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30

THE ART OF SYNTH SOLDING

More Natural Vibrato Techniques

32

EASY GUIDE

Harmonic function



34

CLASSIC GEAR

Roland Juno-106



10

NEW GEAR

News from Nord, Arturia and more



14

SOFTWARE NEWS

IK Multimedia MixBox

Hear all of this month's tutorial audio:
musicradar.com/how-to/em439-july-2021-examples-and-files

16

CUSTOM EFFECTS WITH GUITAR RIG 6



TOM HOLKENBORG

22



MASTERCLASS: CIRCUIT TRACKS

55

HOW TO



60

ROUND-UP
Freeware compressors



64

ELECTRONIC GUITAR
Micro looping

GEAR



36

NOVATION
Circuit Tracks



40

GFORCE SOFTWARE
OB-E



42

MAKE NOISE
0-CTRL



44

SPITFIRE AUDIO
Contemporary Drama Toolkit



46

LINDELL AUDIO
50 Series



48

AUSTRIAN AUDIO
OC818



50

KORG
Nautilus 88 Music Workstation



66

STUDIO TALK
Sheep, Dog & Wolf

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Back to the real world

While the rules governing live music during this pandemic might vary a little depending on where you are, it's fair to say the whole live performance realm has seen a massive shutdown over the past year. International touring has been an absolute no-go, clubs have mostly remained shut and almost all major festivals or concerts have had to postpone or cancel.

Completely aside from the way this state of affairs has affected musicians' ability to make a living, it's also had a fundamental impact on how we perceive music. Particularly in the 'electronic' music realm, a lot of modern music is designed with real world engagement in mind, from festival-ready anthems to groove-driven club tracks or modern orchestral pieces created for grand public recitals.

As 'real life' music begins to start up again, it will be interesting to see

how the shift in the way we've engaged with music for the past year changes the type of music being created. Will we see more dance musicians shifting their attention away from dancefloors towards works which are more designed for 'headphone' listening? Can we expect a golden age of 'ambient' releases? Or are more producers being wooed by the realms of TV, movie or video game sound tracking?

It's hardly conceivable that dance music or live shows won't make a full comeback though. If anything, for many listeners, the time away has cemented a love of communal music experiences; highlighting the power and excitement that comes from hearing music performed at high volumes and around other people. Here's hoping for a great summer of creating and listening.

We hope you enjoy the issue.



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NEW GEAR



Arturia Pigments gets souped-up with additive synthesis and extra analog emulations

Arturia's Pigments combines elements of the French brand's impressive virtual analog technology with modern tools including wavetable, sample and granular synthesis, a sleek modulation system and a flexible multi-lane sequencer. Pigments' real highlight though is its ability to house all of these features in a neatly designed and user-friendly interface, all of which makes it a strong contender for our favorite synth plugin on the market right now.

Now version 3 has arrived, adding yet more functionality to the toolset. The headline addition here is the new Harmonic engine type, which adds additive synthesis alongside the existing wavetable, sample and virtual analog generators.

The look and feel of this new section is fairly reminiscent of NI's excellent Razor, but Arturia's take has a few

unique tricks up its sleeve. Here we get controls to adjust the amount of partials created (up to 512), their ratio, as well as apply audio rate modulation from a separate oscillator.

Below the main display is a Spectrum section, where filtering can be applied to the additive sound, ranging from simple low- or high-pass processors to a variety of complex filter and comb types. Possibly most interesting is the Imaging tool, which lets users pan individual partials across the stereo field in a variety of different ways.

Beyond the Harmonic generator, Pigments 3 also adds a new Utility Engine that contains two noises sources and a virtual analog sub oscillator. This exists in addition to the synth's two existing engine slots, making it a very handy tool for adding extra weight to a synth sound without having to sacrifice one slot which you

could use for wavetable or samples, and so on.

Elsewhere, Pigments gains a few analog emulation tricks lifted from elsewhere in Arturia's range of software synths and effects. This includes a new Jupiter 8 filter model, the classic Juno 6 chorus for the effects section, and a Bel BF-20 analog flanger recreation. There are new non-emulated effects here too, including a pitched delay, and multi-band compressor. Beyond this, there are a selection of refinements including additional filter routing option, an added ramp waveform for the virtual analog engine, and a clutch of new wavetables and presets.

Pigments 3 should be out by the time you read this. Version 3 is a free update for existing users, though new users could have grabbed the synth for an intro price of \$99 before May 11.



IZOTOPE INTRODUCES A NEW VERSION OF SPIRE STUDIO, THE CLOUD-CONNECTED RECORDING DEVICE FOR SINGERS AND INSTRUMENTALISTS

iZotope has released a new version of Spire Studio, its wireless 'smart' recording device that syncs to a cloud-based suite of production tools. Made for vocalists and instrumentalists, this is designed to enable even the most technophobic musicians to capture their performances at decent quality.

Spire features an onboard mic, plus two phantom-powered combo inputs for mics and instruments, and two headphone outputs. There are effects as well, not to mention an auto-mastering tool that's powered by iZotope's Ozone software.

The second generation Spire Studio ups the stakes by offering ultra low-noise preamps that are said to offer smoother, quieter recording, and increased storage capacity (enough for more than eight hours of music, we're told). Enhanced Bluetooth performance should mean faster connection to the Spire app, and we're promised enhanced battery performance and a brighter/updated display.

There's also Spire Pro, an optional subscription service that can be accessed via the companion iOS app. This includes cloud-based audio repair technology from iZotope RX – so you can fix noise, popping, clipping and plosive issues, for example – and a Personalized Soundcheck feature that listens and learns from your voice and environment.

Then there's the randomized 'Inspire Me' feature, which will add iZotope effects to any track (reverb, flanging, chorus, distortion etc).

The new Spire Studio costs \$499 and comes with a six-month subscription to Spire Pro. After this you'll have to pay \$4.99 a month or \$47.99 a year.

THERE'S MORE TO POLYEND'S TRACKER ARTIST EDITIONS THAN MEETS THE EYE

Polyend has introduced some rather lovely looking artist editions of its excellent Tracker sampler/groovebox. Each one does away with the standard black casing and comes with a custom livery, but there's bit more to these limited edition models than that.

Bogdan Raczyński, Legowelt and Pete Cannon are the three artists who've put their personal stamp on the Tracker; each one came up with their own visuals for the hardware. Dig a little deeper, though, and you discover that each model also comes with a vinyl album release from the artist in question, along with original composition project files and a sample pack.

As such, not only do you get to listen to an artist's finished product, but you can also break down their work and see how it was put together. These are very much limited edition releases – only 300 of each Artist Edition will be produced – so get in quick if you want one. Each model is priced at \$983 and will be shipping within a month.





PIONEER DJ LAUNCHES NEW VM MONITOR RANGE

Pioneer DJ has unveiled its new VM Series active studio monitor line, promising smart design and flexible DSP settings that make these speakers suitable for use in any near-field setting.

Designed to be as easy on the eye as they are on the ear, there are three speakers in the VM series: the VM-50, VM-70 and VM-80. While varying in size and power, each model features a 4 mm-thick aluminum front baffle, flat voicing, Class D amplifier, Aramid fibre cones and Vortex Bass Accelerator. The result, we're told, is a speaker range that can deliver deep low-end frequencies without unwanted vibrations. There's also the impressive-

sounding 'constant directivity horn', which is designed to create a broad, uniform listening space while transmitting powerful mid- and high-frequency sounds.

While the VM Series speakers are voiced 'flat' so that you can get an accurate representation of how your music sounds, you can also tweak the DSP setting to suit your room. Control of this comes courtesy of Low and High EQ knobs, which can be combined to create 16 different settings.

The VM Series is out now priced at \$169 (VM-50), \$229 (VM-70) and \$289 (VM-80) per unit. All models are available in black, with the VM-50 also offered in a white finish.

ANALOGUE SOLUTIONS UNVEILS THE "RAW, BALLSY AND RICH" LEIPZIG V3 ALL-ANALOG SYNTH

Analogue Solutions has unveiled Leipzig V3, the latest addition to their acclaimed line of analog synths. If you're looking for the elevator pitch, you need to know that this combines the convenient footprint of AS's Impulse Command with the "raw, ballsy, complexly rich sound" or Leipzig's gone by.

Specifically, there are features lifted from both the Leipzig-SK and Leipzig V2, including patch points that enable expanded sound design potential and connectivity. Designed for huge bass sounds in particular, Leipzig V3 promises to be simple enough for beginners yet deep enough for more advanced synthesists to get their sonic teeth into.

General specs include two analog VCOs with additional sub osc, oscillator sync and cross mod functions, a Moog-style ladder filter and the ability to overdrive the mixer and filter for extra grit. There's a neat 16-step sequencer on board too, which can double up as a modulation source.

Leipzig V3 costs \$1199 and is available to order now.





The Nord Piano 5 offers dual piano and synth engines, and double the sample storage

Clavia has announced the Nord Piano 5, a new version of its pianist-centric stage keyboard. There are no surprises in terms of the way this looks – it's red, as you'd perhaps expect – but some notable tweaks have been made. These include dual independent piano and synth layers, which can be used in a variety of split and layer configurations, and twice the sample memory for both the piano and synth sections.

There's also a new 73-note model with triple sensor keyboard and grand weighted action. This joins the 88-note version, which includes a keyboard of the same spec. A couple of tweaks have been made to the effects section, too, and the synth gets a Unison mode for ensemble-style sounds. The Nord Piano 5 will be available this spring... which presumably means pretty much any time from now!



