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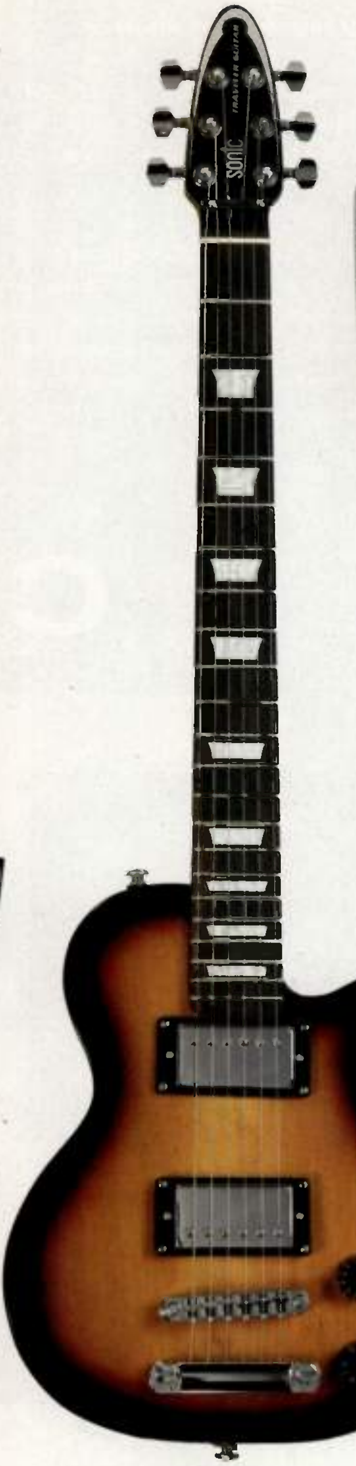
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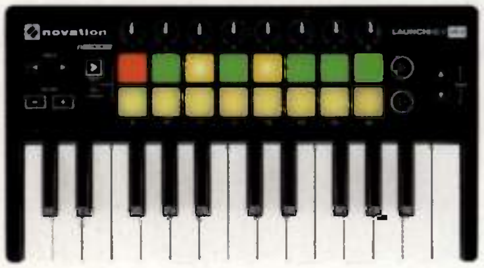

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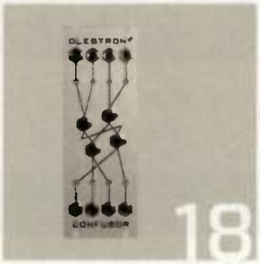

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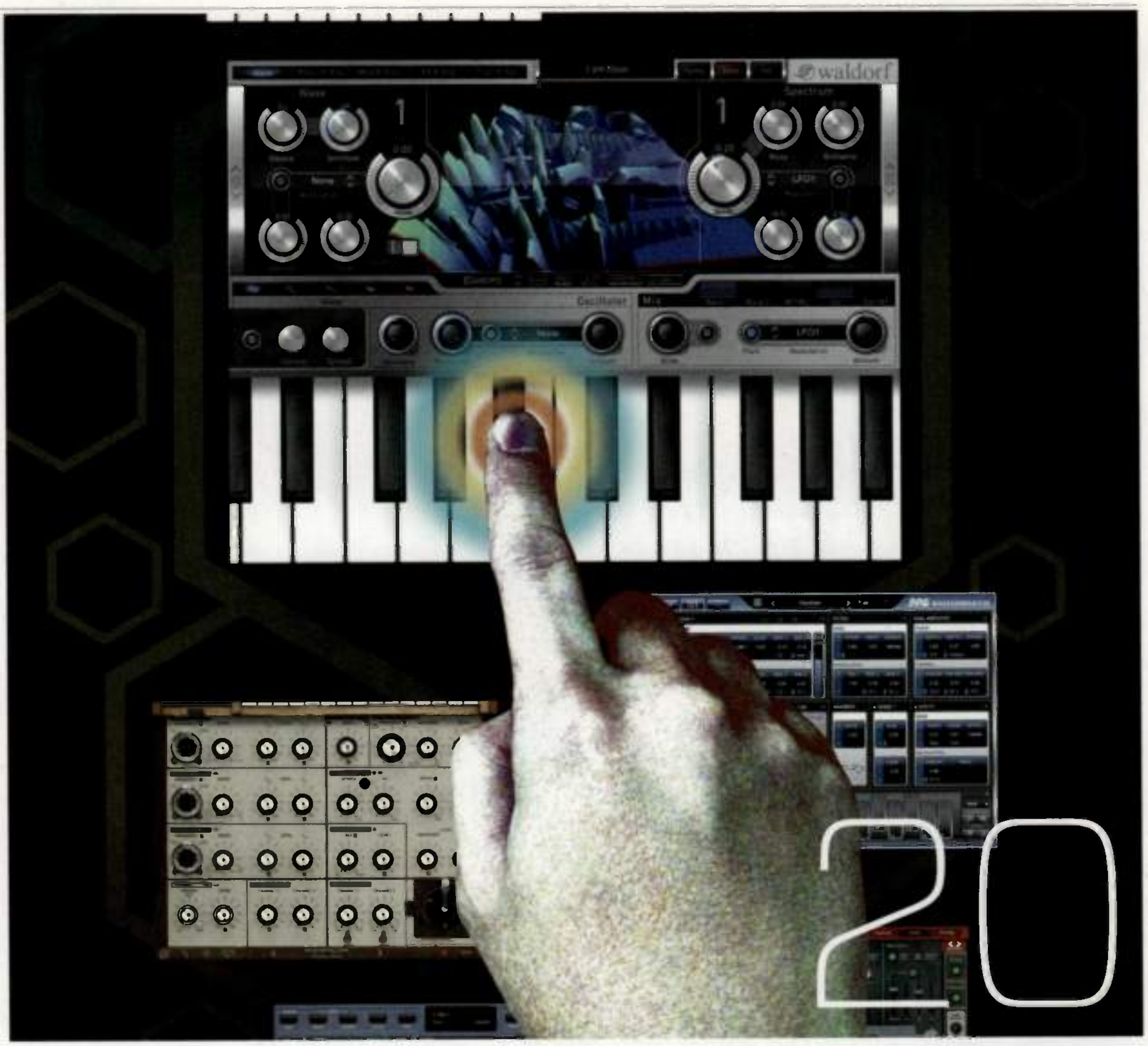

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electronic
MUSICIAN
www.emusician.com | VOL. 32 NO. 4, APRIL 2016

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insight

MIDI for the Masses

FOR MORE than 30 years, MIDI has provided the central nervous system of electronic music, and the MIDI spec, managed by the MIDI Manufacturers Association of product developers, has focused on the needs of professional music production.

The past year has seen broad expansions of MIDI technology, with Apple adding support for Bluetooth MIDI, Google adding MIDI to the Android platform and Web MIDI to the Chrome browser, and Microsoft updating MIDI support in Windows 10.

According to the MMA, these changes will expand the reach of MIDI to 2.6 billion devicess—a whole new universe of MIDI users, from artists to educators to game developers, working on computers, tablets, and cell phones.

To promote the benefits of MIDI to this broad new user community, the MMA launched the consumer-facing The MIDI Association, at MIDI.org. The site provides hundreds of free educational resources, from articles to full MIDI course curriculums, as well as interactive forums and other opportunities to interact with other creators and technology providers. An "official MIDI certification" offering is on the horizon. Learn more about TMA's goals in "Five Questions" on page 66.

And speaking of MIDI, don't miss our complete NAMM report on page 14.

SARAH JONES
EDITOR
sjones@musicplayer.com

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WEB HIGHLIGHTS

This month on emusician.com

Video Walkthrough: Apple Music Memos

Plus...
The DIY Advisor: Star Wars, Music, and Licensing Lessons
Drum Recording Bonus: The Prepared Drumkit

...and lots more!

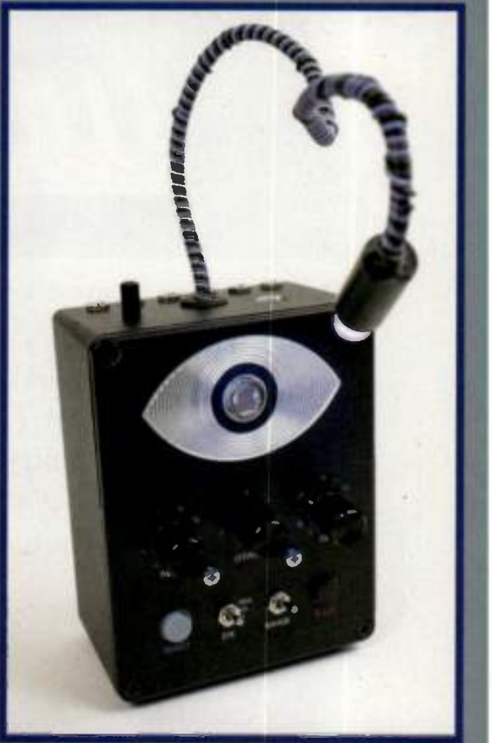
gadget geek

Bleep Labs Thingamagoop 3000

Eye Want to Make Some Noise

It's back and buzzier than ever: Thingamagoop 3000, the latest version of Bleep Labs' light-controlled synthesizer, effect, and "noise friend" generates all sorts of weird and wacky sounds via a photosensitive "eyeball" that alters a sound's frequency, or adjusts a patch or effect. The Arduino-based synth has four patches, and offers new effects that include square and amplitude modulation ("from tremolo to Tune In Tokyo"), lowpass filter, delay, and rate reduction. The unit has a built-in speaker, is powered via USB or 9V battery, and is available in custom LED and plate colors. Audio in and out is 16-bit/44.1kHz.

$240, bleeplabs.com



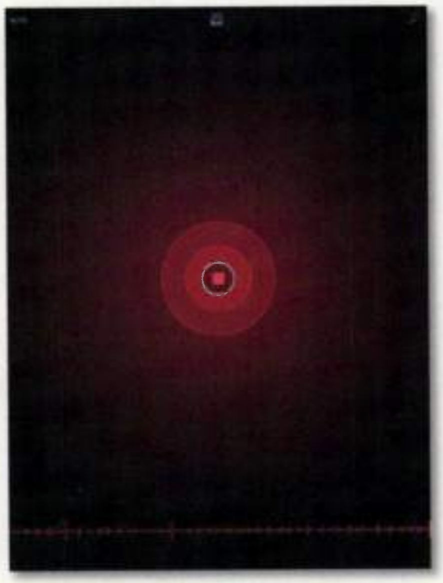
app tip Apple Music Memos

BY MARKKUS ROVITO

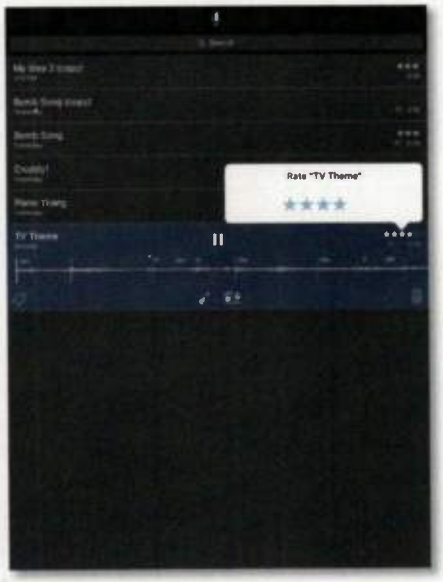
Free quick-record app adds robo-members to your GarageBand

IN CASE GarageBand for iOS wasn't simple enough for you, Apple's new Music Memos for iOS 9.1 or later (apple.com/music-memos), makes it one-touch easy to record your musical ideas while they're fresh in your mind. After detecting your notes and tempo, the app can add a virtual rhythm section, which you can tweak and save before exporting to GarageBand or Logic for further work.

1. From the main recording screen, touch the tuning fork icon to use the built-in tuner on your axe, voice, etc.



2. Just touch the big circle on the main screen to start and stop recording. When you're finished, Music Memos detects your chords, and you can play back, name, rate, and add tags to your song.



3. Touch the bass and/or drums icon below the song to add a rhythm section. Pop-ups give you an *x/y* touchpad to adjust the ratio between simple/complex and quiet/loud for the bass and drum parts. There are two bass sounds (electric, upright) and two drum kits (vintage, modern).

4. Tape the waveform to enter the Details screen, where you can adjust timing (tempo, signature and downbeat offset), trim the clip, transpose chords, silence the band, and add notes, including the guitar tuning and capo position.

5. The Share button lets you upload your songs to cloud storage, SoundCloud, YouTube or other apps. Crucially, you can send a song to GarageBand ($3.99), where the song's audio and instrument parts appear as audio and instrument tracks, respectively, which you you can edit and add to as part of a larger work.

Music Memos is free in the iTunes App Store.

CLASSIC *EM* Eddie Kramer, 2000

IN "MIXING with a Master" (September 2000), we sat in on a master class with the legendary engineer at the SAE Institute in New York City, where he shared recording techniques that he used on landmark sessions with the likes of the Rolling Stones, The Beatles, and Led Zeppelin. Kramer emphasized that in those early rock days, many of the sounds we take for granted today were discovered by trial and error:

"When we were recording stuff like Hendrix, the audio world was our oyster. We didn't give a damn because we knew nothing. We were experimenting. Every time we rolled tape, it was like, "Wow, that sounds cool—and if I turn this knob up here and I turn that knob up there, I'll get a weird effect." Experimentation was the name of the game; it didn't matter what we did. I remember putting one of Jimmy Page's Fender amps inside a fireplace, upside down, and miking it from the top of the building."

Mixing with a Master

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EDDIE KRAMER A DAY IN THE LIFE

WRH

BY BARBARA SCHULTZ

>> Emily Wells

THE POWERFUL string and choral parts on Emily Wells' latest album, *Promise*, reveal her deepest musical roots. The daughter of a music minister, Wells was encouraged to learn classical violin from an early age, and she grew up surrounded by old-world Christian hymns.

"Then more recently, my obsession has been music from Mali. Seeing Tinariwen live a few years ago—I was in awe. Their music falls into a certain place where my body understands it but my mind doesn't, and there's something really thrilling about that."

On the self-produced and mostly self-engineered *Promise*, Wells has fused those sounds of church choirs, classical strings, West African music, and modern electronic instruments into magnificent original songs that evolve throughout the composition and recording process.

"Production is a big part of the writing process for me," Wells explains. "I usually go into the studio with a pretty clear but skeletal idea—a melody and lyrics concept. For me a very focused writing process could take a day or a week, but when I'm in it, it's almost like a fever."

However, sometimes it helps Wells to come up for air: "When I was working on the song 'Light is Draining,'" she says, "I had been obsessively in that space for a few days, and I knew it needed something. Finally, I broke away to have dinner with friends and I witnessed this scene: A taxi driver was pulled over and slumped over, and there was a paramedic knocking on his window. Two girls were walking in front of us; one was lagging back out of concern, and the other was yelling to her friend, 'Come on, we gotta go! Come on, the light is drainin'!' When I returned to my studio that night, I couldn't shake that. Some piece of dialog you overhear can finish a song."

Wells' studio is equipped with Pro Tools, a few microphones, preamps, and outboard pieces, and of course her collection of acoustic and electronic instruments.

She records her strings with a RODE NTK mic, into a Ridge Farm Gas Cooker preamp. "No compression going in," she says. "I keep it simple, and add strings, layer on layer."

Many of Wells vocal parts were done in her studio as well, via her Neumann TLM 103 mic, while other vocals were tracked in Bushwick—a studio that used to be situated in the same building as Wells'. "It was wonderful because I could just trot on down to the next floor," Wells says. "The mic we used was an older Neumann that he had rebuilt and replaced the capsule. Of course, now I would do anything to have it, because it so matched my voice, but he made it himself and the space is in different hands."

SHERVIN LAINEZ

Wells did drum programming in her own studio, and then asked her friend Shayna Dunkelman to play acoustic drums and other percussion instruments in Brooklyn's The Creamery studio, where her friend and occasional production partner Jacob Plasse often works. "Jacob came in close to the end and helped me make some production decisions, which was great. It can be scary sometimes, making choices, telling yourself you made the right choice, and then building on them. If there's a fault, the whole castle can fall."

Those later drums and percussion parts were captured by engineer Jeffrey Fettig. "We did a lot with this enormous bass drum that Shayna has, and it really rounded out the electronic beats," Wells says. "I love that mixture of acoustic and electronic drums."

Wells also recorded additional keyboards in The Creamery before returning to her own space to mix with Plasse. "We wanted to take our time in a comfortable environment," Wells says. "We used a lot of my Fostex spring reverb, Waves plug-ins, a lot of Soundtoys, which I love. But I will say that I also was mixing as I went along [during tracking], so there were not a lot of big ideas that happened in the mix. It was more like, 'This is finished. Now let's make it sound as good as we can.' It was more like massaging something—pulling the blood to the surface."

Emily Wells did most of the recording for *Promise* in her personal studio.

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NAMM 2016

Gear Highlights From Anaheim

BY GINO ROBAIR

If the NAMM show is any indication of the perceived strength of our economy, then this year's event shows great optimism across the industry. With record attendance and every booth occupied, there were not enough hours across the four show days to take in all the new information (let alone get through the crowds). Fortunately, *Electronic Musician* had many boots on the ground, allowing us to present you with these highlights from the show.

KEYBOARDS AND CONTROLLERS

Two of the biggest announcements of the show were polyphonic analog keyboard synths—the **Arturia** MatrixBrute and the **Dave Smith Instruments/Tom Oberheim** collaboration, the OB-6. The 3-oscillator MatrixBrute includes a Steiner filter, a 3-mode ladder filter, a drive control, and analog effects. Moreover, its 16x16 panel is not only for routing modulation sources to destinations, but can be used to recall patches or program the 16-step sequencer.

With two VCOs and a sub-oscillator per voice, the OB-6 utilizes an SEM-style filter combined with cross modulation, polyphonic step sequencing, and dual digital effects (including emulations of Oberheim's classic phase shifter and ring modulator pedals). Both synths sounded massive, even against the din of the show floor, and we can't wait to get our hands on review units.

Yamaha rocked the keyboard workstation world with the Montage. Available in 61-, 76-, and 88-key configurations, the instrument offers two sound engines—the Advanced Wave Memory 2 (AWM2) and FM-X. The AWM2 provides 128-note stereo polyphony, reads earlier Motif libraries (ES/XS/XF Voices), and has roughly 10 times more waveform memory than the MotifXF. The FM-X engine offers DX-style, 8-operator FM synthesis, and 128-note polyphony. You also get Motion Sequences (tempo-synced control sequences for nearly any parameter), onboard DSP effects (including EDM styles), and the Yamaha CFX Premium Grand Piano library with damper resonance and high-definition reverb.

The **Roland** A01 is a MIDI and analog controller with an onboard 8-bit sound module and 16-step sequencer. It can be used on its own or docked in the K-25m Boutique-line keyboard case. MIDI is available via DIN, USB, or Bluetooth, with CV and gate outputs and a speaker also included. It can be powered by batteries or USB.

Another show fave was Roland's EC-10 EL Cajon, a traditional wooden cajon with a built-in sound module, trigger sensors, and speaker that lets you layer electronic sounds over the natural acoustic timbres. Everyone wanted to play it!

Casio unveiled the MZ-X500 and MZ-X300, a pair of keyboard arrangers with built-in speakers, phrase and chord triggering, and sampling. Both 61-key instruments have a color touchscreen and velocity-sensitive pads, and are packed with a wide range of new sounds—from tonewheel organs, synths, and percussion to guitars and basses, reeds, and brass.

If you're looking for portable, low-cost MIDI controllers, check out the **Monoprice** Pro Audio series. The 25-key 606304 and 49-key 606607 are velocity-sensitive and have DIN and USB MIDI outs, four knobs with two banks, a master fader, pitch bend, and a mod wheel. Using the Edit button, the keys can perform other functions such as data-entry.

The **Zoom** ARQ Aero RhythmTrak is a cleverly designed instrument made up of a tambourine-sized controller that connects via Bluetooth to a hardware base station. Together, they offer sampled rhythm and synth sounds, and let you capture phrases and loops. The Ring Controller has 96 pressure- and velocity-sensitive pads that illuminate. It's a blast to play, and once you start, you won't want to put it down.

ZOOM ARQ
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GUITAR SPLITTER & BUFFER
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dbx 580
PowerBlock
Sonnox OXFORD ENVOLUTION
Roland A-01
MASTER VOLUME
ARP ON/OFF
MOTION SEQ ON/OFF
TRIO+ Band Creator + Looper

MODULAR MADNESS

The modular-synth bubble shows no sign of bursting, thanks to the incredible array of new products appearing at NAMM. Among the most interesting news items was the return of E-mu founder Dave Rossum to the modular world with **Rossum Electro-Music**. He showed three new modules—the Evolution variable-character ladder filter, which will ship soon; the Morpheus stereo morphing Z-plane filter; and the Control Forge programmable CV generator. The latter two are still in development.

Waldorf also made a splash at the show with its Eurorack Pack, combining a 37-note Fatar keyboard and 100HP Eurorack case with USB and MIDI. It also showed new modulator, compressor, and dual-VCA modules.

Doepfer showed its new Vintage Edition A-100 modules with all-black panels, the A-157 Trigger Sequencer, and the A-110-6 Trapezoid Thru Zero Quadrature VCO, which promises to be a knockout.

Among the 500 Series modules, we were pleasantly surprised to see **JHS** putting its stompbox technology into this pro-audio format. The modules include the Colourbox preamp/EQ, Emperor analog modulation, Panther Cub analog delay, and Pulp 'n' Peel compressor/distortion/EQ.

Both the **dbx** PowerBlock 3 and PowerRack 3 support three 500 Series modules, on the desktop or in a 1U space, respectively. The company also showed the 540 Class A tube mic preamp, the 555 5-band parametric EQ, and the 565 dual-channel optical compressor.

STUDIO AND STAGE HARDWARE

The big news is mic technology came from **Shure** with the release of its KSM8 Dualdyne, a dual-diaphragm dynamic vocal mic with a cardioid pattern. The dual-diaphragm is designed to mitigate the proximity effect while eliminating presence peaks and low-end roll-off. The mic is also available as a wireless capsule and with a handheld transmitter option for the company's Axient, UHF-R, ULX-D, and QLX-D wireless system.

Audio-Technica unveiled a pair of high-quality dynamic microphones for use on instruments in live sound and recording situations. The diminutive AE2300 is intended for brass and winds, amps, and percussion, with minimal off-axis coloration while handling high SPLs. It has a cardioid pattern and a brass body, and includes a highpass filter. Also suitable for drums and amps, the hypercardioid ATM230 handles high SPLs and comes with a drum mount.

Electro-Voice introduced eight new ND Series wired microphones suitable for live sound reinforcement and recording. Four are handheld, dynamic vocal mics (two with an on-off switch) that have features geared toward various venue sizes. The instrument models—three dynamic and one condenser—include the ND44 for toms and snare (with mounting clip), the ND46 for drums and other instruments with a pivoting capsule, the ND68 for kick drum, and the small-diaphragm ND66 condenser with filter, pad, and pivoting head.

Radial Engineering showed the JDX Direct-Drive, a guitar-amp emulator and direct box for gigging and recording. Offering three amplifier tones, the pedal has a tuner jack, selectable presence boost, ground and polarity switches, and 1/4" and XLR outputs. Radial also showed the Shotgun, a device that lets you drive up to four amps without ground-loop issues. The outputs are buffered and transformer isolated, and you can use it in mono or stereo (the latter with two pairs of outputs). Ground-lift and polarity switches are included.

From **iConnectivity** we saw the iConnect Audio 2+, a 2-in/6-out audio and MIDI interface with 24-bit, 96kHz resolution and the ability to connect two computers simultaneously. Included is a pair of front-panel combo jacks, four TRS outputs and a stereo headphone jack, standard MIDI I/O, and USB. The unit runs on bus power or the optional power supply (great for powering a connected iPad).

The MudGuard V2 is the updated microphone shield from **Auralex**. The shell and foam lining are now a convex shape that redirects sound away from the microphone, while mitigating room tone and off-axis coloration.

And while we're on the topic of studio treatment, **GIK** displayed its Alpha Wood Series panels that combine absorption and diffusion characteristics. Utilizing fabric-wrapped rigid fiberglass in a wood frame, the series is now available in three panel sizes as well as a corner bass trap.

Several companies introduced new headphones at this year's show. **Sennheiser** has reduced the number of its HD 25 models to three—the HD 25 classic with split headband, the HD 25 Plus with extra cables and accessories, and the simpler, less expensive HD 25 Light. The new **Fostex** TR Series also offers three models with 40mm drivers: the open-back TR-70; the fully closed-back TR-80; and the semi-open TR-90. Their high-resolution model has been updated as well. The Fostex TH-900mk2 provides a balanced cable for greater dynamic range and reduced crosstalk. Pair this model with the company's new HP-A4BL D/A converter and headphone amp.

The **Samson** Z Series headphones include four models—Z-25, Z-35, Z-45, and Z-55—with an increase in quality and features with each higher number. The Z-55 is the reference pair and includes lambskin ear pads and three different cables. **AKG** showed its closed-back K182 monitor headphones with 50mm transducers, as well as the on-ear K67 DJ and over-ear K167 DJ headphones with 40mm drivers. Lastly, **Audio-Technica** released the ATH-M50xMG, a matte gray version of its popular critical-listening headphones.

The world of in-ear monitors continues to evolve with **Westone** introducing three new models in its passive Ambient Pro Series. The single-driver AM Pro 10, the dual-driver AM Pro 20, and the three-driver AM Pro 30 utilize the company's new SLED technology to provide high-quality reproduction while allowing the user to hear ambient sound without losing the low end.

Audio-Technica's new E Series in-ear monitors are available in three models, all of which have detachable cables. The top of the line is the ATH-E70, which provides three balanced armature drivers, whereas the ATH-E50 has single balanced armature drivers. The ATH-E40 has dual push-pull drivers.

The **Samson** Expedition XP800 is an 800W portable P.A. package that includes an 8-channel mixer with 4 mic/line inputs and phantom power, 24-bit digital effects, Bluetooth connectivity and USB wireless port, a pair of 8" speakers, a Class D amplifier, a subwoofer output, and two 25' speaker cables. Best of all, everything snaps together neatly into one unit for an easy schlepp.

