can use Chord Pad on its own or with the arpeggiator. When you enter your own notes, the Easy Scale button illuminates only the keys to play in order to stay in tune with the selected scale and key.

All of these features go a long way to help you play and record good material with the nanoKey Studio: Even more so than on the Taktile keyboard, these helper functions allow you to get the most out of the controller, because the nanoKey Studio's 25 velocity-sensitive, button-style keys are very efficient for a product of this size, though they don't make for the best playing experience. Their action feels a bit loose to me, and players of all skill levels will probably find them more difficult to play than full-size keys or even the minikeys on something like the MicroKorg synth.

The nanoKey Studio's eight pads are smaller than average, but are not too small to use. They have a good feel as well—firm, but not too much so. The only time they come up a bit short is when trying to play rapid patterns with two fingers on the same pad. In some of these cases, they are not as responsive and accurate as those on Korg's excellent PadKontrol.

But sacrifices have to be made when creating such a compact unit, and the nanoKey Studio's added features under the hood make up for it. This model also has eight Scene memories that you can program using the Kontrol Editor software. And both controllers can make further use of the Kontrol Editor program for global features such as battery management. You can set them to power off automatically when using battery power after 30 minutes, or one,

two, or four hours. I recommend using this feature; the two AAA alkaline Duracell batteries I tested lasted for about eight hours of controller time.

NANO + NANO. THAT'S A PLANNO

Many users will likely buy one or the other nano Studio units, but they make a great team if you're so inclined. Their functions complement each other, they don't take up much space, and with Bluetooth MIDI, you don't need to worry about running out of USB ports or having a powered hub at the ready. In general, the Bluetooth MIDI worked quite well. After pairing, the latency was mostly negligible. Occasionally after some amount of time, the latency would increase, but shutting down and reconnecting the units cleared that up.

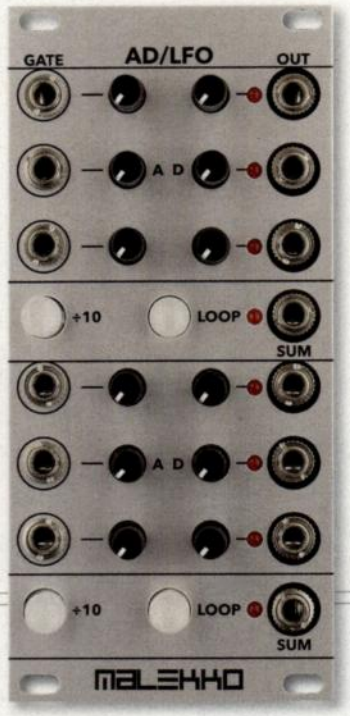
Each controller also comes with a useful software bundle that includes the Korg M1 Le, three modeling instruments from Applied Acoustic Systems and the UVI Digital Synsations sampled synths from the '80s. Technically speaking, Korg's Gadget Le workstation and Module Le sound-module iOS apps are also in the bundle, but they are already free for anyone who wants them. The advantage here is that they are designed to work well with the nanoKey Studio and the nanoKontrol Studio. Both of these little guys, along with Gadget Le and your other iPad apps, make for a really fun and low-weight, low-volume mini-studio for mobile adventures. And I guarantee you will have more than a *nano* bit of fun using them! ■

Setting up the nanoKontrol Studio for DJ mixing

BY FRANCIS PREVE

For years, I used the original Korg nanoKontrol as a four-channel Ableton controller for my laptop DJ gigs. While its eight faders and knobs imply using it in a specific manner, grouping each channel as a dual-fader-and-knob configuration is the key.

In Ableton, I set up every mixer channel to include volume, lowpass and highpass filters, and a tempo-synced delay (the Fade To Grey preset is a great choice for club-ready delay effects, incidentally). On the nanoKontrol, I set up the controls as follows: Fader 1 to volume and knob 1 to delay/echo. For the filters, I assigned fader 2 to highpass cutoff (ergonomically, using a fader for highpass just feels more intuitive to me), while the knob above it controls the lowpass cutoff. By chunking the mixer into four channel groups instead of eight, you can squeeze a lot of control into a miniscule footprint, which is exactly what the nano series was designed to do.



The DSP-based AD/LFO is a 6-channel envelope generator that can be configured into two sets of three LFOs. A combined signal of each set of three CV outputs is available at the Sum output jacks.

MALEKKO

AD/LFO

Six independent channels of modulation in a 12HP panel

BY GINO ROBAIR

No matter how many modules you have in your system, it seems like you can never have too many control signals. The DSP-based Malekko AD/LFO ($249) addresses this conundrum by placing six channels of 2-stage envelopes within a relatively narrow Eurorack panel. (In collaboration with LZX Industries, Malekko also offers the AD/LFO-V [$249], with 1V-scaled outputs that are optimized for use with modular video-synthesis systems.)

Each channel of the AD/LFO has a Gate input, a CV output with a 0 to +10V range, and knobs for setting the length of the attack and decay portions of the envelope (with an LED for visual reference). Although the Gate input accepts anything above 0.5V, the envelopes do not wait for a gate signal to end before the decay portion is triggered; the initiation of the decay depends on the attack setting.

The module's six channels are grouped in threes, with a summed output below each group. This lets you set three discrete envelope shapes and have a separate output with a mix of them at the same time. You can also trigger all three envelopes at once with a single gate or pulse patches into the top Gate input as long as nothing else is plugged into the lower two inputs.

The envelope cycles range from 24 ms to 2.9 seconds, though you can slow each group of envelopes down by using the associated divide-by-ten button: This results is an A/D cycle time ranging from 238 ms to 29 seconds. (Once I got a taste of the slow speed, I immediately wanted a divide-by-100 button!) Each section also includes a Loop button that turns its three envelopes into simple LFOs, with the A and D controls determining the frequency in both fast and slow mode.

The first thing I did after installing the AD/LFO was patch separate signals into the Gate inputs while altering the order or timing between the input signals with a gate delay, to create a complex function generator from the Sum output. But things got really interesting when I introduced sequencing, particularly something with shuffling capabilities—for example, the chaotic outputs of the Epoch Modular Benjolin, a Doepfer A-149-1 RCV Quantized/Stored Random Voltages module (with the A-149-2 Digital Random Voltage extension for 8 randomly generated triggers), or Melekko's outstanding Varigate 4 ($229). (Read the Mod Squad review at emusician.com/varigate4.) The AD/LFO is also a handy module when integrating control signals from your DAW using the Expert Sleepers Silent Way plug-in suite and the company's ES-series Eurorack-based interface modules (read a review at emusician.com/ExpertSleepersSilentWay).

In non-looping mode, I patched the Sum output of the top section into the first Gate input of the lower section to create slowly evolving textures with the six asynchronous envelopes. This sounded fantastic when modulating the Morph inputs on the Synthesis Technology E350 Morphing Terrarium while adding related modulation from the AD/LFO's lower Sum output to a bandpass filter.

Overall, the Malekko AD/LFO requires little rack space, yet provides a surprising amount of functionality while remaining simple enough to use onstage, especially within an improvisational patching environment. ■

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REVIEW

The Radial Tonebone Mix-Blender is a multipurpose utility pedal that can be used with instrument- and line-level sources.

RADIAL ENGINEERING

Tonebone Mix-Blender

A UTILITY PEDAL FOR MIXING AND PARALLEL EFFECTS PROCESSING

BY BARRY CLEVELAND

Barry Cleveland is a San Francisco-based journalist, guitarist, composer, recording artist, and audio engineer. Learn more at barrycleveland.com.

STRENGTHS

Highly versatile. Rugged construction. Superb performance. Excellent value.

LIMITATIONS

None that I encountered.

$169 street
tonebone.com

The Radial product line includes scores of switchers, splitters, boosters, buffers, preamps, DIs, interfaces, and hum and buzz eliminators, as well as a number of effects pedals. The Tonebone line alone features more than two dozen devices. Although most of these products are intended for general usage, a significant number of them were designed either to aid musicians and engineers tackle specific problems for which there were previously no solutions, or to facilitate new creative possibilities.

At first glance, the Mix-Blender appears to be little more than a 2x1 mixer with 1/4" inputs and outputs. Such a device could be useful if, say, you perform with two guitars and one amp and don't want to have to connect and disconnect guitars—especially if they have different output levels and you also have to adjust controls on the amp to compensate. Plug them both into the Mix-Blender, adjust the Level controls, and you're set. And because those inputs accommodate instrument- and line-level signals, you can do the same with bass, keyboards, and many other instruments.