Erica Synths adds 3 new filters to the Black range

Erica Synths has added three new Eurorack filter modules to its ever-expanding Black range, including a High Pass VCF, Low Pass VCF and Filter Coupler module.

Both HP and LP filter modules can operate as standalone modules, while the VCF Coupler can be combined to add even more filtering features. Both the Black Low Pass VCF and High Pass VCF modules are 24dB/oct resonant filters with voltage control over cutoff and resonance. There's also a cutoff CV attenuverter and an adjustable post-filter overdrive circuit on each module. The Black VCF Coupler mixes things up a little further by adding on Bandpass and Band reject filters and gives you the opportunity to have manual or voltage control over center frequency and bandwidth.

The Black VCF Coupler is available for \$109 and both the Black High Pass and Low Pass VCFs are priced at \$189.

IK Multimedia MixBox

It's time to open the lunchbox on a tasty collection of mixing effects, direct from Italy. MixBox is a custom channel strip plugin that lets you build up a rack of effects from a single plugin screen, pulling from ranks of compressors, EQs, distortions and loads more creative effects to come up with your own custom chain.

Many channel strip plugins concentrate on a standard combination of EQ and compression, with some preamp units added for good measure. Thanks to IK Multimedia's heritage in modelling more music gear, you also get studio effects such as delay, reverb and modulation, as well as guitar amp elements such as cabinets. All of this makes MixBox a versatile, creative

effect-hosting unit that will appeal to musicians as well as just producers and mixing engineers.

Here we'll take MixBox for a quick spin to demonstrate some of its strongest features, including its huge selection of devices, its resizable interface, and the standalone mode that lets you load eight separate racks of eight devices, all at the same time.



1. Starting the rack

We'll use MixBox over a synth part to start off with. When we open the plugin up the rack is empty, but there's a world of possibility here. We start off by loading a British EQ into the first slot, and using this SSL-style parametric device to reduce the lows, provide a broad boost to the mids, and notch out some harsh frequencies around 3kHz. We can choose a new unit for the chain from the top of the second slot. Next we'll tame the sound a little with a compressor...



2. Comparing compressors

We load up MixBox's generic 'Compressor' in the second slot, dialling in the usual settings and turning up the Drive to really get things cooking. There are more compressor models to try here, though. We load up a 'Black 76' into the third slot to see how a FET compressor reacts to our synth signal. There's more control here, with the potential for super-fast attack times while keeping the signal clean and true to its original state. We can bypass either compressor in the top bar to compare models and make a choice.

3. Adding some modulation

MixBox doesn't just do a good line in workaday compressors and EQs. There are plenty of creative effects here thanks to IK's experience in the world of amp modeling and other plugin processors. We whip out a Phaser as the next device in the chain, keeping the settings quite light and subtle by dialing back the Depth control. Although we'll stop our experimentation here, MixBox lets you expand the rack to show all eight slots, and can also resize the interface exactly as you like it with a drag in the bottom-right corner.



What's in the box?

With IK's experience in modeling more than just compressors and EQs, MixBox comes with over 70 effects to put into your chain of eight. Nine Amp selections have choices from basic Preamp to British Tube Lead types; three types of delay include Tape Echo, Digital Delay and the interesting Reverb Delay; distortion entities offer Distortion, Lo-fi, bitCrushing, Overdrive and tube screamer; a large choice of EQs are available in the EQ and Channel Strip categories; ten types of filter take in legendary options such as Moog-style, formant filtering and wah pedal models; the modulation category includes a huge number of creative effects from flangers to rotaries and plenty more in between; nine types of reverb take in almost all the algorithms you could possibly dream of; and the three saturators include some interesting vintage options.



4. Drum bus processing

Now to build a channel strip for use on a drum bus. We start with a Sat X device on a subtle and clean distortion setting, and then make some light adjustments with MixBox's generic Parametric EQ unit – warming up some low-mid frequencies and backing off some highs. Next comes a Room Reverb unit, which houses all the most essential reverb controls. You can load up a preset on any device from the bottom strip of the interface, but you'll have to activate this bottom strip first by using the button in the very bottom-left of the interface.



6. Backside controls

We can flip the entire mix rack around to reveal a few more controls hiding at the back. Here, along the bottom, every effect has its own Dry/Wet slider to control its depth. Note that even though we've already set the Reverb to 20% Wet, the slider here acts as a second blend control, remaining 100% Wet itself. Here also, a sidechain control appears at the back of our Bus Compressor module, offering a way to reduce the level of or disable the sidechain signal if one has been routed to MixBox in our DAW.



7. Standalone version

Not only is MixBox a plugin, it also comes as a standalone app, with the expressed intention of the software being used for live mixing duties. Running MixBox in this mode gets you not just one rack but eight, helping you to route multiple interface inputs into processors and then back out again. Switching between the different racks is easy, and you also get a back-side view where you can quickly select new units for every single slot, quickly mix your different channels, and bypass and audition entire racks too.





GUITAR RIG PRO 6

Discover the new gear and sonic possibilities in Native Instruments' one-stop shop for amp and pedal simulation

With the history of amplifiers spanning nearly a hundred years, nowadays there are more ways to send an electrical signal from a guitar pickup rattling through a loudspeaker than you can shake a six-stringed stick at. Tube, solid state, modeling, hybrid; heads, cabinets, parallel or series – it's enough to make your head melt.

For the average home producer, trying out every possible model and mode of amplification would be enough to make your wallet melt too, added to the cost of finding the right microphone, preamp and room acoustics to

record your sound faithfully. For these reasons and more, amp simulation has become a hugely popular part of music production.

An amp simulator is a plugin that mimics the sound of a real-life hardware amplifier. With only a laptop, audio interface and amp simulator software, you can put anything with an output jack through its paces, whether you're looking for smooth tube overdrive or a sparkly clean solid-state amp feel. As you can imagine, any piece of software that manages to do this successfully could potentially save consumers a great deal of money and floor space, so it's no

surprise that audio technology companies have been trying to mine the idea for a number of years now.

Native Instruments' Guitar Rig was first introduced for both Mac and Windows in 2004 as a hardware and software hybrid. The program was simple, featuring only three tube amp emulations, but in the iterations since, the software has been refined and enhanced to a huge extent. Guitar Rig 5, released in 2011, quickly became a market leader in the amp-modeling game, and a go-to when it came to software-based multi-effects processing.

Sure, the user interface was a little bit clunky, but at the time of its release there was none better at doing what it did, and it took a while for competitors to catch up. Catch up they did, however, and in the nine years since Guitar Rig 5 was released, it slowly became less relevant to both guitarists and producers.

In 2021, Guitar Rig 6 is a slick, multi-faceted amp and effects modeling software package that brings Native Instruments' amp simulation software back to center stage, and puts a whole host of creative possibilities at your fingertips. A plugin (also available as a standalone application) with this kind of multi-effects processing ability is far more than just the preserve of bedroom guitar players noodling into audio interfaces. Guitar Rig 6 is a complete audio processing workstation, and it can function as a shop floor for all your audio tinkering, even if turning dry, DI guitar signals into stadium-



New additions to Guitar Rig 6 include amps, emulations of classic hardware compressors and reverbs, and a raft of creative effects plugins

ready amp tones is still its sweet spot. With a redesigned user interface, new amps, new effects, and new machine learning technology to

model state-of-the-art hardware makes Native Instruments first major update to the software since 2011 an intriguing proposition.

Step by step 1. Getting started with Guitar Rig 6



01 Load up Guitar Rig 6 onto an audio track in your DAW. At the top, choose either left, right or stereo as your input, and check your gain. There's a Gate that can eliminate any noise below a threshold you set. The output level is shown to the right, alongside a Limiter.



02 Select an input source in the menu on the left of the display - we're using a guitar - and browse through the Curated presets to hear a selection of sounds. Presets can be filtered by genre, character, effect type and more.



03 Let's have a go at building our own virtual rig. Switch over to the Components menu and click on Amplifiers. We'll build a basic amp and cab setup using Chicago, a mid-'50s combo amp, new in version 6. The amp is automatically matched with a cabinet, but this can be changed.



04 Next, we can start to build an effects chain on our preset. Selecting any of the effects types displays a list of choices below. There's a lot to choose from, but we'll add Twin Delay and RC 48 Reverb. You may recognise the '48 from another NI plugin.



05 The position of the components in the rack can be moved around to change your signal flow (from top to bottom). The order of the effects makes a big impact on the sound, and effects like delay and reverb are typically added after the amplifier in simulated rigs.



06 In the toolbar you can find rack tools, including macro controls. Macros provide global instructions that can be assigned to any parameter in the rack just by dragging. This is helpful as it allows you to automate multiple things at once, using a single knob instead of many.

Step by step 2. Using Guitar Rig's Modifiers and Tools



01 Guitar Rig's modifiers give you extra sound design control. The modulation sources include an Envelope, an LFO and sequencers. These are functions you would normally see on a synth, but we'll show you how to map them onto your rack to create interesting sounds.



02 Start with a Firebreather amp, an LFO and Filterbank. Assign the LFO to the Stretch knob on the Filterbank. Adjust the range to +0.500 in the expert tab. Then, assign the LFO onto any slider on the Filterbank. Set the range to -1.000.



03 Add another LFO module to the rack. Set the rate to 8.06Hz on the main panel and switch it to a Square wave. Assign this LFO to two sliders on the Filterbank. Now we have two LFOs modulating multiple frequency parameters.