JBL's EON600 Series now has some serious low end. The EON618S is a 1,000W powered subwoofer with an 18" speaker, DSP, and Bluetooth control for iOS and Android users. The company also debuted the Sub18 high-output studio subwoofer, featuring an 18" driver that reaches down to 18 Hz and offers 8,000W of peak power.

Small, portable, easy to use, and versatile—those were the design criteria of the **Mackie** ProDX wireless digital mixers. Using the MixerConnect app (iOS/Android), you can mix at a distance, adding effects and streaming audio over Bluetooth from your smart phone. The 4-channel ProDX4 has two combo jacks, a stereo mini-jack input and an aux send, while the 8-channel ProDX8 has 6 combo jacks, a mini-jack input, and two aux sends.

SOFTWARE INSTRUMENTS AND EFFECTS

Plugin Alliance announced its All Bundle V4.0, which includes two new effects—the Dangerous Music BAX EQ and Brainwork bx_cleansweep Pro—as well as two major updates. The SPL Transient Designer Plus adds a limiter, internal and external side-chaining, and parallel processing, whereas the Brainwork bx_digital V3 EQ mastering EQ and mid/side processor now offers full dynamic EQ in the de-esser and an increased EQ frequency range.

Universal Audio enhanced its UAD platform with three new plug-ins at the show. The Marshall JMP 2203 Guitar Amplifier includes five virtual-mic settings and 50 presets from AC/DC engineer Tony Platt, while the Sonnox Oxford Envolution Plug-in gives you control over envelope parameters (attack, hold, release) as well as frequency-dependent control over transients and sustain. UA also added the greatly enhanced Brainworx bx_digital V3 EQ Plug-In Collection to the UAD line.

The **Waves** Abbey Road Reverb Plates plug-in models the studio's four EMT 140 plate reverbs, each of which has its own sonic signature. For example, three of the original plates have hybrid solid-state drive amps, while the fourth has tube-powered drive and output stages. In addition to the original reverb and bass-cut parameters, you get control over real-world artifacts such as crosstalk between the stereo inputs and analog hum and noise.

PG Music released Band-in-a-Box with RealBand 2016, a massive update of its music accompaniment software. The update includes new RealTracks in more genres, filtered sorting, lyric and text layers, additional SuperMIDI tracks and instrumental studies, and support for MusicXML files.

If you own any **Rob Papen** instruments, you can use the new Prisma to stack four of his instrument in one plug-in. Open and edit each instrument individually, add effects from the Prisma library, then save the layered instrument as a preset. Best of all, Prisma is free!

Applied Acoustics Systems showed Chromophone 2, a new rev of its physical-modeling percussion instrument. Version 2 includes an additional drum-skin model, a compressor and EQ module, a multi-effects processor, an updated interface, and presets by Richard and Sean Devine.

Owners of **Synthogy** Ivory II will want to check out the Synthogy Ivory II VR, a portable, standalone hardware module for playing the piano library without a computer. The library loads from a USB stick plugged into the front panel. Features include MIDI I/O, two phantom powered mic/line inputs, a built-in digital mixer, XLR outputs, and a 1/4" headphone jack. The module supports USB 3, Ethernet, and WiFi for wireless use.

EFFECTS, ACCESSORIES, ETC.

Among the **Boss** releases was the VO1 Vocoder, a stompbox with four modes—Vintage, Advanced, Talkbox, and Choir. In addition to 1/4" and XLR inputs, the VO1 provides an effects loop.

With two 5-minute loop tracks available, the true-bypass and stereo **TC Electronic** Ditto X4 Looper offers seven types of effects, MIDI sync, and control over decay. The company also showed the Bonafide Buffer, which allows guitarists to run long cables without sacrificing high frequencies.

Electro-Harmonix displayed several new products, including the Lester G rotating-speaker emulator, the Super Space Drum and Crash Pad percussion effects, and the 720 Looper, which provides 12 minutes of stereo recording on 10 independent loops.

The **DigiTech** Trio+ is a significant upgrade to the company's Trio pedal. New features include an effects loop, an SD card slot, a synchronized looper, and the ability to learn up to five song parts. Controls for Genre, Style, Tempo, Loop, plus bass and drum level are included.

Singular Sound BeatBuddy is now available in a less expensive, compact version. The BeatBuddy Mini is a mono drum-accompaniment pedal offering 16-bit resolution, 10 drum kits, 21 styles, 100 songs, a metronome, and support for the BeatBuddy footswitch.

In addition to launching a full line of accessories—cables, stands, LED clip-on lamps, instrument bags—**Roland** debuted the JC-01, a lightweight, portable Bluetooth audio speaker with classic Jazz Chorus styling. ■

More NAMM Highlights

MOTU announced a free firmware update to its latest generation of audio interfaces, which will add remote control of preamp settings, SMPTE timecode support, and the ability to display pre- and post-fader levels on the input meters of the Mixing tab.

Harrison announced Version 3.1 of its Mixbus DAW.

The **Focusrite** RedNet A16R offers 16 remote-controlled analog I/O in a 1U box for a Dante audio-over-IP network.

MV Pro Audio hosted the new **Klawitter Designs** KD-X Elite Series reference monitors for the studio.

SIMMONS

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ADVANCED FEATURES...

AMAZING PRICE

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Module provides over 350 sounds and 35 kits.

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SD500KIT

5-Piece Electronic Drum Set

The Simmons **SD500KIT** is truly taking electronic drums to an entirely new level of value! This full-size 5-piece electronic drum kit explodes with features, including all the professional benefits of larger kits – 4 drum pads, 3 cymbal pads, hi-hat controller and a radical, integrated kick pad & pedal – plus 352 exceptional drum sounds across 35 drum kits (25 preset/10 user). And its V.A.R. (Variable Attack Response) technology means better nuanced playability than any other kit in its price range.

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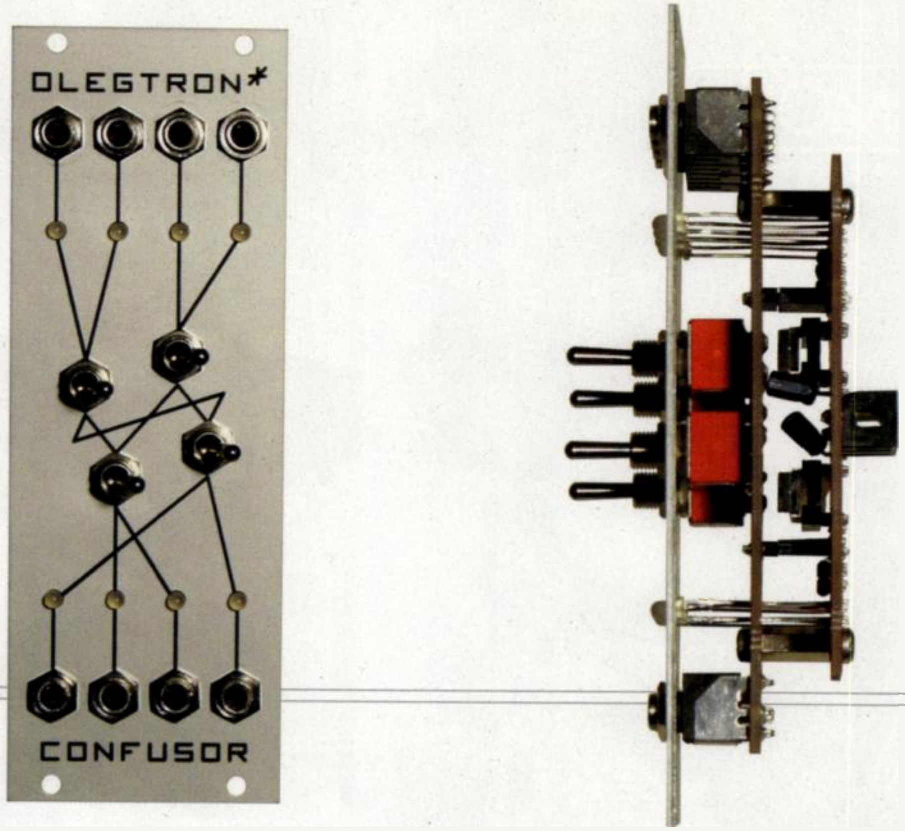


The Olegtron Confusor is a surprisingly powerful yet inexpensive switcher that requires only 9HP of rackspace.

OLEGTRON Confusor

A 4-CHANNEL SIGNAL ROUTER FOR EURORACK SYSTEMS

BY GINO ROBAIR

Although multifeatured sound generators, processors, and filters are exciting to explore, it is hard to deny the creative inspiration that a cleverly designed utility module provides. A great example of this is the Olegtron Confusor ($69; olegtron.com), which lets you redirect signals in a patch without unplugging cables. Using the switches, each of the four inputs can be sent to one of the four outputs, resulting in 16 different routing options. (Signal mixing is not an option.)

The 4-channel signal path is passive and can be used with any combination of control voltages, gates, triggers, and audio. Moreover, you can send signals in either direction—from the top row to the bottom row or vice versa. Two-color LEDs next to each of the 3.5mm jacks show the signal polarity (green when positive, red when negative), which is very handy if you're tracing the path of a signal through the module.

Despite what it says on the Olegtron website, the Confusor can also be used as a mult. If you don't patch signals in the top row sequentially starting with the left jack, the input mults to contiguous inputs on the left. For example, if you plug a cable into the second jack from the left (without any other inputs), the first input gets an unbuffered mult of the input signal, which you can then route to any output using the switches. Plug into the third jack, and the first two channels get the multed signal.

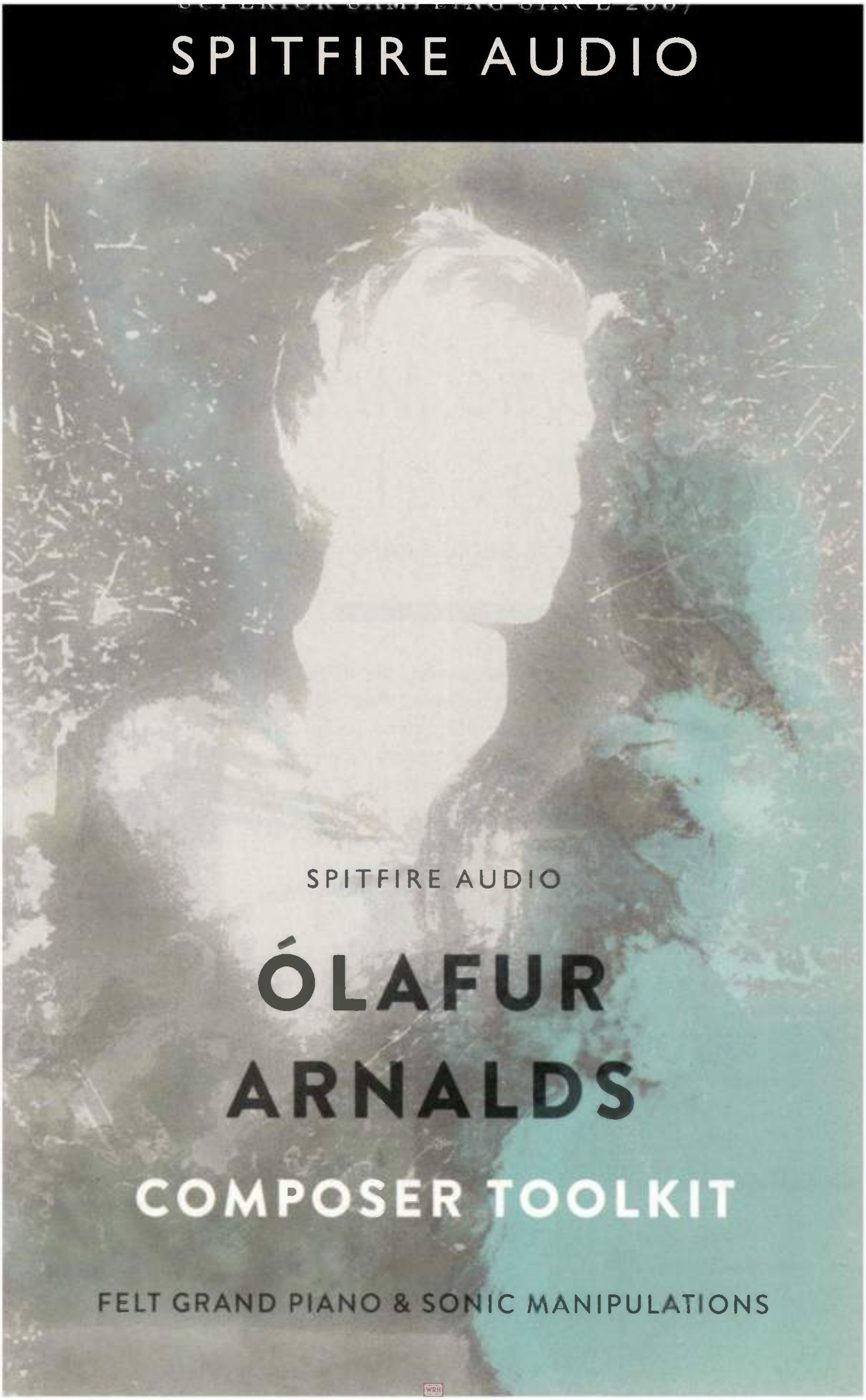
The lower row is also affected when only one cable is patched into the top row. If your input is plugged into the second jack, the signal is routed to two outputs at the same time. Plug a signal into jack 2 and jack 4, and jacks 1 and 3 get multed signals from the input to their right. Patch into the third or fourth jack, and the signal appears simultaneously at three and four outputs, respectively. In all but the last setup, you can still use the switches to move signals between outputs.

While all that may seem confusing, it is easy to grasp once you begin working with the Confusor. In fact, the flexibility in routing makes this a surprisingly powerful module for the money.

I enjoyed using the module as a way to add indeterminacy into a patch by shuffling the input signals between destinations to get unexpected sounds. For example, my favorite patch was to have four signals patched in, with two outputs going to the stereo mixer while the other two outputs were patched to CV inputs of the source modules. I could use one of the bottom-row switches to swap the output channels and the other switch to flip the destinations of the cables running CVs.

To spice things up further, I included an Epoch Modular Benjolin as one of the source modules to get semi-randomized signals, patched in some Circuit Abbey logic modules to chop them up more, then introduced the Make Noise Teleplexer for additional real-time signal routing. With the Confusor at the heart of it all, it felt like I had many more than 16 patching options.

But even in a more modest setup, you'll find the Confusor useful for adding rhythmic and timbral variation, no matter what musical direction you take. ■


SPITFIRE AUDIO
SPITFIRE AUDIO
ÓLAFUR ARNALDS
COMPOSER TOOLKIT
FELT GRAND PIANO & SONIC MANIPULATIONS

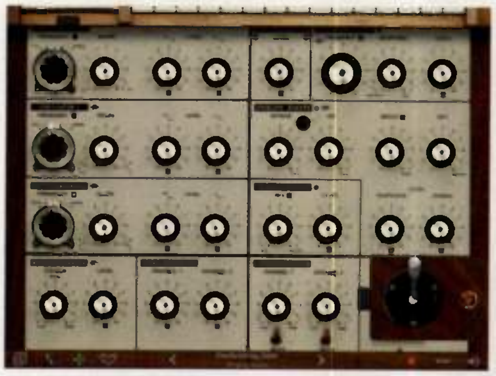
The *Electronic Musician* Guide to iOS Soft Synths

Turn your iPad or iPhone into a portable synthesizer studio

BY GEARY YELTON

In recent years, using iOS-based synthesizers onstage and in the studio has become a practical reality. One reason is that the latest iPads and iPhones contain more powerful processors than even some recent laptop computers. Apps are growing considerably more sophisticated and more closely resemble their computer-based equivalents, often by leveraging all that processing power. Thanks to economies of scale and the difficulty of pirating iOS apps, they're also less expensive than computer-based soft synths and much, much less expensive (and often more versatile) than synthesizer hardware.

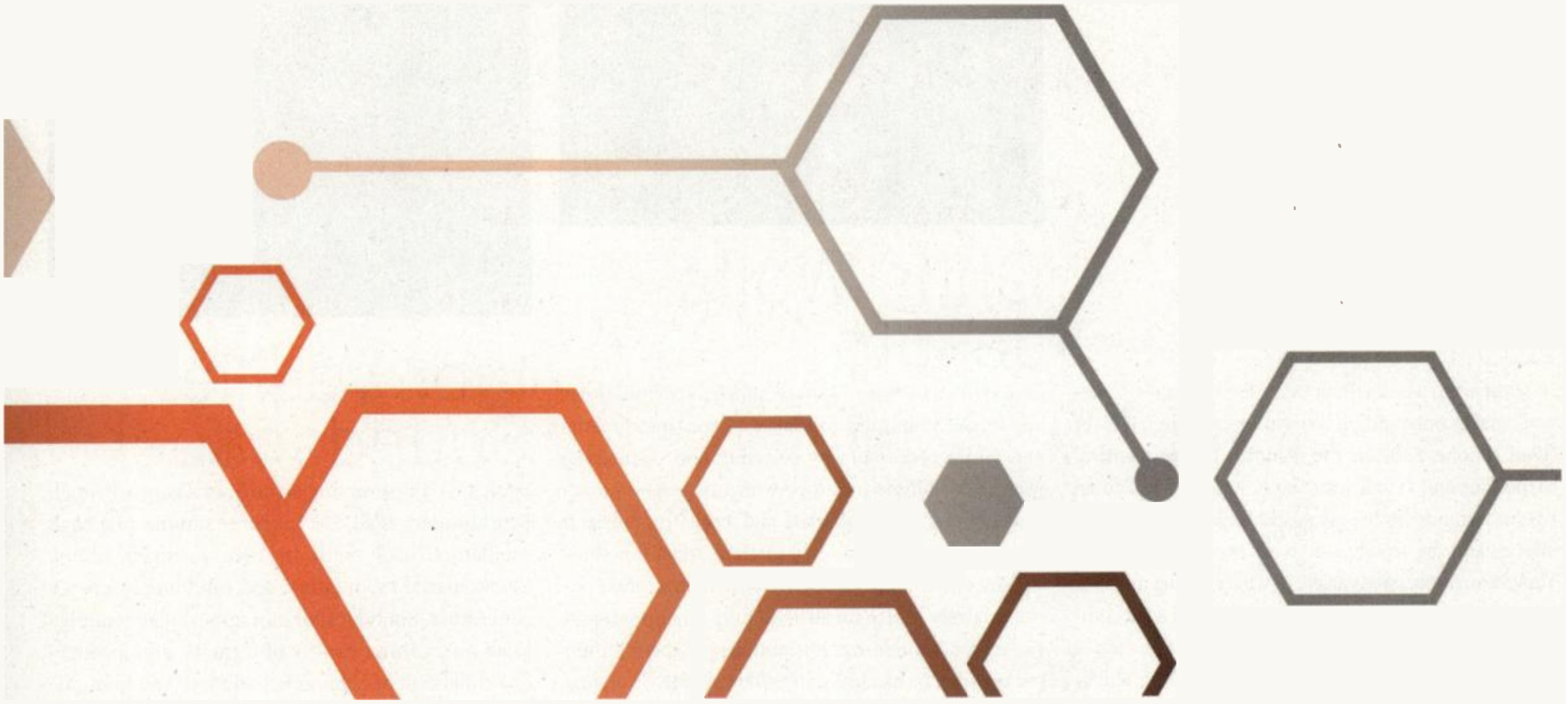
With dozens of synth apps available, you may want some guidance about which ones are worth your time and money. Although this list is by no means comprehensive, I recommend all 20 synths in this article for increasing your timbral range and musical creativity. All are polyphonic, all support Apple's Core Audio, and all except for Roli Noise support Core MIDI and Audiobus. Some provide in-app purchases at extra cost to enhance or expand their capabilities, and additional presets are available for all of them.

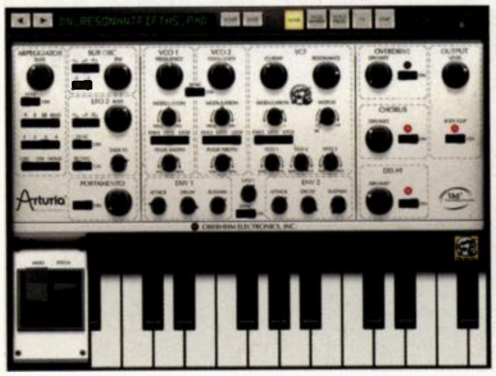


ApeSoft iVCS3

The developer who created iVCS3 (iPad, $15) deserves heaps of credit for making such a faithful emulation of the classic, quirky EMS VCS 3, the first truly portable modular synthesizer. Launched in 1969, the VCS 3 had no hardwired connections; you connected circuits by inserting pins in a patch matrix. To connect a VCO to a VCF, for example, you inserted a pin at their intersection in the matrix. Although iVCS3 adds a keyboard and 16-step sequencer from later EMS instruments, it duplicates the original synth so precisely that I recommend reading the original VCS 3 manual if you want to master it.

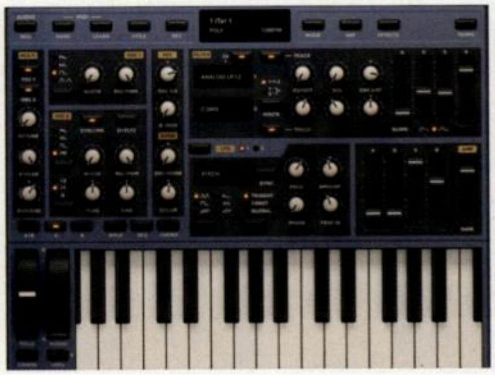
WRH





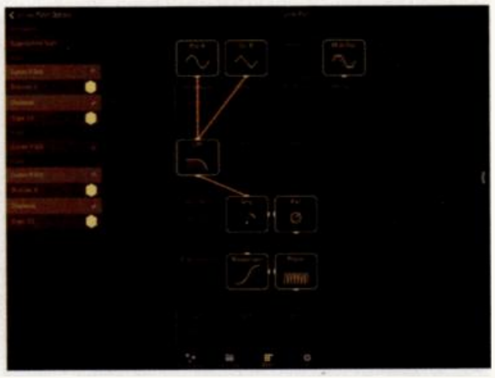
Arturia iSEM

iSEM (iPad, $10) re-creates the Oberheim SEM (Synthesizer Expansion Module), which was introduced in 1974 and supplied each voice in Oberheim's legendary Two-Voice and Four-Voice models. Like the original, iSEM has two oscillators, a 2-pole multimode filter, and two 3-stage envelopes, and its warm, virtual analog sound might fool even a purist. Unlike the original, it also has a suboscillator, second LFO, arpeggiator, and 8-slot modulation matrix, as well as overdrive, chorus, and delay effects. You can offset the values of six parameters so that each of eight voices generates a different sound, making iSEM 8-part multitimbral, too.



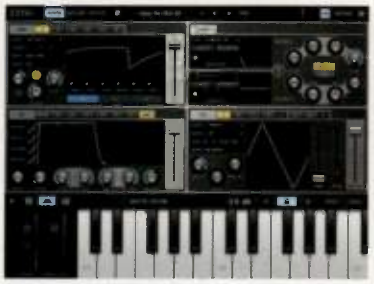
BeepStreet Sunrizer

Sunrizer (iPad, $10) is an analog-modeling synth with a distinctively digital personality. Resembling Roland's JP-8000 in more ways than one, Sunrizer gives you two oscillators featuring stackable supersaw waveforms and two independent filters with a selection of 15 types. In addition, it offers numerous effects, an onboard audio recorder, MIDI CC mapping, up to 20 voices of polyphony, and an arpeggiator that lets you design your own patterns. Sunrizer is also available as an AU and VST plug-in ($50) for the Mac and Windows, and a scaled-down version called SunrizerXS ($3) is available for the iPhone.



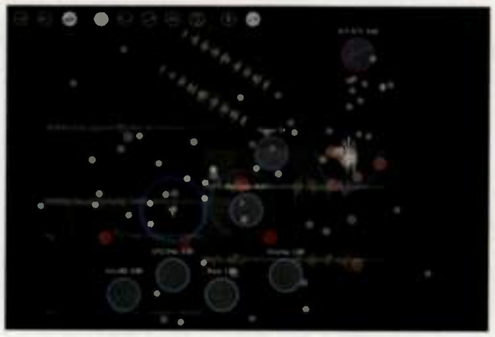
Bit Shape TC-11

TC-11 (iPad, $25) isn't quite like any other synth. Instead of employing knobs and sliders, it relies on iOS's unique capabilities to graphically and expressively control dozens of parameters simultaneously. Using the iPad's multitouch, accelerometer, gyroscope, and compass, TC-11 measures the position and motion of your iPad in space, as well as how many fingers are touching it and the speed, angle, distances and timing of their movements. TC-11 is modular in that you link "synth objects" such as oscillators, filters, and modulators together onscreen to create patches. Best of all, it's great fun to play.



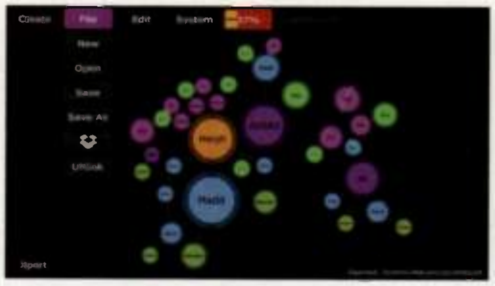
Cakewalk Z3TA+

In addition to a bestselling DAW for Windows, Cakewalk makes outstanding soft synths, including Z3TA+ (iPad/iPhone, $20) for the iPad. It's almost identical to the Mac and Windows version, with six oscillators, two multimode filters, six ADSRs, six LFOs, loads of effects, and an arpeggiator with over 200 patterns. You get an impressive variety of waveshaping tools for warping, twisting, and otherwise mangling a substantial collection of waveforms. Add a modulation matrix with 16 routings, an assignable x-y pad, and the ability to exchange presets with computer-based versions, and you have an app that demonstrates how tablets are catching up with desktop computers.



