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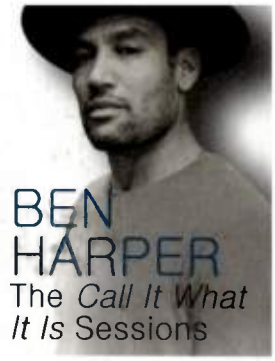

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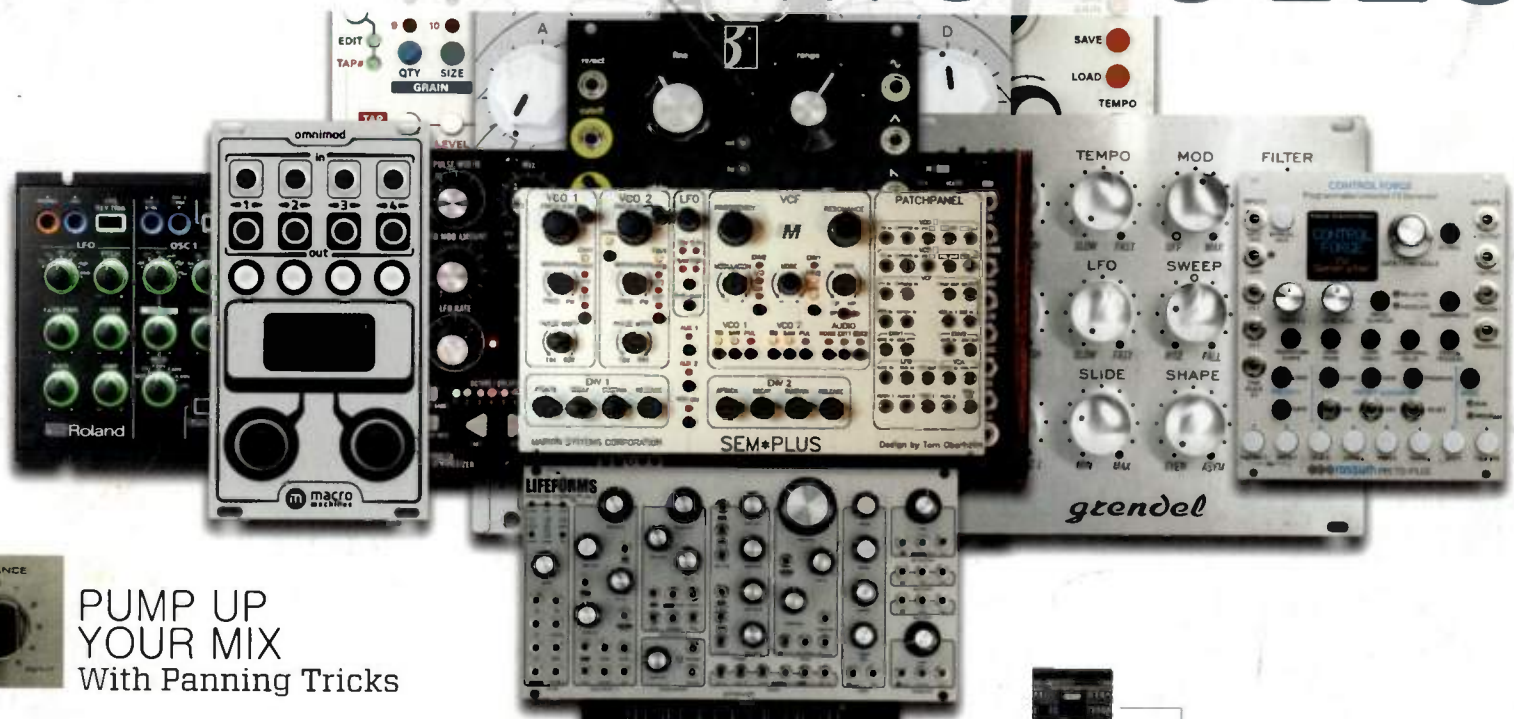

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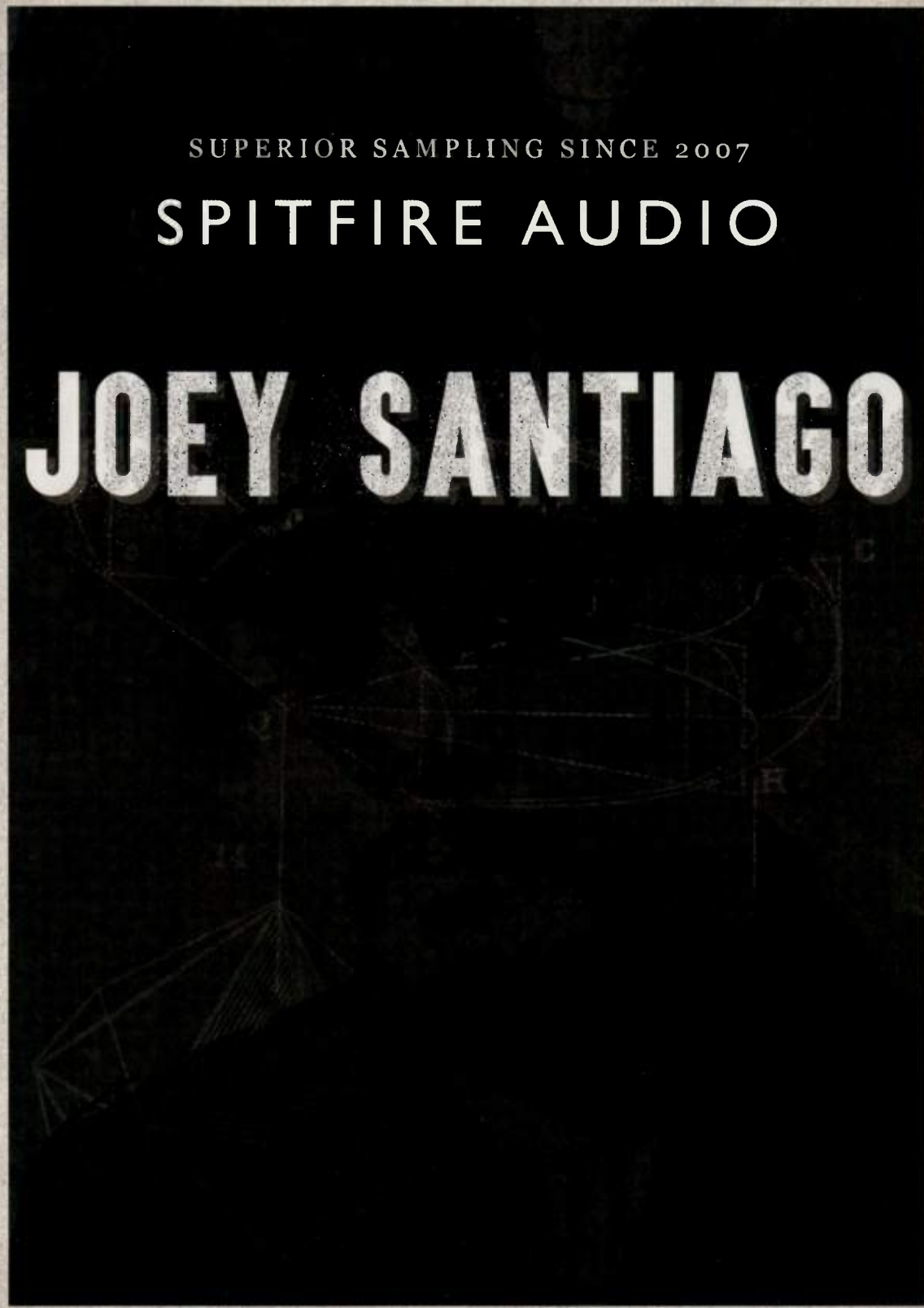

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MODULAR SYNTHESIZERS

Looking to fill your Eurorack spaces with synths that perform double-duty? We survey a dozen of the latest options.

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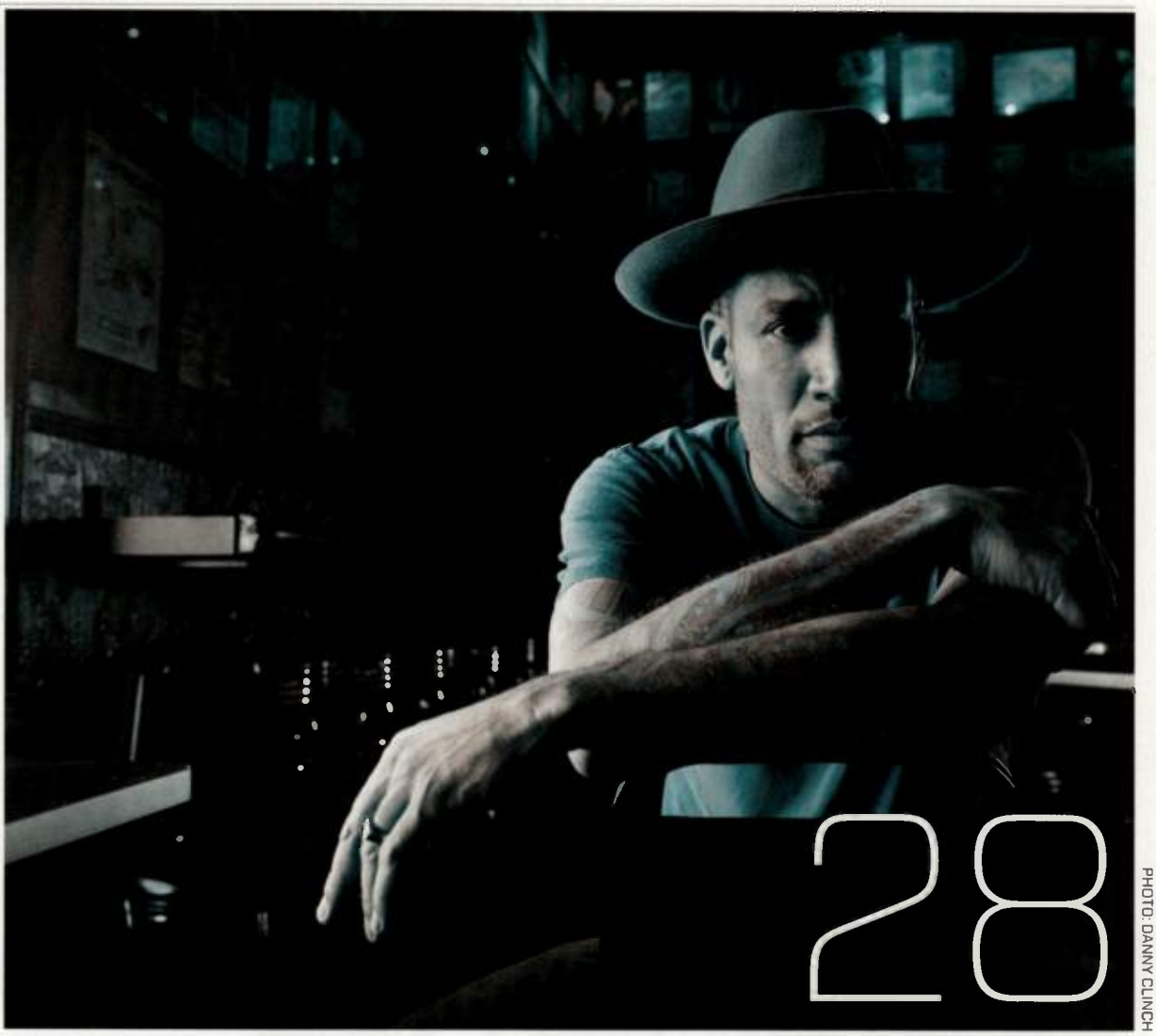

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Can a music program create professional, real-sounding arrangements and solos for your songs from only a chord progression?

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"Your Band-in-a-Box program is extraordinary!" "You're product is AWESOME! THANKS!" "A fantastic leap forward." "Un - Believable." "I can't believe how fast I can generate RealTracks and render to audio!" "They've outdone themselves this time, and I'll be singing the praises of Band-in-a-Box every chance I get." "This new musical concept you have created is nothing short of evolutionary. If it were a living creature, it would be a whole new species." "Just when you think Band-in-a-Box is as cools as it can be, you guys take it to a new level." "Brilliant! I'm awestruck." "All of the new instruments are just smashing." "I must say, the pedal steel is perhaps the greatest accomplishment in the history of this brilliant program." "This is a great gift to jazz musicians, educators, and singers." "Oh, wow. This changes everything." "It's stunning." "Thanks for a superbly useful piece of software." "Wow. I'm learning tunes fast with help of the Audio Chord Wizard... it finds the exact chords to the song perfectly." "Wow!" "I can load my MP3 in and see the chords play on the screen." "I am blown away! The jazz/swing RealTracks stuff is amazing." "Awesome.' "Is this cool or what?" "I'm in seventh heaven!" "You won't regret it (and if you do, there's the 30 day money back guarantee)." "I never thought I'd see the day this was possible " "I know it's been said before, but you guys are incredible." "This is gonna set the world on fire!" "I'm so stoked about how good everything sounds I can hardly stand it." "This is just killer. " "Amazing, simply amazing." "RealDrums are really awesome sounding. Good work!" "Many kudos all around." "You never cease to amaze me. You got it." "Wow and Double Wow!" "The RealTracks and RealDrums sound awesome." "Long live PG Music!" "Mind bending." "I am absolutely delighted with Band-in-a-Box. . Kudos to you and your team!" "I am frankly amazed at most of the styles." "First time I did a song with Band-in-a-Box, I couldn't believe it!" "I use it in the classroom and also in creating music in my studio. It is a fantastic piece of music software to own. I am greatly impressed." "I use Band-in-a-Box regularly. It has improved my musical talents by far and I enjoy it very much Thanks to all who have helped make this program so fantastic!!!" "The immediate feedback is a first-class learning environment!" "Band-in-a-Box is my best learning tool." "I use Band-in-a-Box all the time A truly great product." "Excellent quality is a PG Music standard!" "Band-in-a-Box makes it so easy to quickly build an arrangement for composing." "I've used Band-in-a-Box for a year now, and it just gets better with age.' "Band-in-a-Box, well, it's just a great program!" "Great software and accessible to everyone who loves music!" "Your Band-in-a-Box is fabulous! Congratulations." "I'm looking for those perfect band mates and just discovered that they live in a box!!!" "Thank you very much for my first great Jam Buddy, Band-in-a-Box!" "This is the best music program I've ever seen It makes piano practice a lot easier and fun!" "I am a private music teacher, and since getting Band-in-a-Box years ago, my jazz teaching has improved immeasurably." "You guys are doing a great job in providing not only cool software, but outstanding customer service. I hope other software companies follow your example!" "Awesome software at a fantastic price!" "Band-in-a-Box continues to amaze me!" "Band-in-a-Box is the most powerful, cost effective, user friendly music software I have ever seen!" "I loaded the program, put in some chords, selected solo and trade 4's – now I start jamming and these cats are blowing me away! Miles, Tracy Hubbard, Coltrane, all of them are killing me!" "Band-in-a-Box is, indeed, fantastic! I'm sometimes a little frightened when it plays a series of choruses and the randomized piano part with play something hip. I catch myself nodding at the computer saying yea nice man... oh wait!" "I am very impressed with your fantastic improvisational program It is revolutionary and I am sure it will do wonders for the future of jazz education." "This is a genius program " "Band-in-a-Box is a fantastic program. It has changed my life." "I have been a long time fan. As a performer and music educator, Band-in-a-Box is heaven sent." "This program does more than advertised." "It will revolutionize the way students are taught to improvise jazz solos." "The Band-in-a-Box Audio Chord Wizard is a great tool. There is nothing else like it!" "A class act company with the customer in mind. Great Program. More companies should follow your example. Keep up the good work and thank you!" "A great package! Now I can have a back-up band whenever I practice the guitar." "Who knew what Coltrane would sound like soloing over country music - LOVE IT!!!" "Band-in-a-Box, well, it s just a great program!" "Wow... So much for ever sleeping again." "Songwriters, this will become your most creative tool." "It is great to have a full band at my beck and call." "Best investment in software I've ever made!!" "Band-in-a-Box is a real treat to use!" "I was absolutely blown away at the quality of Band-in-a-Box when I purchased it and began working with it...the professional staff at PG Music know their product!" "I will recommend Band-in-a-Box to all those out there who have a computer." "I use Band-in-a-Box regularly. It has improved my musical talents by far and I enjoy it very much. Thanks to all who have helped make this program so fantastic!!!" "The audio chord wizard is my favorite feature of Band-in-a-Box." "The RealTracks are fantastic and provide great inspiration for creativity." "I tried with many audio files and the chord detection is amazingly accurate." "Band-in-a-Box is some of the most fun you can have with a computer."

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Room Realities

IN A perfect world, we'd all be producing records in gorgeous, acoustically sound studio spaces. But in actuality, most of us are tracking and mixing in rooms intended to work better as bedrooms, basements, and home offices.

Of course, a well-designed recording space makes a world of difference. But the fact is, most of us don't have the option to build a floating floor in our house or soundproof our garage.

Modern production tools bring our studio fantasies within reach. You might not own a grand piano, but thanks to the magic of sampling, you can put one on your recording. Can't book Ocean Way or Abbey Road anytime soon? There's a plug-in for that. And there are plenty of ways to de-emphasize a less-than-optimal recording environment through strategic placement of acoustic materials and creative recording tricks.

But what about actually using that unique room sound to your advantage?

In our "Embrace Your Space" Master Class beginning on page 50, we'll show you some simple recording techniques that will transform your room into a live chamber, using the gear you already own. Your room might be that missing element that adds just the right character to your recording.

Don't let limitations define your work. Stop worrying about your room and make some music.

SARAH JONES
EDITOR
sjones@musicplayer.com

electronic MUSICIAN

WEB HIGHLIGHTS

This month on emusician.com

Room Recording Extra:

Advanced Stereo Miking Techniques

Plus...

The DIY Advisor: "Work for Hire," Explained

UVI Cameo Review: audio clips

...and lots more!

gadget geek

Zvex Candela Vibrophase

Create Effects by Candlelight

A simple tealight is all that's needed to "fire up" the Candela Vibrophase tremolo pedal from Zvex (zvex.com). How does it work? Two solar cells take electrical power from the tealight, and a Stirling engine, a 200-year old design, provides mechanical motion powered by the candle's heat. The Stirling engine uses a hot cylinder, a cooling cylinder, and the expansion and contraction of hot air to drive a flywheel, which drives an optical disc. The oscillations of the optical disc interrupt the light from the candle going to the photocells of the phaser/vibrato circuit. You control the speed of the Stirling engine—and thus the effect—by moving a spherical neodymium magnet closer or further away, and that creates an electro-magnetic force that fights against the magnet and slows down when you get close.

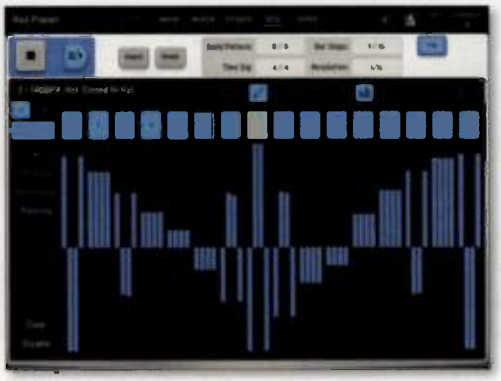
At $6,000, the Candela Vibrophase was meant to be an inspirational, one-of-a-kind piece; this clever bit of boutique engineering from Zachary Vex takes about 77 hours to make, according to Reverb.com, where you can find all of Zvex's cool hand-painted effects pedals.