04 Add an Analog Sequencer. Choose the Min. to Max. preset and set tempo to 1/4. Turn Slide down to 10ms. Add Pitch Pedal and assign the sequencer to the Pitch knob. Set the Mix to 100%. In Expert, change the range to +1.000.

Changing the strength of an effect based on input level

For rip-roaring solos that Clapton himself would be proud of, it can be helpful to know when to step on the gas and when to back off. A technique that you can employ in Guitar Rig 6 to help add expression at the right moments is syncing an effect to your guitar volume using the Input Level modifier.

The Input Level modifier uses the input level to generate a control signal that can modulate any parameter in your rack. For example, you could drag the Input Level modifier onto a Cry Wah effect to create an auto-wah, or onto a Fuzz effect to add bite when you are really digging into the notes in a wailing solo.

You can fiddle with the Attack and Decay knobs on the Input Level modifier to adjust how quickly the modulation hits and comes back, or use the Offset control to set whether it starts in the low or high register.

Step by step 3. Recreating Clapton's Layla guitar tone



01 Add a Tweedman amp to the rack and set it to the Full Lead preset. Turn the Presence to 5. Change the matched cabinet to Control Room Pro and select 4x10 Tweed, DYN 57 Mic and Cap Edge. Bring the Room up to 25%.



02 Add Psyche Delay after the cab. Set the Time to 220ms and dial the Mix back to 25%. Next, put Spring Reverb below. No need to change anything here.



03 Finally, click into the Distortion section in Components and add Dirt before the amp. Set it to the Delta Blues preset.

Guitar Rig's new effects run down

As mentioned previously, Guitar Rig 6 is a multi-effects processor. Along with traditional guitar-focused components there are a wealth of studio effects to shape and characterize your sound. The 54 original effects from Guitar Rig 5 have all remained, including Tape Echo, Spring Reverb and PsycheDelay, plus classic stompboxes, filters and more. There are also a host of intriguing new effects.

Some of the new effects are technically only new to Guitar Rig, and you might recognize them from elsewhere in Native Instruments' armoury. A set of compressors from the Complete package has been added, the VC 160, VC 2A and VC 76, which are based on classic hardware models. There's further vintage

hardware emulation in the form of the RC 24 and RC 48 reverbs. Raum, NI's high fidelity utility reverb plugin has also been added.

Other effects that are new to Guitar Rig 6 include the Crush Pack (Bit Crusher, Frequency Shifter and Distortion), and Mod Pack (Chorus, Phaser and Flanger). We also get the Solid Mix Series which includes a 6-band EQ, a stereo compressor with a gate/expander module, and a transparent, versatile glue compressor.

Transient shaping can be carried out with Transient Master, and there's Driver, a distortion and filtering effect from the creators of Massive. Rounding off the collection of new effects are REPLIKA Shimmer (pitch shifted reverb) and Replika GR (a delay effect with Tape Echo,



Effects are overhauled in Guitar Rig 6, with reinforcements provided from the NI armoury: distortion, saturation, compression, modulation, reverb and more

Analog, Vintage Digital, Diffusion and modern modes) plus 12 DJ inspired effects converted from Traktor.

Step by step 4. Creating a phasey, modulating effects rack



01 Driver is a filter unit, and we're going to use it to create a slow sweeping effect similar to a phaser. There's a preset that does this already, so set it to Slow Sweep. Bring down the Output Level to around +1.0 if your signal is a bit hot.



02 Add the VC 76 compressor. Set the Attack to 3.5 and the Release to 7.0. Keep the ratio at 4:1. Your input gain should be around 25 and your output 18. You can always roll up the Dry knob if the compressor is doing too much!



03 Add Replika GR for some short tape echo. Choose Wide delay and 1/32 in Straight time. Set Feedback to 30%. Pick Tape Echo and switch on the Noise. Turn Wow & Flutter to 85% and Tape Age to 50%. Set Saturation to 25% and Mix to 30%.



04 Next, put Raum onto the rack. Use the Freeze button to loop a sound for an ambient drone effect, which can be controlled with track automation in your DAW. Turn the Size to 100% and the Decay to 6.1s. Set the Low Cut filter to -12dB.



05 Drop a Bite distortion before the amp. We're using a preset, Outside Club, to give the sound a muffled low end and buzz. We'll turn down the Mix to 50% though, and put the Post Filter at 15.3kHz.



06 We'll need another reverb to give our tone space when the Freeze function of the Raum is enabled, so drop an RC 24 onto the rig. We'll use the Room setting to keep the guitar tone up in front of the Raum drone.

Step by step 5. Creating a split processing patch



01 Using the Crossover tool we can split our audio signal and route different effects to either lower or higher frequencies. This can be handy for keeping parts of the mix clear, or dialling in a layered tone, among many other things.



02 Let's take a look at how Crossover works. Add it to the rack and you'll see it has split the signal into Low and High channels, which we can treat independently. You could add different amps to each channel, or just use it for effects components.



03 Take the high frequencies first. Add Phaser 9 to the High channel and turn the Colour up to 8. We're also going to add a fast delay too, so throw in a Delay Man component underneath the phaser and set the Time to 80ms. Set it to Vibrato instead of Chorus.



04 Now for the low frequencies of our audio signal. Let's add a bit of distortion to the low end to set it apart. Put Fuzz onto the Low channel and turn it down to zero, we don't want it overpowering the sound.



05 We can carve out an individual space for both channels using reverbs. Put Iceverb onto the High channel and set the to 0.70. Bring the Color down to 0.40. We want our Low channel separate, so put Octaverb on the low frequencies and set it to the Small Room preset.



06 We want the sound to favour the Low channel, so move the X-Fade in the Crossover tool to the left, until it's at 80% : 20%. This feature allows you to emphasize either the Low or the High channel, and is a great way of blending your sounds together.



07 Let's set the high frequencies slightly to one side, and keep the low frequencies dead centre. Move the Pan knob right to 20%. There's an Invert button that flips the effect backwards, and a Frequency knob to shape the combined sound, but we leave them untouched.



08 Separate the two channels even further by EQing each. Add a Shelving Equalizer to the Low channel and set it to the Highs Out preset. Do the same with the High channel, but set it to Lows Out. Now it sounds like we have two guitars!

TIP

These sort of split patches are pretty easy to make using Guitar Rig's tools, but you can also put these formulations together in your DAW. By splitting your signal in whatever way you choose and then loading up two instances of the Guitar Rig plugin, you can experiment with splitting whole patches and use two different interfaces to do so.

Preset reset

Even if you're a staunch original, using presets can be a good way of looking at rack configurations that you might not previously have considered. A lot of the presets in Guitar Rig 6 are cleverly put together, making use of LFOs, step sequencers, split signal chains and more. Taking a look under the hood of a preset can show you how the professionals put their sounds together, and inspire you creatively to build your own chains using similar techniques.

In the browser, selecting the Input Source type will display presets that work well with your chosen instrument. Guitar Rig presets work best on guitars, so as you would expect, the range of options greatly drops when you select other input sources. There's 611 curated presets

available for guitar, 96 for bass, 72 for drums, 63 for vocals, 50 for keys and so on and so on.

There are also a range of Mixbus presets that you can use to boost your mixes. Some, like Bus Warmer and Mix Energizer, are subtle, while others, like Crush My Mix, are quite intense.



You can browse presets by Input Source, FX Type, Character, Amplifier, Genre and

THREE GREAT NEW EFFECTS



FREAK

Frequency shifting, ring modulation and radio modulation techniques all in one. Three distinct effect modes – Radio, Oscillator and Sidechain – allow you to completely transform your sound. Emulate the noisy tones of AM radios, get classic modulation sounds using an internal sine oscillator, or use a sidechain input signal to create inharmonic ring modulation.



REPLIKA SHIMMER

This sparkling, pitch-shifting reverb is an amalgamation of Native Instruments' other Replika delay models. Layer an ethereal reverb tail on top of your dry signal by adding Shimmer to your sound at pitch intervals from -12 to +12 semitones, and exercise tight control over Time and Feedback. Classic reverb controls such as Diffusion and Size are also included.



FLAIR

For vintage-style or futuristic flanging. Flair's Voices mode uses multiple delay lines to create harmonically tuned flanging layers. Thru Zero mode duplicates voices at their respective pitch, and Scan mode plays them one after another (instead of stacked into chords), with the order set by a chosen waveform. There's also the option of classic analog and pedal flanging effects.

Step by step 6. Running Other Instruments through Guitar Rig



01 You can use Guitar Rig to beef up a soft synth sound. Try placing a Dirt distortion on the rig with the Drive knobs cranked but the Mix down low. Then widen it out with a Choral and add a Large Hall RC 24 reverb on top.