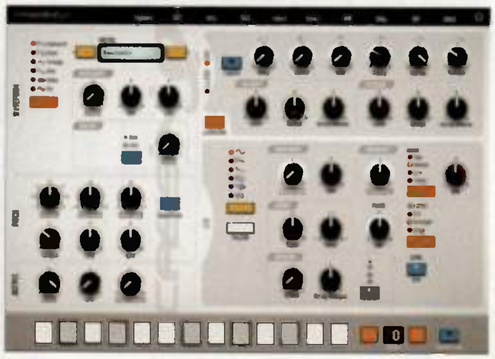
Chris Carlson Borderlands Granular

Like TC-11, Borderlands (iPad, $10) eschews the musical keyboard paradigm in favor of multitouch. One of the best apps for exploring granular synthesis, Borderlands lets you import or record multiple audio clips and then superimpose one or more grain clouds to play selected portions. Double-tapping on a cloud summons buttons to change pitch, duration, filter resonance, polyphony, and similar parameters. Buttons overhead change playback direction, select amplitude envelopes, and so on. You can automate your gestures by recording them, and save and recall your configurations as scenes. Borderlands lets you manipulate sound grains directly and generate unique sounds in the process.



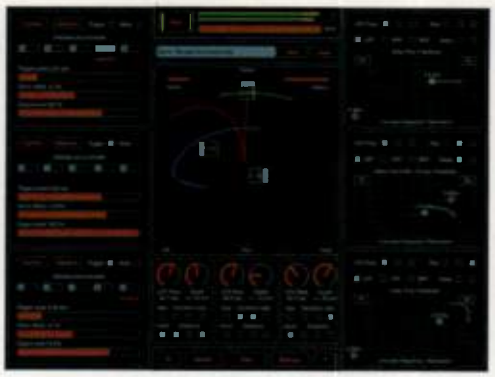
Chris Wolfe Jasuto

Jasuto (iPad/iPhone, $1) is a comprehensive modular app for designing and building onscreen instruments and audio processors by selecting and connecting oscillators, filters, envelopes, effects, a 64-step sequencer, an accelerometer, and other modules. It supports OSC and handles mathematical functions and spectral processes such as convolution and Fourier analysis. It also furnishes a fully functional sample editor. Double-tap on modules to specify their parameters, or modify values in real time by changing the distances between them onscreen. Jasuto isn't for everyone, but it will let you create sounds beyond the reach of most synthesizers.



iceGear Cassini

Cassini (iPad, $6; iPhone, $4) is a straightforward emulation that doesn't focus on any particular synth in the real world. Beyond the initial keyboard and performance control page, an entire screen full of knobs and buttons is devoted to each of Cassini's three virtual analog oscillators, two multimode filters, amplitude modulators, delay, programmable polyphonic arpeggiator, and global parameters. You also get 9 DAHDSR envelopes, 6 LFOs, audio recording, and a ton of excellent, usable sounds that desperately need more descriptive names than they currently have.



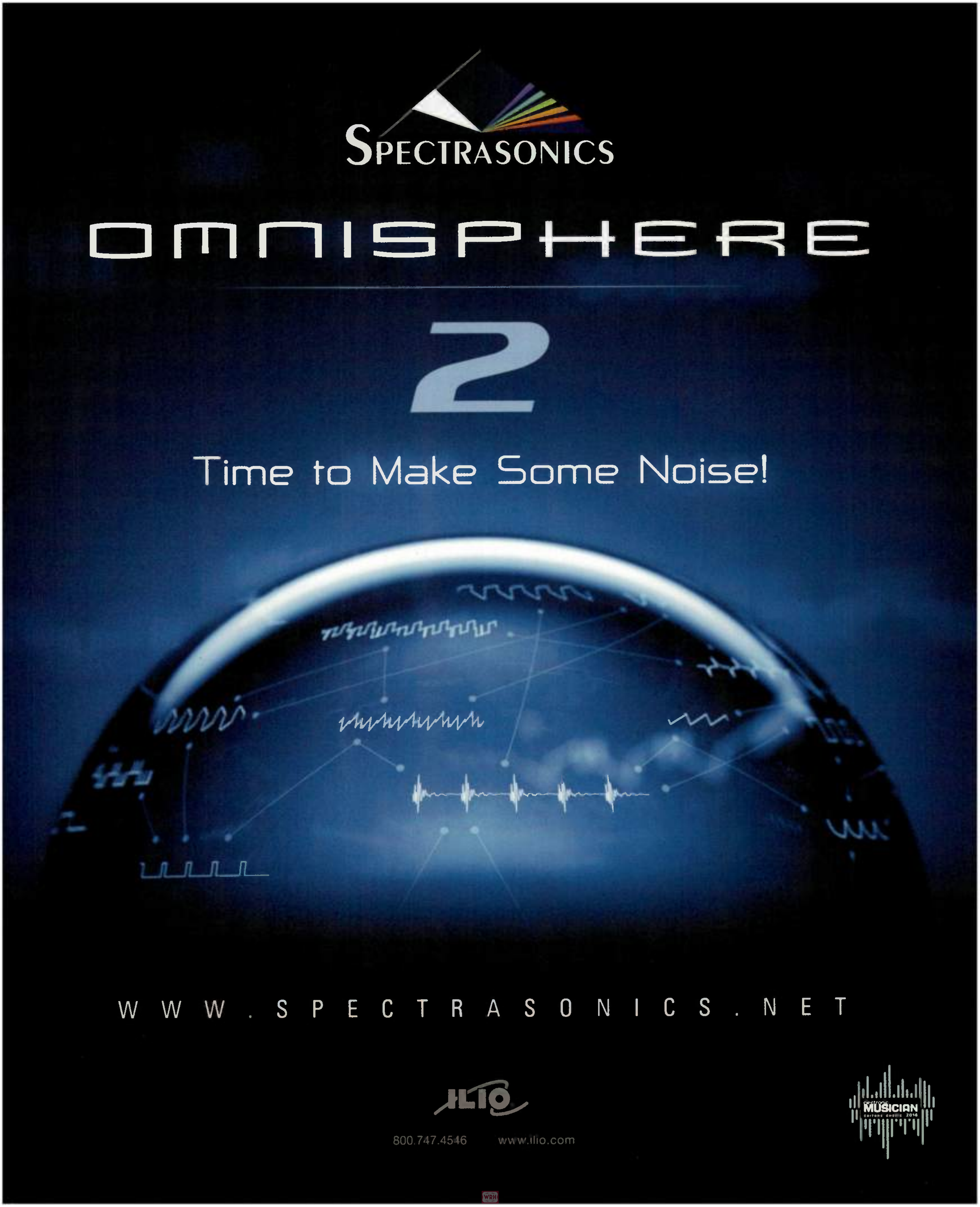
Igor Vasiliev Soundscaper

With a GUI resembling an airliner's control panel, Soundscaper (iPad, $9) has three sample-playback oscillators, each with its own resonant filters, LFOs, spatial modulators, and random parameter generators. Soundscaper can import user samples in an astonishing variety of formats, and a generous collection of content is included. You manipulate samples by modulating their playback speed, processing them with delay, and applying functions that realistically simulate lo-fi circuit bending. Although it may take a while to fully grasp how to use Soundscaper most effectively, it excels at synthesizing bizarre background noises, glitchy rhythms, and otherworldly textures.

Check the Requirements

For usable performance in more-than-casual music environments, many of the apps outlined here require a recent iPad or iPhone running an up-to-date version of iOS. Although iPhone apps run on iPads, most iPad apps don't reciprocate. The iPod Touch, however, is totally compatible with iPhone apps.

Though some apps will function on your old iPhone 4, others require the very latest iOS and at least an iPad Air or iPhone 5s. Getting refunds from Apple can be a pain, so it's your responsibility to check the hardware and iOS requirements before purchasing. Also remember that if your device has additional memory, then not only can you install more apps, but also you can store more audio data—very helpful for apps that import user samples.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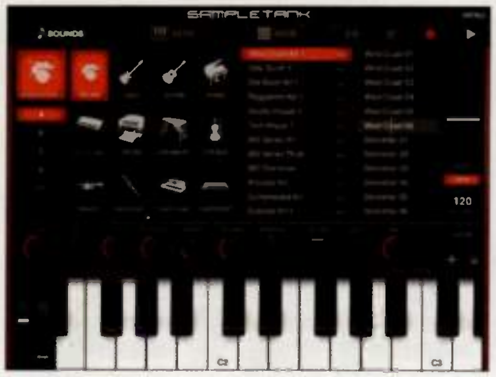
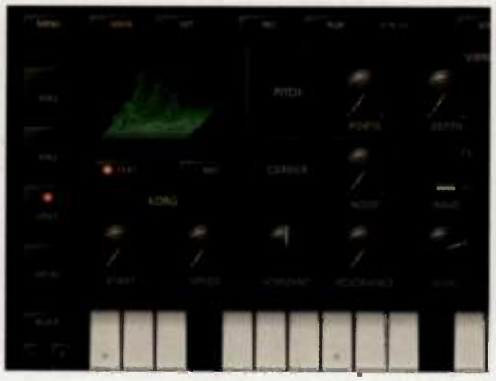


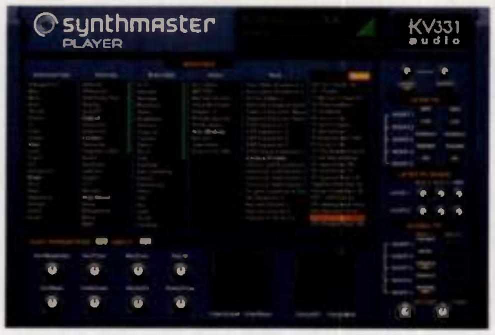
IK Multimedia SampleTank

At 1.3GB, SampleTank (iPad/iPhone, $20) needs more space on your device than other music apps, but that's the price you pay for a virtual ROMpler with so much usable content. And if you opt for any expansion packs, they'll need even more space. Nonetheless, SampleTank is definitely the way to go if you want lots of sampled instruments, as well as riffs, grooves, and patterns designed for specific instrument types. Similar to the Mac and Windows versions, the iOS version has some terrific user-interface touches all its own. A free lite version is also available.



Korg iDS-10

Inspired by all-in-one music production workstations, Korg has taken its popular app for Nintendo's pocket-sized DS game console and expanded it. iDS-10 (iPhone, $20) combines two analog-modeling synths (with virtual patch cords), a voice synth, drum machine, KAOSS pad, mixer, and 64-step sequencer with 32 chainable patterns. The voice synth lets you create vocoder-like wavetables by typing words or phases or by speaking into your iPhone's microphone. You can shape synthesized speech by altering playback speed, formant settings, effects, and more. iDS-10 can also automate parameter changes, load preset keyboard scales, and display animated waveforms in an onboard oscilloscope.



KV331 Audio SynthMaster Player

A 2016 Editors' Choice Award winner, SynthMaster Player (iPad/iPhone, free) is the iOS counterpart to SynthMaster, a fully featured (and highly recommended) soft synth for the Mac and Windows. The free version gives you 200 presets in a variety of categories, along with eight knobs and a pair of x-y pads to modify specified parameters. Upgrading to the Pro version ($10) scores 800 additional presets and the ability to save parameter changes. Many additional banks are available via in-app purchase. If SynthMaster is on your computer, Player can import all its presets, too.

PH34/44 SUT
Step up transformer

Hafler
PH44

- Passive step up transformer boosts signal without noise
- Jensen Transformer for unmatched performance
- Hand wired for optimal signal flow and low noise
- Ruler flat frequency response from 10Hz to 100kHz
- Two models - for 5 and 45 Ohm cartridges

PH44
OUTPUT
GROUND
INPUT
Hafler

"I have been using Hafler for over 25 years and I've never been disappointed. Their performance is outstanding, they are very dependable and their dynamics are just what I look for."

Al Schmitt
Capital Records - Grammy winning Engineer
Frank Sinatra, Barbra Streisand, Steely Dan, Yo-Yo Ma

PH50 phono stage
for moving magnet

Hafler
PH50
LOW CUT
POWER

- Phono stage for moving magnet cartridge
- Ultra low noise transformerless design
- Variable high-pass filter to eliminate rumble
- 91dB dynamic range - 0.002% distortion
- Plug and play easy to set up and use

PH50
PHONO PREAMP FOR MOVING MAGNET
OUTPUT
INPUT
GND
Hafler

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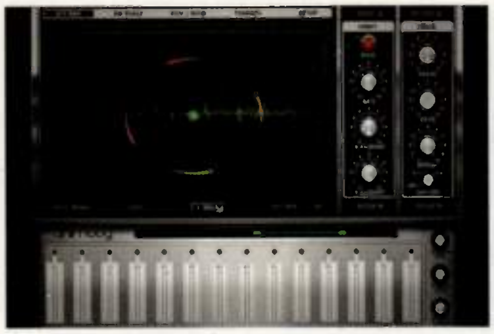
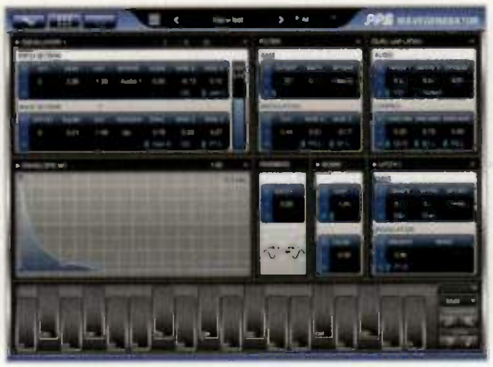


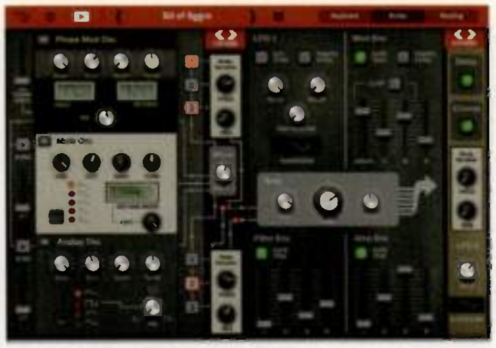
Moog Animoog

Animoog (iPad, $30; iPhone, $6) has long been one of the most formidable and popular music apps for iOS. Beginning with samples of various synths and effects that have been resynthesized into wavetables, Animoog lets you define a 2-dimensional path that modulates individual notes and animates them on an x-y pad. By superimposing modulation animation over a real-time waveform display, you get a vivid representation of dynamic changes in timbre as the index moves through wavetables. Outstanding features include a versatile filter, three ADSRs, four LFOs, 22 editable scales, 4-track audio recording, and "touch" keys that control modulation as you play.



PPG WaveGenerator

PPG's Wolfgang Palm, who invented wavetable synthesis in the late 1970s, began developing iPad apps a few years ago and has since ported them to the Mac and Windows. WaveGenerator (iPad, $20) not only comes with a generous assortment of wavetables, but also allows you to roll your own. Once you've created and edited individual waves and chained as many as 256 of them into wavetables, you can build complete programs using three oscillators, a lowpass filter, 14 ADSR envelopes, 4 LFOs, an arpeggiator, and more. WaveGenerator can even transform your photos into sounds.



Propellerhead Thor

Many Propellerhead Reason users were thrilled when Thor Polysonic Synthesizer (iPad, $15) migrated to the iPad. It looks, sounds, and operates almost exactly like the Reason-based version, with all the same functionality and identical, compatible presets. You get six synthesis types, including wavetable, FM, and phase modulation; four filter types, including state-variable and a formant filter for vocal-like effects; and 6-channel, 16-step sequencing. The 16-slot modulation matrix routes dozens of sources to dozens of destinations, and the onscreen keyboard simulates velocity and aftertouch in response to how and where you touch it.

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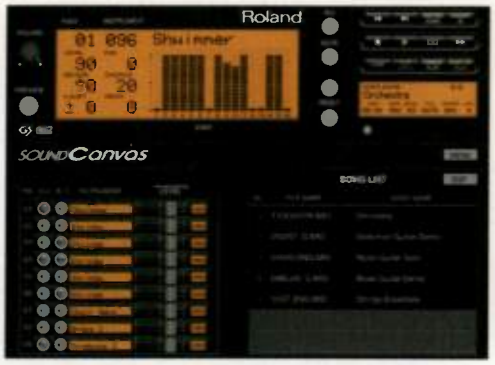
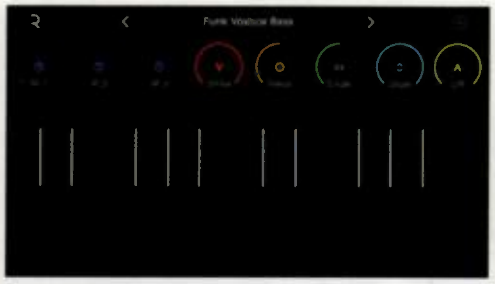


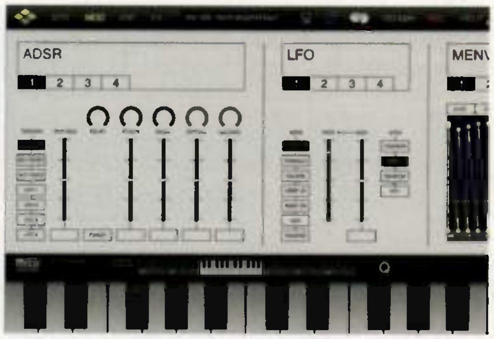
Roland Sound Canvas

When General MIDI was standardized in 1991, one of the first instruments to embrace it was Roland's SC-55, the first of 19 modules to bear the Sound Canvas moniker. Last year Roland resurrected Sound Canvas (iPad/iPhone, $20) as a faithful emulation of its hardware forebears. It duplicates the SC-8820's sound and features and supplies sound maps compatible with four vintage Canvases, making it ideal for playing standard MIDI files. It even supplies a MIDI file player that lets you edit the key and tempo, repeat song sections, and arrange songs in any order you like.



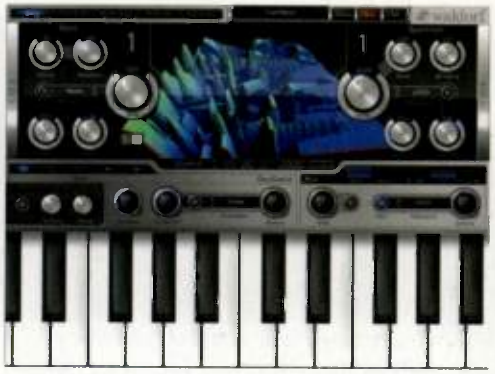
Roli Noise

You've probably heard of the Seaboard Rise, a polyphonic multidimensional controller that's a cross between a squishy keyboard and a ribbon controller, paired with the computer-based soft synth Equator. Recently Roli introduced the Seaboard's iOS counterpart, Noise (iPhone, free). On the iPhone 6s, it senses how much pressure you apply to the display using 3D Touch to generate aftertouch. Even with older devices, you can control velocity, release velocity, and vertical and horizontal finger movement to play expressively. Noise supports MIDI over Bluetooth, and it comes with 25 Equator-derived sounds, with more available through in-app purchase.



VirSyn Tera Synth

Fifteen years ago, VirSyn Tera (iPad, $20) was a Windows-based modular soft synth called VirSyn, which quickly evolved into the cross-platform Tera. After releasing the waveshaping microTera on the iPad in 2014, VirSyn (the company) introduced a full iPad version, sporting many features that made the original so cool. A scrolling front panel affords access to knobs and sliders for all parameters. Tera Synth has oscillators with waveguide and subharmonic options and a formant filter bank supplementing the dual multimode filters. Modulation routing is extensive, too, with four ADSRs and four envelopes with up to 64 stages.



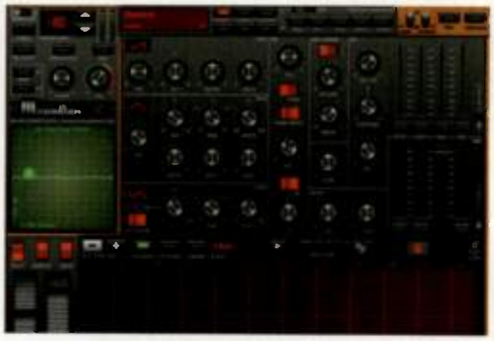
Waldorf Nave

The app that gives you the firmest grasp on wavetable synthesis is Nave ($20, iPad), a 2014 Editors' Choice Award winner. Along with standard analog-style waveforms and a great selection of wavetables, Nave can transform audio files into wavetables and text into synthesized speech. You get three loopable envelopes, numerous effects processors, and a modulation matrix with 8 scalable slots to customize your sounds. Add a 4-track audio recorder, a sophisticated arpeggiator and an alternate keyboard that lets you control modulation directly on the keys, and you have the means to create totally original sounds.

Playing Well Together

You can link soft synths and other music-production apps together so that they communicate with one another within a system. Although Apple has introduced plug-in functionality for iOS apps by means of Audio Unit Extensions, apps that support Audio Units aren't yet commonplace. Until they are, Audiobus (iPad/iPhone, $10) is essential for anyone who wants to route audio between apps. It enables you to stream the output of one of more synths to effects apps for processing and then to a multitrack recording app, for example.

Numerous devices are available for getting high-quality audio and MIDI signals into and out of your iPhone, iPad, or iPod Touch. You can also integrate your iOS apps into your computer-based studio using one of several interfaces from iConnectivity. With iConnectAudio and iConnectMIDI interfaces, you can exchange audio and MIDI data to and from your iOS apps with your computer's DAW as if the apps were plug-ins, using your MIDI keyboard to play the apps or an iOS-based sequencer to play computer-based software or external hardware synths.



Yonac Magellan

Magellan (iPad, $7) is a straightforward virtual analog synth comprising two independent synth engines. Each has three oscillators, an arpeggiator, and dual filters with 11 types. Magellan can display separate keyboards for each engine or stack them as a single 6-oscillator synth. The control panel is spread out over ten screens that display all synthesis parameters (including one-note chord programming) and ten simultaneous effects processors. Route either LFO for each synth to any four of 13 destinations, and link as many as 16 patterns to compose complete songs using the 32-step sequencer. An iPhone version called Magellan Jr. ($5) is also available. ■

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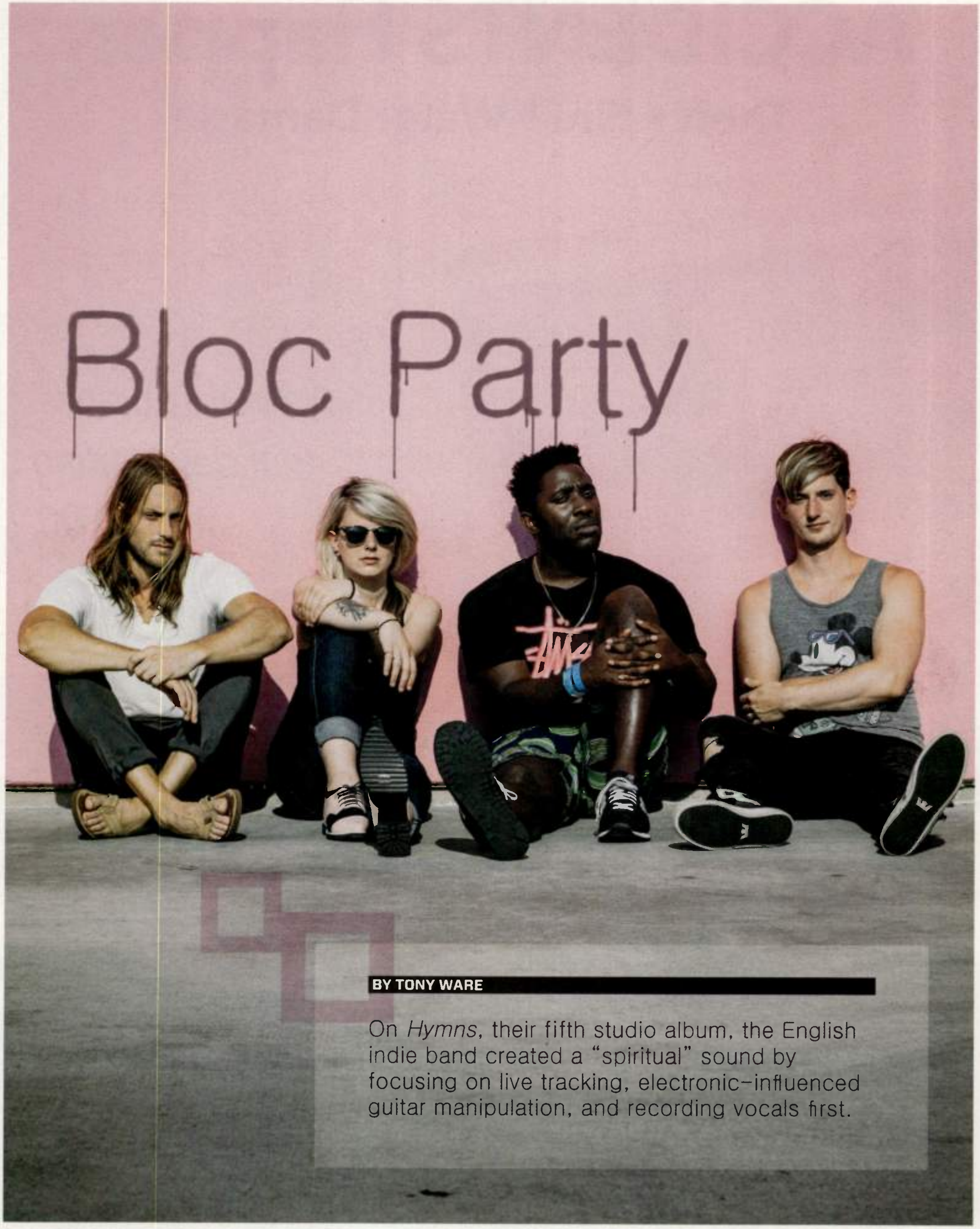
Bloc Party



BY TONY WARE

On *Hymns*, their fifth studio album, the English indie band created a "spiritual" sound by focusing on live tracking, electronic-influenced guitar manipulation, and recording vocals first.

If you want a window into the sessions for *HYMNS*, indie rock band Bloc Party's fifth album, it has to be stained glass.