If your acoustic guitar has both piezo and magnetic pickups (or a high-impedance microphone) with separate outputs, the Mix-Blender can combine them into a single feed to an amp or mixer.

A professional-grade box that mixes the signals from two instruments or pickups into a single-output signal without sucking tone, adding appreciable noise, being a hum and buzz magnet, or introducing other audio bugaboos for $160 is already a decent deal, especially given the Mix-Blender's discrete Class A circuitry, 14-gauge steel construction, and heavy-duty hardware—but that's only half the story.

Mixing two signals down to one also comes in handy when you want to route both through the same effects chain, which brings us to the Mix-Blender's ingenious effects loop section. Unlike a typical "loop switcher" that simply allows you to isolate a pedal and switch it in and out of a signal chain, Mix-Blender has a Blend control that lets you retain the original sound while adding the desired amount of processed sound.

This creates *lots* of possibilities: When I put a compressor pedal in the loop and used the Blend control to dial in the right amount of squashed signal, it amounted to de facto parallel compression. And I got great results blending a clean guitar tone with a nasty-sounding old Big Muff. Inserting an auto-wah, a ring modulator, a harmony pedal, a synth pedal, and even a volume pedal (as a variable boost) also yielded cool sounds. The footswitch lets you instantly engage or disengage the effects loop.

Additionally, the polarity switch inverts the phase of the loop signal, which is important because, if the polarity of your pedal's output signal is opposite that of the dry signal, it can seriously compromise the sound, and there is no consistent polarity standard among manufacturers. Moreover, the effects loop's Send jack may be used to feed a tuner—it is always active—and the Return jack can be used as a third mixer input, with the Blend control serving as its level control.

I tested Mix-Blender using several different guitars, a bass, a synth module, and effects pedals from vintage tone suckers to modern boutique boxes with true-bypass switching; in all cases it performed admirably. Mix-Blender does its job flawlessly and is built to last. What more could you ask for? ■

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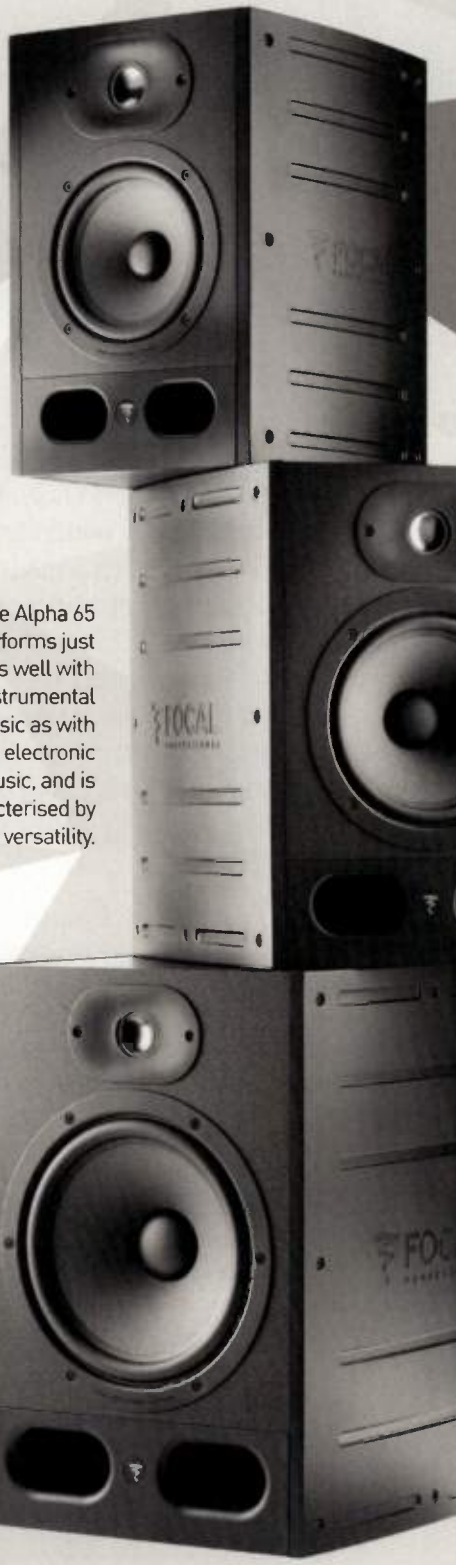

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The G5n combines a broad range of effects with intuitive operation.

ZOOM

G5n

GUITAR-EFFECTS PROCESSOR WITH A COMPREHENSIVE FEATURE SET

BY MIKE LEVINE

Mike Levine is a multi-instrumentalist, composer, and mixer from the New York area. Visit his website at michaelwilliamlevine.com.

STRENGTHS

Huge range of effects, many with excellent sound. Easy to navigate. Stable tuner. USB interface. Librarian software. Onboard parameter controls. 200 rewritable preset slots.

LIMITATIONS

No effects loop. No MIDI. Interface limited to 44.1 kHz. Unable to change effects or adjust parameters when connected to a computer. No case.

$299
zoom-na.com

The G5n is Zoom's new flagship multi-effects processor for guitar, and it includes a host of modern conveniences such as a USB interface, a looper, and the ability to trigger onboard drum loops (68 are provided). The I/O is relatively straightforward—a mono 1/4" input, stereo 1/4" outputs, a 1/4" control input, and mini jacks for headphones and the Aux input (see Figure 1). However, there is no effects loop or MIDI ports (for using MIDI control pedals) on the unit.

The top panel has four modules, each with an on/off footswitch and indicator, LCD, and four parameter knobs. There is also a master LCD (the Overview Display) with navigation controls for adjusting global settings, a Master Level knob, and the Output Boost and Tone knobs. At the bottom are five footswitches that control basic functions such as the excellent and stable Tuner, Bank, and Preset scrolling; Tap Tempo; and switching between Memory mode and Stomp mode.

The built-in expression pedal can function in a variety of ways, including wah, volume, or controlling selected parameters: It is much simpler than the Z-Pedal from the unit's predecessor, the G5, which could control several parameters at once. But unlike the G5, the G5n has no built-in 12AX7 tube. Rather, it has an Output Booster that is designed to add tube-like qualities. (More on that in a moment.)

The G5n does not come with a case, nor could I find one for sale on the Zoom website. Gigging guitarists will have to search for a third-party solution.

THE LINEUP

The G5n offers 78 effects, including 68 DSP effects, five amp models, and five cabinet models. The DSP effects cover all the major categories, and some emulate renowned stompboxes—Seq-FLTR is based on the Z-Vex Seek Wah, TS Drive on the TS808, and MetalWRLD on the Boss Metal Zone.

The amp models include emulations of a Fender Twin Reverb, Marshall JCM800, Vox

Fig. 1. The rear panel shows the G5n's I/O, which gives you what you need to use the unit, but no effects loop or MIDI ports.

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AC-30, Mesa/Boogie Mark III, and the Bogner Ecstasy Blue channel. Matching cabinets are provided and count as separate effects. The upshot is that you can mix and match them; the downside is that you have to use two effects slots—one for the amp and another for the cabinet.

Also included in the effects lineup are stereo and mono loopers, which provide up to 80 seconds in mono, 40 seconds for stereo. One useful feature is the ability to create set-length loops (1 bar, 2 bars, etc.), which makes it easy to record perfectly in time. Of course, you need a tempo reference, which is where the unit's built-in drum loops come in handy. The drums sound decent, and they give you a count-in when you press record for the first pass of a loop.

The USB port can be connected to a Mac or PC to allow the G5n to function as an audio interface for recording in mono or stereo. You can adjust the balance between the direct sound from the pedal and the sound returning from your DAW, as you would with the mix feature on many budget interfaces. However, when it is connected to a computer, the G5n automatically goes into PC Mode, which hides all the details in the displays on the unit and essentially freezes it at its current setup. To change settings, you must remove the cable, adjust the unit, and then connect it again. The unit offers 16-bit audio and a sampling rate of 44.1 kHz.

Once connected to a computer, you can access the free Zoom Guitar Lab librarian software, which lets you rearrange your presets and load new effects that Zoom posts to its online collection, free (see Figure. 2). When I first opened the software, I found six new effects available, including an amp model based on a '59 Fender Bassman, as well as NYC Muff, modeled after the Electro-Harmonix Big Muff Pi. I don't know how often new items are posted, but later in the same week I found that another batch of effects had been added, including an amp model based on a Hiwatt.