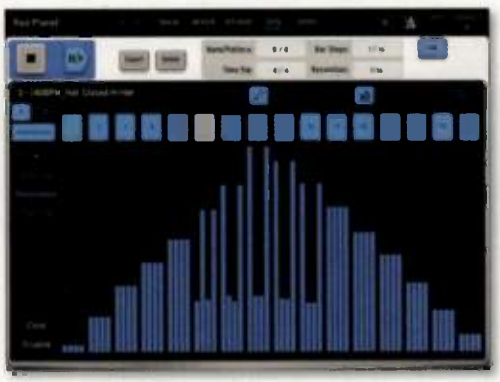
—MARKKUS ROVITO

app tip Arturia iSpark

BY MARKKUS ROVITO

Automate any parameter of 16 drum sequencer tracks.





WHEN ARTURIA recently released its iSpark drum machine for iPad (iOS 8 or later, arturia.com), it felt almost as hefty as its powerhouse namesake, the Spark 2 drum-production plug-in. iSpark has dozens of great-sounding kits, with 16 sounds each for the 16-track built-in sequencer. Each sound has its own synthesis controls and two effect slots; a 16-track mixer also has two send effects and master channel effects. A song section lets you string together patterns and perform real-time touch effects on them. But here's how to use the powerful track automation.

1. Choose a kit from the menu bar and record or sequence your beat parts from either the Main view sequencer or the SEQ view 16-track sequencer.

2. Go to the SEQ view, and for any track, tap its Automate button to open the automation editor. The default automation curve is for Velocity. Tap the "plus sign" above that to choose to automate more than 30 parameters, including filter controls, envelope controls, panning and effect parameters. You can open automation curves for as many parameters as you want.

3. With the default pencil tool, drag your finger to draw in an automation curve. Use the SEQ tracks' Solo and Mute buttons to better hear the changes you make.

4. Use the up/down tool to move the existing automation values up or down in relation to each other. A segment button allows you to split each 16th-note step of automation into four segments for finer control. The eraser tool lets you erase whole steps of the automation curve or individual segments in each step.

5. These automation features let you infuse your beats with a dynamic sense of motion. When you're finished, tap Export in the SEQ view to save a WAV file of the beat in the iTunes Share directory.

Fire up the iTunes App Store to get iSpark for $19.99.

CLASSIC EM Howard Jones, 1986

IN "KEEPING Up With Howard Jones," (March 1986), Craig Anderton caught up with the pop star soon after the release of his second album, *Dream Into Action*, which included the monster hits "No One Is to Blame" and "Things Can Only Get Better." Jones shared his perspectives on everything from his synth rig to stage show to songwriting process; read more of this interview at emusician.com/HowardJones.


Interview

Howard Jones has come a long way since he told his factory co-workers that one day he was going to quit his job and just play his music. From playing to five people in a pub only a few years ago, to headlining—and filling—major arenas, here's an electronic musician who turned his dream into action.

Keeping up with Howard Jones

EM: You approach the studio and your concert quite differently, yet the overall sound is consistent. I don't think people would be disappointed hearing you live after hearing the record.

Jones: I do approach it differently, although I try and be as authentic as possible with the actual sounds. I think things like reverb perspective should be accurate. I take a lot (of parts) out for live performance, because you can't fit all that in—you just end up cluttering the sound. There's nothing worse than a big blob of sound. It often takes a lot more nerve to strip things down—it gives you confidence to have tons of things all playing behind you. But I think it's much more effective if you make sure that the song is very well arranged, and that everything has its place in the sound spectrum.

SPOTLIGHT | Beatport's New BitTorrent Bundle

A Free Music Production Toolkit

BEATPORT LAUNCHED a free Production Starter Kit loaded with everything music creators and aspiring producers need start making music through the BitTorrent Bundle direct-to-fan publishing platform. Beatport's Production Starter Kit BitTorrent Bundle includes:

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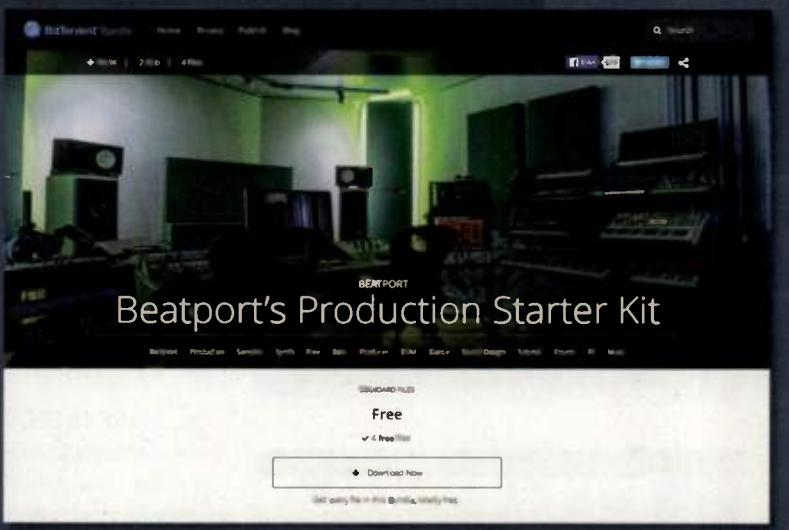

The package, part of Beatport's commitment to supporting creators by "lowering the barrieditioner of entry to newcomers interested in producing and mixing music," is available for download on the BitTorrent site, at bundles.bittorrent.com.

YOUR TAKE | Studio In a Semi

MEET **ANDY KOTZ**, WINNER OF OUR HEAVYOCITY GRAVITY GIVEAWAY

WHEN WE asked you to send us pics of your mobile rigs for our "Your Take" contest, we didn't expect to see an actual big rig. Enter reader Andy Kotz, who turned in the winning submission:

"My name is Andy Kotz and I'm from Monticello, MN. I am the epitome of 'music-on-the-go'! Unfortunately, my music hasn't made me enough money to quit driving a Twin Express truck and trailer to support the family. But that doesn't stop me from trying! I may just be the only ASCAP composer with music on TV that's traversing the United States in an 18-wheeler."

Andy wins a limited-edition Gravity Drive loaded up with Heavyocity's flagship virtual instrument, *GRAVITY: Modern Scoring Tools*, which includes 12 GB of sounds, including complex pads, evocative risers, otherworldly strings, and earth-shattering hits (value: $449). Learn more about GRAVITY at heavyocity.com.

Take a look at the awesome studio setup Andy built right behind his driver's seat, and learn more about his scoring projects and touring gigs at andykotz.com.

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BY BARBARA SCHULTZ

>> Brooke Waggoner's *Sweven*

THIS LUSH, atmospheric release from artist/composer Brooke Waggoner, *Sweven*, began as an instrumental album, recorded in 2014. "I did two of the songs in Nashville with [engineer] Kyle Richter two years before I started making this record," she explains. "Then I recorded piano and Rhodes in a small studio in New Orleans, where I'm from originally. I have a good friend who has a studio with a really nice Kawai upright; since I grew up learning on a Kawai, I thought that would be a nice place to get the feeling of being at home. Then I just sat on those tracks for a while."

It was later that year, when Waggoner was on tour in China, that she was struck with some lyric ideas that felt right for the songs. "The min- ute I got home, I started working away, plugging lyrics into the instrumental tracks," she says. "I put those instrumentals on a loop for days and immersed myself in them, trying to figure out: I've got the foundation of an album, but it's not in a grid; how can I put lyrics in that make sense as part of a song? It was a different way to write."

Writing and recording are pretty fluid for Waggoner, who often works in her own studio, Turquoise Noise, in Nashville. She captures tracks to Pro Tools via her "one nice mic," a Neumann TLM105. All of *Sweven*'s vocals and added keyboard textures on *Sweven* were recorded there.

"A lot of the organ bits and textures are from a Casio Privia or my Yamaha Motif, and then I have a mini Roland and lots of other little sound machines," Waggoner says. "My husband's a drummer, so we also have endless percussion in there, and we could play around with those textures, as well."

Other parts of *Sweven* were captured in various owner-operated studios that Waggoner has used and liked. Bobby Shin recorded orchestral strings in Miami; Logan Matheny tracked drums and bass in Nashville; and Waggoner's brother Phillip recorded guitars in his Houston studio. When all of the tracks were realized, Waggoner met with engineer Eddie Spear, who mixed the album at Nashville's 16 Ton, which has since closed.

"Brooke has concise arrangements and a great ear for production," Spear says. "We talked about leaning into a modern aesthetic, but still having it sound like it could be from the '70s."

Spear mixed all-analog on a Neotek Elan console. "We used a lot of vintage outboard gear, real tape echo and tape machines," says Spear, who served as top engineer Vance Powell's assistant for four years. "The majority of Brooke's vocal sound includes the Cooper Time Cube, which we love on John Lennon's records. We also used an Ampex ATR 102 half-inch machine for slap echo, as well as a '50s green Echoplex. Those things sounded incredible."

Brad Odun tracked drums in Logan Matheny's Big Light studio.

Mix engineer Eddie Spear, and friend

Piano sounds were also embellished to effect a better room sound: "The stereo image of the piano was absolutely perfect," Spear says. "The sounds came from eight microphones [overheads, close mics, room mics]. I bussed all of those together and compressed as one. I also used a Universal Audio Pultec EQP1A plug-in and the UA Fairchild 670 plug-in, and added some tape delay underneath."

Spear used parallel compression on many of the parts to create glue between tracks that had been recorded in so many different spaces. He also purposefully used the same reverbs on all of the tracks. "I had an AKG BX20 and then also a [MicMix] Master Room 305: two beautiful spring reverbs," says Spear. "Those helped get all of the instruments to sound like they were in the same room together."

NEW GEAR

1

ZOOM

Q4N HANDY VIDEO RECORDER

Video camera and audio recorder

$299

HIGHLIGHTS Built-in cardioid condenser mics can be positioned in XY or ORTF stereo configuration • stereo input jack • records WAV files up to 24-bit, 96kHz, as well as AAC files • creates MOV files with 3M HD (2.3k) video resolution at 30 or 60 fps frame rates • USB and micro HDMI connectors • supports SD/SDHC/SDXC cards up to 128GB

TARGET MARKET Musicians in the studio or onstage, students, and educators

ANALYSIS An inexpensive and easy-to-use video camera with high-quality audio reproduction.

zoom-na.com

2

IZOTOPE

RX PLUG-IN PACK

Audio restoration plug-in suite

$129

HIGHLIGHTS Four audio repair plug-ins taken from RX 5 • De-click is used to remove clicks and pops and includes stereo metering and a Sensitivity control • De-hum provides linear-phase filters and adaptive technology to remove hum and its harmonics • De-clip offers a threshold control and metering • Dialogue De-Noise has Threshold and Reduction controls and a real-time display of input, output, and threshold levels

TARGET MARKET Recording, mixing, and broadcast engineers

ANALYSIS A low-cost way to add key audio restoration plug-ins to your system.

izotope.com

3

QSC

E SERIES

Passive loudspeakers

$459-$749 street

HIGHLIGHTS Four models offering Directivity Matched Transition (DMT) technology—the E10 with a 10" woofer and 2.5" voice coil; the trapezoidal, 2-way E12 with 12" woofer and 3" voice coil; the trapezoidal, 2-way E15 with 15" woofer and 3" voice coil; and the E18SW subwoofer with single 18-inch speaker • designed to work with PLD and GXD amplifiers and TouchMix digital mixers

TARGET MARKET Musicians, DJs, stage monitoring, karaoke

ANALYSIS Designed with a variety of uses and mounting options in mind.

qsc.com

4

MODARTT

PIANOTEQ MODEL B

Virtual grand piano

€49 (about $53)

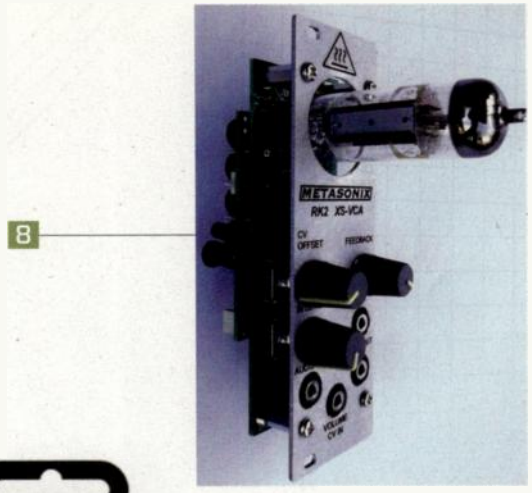
HIGHLIGHTS Physically modeled Steinway & Sons Model B-211 grand piano from Hamburg, Germany, based on the Martha Argerich Edition of 25 instruments hand-chosen and signed by the artist • the software was tweaked to provide tonal clarity and maximum dynamic range

TARGET MARKET Keyboardists, composers, producers, sound designers

ANALYSIS A highly realistic playing experience from a high-quality (and rare) piano that offers greater subtlety in expression than sample-based instruments typically offer.

pianoteq.com

All prices are MSRP except as noted



5

BOME SOFTWARE

BOME BOX

Wireless MIDI hub

€199 (about $217)

HIGHLIGHTS Low-latency networking and mapping of MIDI data via DIN I/O, Ethernet, WiFi, and USB • supports Mac OS X, Windows, and iOS • loads and executes MIDI Translator Pro project files • two Ethernet ports • standard MIDI I/O • USB port • WiFi enable/disable button • powered by external supply, battery, USB, or Ethernet • small, lightweight case

TARGET MARKET Musicians and composers

ANALYSIS Wirelessly move MIDI data between devices onstage or in the studio without the need for a computer.

bome.com

6

SOUNDNESS

SOUNDSOAP 5

Audio restoration software and plug-in (Mac/Win)

$149

HIGHLIGHTS New features include automatic noise detection, improved hum removal, graphical learn-noise mode, support for MP3 and FLAC files, and metering • waveform display for video • full bypass for A/B comparisons • playback includes backward/forward and Return to Start • reset button in the full application • AAX, Audio Units, VST, and AudioSuite support

TARGET MARKET Recording engineers, podcasters, video editors

ANALYSIS With its simplified interface, SoundSoap 5 provides a basic set of tools for cleaning up recordings destined for multimedia applications and audio-only release.

soundness-llc.com

7

TEENAGE ENGINEERING

PO-20 SERIES

Handheld electronic instruments

$59 each

HIGHLIGHTS Designed in collaboration with Cheap Monday, three new "pocket operator" synths, each with pattern chaining and step multiplier • the PO-20 Arcade synth provides arcade-game-style sounds, sequencer, chord control, and effects • PO-24 Office offers noise percussion from a synth engine and samples • PO-28 Robot is an 8-bit synth with sequencer, glide, and effects

TARGET MARKET Composers, performers, DJs, producers, and kids

ANALYSIS It's hard to deny the fun factor and musical usefulness of these impulse-buy-priced instruments.

teenageengineering.com

8

METASONIX

RK2 XS VCA

Eurorack module

$329

HIGHLIGHTS A 15LE8 vacuum tube-based VCA module that includes an inverting/non-inverting amplifier for creating stereo and signal cancelling effects • preamp offers approximately 30 dB of gain • can be used for adding distortion • 3.5mm audio input and output jacks • volume CV input handles ±10V range • handmade in California using premium new-old-stock tubes

TARGET MARKET Musicians and composers looking to add extreme sounds to their modular system

ANALYSIS A multifunction utility module that takes full advantage of the tube's non-linear behavior.

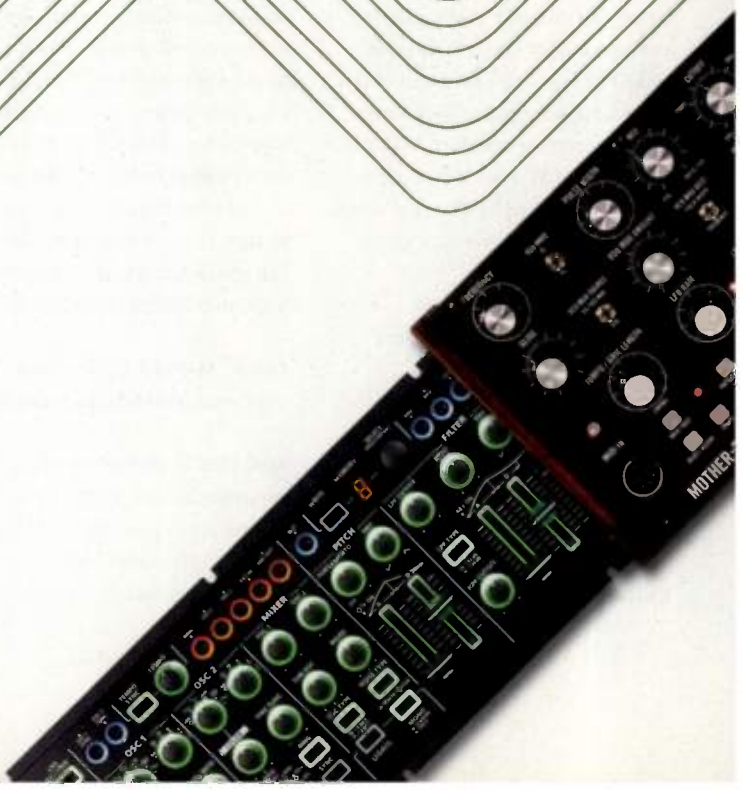
metasonix.com

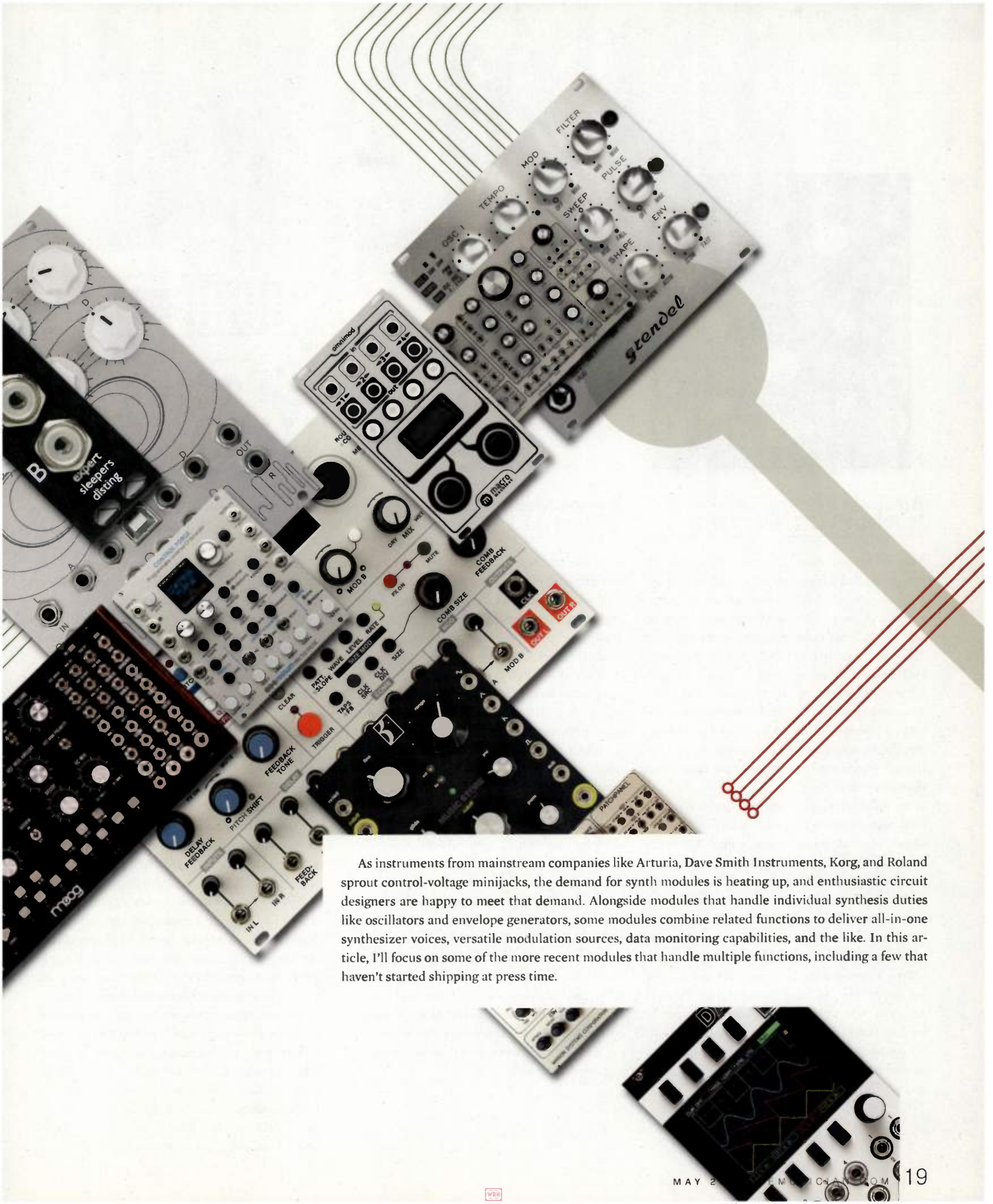
Eurorack Is the New Black

A look at multifunction modules introduced since the beginning of last year

BY GEARY YELTON

Not everyone agrees, but the synthesizer format wars are over, and Eurorack is the clear winner. One of the most noticeable trends at this year's NAMM show in January was the proliferation of synth modules in Eurorack format, with small manufacturers sharing the main hall with larger, better-known companies. Other modular formats remained almost entirely on the sidelines.