Surrounded by custom pedalboards and electric pianos, wrapped in an atmosphere of transition following the departures of drummer Matt Tong and bassist Gordon Moakes, founding members Kele Okereke and Russell Lissack set out to make an album imbued with both renewed faith and an approach where nothing is sacred. To help achieve this end, they set a pane of colored glass in the tracking room, projecting random films through it and bathing the room in an attitude.

On the one hand, this window cast an appropriately spiritual dimension on an album with devotional underpinnings, while it also represented a newfound approach to controlling sound. "After *Four* I was kind of repulsed, if I'm honest, by harsh, trebly, angry sounds," says Okereke, the band's vocalist and rhythm guitarist. "*Four* felt cranked up to 11—intense and overdriven, harsh and raw, which was what we wanted, everything sounding like it was in the red. But a year into touring, I wasn't enjoying performing those songs. They felt like we were posturing, playing at rock 'n' roll; it didn't feel like it was coming from an honest place. So as an instinctive mechanism I started gravitating toward more gentle, sensual music."

Immersing himself in DJing, as well as producing his second solo album, *Trick*, Okereke embraced the warmer, deeper, bassier sounds resonating with him. So, when Okereke and guitarist Lissack convened in 2014 to start drafting rough ideas for a new album, the two spoke at length about foregoing scratchy, piercing riffs and instead treating guitar as a malleable, textural element.

"I can imagine people think I have a recognizable style, which is flattering, but they often associate it mostly with the well-known songs from our early releases, which were more frenetic, cutting, and angular," says Lissack. "However, over the course of our history with music I feel like I've covered a lot more than that and my philosophy has always been to progress and do something different.

"Making a guitar sound not like a guitar has always appealed to me, and looking back at the song 'Hunting for Witches' on our second album [*A Weekend in the City*] you can hear what is clearly a guitar, but one with a harsh, computerized edge to it," he explains. "And Kele continues to push me to explore new ideas, as I do the same for him, so there are even more processed, manipulated tones [across *HYMNS*]. On the flip side, on the song 'The Good News' I play slide guitar, which is such a traditional antithesis to the electronically produced tones, but it's still different as it's something I've not done before. There are multiple routes down the path to something new."

Bloc Party debuted in 2003, rising above a wave of raw post-punk bands. Over the next decade the band released four albums that veered between moments of reflective intimacy and blunt aggression. With *HYMNS* Okereke and Lissack entered into what could be considered Bloc Party 2.0, and the efforts to redirect the band's studio process in terms of technicality and musicality proved very illuminating.

"The track 'Only He Can Tell Me' was one of the first things we demoed, and it was incredibly exciting when that song came into being and we stumbled onto that pulsing tremolo effect," reflects Okereke. "It took the brittle nature of the guitar work on Four and gave it instead an impressionistic, almost watercolor feel. To me it was super exciting to hear this blurring of a sound I was so used to hearing, to create songs where the guitar line is almost symphonic, like a distant string section in another room. Russell's sound has always been so close, so sharpened, so there was a beauty to hearing him making these new sounds."

Feeling renewed and ready to fully explore a more diffused aesthetic, Okereke and Lissack turned to production duo MyRiot—Tim Bran and Roy Kerr—well-known most recently for their work on 2013's London Grammar debut record. "Our production for London Grammar involved a lot of reverbs, specific uses of gaps in the audio, and a willingness to not fill every microsecond with something," says Bran. "Right from the beginning Kele and Russell talked about wanting a record with a lot of space and width, saying it would have this personal, spiritual feeling in many forms, and we loved that idea."

Writing across 2014 in bursts, Okereke and Lissack knew they wanted songs enriched by sound design, but constructed from live elements. Additionally, Okerele and Lissack were integrating new bassist Jason Harris (of Portland, Oregon, indie rock group Menomena) into the group. (New drummer Louise Bartle was brought in late in the recording process.) So, booking rehearsal space for several weeks, Bloc Party invited Bran and Kerr to sit in on the last week and offer arrangement suggestions as the band ran through the songs repeatedly.

"It quickly became apparent the goal was always the sound of four people playing in a room, even if augmented or magnified," says Bran. "They might be alternating between electric piano, different guitars, bass guitar or subbass keyboards, but it all reflected people plugged in, so the first

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step was to find ways to distill eight hours of rehearsal a day into the best four-minute songs."

"A lot of the guitar parts were written by Russell through his pedalboards, so they came in fully formed," says Kerr. "But they were also great at being open, not so prescripted. Part of the point was letting us take things a step further. It was very refreshing to work with people so confident, with clear ideas, but still allowing us to experiment. Some days it was an engineering project, and others it was really creative."

Moving to Lynchmob studios in London, where they worked with engineer Max Heyes and his vintage 1969 Neve (featuring 28x1070L mic pre/EQs and 6x1081 mic pre/EQs), Bloc Party and MyRiot initiated the sessions around a Sontronics ARIA large-diaphragm cardioid valve condenser microphone.

"In the past we jammed instrumental and then I would write the vocal at the end of the process with the range and structure predetermined," says Okereke. "But I become frustrated over the years because it felt I was just joining the dots, and I always thought the vocal should be the most important part of a pop track, so that's why we started with them. And what I found was it meant I could take an idea as far as I wanted and then fill in the canvas around it instead of constantly trying to somehow bridge everything together. It meant I was able to try more adventurous stuff with phrasing; I was able to explore different nuances with my singing voice that I don't feel would have been my luxury given the way in the past we would write chord progressions that were convoluted and would change every bar, where it's hard to settle vocals into a groove."

> "I always thought the vocal should be the most important part of a pop track, so that's why we started with them."
> —Kele Okereke

Tracking the ARIA through a Warm Audio WA76 compressor set on slow attack and fast release, as well as a Neve preamp, Okereke carried through an understated, tender quality to his voice first explored on his last solo album. After reading about the recording of Talk Talk's *Spirit of Eden*, much of which was recorded in darkness, Okereke also chose to track 80 percent of his vocals with lights off and eyes closed to heighten a sensation of physicality.

Bran, Kerr and the band tracked 15 songs over two weeks. The MyRiot setup was centered on networked, side-by-side rigs dedicated recording/editing/comping (Bran switching between Pro Tools and Logic X) and processing (Kerr building in Logic X and the Native Instruments Komplete suite, with Softube Passive Equalizer and PSP Vintage Warmer 2 Multiband Compressor Limiter on the stereo bus). "We can travel twice the distance in the same time," says Bran. For instance, Bran might be working to record passes with Lissack, capturing the smooth harmonic response and breathing cadences of the guitar parts, while Kerr might be blending custom reverbs onto the back of vocals.

On the song "Fortress," you can hear a long snap and swirling tails recorded in the concrete tunnels of a government research facility from the Cold War, while "Different Drugs" contains "subliminal elements" crafted out of vocals or other sounds clearly presented in the song but then warped and repurposed through a patchwork of octave and speed effects (digital, as well as a Line 6 DL4 delay and/or JM4 looper). An Apogee Ensemble into KRK VXT8 monitors handled playback for one producer, while the other would work within Sennheiser headphones or Etymotic in-ear monitors, or vice versa.

Lissack's parts—played on a combination of Fender Telecaster, Fender Stratocaster, and Gibson SG through various pedals and amps—were fed through two BSS Audio AR-133 active DI setups, splitting up clean signal and pedalboard with amps connected on the thru of the DI box. The amps—including Vintage Vox AX30, Fender Bassman, Fender Deluxe Reverb, and Marshall MS-2, as well as Audio Kitchen Big Chopper—were miked with a Beyerdynamic M88 to get a fatter tone then sent through Neve 1081 preamps and into Pro Tools, where the various signals were blended in the final result. (Okereke's Fender Deluxe Reverb was similarly DI'd and miked, while the bass setup was DIed, miked with an AKG D12 E dynamic, then compressed with a dbx 160X and EQed with Amek PMO1.)

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Lissack's pedalboard has evolved substantially over the years with the most recent builds by Audio Kitchen's Steve Crow, who designed switchers to allow multiple pedals to flip between EFX chains with a true bypass built in. While the pedals still include a simple Boss DD-5 delay—one of Lissack's first pedals and a key element on Bloc Party's earliest material—one of the most prominent new additions is the Eventide PitchFactor, a "Pandora's box" Lissack selected for its HarPeggiator function.

Lissack uses some pedals to direct loops and mutating, almost synth-like sweeps; these needed to be at hand height to avoid entire songs being performed in a crouch, so Crow and the band's guitar tech Leif did lots of sawing, hammering, and drilling to craft a compact controller platform.

For drum parts, which were performed by Alex Thomas, Heyes set up a variety of microphones, including the AKG D12 E on kick, Shure SM7b on snare, Shure SM57 under snare, Neumann KM140 on hi-hat, Sennheiser 421 on rack and floor toms, two Neumann KM84s on overhead, Neumann SM69 for room ambiance, and two AKG 414s for ambience in the corridor.

"Kick drum came back into a Neve 1070 desk channel, then the output of the channel was routed through a Focusrite ISA 215 to add some bass EQ, then into a Digidesign 192 HD interface," says Heyes. "Snare came back through a Neve 1081 channel. Under-snare, hi-hat, toms, overheads, room ambience, and corridor ambience went through Neve 1070 channels. The hi-hat had AMEK PM01 EQ added, and under-snare had AMEK PM01 EQ added. I also paralleled the under-snare with a Valley People Gain Brain to bring out loads of rattle and vibe." Corridor ambience microphones were compressed heavily with Valley People 610 stereo comp, and room-ambience mics were compressed using a Neve 2254c.

Discussing the coloration of the signal chain, Bran explains that "some saturation and a bit of distortion helped offset the clarity, and having multiple DIs and ambiance channels gave us great character choices."

MyRiot auditioned channels, muting one by one and stripping back anything that left no impact in its absence. A combination of digital and spring reverb—with widening automation—filled in grandeur around the parts.

Rough mixes established, the band and MyRiot sent the album to David Wrench for final mixing; he worked in Pro Tools 11, while often running things out through a Mutron Bi-Phase, Roland CE1, Roland Space Echo RE201, and/or '80s MXR Phase 100 pedal.

In the box, Wrench applied a wide range of compression, including PSP MasterQ2 and Waves SSL on the drum and mix buses. On vocals, he applied UAD 1176AE or LA2A Grey, Fairchild 660, and 1176 emulations, as well as Avid EQ3, Waves Renaissance DeEsser, and sometimes C4 multiband EQ, with both volume automation and Roland Space Echo manually adjusted along each phrase to remove clicks and noise and to create movement. Guitars also got UAD LA2A, Fairchild 660, and 1176, as well as two runs through the Bi-Phase that would be panned to create extra width. Some Valhalla DSP Vintage Verb would reinforce but not emphasize separation. "The main thing that keeps air while allowing me to sculpt the tone is using multiband EQ," says Wrench. "I use this on the mix bus as well. Either [Waves] C4, C6, or Linear Phase MB. I find I can control frequencies without having to lose them completely; I can tame a guitar with the occasional boom without making it sound thin elsewhere." Wrench achieved what Kerr describes as an "analog crunch and toughness ... a leanness while the sounds are still wide ... tight, thuddy, and warm."

Lissack sees *HYMNS* as an album that follows Bloc Party's practice of creating shifting palettes of rich, emotional tones. "This album came from a time of big changes, but one where we also returned to the way we started making music," he says. "People might judge us on the differences in texture of the new material, but they should also see we're still working off the same chemistry we always have, pushing each other to produce something organic we'd never have thought of on our own." ■

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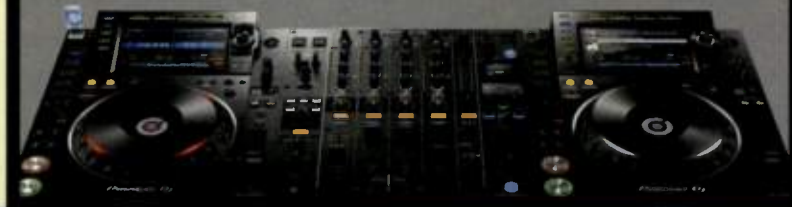

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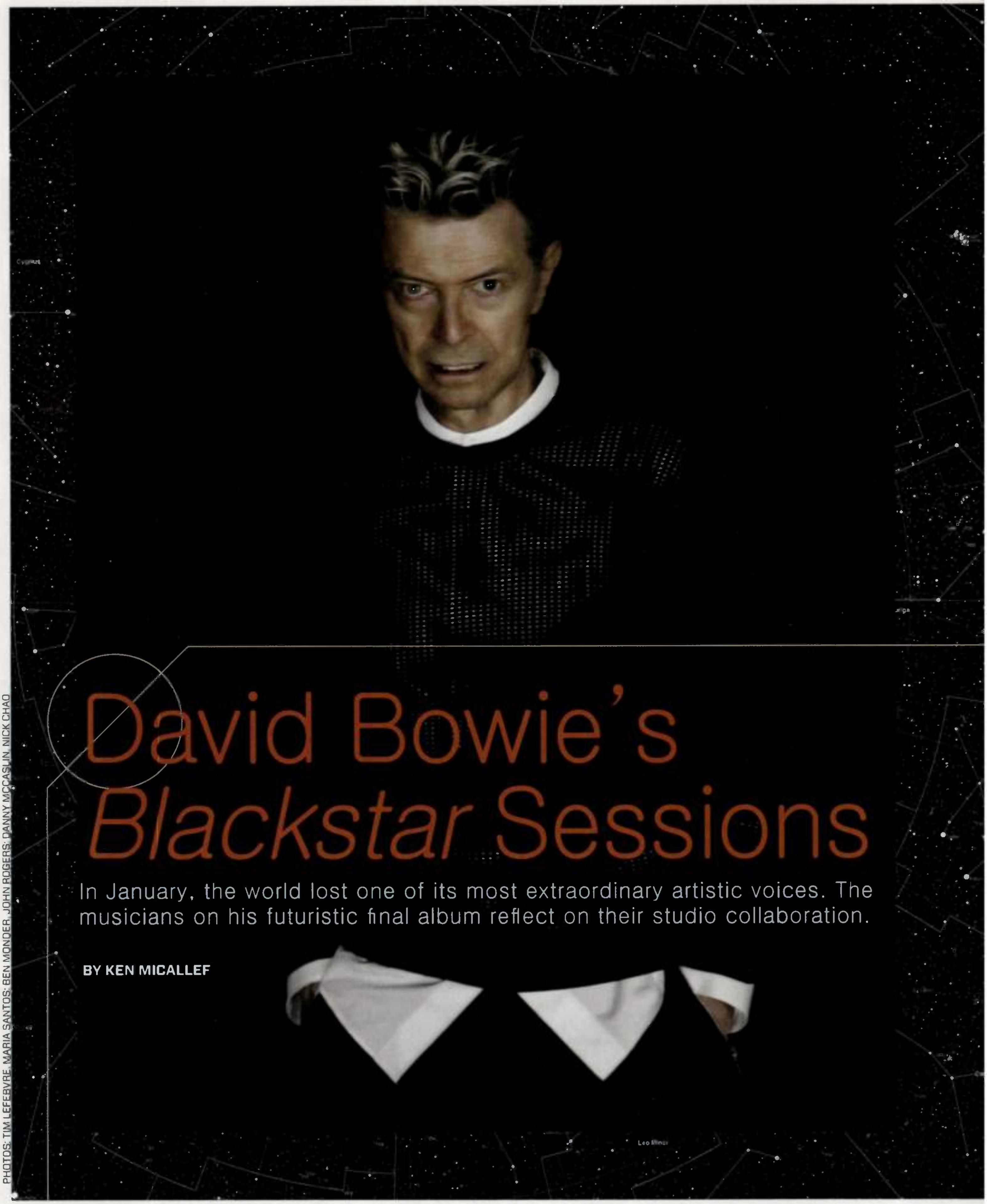

David Bowie's *Blackstar* Sessions

In January, the world lost one of its most extraordinary artistic voices. The musicians on his futuristic final album reflect on their studio collaboration.

BY KEN MICALLEF

PHOTOS: TIM LEFEBVRE, MARIA SANTOS; BEN MONDER, JOHN ROGERS; DANNY MCCASLIN, NICK CHAO

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Performing on a cold January evening at New York City's Village Vanguard, the Donny McCaslin quartet played their brand of burly, kinetic jazz to a sold-out audience. Saxophonist McCaslin, drummer Mark Guiliana, keyboard player Jason Lindner, and bassist Nate Wood (subbing for Tim Lefebvre) explored jazz's outer edges, drawing on influences ranging from Boards of Canada and Sonny Rollins, Deadmau5, and Archie Shepp. But tonight was something different.

After an intense set of sprawling improvisations based on his compositions, McCaslin spoke about David Bowie, stopping to catch himself lest the tears flow. What followed was a version of "Warszawa," a doom-laden yet beautiful track from Bowie's 1977 album, *Low*, one third of his "Berlin Trilogy." Lindner framed the haunting melodies in spacious Wurlitzer and Moog Voyager tones, then McCaslin led the band to a tremendous crescendo, followed by a hushed, almost mournful finale.

A year earlier, almost to the day, McCaslin, Lindner, Guiliana, and Lefebvre were in Soho's Magic Shop laying tracks for what would be David Bowie's final album, *Blackstar*. Prior to that, in 2014, Bowie had popped into beloved Greenwich Village performance dump 55 Bar to catch the McCaslin quartet at full force. Soon he sent demos to McCaslin and began developing recording scenarios with longtime producer Tony Visconti. Though Bowie had undergone treatment for liver cancer for 18 months, once in the studio he was "spry and full of energy," said Lefebvre.

The band Bowie assembled on *Blackstar* performs his futuristic final music with creativity, intelligence, and daring. On Bowie's urging, McCaslin's quartet, aided by guitarist Ben Monder with percussion on two tracks by LCD Soundsystem's James Murphy, turn Bowie's demos into rich, crackling vehicles comprising nervous beats, mournful saxophones, deep-bowelled electric bass, and embedded keyboards that form an oceanic, stormy sound world.

The first part of opener "Blackstar" pulses like a silent UFO over Guiliana's frantic pulse and Bowie's woozy vocal, which recalls a tormented angel. Guiliana's visceral, pounding beat propels "'Tis a Pity She Was a Whore." As McCaslin bends notes and sounds ready to jettison the deck, Bowie sings a humorous tale, layered voices surrounding him from on high. The languorous groove and crashing guitars of "Lazarus" are truly nightmarish, the feel pure '70s Lower East Side: dank, dark, dangerous. Bowie and band beat it with their drum-and-bass fist on "Sue (Or in a Season of Crime)," Bowie's voice feeble and demented, as it is on much of *Blackstar*. The stroboscopic electric bass and stalking drums of "Girl Loves Me" create a hypnotic bed, Bowie's ghostly vocal adding to the spell. "Dollar Days"—the one song none of the band can listen to—is the most sentimental and moving track of the album. "I Can't Give It All Away" is an oddly grand finale, a song that wouldn't be out of place on Bowie's '70s white soul masterpiece *Station to Station*.

Tapping McCaslin's band and their innovative aesthetic to forge a new sound in a career that traded in stylistic changes practically as a brand, Bowie ran the *Blackstar* sessions loosely. Working a nine-to-five schedule that meshed well with his neighborhood SoHo jaunts, and energized by double macchiatos from Parisian bistro Balthazar, Bowie relied on the band's exploratory skill set, never requiring more than three takes to nail a keeper. Bowie sang live in the studio with the band, and encouraged them to experiment. He even had a copy of Guiliana's groundbreaking electronic treatise, *Beat Music: The Los Angeles Improvisations*, and asked the drummer to freely reference his electronic arsenal, which he did on the clambering "'Tis a Pity She Was a Whore." "The main reason Bowie hired the band, besides Donny, was because of Mark's *Beat Music* album; he wanted his ass in there," says Lefebvre.

Bowie and Visconti reportedly took inspiration from D'Angelo's *Black Messiah* and Kendrick Lamar's *To Pimp a Butterfly*. The *Blackstar* sessions were fast, productive, and fun for all, recorded over three separate weeks in early 2015.

"We had these skeleton parts, but everyone on the session was a genius and had great ideas," says Lindner. "There was a lot of brainstorming and inspired discussions. 'Let's try this or this.' David and Tony graciously allowed us to explore our ideas."

In addition to the seven songs on *Blackstar*, Visconti has stated that there are five outtakes, including a Ziggy Stardust-worthy track called "When Things Go Bad." The tracks will hopefully appear on a *Blackstar* deluxe edition.

"*Blackstar* and *Next Day* (also recorded at Magic Shop) were stress-free, no problems," Visconti told the *Los Angeles Times* in late 2015. "He comes prepared now. This is an old dog with new tricks. Now, by not announcing he's making a record, he gives himself the time to be creative. Playing saxophone on these demos, bringing in radical guitar parts. He really is making music for himself these days. There's no fluff about David Bowie anymore. There never was, really."

The *Blackstar* sessions were tracked through Magic Shop's Custom 80 Series Neve console "The Neve was used for the front end, meaning preamps and EQs, as well as for monitoring," says assistant engineer Kabir Hermon. "It runs as a split console, so there was one side for tracking and one side for monitoring. The sessions were tracked to the Magic Shop's Pro Tools HDX system running Pro Tools 10.

Sessions featured vintage microphones and the studio's extensive collection of outboard gear that includes models from Neumann, API, EMI/Chandler, Focusrite, Sontec, GML, Drawmer, Neve, Teletronix, Joe Meek, dbx, Eventide, Lexicon, and Urei. Signal processing was done almost entirely in post.

"The tracking process was live," Hermon explains. "They would do mostly full takes in the 1,000-square foot live room. After takes, they would come into the control room and listen. As they listened, the band, Tony, and David would discuss what they were hearing and if needed, make adjustments. If they felt they could play it better or that changes needed to be made, then they would go out and play it again."

Each band member shared their perspectives on their final studio sessions with Bowie.

MARK GUILIANA, DRUMS, ELECTRONICS

"David comes into the live room on the first day and sings the first tune," Guiliana recalls. "In my headphone mix, as they turn up the vocal, my drums get louder too. I realize I'm bleeding into David's mic. Afterward, we go into listen and I tell David and Tony that we have a problem. My snare drum is getting into David's vocal mic. And David and Tony reply, 'Isn't that great?' That was take one, day one, song one. From then on I knew this was a new kind of experience for me. It was extremely liberating. And very humbling."

Engineer Kevin Killen's miking setup for Guiliana's drums was standard: two overheads, three feet above the highest cymbal; top and bottom snare drum mics; and two room mics. "I think the creative stuff came from utilizing other microphones in the room that might have not necessarily been drum mics," Guiliana says. "All the mics were open so they could have been used as such.

"On the first day [Bowie] said something like, 'Mark, I love what you're doing with *Beat Music*,'" he says. "If you feel any of this stuff can go in that direction please feel free.' Which is pretty crazy! He did his homework. He was really, really hungry, and present and in tune with us. He was checking everybody out. He actually asked me to bring my electronics, which is a minimal rig, but that was based on his hearing *Beat Music*. That was cool. I used the electronics on ''Tis a Pity She Was a Whore.' I did an overdub of 808 tom fills using my Roland SPD. I can't hear that they altered the performances at all."

The goal was to complete a song a day, including overdubs. Lindner and McCaslin stacked parts, including multiple keyboard and woodwind sections. Guiliana and Lefebvre signed off on takes quickly, followed by overdubbing.

"David would often choose the take but he'd make sure Tim and I were happy with the take," Guiliana says. "The idea of 'this is the take or not' was very intuitive and we all felt it the way good takes seem to pop out."

JASON LINDNER, KEYBOARDS

As Lindner proved at the Vanguard with his own band Now Vs. Now, and on *Blackstar*, he's a sonic conjurer of the first order. His keyboards and their subliminal sounds form the bedrock of *Blackstar*, one keyboard seemingly merging into the next. His instruments on the sessions included a Hohner Clavinet, Moog Voyager and early '70s Moog Micromoog, Sequential Circuits Six-Trak, Oberheim Prophet 08 and Prophet 12, tack piano, and two Wurlitzers, including a tube model. His gear ran direct but also to a Fender Twin, at which time the signal chain included MXR Analog Chorus, Boss Phase Shifter, Moogerfooger Delay, Fulltone Obsessive Compulsive Drive, Malekko Omicron Vibrato, and his favorite, the WMD Geiger Counter Digital Destruction.

"I used the WMD a couple times on *Blackstar*," Lindner says. "The two Wurlitizers are all over the record. And they are very different sounding. The black Wurly is prettier and has more sustain. The tube Wurly sounds more trashy and imperfect and noisy. We used that on the more funky rocking songs."

Though everything else was established in the demos, Lindner was free to chart his own path on the sessions. He believes his keyboards were treated in post, including manipulation of levels, compression, distortion, and gating, but that very few plug-ins were used. All effects were tracked live and on Visconti's end, the effects changed track to track.

"The Moog Voyager is on 'Blackstar' when the beat kicks in," Jason says. "Mark is playing what reminded me of an '80s freestyle beat. The stabby synth sound synced with his bass drum is the Moog Voyager. The pads are the Prophet 8, which is warmer, and the Prophet 12, which is modern and grittier sounding. The Wurlys are on every track. There's also some weird delay on 'Blackstar,' but the strings are all Tony. 'Lazarus' is pretty much all Wurlitzer. In 'Sue,' the Wurly is embedded in the track, but there are

From left to right: Mark Guiliana, Jason Lindner and his keyboard rig, Tim Lefebvre, Ben Monder, Donny McCaslin.

some extreme sounds in the drum and bass part, these huge sounds which are delayed; that's one of my Prophet keyboards. A lot of the watery reverb sounds used in 'Sue' are the Wurlys through pedals."

Given the experimental nature of the sessions, Lindner was unsure of their outcome. "I didn't expect it to be an album," he says. "Anything can happen in this industry. I didn't know until September they'd scheduled a release date. I would have been happy to just have had the experience of working with David Bowie."

TIM LEFEBVRE, BASS

"David's demos were specific," Lefebvre says. "For instance, on the bass part in 'Lazarus' I changed the sound a little but that's basically what David had demoed; the exact part. The band and I came up with the intro and outro. But 60 to 70 percent of the tunes were right off his demos. David told me he played the bass on the demos too.