The software librarian also lets you rearrange your patches and perform backups. Inexplicably, it doesn't offer editing capabilities (the G5's software did). That's too bad, because it is useful to be able to program patches onscreen.

EASY NOW

Overall, however, the G5n has an intuitive architecture. In Memory Mode you see four presets, one in each of the modules. Pressing the left or right arrow will take you to adjacent presets, so you can scroll through the collection relatively quickly.

Press the Memory/Stomp pedal to enter Stomp mode, where each of the four modules shows an effect from the preset. The effects that are visible can be edited using the parameter knobs. The scroll pedals let you change which effects are visible for editing. Since you can have up to nine simultaneous effects in a preset, that is an essential feature.

Not only does each module display the name of one of the effects in the chain (if it is empty, you get a blank line), but you also see the entire effects chain in the global Overview display. You can use the associated controls to change the order of the effects, as well as access preferences and settings.

When in Stomp mode, the up and down buttons at the top of each module let you replace effects currently in the chain, or add effects to modules that are empty. Although, technically, you can have up to nine effects, you are also limited by the available processing power. If you try to load an effect that pushes you over the limit, you get an error message. The unit comes with 200 rewritable preset slots, 100 of which contain factory presets, with the other 100 blank.

For live playing, I programmed several basic presets, each offering effects for different types of songs, and then saved them adjacent to each other. I was then able to switch between them easily. And once inside a preset in Stomp mode, I could reach down to adjust individual effects. Although adjusting the G5n may not be as easy as tweaking individual stompboxes in a pedalboard, it brings you closer to that experience than many menu-heavy multi-effects units do.

ZOOMING IN ON THE SOUND

Overall, I was impressed with the sound quality of the G5n. Many of the effects sound as good as what you'd get from a stompbox, and you have a lot of choices. I particularly liked the modulation effects. The reverbs and delays are quite nice, too. The pitch effects are useful, especially the Octave effect, which sounds fantastic. The weakest, for me, are the distortion and overdrive effects, which are a mixed bag.

The amp models allow you to really change up your tone (including adding gain), even when playing through an real amp. Though most aren't dead-on emulations, they imbue your sound with the vibe of the amps they're emulating, to a greater or lesser degree. The Tube Booster circuit definitely helps fatten up the sound and gives it a little extra gain. I ended up leaving it turned up most of the time.

ZOOMING OUT

Although some of my favorite features from the G5 have gone missing, the G5n is a powerful unit that includes virtually any type of effect you'd ever want. It's easy to navigate on a gig and allows you to customize your sounds to match your repertoire in a way that would be very difficult with stompboxes alone.

The USB interface is limited, and I doubt most people would want it as their only one; but having the USB connectivity is very useful for downloading new effects, and reorganizing and backing up patches. An editor section in Zoom Guitar Lab would be a helpful addition. Nonetheless, priced just below $300, the G5n is a great value and a powerful tool. ■

Fig. 2. The Guitar Lab software offers librarian functionality and it's the place to find newly released effects and amp models from Zoom.

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ELECTRO-HARMONIX

Mel9

ADD CLASSIC MELLOTRON SOUNDS TO YOUR PEDALBOARD

BY GINO ROBAIR

Gino Robair is *EM*'s technical editor, and the editor of *Keyboard* magazine.

STRENGTHS
Tracks well. Attack and Sustain controls. Strong output. Sounds convincing if played idiomatically.

LIMITATIONS
Nothing significant.

$295
ehx.com

Following the lead of its B9, C9, and Key9 emulator pedals, Electro-Harmonix has released the Mel9, which tackles the recognizable, yet quirky, sounds of the most famous tape-replay keyboard, the Mellotron. As with the other pedals, the Mel9 offers nine presets—in this case Orchestra, Cello, Strings, Flute, Clarinet, Saxophone, Brass, Low Choir, and High Choir—and includes separate Dry and Effect outputs, the latter with individual Wet and Dry knobs to create a blend.

The pedal's other knobs—Attack and Sustain—provide control over a preset's envelope. Sustain, however, sounds more like a combination of an AD-SR's release parameter combined with reverb/delay, depending on the instrument. Nonetheless, the ability to alter a preset's envelope lets you increase the realism of each instrument, with one exception: Turning up the Attack control for the Brass preset creates a filtered reverse envelope, as if it were played backwards—very cool! The Sustain control supposedly adds modeled "lip buzz," but I couldn't detect any change when moving the knob.

There also seems to be a compressor circuit on the Mel9's input, which provides a very long sustain, particularly from a guitar's lower strings, which have more energy than the higher ones. More than once, I thought my guitar was feeding back because the note just kept going. And it was a blast playing the Cello, Orchestra, or Sax presets on the low strings with this kind of sustain; a full, complex sound and no Ebow required!

To nail the unique qualities of the original instruments, play idiomatic parts in the proper register of the guitar. For example, the Flute preset sounds wonderful when your melody or chords are in the middle of the neck on the B and E strings, especially with increased Attack and Sustain settings. To make Mellotron sounds even more convincing, put a volume pedal in front of the Mel9 and a delay or reverb pedal after it.

On the original Mellotron, there was often little consistency from one note to another, because each was an individual performance. The Mel9 doesn't have this issue, but you *will* notice a different artifact: audible looping, as if there is LFO modulation or a short sample being repeated. On Cello and Flute, it resembles vibrato; on other presets, it has a more pulsating quality. The trick is to find the best register on your guitar and to play in a way where these rhythmic elements sound natural.

But whether you play melodically or arpeggiate chords, you'll need to articulate the notes as cleanly as possible because the Mel9 is very sensitive: Any errant sound you make when finishing a note (or if one of the strings is unintentionally ringing) will trigger the synth engine.

Electro-Harmonix has done a remarkable job of capturing the Mellotron vibe, complete with the subtle pitch variations. Of the four Electro-Harmonix keyboard-emulation pedals, Mel9 is hands-down my favorite. The preset timbres are clearer and they give you plenty of tones to work with, depending on which register you use; especially if you're not worried about mimicking a Mellotron. And, of course, you can rock Led Zeppelin's "Kashmir" convincingly using the Orchestra preset in DADGAD when you need to.

The Orchestra, Cello, and reversed Brass sounds, alone, are well worth adding Mel9 to any rig. The Mel9's got Mellotron when you want it, but don't let that stop you from getting creative with it. ■

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With Chromaphone 2, you can run the resonators in series or parallel and integrate filtering and effects as needed.

Chroma-phone 2

A GREAT SOUNDING, EASY-TO-USE PHYSICAL MODELING INSTRUMENT

BY MARTY CUTLER

Chromaphone represents a fairly recent entry in Applied Acoustic Systems' (AAS) stable, having been released less than three years ago. The Version 2 update keeps with the consistent user interface design of AAS' other virtual instruments, but the new GUI is only a small facet of the instrument's redesign. Chromaphone 2 works as a standalone instrument on Mac and Windows computers, and supports AAX, AU, RTAS, and VST formats.

Chromaphone 2's GUI divides into three main pages: Play, Edit, and Effects. Play features basic effects and performance parameters such as clock-sync and vibrato settings, and an arpeggiator, which is new. At first glance, the arpeggiator may seem bland, until you discover that you can edit which notes play in the strip at the bottom of the page. Still, I wish note durations for the arpeggiator were more flexible rather than uniform values across the board.

Though version 1 was called a percussion synthesizer, Chromaphone 2 is labeled an "acoustic object synthesizer" with added string modeling and additive synthesis capabilities. You can mix the output of the resonators and weight the balance positively or inversely by following keyboard position. Chromaphone 2 provides basic subtractive synthesizer parameters—filters, an LFO, and an envelope generator—and these are behind many of the synth-like pads, washes, and sweeps.

With Version 2 comes the new Drumhead resonator, and a quick trip to the kits and kit-piece banks shows its effectiveness. The kicks sound deep and authentic, or depending on other parameters, as synthetic as you please. Many of the snares have a slightly pronounced and more authentic-sounding metallic ring and acoustic snap, compared to the snares using the Membrane or Plate resonators from Chromaphone 1. A lot of great drum sounds were created by combining Drumhead with other resonators, usually Plate and Membrane or Hollow tube.