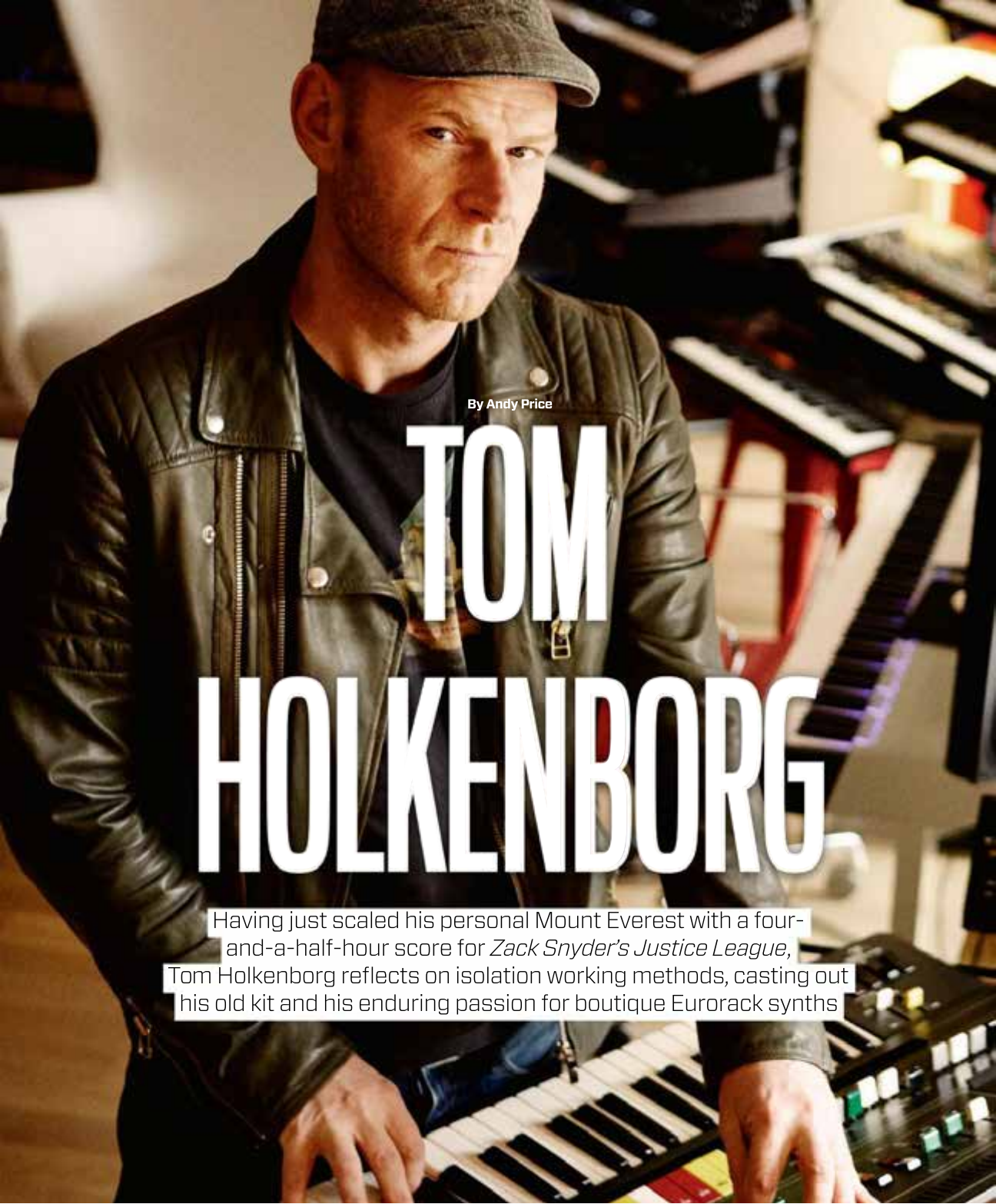
02 There's only one curated preset suggested with piano as the input source, and that's Suitcase Piano, a cheap sounding lo-fi effect. Using Guitar Rig's reverbs to change the room setting of your piano works well. Try adding choruses and Ensemble for an easy way to turn electric.



03 Guitar Rig has plenty of options for bass guitar, especially as a tone shaper. Put a Pro Filter with a HiCut preset selected, a Solid EQ on Rock Bass setting and a VC 160 compressor with a Bass preset on. Use the Gate to cut noisy inputs.



04 Setting up Guitar Rig on an auxiliary bus allows you to parallel process a vocal track. This could be useful for EQing or compressing, or blending in some of the onboard effects into your dry signal. Distortion, Pitch and Modulation components can be applied to create modern pop and hip-hop hooks.

A full-page photograph of Tom Holkenborg in a music studio. He is wearing a dark leather jacket over a black t-shirt and a grey flat cap. He is looking off-camera to the right with a serious expression. His hands are on a keyboard synthesizer. In the background, there are racks of electronic equipment and another keyboard on a stand.

By Andy Price

TOM HOLKENBORG

Having just scaled his personal Mount Everest with a four-and-a-half-hour score for *Zack Snyder's Justice League*, Tom Holkenborg reflects on isolation working methods, casting out his old kit and his enduring passion for boutique Eurorack synths

"This is definitely up there with some of the longest scores in history, it's been intense," explains an excited

Tom Holkenborg (widely known as Junkie XL). Tom is delighted that the long-anticipated Zack Snyder cut of *Justice League* is finally seeing the light of day. This substantial re-edit of 2017's superhero extravaganza *Justice League* is a labor of love sprung from a relationship Tom has had with director Zack Snyder since 2013's *300: Rise of an Empire*. "Zack and I have been talking about bringing this out for years," the Dutch polymath tells us. "It's really thanks to the power of the fans that this happened. They have not only been harassing Warner Brothers for the movie, but also to release the score. So, we really owe it to them and their tenacity that this finally got made. We felt it coming."

One of Hollywood's most in-demand composers, Tom's acclaimed soundtracks have fused electronic music with classical approaches, cacophonous, relentless percussion and visceral rock elements. An ongoing love of modular synthesis permeates nearly all of his diverse projects, using the potential of a breathtaking modular 'wall'.

With this four-and-a-half-hour score, Tom was given free rein to pull all the threads together. "This is movie number six Zack and I have collaborated on. I decided to do this new score from the ground up. I listened back to what I had originally planned for it (before Tom and Zack left the project in 2017, replaced by Danny Elfman and Joss Whedon respectively) and felt that I could do way better. I've learned a lot from all the great directors I've worked with: Robert Rodriguez, James Cameron, Peter Jackson, George Miller; I learned so much from all these people. What I had originally planned wasn't up to scratch. I called Zack late April last year and said, 'Would you mind if I start over?', and then he said 'By all means!'. He said: 'keep in mind, the shackles are off'. That's where the project began."

Tom has still not seen any of his friends or family over the last 12 months: "I've been pretty careful. Making this score has been like climbing Mount Everest – it was a solo affair. It's something you have to do on your own and no one will carry you on your back. I finally reached the top of the mountain in the first week of January."

A deep dive

Working in isolation, and without any studio or creative interference, Tom's creative process was free and unfettered: "I could really explore

everything that I have in me as a composer. So starting with the most conventional side, this was my moment to dive deep into my admiration for classic Hollywood movies from the 1930s to the 1960s, and at the same time my love of classical music between 1880 and 1925. On the more unconventional side, I decided to bring in some noises made using my modular wall and also explored some odd ways of thinking about sonics – like what would happen if I put a guitar on fire, for example." Tom laughs, "So what you find in the score is a combination of modern sound design pieces that are really on the cutting edge of what you can do with sound design at this point. On the other hand, there's an Adagio for one of the characters that is almost 12 minutes long. That piece is almost exclusively orchestral. Then there are sections that have stoner rock guitar sounds and other sounds that have a hip-hop approach. Other sections are a blend between all kinds of different styles. There's a choir from hell in there that gradually detunes and gets more and more evil as it goes on," adds Holkenborg, tantalizingly. Of course there is!

Lock and key

Due to the global pandemic, and its resulting lockdown, Tom was forced to tackle this mammoth project without his usual studio arsenal, and without his creative team. "For us to move everybody at home with their own computer setups and stuff was not that hard," he tells us. "We started doing that from the last week of February 2020 – so we actually locked down early. For the process of it, things weren't majorly different, but there were a few things that required rethinking. When I started working from home, I worked in my spare bedroom of 8x8 feet, so it was pretty limited. Normally I surround myself with all the gear and drum kits I can. I'm a 'full-contact' composer which means I love to touch things, play things, experiment with things, but here I had fewer options. I had just one guitar, one bass, a few percussion instruments and one or two favorite synths. I wrote the entire score with those limited options and some plugins. It was quite revealing. I was always thinking about how to get the most out of that one instrument, rather than switching between multiple things for different purposes."

Limitation was what really forced Tom to explore every possible permutation of his reduced toolkit. "Every now and then, I'd throw one synth in the car, drive up to my studio house, and replace it with something



Full contact

Famously self-defined as a 'full-contact' composer, we ask Tom to detail exactly how that process differs from the norm in soundtracking terms: "It's not only the fact that I want to be turning knobs and playing instruments, but it's the fact that I want to be in control of every step of the process. When I can, I love to record the orchestra myself. I still mix all my film scores by myself. I still master all my recordings myself. I deliver all these stems to the final product also myself. I want to be in control as much as I can. Every step of the way I feel I can add more identity of what I am as a person. My career started in my late teens as a very traditional recordist, recording bands and mixing and then I grew into being a producer, working with international acts. But my core career was to make sure that the music being produced had a strong identity and sound, purely based on how you record and how you mix and how you guide the musicians into a certain type of performance. That's stayed with me throughout."

else. It reminded me of doing my first four-track recordings back in 1981 and 1982, when I was 15 years old. One track recorder, one drum computer and maybe one guitar and a bass. I was not a singer, I was a screamer. So it was always really limited, it often led to baffling results. It had a magic to it though."