"Mark and I had suggestions regarding forms," he continues. "Donny wrote scratch charts. But it was all scripted out by David in the demos, including the saxophone parts and the weird tennis-ball-bouncing saxophone in "'Tis a Pity She Was a Whore.'"

Playing his Moollon P Classic and 1968 Fender Precision basses, Lefebvre used a Yamaha EM 80 head through an Ampeg B15 cabinet with some reverb dialed in. Various pedals helped him create the trademark style he's known for with the Tedeshi-Trucks Band and Wayne Krantz. A 3Leaf Audio Octabvre, Boss OC2 and SVT, and Dark Glass Audio Vintage Microtubes added that patented Lefebvre stealth. An Avalon U5 Direct box was used, as well as EV RE20 microphone to cover the Ampeg cabinet.

"They gave us some sonic choices, so I was gunning for Serge Gainsbourg bass sounds/Justin Meldal-Johnsen, with a lot of pick," Lefebvre says. "Bowie had specific bass lines for the beginning of 'Blackstar'; he wanted a more floaty thing. ''Tis a Pity She Was a Whore' was straight off the demo. 'Lazarus,' too. And I play guitar on 'Girl Loves Me,' Bowie's white 1960s Supro Dual Tone guitar and his multi-effects pedal. I play exactly what he plays in the demo. It's very warbly sounding. I don't even know how he made that sound. But I just doubled the bass line (through a TC Electronics chorus pedal and Octabvre) on guitar. On 'Sue,' I'm using the sine wave and bending the string so the pitch is rising. It's like EDM, that rising chromatic thing. I was surprised that made it to the record; it's very experimental."

And as everyone who worked on *Blackstar* has said, Tim says Bowie was in fine form throughout, singing on every take, offering and receiving ideas, working with the band as if they were equal journeymen in the trenches.

"He would sing every take with us," Tim says. "Live takes. He was in the room with the drums and there's not much separation, so a ton of drums bled into his vocal takes. I think they sampled the snare from 'Girl Loves Me' from Bowie's mic. '*Blackstar*' was one of the last tracks he did with us. The first half was pretty scripted, then they let me go off. That's one of my favorite tracks for the bass."

BEN MONDER, GUITAR

"The bizarre shrapnel guitars in 'Lazarus' are all Bowie," Monder explains. "I was hoping it was me, but it's David. He sounds great on that. I don't think they did anything to my guitars in post. They didn't seem to touch anything."

Monder's guitar rig included Ibanez AS 50 and Stratocaster guitars (with its two pre-CBS pickups), and he brought two amps to run stereo; a 1968 Fender Princeton and a Fender Blackface Deluxe. Monder used all his pedals on the sessions: Lexicon LXP-1 reverb, a Rat distortion, Walrus Audio Mayflower and Deep Six Compressor pedal, Ernie Ball volume pedal, Fulltone Deja Vibe, an MXR Carbon Copy Analog Delay, and Strymon BlueSky Reverb.

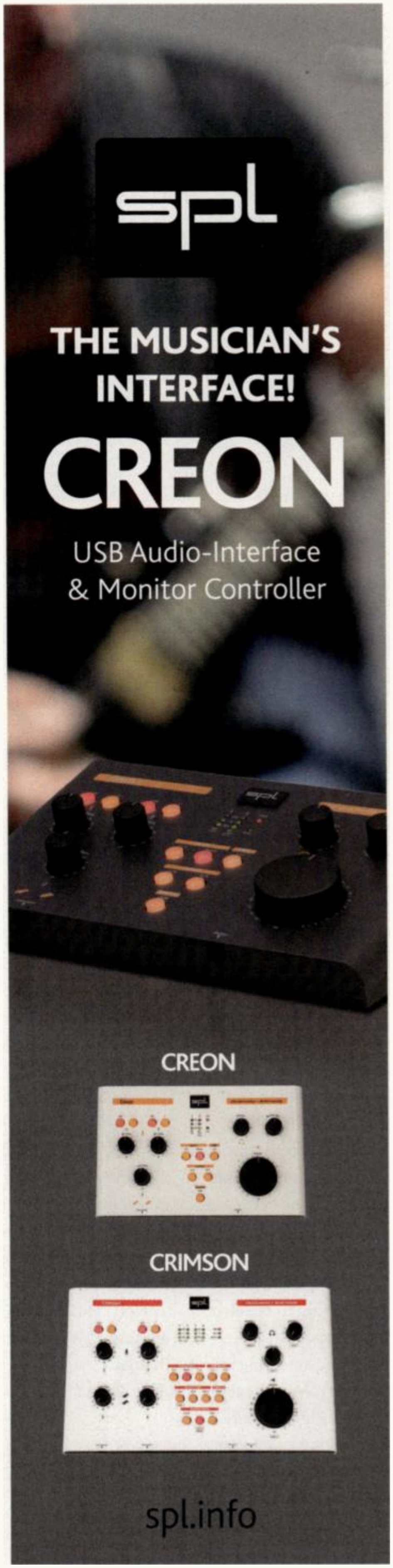
"Bowie's directions were very minimal," Monder says. "I was there at the end of the sessions, and on the final day I was alone with David and Tony, experimenting. He really let all of us create our own parts. He was very enthusiastic and when something didn't work it, was obvious to everybody. It was a very relaxed atmosphere."

DONNY MCCASLIN, TENOR, ALTO, CLARINET, FLUTE, ALTO FLUTE

"I sent demos to the guys, and I made scores so I orchestrate the parts and expand them with different woodwind combinations," Donny McCaslin recalls. "The band got together to rehearse the song forms before recording began in January, 2015. We got sounds one day, the next day David came in and we started recording."

McCaslin's instruments were all effected in real time. Tony Visconti added reverb and what sounds like mad pitch-bending effects, but it's all McCaslin, in the moment. McCaslin followed the saxophone parts Bowie recorded on his demos, often note for note. "I love his saxophone playing," McCaslin says. "It's always very soulful.

"David usually offered conceptual advice so that he engaged your imagination," McCaslin adds. "He always engaged our creativity. David would pore over every detail and work really hard until he got it exactly as he wanted it. He was fully engaged in the process. He'd take in every detail. Then when he and Tony worked on the tracks after we finished recording there was an incredible amount of attention to detail and the bigger picture. The fact that *Blackstar* is a Number One album is both surreal and bittersweet. That will always stick with me." ■



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ATLANTIC

From the production team that created the groundbreaking but period-perfect soundtrack to *Boardwalk Empire* comes this batch of new and vintage recordings from the first episode of HBO's *Vinyl*. The producers of this new series—set NYC's 1970s record industry—plan to release a soundtrack a week to accompany each new episode. If every volume rocks as hard as Vol. 1—with 18 songs from Kaleo, Sturgill Simpson, Mott the Hoople, Otis Redding, The Meters, and more—this could become the welcome soundtrack of your every week.

BARBARA SCHULTZ

Parker Millsap

PARKER MILLSAP

THE VERY LAST DAY

THIRTY TIGERS/OKRA HOMA

It didn't take hipster Americana fans long to discover Parker Millsap. His eponymous debut earned him much-deserved fans, high-profile gigs, and the opening spot on the Devil Makes Three's current tour, where he's promoting this sophomore release. Millsap's unique singing approach, with an aggressive rasp often rising to falsetto is even more developed and arresting on *Last Day*. Must hear: "Hades Please" and the moving story song "Heaven Sent."

BARBARA SCHULTZ

ST LUCIA
MATTER

ST. LUCIA

MATTER

COLUMBIA

The one-time jingle writer hiding inside St. Lucia's Jean Philip-Grobler is always trying to get out, and the band's second album, *Matter*, is at its mercy. The '80s synth-dance of St. Lucia's debut, *When The Night*, is at the core of its creations, the search for the perfect hook lost in a jungle of choking tracks. Philip-Grobler definitely has pop chops which he almost manages on the lighthearted "Home" and the lilting "Winds Of Change."

LILY MOAYERI

MODERAT

III

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Enriched over almost 15 years, the sound design of Moderat is a viscous continuum cycling with turbulence and vitality. Comprising Berlin producers Gernot Bronsert, Sebastian Szary (aka Modeselektor), and Sascha Ring (aka Apparat), Moderat challenges a balance between the astral and seismic resonances of post-club saturation, and *III* is the trio's most solvent collection of formed elements to date. Forty-two oxygenated minutes throb with bass; bit-crushed harmonics; pivoting, slurred samples; and reflective melodies.

TONY WARE

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CONCORD

This L.A.-based trio of Chris Vos (guitar, vocals), Alex Stiff (bass, vocals), and Marc Cazorla (drums, piano, vocals) likens themselves to *Sticky Fingers* by way of Mississippi John Hurt, but their acoustic pulse is pure Midwestern, corn-fed rock riffage. And that's a good thing. What TRC lacks in hard-luck living, they make up for in streamlined songcraft. When they bust their fuzzbox in "Rita Mae Young" or shake their tail feathers in "Feels So Good," you'll turn up a bottle and forget your blues.

KEN MICALLEF

CHAOSMOSIS

PRIMAL SCREAM

CHAOSMOSIS

FIRST INTERNATIONAL/IGNITION

Bobby Gillespie follows a polarizing blueprint, drafting fiercely churning triumphs between bloozy bar rock or gaunt stylistic shambles. Following 2013's aggro, empowered *More Light*, this 11th full-length is in the idea-dump slot, but avoids being the jumble that its title would imply. Collaborating with Andrew Innes, Björn Yttling, Haim, Rachel Zeffira, and Sky Ferreira, Gillespie equalizes cavernous post-punk, shamanistic arena stompers, chiming Beatlesesque psychedelia, and percolating "hallelujah"-peppered Madchester into sweeping physicality.

TONY WARE

MM STUDIO
GOOD STAR
DUBS

MM STUDIO

GOOD STAR DUBS

ALBUMLABEL

Written and recorded by Tadd Mullinix and Daniel Meteo in Berlin, MM Studio envisioned a modern take on old-school Jamaican dub. But this ain't your granddad's dub: Sure, MM Studio combined guitars, organs, keyboards, and drum machines with delay and echo plug-ins, but given their Berlin recording location, *Good Star Dubs* has a nocturnal, synthetic, Pong-like feeling. Think playtime with stoned tots, the songs bouncing like a lunar walk one minute, a robo house dance the next.

KEN MICALLEF

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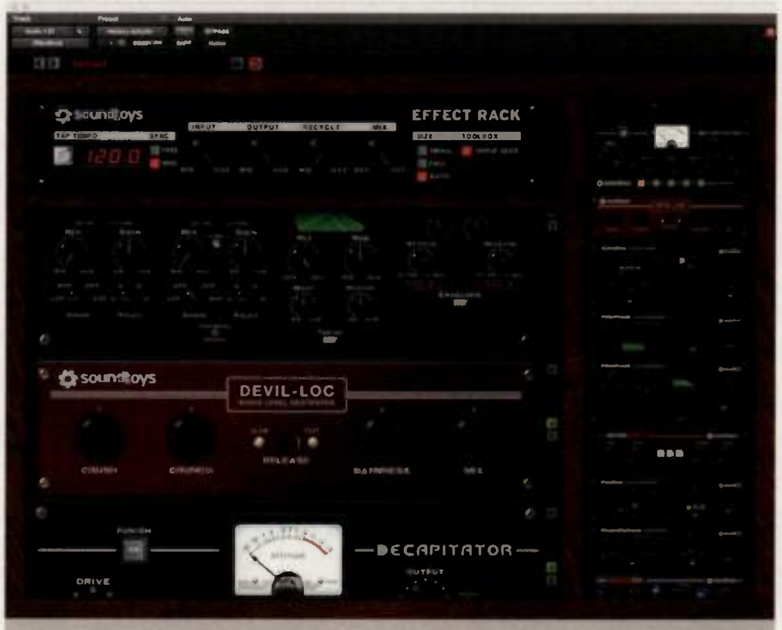

Fig. 1. The new Effect Rack lets you assemble groups of Soundtoys effects in a single insert slot.

SOUNDTOYS

Soundtoys 5 Effects Bundle

THE WHOLE LINEUP OF CREATIVE PROCESSORS

BY MIKE LEVINE

Mike Levine is an editor, writer, and multi-instrumentalist who lives in the New York area.

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Lite effects don't add any functionality. Speed no longer available. RTAS no longer supported. Tricky to position effects in the rack once it has several loaded already.

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Soundtoys has a well-deserved reputation for developing effects plug-ins that are anything but cookie-cutter. Remarkably, the Soundtoys 5 collection assembles the complete lineup into one bundle—18 plug-ins in all.

The full list includes three new plug-ins, Effect Rack, Little AlterBoy (vocal pitch shifting and manipulation), and PrimalTap (delay), as well as Crystallizer (granular effects and reverse delays), Decapitator (analog-modeled saturation), Devil-Loc Deluxe (a modeled auto-leveler that produces lots of distortion), Devil-Loc, EchoBoy, Filter-Freak 1 and 2, MicroShift (pitch-shifting), Little MicroShift, PanMan (auto-panning), PhaseMistress (phase shifting), Radiator (modeled channel strip), Little PrimalTap, Little Radiator, and Tremolator (tremolo effects). In fact, all of the plug-ins that were in Version 4 have returned in Soundtoys 5, with the exception of Speed.

There are 11 more plug-ins in Soundtoys 5 than in Soundtoys 4, some of which share a name but offer different functionality. For example, Little Radiator is based on the Altec 1566a mic preamp and has only one drive stage, whereas the Radiator is based on the 1567a and is a tube mixer with input and output drive stages modeled separately. And Little PrimalTap is a single stereo delay, while PrimalTap requires both delays to achieve stereo.

Soundtoys still supports the iLok dongle for authorization, but now you have the option to authorize up to two computers directly instead, by using the iLok license manager software. That is a welcome change for those of us who switch between desktop and laptop units and don't want to have to move an iLok back and forth. While RTAS is no longer supported, AAX 32-bit native is available for Pro Tools 10 users.

SELF CONTAINED

One of the new plug-ins in the bundle is called the Effect Rack, a container for hosting up to six Soundtoys effects in one instantiation. Use it to create complex effects combinations that can be saved and conveniently recalled. Effect Rack, however, doesn't accept the lite versions (though Soundtoys says that this may change in future updates). But with the exception of Little AlterBoy, which doesn't have a full version, this is not much of a limitation.

The Effect Rack has a column on the right called the Gear List, which shows all the eligible effects (see Figure 1). You add effects to the main area of the Rack by dragging and dropping them from the Gear List into an open spot. Once they are loaded, individual effects in the Rack can be moved around within the rack, or replaced by dragging another effect in on top of them. However, once the rack has a few effects in it, and there is only a little open space visible in the rack area, it is difficult to bring in and position a new effect from the Gear List without accidentally replacing one of the effects already there.

At the top of the rack is the Control Panel, a global control area where you can select the tempo mode (Tap, Free, or MIDI sync) as well as set Input and Output levels. The Recycle control sends a copy of the output signal back to the input and is useful for creating echoes and flanging effects, among other things.

The Control panel also offers three size options for the rack: Small, Full, and Auto. The first two give you small and larger-sized racks, whereas Auto automatically resizes the plug-in depending on how many effects you have loaded.

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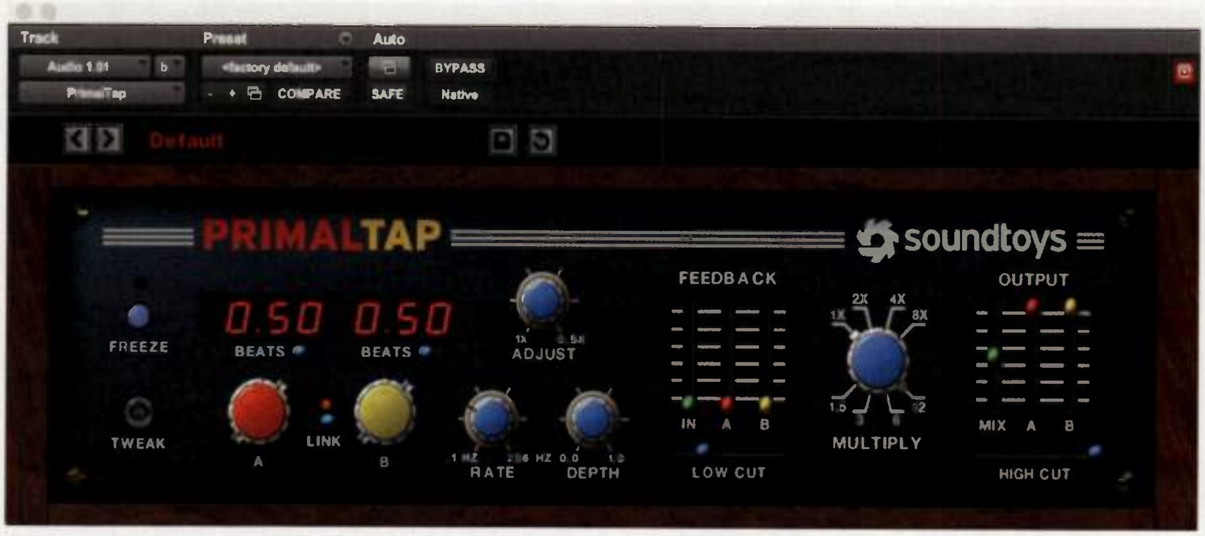

Fig. 2. PrimalTap offers unique parameters for shaping your delay effects.

GETTING ALL PRIMAL

PrimalTap is a delay plug-in that's modeled after the Lexicon Prime Time Model 93 Digital Delay Processor, which was on the market in the late 1970s (see Figure 2). It's a stereo delay with A and B channels that can be linked or set to independent delay times (and levels) for creating stereo effects. In addition to standard Mix, Output, and Feedback controls, PrimalTap has some unique features that differentiate it from other delays (including EchoBoy). The Multiply knob emulates a feature on the original Model 93 that extended delay time by lowering the sampling rate. The result is an increasingly low-fi delay signal as you increase the delay time from 2X to 4X to 8X settings. In the 8X setting, the delayed signal sounds almost distorted. Consequently, the Multiply feature lets you significantly alter the character of the delay.

The Freeze function is another cool feature that Soundtoys modeled on the Prime Time. Pressing and releasing the Freeze button while signal is passing through the plug-in loops a short portion of audio. When used in tandem with the Multiply knob, you can create some very unusual sound-design-like effects.

Little AlterBoy is a powerful, monophonic vocal processor with simple controls (see Figure 3). It includes knobs for Pitch, Formant, Drive, and Mix. The Pitch shifting is in semitone increments (though smaller increments can be accessed via automation), and the quality is quite impressive. By default, the Pitch knob is linked to the Formant control, so that changes in Pitch also change the character of the shifted voice. However, you can unlink them and keep the Formant at one setting, which is better if you're trying to create harmonies. By setting the Mix control less than 100 percent wet, you will hear both the original and pitch-shifted content. If you want the melody and harmony on separate tracks, put the plug-in on an Aux track with the Mix up to 100 percent wet. You can use your DAW's Automation to change the pitch and create moving harmony parts.

The Drive control allows you to dial in saturation

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

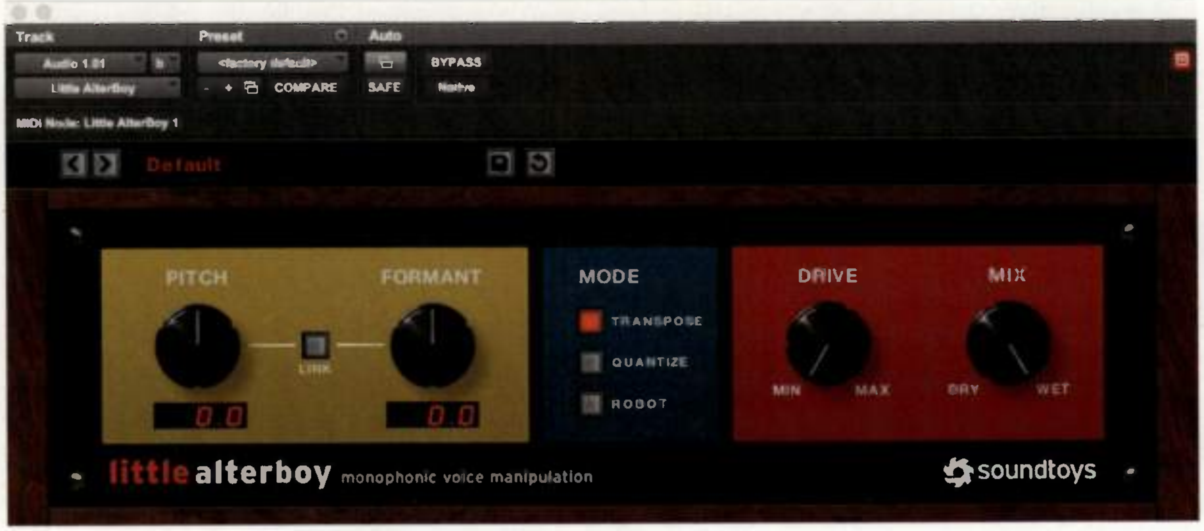

Fig. 3. Little AlterBoy is a simple but powerful vocal processor.

ranging from light to rather heavy. You can switch Little Alter Boy between three modes: Transpose, for standard pitch shifting and creating harmonies; Quantize for T-Pain effects; and Robot, which produces a static pitch controlled by the Pitch and Formant knobs. One cool way to use the latter mode is to lower the Mix control so you hear the original vocal melody against the drone created by Robot mode; you can get some cool harmony effects that way. Little Alter Boy can also produce doubles, detuning effects, and a lot more.

CHANGE LOG

In addition to adding new effects, some of Soundtoys' mainstay plug-ins have been beefed up in Version 5. Perhaps the most significant change is the addition of a Feel knob in Tremolator. The two extremes of the knob are called Rushin and Draggin. The former lets you push the tremolo forward in time so that it starts a tiny bit earlier in relation to the beat, while the latter setting starts the effect a bit later. It's a subtle change but one that lets you adjust the groove of the effect.

EchoBoy has also been tweaked, with its total delay time upped to 15 seconds. Crystallizer's delay time has been increased to 20 seconds.

TOYING WITH AUDIO

All told, Soundtoys 5 offers a large selection of exceptionally designed delay, modulation, and distortion effects that provide a ton of creative control. If you've never tried Soundtoys products before, you can get a 30-day demo of the entire bundle. Describing the effects doesn't do them justice: You have to use them to really appreciate their sound quality, power, and potential.

If you're already a Soundtoys user, your upgrade price for the Version 5 bundle can be as low as $50, depending on how many Soundtoys effects you currently own.

Considering the new Effect Rack and effects, and the additional plug-ins you get in the Soundtoys 5 bundle, it's definitely worth the upgrade and highly recommended. ■

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~ ***John Rzeznik*** - Goo Goo Dolls.

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

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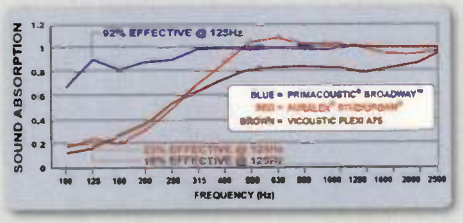

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Focusrite's Clarett 2Pre is a simple Thunderbolt audio interface with two analog inputs, fast throughput, and terrific sound.

FOCUSRITE

Clarett 2Pre

A PORTABLE, YET POWERFUL, THUNDERBOLT AUDIO INTERFACE

BY MARTY CUTLER

Frequent *Electronic Musician* contributor Marty Cutler is busy writing a new book, tentatively titled *The New Electronic Guitarist.*

STRENGTHS

High-quality audio with very low latency. Air feature adds highs and presence.

LIMITATIONS

Registration required before accessing driver.

$499 street
focusrite.com

The Clarett line of Thunderbolt interfaces includes four models that support a variety of studio and mobile-recording needs. Designed for desktop and portable work, the Clarett 2Pre is the smallest of the bunch, yet it offers a total of 10 inputs, 4 outputs, and supports up to 24-bit, 192kHz resolution.

Focusrite's utilization of Thunderbolt technology promises low-latency throughput and high track counts, even with low buffer settings. To test this, I used the Clarett 2Pre with my iMac Retina 5K (quad-core I7 processor and 40GB RAM) under Mac OS X 10.11.2 using MOTU Digital Performer 9.0.1 and Ableton Live Suite 9.5. The Clarett 2Pre is housed in a sturdy aluminum, half-rack case with a pair of front-panel combo jacks that accept XLR and 1/4" instrument- and line-level input. A master level control and a headphone jack with output knob complete the scene. Each channel has its own 48V phantom-power switch and analog Air effect. Air enhances the mic preamp's frequency response to add subtle definition and presence. Auditioning my Gibson Mastertone five-string banjo using a Shure KSM-32 mic and the Air feature provided noticeable brilliance and sizzle to the deep, plunky overtones of the instrument. It even enhanced the Les Paul-like snap of my Epiphone Genesis Pro Deluxe, especially with the middle-pickup settings.

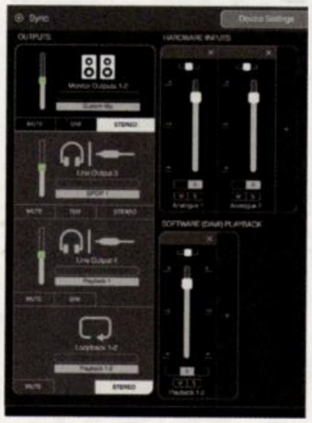

Fig. 1. Use the Focusrite Control app to route analog and optical inputs, engage Air, and select the sample rate, digital-clock sync, and analog line or instrument levels.

The rear panel has four 1/4" TRS analog outputs, MIDI I/O, the Thunderbolt port, and an 8-channel ADAT optical input. The included Focusrite Control software is used for engaging the Air effect and configuring the I/O. The Clarett products support Mac OS X (Mavericks or later); support for Windows OS is on the way.

Using software synths in standalone operation, I enjoyed fast response times with the interface, devoid of any perceivable latency—even at the highest sampling rate and with buffer settings down to 64 samples. The same was true using the Clarett 2Pre as a DI and running my guitar through Native Instruments Guitar Rig 5: In the past, it had been difficult to use this app as a standalone processor due to high latency issues, but no longer. Playing guitar through Guitar Rig in conjunction with MOTU's Live Room G plug-in using the Clarett 2Pre, I was able to create real-time rhythm guitar tracks without the feeling of pushback that latency usually imposes. I cautiously started at buffer settings of 128 samples and got as low as 64 in these instances.