A/B comparisons between factory presets of the two software versions revealed that Chromaphone 2 sounds brighter, with a bit more high-frequency detail overall, but I couldn't tell precisely why. Although the instrument's engine has not been overhauled, the effects have, and the addition of an equalizer to the instrument might have something to do with it.

The mallet sounds are very versatile, ranging from woody and warm marimbas to bright, cool-sounding vibes, and on into exotic-sounding hybrid instruments with unusual, coruscating, acoustic halos. (Think Magic Piano from the Korg M1.) Thankfully, Chromaphone 2 is backward-compatible with Chromaphone 1 patches, and I was able to quickly load my own work along with Martin Walker's marvelous KitNetix banks. Many of Chromaphone's percussive instruments cry out for microtonal tunings, and Version 2 adds support for Scala tunings, which loaded in without a hitch.

Chromaphone 2 is another of Applied Acoustic's great sorties into physical modeling. The streamlined user interface invites experimentation, all while providing authentic-sounding percussion instruments. The interface illustrates how acoustic properties are generated, making it an excellent resource for teachers. I heartily suggest that you download the fully functional demo of the program at the AAS Web site. ■

Among Marty Cutler's current projects are the Fiscal-Modeling Synthesizer, the Paramedic Equalizer, the Lopez Filter, and the Orthopedic Hat.

STRENGTHS

Easy to understand interface. Drumhead resonator. Effects. Arpeggiator. Support for Scala tunings.

LIMITATIONS

Nothing significant.

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Computer Music (January 2011)

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Soaring with UVI Falcon

Get hands-on with a remarkably versatile soft synth

BY GEARY YELTON

Geary Yelton has been programming synthesizers for 40 years and writing for *Electronic Musician* for more than 30 years.

Since its release late last October, UVI's flagship virtual instrument has gradually gained an enthusiastic following. Falcon's dizzying wealth of creative possibilities is an open invitation to explore and discover new ways to program and manipulate audio samples and algorithmic timbres. Although Falcon is an extremely capable synthesizer, its user interface is so complex and unlike other soft synths that it can be difficult to wrap your head around. Despite UVI's helpful series of fast-paced online tutorial videos, you could easily become intimidated trying to accomplish even the most basic programming tasks.

As much as any synth, Falcon is a timbre-construction kit for designing finely detailed original sounds. As with any construction kit, the best way to learn your way around is to get your hands dirty building things. In this tutorial, I'll walk you through some of the basics while pointing you toward some of Falcon's more advanced features. So let's dive in and start learning, shall we?

ORIENTATION CLASS

A Falcon multi contains one or more parts listed in the left sidebar. Each part contains a single program, and a multi may contain any number of parts. The right sidebar is the browser, where you can find and select soundbanks, factory programs, oscillators, effects, event processors, and modulators—all the various elements in Falcon's virtual box of spare parts.

What appears in the center panel depends on which buttons and tabs you click in the panel's upper area. You'll spend most of your time in Edit view, accessed by clicking on the Main button and the Edit tab (see Fig. 1). Edit view displays the parameters for the currently selected program in a top-down hierarchy of editors. Editors are stacked in levels, like a layer cake, and you can reveal parameter controls by clicking on buttons at the top-center and on triangles on the left of each level, very much like opening folders within folders. The Program, Layer, Keygroup, Oscillator, and Mapping Editors each serve specific functions within the hierarchy. The Modulation Editor at the bottom of Edit view connects to any and all of them.

Fig. 1. Because Falcon is so flexible, it can be challenging to figure out what goes where in its complex top-down hierarchy.

BUILD A CUSTOM SYNTH TEMPLATE

Many synthesizers supply an initialized program or template you can use as a starting point for building your own programs from scratch. A template with oscillators, a filter, envelope generators, and vibrato already in place would save time whenever you're inspired to whip up a new sound. Because Falcon Factory lacks such a template, programming your own is a useful exercise,

and it will also help you learn to maneuver Falcon's user interface. Even though you'll likely replace oscillators or filters with other elements in future projects, your workflow will go more quickly if you don't have to start from zero.

Near the bottom of Edit view, just above the Modulation Editor, unfold the Mapping Editor by clicking on its triangle. To ensure that you'll see every lane you'll need to see for this exercise, enable the three buttons (Parameters, FX, and Modulators) in the Keygroup Editor's header and the Parameters button in the Oscillator Editor.

The first step in building our template is adding an oscillator to an empty program. In the right sidebar, click on the waveform tab, open the Synthesis folder, and then open the Analog subfolder. Click on the word Saw, drag it from the folder to the Mapping Editor, and then drop it at the very top of the keymap. How high you drop it on the keymap determines the width of its pitch range, and because we want it to use the entire keyboard, be sure to drop it just below the top edge. You'll know you've done it correctly when the entire keymap turns blue.

If it isn't already open, unfold the Oscillator Editor by clicking on its triangle. Double-click on the Pitch knob and type in the number 0 to bring it down an octave from its default setting. (Tip: When you're searching for a setting that sounds right, turn the knob. When you already know the value you want to enter, double-click and type it in.) Save your new program by clicking on the toolbar's main menu (the wrench button on the window's header), selecting either Save Program or Save Program as... from the dropdown menu, and name it Synth Template.

Click on the + symbol in the lane labeled Osc and select Analog from the dropdown menu to insert an additional analog oscillator. On the Oscillator Editor's upper left, click on the Edit All Oscillators button (the chain link icon) to disable it. Doing that is crucial in order to adjust the second oscillator's gain, tuning, or note tracking independent of the first oscillator's. Once you've done that, double-click on the second oscillator's Coarse Tune knob and enter -12 to tune it an octave below the first oscillator.

Now let's add a lowpass filter. In the Keygroup Editor, click on the + symbol in the FX lane to reveal another dropdown menu. Select Filter and then Analog filter from the submenu. (Yes, Falcon classifies filters as effects.) Because the default setting is a lowpass filter with a 1kHz cutoff, all frequencies above that point will be rolled off.

JUST ADD MODULATORS

We'll need an envelope generator to shape the filter cutoff. As with oscillator and filter types, Falcon gives you numerous choices. Right-click (or Control-click) on the filter's Cutoff knob to reveal the dropdown menu, choose Add Modulation, go all the way down to Keygroup, and choose New Analog ADSR. The envelope's controls will appear in the Modulation Editor. Their settings will be identical to the amplitude envelope's settings, which you can view by clicking on Amp Env next to the filter envelope (labeled Analog ADSR 1) in the same lane. Double-click on the Analog ADSR 1 label and change the name to Filter Env. If you haven't saved since inserting the first oscillator, now would be a good time to save your changes again.

At this point, I suggest experimenting with parameter values. With Filter Env still selected, you'll see a tiny horizontal Ratio slider in the Modulation Editor's Keygroup lane. Dragging it to the left decreases the filter envelope's modulation depth. Try different attack, decay, sustain, and release values for both envelope generators. Change the oscillator waveforms by clicking on the tiny triangle on the Osc lane's far right, which reveals a menu listing options that include basic analog-type waveforms, as well as waveforms such as '80s, brass, kazoo, and nasal.

Let's add some vibrato to the template we've created. First, re-enable Edit All Oscillators to ensure that LFO modulation will affect both oscillators equally. Right-click on the Oscillator Editor's Pitch knob and choose New LFO from the Add Modulation menu's Keygroup submenu. LFO1 will appear in the Modulation Editor's Keygroup lane. Double-click on the Freq knob and change its value to 6. Now right-click on the Depth knob and choose Modulation Wheel from the Add Modulation submenu. Lean into your keyboard's mod wheel, and voilà! You have vibrato.

Fig. 2. In Falcon's Info view, each program displays a unique panel of controls defined by its programmer. Because a single macro can simultaneously control numerous parameters, you can name them anything you like.