As instruments from mainstream companies like Arturia, Dave Smith Instruments, Korg, and Roland sprout control-voltage minijacks, the demand for synth modules is heating up, and enthusiastic circuit designers are happy to meet that demand. Alongside modules that handle individual synthesis duties like oscillators and envelope generators, some modules combine related functions to deliver all-in-one synthesizer voices, versatile modulation sources, data monitoring capabilities, and the like. In this article, I'll focus on some of the more recent modules that handle multiple functions, including a few that haven't started shipping at press time.

Birdkids
Bateleur VCO ($547, 22HP)

This module combines an unusually stable voltage-controlled analog oscillator with a VCA and a 4-pole lowpass VCF. Renowned for its unique sound and named after an African eagle, the Bateleur VCO's most notable feature is through-zero frequency modulation (TZFM), a near-mythical synthesis technique offering a broader range of inharmonic overtones than traditional FM. In the Thru-Zero position, carrier waveforms reverse direction whenever the modulator produces a negative frequency. (Yes, negative frequencies exist, though explaining them would take more space than I have here.)

In addition to four separate jacks for standard analog waveforms, a sub-octave jack emits a square wave an octave below. A knob for setting depth of the pulse-width modulation CV input supplements another for manually setting pulse width. Additional knobs control glide and FM amounts and filter input and output levels. The filter is unusual in that you can turn resonance only off or up full, making it a self-oscillating sine-wave source. Because it tracks so well, the self-oscillating filter makes an ideal modulator for through-zero FM. The optional 8HP Bateleur Expander module ($154) adds CV inputs paired with knobs for controlling filter cutoff, resonance, and exponential FM. It also supplies a VCA input with an attenuation knob.

Expert Sleepers
Disting mk3 ($179, 4HP)

With the Disting mk3, Expert Sleepers packs an incredible number of digital capabilities into a slim form factor, including some that would be impossible with analog electronics alone. Depending on the algorithm you select, it can be an oscillator with FM and waveshaping capabilities, state-variable filter, 2-stage envelope generator, sample and hold, slew-rate limiter, quantizer with selectable scales, pitch and envelope tracker, and quite a bit more. Among its additional functions, it's also a resonator that can generate electronic drum sounds, a phaser with up to ten stages, a random CV generator, and a delay with numerous variations, including stereo ping-pong, tape-delay simulation with variable tape speed, and sync-to-clock options with a 1.7-second delay time.

The Disting has three inputs, two outputs, a rotary encoder for selecting parameters that operates as a button when needed, and a knob for selecting values that also operates as a button. All jacks are backlit and glow red or blue to indicate positive or negative voltages. Eight LEDs in the panel's upper section indicate the selected algorithm and parameter values. If you want to implement custom functions, Expert Sleepers supports an open-source code framework that lets you hack the module's software using development tools you can download for free.

Intellijel Cylonix
Rainmaker ($639, 36HP)

If you want to generate timbres you can't get any other way, the Rainmaker encompasses effects ranging from mathematically complex echoing patterns to unearthly drones and twisted reverb-like sounds. The module combines a stereo spectral rhythm delay and comb resonator with tons of control and configuration options, allowing for deep exploration of unconventional sonic territories.

The delay section lets you employ a single tap for delays as long as 20 seconds or as many as 16 taps to create rhythmic patterns. Each tap has its own resonant filter with lowpass, bandpass, and highpass responses. Because you can push filters to self-oscillate, you can harness them as sound sources for modal synthesis. Each tap also has its own level and pan parameters, instant mute button, and granular pitch shifter that lets you specify the number of grains, grain size, and transposition range. Globally pitch-shift signals as much as an octave up or down by applying a control voltage, and specify delay time using a rotary encoder, tap-tempo button, external clock sync, or 1V-per-octave CV. Apply preset groove patterns to individual taps and stack the taps for elaborate filtering and chord effects.

The comb resonator section has up to 64 time-delayed taps whose outputs are summed. Choose preset patterns for comb-tap spacing and relative amplitudes, and select from numerous filter modes for the global feedback path. Large comb sizes (longer time delays) produce dense echo and simulated reverb, and shorter delays produce flanging and Karplus-Strong-type plucked-string and woodwind-like sounds.

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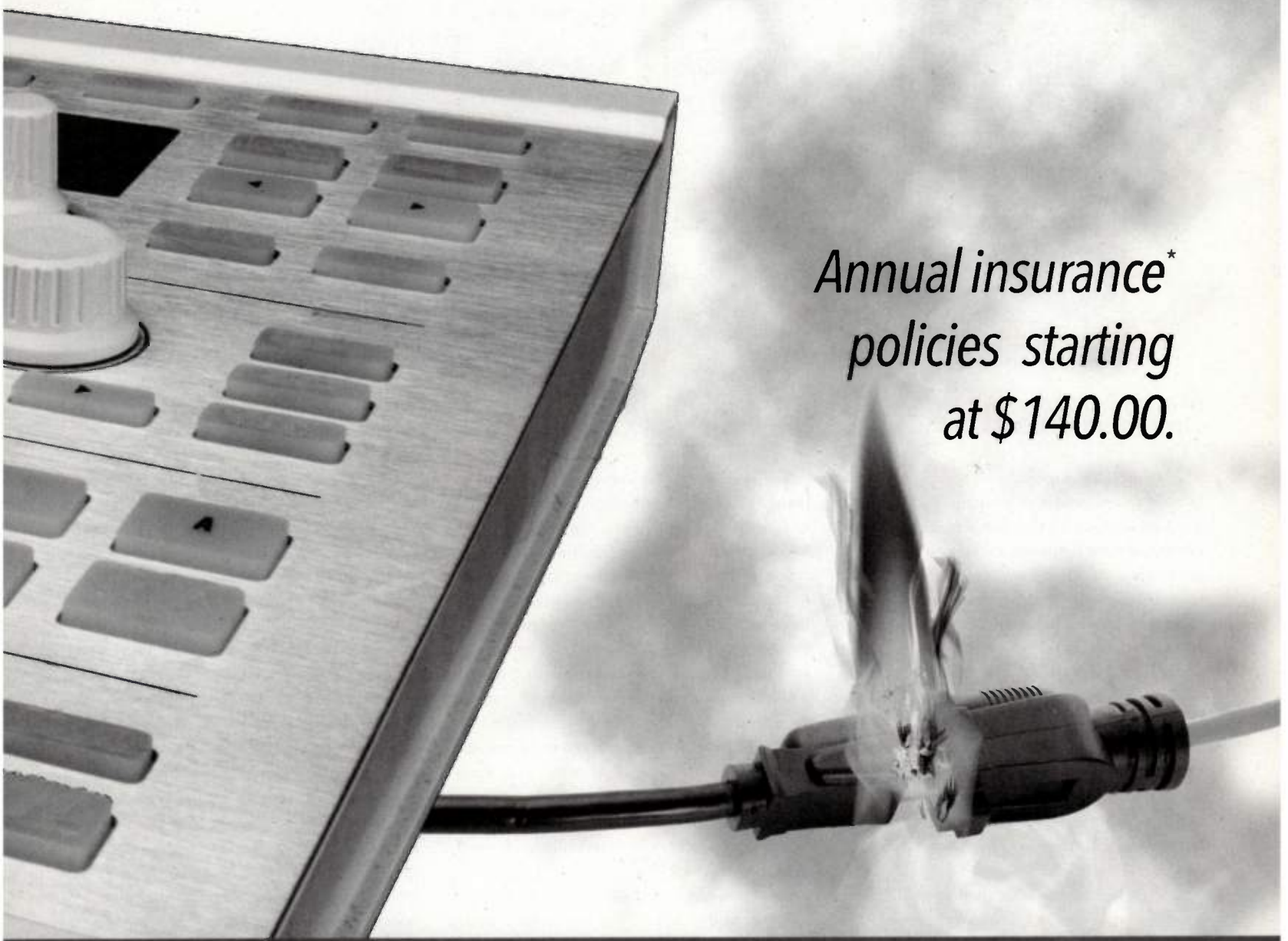

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Macro Machines
Omnimod ($385, 14HP)

The Omnimod is a modulation source that serves as an envelope generator, envelope follower, LFO, and step sequencer and also combines these functions to stream four independent control signals simultaneously. Create custom modulation patterns called shapes, and then store them in 64 user presets for later recall. Each shape has five breakpoints, and you can link any number of presets for longer, more complex modulation patterns. In addition to one-shot and looping modes, you can scrub control values and trigger modulation events in numerous ways. Each segment can have modifiers that cause repetitions with different values or transitions. To quickly form unique shapes in a fluid manner, use the left encoder to select breakpoints and select modifiers, and use the right encoder to select values.

The Omnimod has four channels with corresponding inputs and outputs, as well as four LEDs whose brightness indicates their output levels. Use the inputs to control Omnimod parameters with control voltages, triggers, and audio signals. The high-contrast OLED displays modulation shapes, parameter data, and other information. Scale input signals, set thresholds to trigger events, enable envelope following, and extract or specify tempo in beats per minute on the input oscillator page. The Omnimod stores all current parameter values when you power down and then reloads them when you power back up, so you can continue editing exactly where you left off.

Marion Systems
SEM Plus ($795, 42HP)

Introduced in 1974, pioneering synth designer Tom Oberheim's SEM (Synthesizer Expander Module) was originally intended as a supplementary voice for monosynths, either to fatten their sound or to connect to a sequencer. By the next year, a pair of SEMs was the foundation of the Oberheim Two-Voice (TVS-1), and SEMs were later integrated into the Four-Voice and Eight-Voice models. The original SEM had two audio oscillators, a resonant 2-pole multimode filter, a sine-wave LFO, and two 3-stage envelope generators.

The SEM Plus module takes the same functionality, expands on its capabilities, adds a patch panel with 32 jacks, and houses it in a Eurorack module, making it a complete synthesizer voice for your modular system. The oscillators now offer triangle waves as well as sawtooth and pulse, and you can mix any combination of the three waveforms, a noise generator, and two external signals. ADSR generators replace the previous ADS envelopes. The LFO now offers four waveforms instead of one. In addition to looping, the LFO is capable of one-shot mode, giving it the functionality of a simple envelope generator.

Moog Music
Mother-32 ($599, 60HP)

Although Moog's first foray into Eurorack can operate as a tabletop synthesizer with the included power supply, it's also designed to be part of a modular system. Many normal connections are hardwired, but the semi-modular Mother-32 is considerably more flexible if you bypass them with patch cords. For example, you can choose between two oscillator waveforms by flipping a switch or hear both simultaneously using their outputs on the 32-jack patch bay.

A single VCO spits out sawtooth and pulse waves, with variable pulse width and both linear and exponential FM inputs. The LFO and envelope modulate pitch and pulse width. The 4-pole VCF has voltage-controlled resonance and toggles between lowpass and highpass. The single 2-stage AD envelope generator has a switch to enable sustain. The LFO has triangle and square-wave outputs, and an assignable control output offers selectable functions such as MIDI velocity or aftertouch, pitch bend, and sequencer clock. The Mother-32 also has a VCA (either open or controlled by the envelope), a white noise generator, two voltage-controlled mixers, a 1-input/2-output signal multiplier, and an onboard MIDI-to-CV converter.

The versatile step sequencer provides 64 pattern locations, each with a maximum length of 32 steps. Options for each step include gate length, rest, accent, glide on and off, and ratcheting, which subdivides a step into as many as four repeated notes for a sort of stuttering effect. The front panel has a 13-button "keyboard" for entering note data, either by playing the buttons or by entering notes one step at a time. Octave up/down buttons give the keyboard an 8-octave range.

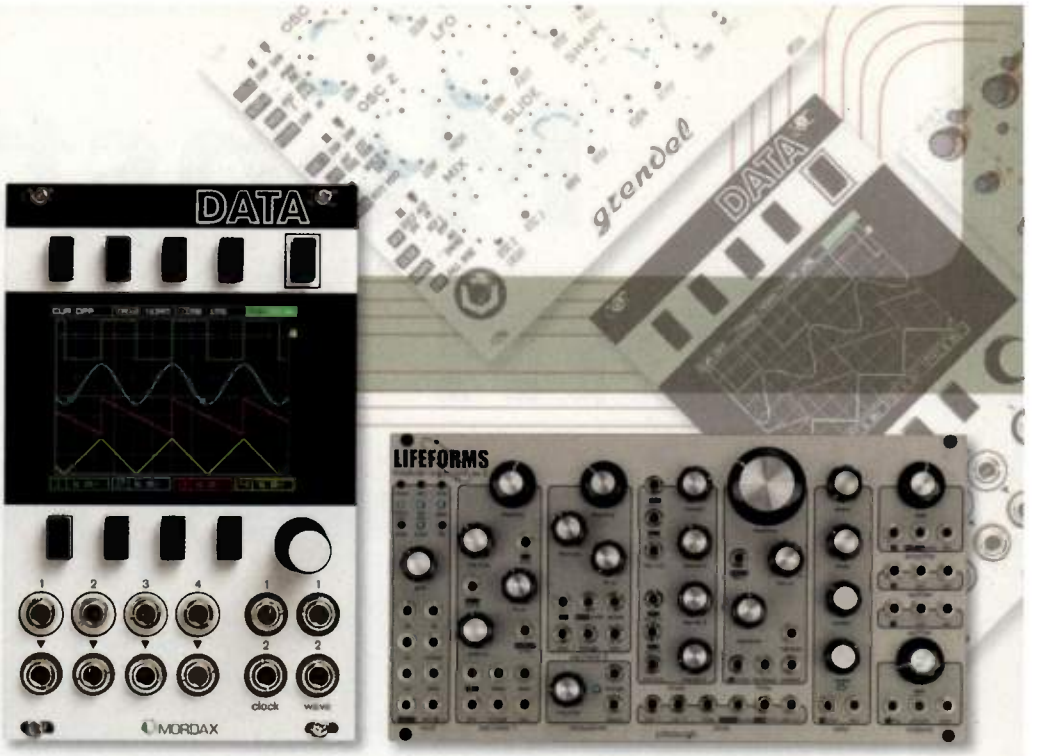
Monster from the Deep

After lurking in the depths of u-he headquarters for many years, Bazille has finally been released into the world. A modular monster synthesizer combining digital oscillators (FM, phase distortion and fractal resonance) with analogue-type multimode filters that ooze quality. The Multiplex offers ring modulation, amplitude modulation and much more, and there are tons more modulation capabilities: LFOs, ramp generators, modulation maps, lag processors, rectifiers, sample & hold, looping envelopes — plus a unique 8-snapshot morphing sequencer. Rounding off the features are four classic effects, including tube distortion and spring reverb.

Download now, and start patching:
www.u-he.com

u-he

While you're at it, check out the award winning Zebra2, Diva, Satin, ACE and Uhbik too. Same developer, same website, same fun factor.



Mordax
Data ($395, 16HP)

With all that's going on inside a modular synthesizer, it helps to visualize every aspect of signal flow possible. That's exactly what makes the Data indispensible. It's a display module for monitoring various signal types in numerous ways. In addition to displaying waveforms, voltages, frequencies, spectra, and tempo, the Data functions as a waveform, fixed voltage, and clock-signal generator. Four input jacks are paired with four buffered thru jacks to ensure that signals passing through are unchanged. It also has two outputs for clock and gate signals and two outputs for control voltages and audio signals. You can update the Data's firmware to add new functions and presets via the included MicroSD card.

One of the Data's most useful roles is as a 4-channel oscilloscope, which operates exactly like a bench scope. You can select which channel to view, scale time and amplitude, and freeze the waveform display. Because you can monitor four inputs, you can view an audio input, two modulating signals, and the audio output at the same time, allowing you to immediately grasp the relationship between audio signals and modulators. The spectrum analyzer function lets you view an audio signal's harmonic content, and when you modulate the signal, you can see exactly how spectra changes over time. Because the Data's voltage-controllable dual waveform generator can produce basic waveforms over a wide frequency range, and because you can specify their frequency, amplitude, and phase, you can also use it as a control source (like an LFO) or an audio source (like an audio oscillator).

Pittsburgh Modular
Lifeforms SV-1 ($699, 48HP)

Lifeforms SV-1 is a complete synthesizer voice housed in a single module. A total of 53 patch points are available, but it also has internally hardwired connections, making it semi-modular and minimizing the patch-cord spaghetti often associated with modular synthesis. This all-in-one unit furnishes most components you'd expect in a basic analog monosynth, including two VCOs, a state-variable resonant VCF, a VCA, a triangle and square-wave LFO, and a single ADSR generator. The MIDI-to-CV converter's 3.5mm jack accepts a 5-pin DIN connection using the included adapter. The converter section has outputs for gate and 1V-per-octave control voltage signals, as well as dedicated CV outputs for MIDI CC, velocity, and LFO messages. For controlling portamento, a Glide knob introduces lag to the 1V-per-octave output.

The SV-1's VCOs generate sine, triangle, and sawtooth, with variable-width pulse and blade (a type of sawtooth with waveshaping options) from oscillator 1 and a fixed square from oscillator 2, with a knob for FM depth. You can use the 4-channel mixer as two 2-channel mixers by defeating the mixer's hardwired oscillator connections. The classic Pittsburgh Modular filter has lowpass, highpass, and bandpass outputs and an attenuverter. If you prefer, you can purchase the SV-1 with one of three Lifeforms Systems enclosures that accommodate a KB-1 capacitive-touch controller.

Rare Waves
Grendel DC-2e Drone Commander 2 ($435, 28HP)

The Drone Commander 2 is a unique sound source with a personality all its own. It features two VCOs, two VCFs, a 2-stage envelope generator, and five LFOs. Although the DC-2e is an all-in-one synth voice, its architecture is unusual enough that it can produce sounds most other synths can't. At the same time, its focus on drone sounds make it incapable of producing most sounds that other synths can without using external CV sources.

The oscillators generate sawtooth and pulse waves, and two fixed-frequency sine-wave LFOs modulate pulse width. Three additional LFOs modulate other parameters in a cascade of pulsating effects. VCF 1 is a resonant bandpass filter with overdrive, and VCF 2 is 4-pole lowpass. The envelope controls only VCF 2, and attack time is always equal to decay time—ideal for sounds that sweep in and out. All 12 knobs are push-pull switches with different functions. For example, pulling an oscillator knob up selects a sawtooth wave, and pushing it down selects a pulse wave. Set the bandpass filter's range by pulling the Filter knob up for midrange tones and pushing down for gritty, low-end sounds.

You can purchase the DC-2e separately from the accompanying Expander module ($109, 7HP). However, because the Expander provides all 18 patch-bay jacks and the DC-2e's only jack is a 1/4-inch audio out, you'll need both modules unless you're satisfied with droning tones only.