Out with the old

The only contact Tom had through the entire process was with Zack Snyder. "Normally composing a film score is a team effort, with the director as the most important member – and a lot of cooks in the kitchen. I do like working that way. But the fact that I was able to work on my own with nobody asking me questions and not hearing other people's music throughout the building was freeing. I was living alone, and getting groceries delivered and that's it. It made everything SO intense. It was a very pleasurable experience though, I just missed human contact. On the back end of this – I'm not sure if we'll ever go back to how we worked before. Some of my assistants love it

Tom continues, "so I bought all that older stuff and kept buying, and kept buying. It wasn't that I had a brilliant future plan, or knew it'd be worth loads of money later on. I just loved the sound of these things. They were well-built boxes that were purely mechanical wonders. The problem eventually became that because the tech was so old, if I wanted to use it, I'd have to spend \$2,000 getting it fixed. By the time it was fixed I'd lost interest in using it because it was a spur of the moment thing. If I thought 'ah, let's use the Jupiter-8 today' I'd turn it on and 'bam', one oscillator is out and the other one is horribly out of tune and needed to be completely re-tuned by an engineer. At a certain point I was done. I made a deal with Reverb.com and eventually they sold everything for me."

Where does this leave Tom now? "Well, I just started to buy analog synths and digital synths again – but the top class, modern stuff. At this point I have the Waldorf Quantum, I've got the Modulus 002, I've got the Moog One and Matriarch. I've got the GRP Synths A4, I've got

"I explored some odd ways of thinking about sonics – like what would happen if I put a guitar on fire"

too. They loved being able to schedule their own time and work how they wanted to work."

Last year, to everyone's shock, Tom announced he was shedding his treasure trove of vintage gear, and selling it via Reverb.com. Out went more than 200 synths, samplers and close to 100 pedals, as well as a selection of older guitars and kits. So, what prompted this dramatic ejection? "I didn't know how much I'd hoarded over the last 40 years!" Tom admits. "I started buying stuff when I was 13. The stuff that I bought was stuff that was ridiculously cheap when I bought it. I then worked in a music store where instruments were traded in that nobody wanted. I always give the example of the Memorymoog. I think I bought that for 60 or 70 Guilders (which would be around \$20). In 1983 you couldn't give them away. People wanted the DX7 and then they wanted the Roland D-50, they wanted the Korg M1. Nobody cared about the old, massive analog boxes that had no presets with limited options and weren't capable of the sounds they were hearing in the 80s that they loved so much. The bass sounds, the pads and the strings were elsewhere."

an Erica Modular System, and also their Syntrex. The Yamaha Montage, I've got the Code 8 and the MiniMoog by Studio Electronics and I've got the Dave Smith Prophet-12. Then I've got the Analog Solutions Vostok semi-modular system. I've got the Motor Synth from Gamechanger Audio – I was actually part of their startup around three years ago. I'd forgotten about it, but it arrived a month ago!"

Tom had previously retrofitted his older selection of synthesizers with Kenton Electronics' MIDI convertors so that they could be routed into his computer. "The Kenton convertors meant I was able to sequence a lot of them in Cubase, which is still my DAW of choice," says Tom. "Since they were analog and vintage and unreliable I'd just record everything in. I'd then chop up all the recordings and work with little pieces. I've still got libraries, that are well in the terabytes, of sounds that I made with that older kit. In this lifetime there won't be enough film score projects to use all of them. But the modern synths don't have any of those vintage pitfalls. You can actually work on a sound that's amazing, store the preset and switch it off. Next

day, come in and switch it on and hey – the oscillators are in tune and the preset is still there and it sounds exactly identical to what it did yesterday!”

That being said, the potential for sonic discovery is still high, “My new modular gear is so intuitive, the Vostok, the Syntrix, the Motor Synth for example, when you turn all those knobs, all kinds of new sounds can reveal themselves, so it’s still great to record everything that you do with them. The same with the Montage. I bought it for the 8-operator DX and TX sounds. While I’m editing, loads of unexpected things can happen. You go through all these algorithms and sounds will jump and distort. It’s hard to sequence that later on.”

But how does Tom go about channeling this diverse sonic arsenal into Cubase now? “It’s a little easier now. I have this professional wUSB hub that is connected to my PC which has 16 USB ins. That’s able to get all that information without any delay or buffer hiccups into my PC. Most of the analog synths, even the ones that are 100% analog, have USB out. Then, I go

Zack Snyder’s Justice League: Justice Is Grey



INTERVIEW



Photo: dlrk lekstra

2021 kit list

Since shedding his vintage gear, Tom has started hoovering up some of the big boys of modern synthesis, as well as some choice boutique Eurorack. This is very much a selected list...

SYNTHS

Waldorf Quantum
Korg Prologue
Korg Wavestate
Modal Modulus 002
Moog One
Moog Matriarch
GRP Synths A4
Yamaha Montage 6
Studio Electronics Code 8
Studio Electronics MiniMoog
Dave Smith Prophet 12

EURORACK CHOICES

Too many modules to list from Analogue Solutions (Vostok System), Gamechanger Audio (Motor Synth), Erica Synths, Make Noise, Intellijel, and Mutable Instruments

New learning

"A lot of people have no experience in the electronic world and ask me where they begin to learn about electronic elements," Tom tells us, in relation to idea-forming for his Studio Time series, "I also think it's good to weave in conversations that are interesting to everyone. The beautiful thing about the internet is that sometimes you learn things you might not even realize you needed, or that you wanted to know about. There'll be 20 tutorial videos and then 20 'ask me anything' videos. People can ask me anything they want. I try to answer as honestly as I can. Not just about music technology, but mental health, productivity and time management. Nobody is a machine, everyone has stresses."

Getty

INTERVIEW

through a PreSonus StudioLive 32 digital mixer. With my laptop I program the channel configuration and everything comes into Cubase. When I've done any kind of submitting in the past with vintage gear, the amount of noise coming into Cubase was insane. With these new ones, they're all on, and there is maybe a slight little hiss at loud volumes, but then when I turn them down to a level that I actually work on, they're remarkably clean."

Rack and roll

Tom equates his active passion for the modular synth world to the car world, "If you want to drive a really good car, you get yourself an Audi A4 or A6," Tom chuckles. "But, if you want to drive a good car and show everybody around you that you make a shit-load of money, you get a Lamborghini. It's similar in the modular world; if you want a really good modular sound,

in the 5U format, then there are so many incredible modular builders making very affordable, superb sounding stuff. To name a few, there's Moon Modular in the UK, there is Crisp Brown, Synthcube who is from Spain and is really great. There's a German guy called Kazike who runs cluboftheknobs.com. Then there is Analog Haven and The Harvestman. But if you want a great sound – and also show off – you need to buy all the Moog vintage stuff. But that was never my aim."

"What you do in the modular world is so unpredictable and that's what makes it so great," evangelizes Tom. "If you ask me to patch you up a percussive bass sound with five oscillators, I can do that in five minutes, or if you want a sound that has wave-shaping and really cool frequency modulation from two different oscillators on two different pitches, sure I'll patch that up for you. But the beauty

really happens when you start stacking up that wall, and it gets kind of out of control. It's a house of cards. As your patch becomes ever more complex you might have a problem somewhere and not know where you went wrong. You then have to go back."

Tom admits that he has a slight phobia of performing live with modular gear, and has nothing but respect for those who do. "It's precarious. I once did a live show with modular gear, and I realized just how limited a live performance is with a 5U setup. With a Eurorack setup it's a lot easier."

Studio time

A big focus for Tom right now is his Studio Time educational series on YouTube. Over the course of this show, Tom has demonstrated some of the techniques and his approaches to recording and production, yielding millions of



Gatry

views and subscribers. We wonder where the idea to launch this began, and what we can expect from the upcoming third season? “My mum was a music teacher when I was younger. She made her money with it, but in the evenings she would give free classes to people from less fortunate families and arrange instruments for these kids to play on. She was really considered like a charity worker in the countryside of Holland where I lived. She made sure that music was accessible to everybody. So I already grew up with that as an important ideal. When my mother passed away in 2002, it always stuck with me, to take her legacy and do something cool with it,” Tom shares.

“Back in 2005, I got approached by one of the bigger music universities in Holland, ArtEZ, to help set up a four-year course with them for young students. So I was doing lots of masterclasses there and writing the curriculum. It was around 2016 that I left, but I got together with a bunch of advisors to discuss what to do next. The idea was born to do high-quality YouTube videos with an average length between 50 mins to one hour. Talking in-depth about what it’s like to be a composer, the struggles that everyone has. Practical and technical things as well as broader mental

health, and personal growth topics. Studio Time became a great success. It was not my interest to make money out of it – it’s my way of continuing my mum’s idea of spreading music. I make my music as a composer. We do it for free.

“We’re about to start recording some new episodes in VR, that’ll be a great experiment.”

Crossing careers

With not just one, but three long, prolific and quite distinct careers behind him, divided between his work as an electronic musician, producer and film composer, Tom has finally decided to settle his course to one path, and focus solely on film scoring.

“It’s funny, even when I started doing films I was still being called a ‘DJ’ which is very strange, because I actually never was a DJ – I made electronic music. I guess the perception a few years ago was that because I was playing with computers and laptops, the naked eye would think ‘oh, that’s what Tiësto does as well, he must be the same’. But I technically was never a DJ. Now that there is a body of film work out there, some people actually don’t know that I have an artist history too, or a producing/recording history. The last gig that I

did was ten years ago, and the last album I released was seven years ago. It’s almost like a different generation.” With clear focus on the big screen, Tom’s status as one of the world’s most high profile movie composers now seems impossible to challenge. “It only took 20 years!” grins the sonic mountaineer. ■

Zack Snyder’s *Justice League* is available for streaming now

HEAR MORE



Justice League
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A Little Less Conversation
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THE ART OF SYNTH SOLOING

More Natural Vibrato Techniques

Stop using LFO-based vibrato and explore direct control of your pitch manipulation.