MAKING MACROS

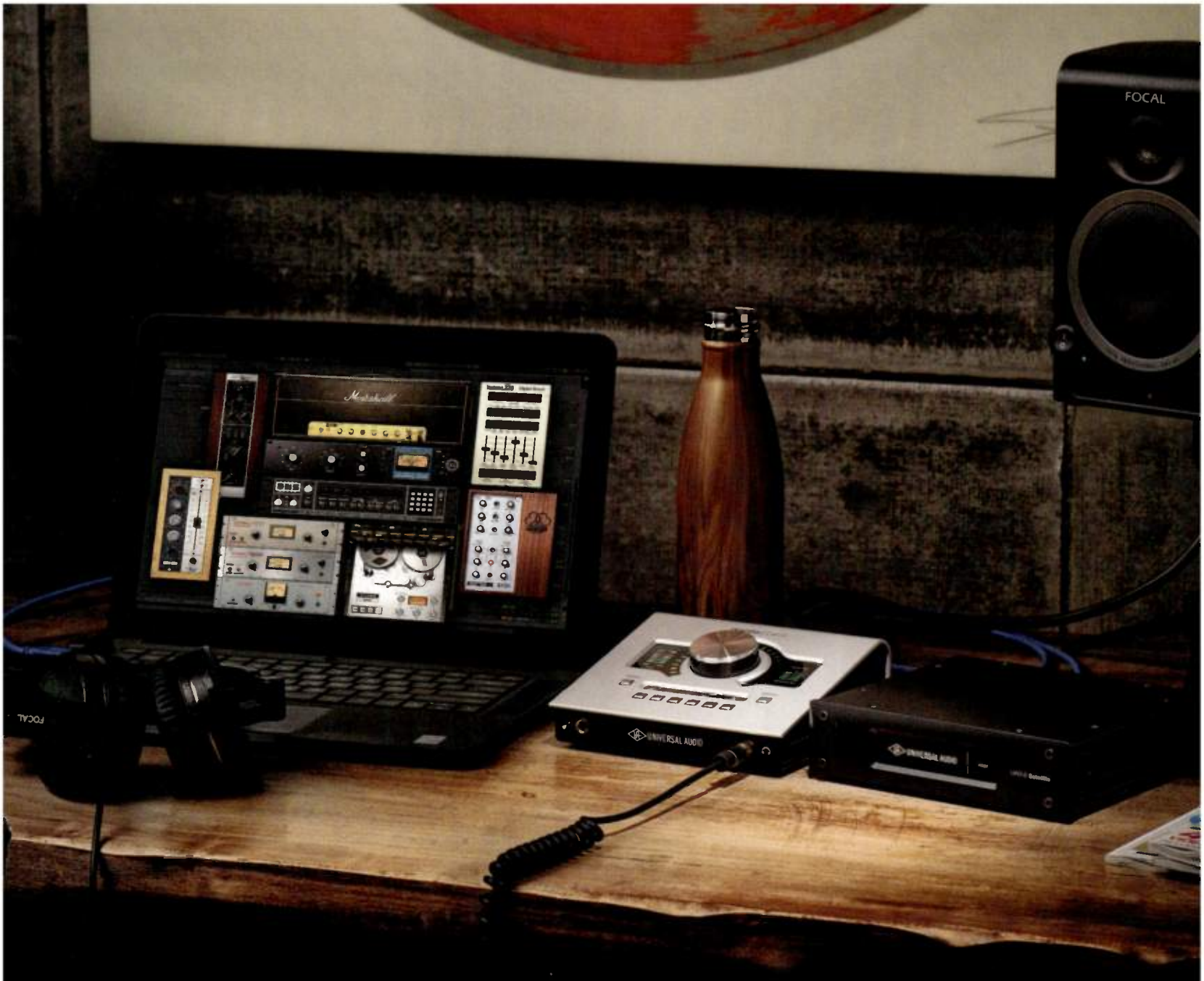
In Falcon, a macro is a programmer-defined knob or button that controls one or more parameters. Macros appear as front-panel controls when you select the Info tab next to the Edit tab (see Fig. 2). In factory patches, Info view is where you can access the parameters you'll use most often, such as filter cutoff and resonance, LFO speed and depth, delay times and depth, and so on. Macros can be either continuous (knobs) or on-off (buttons), depending on what type of parameters they control. When you view the Info tab on your custom synth template, though, you'll notice that the panel is completely blank. Let's add a few macros to populate it.

Return to Edit view and click on Analog Filter in the Keygroup Editor's FX lane to make it visible if it's hidden. Right-click on the Cutoff knob and choose Add New Macro from Assign To Macro's submenu. In the Modulation Editor's Program lane, click on Macro 1 and then change the name to Cutoff. In the Modulation Editor's Keygroup lane, right-click on the Filter Envelope's Ratio slider to add another macro, and then rename it Env Depth. Back at the filter, right-click on the Resonance knob, add a third macro, and change its name to Resonance.

Now click on the Info tab to view the three new controls you've created. If you'd like to change their order or positioning, click on the Edit button (which looks like wrench in the upper left corner) and drag the knobs to wherever you'd prefer. You can also use your computer's arrow keys to move them more precisely.

Like practically any parameter in Falcon, macros can be modulated by other sources, including external MIDI controllers and DAW automation. If your controller has assignable knobs or sliders, right-click on the Cutoff knob, choose MIDI Learn, and turn the knob you want to control cutoff. Repeat the procedure to assign physical knobs to the onscreen Env Depth and Resonance knobs. To better hear the effect of changing those parameters, go back to the Edit tab and adjust the filter envelope so that its attack is slower than amplitude attack, sustain is lower than amplitude sustain, and release is faster than filter release. When you're satisfied your template is a good starting point for creating other new programs, save your changes once more.

continued on pg 69



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UNIVERSAL AUDIO

Fig. 1. Metric Halo Thump can generate multiple subharmonics that sound fantastic on drum tracks. Here, Thump's two oscillators are tuned to *E* notes an octave apart.

Hum Drum

Supersize the kick track by tuning it to your song's key

BY MICHAEL COOPER

Michael Cooper is a recording, mix, mastering, and post-production engineer, and a contributing editor for *Mix* magazine. You can reach Michael at michaelcooper@bendbroadband.com and hear some of his mixes at soundcloud.com/michael-cooper-recording.

To add low-end punch to drums in a mix, we often use equalizers to boost bass frequencies. But for the kick drum in particular, there's another tool we can use to jack up the bottom: the subharmonic generator. Not just more precise, a subharmonic generator can sometimes also sound more transparent and musical than EQ.

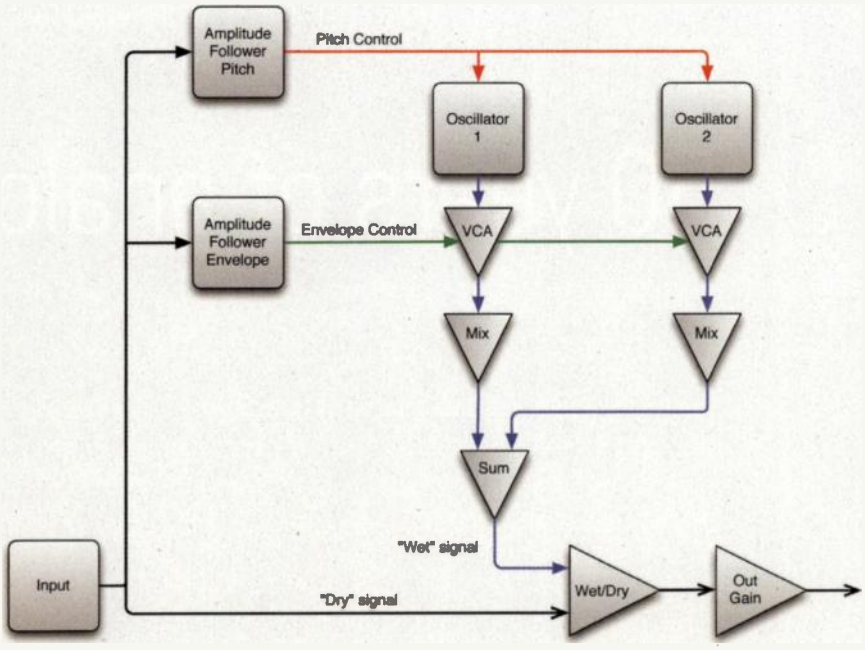

Fig. 2. Thump's block diagram shows the signal paths for its two oscillators.

In this article, I'll show you how to use a subharmonic generator, the excellent (and free!) Metric Halo Thump Percussive Subharmonic Synth plug-in, to make your kick drum track sound more powerful—while also reinforcing your song's harmonic structure.