Rebel Technology
OWL Modular ($495, 20HP)

The OWL Modular is the Eurorack version of a user-programmable open-source multi-effects pedal originally designed for guitar, adding voltage control and DC-coupled ins and outs. OWL is an acronym for Open Ware Laboratory, and most of its patches are the result of crowdsourcing. The module's internal processor lets users create programs in C++, Pure Data, or Faust programming languages. You can also use patches created by others, of course, whether they come standard on the OWL or you download them from the Web and load them from your computer via the module's MIDI-compliant USB port. Thanks to Web Audio and Web MIDI support, you can even preview patches in Google Chrome and then load them directly into the OWL.

Although most popular as an effects processor, the OWL is designed to handle whatever DSP tasks you throw at it. Depending on what patch you load, it can be a tempo-synced delay, dual ADSR generator, arpeggiator, wavetable oscillator, distortion processor, state-variable filter, parametric EQ, octave splitter, ring modulator, pitch shifter, or assume dozens of other personalities. In addition to the USB connector, the OWL's faceplate has four assignable knobs, four CV attenuation knobs, and eleven jacks: two audio ins, two audio outs, five control voltage ins, one gate in, and one gate out. Both the hardware and software are open source, and you can download schematics and a digital pin-out diagram directly from Rebel Technology's website.

Roland
System-1m ($599, 84HP)

The System-1m is a complete digital synthesizer that's functionally identical to Roland's Aira System-1, minus the keyboard, arpeggiator, and scatter functions, with the addition of 19 illuminated 3.5mm jacks. In addition to Eurorack compatibility, it can be a desktop synth or a rackmount MIDI module, thanks to the included power supply. Like the Mother-32 and Lifeforms SV-1, the System-1m has hardwired internal connections you can bypass with patch cords. It stores and recalls 64 presets.

The architecture furnishes two audio oscillators, a suboscillator, white and pink noise, a single filter, three envelope generators, a 6-waveform LFO, and bit-crusher, delay, and reverb effects. The oscillators generate a dozen waveforms ranging from the usual analog types to the decidedly more unusual Logic Operation, Noise Saw, and Cowbell. Each oscillator has a Color knob affecting pulse width, waveform symmetry, or detuning, and Color can be a mod destination. The filter offers simultaneous highpass and resonant lowpass responses, and you can switch lowpass from 2- to 4-pole. Two ADSR envelopes modulate the filter and amplifier, and an AD envelope modulates pitch.

Plug-Out compatibility is probably the System-1m's most remarkable feature. It hosts soft synths that emulate classic Roland hardware, running as plug-ins on your computer or within the module. Although the System-1m is 4-note polyphonic, it becomes monophonic whenever you connect patch cords or it hosts a Plug-Out soft synth. Five-pin MIDI jacks are mounted above and opposite the front panel. A USB port, also mounted above the front panel, handles MIDI and audio data up to 24-bit, 96kHz.

Power to the People

I can hardly stress enough just how crucial it is to plan for future needs when you're designing your modular system. In addition to requiring sufficient space in your Eurorack case, some of these newer multifunction modules require more electricity to operate than previous-generation modules. Just make sure that when you accommodate for space as your system grows, you also accommodate for power requirements. Otherwise you risk having to invest in a new power supply—an expense that could have been avoided.—Geary Yelton

Rossum Electro-Music Control Forge ($TBD, 22HP)

E-mu Systems founder Dave Rossum's new company specializes in designing Eurorack modules with unique capabilities. One forthcoming module is the Control Forge, a programmable source of modulation signals that functions as an envelope generator, LFO, sequencer, or any other control-voltage source that requires precisely defined stages. The Control Forge will save and recall hundreds of presets, each with a maximum length of eight segments. You can link presets so that one follows another to create sequential lists of automated events as long and complex as you want.

In addition to each segment's length, you can define its target level as either a specific voltage or relative to the previous segment's voltage, optionally quantized to the nearest 1/12th of a volt. Between stages, choose from 67 transition shapes and view them graphically on the module's color LCD. You can also determine whether any stage automatically jumps to another stage when certain conditions are met, such as exceeding a value threshold, enabling looping patterns whose evolution depends on changing conditions. Define segment levels and lengths either by manually twisting an encoder or by applying a control voltage.

You can offload the Control Forge's entire library of presets and sequences into an optional nonprogrammable module called the Satellite ($TBD, 12HP). Once settings are transferred, use as many Satellites as you need to serve as multifunction modulation sources in your Eurorack system. ■

Former *Electronic Musician* senior editor Geary Yelton has been fascinated with synthesizers since 1967, when he saw The Monkees play one on TV.

PHOTO: DANNY CLINCH

Ben Harper and the Innocent Criminals' *Call It What It Is*

Essential Music for Turbulent Times

BY BARBARA SCHULTZ

Ben Harper, producer/engineer Ethan Allen, and the band recorded *Call It What It Is* in The Village, Studio A.

"Songs either find you, they taunt you, or they need you to work in a collective that somehow brings them to life," Ben Harper says. His latest album with the Innocent Criminals, *Call It What It Is* (Stax, April 2016), includes all three types of songs, in equal measure.

Examples of songs that "found" Harper include the blues rocker "Pink Balloon," which Harper says came in "a complete burst, fully formed." Likewise, arriving of-a-piece was the lead track, "When Sex Was Dirty," which features the memorable refrain "I remember when sex was dirty, and the air was clean/And everything worth knowing was in a magazine." That says it all.

The cornerstone of this powerful, eclectic album is another of Harper's found songs: the title track, "Call It What It Is." An intense, almost brutal, electric blues performance of this track underscores the violence of lyric: "They shot him in the back, now it's a crime to be black/So don't act surprised if it gets vandalized/Call it what it is call it what it is call it what it is—murder."

Once the song occurred to Harper, it was undeniable. However, recording it was quite a different story: "That was the last song we recorded," Harper says. "There was debate about me doing it with just me and guitar, because I'd already done a version like that and it was out in the world. There was a nervousness about approaching that song and being able to take it anywhere else.

"We left the better part of a week for that song, and it came together in a true band effort," the artist continues. "Everybody was just digging in with a fearlessness, and it went in a few different directions. It wasn't an easy production, that one, but Oliver [Charles, drummer] and Leon [Mobley, percussionist} and Jason [Yates, keyboardist] really took the helm. In the chorus the beat turns over into kind of a more rocking thing and then it's more blues in the verses.

"For a long time the song spooked us. It spooks me to this day. But that's one that definitely found me, and said, 'You gotta say this.'"

The tracking dates for "Call It What It Is" took place during the last of four separate week-long sessions at The Village. The entire album was captured to Pro Tools by engineer/co-producer Ethan Allen.

"We would get together every month or so and do another week of recording," Allen says. "It kept everybody fresh creatively and maintain some objectivity about the songs. We would, each week, concentrate on about three songs. Then we would listen to them over time, and perhaps revisit them later with new ideas. We took time to digest the work that we'd done, and then we moved on. It was really different from being constantly in the trenches."

Each of the tracks on *Call It What It Is* started with live full-band tracking in The Village's Studio A, where the facility's centerpiece, a vintage Neve 8048 console colored much of the sound.

Electric guitar amps, for example, were taken through a single Neumann KM84 mic, into the pre's in the console, with just a bit of Teletronix LA2A compression. A few keyboards were taken direct—Mellotron, some synth parts—but all Wurlitzer, B-3, and piano parts also went through the Neve mic pre's.

"On the B-3, I would set up a pair of AEA R88 ribbon mics or [Sennheiser] MD421s at 90 degrees on top of the cabinet, and a [Neumann] U47 on the bottom to get the bass," Allen says. "Sometimes we'd just go mono with everything, but often I would keep it in stereo if we wanted a wider picture."

Allen's piano-miking scheme involves two Neumann M49s, spaced apart but both near the hammers. "Since they have that nice Yamaha grand, it had a touch of natural brightness to it, which was good in a band context," Allen says. "Sometimes I would EQ it a bit, but the piano sounded so good, it was just more about capturing it."

Harper would sing into a ribbon mic, such as an RCA 44 or an AEA R88, or into an M49, any of which would, again, be sent into the Neve board. "Then I would use either an LA2A or an RCA BA6A tube limiter, sometimes into a Pultec at the end, just for the top—but not always. There were also times when we did something different with a [UREI] 1176 to get something more aggressive," Allen explains.

Mic placement was also key to a wide variety of sounds on the album. "The great thing about a

great room is how many sonic options you have," Harper says. "You can go down to just one mic on the drums and it's just another version of good. The room sounds great in every corner.

"You can use the room to change your *era* of sound. If you want a modern vocal sound, get right up on the mic. If you want a Motown vocal sound, step away from the mic three feet and sing harder. Production can be as simple as moving the mic 10 feet back from the amp, and what started as a clean guitar sound becomes a funky sound, without changing the amp."

Allen and the musicians also used creative distortion to push the sound they were after, and the gritty "Pink Balloon" is a great example of the ways mic placement was paired with sonic manipulation for effect.

"We had a basic drum setup with an interior kick drum mic, usually a 421, plus a FET 47 on the outside of the kick, 57 top and bottom snare, 421s on toms," Allen explains. "I also used a pair of 67s as overheads, a Coles ribbon out in front, and then a spaced pair of room mics.

"But that being said, sometimes I would go for something completely different, and wherever possible I would try to get an unusual drum miking picture. I would use a single ribbon mic, compress it quite a bit, and try to get the whole picture with just that, just as an example. We might have a tom-centric song, or brushes—give some more interesting fabric to the picture of what was going on.

"On 'Pink Balloon,' I took just two or three of the mics on the kit and made them real character pieces, overdistorting the Neve mic pre and compression," says Allen. "There's also an acoustic guitar on that song that's sort of a brash and non-beautiful—an acoustic sound that had a Leadbelly-ish primitive blues approach. It's meant to have an aggressive edge, but it's coming from an acoustic rather than an electric guitar, so it was a unique sound."

"That acoustic guitar was played through my Dumble amp," Harper says. "It's a pretty clean acoustic sound driving the riff, but the bass is distorted. The dirt, the girth underneath it is the bass."

The sonics of the title track were also carefully shaped during the tracking sessions. "We looked at how to make the drums more turbulent and dark on that song," Allen says. "The sound was informed by these dark, indirect drums, some distortion, and percussion that was used in unusual ways—that sounded very mid-period Marvin Gaye.

"We had a kit miked up but we emphasized the ribbon out in front of the kit," Allen continues. "That was compressed through an 1176 so we had a very dark, low-centered picture of the drum kit. There was a proper kick drum of a normal size—probably 22 inches or so—and then in front of that, a much larger, older kick drum with two heads that would resonate, so there was a lot of *boom* going on, and the snare had a more distant kind of sound.

"Oliver also played an overdub that was meant to approximate the sound of a gun, and we did that using the real plate reverb at the Village. There was a lot of effort to reach for something more turbulent and dischordant like the song is talking about. The bass was distorted—everything was a little distorted in that song."

Allen and the musicians put a lot of care into nailing down the feel and sound of the songs during tracking. Other musical approaches that are represented include an Al Green-ish arrangement on the song "Bones," reggae on the tune "Finding Our Way," CSN-style harmonies on "Deeper and Deeper," and more.

"You can't ever duplicate the authenticity of a brave sound going down on the floor," Allen says. "If you can get the character going down, then it remains throughout the process and the life of the song."

That said, Allen is confident about the mixes he gets in his personal studio, Royal Triton. "It's a fairly modest setup," he says. "I have a Pro Tools HD rig that I use with a Dangerous Music D-box—just eight channels and summing, four stereo pairs—and I print it all through a Burl B2 bomber digital converter."

Allen's monitors are Barefoot MM27s. "They seem to have a great stereo picture," he says. "I like how there's a lot of clarity in the midrange to the upper end, and especially in the low end on a record like this, where your picture seems to go clear down to the bottom and there are potentially competing elements in the low end. These songs have so many large drums and organs, plus the bass itself, and synths—a lot of low-end information that needed to be managed well."

Mixing in Pro Tools, Allen used some of his preferred UA plug-ins to enhance the tracks. The UAD 1073, Roland Dimension D, Plate Reverb, and Tape Emulator plug-ins all came into play.

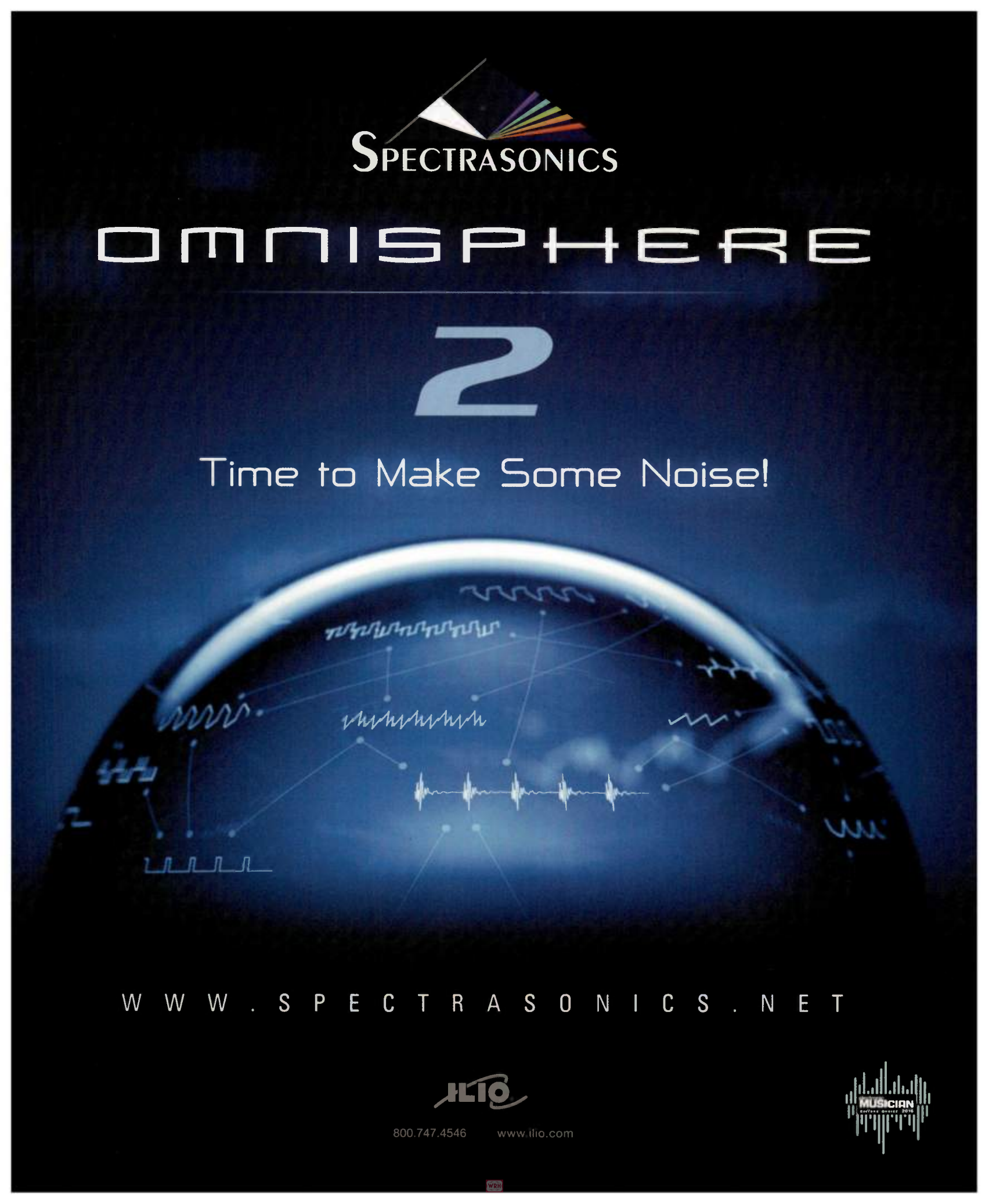
"I also used the Slate Digital Virtual Mastering Console a fair amount on the mix bus on this record," Allen says. "Sometimes, I used something like Melodyne, not for its usual tuning properties, but to elongate an outside kick drum mic in an unusual way—a bit of unnatural processing here and there.

"And then Gavin Lurssen, in mastering, did just a fantastic job of pulling it all out and really making it feel grand. He has a real ability to make something bigger without it ever feeling strained. It always feels like the music he touches is its natural self on its best day."

"What an exploration this was," Harper adds. "We put so much into the production on this album, and it makes me think about what a shame it is that people steal music at such a low-grade level, because they're not hearing the way it was intended to be presented. I recently got an audiophile-grade system at my house—I grew up! And I was listening to [Joni Mitchell's] *Court and Spark* the other day and just having the sonic time of my life, re-listening and delving into this music. Music at a high-quality level, to me, is still worth its weight in freaking gold." ■

"You can use the room to change the era of sound. If you want a modern vocal sound, get right up on the mic. If you want a Motown vocal sound, step away from the mic three feet and sing harder."

—Ben Harper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DUSTIN O'HALLORAN'S TRANSPARENT MUSIC

BY BARBARA SCHULTZ

Setting the tone for a family's evolving emotions on Amazon's hit series

Amazon's original series *Transparent* explores the journey, the vulnerability, and sexual identity not only of lead character Maura Pfefferman (played by Jeffrey Tambor)—who reveals herself in season one as a trans woman—but also of Maura's former wife and three adult children. Maura's transition is at the center of an evolving present-day Jewish family that remains strongly bonded, but full of questions.

Created and directed by Jill Solloway, the series has completed two seasons (you can watch every episode via Amazon Prime), and work is soon to begin on season three. Among the numerous awards the show has earned (Emmys, Golden Globes, Critics' Choice, Director's Guild, GLAAD Media Awards, etc.) is composer/musician Dustin O'Halloran's Emmy for Outstanding Main Title Theme Music.

Before *Transparent* came into his life, O'Halloran was best known as a solo artist and film composer whose credits include Sofia Coppola's *Marie Antoinette*, and Sundance Grand Jury Prize-winning romance *Like Crazy*. He works mainly from his personal studio in Berlin, but also travels to L.A. where he works closely with other creative members of the *Transparent* team to create the show's original score.

O'Halloran seems pleasantly surprised that the gentle piano-centered waltz he wrote as the show's theme has been so well-received. "It's nice that you can do something so restrained and it cuts through," O'Halloran says. "I appreciate that. I'd like to see more restraint."

How did *Transparent* come your way?

Jill Solloway has been a friend for a long time, and she loved the first two solo piano records that I had made. She used a little bit in the pilot episode, which I loved, and we talked about how, if it got picked up, maybe I could try scoring the whole thing.

When you came onboard, did the theme come first?

I needed to get into the show to really understand where it was going before I could work on the theme, and the one on the show is actually the second version I came up with. When I recorded it, I worried maybe it's too withheld because the opening of shows usually has more of a *big moment*.

The music in the show seems to be more about connections between different characters and generations of the family, from scene to scene. It's different from some

O'Halloran's studio in Berlin contains his recording gear, and the pianos and keyboards that have become the signature sounds of *Transparent*. At right, season 2 of the series begins with a family wedding.

shows, where each character has individual theme music.

When we were doing the first season, there was always this idea that we were making a five-hour film and not episodic television. Maybe with some television you would get more thematic with characters, but this is more about the overall arc of the story and the whole family.

Jill talks about the music as being this warm blanket that covers the entire family. Whatever directions or turmoil or confusion the story takes on, the family is in it together, and there's a lot of love and support and strength, and the music represents that.

Can you describe the logistics of how you interact with the team and when the music is created?

Everything starts with the scripts, which I get pretty early on. There are always a couple scenes that are especially musical, and I'll get a head start on those things that need a little more time to craft out, even before I get picture.