By Jerry Kovarsky

Adding some vibrato to the end of a note or phrase is one of the most time-honored ways of adding expression to your playing. And for most of us that has meant reaching for the mod wheel to bring in some LFO-based modulation of pitch. After all, the mod wheel was first featured on the Minimoog (see Fig. 1), which came out in 1971. LFO modulation has existed since the beginning of synthesizer design, but it was the mod wheel that first offered a musically useful gestural controller to “play” the modulation. That said, it is acknowledged that LFO-driven modulation of pitch does not always sound natural, as it is a periodically repeating source that lacks nuance and variety (without your help!). If you look at all the real world examples of vibrato being introduced to pitch such as a singer, or a string player wiggling their finger on the held note position, you will observe that it is a direct manipulation of the pitch, and the player is in complete control of the shape, speed and depth. Let’s explore how you can take control of your vibrato and free up the mod wheel to do other things.

Play Your Pitch Bend Controller

The basic concept of direct pitch manipulation is to use your pitch bend controller to impart vibrato. Depending on the type of instrument you are referencing, vibrato is either a deviation of the held note’s pitch going both above and below the pitch (in the case of the human voice and non-fretted string instruments like violin, viola, cello etc.), or only going above the pitch and then back down (as in fretted guitar). So for the sake of general discussion here, it is valid to do either type of movement.

To get a basic sense of how good vibrato sounds, look up plenty of video performances of string players (violin, viola and cello are best) and blues/rock guitar players. Notice how they move their hands/fingers and the resulting sound. My favorite example has always been B. B. King, and how he really shakes his finger/hand for his trademark rapid vibrato.

Rocking The Pitch Wheel

Each available mechanism for pitch bending on various synths/controllers requires its own approach. Believe it or not, the long-standard pitch bend wheel (See Fig. 2) is actually the most difficult to execute direct pitch manipulation on well. This is because most tend to have a dead, or null spot in the center, which you have to travel past to hear a pitch change. It can be done, but you need to do a very broad motion to get through this larger travel distance. I like to think of rocking my whole hand pretty violently, not unlike that B.B. King motion I mentioned earlier. This means I’m less likely to grip the side of the keyboard while I use my thumb on the wheel, or rest my palm on the panel so I can use my index finger.

For subtler vibrato, try moving the wheel the slightest bit forward, so you get out of the null area. Then you can rock back and forth ever so gently in a smaller range. Yes, your note will be just a little bit sharp, but done gently it doesn’t sound bad, or out of tune. If you have already bent up into a note, then you can rock the wheel a bit back and forth while holding the note, so your vibrato will be slightly below and then back into the final pitch. If you scoop from below into a note so your wheel is now back in the center position, rocking back and forth below and back to center works well. Both of these methods produce a vibrato that never goes above the pitch, so it seems to break the science of acoustic instrument vibrato, but it sounds fine.

Fig. 1. The left hand controller section of the Minimoog first established the pitch bend and mod wheel design paradigm that has become near standard on keyboards today.



Fig. 2. IK Multimedia’s Amplitude 5 is a complete suite of pedals, amps, speaker cabinets and more to recreate any guitar setup imaginable.



Fig. 3. Here's a technique for wiggling the wheel with a bit more stability: grab the wheel near the top of its range so your finger can be anchored against the front panel.



Fig. 4. Roland first promoted the concept of a paddle, or joystick on their synths, as seen here on the GAIA/SH-01 analog modeling synthesizer.



Fig. 5. The joystick design of the Korg Kronos, which can easily be moved in four directions.



Fig. 6. The tall joystick found on Modal's Argon 8 wavetable synthesizer.



Fig. 6. The wooden Pitch Stick found on most Nord keyboards is considered by many to be the best-feeling mechanism for creating natural vibrato in addition to pitch bending.



Discussing this topic in an online forum, a user (Tom Williams) offered an interesting technique for getting subtle control using a wheel: he places his finger up near the top edge of the wheel where it meets the case, and then can wiggle it with more precision and with his finger feeling more anchored to the case (see Fig. 3).

Joystick Jamming

I believe Roland was the first company to develop what is commonly called their paddle controller (see Fig. 4), quickly followed by other joystick designs from Korg and other companies (see Figs. 5 and 6). The concept of these spring-loaded controllers is that moving the mechanism from side to side does pitch bend, and moving it away from you usually produces LFO-driven vibrato, and pulling towards you can do whatever you want/need. Most of them have smaller null centers, which make them easier to manipulate. Physically it is much easier to wiggle a vertical object side-to-side using the side of your finger; so doing only upward or downward motions is a breeze. Grabbing the joystick/paddle between your thumb and forefinger is also great, giving you a sure grip to do wider gestures above and below the center pitch.

Best In Class?

For many players, the design Nord developed for their keyboards is the most comfortable and nuanced mechanism ever offered. Their Pitch Stick

is a vertical, smooth wooden rectangle that has a curved indent on the top, which feels great and fits a finger very well (see Fig. 7). This design enables you to keep in contact with it the whole time, and move it around subtly or aggressively with ease. It also has no null spot, so even a small gesture produces some change, making it perfect for direct pitch manipulation-based vibrato.

Not to be outdone, however, a new class of controllers has been evolving that can create multiple gestures and messages on a per-key basis, allowing you to move your finger around on a key, press down on it after sounding the note not unlike polyphonic aftertouch, and create a highly nuanced and expressive performances. This technology has been dubbed MIDI Polyphonic Expression (MPE) and has been adopted as part of the MIDI 2.0 standard. Direct vibrato is very easy to integrate into your performance with these instruments. Read more about it here: <https://roli.com/mpe>.

One Last Route

Another method for directly manipulating pitch is to use aftertouch to slightly modulate the pitch of a note upward. You don't want much range, only 10-15+ cents max. Then you can press down into the key at a variable rate and depth to produce positive-only vibrato, great for guitar simulations. Better yet, if you have a keyboard that can produce polyphonic aftertouch (not many do this nowadays, but I love the feel of the AMS Hydrasynth's keys for this) you can even do this on individual notes within a chord. ■

EASY GUIDE

Harmonic function

This month, Dave Clews shows you how to manipulate your listeners' emotions with chords

Harmonic function... what's that? Well, it's not the big party after a choral performance! Instead, it's the term used to describe the purpose of particular chords – the relationship that they have to the tonal centre of a piece, and why they work in a particular progression.

Music taps into emotions, and harmonic function is the process by which, either by luck or by design, a string of chords combine

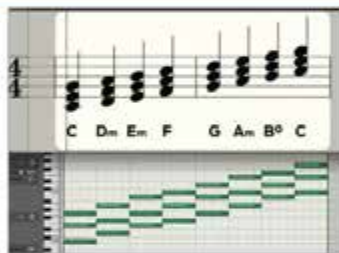
to make the listener feel something. The basic theory of harmonic function has its roots mainly in Western tonal classical music, when composers would use chords in a certain way to convey an emotion or mood – but that doesn't mean that we can't apply the same principles to more current compositions and productions. It relies on grouping and labeling the chords that are diatonic to (ie, belong to) harmonized major or minor scales.

We have touched on diatonic chord 'families' before, but that was more to do with substituting one chord for another within the same family. This time, I'll focus more on building functional harmonic progressions in the first place. We'll start with a brief refresher on diatonic harmony, then plunge into the functions of the chords themselves, and illustrate a couple of ways in which they can be strung together effectively.

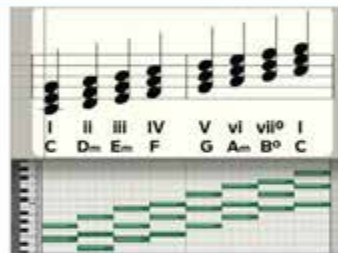
Step by step Exploring harmonic function



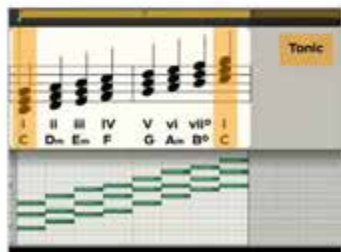
01 Right, so let's start off in familiar territory with our old friend, the C major scale – seven notes, played on the white keys of the piano keyboard, starting on C and going up the keyboard through D, E, F, G, A and B, before concluding on the higher C, an octave above our root note of C.



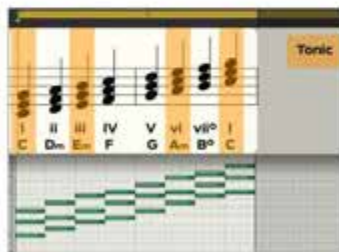
02 The notes in the scale are known as degrees. If we stack alternate notes onto each degree to produce three-note chords or triads, we end up with the following set of diatonic chords (ie 'belonging to the scale'): C, Dm, Em, F, G, Am and Bdim. Note the last chord (Bdim) is a diminished chord.



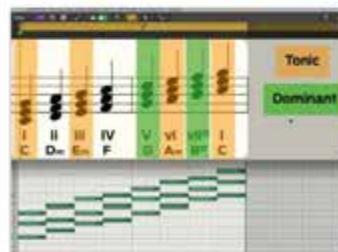
03 As well as the regular chord names, we can label these diatonic chords with Roman numerals that describe their position in the scale and also whether they're major or minor. Upper case numerals denote major chords, while lower case denotes minor or diminished chords. This helps describe progressions without being confined to a specific key.