STAY TUNED

Thump can be instantiated either on an insert for the kick drum track or, for even greater tonal control, on an aux fed by the kick. The plug-in can tune the subharmonics it generates to multiple frequencies of your choosing (see Fig. 1). What we want to do is use the plug-in to tune the kick to the key of your song. For example, if your song is in the key of *E* major or *E* minor, make the plug-in generate a low *E* (the tonic note for the key). Every time the kick drum strikes, the low *E* that's generated will reinforce your song's foundation. And because a discrete frequency is generated, you'll leave plenty of space in the bass-frequency band for the electric bass to voice clearly in the mix.

A subharmonic generator can sometimes sound more transparent and musical than EQ.

The octave in which you choose the subharmonic to be generated is very important. Keeping in mind that our goal is to reinforce the kick drum's bottom end, the subharmonic should generally fall in the range between *C0* (32.70 Hz) and *E1* (82.41 Hz). (Go to phy.mtu.edu/~suits/notefreqs.html for an excellent table identifying the frequencies that correspond to musical notes.) That said, there are no hard and fast rules.

Keep these considerations in mind: The lower the subharmonic's frequency, the less audible it will be on some consumer playback systems, and it will eat up more of your mix's headroom (all other things, such as volume, being equal). On the other hand, the higher the frequency the more likely it will be recognized as a discrete note and clash with the bass guitar (or sound just plain stupid!).

MIGHT AS WELL THUMP

Thump provides two independent subharmonic generators (Oscillators 1 and 2; see Fig. 2), each of which can attack (voice initially) and sustain at different frequencies as determined by their respective Atk Freq (Attack Frequency) and Sust Freq (Sustain Frequency) controls. For example, Thump's attack frequency can be set higher than its sustain frequency to make a tom track resonate initially at one frequency and then pitch-bend downward.

Since we want the kick drum to voice only at our song's tonic pitch, we're going to keep the Atk Freq and Sust Freq controls for each oscillator set to the same frequency. There's no rule saying you need to use both oscillators. But if your song's key is between *C* and *E* natural, you can set respective frequencies for the two oscillators that are an octave apart within the optimal 32.70-82.41Hz range I mentioned above.

For example, if your song is in the key of *E*, you can set Oscillator 1's attack and sustain frequencies to 41.20 Hz and Oscillator 2's attack and sustain frequencies to 82.41 Hz (*E* notes an octave apart). Thump's stepped frequency selections don't necessarily correspond exactly to musical notes. To select the precise frequency you want, click on a frequency readout and type in the number of Hz you want to generate.

When generating two subharmonics on a kick drum track, I generally like to use Thump's Mix sliders to attenuate the higher of the two frequencies around 10 dB with respect to the lower (depending on the dry track's spectral balance). Doing so keeps the kick from sounding top-heavy.

To avoid causing distortion when closely spaced bass frequencies in wet and dry signals combine, set Thump's Env Atk (Envelope Attack) control to roughly 2 ms; this will make the subharmonics voice a split second later than the dry signal. Raising the Env Sust (Envelope Sustain) control makes the subharmonics sustain longer in between kick-drum hits; if the bass guitar and processed kick clash, lower the Env Sust control. You can ignore Thump's Pitch Atk and Pitch Sust (Pitch Attack and Pitch Sustain) controls for this application, as they will have no effect when the Atk Freq and Sust Freq controls are set to the same value.

If you placed Thump on your track's insert, use the plug-in's Wet/Dry Mix control to dial in the best blend of original signal and added subharmonics. Placing Thump on an aux—with Wet/Dry Mix set to 100 percent wet—will give you even better control, as you won't have to attenuate the kick's beater slap just to get more subharmonic level. Consider that last tip as my, ahem, punch line for this story! ■

Fig. 1. The selected section of this word is the plosive "P" at the beginning before it's reduced.

Fig. 2. An "S" sound like the one selected here is easy to graft onto another word to repair it.

Making it Flow

Techniques for more natural-sounding spoken-word editing

BY MIKE LEVINE

Mike Levine is a musician and producer in the New York area, and edits the weekly podcast of *New Jersey Monthly* magazine.

There's more spoken-word content being posted online than ever these days—from podcasts to video soundtracks, and it's useful to know how to edit this material effectively. Spoken-word editing brings with it a unique set of issues and techniques compared to editing music. I'll take you through some of the more important considerations.

Editing spoken-word material usually involves removing or minimizing glitches and momentary background noises. Unlike in music recordings, where such anomalies are often covered up by instruments, these events are quite obvious to the listener of a spoken-word recording, and will likely need mitigation. What's more, when people are recorded speaking extemporaneously, they often inject "umms," "ahhs," "you knows," and other interruptions (a.k.a. "disfluencies") into their speech. You'll want to remove them to make the program material more intelligible and smooth.

Many of the techniques mentioned here apply to both audio-only and video-soundtrack editing situations, but there is one important difference. If your speaker is on camera, you can't remove words without creating either a jump cut—if you're editing the video and audio together—or a disconcerting audio dropout, if you're just editing the audio. Timing is also affected: In an audio-only situation, you generally have the leeway to completely cut out unnecessary words or noises from the program, slightly shortening the duration. On a video, you have to be careful not to do anything that moves the subsequent audio out of sync.

KEEPING IT NATURAL

When editing spoken-word audio, your goal is to make your edits seamless, so nobody will know they're there. Whether you're getting rid of disfluencies or cutting out entire sections for editorial reasons, be careful to keep the speaker's rhythms natural at the point of the edit. You'll quickly discover that editing some words too close together creates the audio equivalent of a jump cut. Typically, the best way to fix that problem is to undo the edit and try to adjust the boundaries so that there's a little more space between words. Working at a sufficiently zoomed-in level is key to finding the best edit points. You'll quickly discover

that viewing at a detailed magnified level will open up a world of new edit possibilities.

If you're unable to extend the pause enough by adjusting your edit, you can use room tone to add space at the edit point. Find a spot in your material where there's a pause in speaking and only room tone is audible. Copy it and paste it at the edit point. When editing in a DAW, it's always good practice to crossfade at the edit boundaries to avoid introducing clicks. As with any edit, make sure you're zoomed in enough to set those boundaries accurately.

GET RID OF PLOSIVES

Microphones—especially when used without pop screens—are vulnerable to picking up plosives, those popped "P," "B," and other consonant sounds (see Figure 1). Plosives are usually found at the beginning of words or syllables, and you can see their waveforms pretty easily, as their squiggly shape stands out from the rest of the word's waveform. You generally don't want to remove them completely, because you'll lose the consonant sound altogether, but you do want to reduce their level.

Zoom in on the plosive, select it (but not any part of the rest of the word), and use either your DAW or audio editor's gain feature or volume automation to lower its level. I usually start with about 8 to 10 dB and adjust from there. If you're using automation, sometimes it helps to angle slightly the drop at the beginning of the word and the rise in volume at the end to smooth transitions. (If you're using iZotope RX Advanced, it has an amazing De-Plosive module that takes care of plosives in one click.)

REPLACE SOUNDS AND WORDS

Sometimes, you'll run into a situation in which a speaker misspoke a letter sound at the beginning or end of a word, or some sort of click or pop occurred at the same time, and the word sounds bad as a consequence. While you might think you have no choice but to leave that pop or click in, you can often either replace just that letter sound with another from the same recording, or replace the entire word. In the case of the former, find the same letter sound in another spot ("s" sounds are the easiest to find and to work with), copy it, and paste it in to replace the problematic letter sound (see Fig. 2). You might have to adjust its level to match it more closely.

Replacing an entire word can be more tricky because a person doesn't always use the same inflections when he or she says the word in a different sentence, and you might copy and paste another instance of it in only to discover that the pitch of the speaker's voice was different in the sentence you took it from. If that's the case, it will sound unnatural and out of place. You may have to try a few different versions of the word (if you can find them), and hope that one sounds similar to the problematic word you're replacing.

REDUCE BROADBAND NOISE

Background noise, whether it's a result of the mic being too far from the subject, a noisy fan, air conditioner, etc., can mar a spoken-word recording. To help mitigate noise, most audio editors have some sort of broadband noise-reduction features built in. (Some are very deep and some aren't.) A number of noise-reduction plug-ins are available, as well.

Broadband noise reducers "learn" the background noise from a sample that you select (some do it automatically as the audio plays), and use that to figure out which part of the signal needs reduction applied to it and which part should be left alone. The problem is that the process creates artifacts, and can make your audio sound weird and harsh. The trick is to apply as little as you can. Often you have to compromise, lowering, but not eliminating the noise, in order to maintain decent audio quality. ■

continued from pg 62

MORE OSCILLATORS AND FILTERS

At this point, you've learned programming essentials such as how to add oscillators and filters, how to modulate them with envelopes and LFOs, and how to control modulators with an external controller. Now would be a good time to experiment with oscillator, filter, and envelope settings. Better yet, let's replace the oscillators and filters with different types.