Then as we start getting picture, that starts to inform a little more where the music needs to go. Where we use the music tends to be decided in the editing process. I'll create a lot of different music, and the editors will see what works, or when we should take music out.

The entire show is very instinctual in the way it's directed and the way it's acted, too. There's a lot of careful planning, but Jill gives everybody a lot of room to be the artist they are, and I think that's her strength as a director. She's just trying to get the sensibility across, a feeling. She lets people go down paths, and then once it clicks for her, she doesn't hesitate.

What's your studio like? What instruments do you use on these pieces?

I live in Berlin, and my studio has been in Berlin for about eight years. I have a few pianos: really old, beautiful pianos that are becoming the sound of the show. They have a really strong identity, and I'm recording them in very particular ways—close-miked, and with felt and different preparations, and I get a really unique sound. Everything is done with real instruments.

Could you describe the different sounds of the pianos, and when you might use one vs. the other?

When I need a more restrained sound, I have this old Sabel; it's a Swiss piano from the '30s. I'll put felt inside and get really beautiful harmonics that are very soft. When there's a little more energy and playfulness in a scene, I use another upright, an August Förster, also from the '30s, that has a more upright classic, old-timey sound. And then there's a Blüthner grand that gets used a lot when I need a rich low end.

The different pianos really bring a dimension and character to the show. If everything was recorded on the same piano, I think it would get old to hear that much piano in a score.

What are some examples of how you've used the different pianos in different scenes?

In season two, there's a theme that comes through in the historical scenes [that show the Pfeffermans' family in the early 1930s, before Maura's mother and grandmother arrived in the U.S.]. When they're traveling by boat, the music is the Blüthner, and it has a really deep, rich sound that carries a lot of weight to it. I'll use that when I want to have more emotional weight to the sound.

There's a theme that recurs in both seasons that happens when Sarah is alone in her father's house. You see her just hanging around the house, looking at a book, emphasizing that she's bored, and there's a really light piano theme—that's the Sabel with felt, and it has a really soft, homey feel to it.

Do you record your own music, or do you work with an engineer?

I do a lot of the recording myself. I have a great mixer, whose name is Maurizio Borgna. He has the studio next to mine, and occasionally he'll help me do a little bit of recording, but mostly I do the recording and he does the mixing.

I record to Pro Tools, and I've got two AKG C12 mics that I found in Italy and brought them back to Berlin. They have a beautiful vintage sound. I'm using some Neve 1073 preamps, as well as some old Neumann 472s that are from the '60s, and they sound great.

I like getting into how things are recorded, how that effects the way you listen to it. You could play the same piece of music on a different piano, on a beautiful Steinway recorded in a studio, and it would sound good, but it might sound more interesting if you put felt and close-mic it with vintage mics, and you hear all of the mechanics. I think it's interesting how the feel of the music changes, even the same piece of music.

Do you use any compression going in?

I use just a little bit, but I don't usually like to hear compression on piano. I think it takes away a lot of the upper harmonics, and I don't like to squash the sound. But sometimes when you do close miking, you'll want a little bit—just make sure you don't clip it. I really like a TubeTech compressor for that, because it does color the sound a bit, but it sounds very open. I'll just set it so that it gives a little bit of gain and captures a bit of the transients that might be peaking a little.

Do you record all of the other instruments on your tracks as well?

We do everything there. The schedule is so fast that, if it doesn't work in my studio, I have to figure out another way to make it happen. So I record the harmonium as well, vibraphone, electric guitar, bass, horns. I try to keep the palette minimal, and work with what I have so I can really play everything.

But there's so much communication and collaboration when we're creating this show. I'll tell you a story that gives some insight into this process: In episode nine, there's a beautiful Alice Bowman track that repeats. It's called "Waiting," and it plays in a scene in the forest where Nazis are burning books.

Alice recorded the song in a studio, and then they actually brought a piano into the scene and had her perform it live during the scene, too, along with some horn players who were playing on the set as well. Then they sent me all that music, and I added more horns, bass, harmonium, drums—a lot of other elements. So it's a combination of my work, Alice recording in the studio, and music that was recorded on the set with just booms, all put together. It's beautiful and it works so well because you really feel like the music is happening half in the scene and half out. ■

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Tweaking Boards of Canada's malevolent musings through a plug-in dubbed "Mr. Happy," Bibio makes acoustic/electronic sounds as friendly as Raffi. We all need a break from the grind, and that's what *A Mineral Love* consistently supplies. Undulating guitars and Twinkie-sweet keyboards comprise Bibio's world, from the soft-beat hit-single worthy "Town & Country" to puppy-love track "The Way You Talk" (featuring Goyte). Bibio blends his touchy-feely ingredients like a savvy lifestyle chef, where his cream-filled tracks are topped by his loveable, amateurish vocals.
KEN MICALLEF

THE BIG PINK
EMPIRE UNDER-GROUND EP
B3SCI

Nu-gaze standard setter The Big Pink follows up its two smash albums with the *Empire Underground EP*. A carved out four-track punch of inventive synth lines, taut guitars, and equally on-edge vocals, the multiple layers of *Empire Underground* don't have a superfluous note anywhere. Robbie Furze's voice brings a swing to the scratchiness of "Decoy"; Mary Charteris is a great accompaniment, bringing even more equilibrium to the equation on their duet, "Hightimes."
LILY MOAYERI

MAVIS STAPLES
LIVIN' ON A HIGH NOTE
ANTI

National treasure Mavis Staples' latest is a funky, uplifting soul album produced by M. Ward, and featuring a dozen original songs from superb younger artists, including Neko Case, Nick Cave, Ben Harper, Valerie June, Aloe Blacc, and more. Given Ward's insight and respect for vintage music, and with each of these songs specially written for the great singer and activist, this is an extremely high-quality project. Forty-five years ago, any one of these songs could have been a hit single.
BARBARA SCHULTZ

THE RANGE
POTENTIAL
DOMINO

Rhode Island producer James Hinton hones computative, contemplative dance music. His algorithm is simple and hard to perfect: Lift life's weight with heavy bass's kinetic force. Thick pads, resonant low end, plucked synths, and animated kicks cycle into resolute phase, while shaky YouTube-sourced vocal hooks bleed intimate uncertainties. Resounding piano chords shower and blunt snares swarm, recalling the catalytic bliss-outs of early '90s Hardkiss and 'ardcore records. Delicate nuances stir heart as well as sole.
TONY WARE

JAN ST. WERNER
FELDER
THRILL JOCKEY

Jan St. Werner's sonic palette comprises samples, instruments, and found sounds. Each track of *Felder* ("fields" in German) is gentle, contemplative, but often disturbing. What sounds like death angels falling into the abyss on "The Abstact Pit" is practically interchangeable with the evil Eeyore spews in "Sin Goth." Perhaps this former Mouse on Mars collaborator has joined a death cult, or has been utterly transmogrified. His freakish talents remain.
KEN MICALLEF

DÄLEK
ASPHALT FOR EDEN
PROFOUND LORE

Ending a too-long half-decade hiatus, Newark's industrial hip-hop singularity dälek has lost no stellar mass despite time and lineup changes. Will "MC dälek" Brooks, joined by co-producer Mikey Manteca and DJ rEk, exerts inescapable gravitational force, folding shudder and snap across 38 overdriven minutes. Crunched boom-bap, tectonic subbass, and charred harmonics threaten to suffocate blistering lyrics, but Brooks' snarling cautions skirt the event horizon as he ciphers against his white-noise abyss.
TONY WARE

DION
NEW YORK IS MY HOME
INSTANT

May we all age as gracefully as doo-wop icon Dion. He retains one of the most beautiful and expressive voices in rock 'n' roll. Dion's sultry take on Lightnin' Hopkins' "Katie Mae" is one of only two non-original songs on the album; the artist co-wrote the other eight. Other highlights include the fuzzy blues rocker "Can't Go Back to Memphis," and the simmering yet uplifting title track, where Dion sings a delicate and beautiful duet with Paul Simon.
BARBARA SCHULTZ

Soul POG

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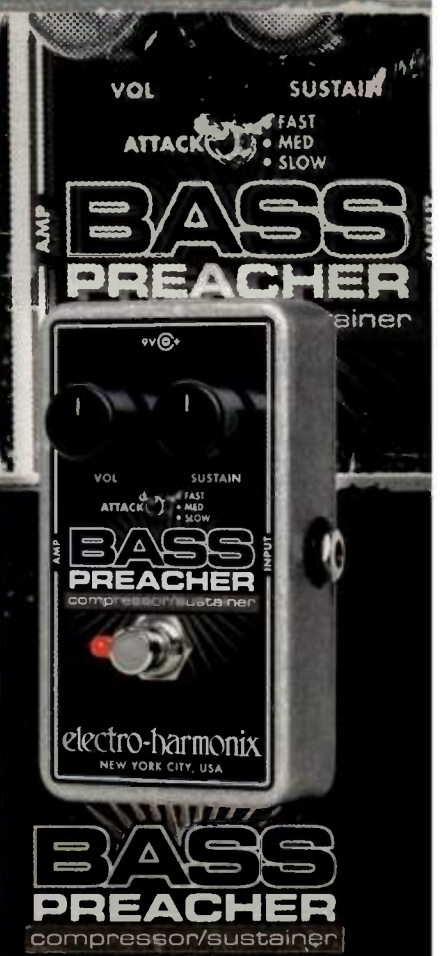
A faithful reissue of the cult-classic released in 1979, the SSD uses analog synthesis techniques to create mind-blowing sounds ranging from deep kicks to high toms to sci-fi drums. Trigger it from the built-in pushbutton or an external (non-MIDI) electronic drum pad. Pass external sounds through the gated amplifier via the aux input. The Super Space Drum lets you create, control and manipulate a stunning array of synthesized sounds.



Bass guitars possess a huge dynamic range and produce powerful low frequencies. Designed for and by bassists, this compact compressor/sustainer features fully adjustable controls that can subtly transform the dynamic qualities of a bass guitar or take them to the extreme. From transparently leveling out notes so they sit in a track to creating an intensely squashed sound, the Bass Preacher helps spread the gospel of great bass tone!

Like the 1980's original, this new version creates drum sounds ranging from cymbals to snares to other-worldly oscillation sweeps, and can process external sounds thru its resonant filter. It's triggered via the built-in pushbutton or an external (non-MIDI) drum pad. It also responds to expression pedal/CV input for external control over the filter in real-time. The Crash Pad is very cool by itself, but also works especially well with our Clockworks Rhythm Generator and 8 Step Program.

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Fig. 1. At first glance, the Cameo CZ user interface bears a close resemblance to its hardware namesake.

UVI

Cameo

CZ-DERIVED LIBRARY FOR UVI WORKSTATION AND FALCON

BY MARTY CUTLER

Marty Cutler tips his hat to Jerry Kovarsky, whose excellent manual on programming the Casio CZ was fundamental to his understanding of synthesis.

STRENGTHS

Great re-creations of vintage CZ-series sound. Step Modulator adds timbre and amplitude motion. The CZ and CM synths add flexibility to characteristic CZ tones, including layering, phase distortion, and wavetable motion.

LIMITATIONS

ADSR envelope generators only. No Aftertouch in UVI Workstation shell. CM wavetable lacks tempo-sync modulation.

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My very first synthesizer was a Casio CZ-1000, which I used to supplement my functional piano courses at the Manhattan School of Music. With only 61 velocity-*insensitive* keys, in retrospect, it might not have been my best choice for the task, but I finally owned a synthesizer, and that was what it was all about.

Its sounds relied on a type of synthesis called *phase distortion* (PD), which created different waveforms by minutely altering the rates at which a cosine wave would reach points in a cycle. While phase distortion yielded a selection of eight different waveforms as starting points, the instrument also included a noise generator that was assignable to one of two signal paths called Lines. The total polyphony was eight voices with a one-line patch, and half that with two lines.

Three envelopes—one each for pitch, amplitude, and DCW (phase distortion deployed as a filter)—were pretty much all you got for modulation, as the LFO was strictly on and off and hardwired to vibrato. But the CZ-1000 had spectacular 8-stage, multi-segmented EGs, with each stage including rate and level so you could set your own sustain and end points. In a world dominated by ADSR modulation, the CZ-1000 was unique.

But despite its sophisticated envelopes and unique tone-generating oscillators, the first batch of instruments in Casio's CZ line fell short in real-time control; in addition to the absence of velocity sensitivity, there was no Aftertouch, and the mod wheel was strictly on or off (purportedly from a misunderstanding of the MIDI specifications).

Still, the original factory presets only hinted at the synth's possibilities, which included a clean but beefy analog-flavored tone. Scattered among the many cheesy presets were timbres of sublime beauty and complexity: The instrument was readily adopted by synth luminaries such as Isao Tomita and Vince Clarke. The CZ series continued to evolve, eventually adding velocity sensitivity, and onboard sequencing and effects, before developing into the more complex VZ series.

CAMEO APPEARANCE

Although the CZ series has spawned several sample libraries (and even a few modeled CZ instruments), UVI Cameo is the most recent tribute to this Casio synth family. Cameo requires UVI Workstation (a free download from UVI's Web site) or UVI Falcon as a hosting shell. I tested Cameo in both hosts using an iMac Retina 5K, 27" computer with 40GB RAM and Mac OS X 10.11.3.

UVI Cameo offers three different sample-based instruments—CZ, CX, and CM. The CZ bank sticks primarily to sounds that could have issued from the CZ series, whereas the CX and CM instruments use the samples as springboards for their own engines. The sample sets derive from custom-designed presets created on the original hardware.

If you are a seasoned phase-distortion maven, the first thing you might notice is the similarity of Cameo's CZ programming panel to the hardware instrument (see Figure 1). Look closer, and you will find that the envelopes are strictly ADSR, as opposed to the 8-stage, multi-segmented envelope generators of the original. Absent, too, are the choice of noise- or ring-modulation (although you can introduce noise additively) and the line-select buttons that allowed you to double an oscillator with itself, layer the two oscilla-

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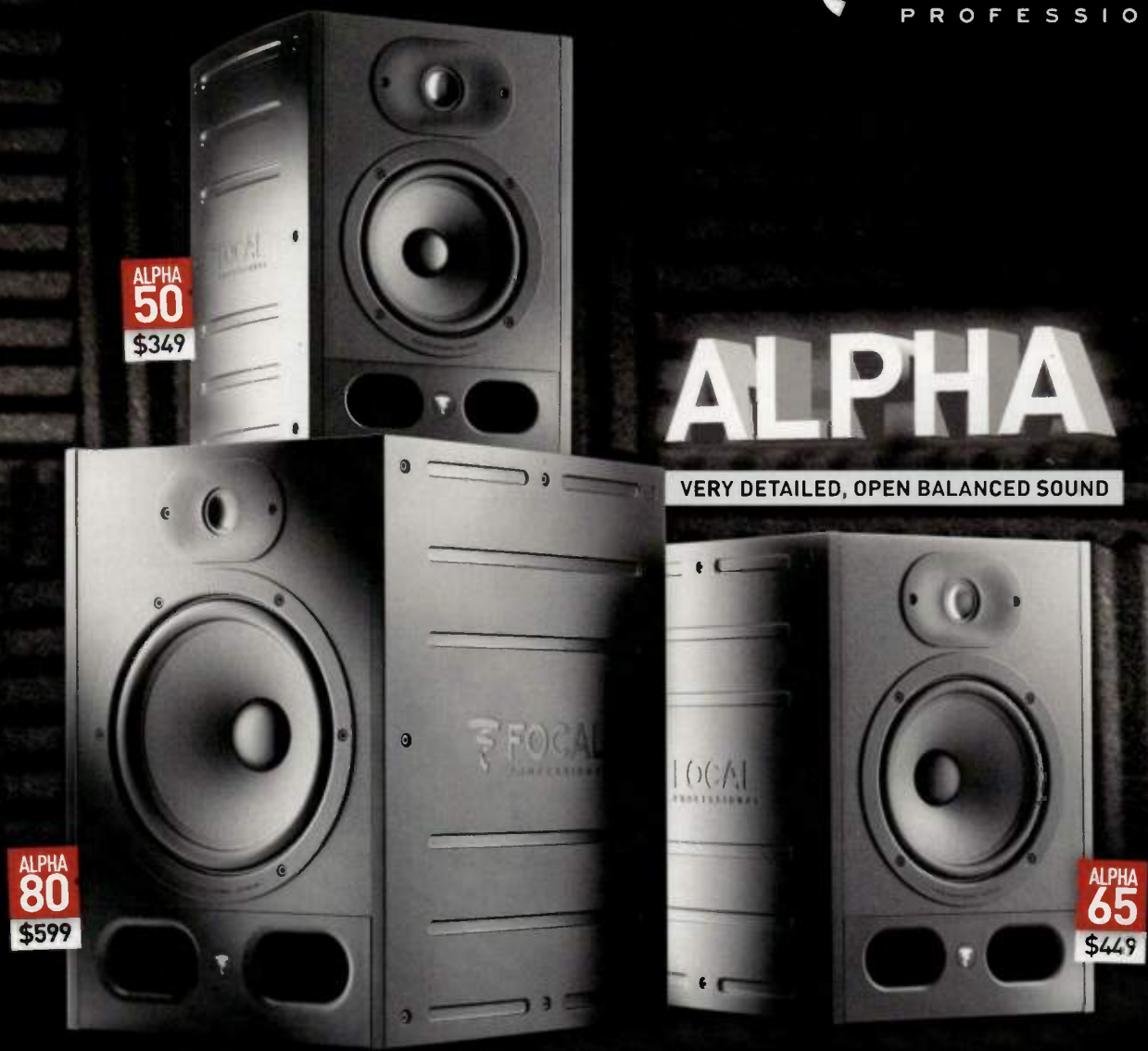

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Fig. 2. Cameo CX layers patches and adds independent arpeggiators and modulation.

Fig. 3. Notice the knob just below the patch window in the CM synth: Use it to select any of 33 available waveforms. Furthermore, you can assign MIDI messages to sweep the table. Just below the amplitude ADSR is a slider to add or decrease phase distortion.

Fig. 4. A click on the Mod page reveals Cameo's Step Modulator and LFO parameters.

tors, or simply create a single-oscillator patch. In fact, all patches in the CZ banks are single-oscillator.

UVI Cameo makes no attempt to replicate the CZ factory patches precisely, but many of the sounds have the ring of authenticity, in part because of the expertise of UVI's programmers in exploiting the CZ series' raw waveforms and sounds sampled using the CZ's noise-and-ring-modulation effects. However, the subtractive-synth engine that hosts the CZ banks offers a choice of resonant, highpass, lowpass, and bandpass filters, along with velocity and Mod wheel control—features that weren't available from the Casio CZ series, as they didn't use filters.

The UVI Workstation provides a modicum of editing, including the envelope generators and filter settings, and fairly complete programmability over a complement of effects, including UVI's excellent Sparkverb, among others. The programming amenity I missed most was the waveform-select feature of the original instrument and the DCW's formidable timbre-shifting power. On the positive side, Cameo CZ is a breeze to program.

The appeal of the CZ sounds is undeniable, especially the huge bass sounds and the clangorous, inharmonic bells. Cameo's built-in arpeggiator and Step Modulator come in handy here, with some nice, quirky patterns as jumping-off points for your own creations. A few of the sounds from the Polysynth bank reminded me of the subtly metallic-tinged pads that Joe Zawinul seemed to favor (listen to audio example 1 at emusician.com/UVICameo). If you are at all comfortable programming subtractive synthesizers, CZ should be a breeze to program and a fun synth to explore.

CAMEO CX

You could view Cameo CX as two CZs layered, but that's only where the fun starts. Most of the programming apparatus is similar to the CZ, albeit with a reorganized layout to accommodate parameters for two layers instead of a single layer (see Figure 2). Each layer has its own filter and envelope-generator settings; buttons are provided for editing either layer or both simultaneously. The left and right keys let you shuttle between different patches if you'd like to experiment with different layers, with no perceptible hiccups between patches.