Consequently, the Clarett 2Pre is an excellent interface for singer/songwriters and personal studios that don't need much analog I/O. The preamps—with and without the Air feature—sound marvelous, and the unit is simple to use and understand. In fact, it sounds better than almost anything else in its price range, and the bandwidth and speed of the Thunderbolt format will kick your projects into high gear. If you are looking for a great-sounding interface for your Thunderbolt-based personal studio, the Focusrite Clarett 2Pre is definitely worth your attention. ■

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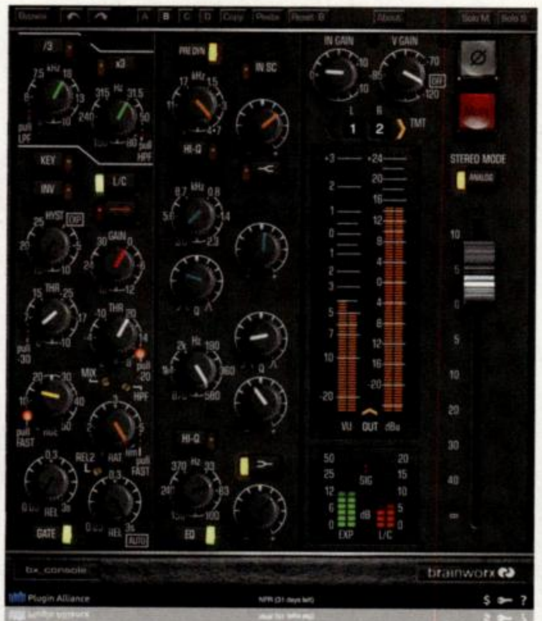

Brainworx bx_console emulates the rare Neve VXS mixing board. It includes 4-band EQ, a limiter/compressor, and a gate/expander.

BRAINWORX

bx_ console

DIGITAL MIXER WITH AN ANALOG SOUL

BY MICHAEL COOPER

Michael Cooper is a recording, mixing, 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.

STRENGTHS

Sounds terrific. EQ can be placed pre- or post-dynamics, or inserted in sidechain. Parallel compression. Mid and side solos. Negligible CPU drain. Reasonably priced.

LIMITATIONS

Cranking the Input control doesn't produce classic Neve saturation.

$299
plugin-alliance.com (distributor)

The Brainworx bx_console plug-in emulates the rare 72-channel Neve VXS analog mixer owned by Dirk Ulrich, Founder and CEO of Brainworx. One channel of the console was modeled down to the component level, and the resulting virtual channel—Channel 1 in the plug-in—was used as a starting point for coding the other channels. Brainworx's new Tolerance Modeling Technology (TMT) was used to apply the manufacturing tolerances for the VXS' components to Channel 1's model, thereby producing models for the plug-in's other mixer channels. As manufacturing tolerances cause variations in frequency, phase, and dynamics responses, no two channels of the plug-in sound exactly alike.

bx_console includes the VXS's controls for input gain, highpass, and lowpass filters (HPF and LPF), 4-band EQ, a limiter/compressor, a gate/expander and output gain. But the plug-in also has some features that the VXS console lacks. The range of corner frequencies for the continuously variable HPF and LPF has been extended. A dry/wet Mix control for the compressor enables parallel compression, and an optional HPF in the sidechain pre-conditions the compressor's response by rolling off lows. (The HPF's corner frequency can be adjusted from 10 to 2000 Hz.)

While the VXS's compressor features a secondary release that always kicks in 40 dB below the set threshold, bx_console allows you to adjust the level for secondary release from 10 to 60 dB below threshold; the secondary release slows the restoration of gain for quiet signals that quickly follow loud peaks, thereby reducing pumping. You can also swap the order of the EQ and dynamics sections and adjust noise levels to taste. The corner frequency for the audio path's HPF can be adjusted from 31.5 to 315 Hz or, with its "3x" multiplier engaged, from 94.5 to 945 Hz. The LPF's range is 7.5 to 18 kHz or, with its "/3" divider engaged, 2.5 to 6 kHz. The plug-in's gate can be triggered from either the input or an external-sidechain signal. A hysteresis control lets you offset the gate's opening and closing thresholds up to 25 dB; by effectively setting two different thresholds, you prevent the on-off-on gate chattering that would otherwise occur with a signal level that fluctuates slightly around a single threshold level. Turning the hysteresis control fully counterclockwise produces expansion instead of gating. A bypass switch and wide-ranging threshold, range, and release-time controls are also included.

The bx_console's limiter/compressor provides makeup gain and an auto-release mode. A link switch links all channels within one instance of the plug-in (including any surround channels). Turning the ratio control fully clockwise switches the action from compression to limiting.

bx_console's EQ section can be placed in either the audio path or the sidechain, and can be bypassed. Adjacent bands overlap. The high- and low-frequency bands can each be switched to provide either peaking or shelving response, and they offer two alternate Q values. The two middle bands are fully parametric.

The plug-in's output section includes controls for selecting which modeled console channel or pair of channels you wish to use, adding artificial noise (similar to that produced by the VXS console) and phase inversion, and adjusting and muting the plug-in's output. I/O and gain-reduction meters are provided. For stereo tracks, you can toggle Analog mode on or off; when switched on, TMT's modeling of manufacturing tolerances are incorporated into the sound of each channel.

A toolbar offers 32 steps of Undo and Redo, four alternate workspaces (global plug-in setups that can be switched using automation), and two buttons that respectively solo the mid and side channels in stereo configurations.

IN THE MIX

Most of the variances among bx_console's modeled channels only become audible when you apply at least a few dB of equalization or gain reduction. When I used bx_console in that way, I could immediately hear a difference when I was toggling between digital and analog mode on stereo tracks (especially on keyboards, guitars, and other pitched instruments): Analog mode sounded significantly more dimensional and musical. This is the secret sauce that digital mixes are starving for. And you can slosh it on without worry; more than 30 instantiations of bx_console caused only negligible CPU drain during my mix sessions.

bx_console's EQ sounded gorgeous. Low-frequency shelving boost and a 4kHz lift lent a wonderfully meaty and slappy sound to a kick drum track. Limiting with a fast attack and auto release—producing 15 dB of gain reduction—whittled the kick's sound down to just the pointy attack, with virtually no sustain.

Dialing back the Mix (parallel-compression) control to 75 percent gave me the perfect combination of beefy (uncompressed) and pointy (overcompressed) sound. The gate cleanly shortened the overbearing room tone and weeded out a muffled pedal squeak that had been polluting the track. I got similarly great results using pre-dynamics EQ and parallel compression on electric guitar tracks.

The compressor (using a 2:1 ratio) dulled lead vocals very slightly when 100 percent wet, but it thickened vocals beautifully and without compromise when I used parallel compression. I could transparently and effectively de-ess a vocal track by cranking the high frequencies, cutting the lows, routing the EQ to the sidechain, and activating the limiter (using the fastest attack and release times). Nice!

Because the VXS is a very clean-sounding console, I couldn't use a high-input gain setting to drive the plug-in to saturation—a popular technique used with most Neve gear. Even so, bx_console sounds fantastic, and it's reasonably priced to boot. Two thumbs up! ■

Analog mode sounded significantly more dimensional and musical. This is the secret sauce that digital mixes are starving for.

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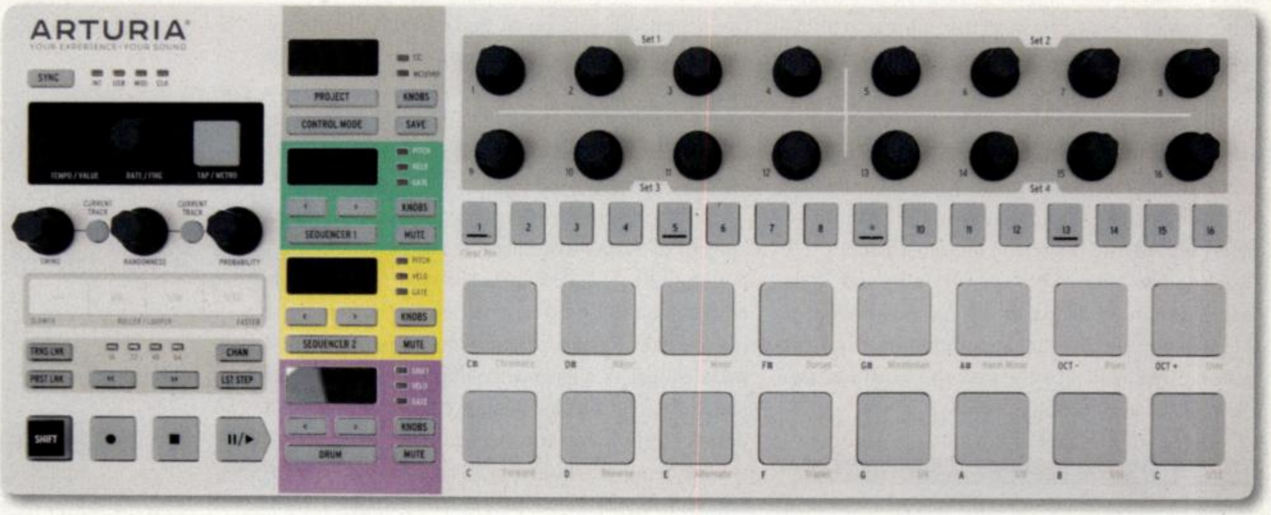


The BeatStep Pro's three sequencers are color-coded, so the step buttons match the color of the sequencer.

ARTURIA

BeatStep Pro

THE LEADER OF YOUR ONE-MAN BAND

BY MARKKUS ROVITO

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

STRENGTHS

Three sequencers. CV/gate, DIN sync, and MIDI. MIDI control mode. Touch-sensitive encoders. Velocity- and pressure-sensitive pads feel firm. Excellent variety of sequence editing features.

LIMITATIONS

Breakout cables required (three included) for MIDI and DIN ports. Deep capabilities take a bit of time to learn and understand.

$249 street
arturia.com

If you judge books by their covers, you may not get the best read on the BeatStep Pro at first. Seeing its price and layout, you may not fully grasp the potential of this clever, compact unit. Yes, it's a fully assignable MIDI controller with transport controls with comprehensive MIDI Control Center software to configure and save your setups, but that's only a fraction of what's on deck (see Figure 1). The main appeal of BeatStep Pro comes from its three sequencer modules—one for drums, two for melodic parts—that can control pretty much anything, past or present.

THE THIN WHITE DUKE

First off, I have to comment on the exceptional build quality and design of the BeatStep Pro. It packs utility into every square inch of its surface, yet sections off its controls in a clear, understandable manner. The top is covered with a sturdy white plastic faceplate while the metal bottom plate has five rubber feet for tabletop grip. This keeps the unit very flat in height and reliably strong in construction while it only weighs about three pounds.

The back panel absolutely abounds with 3.5mm minijack connections for a variety of gear types (see Figure 2). There are two sets of analog connections for Pitch (CV), Velocity and Gate, which are color-coded green and yellow to match the two melodic sequencers on the front panel. Next there are eight Drum Gate outputs for triggering drum sounds from analog modules from the first eight drum pads of the BeatStep Pro's Drum sequencer. You also get Clock I/O and MIDI I/O connections, with three included minijack-to-5-pin DIN breakout cables. The MIDI connections are obvious: You can set the three sequencers to any MIDI channel for sequencing outboard MIDI gear, either from the MIDI I/O or to virtual instruments within a DAW using the micro USB port (cable included). You can even sequence iOS apps over MIDI. The Clock I/O ports are for syncing up pre-MIDI gear such as the old DIN Sync-based Korg drum machines, Roland TB-303, and others.

So you can see how the BeatStep Pro can act as your command center for electronic music composition and live performance, wrangling all kinds of gear together into one electric orchestra. You can use the three sequencers for any MIDI or CV/gate-compatible modules or software, including up to eight drum modules (if using just one sound per module) while also syncing up other MIDI and DIN Sync units that have their own sequencers.

Fig. 1. Even though programmable MIDI control makes up a fraction of the BeatStep Pro's appeal, Arturia's MIDI Control Center software facilitates thorough MIDI programmability.

SEQUENTIAL CIRCUITS

The BeatStep Pro has internal memory for 16 Projects. For each Project, each of the three sequencers has 16 pattern memories, and you can set each pattern to have 16, 32, 48, or 64 steps, as well as chain up to 16 patterns together, so you can create long-playing sequences.

You can input notes either in step-sequencer style on the 16 multicolored step buttons, or record them in real time on the 16 velocity- and pressure-sensitive pads with input quantization. On Sequencers 1 and 2, the pads illuminate to represent a 13-note chromatic keyboard, going from C to C, with two more pads used to switch octaves up and down.

Creating and chaining patterns together is only the beginning of your creative possibilities. Once a sequence is running, you can transpose the notes using the pads, change the timing and the direction of the sequence playback using Shift plus the pads, and change pitch, velocity, and gate of the notes using the touch-sensitive rotary encoders. A Knobs button on each sequencer determines if the 16 encoders will change the note's pitch, velocity (volume), or gate (duration). The 16 encoders correspond with the 16 steps of each section of the sequence, so you can spontaneously make many creative edits to the music while it's running. (On the Drum sequencer, the knobs can "shift" the timing of drums forward or backward, rather than editing pitch.) With the capacitive encoders, you only need to touch them to see their current values on one of the displays, which is very helpful when you have the same set of knobs editing many sequence parameters, as well as functioning as MIDI controllers in Control mode.

In addition, there are several global controls on the left side of the BeatStep Pro for setting Swing, Randomness, and Probability percentage, which are also touch-sensitive endless encoders. Randomness changes the pitch, velocity, and gate for notes from 0 percent (no change) to 100 percent (completely random), and Probability determines how often the Randomness occurs. These three knobs affect all three sequencers unless you engage the Current Track buttons.

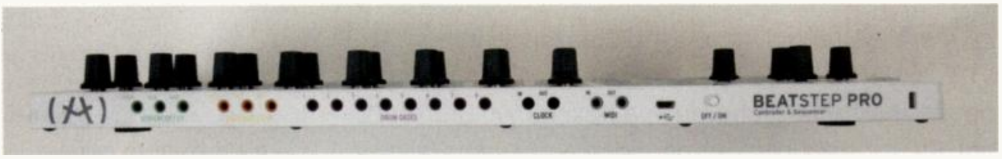


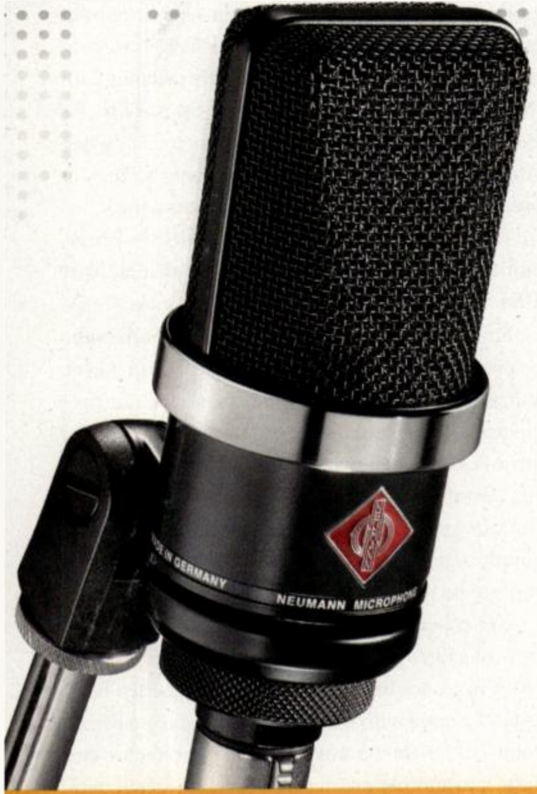
Fig. 2. Plenty of CV/gate, MIDI and Clock sync connections mean the BeatStep Pro can wrangle together just about any music gear into a cohesive performance troupe.

The Roller/Looper touch-strip works as a type of responsive Note Repeat feature for single pads when in Control mode, or for looping all three sequencers in sequencing mode. There are also mute buttons for each sequencer.

MANY STEPS IN THE RIGHT DIRECTION

Expansive sequencing and performance editing features make the BeatStep Pro a performer's dream for anyone doing improvised or semi-improvised live sets. All the global and single-note-sequence editing features provide endless variation for your music at your fingertips.

If that weren't enough, Arturia has proven to be keen on updating the unit with new features over firmware. All of these abilities on a hardware unit with no screen make it a necessity to dive into the manual to fully comprehend all the possibilities, but it's well worth the time. This is no comic-book MIDI controller; it is a deep read with powerful sequencing abilities at its core. Best of all, to analog gear and hardware module fanatics, this story is nonfiction: The BeatStep Pro controls and syncs all of your analog and digital gear at once for a very reasonable price. ■



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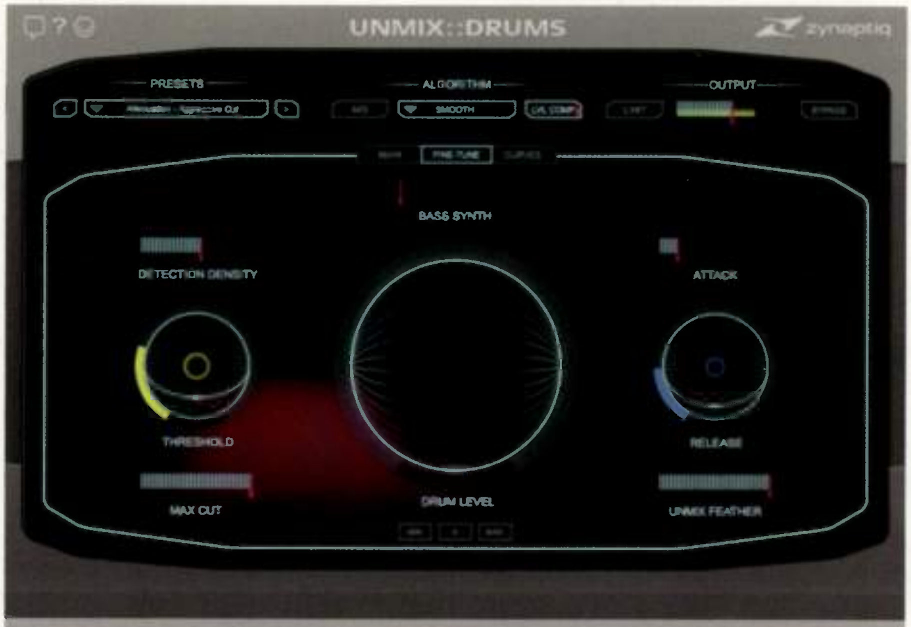

Fig. 1. Zynaptiq Unmix::Drums can transparently boost or attenuate drums in a prerecorded mix. The GUI's Fine-Tune view is shown here.

ZYNAPTIQ

Unmix::Drums

ADJUST LEVELS OF TRAPS AND CYMBALS IN PRERECORDED MIXES

BY MICHAEL COOPER

STRENGTHS

Uniquely powerful. Transparent full-mix processing (if carefully set up). Editable breakpoints allow frequency-dependent processing. High-quality sub-harmonic synthesis. Built-in limiter. Low price.

LIMITATIONS

Curve for detected drums often doesn't show in GUI. Bass Synth cut-off is a bit high. No Undo or Redo. No A and B workspaces.

$189
zynaptiq.com

Zynaptiq Unmix::Drums (a plug-in available in AU, VST 2.4, RTAS, and AAX formats) can dramatically boost or attenuate drums in a baked mix. But that's not all. Its frequency-dependent processing allows you to goose some drums while cutting others.

AT THE CONTROLS

The plug-in's GUI offers two algorithms: Smooth generally sounds less processed but also offers less separation between drums and other sounds; Punchy provides better separation and sounds more snappy, but it's more prone to producing artifacts. Activating the M/S switch causes hard-panned drums to be processed equally (producing more stable imaging), whereas bypassing it treats drums in left and right channels separately and is less likely to cause pumping or processing of non-drum sounds. Note that this M/S mode can't be used to process mid and side channels separately.

When the Level Compensation button is activated, the plug-in's output level is raised or lowered to compensate for a change in drum levels. You can also activate the built-in limiter (which follows the plug-in's output-gain control) to keep boosted drums from clipping the plug-in's output.

The GUI provides three alternate views: Main, Fine-Tune, and Curves. All three views offer the following controls: Drum Level adjusts the amount of boost or attenuation of drums; Threshold determines how "drum-like" component sounds must be in order to be processed; and Release adjusts how long drum levels are boosted or attenuated after the respective processing is triggered.

The Fine-Tune view adds several more controls (see Figure 1). Lowering the Detection Density slider makes the processing more selective (for example, filtering out pitched components when boosting drums). Max Cut limits the maximum amount of attenuation. Raising the Bass Synth slider progressively adds sample-accurate, re-synthesized subharmonic frequencies between 20 and 200 Hz. At low settings, the Attack control directs processing toward sounds with a fast attack and high bandwidth; high settings process more low frequencies and non-drum sounds. The Unmix Feather control essentially adjusts how much of the "baby" the processing will allow to be potentially thrown out with the "bathwater" around detection thresholds; for example, using a low Unmix Feather setting when attenuating drums will cut fewer drum sounds in order to avoid also lowering non-drum sounds.

The Curves view provides adjustable breakpoints along three curves in an XY display that plots frequency vs. relative amplitude (see Figure 2). Editing the three curves allows you to offset the respective values of the Threshold, Drum Level, and Release controls' parameters at specific frequencies. For example, you can lower the threshold for a bass frequency band to make processing include more drum hits—without affecting cymbals. Not sure your breakpoint editing improved results? Simply toggle a curve on and off to alternately hear and bypass its effect.

You can click on other buttons in the Curves view to snap a node to zero (to null a pre-existing offset from nominal value), solo a frequency band around a node with a bandpass filter, clear a breakpoint curve, copy a curve for one parameter and paste it to another parameter's curve, invert a curve, and double or halve the amplitude of a curve, re-

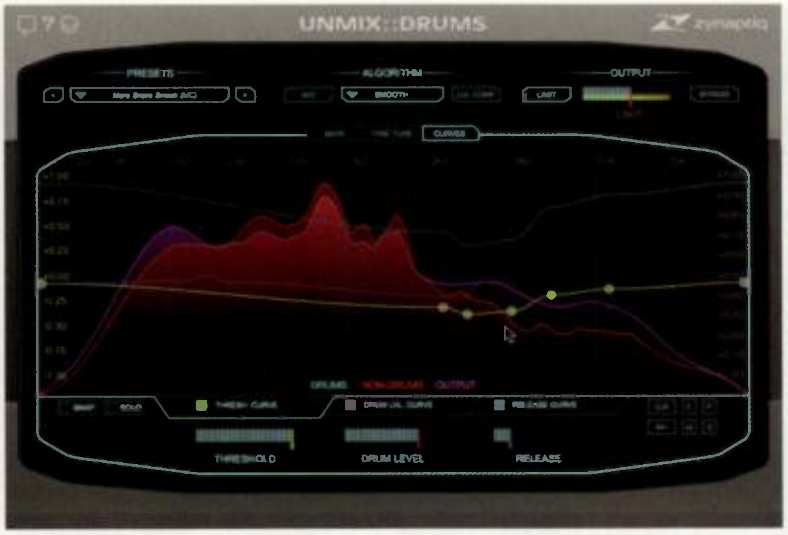

Fig. 2. The Curves view allows breakpoint editing for Threshold, Drum Level, and Release controls on an XY plot, shaping powerful frequency-dependent processing.

spectively. The XY display also illustrates the levels of detected drums and non-drum sounds, and the plug-in's output signal, using different colors below their associated curves. That said, in my tests the curve for detected drums rarely—and never for kick drum hits—showed on the display.

All of the main parameters can be controlled by MIDI by mapping each control to a specific MIDI Channel and CC, and defining its parameter range and response curve. The GUI also includes pop-up help balloons, presets to use as starting points for specific applications, and the usual preset-management functions.

DRUMMING SOMETHING UP (AND DOWN)

I was amazed at how transparently I could boost or lower drums on full mixes. Attaining superb results took some tweaking; nobody ever said doing the impossible would be easy! When boosting, I had to lower the Attack and Detection Density controls a bit to avoid also boosting vocals. Lowering breakpoints for the Threshold curve—and boosting those for the Drum Level curve—between 3 and 5 kHz goosed stick strikes on snare drum hits. I avoided similar adjustments at higher frequencies to preclude also enhancing vocal sibilance.

The Bass Synth processing sounded smooth and musical with judicious use, causing no distortion or time-domain problems; raising the control only ten percent added all the sub-bass energy I needed on a mix that had a weak bottom. I wished its high cut-off was lower than 200 Hz, however, as any more than very spare use tended to blur the mix slightly.

Unmix::Drums can't completely remove drums from a mix, but it can reduce their levels dramatically. This came in really handy on a restoration project that required me to extract a lead vocal from a mix. Using very low Drum Level, Threshold, and Release settings, and cranking Max Cut all the way, I could reduce the drums' levels in the mix over 90 percent. I then used other software to isolate the mid-channel and winnow bass guitar from the mix.