If you've changed any parameters since your last save, reload your synth template. Disable the second analog oscillator by toggling its power button off in the Oscillator Editor's Osc lane. In the same lane, right-click on the first oscillator's Analog label and select Pluck from the Synthesis menu. In the pluck oscillator that appears, click on <No Sample> and choose Hard Pluck from the Basic submenu. Play a few notes, and then try some of the other samples. The pluck oscillator is a physical model of a plucked string, and the sample contributes to the synthesized timbre's initial transients. Bring the Sample slider down about -12dB and notice the difference. Now bring the Noise slider up full and notice the difference. Experiment with the other parameters to hear their effect.

If you'd like to learn more about what all the pluck parameters do, consult the Falcon user manual. And if you'd like to find out how other oscillator types work, give them a try by replacing the oscillators in your template. I particularly recommend checking out the analog stack, wavetable, FM, and organ oscillators, as well as Falcon's various sampling oscillators.

Now, reload your synth template. In the Keygroup Editor's FX lane, right-click on the Analog Filter label and choose Xpander Filter from the Filter submenu. The Xpander filter is Falcon's most flexible, a multimode ladder filter with 37 variations ranging from 6dB-per-octave lowpass to an impressive assortment of bandpass, highpass, peak, notch, all-pass, and even no-pass filters. In addition to cutoff and resonance, you can dial in the Xpander filter's distortion type, distortion amount, and key tracking. If you can't find a suitable response curve somewhere in Falcon's library of filters, it probably doesn't exist.

RACK 'EM UP

Before we finish up this tutorial, let's look at effects. Like filters, the most logical place to insert most effects types is in the Keygroup Editor. Most often, you'll add effects directly to the FX lane, but let's try a different approach. In the Keygroup Editor's FX lane, click on the + symbol and choose Default from the Effect Rack submenu. A blank panel will appear. Click on the Tree tab in the left sidebar and unfold Part 1 and then Synth Template, Layer 1, Keygroup 1, and finally, Effect Rack. Tree view gives you an alternate perspective on your program's architecture, which can be especially useful for more advanced functions. It's also the only way to populate an effect rack.

Right-click on Chain1 and add an analog tape delay. Right-click on Chain1 again and add an analog chorus. Right-click on it a third time and add a spectrum analyzer. You'll notice immediately that the effect rack remains a blank panel. To view the controls for the delay, chorus, and analyzer, switch from Edit view to Effects view by clicking on the center panel's Effects tab.

To add controls to the effect rack panel in Edit view, right-click on the knob you want to add in Effects view and assign it to a new macro from the Assign to Effect Rack Macro submenu. Repeat as needed until you have all the controls you want in the Effects Rack. If the controls would be more useful to you in Info view, choose Assign to Macro instead.

All this complex maneuvering may seem like a convoluted way to program Falcon, but it's the only way to achieve many tasks. Though Falcon's user interface may not be particularly intuitive, you'll eventually master its intricacies if you approach it with persistence, patience, and determination. ■

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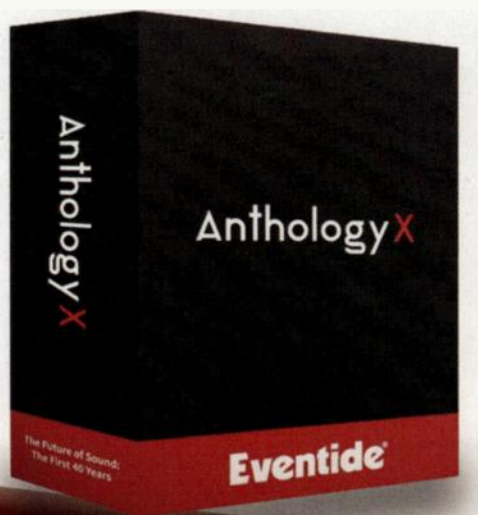

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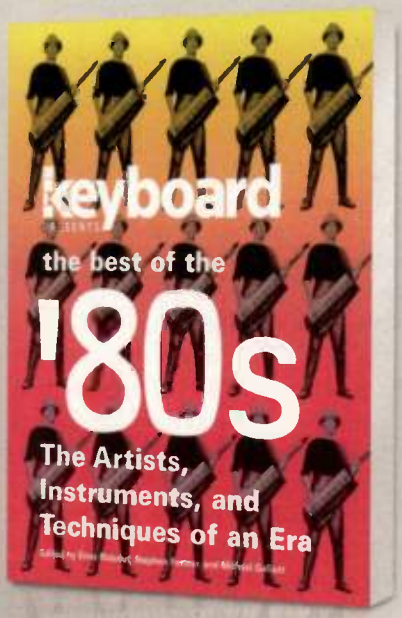

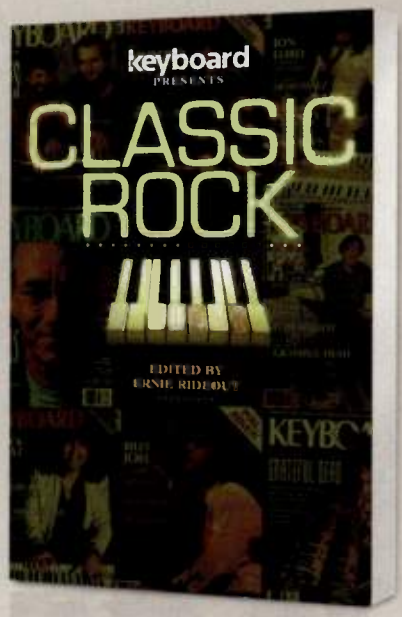

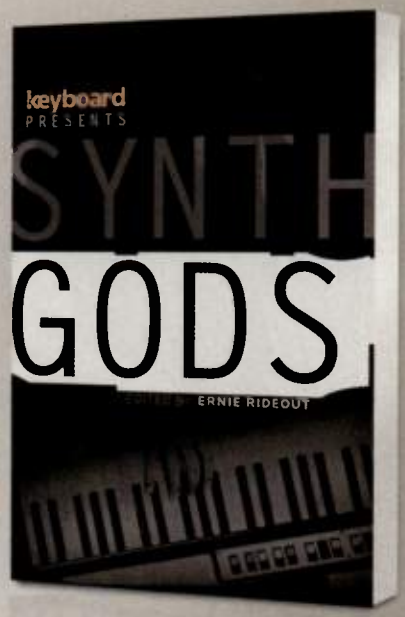

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FIVE QUESTIONS

DJ Shadow

Producer/DJ Josh Davis talks about the evolution of his rhythmic vocabulary and his move away from sampling to create *The Mountain Will Fall*.

BY LILY MOAYERI

Josh Davis a.k.a. DJ Shadow, borders on being a mythical character. The longstanding DJ and producer changed the face of music 20 years ago with his groundbreaking debut album, *Endtroducing...* and no one has come close to being able to replicate his identifiable sound since. Two decades on, his latest album, *The Mountain Will Fall,* fits tidily into today's electronic/underground hip hop landscape, yet it remains quintessentially DJ Shadow—unlike anything else out there.

Why had you not played a traditional DJ set for about a decade until your Low End Theory sets in 2012?

If I'm doing a show as DJ Shadow, people expect me to play my music. I felt I had an obligation to live up to that. It served me well in the sense that there weren't a lot of DJs in the late '90s/early 2000s that could play festival stages in Europe alongside big rock groups. It was something I embraced and felt was an honor to do.

I never stopped DJing, but there wasn't an avenue for me to just have fun. With Low End Theory, there's a built-in context that opened up a new way to express my love of music, which is why I became a DJ in the first place.

How did the subsequent DJ gigs lead to the development of the album?

I did more of what I was already doing: looking for music on SoundCloud, Bandcamp, wherever music is found. Through the course of doing that I started to zero in on a sound I was comfortable representing. Inevitably, some of that rhythmic vocabulary started to inform the way I make beats. That's also why I started working on Ableton. It was a very organic process of hearing music I was being inspired by, adding it to my lifetime of musical knowledge and sensibilities then trying to incorporate just enough of it so it still felt like me and not some radical self-conscious departure.