04 These chords can be grouped into different function 'families' – that is, groups of chords that can perform a similar function within a progression. Let's look first at our I chord – C major in this case. This first chord in the diatonic set is known as the tonic chord, since it's rooted on the tonic of the scale – C.




05 The tonic function represents a feeling of 'home' or rest in a musical setting – if a progression is a journey, the tonic is the natural end point that all the other chords are leading back towards. The I chord's tonic function is shared, although to a lesser extent, by the iii and vi chords – Em and Am in this case.





06 The dominant function, the second of our chord families, is all about tension and forward motion. Dominant chords have a natural tendency to want to resolve or pull back to the tonic, creating a sense of relief from the tension. Chords that have a dominant function include the V and vii chords – G and Bdim in this case.

Recommended listening




ANNE-MARIE - 2002
The verse progression in this pop nostalgia-fest is a classic I - vi - IV - V, T - T - P - D phrase.

 bit.ly/anne-marie_2002



CLEAN BANDIT feat DEMI LOVATO - Solo
This Bm - A - F# - G progression is a good example of a minor key I - VII - V - VI, T - D - D - T phrase.

 bit.ly/cleanbandit_solo



The verse progression in this pop nostalgia-fest is a classic I - vi - IV - V, T - T - P - D phrase.



bit.ly/anne-marie 2002



This Bm - A - F# - G progression is a good example of a minor key i - VII - V - VI, T - D - D - T phrase.



bit.ly/cleanbandit solo

Pro tips

Harmonic function in minor keys

Tonic, dominant and predominant chord families still exist for minor keys as well as major ones, but there are some differences owing to the different diatonic chords that you get when you harmonize a minor scale. These are *i*, *ii°*, *III*, *iv*, *v*, *VI*, *VII*, where *i*, *III* and *VI* have tonic function, *iv*, *ii°*, and sometimes *VI* have predominant function, and *v* and *VII* have dominant function.

Inversion therapy

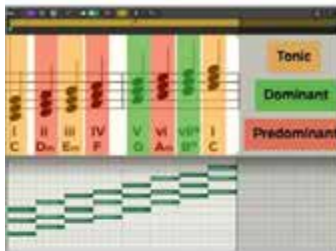
Using inversions is a good way of smoothing out chord progressions so they don't 'jump around' the keyboard too much, which can occur if you only use chords that are in root position, i.e. have the root note at the bottom of the stack. For example, instead of having a tonic chord of C major with the notes C, E, G jumping to a dominant G major with G, B, D, you could voice the G chord as D, G, B for a smoother transition.

Tonic, dominant and predominant chord families still exist for minor keys as well as major ones, but there are some differences owing to the different diatonic chords that you get when you harmonize a minor scale. These are i, ii^o, III, iv, V, VI, VII, where i, III and VI have tonic function, iv, ii^o, and sometimes VI have predominant function, and V and VII have dominant function.

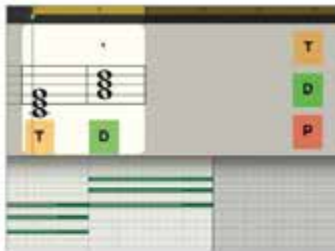
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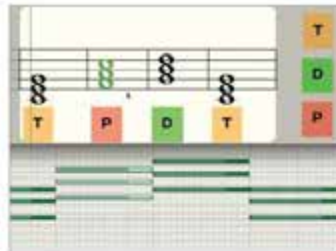
Over the course of his 25-year career, Dave has engineered, programmed and played keyboards for numerous artists including George Michael and Tina Turner.



07 The final chord family is the predominant group, whose task it is to bridge the gap between the tonic and the dominant chords, extending the progression in a more interesting way than just using tonic and dominant chords alone. The IV, ii and sometimes the vi chord can all have predominant function (F, Dm and Am in this case).



08 Let's look at a few examples, beginning with the basic tonic to dominant progression. I'm using T to stand for tonic, P for predominant and D for dominant in these examples. Left open-ended, a T - D progression or 'phrase' like this one leaves the listener wanting and expecting more music - it just doesn't sound finished.



09 Stick a T on the end of the phrase for the dominant to resolve back to, and it suddenly sounds much more satisfying – although a bit short. We can extend it by bunging a P in between the two to get a T - P - D - T phrase – C - F - G - C – a pretty common progression found in thousands of tunes.



10 Making a progression longer by inserting extra chords is known as prolongation, as we're prolonging the inevitable return to the tonic via the dominant. In our next example, we'll start with a move from the tonic to the iii chord: C to Em. This is known as a tonic prolongation, as the iii chord's tonic function prolongs the sense of rest.



11 We can prolong the tonic function even further by moving to the vi chord next – Am in this case – after which we could move to a predominant: say, the IV chord, F major. We can prolong the move to the dominant even further by following this with a ii chord: Dm, another predominant chord.



12 Taking the Dm as the start of a classic 2 - 5 - 1 turnaround, we can now stick in our dominant V chord. After all this prolongation, we're crying out for a resolution back to the tonic, which we get in bars 7 and 8 with a return to the I chord, C major. This completes our T - T - T - P - P - D - T phrase.

BLAST FROM THE PAST

Roland Juno-106

A dead simple architecture, thick chorus effect and a relatively comprehensive MIDI implementation turned this bargain-basement beastie into a cult classic

It's easy to understand why some instruments have achieved legendary stature. Sequential Circuits' Prophet-5, for example, offered innovative features like polyphony and programmability in a classy package, and even a cursory play on a Minimoog leaves little doubt that it was a performer's dream machine. Why, though, has Roland's Juno-106 entered the synth pantheon? Surely not because it was in any way a comprehensive synthesizer, offering as it did only a single DCO for each of its six voices, an all-too-familiar (if satisfyingly squelchy) 24dB filter and a single four-stage envelope generator shared by filter and amplitude circuits. And the LFO? A laughable affair with a single waveshape. Performance features were similarly anaemic – no velocity functions or aftertouch here, just Roland's favored horizontally-aligned 'bender' and mod wheel plus a portamento knob.

It's a pretty generic list of specifications, not dissimilar to the many inexpensive polysynths that cropped up in the wake of the Prophet-5. So why the hubbub surrounding the 106? Certainly, much credit could be given to the sound of the machine. The DCO was joined by a sub oscillator

that could add a bit of oomph, and the available pulse and the DCO's sawtooth waveforms could be used simultaneously to create interesting hybrids of the two. Roland's dependable four-pole resonant low-pass filter was joined by a simple high-pass, adding timbral variety. Then, too, there was that now-famous Roland chorus circuit, an analog bucket-brigade design resulting in a thick swirl – the perfect companion to the Juno's noise generator.

Reasonable enough, to be sure, but do such niceties justify the instrument's sustained popularity? Possibly. As any 106 owner will tell you, this is an instrument on which it's easy to learn the basics of synthesis. More importantly, its solid, stable sound provides an encouraging impetus to dig in. Parameters' values can be transmitted over MIDI (albeit in SysEx form), and thus recorded into a sequencer or software editor/librarian. The 106's MIDI implementation was partially responsible for the instrument's longevity in the secondhand market.

The Juno-106 enjoyed healthy sales, and it's still numerous enough to be found for reasonable prices. A 'home' version with built-in



speakers was also available in the form of the HS-60 (or Juno-106S in Japan). If you can find one, Roland's multitimbral MKS-7 module provides two and four voice channels with nearly identical architecture to that of the 106, with an added monophonic bass synth and a smattering of samples from Roland's TR-707 drum machine. Out of the box, the MKS-7 is a preset-only affair, but most Juno-106 editors will allow you to edit the sounds to your liking. And another bonus? The MKS-7 versions respond to incoming keyboard velocity.

As you may have guessed, the rudimentary synthesis of the Juno-106 is easily replaced by software variants, of which there are plenty around. Like the hardware from which they take inspiration, such clones are excellent synths on which to learn the ropes. ■

TECH SPECS

Year of manufacture
1984-1988
Original sale value
\$1,104
Current price
\$900
Number made
unknown

Three emulative 106 alternatives



u-he D1VA \$179

Urs Heckmann's divine D1VA features a choice of vintage-emulating oscillator, filter and envelope modules that can be mixed and matched as you like. D1VA's DCO module was actually inspired by Roland's later Alpha Juno synth, but this plugin is equally adept at aping any one of the Junos, including the 106.

www.u-he.com



mztK DCO-6 Free

For those of you on a budget and assuming you use Windows, there is the free DCO-6, a spiffy parameter-for-parameter copy of the venerable Juno-106. Like the instrument from which it takes its name, DCO-6 provides a quick and easy answer when you need those spiky basses, swirling pads or piercing portamento lead sounds.

bit.ly/MZTKDC06



TAL-U-NO-LX \$60

Though not specifically cloned from a Juno-106, TAL-U-NO-LX was based on the 106's immediate predecessor, the Juno-60, which shared a nearly identical feature set with the 106. In fact, with its switches for saw and pulse waveforms and dual chorus options, TAL-U-NO-LX is closer to the 106 than many that claim to be direct copies.

tal-software.com



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By Si Truss

Strengths

- + The new MIDI tracks are an excellent addition
- + Hardware is now lighter, more portable and better-equipped
- + MicroSD card makes it far easier to swap out sounds

Limitations

- 4hr battery life is fairly short
- Finding and recalling patches without a screen can be tricky

The original Circuit was fun, powerful and great value. Can this new follow-up top it?