I wished Unmix::Drums provided Undo and Redo functions and alternate workspaces. But these are niggles when you consider how Unmix::Drums pulls off the virtually impossible with grace. Costing only $189, Unmix::Drums is a powerful tool for mixing, mastering, and restoration work. Highly recommended! ■

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

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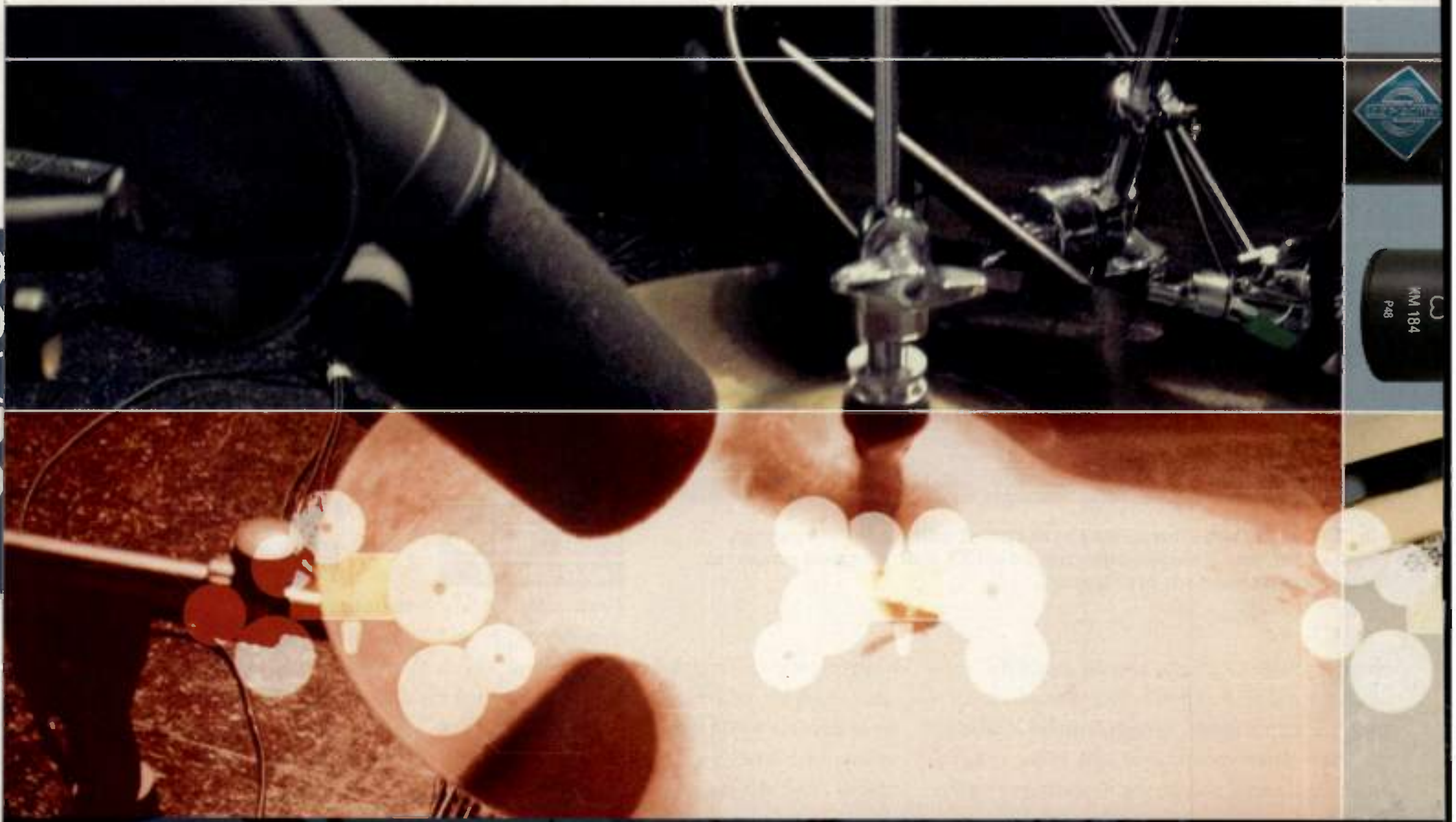


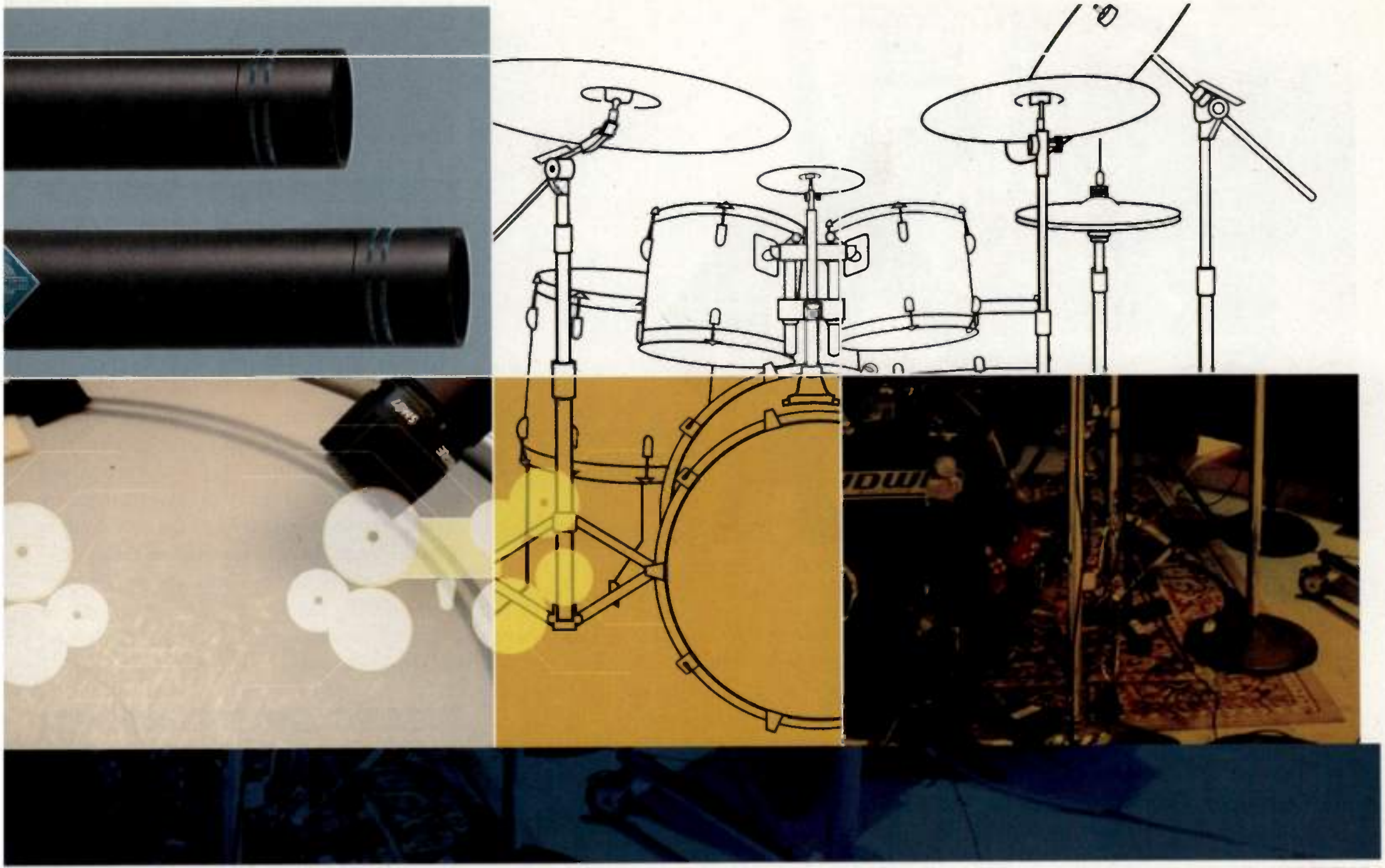
Big Drums, Small Spaces

Tricks for recording monster sounds in meek rooms

BY STEVE LA CERRA

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

We all want a huge space for tracking drums, but in reality, most of us are recording in project studios, garages, spare bedrooms, and other less-than-cavernous spaces. But just because you have a small room, doesn't mean you have to record a small drum sound.



But first, a few things to keep in mind. Drums, like any instrument, sound different depending where they are placed in a room. Recording drum kits requires you to do a bit of homework, moving the kit to different areas of the room and recording it again to compare how the room reacts to the different placements. Reflected sound from nearby boundaries can cause constructive or destructive interference, particularly in the low frequencies, so placing the kick drum in one area may produce more low end versus placing it somewhere else. No doubt this fine-tuning is far more of a pain in the arse than moving an acoustic guitar player, but the good news is that you'll probably only need to do this once; then you can nail the drums and stands to the floor. (Okay, maybe you shouldn't do that.) Keep in mind that drumming is physical and requires elbowroom. You'll need space to fit mics, stands and cables, *and* the drummer, so make sure that they can be comfortable.

Most music genres call for close miking individual drums in the kit. Jazz is one exception: Many jazz drummers prefer minimal miking so that they can create their own mix of the kit. For a jazz recording, I'd typically use mics for kick, snare, and a pair of overheads unless the drummer requests otherwise. Recording drums for any other genre usually requires adding a mic per tom, hi-hat, and possibly the room. Generally, each microphone is recorded to its own track.

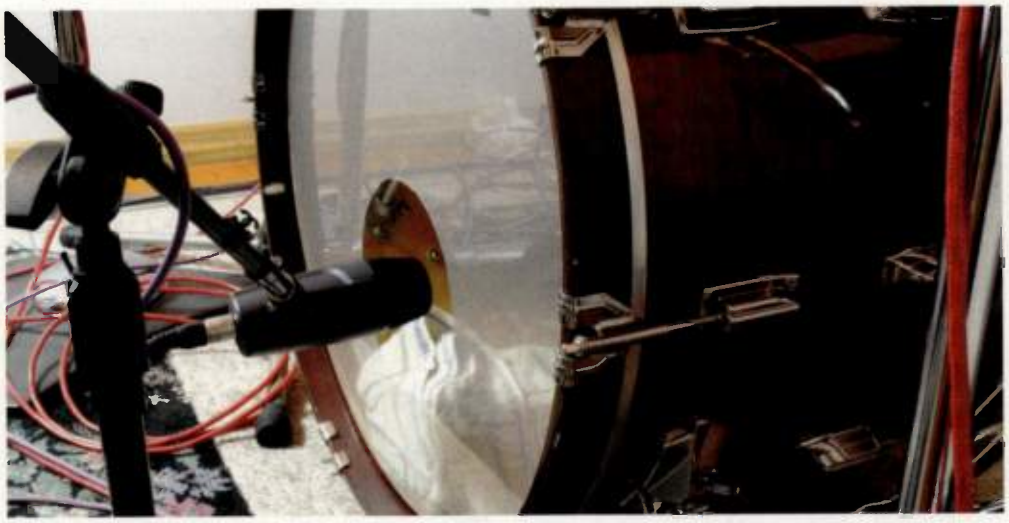


Fig. 1. To record kick, start with a single dynamic mic placed so that most of the body is outside the drum, and the grille is just inside the resonant head's hole.

A HOLE IN THE HEAD

Let's start with the kick drum itself. Life is easier if you either cut a hole in the front head or remove it (the exception being jazz, when the front head usually stays on). Back in the day, cutting a hole in the front ("resonant") kick head was such a pain that drumhead manufacturers eventually got hip and started selling "ported" heads with pre-cut holes. Obviously, the hole facilitates access to the

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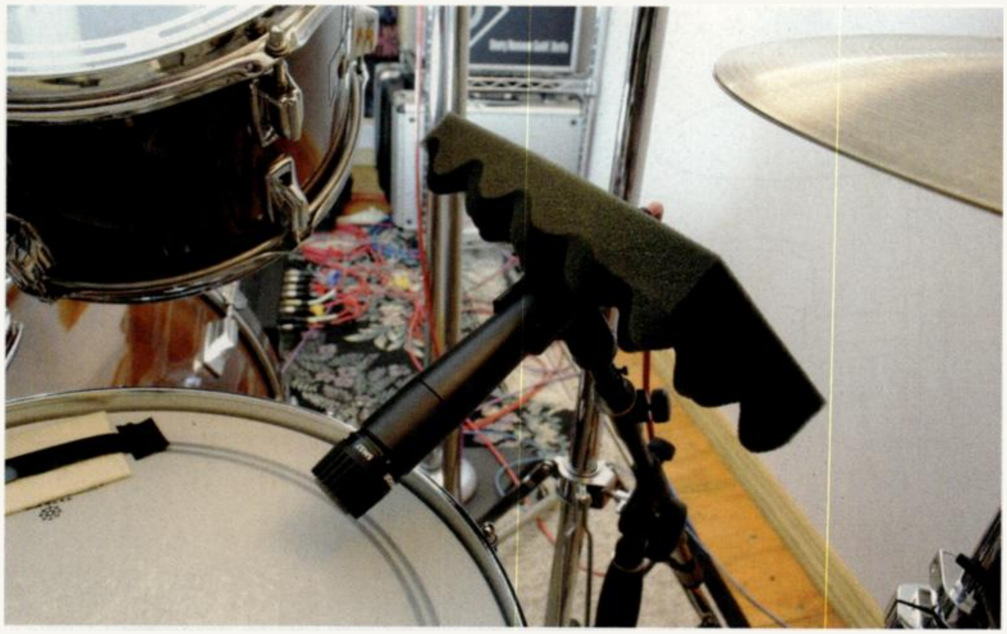

Fig. 2. Classic configuration: Shure SM57 on the snare.

interior of the drum (as will removing the head) but using a ported head also maintains the kick's bottom end "whump," which is sometimes lost when the head is removed. It also helps to keep in place the blanket or pillow you'll need to place inside the drum to prevent it from ringing incessantly (and for those long days when you need a nap on the studio floor). Don't overstuff the kick drum or you'll kill the tone. Use a *small* pillow or blanket, or a towel large enough to damp the heads a bit. You can also try specialty drumheads designed to reduce ringing, such as Remo's Powerstroke 3, or products specifically designed to dampen a bass drum.

Mic manufacturers have gone to a lot of effort to make it easy to achieve good drum sounds, so take advantage of all of that R&D. Popular candidates for kick drum include the Audix D6, AKG D112, Sennheiser e602, and Shure Beta 52. Flying under the radar are the beyerdynamic M88 (TG, initially developed for voice) and Electro-Voice RE20.

I like to start with a single dynamic mic placed so that most of the body is outside the drum, and the grille is just inside the resonant head's hole (see Figure 1). Simply pushing the mic into or pulling it out from the hole can have a profound impact on the timbre, so try a few different positions. Modern kick drum microphones usually have a tailored response, but you may find that some mics require a cut somewhere between 300 and 500 Hz to reduce midrange "boxiness."

Some engineers like to record kick using two microphones: an "inside" mic and an "outside" mic. A small-diaphragm condenser inside captures the smack of the beater on the head. Add a dynamic just inside the hole or a large-diaphragm condenser mic one to three feet in front of the drum to capture the low end. The Shure SM91/Beta 91 is a popular choice for the high end. It's a boundary mic intended for use on conference tables and lecterns but works great for getting the kick's attack. You can lay it on that blanket, or for more reliable placement, check out the Kelly SHU mounting system (kellyshu.com).

At least one manufacturer, Audio-Technica, produces a single microphone with two capsules. The AT2500AE and ATM250DE both feature dynamic and condenser transducers in the same housing, facilitating placement as well as ensuring that there will not be phase issues between the two capsules. A breakout cable with a 5-pin XLR on one end and two 3-pin XLRs on the other allows you to record each capsule separately.

NO SNORING ON THE SNARE

Experienced recordists will agree that you need look no further than a Shure SM57 when recording a snare drum. Billions sold, billions digested. Try placing it as shown in Figure 2 and pay attention to the rear end. It's important to minimize the amount of hi-hat bleeding into the snare mic (and vice versa) so that (a) the level of the snare can be changed independent of the hi-hat and (b) any processing applied to snare (gate, compressor, EQ, reverb) will not affect the 'hat. Taking advantage of a mic's polar pattern helps control such leakage. The SM57 is a cardioid mic so if we point the back of the mic—the point of maximum rejection—at the hi hat, we can reduce leakage. The foam behind the mic further reduces leakage.

Other go-tos for snare miking include the Audix i5, AKG C451 (B), and Neumann KM84. For years the C451 and KM84 were the "standard" condenser microphones, often combined with a Shure 57. If you're lucky enough to have a C451 or KM84, place it out of harm's way—a KM84 in good condition fetches about a thousand bucks. Other microphones worth trying on snare include the Sennheiser MD441, Shure SM85, and AKG D330.

BOTTOMS UP

Many a time I have recorded a bottom snare and not used it, but the bottom mic does add a papery sizzle that some people like. I feel that adding too much of the bottom mic makes the drum sound wimpy. There's an extremely good chance that the bottom microphone will be out of phase with the top mic because they probably face in opposite directions—so be sure to check it using the "REV" or "Ø" button on your preamp. If your preamp lacks this feature, find a DAW plug-in that has it, and use it (e.g. a "trim" plug-in). Try to point the snare bottom mic slightly away from the kick drum to reduce leakage. You can severely cut the low frequencies (400 Hz and below) on the snare bottom mic to remove kick bleed, because you'll get the low and low-mids from the top mic. The bottom mic should be recorded to its own track.

TOMS

The big challenges for miking toms are keeping the mics out of the drummer's path and preventing cymbals from bleeding into the tom microphones. It's really not fair to ask drummers to change *their* setup to accommodate your microphone placement. That said, your job is easier when there is physical separation between toms and cymbals. This is where the condenser-vs.-dynamic mic debate enters. Condenser mics generally produce more detail and a more "hi-fi" sound but those attributes translate into greater leakage. Dynamic microphones may sound a bit dull compared to condensers but they tend to be better at rejecting unwanted sounds, and you can always add a bit of EQ in the mix. You'll have to listen for yourself.

Figure 3 shows placement of a microphone on a rack tom. Notice that the mic is not pointing directly at the head. It is pointing across the head from the rim toward the center of the drum. Pointing the mic directly at the head isolates a small portion of the head, reducing the roundness and emphasizing weird overtones or tuning anomalies. Try to aim the rejection area of the pattern toward what you *don't* want leaking into the mic. Don't be afraid to get close with a tom mic, within an inch or two. Most directional mics produce a fair amount of proximity effect, which can provide some of the low-frequency response that we'd otherwise need to add using EQ. If the toms do not have bottom heads you can try placing the mics inside the drum from underneath. This increases the isolation, but usually the tone suffers.

The Sennheiser MD421 (II) is a great dynamic

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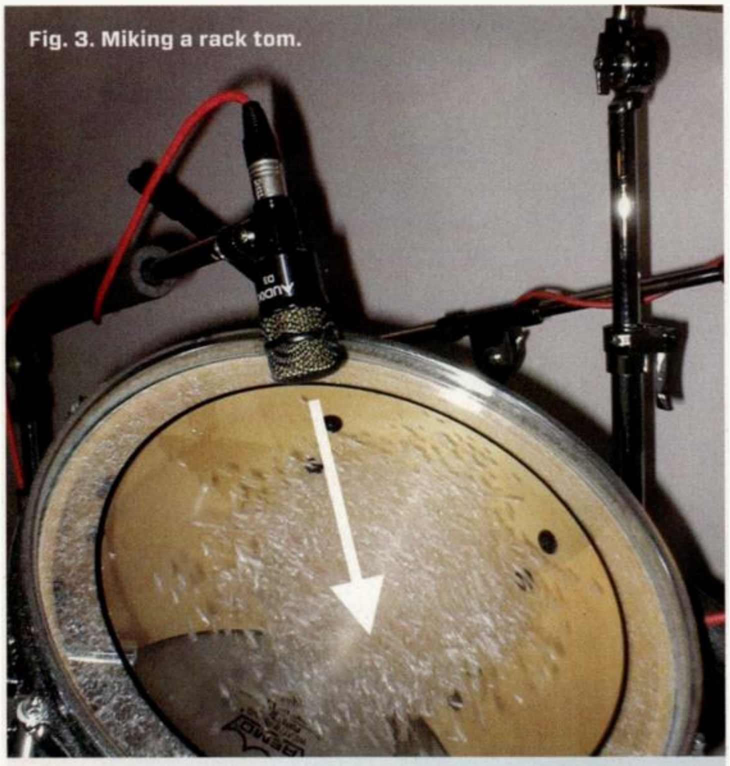
Fig. 3. Miking a rack tom.

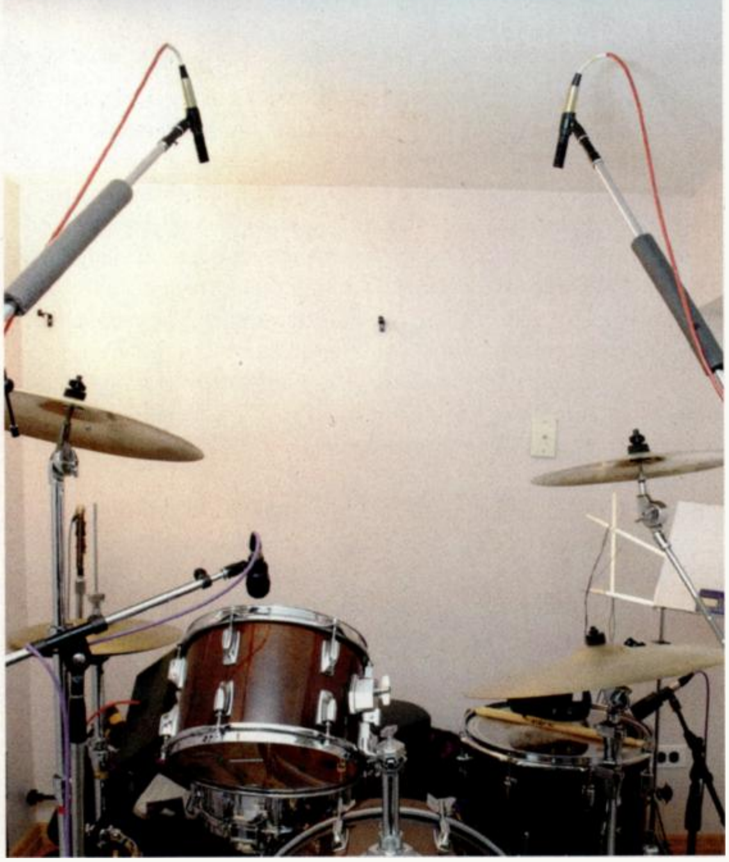
Fig. 4. Try miking a kit with a spaced microphone pair, placing mics about six feet high, four to five feet apart, and pointing straight down at the floor.

tom mic, but its size can sometimes make placement difficult. Other strong candidates for tom mics include the Sennheiser e904 and its descendants the e504 and e604, Audix D2 and D4, and Shure Beta 56 (A). Condenser mic choices for toms typically include the Shure Beta 98, Audio-Technica ATM350, and beyer TG D57c. All of these are fairly compact and some can be clipped onto the rim of the drum, reducing the number of microphone stands cluttering your small space. Be sure to listen to each mic "solo" to make sure you're not capturing noises that might be mechanically transmitted through the mounting hardware.

OVERHEADS

Overhead or cymbal microphones are where the fun really starts. (If you're interested in going deep into stereo miking, read "Master Basic Stereo-Miking Techniques" in the June 2013 issue of *Electronic Musician*, or at emusician.com.) These can be used as cymbal mics, simply providing the "top end" of the kit, or as the foundation of the kit with the close mics added for definition. When these mics are used as cymbal mics, it's likely that you'll filter the bottom end out below say, 500 Hz. Do this in the mix, please! When using overheads as the foundation, you really want the total spectrum of the kit even before the close mics are added. A coincident stereo recording technique such as X/Y or Blumlein with the mics centered over the middle of the kick drum is a good starting point (especially if you are worried about phase issues or mono compatibility) but provides a small stereo image. Close snare mic is usually panned center so when it's mixed with the overheads you may find that the snare "pulls" to one side of the mix. To alleviate this issue, move the overhead mics slightly toward the middle of the snare drum. Make sure that the panning of the close mics matches that of the overheads or the stereo image will weaken.

I usually start with either a spaced or near-coincident pair, as shown in Figure 4. These deliver a wide stereo image, but check your mix in mono to reveal phase issues and move the mics accordingly. Try a spaced pair with the mics about six feet high, four to five feet apart and pointing straight down at the floor, or an ORTF pair centered above the middle of the kick drum at the same height. When the room has a low ceiling, mics with a cardioid pattern help reject reflections from the ceiling. If the room has a high ceiling, try figure-eight patterns to allow in more of the room's "air."

Condenser mics are the de-facto choice for overheads because they capture the shimmer of cymbals more realistically. The usual suspects include Shure SM81, Audio-Technica AT4050 or AT4033, Neumann KM184, AKG C451 B, Blue Dragonfly, or DPA 2011C. If you're on a tight budget, the Shure PGA181 (less than $100 street) is an excellent, affordable mic for overheads and hi-hat.

Any mic that you'd choose for overheads is likely a good choice for hi-hat (or spot mic for ride cymbal), though lately I am having success with a Shure SM7B dynamic. Figure 5 illustrates what at first glance appears to be a weird placement for a hi-hat microphone: It's pointing away from the kit to reduce leakage, but captures plenty of "chick" from the cymbals. Note that the mic is not pointing at the closest wall, which would increase possibility of capturing reflections. I generally don't recommend miking a hat from underneath, but I don't like cherry vanilla ice cream either, so feel free to try it.