The CX library starts with an impressive bank of arpeggiated sounds, some layered with pads, and a bunch that show off the complex rhythmic interplay of paired arpeggiators (audio clip 2). The arpeggiators sync to MIDI clock, as do the delay and modulation effects, among other features. Tabs at the upper right access edits for the Modulator and Arpeggiator pages.

In addition to LFOs, CX adds features to its very cool Step Modulator, which lets you target its Filter and Volume destinations independently for each layer. If the effect of the Step Modulator seems too stepped, use the Rise and Smooth parameters to reshape the transitions between steps. LFOs for each add Drive and Pitch modulation to Filter and Volume tasks. The Modulation page applies to all Cameo banks, but adds features as needed for the different engines.

THE MOTION IS TABLED

Cameo CM starts with the same dual-layer scheme as CX, but adds sound-sculpting capabilities derived from Falcon's sophisticated synthesis engine. CM also introduces a few twists to the previous CZ and CX engines, including a slider that adds Phase Distortion and—most visibly—a knob that selects and can sweep through any of 33 different waveforms (see Figure 3). Naturally, each layer can select waveforms independently, and thanks to UVI's simple point-and-click MIDI-assignment menu, it's easy to choose a Control Change message or assign host automation for each layer.

Setting up my modulation wheel to sweep through the wavetable was immediate and gratifying, providing moving, animated timbres (see Figure 4). I would love to see MIDI clock and the Step Modulator as modulation sources for this feature in an update.

Added to the LFO destinations is the Phase Distortion parameter; again, wavetable modulation would be welcome here, as would step modulation of the Phase-Distortion parameter. Aftertouch, available from the top editing level as a source in Falcon, is not available from the UVI Workstation's pull-down assignment menu. In general, many more modulation options readily avail themselves using Falcon without a deep dive into its more complex architecture.

Sonically, a good number of the patches reminded me of the Sequential Prophet VS, with bright, bell-like timbres mingling with somewhat raw-sounding sustained pads. Others offered tempo-synchronized gating effects and powerful filter-swept basses and pads. Remarkably, all retained something of the squeaky-clean sonic stamp of the original Casio instruments.

EASY CZ

It's great to have the sound of the Casio CZ series back in my library. When I bought my first Casio, I obliterated the factory presets, striving for sounds with the character and animation that inhabit much of the Cameo library. I do miss the hardware unit's 8-stage envelope generators, particularly the DCW. If you need that, there are excellent software emulations on the market.

Still, I prefer Cameo and the capabilities of Falcon and the UVI Workstation, which add extensive multitimbral features, including splits and layers. If you already own Falcon, you are ahead of the game with a ton of great programming tools. Falcon's editing options go significantly deeper than the UVI Workstation to include such details as sample-map editing, scripting, and the ability to edit at the oscillator level.

Either way, UVI Cameo confers the vintage sounds of Casio's most influential synthesizer with modern programmability. ■

fabfilter

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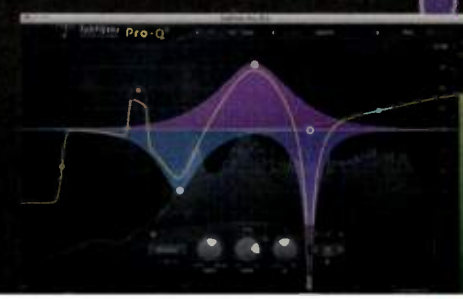
Computer Music Magazine (CM212)

Pro·Q²



An equalizer is probably the tool you use most while mixing and mastering, so you need the best of the best! With FabFilter Pro-Q 2, you get the highest possible sound quality and a gorgeous, innovative interface with unrivalled ease of use.

The Electro-Harmonix 22500 is a feature-rich looper that accepts line-, instrument-, and mic-level signals. The pedal records to an SDHC memory card and comes with the required 9V power adapter.

ELECTRO-HARMONIX

22500

FULL-FEATURED 2-TRACK STEREO LOOPER

BY GINO ROBAIR

STRENGTHS

Two stereo tracks. Phantom-powered mic input. Reverse. Octave. Plays rhythm tracks. SDHC card and USB.

LIMITATIONS

Significant learning curve. Time compression/expansion artifacts. No external clock input. Loops stop when switching banks. Rhythm track stops when changing patterns.

$276 street
ehx.com

Among looping pedals these days, the trend is toward plug-and-play designs within a small footprint. Nevertheless, Electro-Harmonix bucks this trend with the 22500, a sophisticated 2-track stereo looper that accepts instrument-, line-, and most notably, mic-level input, in a case the size of two standard stompboxes. Its XLR input (left-channel only) offers phantom power and +27 dB of gain—great for dynamic or condenser mics.

The 22500 stores its CD-quality (16-bit/44.1kHz) files on an SDHC card, and the included 8GB card can capture 12 hours of audio (4GB to 32GB cards are supported). A USB port is included for file transfers.

Both Loop A and Loop B have a footswitch, output control, Reverse and Octave (playback speed) buttons, and undo/redo. Loops can be quantized at one of several time divisions, locked to each other, or rhythmically independent, and the tracks can be set to play sequentially or simultaneously. When you reverse or change the octave of a loop, it eventually loses sync with the clock in the quantized modes (noticeable when you return to the original direction and speed). Simply toggle the loop on and off and it will re-sync at the next bar line.

The 22500 also offers a 1-shot mode and auto-trigger looping that begins recording when the unit detects an input signal. You can even put the pedal to work as a digital delay.

The pedal stores 100 banks of loops on its SD card, and each bank holds two loops. The optional foot controller ($87 street) is used for stepping through the banks and is a worthwhile addition. Loop playback stops when you switch banks.

You can also change the overall tempo of your loops, manually or via tap tempo, without altering pitch. However, this time compression/expansion creates vibrato-like artifacts, although the looped audio, itself, sounds decent, even with extreme tempo changes. If you overdub onto a loop when the tempo is altered, you get the same artifacts with the new loop until you return to your initial tempo.

To help you with timing, the 22500 can play rhythm tracks; 16 are provided (including a metronome). The tracks are useful for jamming, practicing, or songwriting, and you can load up to 100 of your own rhythm loops on the SDHC card. In contrast to the real-time loops, the pitch of the rhythm files raises and lowers as you increase or decrease the tempo, respectively. Moreover, the beat stops when changing rhythm tracks.

Of course, with all this power comes responsibility: Be prepared to read the manual. The 22500 offers so many options with so few controls, you need to learn the intricacies of its interface before you can start using it. Fortunately, the manual is easy to follow: I figured out the 22500's main features in about 30 minutes. With a bit more practice, I was moving easily between free-form, loop-locked, and 1-shot modes.

The 22500 is for musicians who are serious about looping, and it does much more than any other pedal at this price. Although it's suitable for use in a pedalboard, you'll need to use your hands *and* your feet if you want to take full advantage of all the cool stuff the 22500 can do. ■

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#MOM32
$599.00

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Fig. 1. Magic AB Version 2 adds Latch and Sync playback modes, cue points, expedited track selection and waveform zooming, mono monitoring, and high-resolution metering to its original feature set.

SAMPLE MAGIC

Magic AB Version 2

A MUST-HAVE PLUG-IN THAT ADDS POTENT NEW FEATURES

BY MICHAEL COOPER

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

STRENGTHS

Unrivaled facility for making A/B comparisons. Set cue points and loops. Latch to host's play function and sync to its timeline. High-res metering. Extremely affordable.

LIMITATIONS

Can't open version 1 presets or give custom names to cue points. Can't import FLAC files for Mac. Play buttons don't always work in Manual mode.

£49.90 (about $71.50)
£9.90 (about $14) upgrade from V1
samplemagic.com

Sample Magic's Magic AB plug-in has been an invaluable tool in my mixing and mastering sessions since its release a few years ago. The innovative cross-platform plug-in—available in AAX, AU, and VST formats—lets you compare the mix you're working on with up to nine reference tracks at selected timeline locations, and with optional level balancing and looping. With the release of Version 2, Magic AB presents an all-new engine and preset system, expedited waveform zooming, and several new and powerful features (see Fig. 1).

I'll report here on V. 2's new features, which I tested in Digital Performer 9.01, using an 8-core Mac Pro running OS X 10.9.5. Check out *EM's* review of the original Magic AB at emusician.com for a refresher on legacy features.

IMPROVED DAW INTEROPERABILITY

In lieu of initiating playback of reference tracks within the plug-in (which is still possible), Magic AB's new Latch mode can start playback using your DAW's play button—way more convenient in many situations. The new Sync mode goes even further, synching the playback of reference tracks to your DAW's timeline. For each reference track, you can save and name up to four cue points in the timeline and jump to each with a single mouse-click. The cue points can also be used as the starting point for playback loops.

A switch has been added that lets you toggle mono and stereo monitoring (a global setting for the plug-in's output). The audio files for reference tracks can be loaded by dragging and dropping them into the plug-in's nine playback slots (or by using the legacy method of navigating in the GUI to a track via your computer's file directory). Version 2 can import audio files in most major formats, with the exception of FLAC on the Mac. One or more reference tracks can be deactivated to instantly reduce Magic AB's RAM usage, which a useful readout displays.

Version 2's output meters have a less extended range than Version 1's—a good thing—showing levels from -48 to 0 dBFS, and allocating roughly the top half of its meters to the top 12 dB of headroom. This makes exacting A/B comparisons of peak and RMS levels a lot easier than when using Version 1. Version 1's zoom buttons have also been replaced by enhanced mouse functionality that lets you work faster: To zoom in and out on a track's waveform, drag your mouse up and down (or use a scroll-wheel or Apple Magic Mouse) on the GUI's waveform overview. Drag a white scrollbar left or right—or simply click on the waveform overview—to move your zoomed view earlier or later in the waveform's timeline.

Version 1's Big Button mode has been redesigned and renamed Mini AB mode in Version 2 (see Figure 2). The Mini AB view provides a stripped-down control set and a smaller footprint than Version 2's main view; it's useful once your reference tracks have all been loaded and their relative levels, cue points, and loops have all been set. Despite its tiny frame, Mini AB manages to provide A and B (playback-source selection) buttons, track-selection buttons (for alternate playback of nine reference

Fig. 2. The new Mini AB view packs a ton of potent functions into its tiny frame.

tracks), L/R output meters, a mono/stereo output-monitoring switch, rudimentary transport controls, buttons for jumping to cue points, and a toggle for turning loops on and off.

COMPARED TO WHAT

As Magic AB Version 2 is an entirely new plug-in and not simply the original plug-in with modified code, it's not backward-compatible with Magic AB Version 1 presets. Rebuilding my custom presets from scratch was a minor hassle, but Version 2's awesome new features made the effort well worthwhile. The new Latch mode facilitated my A/B comparisons with fewer mouse clicks and was the mode I found myself using most often. The new Sync playback mode is also fantastic; I could use it to compare different mixes of the same song, switching among them at the same timeline location during playback. Sync mode even worked with DP's auto-rewind function, prompting reference tracks to also rewind.

For each reference track, I could assign four cue points to the start of various song sections and then use a drop-down menu to name each using a fixed selection of names (Intro, Verse 1, Chorus 2, Breakdown, and so on). I could then jump to a song section during playback by clicking on its associated cue-point button. Better yet, I could set up a separate playback loop to start at each cue point so that the corresponding song section would repeat. While I preferred setting cue points in Manual playback mode, Magic AB Version 2's Play buttons didn't always respond unless DP was also playing. I also wished I could create my own names for cue points (for example, "max RMS" for mastering); Sample Magic hopes to add this capability in a future update.

Rebuilding my custom presets from scratch was a minor hassle, but Version 2's awesome new features made the effort well worthwhile.

GOTTA HAVE IT EVEN MORE!

From the time of its original release, Magic AB has always been a must-have plug-in for mixing and mastering engineers. Version 2 makes A/B comparisons even faster, easier, and more precise. Especially considering its rock-bottom price, I believe this is one plug-in you can't afford *not* to buy. ■

REVIEW

HUDSON ELECTRONICS, UK

Broadcast

BOOST OR OVERDRIVE, FROM VINTAGE TO MODERN

BY GINO ROBAIR

$285
hudsonelectronicsuk.com

THE SEARING guitar distortion on the Beatles' "Revolution" as well as other late-'60s/early-'70s hits is the result of an instrument plugged directly into a transistor-based mixer with the input gain cranked up. However, such a dramatic DI approach also provides a wide range of tonal colors when used less aggressively.

Hudson Electronics, UK designed the Broadcast to re-create the sounds and behavior of the preamps used in classic broadcast-style mixers. What they ended up with is a great-sounding pedal that can be used for simple gain boosting as well as various shades of overdrive that never gets thin or hissy.

Suitable for use on electric guitar and bass, the Broadcast utilizes a Class A design featuring a new-old-stock germanium transistor and a Triad steel-core transformer. As you turn up the Gain Trim, the transformer is increasingly overdriven resulting in a nice, chunky tone. Moreover, you have high- and low-gain settings to choose from, allowing you to dial in various subtleties of color. Because the high-gain setting rolls off high frequencies as the Trim control is increased, a pre-gain, Low Cut knob is provided to compensate.

The Broadcast requires a 9VDC external power supply (not included), although you can increase its headroom by feeding it 18V or 24V from a dedicated pedal-power supply. The manufacturer suggests this approach when you want maximum clean pre-amplifier boost or when using the pedal on electric bass.

Overall, the Broadcast is very responsive, with the expected compression increase as you turn things up. But even with everything cranked—and there's a ton of boost available—the sound remains musical and not uselessly over-the-top. The ability to taper off the lows when the distortion is full-on was especially useful whether I was using single-coil or humbucker pickups.

If you're looking for a pedal that offers vintage overdrive tones as well as a clean, surprisingly hi-fi level-boost, the Broadcast is definitely worth a test drive. ■

Fig. 1. Exhale offers a wide range of tools to transform vocal samples into exciting and unusual new timbres.

OUTPUT

Exhale

VOCAL-BASED SAMPLE LIBRARY FOR KONTAKT

BY MARTY CUTLER

STRENGTHS
Broad array of intriguing sounds derived from vocals. Extensive set of sound-shaping tools.

LIMITATIONS
Nothing Significant.

$199
output.com

Output is well known for creating instruments that mine expressive and fresh sounds using a wide range of sampling and processing techniques, and its most recent release, Exhale, is no exception. The library focuses on one of the most appealing and commonly sought after timbres—the human voice—and the results will certainly delight and surprise many.

Exhale includes 9 GB of voice-derived samples and requires Native Instruments Kontakt 5.31 and Windows 7 or Mac OS X 10.8 to run. (Output will provide an OS X 10.7-compatible version upon request.) I put Exhale through its paces using OS X 10.11.3 on a quad-core, 4GHz Intel Core i7 iMac with 40GB RAM.

MODUS OPERANDI

Three performance modes—Notes, Loops, and Slices—are accessed from the Main panel. There is some functional overlap, as the Notes section contains chromatically mapped loops, as opposed to the construction-kit style of the Loops mode. Exhale provides its own browser window, and you can move through the patch list using the left-and-right arrows.

You can also search for sounds using an array of tag buttons and criteria ranging from Light, One-Shot, and Percussive to Pure, Heavy, and Complex. Select multiple tags to refine your search. When you save an edited patch, you can assign the appropriate tags. There are no Multis in the main menu, but Kontakt lets you devise your own.

As with other Output instruments, Exhale offers four macro sliders that modulate characteristics of the patch; for example Pulse, Filter, Stutter, and Dirt, or Talk, Filter, Stutter, and Reverb (see Figure 1). The macro selections are not hard-wired to each patch; click and hold any of the sliders and a pull-down menu lets you change a macro's characteristics. You can also edit and scale the range of the macros. For instance, you can right-click on the slider in order to assign a MIDI Control Change message.

Next to the Main panel button, you can open Exhale's remarkably deep and well-appointed Engine, which lets you audition and alter everything from the step sequencers that animate the samples to the individual effects, which range from rotation to compressors and reverb. You can even audition and choose different sample groups, change sample start times for individual keys, apply formant filters, and much more.

BREATHE IN, BREATHE OUT

The depth of control wouldn't amount to much unless the sounds had something to offer. Exhale is rife with dual-layered, intriguing pads that sometimes end in vocal utterances, snippets of phrases with a pronounced exotic or ethnic character, or phrases and sliced passages that can be played either in discrete snippets or as continuous phrases. The Patches run the gamut from glossy and pristine to cloudy, mysteriously garbled, and distorted. This is not your typical collection of vocal pads, but rather an insanely creative grab bag of voice-derived instruments that will serve anyone interested exotic sounds.

The elegant user interface, combined with a ton of onboard editing tools encourages you to build your own patches. I highly recommend Exhale for creative artists in search of atmospheric, vocal-based instruments. ■

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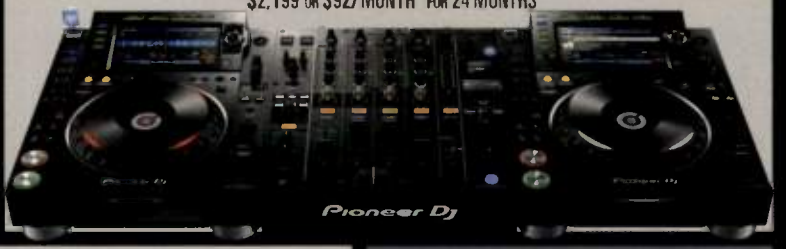

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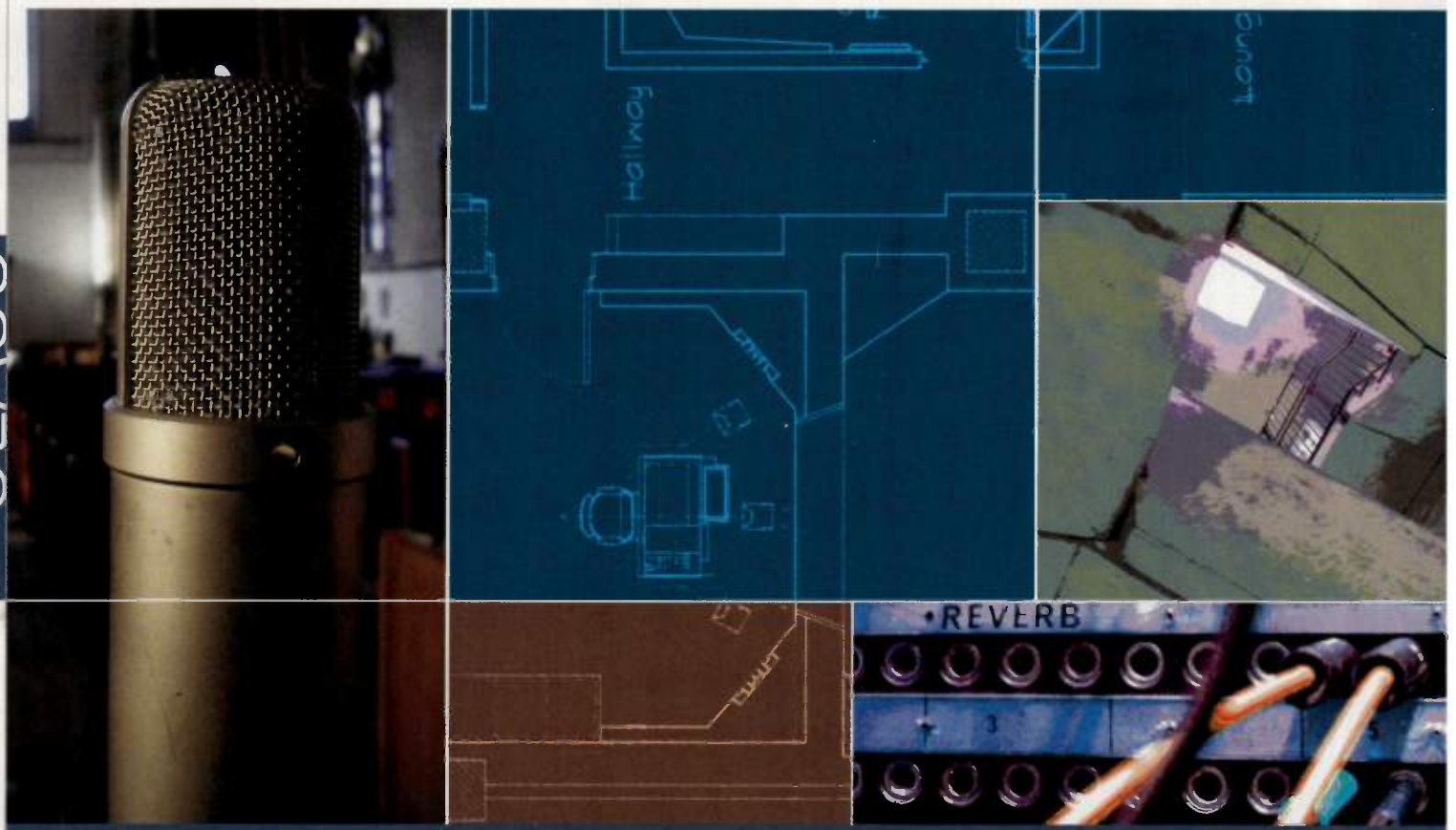