In addition to crate digging and the sources you mentioned earlier, where else do you look for your sounds?

It comes down to music as a quest. For me, music is like a puzzle. It's like a constantly trying a key. I feel the same way about a stack of records and trying to find a sample, or a different plug-in or another synth that's going to get me to the next step. I'll always employ the same tactics. But at the same time, I'm a curious individual and I'm impressionable. When I hear music being made in an interesting new way, I don't want to say I can't do that because I limited myself to this discipline only. That's a creatively bankrupt way of thinking about music.

What are the main components that figured into the creation of this album?

The first thing I do is play through some records. I'll grab a handful, drop the needle, and see if something inspires me. I'll sit down to music that's been sent to me in emails or links to people's stuff to balance things out.

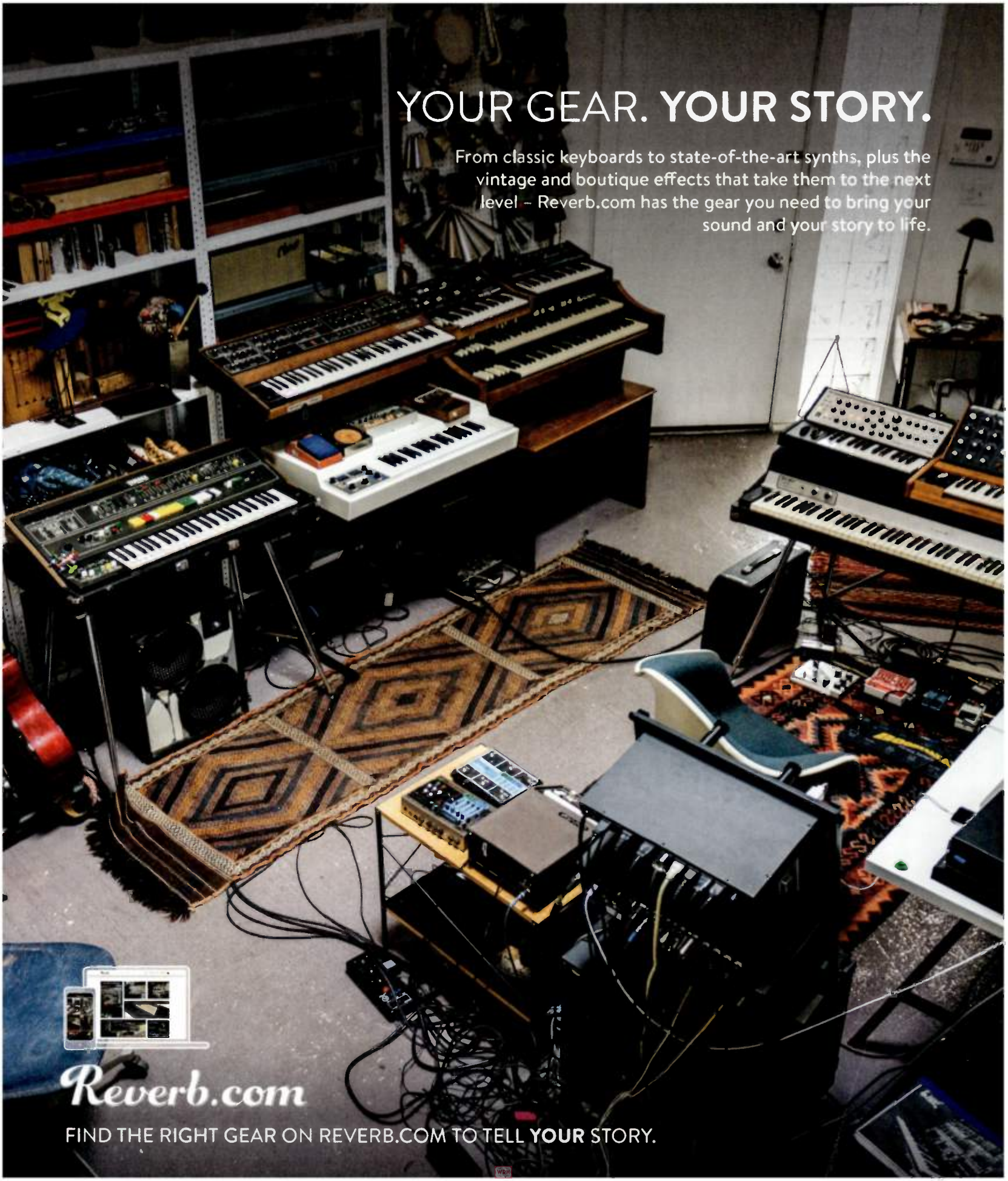
I made the big switch to Ableton Live in 2013. It's the most intuitive platform for making music I have used since the MPC. I tried and failed on so many different platforms and went back to the MPC saying, "What am I doing? This is ridiculous. I don't want to go back." All the beats I make and every track on this record was made on Ableton. I still find Pro Tools to be a little easier and quicker to edit, especially if you have to do batch editing.

I did a couple of sessions at my friend's studio. He has these incredible, almost one-of-a-kind modular synths. You have to take the synths right then and there because you'll never be able to retrace your steps to get it back to where it is. I like to build with my own eyes and ears. The time you put into sample chops is going to pay off later when you start loading a track with sonic ideas and textures.

This album is a long way from your sample-based debut.

When I did *Endtroducing...* I only knew left/right, bass/treble, and up or down. That was it. When I started the Unkle record in a big, expensive studio in London, the first day we walked in, the tape ops and assistant engineers were cranking *Endtroducing...* I was embarrassed because that record is so rudimentary. I totally understand there's a homogenous warmth to it which is impossible to replicate, but when I'm putting my set together now and I have to reference *Endtroducing...* I have to do so much to those songs to make them be able to sit with the music I've made in the last 10 years because they're so simple. There's only one chance and one time in your life where you can get away with that.

Read our extended interview with DJ Shadow at emusician.com/DJShadow. ■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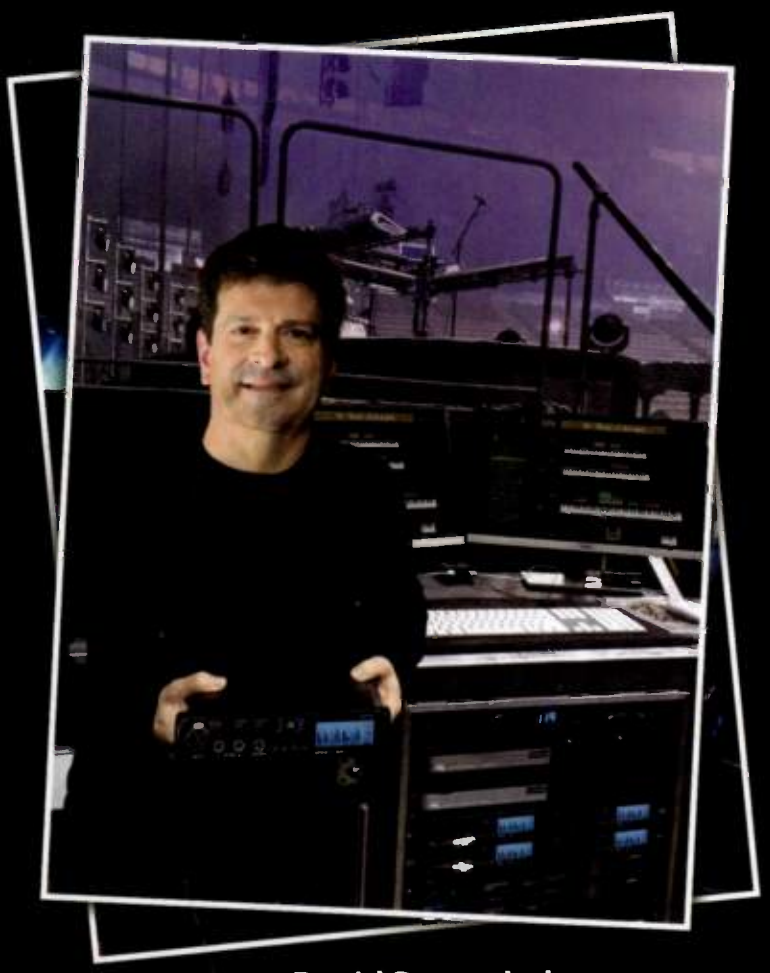

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