DIRTY DEEDS DONE DIRT CHEAP

We could probably do an entire *Master Class* on room miking but let's start by saying that even in a small room, it's worth putting up a room mic. If you prefer you can think of it as an effect mic so don't be afraid to compress the daylights out of it. There are two tricks you can use in a small room to provide the illusion of a larger space. One is placing a directional condenser mic (cardioid, hyper-, or super-cardioid) at the end of the room opposite the drums, and then facing the front of the mic toward the wall opposite the drums. The mic will capture the early reflections from that wall with a longer delay time. For a slightly different flavor, try a figure-eight mic about five feet high with the null facing the drums, and the front facing the ceiling. The figure-eight pattern will reject direct sound from the drums and capture reflections from the floor and ceiling (you can do this with the walls, too). Experiment with distance from the kit until you get the optimum "size," and compress to taste. A variation of either of these can be set up with a pair of mics; don't be afraid to back them off ten feet if room size permits. Another technique that works well is a pair of large-diaphragm condens-

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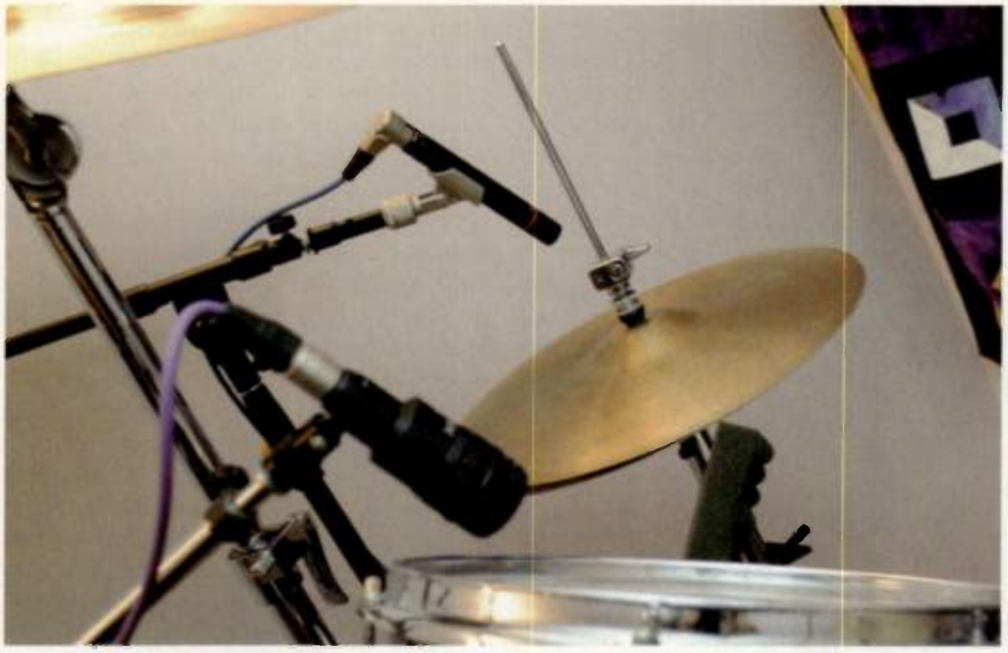


Fig. 5. Hi-hat mic placement. Here, the mic is pointing away from the kit to reduce leakage, but captures plenty of "chick" from the cymbals.

ers such as AKG C414s or AT4050s set to cardioid, flanking the kit and pointing toward the snare, five or six feet in front, one to four feet high.

POWER TRIO

Recently, I did a session in which I recorded drums using three mics: kick (Shure Beta 52), snare (Audix i5), and one overhead (Røde Classic II). The good news about recording this way is that the sound has a lot of focus and there's very little phase cancellation. The bad news is that if you do this with a drummer who doesn't know how to balance the kit, you're in big trouble because there's no safety net—i.e. you can't fix it in the mix. Lucky for me, I recorded an experienced drummer who knew how to play, tune, and balance the kit. Close-miking each element of the kit definitely allows more control when it comes time to mix, but keep this in mind: No matter the number of components in a drum set, it's still *one instrument*. Treat it as such. ■

The Glyn Johns Drum Recording Technique

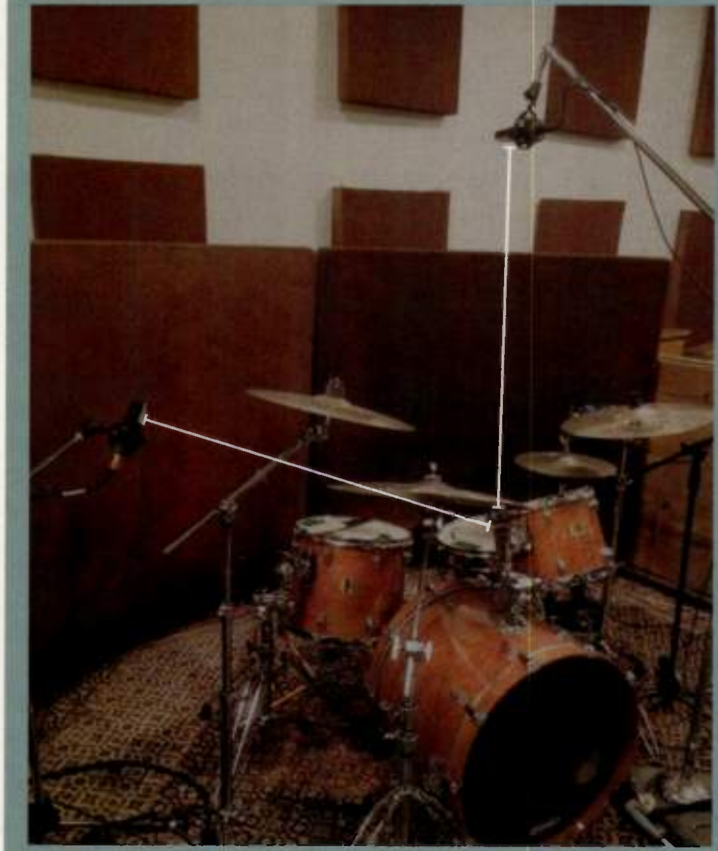
Glyn Johns is a world-class recording engineer and producer whose credits read like a page out of classic rock history, including The Beatles, Led Zeppelin, The Stones, The Eagles, and The Clash. Johns developed a very effective, minimal drum recording technique that he reportedly used to record John Bonham. The method uses four microphones: two identical condenser microphones (usually cardioid) plus two dynamic mics. The condenser mics are used for "overhead" while the dynamics are used for kick and snare.

The setup starts with one of the condenser mics placed as if you were recording the kit in mono: directly above the snare, three to four feet from the snare head, and pointing straight down at it. I typically place this mic 40 inches from the snare head. Make a quick test recording and listen for overall balance. If the rack tom is not present enough, you can try pointing the microphone slightly toward it.

The next overhead mic is really not overhead at all. It is placed to the side of the kit four to six inches above the floor tom, pointing toward the snare. It should be (and this is critical) the *exact* same distance from the center of the snare as the first overhead mic. This greatly increases the phase coherency of the recording. These two mics are panned hard, the first overhead hard right and the floor tom overhead hard left (audience perspective). If you are recording a left-handed drummer, these will be reversed.

Next we add two close mics, one for the kick and another for the snare. You can place the kick microphone in the traditional location, either inside the drum or just inside the hole in the front head. Last, add a snare mic placed an inch or two above the rim of the snare pointing toward the center of the head.

When mixing these mics, start with the two overheads then add the close kick and snare mics as "fill" mics. (The snare and kick should be panned center.) As far as microphone choices, try large-diaphragm condensers for the overheads, such as Audio-Technica AT4050s or AKG C414s set to cardioid. A Shure SM81s also work well for this application. Do not use a mic's low-frequency rolloff here—you want a full-frequency recording from the overhead mics. You can also experiment a bit with the distance of the close snare mic, which can change the overall tone.



Glyn Johns' Mic technique. Note distance from each mic to snare must be identical.

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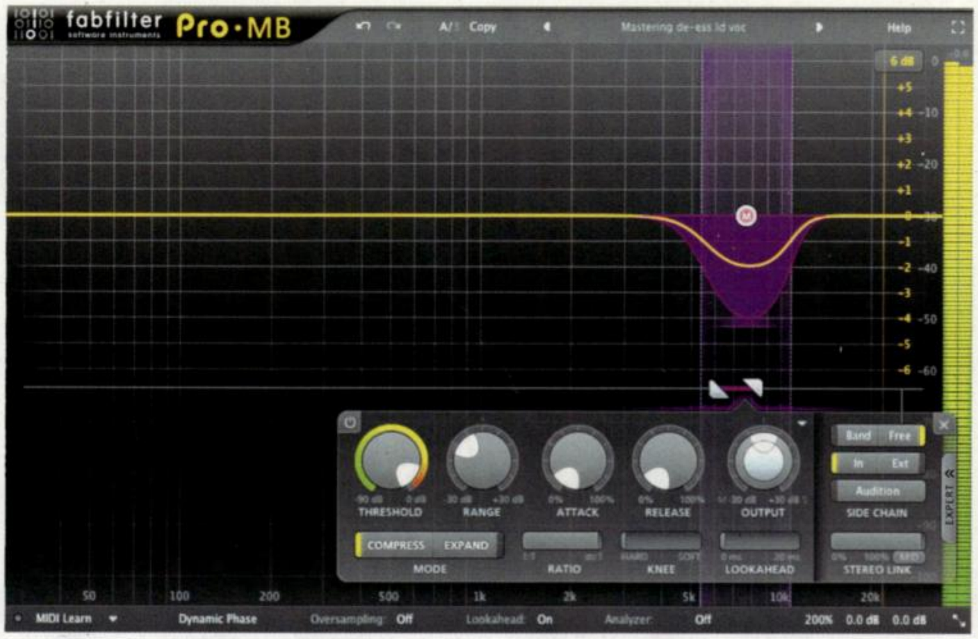

Oversampling: Off

Lookahead: On

Analyzer: Off

Fig. 1: To de-ess vocals in a full mix—and prevent instruments from triggering compression—set the bandpass filter in FabFilter Pro-MB's sidechain to a narrower bandwidth than the filter in the mid channel's audio path.

Surgical Compression for Mastering

Use these meticulous—and improbable—techniques for transparent results

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 michael-cooper@bendbroadband.com and hear some of his mixes at soundcloud.com/michael-cooper-recording.

You normally wouldn't think of using sky-high compression ratios and a hard knee for delicate mastering applications. Those settings are used to slam tracks with heavy gain reduction, right? Yes, but sometimes they can be used for much more subtle and delicate effect. In this article, I'll show you how to use unlikely compressor settings for surgical mastering.

MISSION IMPOSSIBLE?

Some mastering challenges may at first seem impossible to meet. Take for example a mix in which the lead vocal needs de-essing. Using a mid-side compressor, you can de-ess the mid channel—where the lead vocal lives—but it will be difficult to set a threshold that won't also suck down every kick and snare drum hit and maybe center-panned guitars, too. The cure can be worse than the disease! That is, unless you use smart medicine.

For this task, nothing but the most full-featured compressor will get the job done without incurring audible collateral damage. You'll need a multiband, mid-side compressor outfitted with either a freely adjustable sidechain filter or an external sidechain input. The compressor should also offer a range control, super-fast attack and release times, a very hard knee, sky-high ratio, sidechain monitor and very fine threshold control. FabFilter's Pro-MB plug-in fits the bill perfectly.

IN THE OPERATING ROOM

Set up Pro-MB so that only the mid channel triggers compression and only the mid channel's high frequencies—between roughly 5 and 10 kHz—will be compressed (see Fig. 1). Dial in an infinity:1 ratio and 2dB range to start. When de-essing a vocal embedded in a mix, the threshold typically must be set barely below the amplitude of the vocal sibilance. Any lower, and slightly quieter elements in the mid channel (such as electric guitars) will also spark gain reduction. You want sibilance that barely exceeds the threshold to reliably trigger significant compression (hence the high ratio), but no more than about 2 dB (delimited by the Range control); 2 dB is typically the max you can get away with when de-essing a full mix. Sibilance typically comes and goes very quickly, so set Pro-MB's attack and release controls to their fastest settings to treat the problem and avoid collateral damage. You also don't want the compressor to kick in as the audio signal approaches the threshold, so set Pro-MB's

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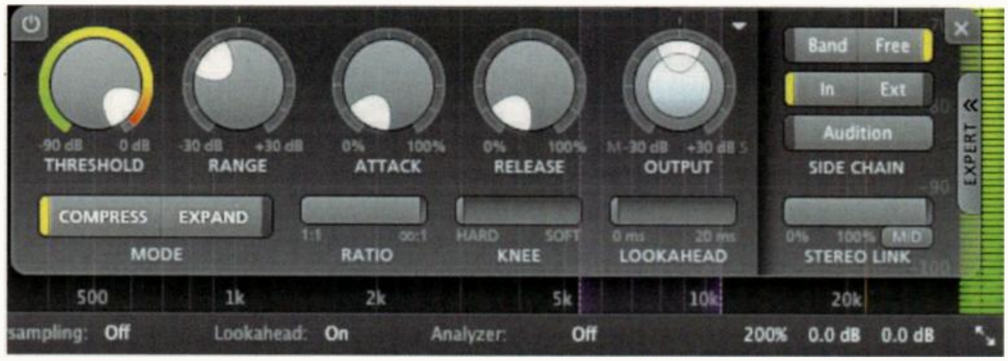

-90 dB
0 dB
THRESHOLD
-30 dB
+30 dB
RANGE
0%
100%
ATTACK
0%
100%
RELEASE
-30 dB
+30 dB
OUTPUT
Band
Free
In
Ext
Audition
SIDE CHAIN
EXPERT
COMPRESS
EXPAND
MODE
1:1
∞:1
RATIO
HARD
SOFT
KNEE
0 ms
20 ms
LOOKAHEAD
0%
100%
MID
STEREO LINK
500
1k
2k
5k
10k
20k
sampling: Off
Lookahead: On
Analyzer: Off
200%
0.0 dB
0.0 dB

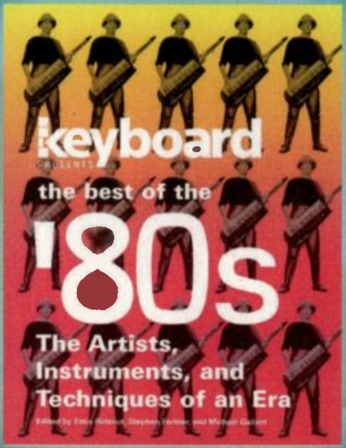
Fig. 2: Detail of compressor controls: Use a hard knee and high ratio and threshold settings.

Knee control to fashion the hardest possible knee.

At this point, you'll probably notice that some kick and snare hits are still triggering compression. In Pro-MB's sidechain, narrow the range for the adjustable bandpass filter to whittle down the drum hits and pass only a thin slice of sibilant frequencies (narrower than the range that will be compressed in the audio path). (If your compressor doesn't have a bandpass filter for its sidechain, route a bandpass-filtered copy of your mix to your compressor's external sidechain input.) While listening to Pro-MB's sidechain signal, fine-tune the bandpass filter's range to find the sweet spot where vocal sibilance sounds louder than kick and snare hits. (On mixes in which the vocals are deeply buried, this might not be possible.) Even though you're compressing in the audio path between roughly 5 and 10 kHz, the sidechain filter might only span, for example, 6.3 to 8 kHz—a much narrower slice.

After adjusting the sidechain filter, you'll likely have to fine-tune Pro-MB's threshold again to completely weed out the kick and snare. If the filtered sibilance barely exceeds the reset threshold (likely!), you may also need to increase Pro-MB's Mix parameter to as much as 200% (to double the gain-reduction amount) and its range from 2 dB to 4 dB to achieve as much as 2 dB of gain reduction on peaks. (Because Pro-MB's Range control slightly softens the knee at higher settings, sub-maximal gain reduction will also slightly increase.) With the correct setup, the vocals should be lightly and transparently de-essed. Mission accomplished! ■

> For this task, nothing but the most full-featured compressor will get the job done without incurring audible collateral damage.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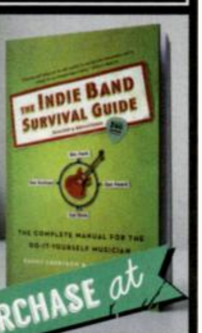
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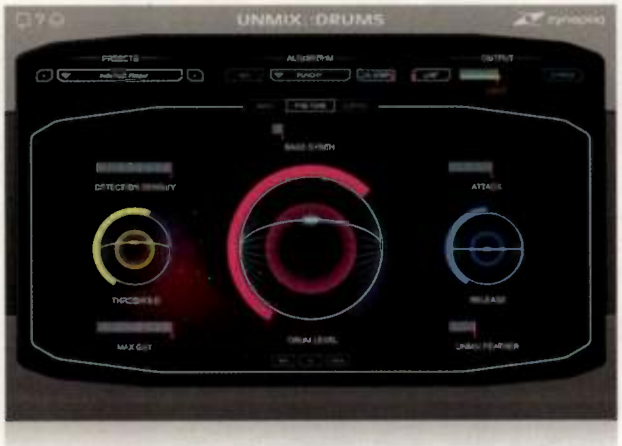

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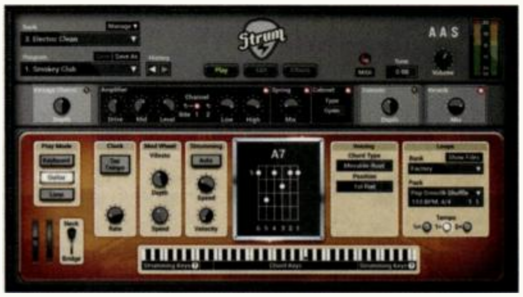
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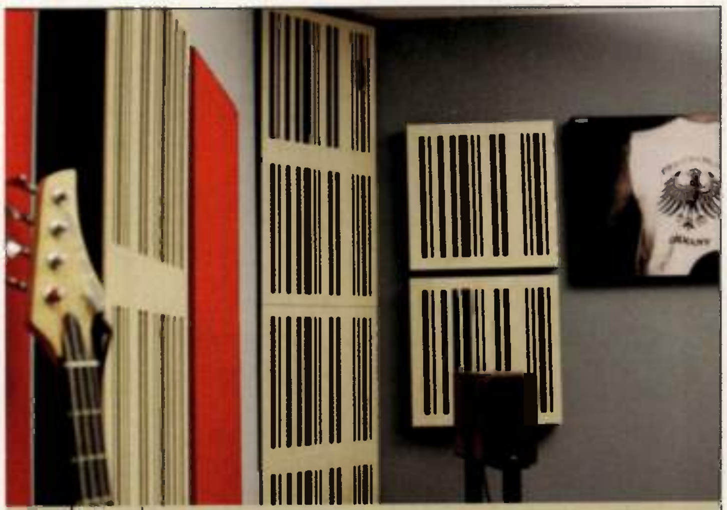

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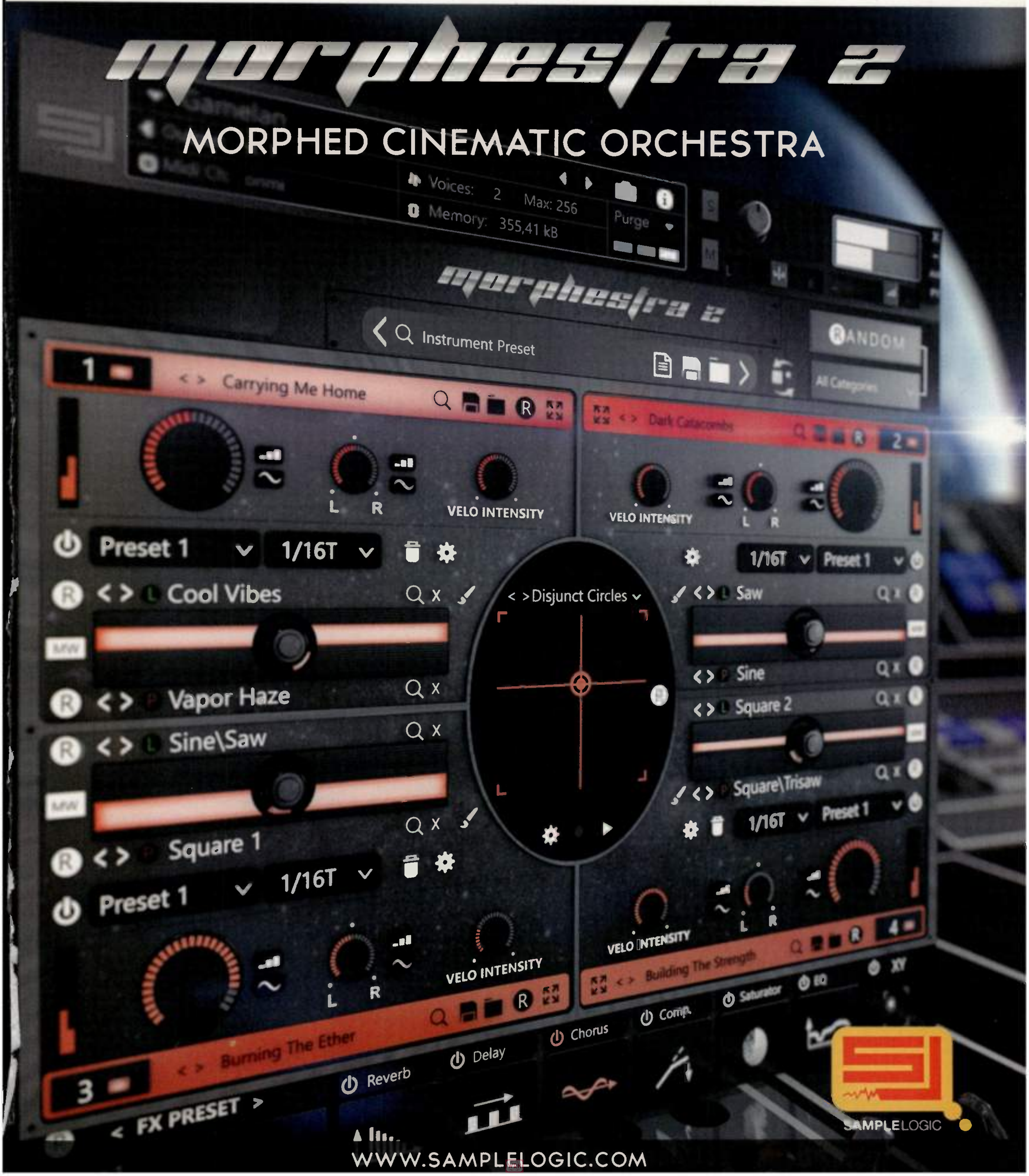
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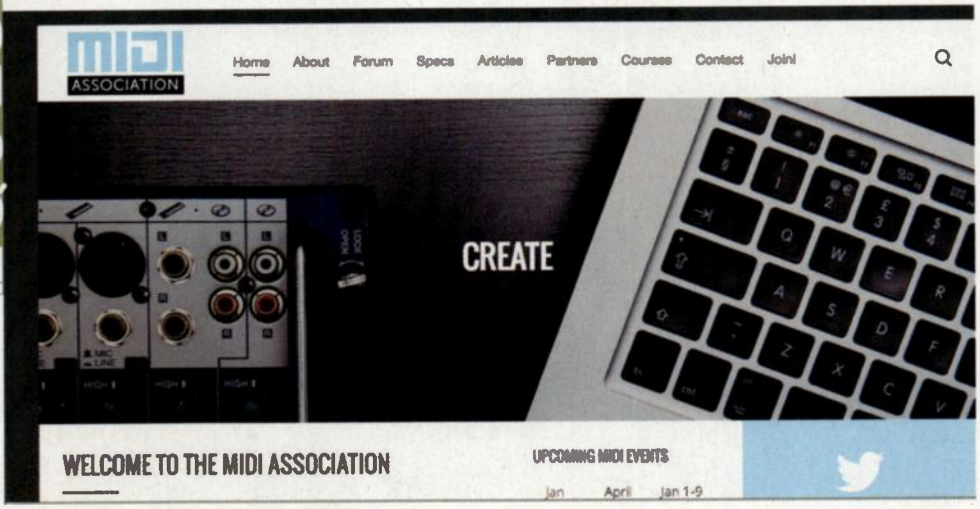
FIVE QUESTIONS

The MIDI Association's Athan Billias

Charting the course of an evolving protocol



BY SARAH JONES

MIDI has provided the backbone for electronic music for more than three decades. And though we've seen the adoption of significant extensions (Standard MIDI files, General MIDI, MIDI over FireWire) during that time, with the advent of Bluetooth LE, Web MIDI, and integration into Android, Chrome, and other consumer platforms, the scope of MIDI users is broadening considerably.

To meet growing demand for education, the MIDI Manufacturers Association, a nonprofit trade association of MIDI technology providers, announced The MIDI Association, which is conceived to educate and nurture a global community of MIDI users through its MIDI.org web hub (above). The MIDI Association (TMA) advisory board member and longtime MMA advocate Athan Billias, Yamaha's director of strategic planning, walked us through the association's plans and goals.

What led to the MIDI Manufacturers Association launching The MIDI Association?

At Winter NAMM 2015, we looked at all of the upcoming advances to MIDI. We knew that wireless Bluetooth MIDI Low Energy was coming, spearheaded by Apple; we knew that Microsoft was working on a new MIDI API and unifying their platform for audio and MIDI across all their devices from desktop to xBox; and Google was planning on putting the Web MIDI API in Chrome and adding MIDI to the Android platform. We realized that by the end of 2016 there would be an estimated 2.6 billion MIDI-enabled devices on the planet, but no centralized place for people to learn and share stories about MIDI.

How are the goals of the The MIDI Association different from those of the MIDI Manufacturers Association?

The MIDI Manufacturers Association (MMA) has been focused on the companies that make MIDI products, and maintaining and developing the MIDI specification. TMA is focused on people who use MIDI. As a standards body, the MMA needs to be somewhat protective of information and is an exclusive group. [Members must be companies that make MIDI products and pay a membership fee to join.] TMA is an inclusive global community of individuals who create music and art, and is free to join.

The MIDI.org website is the central repository of information about anything related to MIDI technology, from classic legacy gear to next-gen protocols on the horizon.

Individuals who use MIDI technology can join The MIDI Association to learn about MIDI, share their experiences and creative projects on forums, participate in TMA webinars and broaden their MIDI knowledge. This includes musicians, artists, educators, retail salespeople, DYI/Arduino enthusiasts, DJs, game developers, sound designers, and audio engineers.

How does TMA facilitate dialog between technology providers and users?

There are forums on the site where end users can post questions and interact with MIDI experts from member companies. Member companies are creating articles about new MIDI technologies and posting them in the site. So MIDI.org is where MIDI companies and MIDI users can meet to interact.

How will educational outreach expand as the community of MIDI users expands?

We have partnered with Nonlinear Educating and Ask.Audio. There are 93 hours of free video training available on the site now, and you can sign up for full MIDI courses and curriculums. These courses have quizzes and tests built in to them. We are planning on adding official MIDI certification in the very near future.

We also have an education panel led by Paul Lerhman from Tufts University, and they are looking at institutional solutions for classroom curriculums on MIDI. We encourage educators at all levels to get involved.

Why is it important for music creators at every experience level to get involved?

MIDI is like air. It's transparent, it's all around you, and most of the time you don't have to think about it much. But if you're a musician today, imagine trying to live without it.

Staying on top of the newest MIDI specifications, exploring new creative possibilities, sharing stories, and interacting with other people who have a passion for creating with MIDI is what the new MIDI Association is all about.

So please go to midi.org and join the global community of people who work, play, and create music and art with MIDI. ■

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