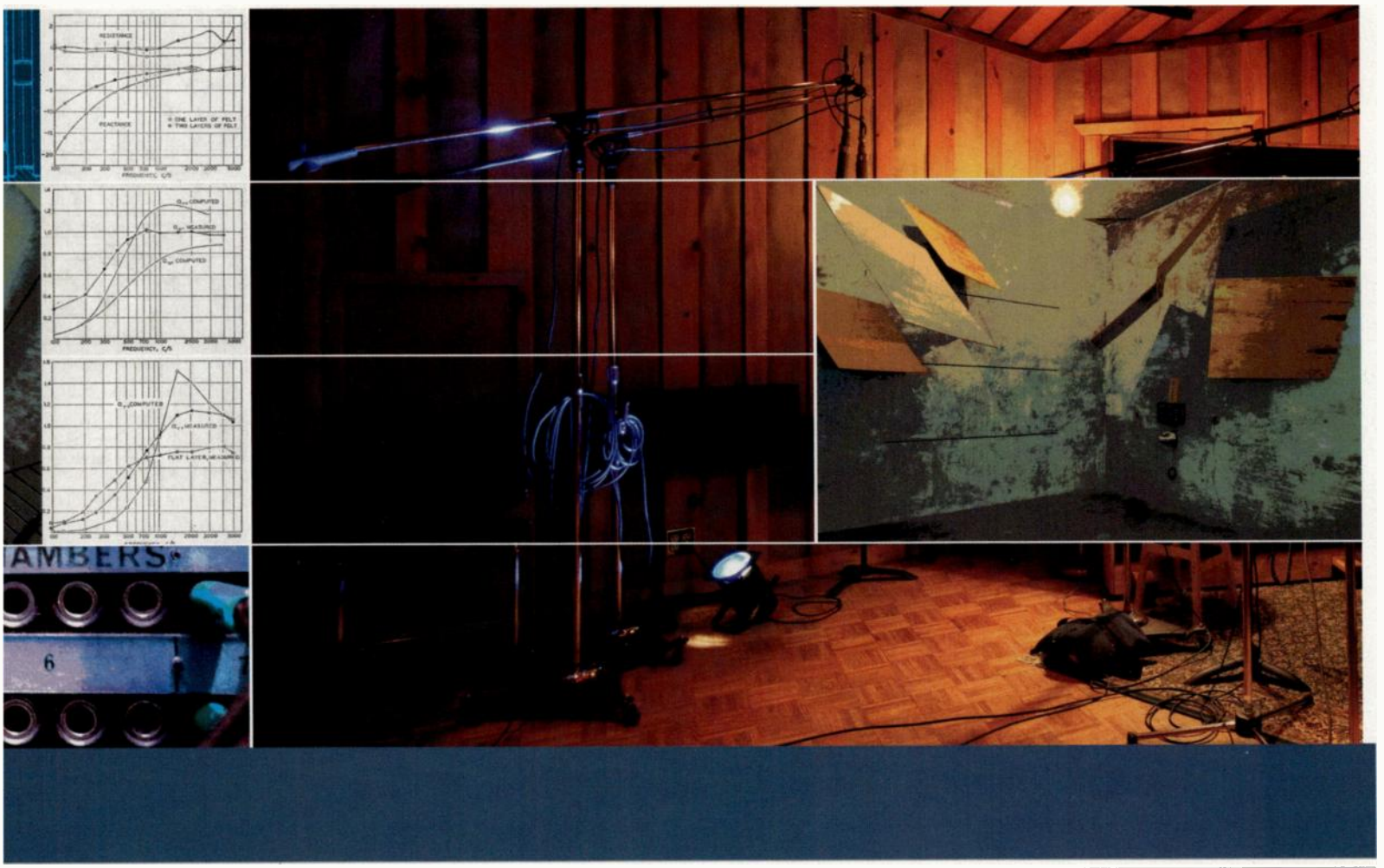
Embrace Your Space

Turn your room into a live chamber with these recording tricks

STEVE LA CERRA

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

Back in days of yore, when the term "digital" referred to a caveman's fingers, the only way to add a sense of space to one's recordings was by, well... recording in the space. Spring and plate reverbs were still a few thousand years off and homo-Neanderthal musicians could barely dream of hardware digital room simulators, let alone their software counterparts. Audio engineers eventually developed methods for generating a sense of space in a recording—some of which are not only still used, but still sound great.



Converting an empty room into a reverb "chamber" was one of the earliest methods of creating ambient effects. Audio pioneers like Les Paul and Bill Putnam designed reverb chambers for Capitol Studios and Universal Recording (respectively), the sound quality of which remains legendary today. You can emulate their efforts with surprisingly good results by using a room at home as a chamber. You'll need two microphones (for stereo), an amplifier, and at least one speaker (or powered speaker). Using two speakers will dramatically increase the sense of stereo but the size of the speakers is really not critical. Bookshelf-type speakers work very well.

Start by choosing a room, preferably one that is relatively empty and does not have a lot of absorptive material in it. The room doesn't need to be large; it's more about how lively it is. The more reflective the room's surfaces, the more dramatic the results. Place a pair of speakers at one end of the room. Aim them toward the side walls to generate tangential reflections, as opposed to facing them directly toward the opposite wall. At the other end of the room, set up a pair of microphones. The mics can face the speakers, but pointing them away from the speakers will allow them to capture more reflected sound and less direct sound. Facing the mics away from the speakers lengthens the path that sound waves travel from speaker to microphone, enabling you to vary the perceived room size (see Figure 1).

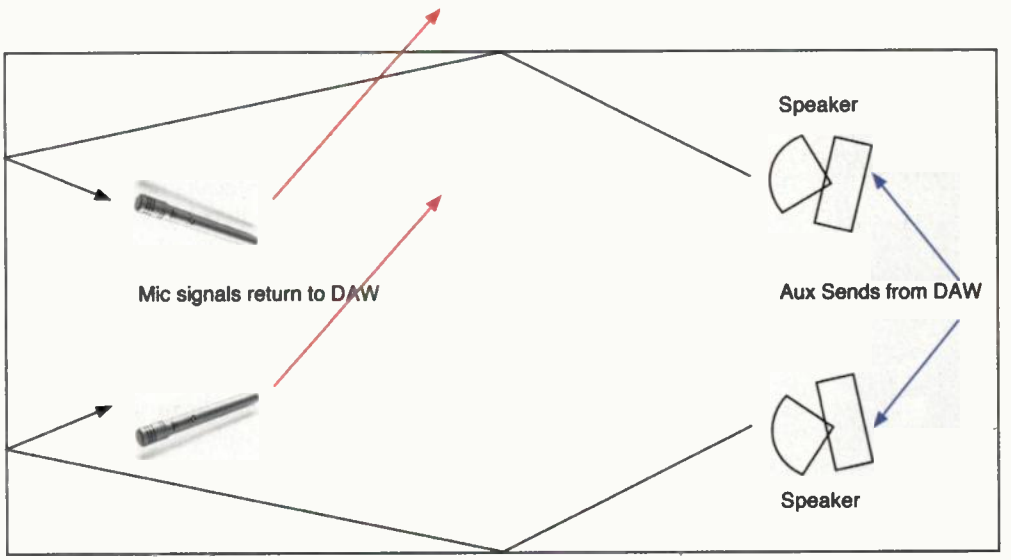


Fig. 1. Speaker and mic placement in the room.

Next patch an aux send (stereo if possible) from your DAW or mixer to the amp or powered speakers. Use a post-fader send so that the room effect stays proportionate to the level of the "dry" sound. For example, if you are treating a vocal, you want the amount of effect applied to follow the

Fig. 2. Triggering a gate from a close-miked snare track.

fader level when you raise or lower it. The mics are patched back into your DAW or mixer, providing you with a "return" from your reverb chamber. You can return the mics to an aux track in the DAW, or record them to audio tracks so that the effect becomes part of your session. (I recommend the latter.) If you are using a hardware mixer, return the mics to a pair of input channels so you can use the mic preamp. You probably can't use the effect return on a hardware mixer for this purpose because effect return inputs are almost always line level and never provide phantom power. (I'm sure somewhere there's an exception...)

The nice thing about generating room sound in this manner is that you don't need high-ticket mics and speakers. Room sound isn't necessarily about having a frequency response from 20 Hz to 20 kHz, and I'd argue that room sound *shouldn't* be full bandwidth. I typically roll off the high frequency response of a reverb around 4 or 5 kHz to prevent it from getting splashy. A lot of low end in your 'verb muddies the mix, so cut the bottom end around 100 to 200 Hz using a highpass filter.

To capture a solid stereo image, use cardioid microphones; omni mics make the image more diffuse. Most engineers use condenser mics for

this purpose but you can try dynamics as well. I've used everything from AKG C414s to Shure SM57s. Experimentation is key. Some rooms sound better when the speakers are played louder to excite more of the room resonance, other rooms not so much. You can also compress the "return" from your chamber or—if you're looking for that '80s snare sound—gate the return.

A typical living room probably won't work very well as a live chamber because stuffed furniture and carpets don't create a lot of nice reflections. A tiled bathroom, on the other hand, is a much more interesting space. Try placing the speakers on the floor facing up, and put the mics near the ceiling to increase the path between speaker and mic. A garage can be an interesting place to record, though you may hear noise from the outside world.

HEROIC AMBIENCE

As much as I wish I could take credit for this next idea, it was producer/engineer Tony Visconti who orchestrated the radical vocal recording method used on David Bowie's "Heroes" from the album of the same name. Bowie begins singing the song at a relatively low level, giving the first verse vocal an intimate, dry sound. As the song progresses, his voice gets louder (eventually rising an octave) and the room ambience creeps into the vocal sound. As Bowie's dynamics become more intense, so does the proportion of room sound. While it might seem that someone is simply turning up a reverb return, the reality (and the result) is *far* different.

Visconti recorded Bowie's voice using three microphones placed in different locations. (The track was recorded at Hansa Studios in Berlin.) In the modern era, we'd have simply recorded each mic to its own track, but this was in the day of analog tape and limited track availability. Visconti had track for the lead vocal, so recording each mic to a separate track was not an option. His solution was to place one microphone, a tube Neumann U47, up-close to capture the dry vocal sound. A Neumann U87 was set approximately 15 feet from the first mic, and another U87 was placed at the opposite end of the room. Visconti then gated the two U87s, setting the gates so that they would open only when Bowie sang progressively louder. The opening vocal lines were sung softly and did not open the gates so the U87s are muted. As Bowie sings louder, the gate on the first U87 opens, adding some room tone. At his loudest volume, the gate on the distant U87 opens as well. In the loudest sections, all three mics contribute to the track, creating the vocal sound that's heard on the recording.

This trick can be accomplished much more easily in modern times by recording each mic to a separate track and gating the two ambient tracks after the fact—giving you the ability to fine-tune the threshold at which the room sound opens up. You may notice that until you get the gate's threshold at just the right setting, the gate will "chatter" (open briefly when it should not); filtering a bit of the bottom out of the gated tracks may help this. It's important not to compress the ambient tracks because doing so will change the perception of ambience. (Of course if you have a singer of Bowie's caliber, a Fisher Price Mr. Microphone would probably suffice.)

A variation of this concept can be used to add room sound to a snare drum without affecting the kick and toms. This method was common in the '80s, when reverbs were almost as big as musicians' hair. Close-mic the snare using one of the tried-and-true mics: Shure SM57, Audix i5, AKG C451, etc. Add a second mic pointing straight down toward the center of the snare and set it as high as the ceiling allows. The second mic can be a condenser mic with a cardioid or supercardioid pattern. Record the mics to separate tracks. When it comes time to mix, insert a gate on the distant snare mic track. Of course it will be difficult to get the gate to open and close reliably on the snare hits because the distant snare mic will have recorded leakage from toms and cymbals.

To solve this problem, set up a trigger or key for the gate from the close snare track. The close

Figs. 3 and 4. Placement of two PZM mics, one on either side of a drum kit.

snare mic makes a good key signal because it will have a better ratio of snare-to-everything-else, and will enable you to set the gate to open only on snare hits. Figure 2 shows the routing for this in Digital Performer. On the left is the Snare Close track (blue), on the right is the Snare Far track (red). A gate is inserted on the Snare Far track. The Snare Close track is routed pre-fader to Bus 1, and the Key Source in the gate is set to Bus 1. (That last part is critical.) Every time the snare is hit, the Snare Close signal on Bus 1 opens the gate on the Snare Far track, allowing the room sound to be heard. The room sound will last as long as the hold and decay times you set on the gate. Start with 100–200 ms each and see if you like the way the decay works with the tempo of the song. The key filter in the example is set at 200 Hz for the low cut and 3 kHz for the high cut, which increases the reliability of the trigger by reducing the effects of bleed in the close microphone. This filter applies to audio *in the key signal only*, not the audio path [Note: using a pre-fader send for the key signal means that the gate will trigger reliably even if you move the fader on the Snare Close track].

RECORDING WITH BOUNDARIES

A completely different approach to capturing room sound can be obtained using a boundary microphone or a Pressure Zone Microphone (PZM). Both employ a flat plate near which the capsule is mounted, but work a little differently. A boundary mic is intended to be placed on a flat surface such as a table, lectern, floor, or wall. Most boundary mic capsules are oriented so that the diaphragm is perpendicular to the plate and thus the boundary. Other boundary mics fit into holes drilled into conference tables and mount flush with the tabletop.

Boundary mics do not pick up sound the way typical microphones do. Despite their directionality, typical microphones receive sound that travels directly from the source to the capsule, as well as sounds that bounce off a boundary before reaching the capsule. When the direct and reflected sounds meet at the diaphragm, they arrive at different times because the path of reflected sound is longer than the path for direct sound. This difference causes comb filtering and anomalies in the frequency response. Now, let's say that you lay a Shure SM57 on the floor. The difference in the path length for direct and reflected sound is much smaller. The smaller we can make the diaphragm, and the closer we can get it to the boundary, the less the difference in these paths—even at high frequencies. The result is that phase cancellation between direct and reflected sounds is minimized. That's the concept of a boundary microphone.

A PZM is a type of boundary mic, but not all boundary mics are PZMs. The diaphragm of a PZM is mounted parallel to the plate and separated from the plate by a very small air space or slit called the pressure zone. This thin slit is where direct and reflected sounds are in-phase. The smaller the pressure zone, the higher the frequency response is extended (up to a point). Because direct and reflected sounds are in phase here, you get a 6dB increase in the mic's sensitivity at no extra charge. PZMs produce a wide, smooth frequency response, even when sounds are off-axis.

An important point when using a PZM or boundary mic is that their low-frequency response is affected by the size of the plate. Hanging a PZM mid-air is likely to produce a thin, bright sound. But taping it to a wall, ceiling, or floor is another story.

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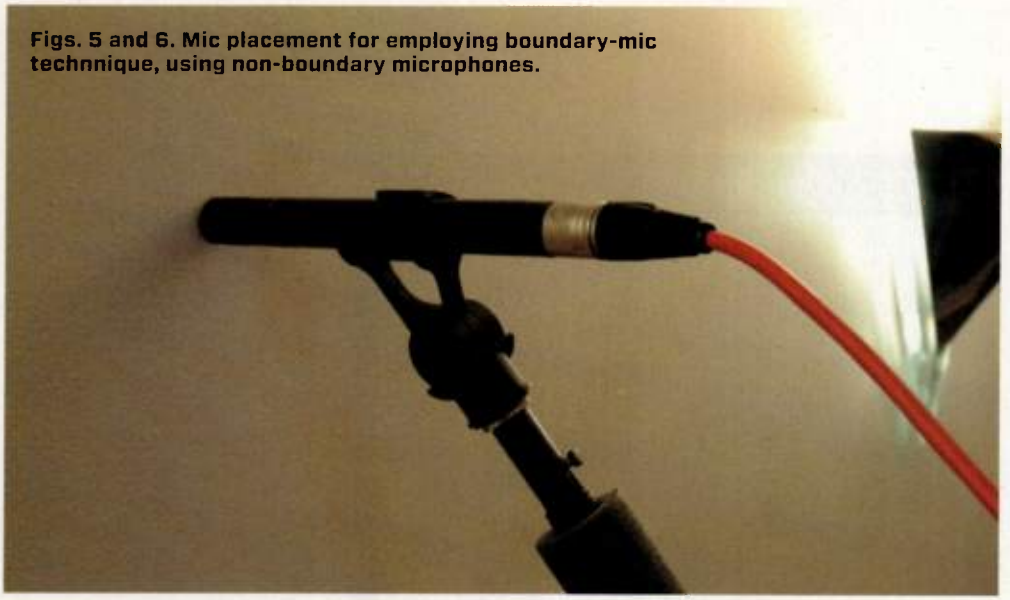

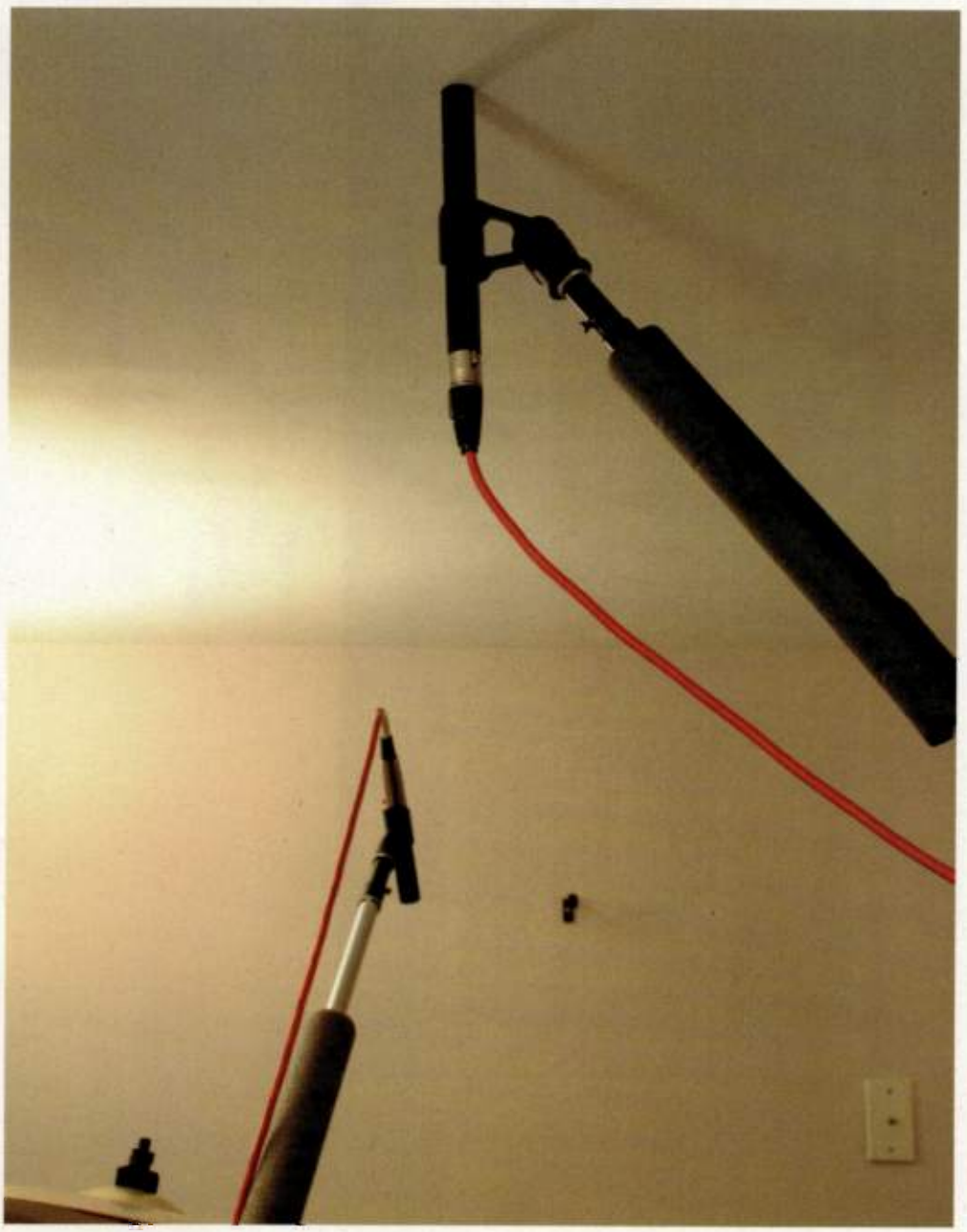

Figs. 5 and 6. Mic placement for employing boundary-mic technnique, using non-boundary microphones.

Figures 3 and 4 show placement of two PZMs, one on either side of a drum kit, approximately four feet high and two feet from the wall behind the kit. The stereo image of this setup is stunningly realistic. Add some compression for a bit of crush and you are off and running. If you'd rather not worry about tape pulling the paint from your walls when it's time to remove the mics, you can mount the mics on 4x4-foot pieces of plywood or Plexiglas™ and set the panels alongside the kit. For a variation on the ORTF stereo-miking technique, the mics can be centered at the edges of two panels, and the panels angled 60 to 70 degrees in a V-shape.

I've seen a lot of engineers lay a boundary mic or PZM inside a kick drum, but that will probably produce a lot of attack and not much low end; I would not use this as the primary kick mic. Placing a PZM on the floor in *front* of the kick is another story. Since the floor becomes the boundary mic's plate, the frequency response of the mic will extend way lower than if the mic is laid inside the drum, and can deliver some booty-shaking bottom. If you're really adventurous, you can try something that producer/engineer Terry Brown did when recording Rush's song "Vital Signs" from *Moving Pictures*. Look up the video for this song, and you'll see that there's a PZM strapped to drummer Neil Peart's chest, facing the kit. How much of this mic made it into the final mix, I cannot say, but it certainly delivers the drummer's perspective.

If you don't own a boundary microphone, you can test the waters by placing a traditional mic as shown in Figures 5 and 6. (A small-diaphragm condenser is the best bet for this placement; you can also try cardioid or omni patterns.) The mic looks like its front is touching the wall or ceiling, but in reality there's a small gap between the front grille and the wall, which creates the pressure zone. You can use a few business cards as spacers while adjusting the mic stand so that the mic is extremely close to the wall but not touching it. When choosing a mic be conscious of the position of the diaphragm inside the head of the microphone: just because the grille is at the front does not mean that the diaphragm is directly behind it; and in fact a lot of mics have capsules set back behind the grille.

It's worth a mention that Mid-Side (or M/S) stereo is a great technique for capturing room sound. In the July 2013 issue of *Electronic Musician*, we discussed advanced stereo mic techniques, one of which was M/S. (Revisit that article, "Advanced Stereo Miking Techniques," at emusician.com/stereorecording.) The "side" signals represent room reflections, which are separate from the "mid" (dry) signal. This method gives you the ability to dial the room sound up or down by raising or lowering the side channels relative to the mid signal. It's a technique that can add a lot of personality to your recordings. ■

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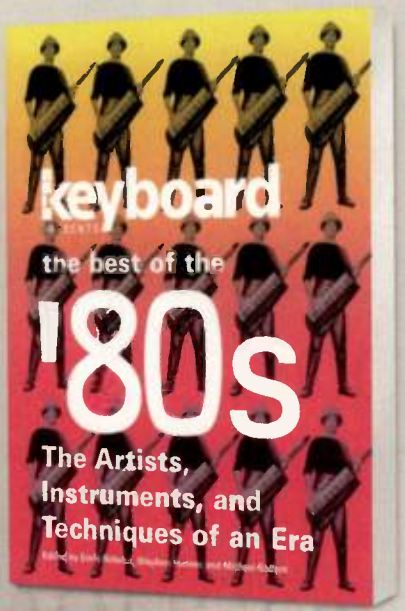

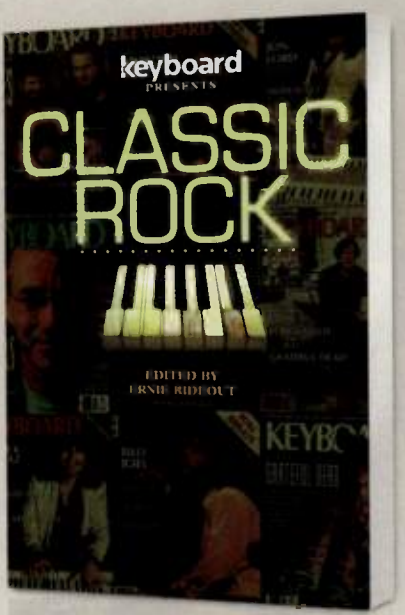

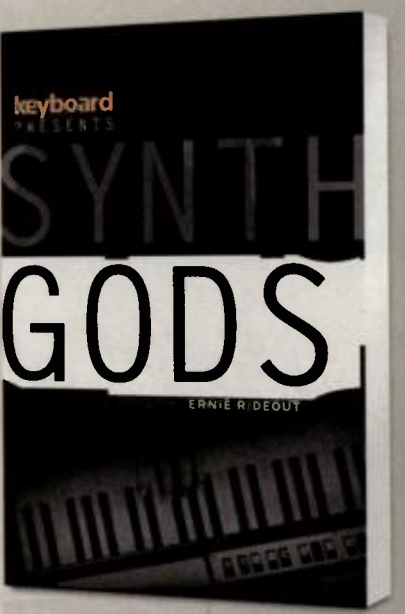

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Fig. 1. When adjusting the output-gain control for a filter assigned to the mid or side channel in FabFilter Pro-MB, use the filter's pan control to reverse the gain change in the opposing channel.

Panhandling Instructions

How to use FabFilter Pro-MB's in-band pan and gain controls

BY MICHAEL COOPER

FabFilter Pro-MB is arguably the most powerful multiband dynamics plug-in available today. But with that power comes the potential to screw things up if you don't use it properly. This is especially true when using the gain and pan controls for each band in Mid-Side mode, as they work together in ways that are not obvious. Improper use of these controls can lead to unintended EQ changes in the mid or side channel.

Fig. 2. A low-shelving filter's pan control (see mouse pointer) is used in Pro-MB to collapse a mix's bass frequencies to mono. The filter's Range control has no effect on the bass band's panning to center and is set to -6 dB here solely to make the filter's bandwidth more apparent for illustrative purposes.

In this article, I'll explain how Pro-MB's gain and pan controls work and show you how to use them to get great results. I'll illustrate my points using real-world mastering applications.

WHAT HAVE YOU GOT TO GAIN?

An advanced technique used in mastering is to boost the gain in a single band to accentuate a key element, while compressing the same band to automatically prevent another element in the same frequency range from also being enhanced. For example, Pro-MB can be used to boost the bass guitar in a previously recorded mix without also goosing the kick drum.

To pull this off, create a filter in the bass band and assign it to the mix's mid channel (see Fig. 1). Key the filter's sidechain with the mid channel and restrict the sidechain's bandwidth to 30-80 Hz to weed out everything but the kick drum and bass guitar from its signal. Set the bass filter's range control to -6 dB and its ratio to 100:1, and use the fastest attack and release times possible along with at least 1 ms of look-ahead detection. Now the magic begins. By boosting the bass filter's output gain 6 dB and compressing the same band an equal amount—using the proper threshold setting—you end up boosting bass frequencies in the mid channel (where the bass guitar lives) at all times except when kick-drum hits occur.

But here's the rub: Raising the bass filter's output gain in Mid-Side mode will apply bass boost to both the mid *and* side channel—even if the filter is assigned to only one of those channels—making any hard-panned guitars and reverb also sound more bassy. To prevent this from happening, you must use the bass filter's pan control to cut an equal amount of gain (in this example, 6 dB) in the opposing channel (the side channel). Specifically, drag the filter's pan control counter-clockwise to the "Mid 0 dB/Side -6 dB" position.

The takeaway is that a band's pan control affects how much filter gain will be individually applied to mid and side channels—even if the band is applying dynamics processing to only one channel. Note that a band's pan control has no effect on the balance between left and right channels, even when used in stereo mode. (That's what the plug-in's master or global pan control is used for.)

There's a keyboard shortcut you can use to keep yourself out of trouble and consistently dial in the perfect amount of compensatory panning: Whenever altering (boosting or lowering) output gain in a mid or side channel's band, alt-drag (using a Mac, option-drag) the band's output-gain control. Doing so will automatically apply the correct pan amount to preclude making a gain change in the opposing channel's band.

When a band's output gain is set to 0 dB in Mid-Side mode, you should generally keep its pan control set to the noon position. Any other pan position will cut gain from unity in one of the two channels. Of course, there are times when that's exactly what you want to happen. One example involves again our old friends, the bass frequencies.

MONO A MONO

In many if not most cases, it helps to focus a mix's bass frequencies by collapsing them to mono in the stereo field. To do this using Pro-MB, create a low-shelving filter at roughly 100 Hz and crank the filter's pan control fully counter-clockwise to the "Mid 0 dB/Side -INF dB" position (see Fig. 2). Doing so will completely strip the band's bass frequencies from the side channel, seating them dead-center in your mix. You don't need to boost or cut the bass band's gain or activate dynamics processing for this to work—a 1:1 ratio will still get 'er done. In fact, you don't even need to assign the filter to the mid or side channel. Simply panning it fully counter-clockwise will collapse its frequencies to mono.

Armed with the knowledge imparted by this article, you'll hopefully be able to handle any audio-related situation—even NAMM conventions—with aplomb. The next time your fellow engineers bemoan the devaluing of music and its attendant revenue destruction for studios, tell 'em it's okay—you've become a panhandling expert! ■

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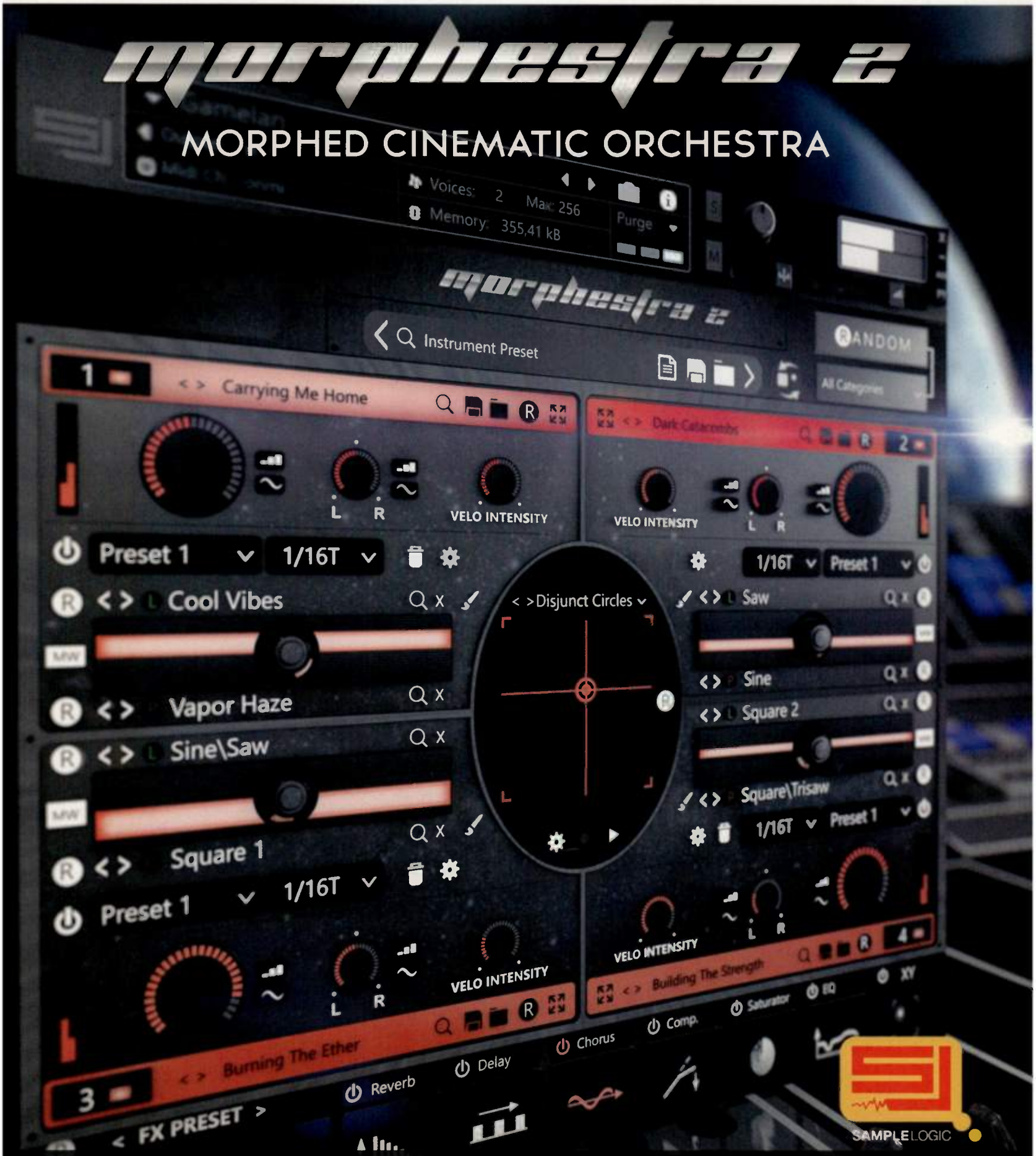
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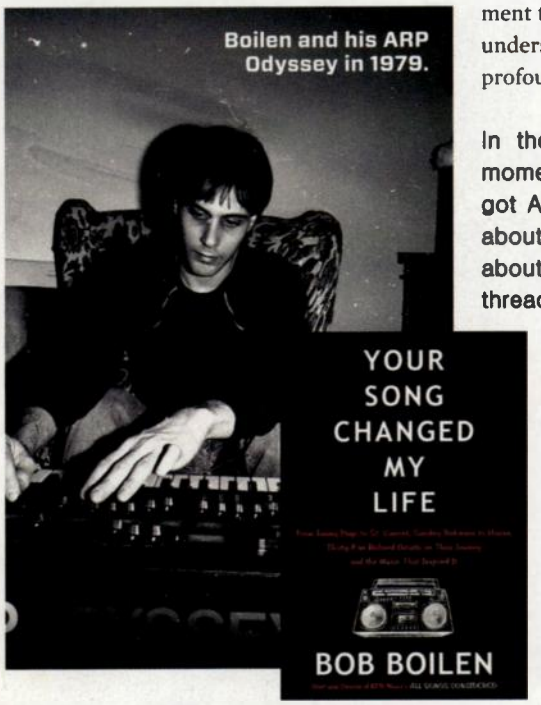
FIVE QUESTIONS

Bob Boilen

The host of NPR's *All Songs Considered* (and longtime electronic musician) documents music's power to transform in his first book, *Your Song Changed My Life*.



CLAUDIA JOSEPH

BY SARAH JONES

You know him as the voice (and founder) of NPR's *All Songs Considered*. And he's been making electronic music for 30 years with his bands Tiny Desk Unit and Danger Painter. In *Your Song Changed My Life*, Bob Boilen asks 35 artists to share the pivotal musical moments that inspired them.

You've been profiling artists for more than 15 years on the radio. What led to a book?

I've had so many interesting conversations with musicians about their lives and how they came to music as a way of life. I found it fascinating how often their path in life seemed almost accidental, coincidental—a song on the radio, a found guitar, seeing someone on TV. I also find it remarkable how we're shaped by what we see and hear and how it changes us and forces us to take action, pick up a guitar, write words, beat a drum. I wanted to document those moments, put it all in one place to understand how small moments can become profound.

In the book, artists share the musical moments that transformed them. You've got Annie Clark (aka St. Vincent) talking about Pearl Jam, and Philip Glass talking about Spike Jones. Were there common threads?

Often it was that lightbulb moment of, "Wow, I feel a part of this, I get this, this speaks to me." And many of these moments happened at formative ages, often teens or younger, many times through parents' record collections or an older sibling. There was often a sense of belonging and identity that happened—Philip Glass hearing humor in Spike Jones and I think identifying with a maverick like Spike Jones. Jones, like Glass, is a rule breaker. In the case of Spike Jones, he took and twisted classical music and made farce out of it, complete with comic jabs at Hitler. For Annie Clark, seeing a video of the Pearl Jam song "Jeremy" and then voraciously discovering all she could about a band that spoke to her gave her a sense of identity, something to call her own.

You talk about The Beatles' evolution from "I Want to Hold Your Hand" to "A Day in the Life," and how that musical potential to evolve keeps you searching for new artists. What else thrills you about music discovery?

I'm still a sucker for a good song. I love melody, lyrics, and storytelling most of all. I don't get tired of that. I'm very much a texture guy, too; I love layered sound and these days with all the richness that technology allows, there's room for invention, for hearing something that literally never occurred before, and I find that endlessly fascinating.

You've been making electronic music since the '70s. You even built a Serge Modular back in the day. And I heard that you just picked up the new ARP Odyssey. What excites you most about today's synth technology that wasn't imaginable four decades ago?

It's funny, but I bet there are few musicians working with computers and electronics that think twice about the fact that when they end their day at a session that they can come back the next day and pick up right where they left off. When I started making electronic music, instruments and mixing boards didn't have a memory. On my ARP Odyssey, if I had an amazing sound I couldn't hit a button and save that sound. My Serge Modular had so many patch chords, I had to remember the position of all those sliders and switches... and more than likely getting right back to what you remember was elusive, an art as much as anything else. I remember leaving mixing sessions with big X's of masking tape on the consoles with the words "DO NOT TOUCH" on them... sliders and knobs dialed in just right.

When I played around with the Synclavier II in the early '80s, I found the creation of sound near limitless; now an instrument like that might be one of a few dozen plug-ins used on a given song, and the range of possibilities that seemed endless before is now profoundly endless. It's like discovering that there's a galaxy and then realizing there's a universe filled with galaxies.

You create an album every February as part of the RPM Challenge. What have you learned from imposing a time limitation on the music-making process?

Deadlines make me a better musician, a more reactive musician. I make music more from the gut, more from instinct than analysis when I'm on deadline. It's closer to live music. It wasn't unusual for me to take eight hours or more just to create a sound on the Synclavier II. It surely was fun, but I find that the combination of computers and music can create a giant rabbit hole, a time suck that for me made music more about the head and less about the heart. As a listener, I want music with heart and expression at its core and when I find it, then, to hold my interest; I want the kind of sound rich adventure electronic music offers. ■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