Back in 2015 when Novation released the original Circuit, we were immediately impressed. For a battery-powered instrument priced at just \$330, this digital groovebox was remarkably well-equipped, boasting two independent polysynths, a four-track sampled drum machine, send effects and a nifty step-sequencing workflow. It's a credit to Novation that, even given this strong starting point, Circuit has only improved since through a steady stream of firmware updates.

What reservations we had at launch mostly focussed on areas where Circuit felt a little shallow; synth design was limited to adjusting unlabeled macro knobs, and there was no user sample upload. Both of these issues were rectified with the roll-out of Novation's browser-based Components app, which includes a full editor for the synth and sample libraries. Circuit itself has been fleshed out with a multitude of new features too, including sequencer micro-steps, polyphonic velocity and a host of new patches. In short, if you were an early adopter of the original Circuit, it's likely you'll feel you've got good value for your \$330 outlay.

Now Novation has released Circuit Tracks, which despite the new name – which is intended to differentiate it from the underrated Circuit Mono Station and forthcoming Circuit Rhythm – is a straight sequel to that original groovebox. While the launch price is higher this time around, there's

even more functionality and, if anything, Tracks now looks like an even better value proposition than its predecessor.

For the most part, the functionality of the original Circuit is carried over here with few changes, meaning the synths and sampling capabilities are broadly similar to those on the original. The most significant additions are to the hardware itself. Where the original Circuit used a combination of AA batteries and an optional external PSU for power, Tracks now features a built-in rechargeable battery and draws power using its USB input (a USB-C plug adapter comes supplied). Battery life is around four hours, which isn't massive, but USB power certainly means more options for powering the unit on the go.

The change in battery setup also means the Tracks is significantly thinner and more lightweight, something aided by the removal of another feature of the original – the onboard speaker. This is the only element of the original Circuit that's been outright removed, and honestly it's not missed – the audio quality was decent, but not great, and there are very few situations where headphones or connection to a proper set of speakers aren't far better options.

Despite the trimmed-down size, Circuit Tracks makes room for some extra I/O. The mini-jack MIDI ports of the original, which required the use of an adapter, are replaced here with full-sized ports with an additional



“The highlight is the slick, approachable and versatile sequencing workflow”

Thru output alongside the existing In and Out. It gains a single analog pulse sync port too. Tracks also adds a pair of audio input jacks, allowing external signals to be mixed internally and processed through the effects.

To make the most of this added I/O, Tracks adds a pair of standalone MIDI sequencers. This is the most significant workflow addition, and a really smart choice on Novation's part. Like the original, the highlight of Circuit Tracks is the slick, approachable and surprisingly versatile sequencing workflow. This setup made the original a dark horse for sequencing external MIDI synths, particularly for live performance, bolstered by the flexible pattern saving/chaining. Doing so involved repurposing one of the synth tracks though, so being able to do this while still having separate control over the internal synths is a great touch. In fact, those two synth tracks – and the drum tracks – all output MIDI too, so you could happily drive multiple polyphonic instruments from Circuit Tracks when used as part of a live setup.

The sequencing workflow for these two

MIDI tracks is identical to that of the synth tracks, and remains similar to that of the original Circuit aside from a few enhancements. Again, the pad grid can be used in several ways to play or input patterns. It can function as a multi-octave playing grid based around defined scales, act as a polyphonic step sequencer, or be used in both ways simultaneously. As well as existing tools for programming gate, polyphonic velocity, sub steps and length or direction of patterns, Tracks adds a dedicated step probability editing view.

The simple pattern chaining system from the original Circuit is carried across here, allowing users to connect up to eight 32-step patterns. Tracks can record Macro movements into patterns too, and those eight controls can send configurable CC messages, allowing for automation of external gear when sequenced via the MIDI tracks.

Sound investment

As before, each synth is a four-voice digital poly derived from the design of Novation's

Nova instruments. Each has two oscs that can be assigned either virtual analog waves or an assortment of wavetables with options for oscillator sync and ring mod. Each synth is equipped with a resonant multi-mode filter with a drive control, three routable ADSR envelopes and two LFOs, plus chorus/phaser, EQ and distortion effects.

Not that you'd be able to derive any of this from the hardware itself. As with its predecessor, the synth elements of Tracks are essentially preset players, albeit with eight macro rotaries that can be used to adjust and automate various sound elements. While this might sound limiting for experienced synthesists, the surface-level depth of the synths keeps Circuit Tracks feeling accessible and hands-on, particularly given its lack of a screen. Novation clearly don't want to intimidate newcomers but if/when users want to go a little deeper, the Components editor offers a slick interface, giving access to every element of each synth engine from within your web browser.

There is one concession made to sound design depth this time around: where the original Circuit's Macros were simply labelled numerically, Tracks' knobs come with annotations indicating what element each is (usually) assigned to, such as oscillator mod,

Pack 'em in

Tracks adds a MicroSD card to the hardware, making the process of importing and storing samples more flexible, although some prep is still required. Rather than simply adding loose samples to the card and then importing them into the hardware – something that would be tricky, given Tracks' lack of a screen – the card is used to hold and import complete Packs. A Pack is essentially a full memory state for Tracks, containing samples but also synth presets, sequences and projects. These are compiled and added to the SD card using the Components tool. The hardware itself holds one pack at a time, but the use of a card adds the option to store up to 31 additional full packs, significantly expanding the memory and making it easy to switch up the sound palette without plugging in to a computer.



filter envelope, filter cutoff, effects, etc. There's an expanded range of presets too, doubled from 64 to 128. As before, patches are selected using the central pad grid, and as nice as it is having extra storage for patches, trying to remember where your favorite sounds are stored across four pages of unlabeled pads isn't exactly easy.

The four drum tracks are used to trigger one-shot samples. As with the synths, sounds are selected using the pad grid with a total of 64 pre-loaded sample slots. This time, however, the selection can be expanded using a new MicroSD card slot. In a particularly nice touch, samples can be assigned to each step, rather than full tracks, meaning it's possible to trigger considerably more than just four sounds using these drum tracks. As with the synths, the Macro rotaries are employed to edit sounds, but only the top four are used for sample editing, controlling pitch, decay, distortion and EQ – although these parameters still aren't labelled on the hardware itself.

Circuit breaker?

Beyond this, as before, Circuit Tracks offers reverb and delay send effects, each with a selection of presets ranging from subtle to extreme. The bi-directional, DJ-style master filter returns here. There's a slightly revamped sidechain tool too, which can apply ducking to synths and external inputs driven by drum tracks. There's now also a master compressor added, though this is a simple on/off affair and, oddly, control for it is hidden in the setup menu alongside options like MIDI track assignment and pad brightness. The original Circuit wasn't the cheapest synth on the

market, at more than double the price of a Korg Volca, for example, but for the combination of elements it was excellent value, particularly for hardware beginners. By adding another \$150 to the price point Novation risks losing some of that appeal, although the new features, particularly the external sequencing capabilities, make Tracks a better value package than its predecessor.

I can't think of any hardware options – either a single instrument or combination of several – that would offer the same range of polyphonic external sequencing, multi-timbral synthesis and sample sequencing for under \$500. Yes, there are products that will do each of these individual things for cheaper, and in some cases better, but as a rounded and versatile package this is unrivaled.

I particularly like that, although you could effectively describe it as entry-level, there's deceptive depth here. Someone with minimal synthesis or music theory knowledge could learn how to throw a groove together fairly easily. Deeper features, like the synth editor, probability sequencing and sub-steps, are easy enough to ignore until you're ready. Having them there though, means that improving music makers have plenty of options to grow – whether exploring sound design with the polysynths, creating unusual rhythms or incorporating external hardware.

For all this talk of approachability though, Circuit Tracks has plenty to offer music makers at all levels. Whether as a convenient and portable tool to sequence a live setup, a portable synth and drum sketchpad or an all-round studio workhorse, Circuit Tracks has a lot going for it. ■

THE ALTERNATIVES



ELEKTRON Digitone/Digitakt from \$866

While they're more focused in sound design terms, there's a surprising number of similarities between the creative sequencing tools of Circuit and Elektron's sampler and FM synth.

elektron.se



ARTURIA Keystep Pro \$440

A pure sequencer/controller, but, like with Circuit Tracks, it can output multiple polyphonic patterns and drums at once. It goes deeper though, with arps, CV outputs and much more.

arturia.com



MODAL Cobalt8 \$770

A modern digital polysynth with lots of sonic power and flexibility. The included keyboard will appeal more to traditional 'players' than Circuit's pads.

modalelectronics.com



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focusrite.com/scarlett

Focusrite®

GForce Software
OB-E
 \$205
 gforcesoftware.com

By Jon
Musgrave

Strengths

- + Faithful emulation
- + All eight SEMs on one screen
- + Sounds amazing particularly in Unison
- + Enhanced yet retro-style sequencer
- + Resizable window/SEM zoom options
- + Excellent set of 600 factory presets

Limitations

- No PC version as yet



We love a good vintage synth emulation, but does this latest offering from GForce honor an Oberheim synth classic?

Back in the day and before polysynths became a thing, Oberheim upscaled its SEM (Synthesizer Expander Module) monosynth into a number of multi module designs. The most ambitious (EVS-1) used eight SEMs and was better known as the 8-Voice. This delivered 8-note polyphony where each voice was basically a different synth and could therefore create rich polytonal sounds. But things moved on and Oberheim developed a synth (the OB-X) that achieved polyphony in a more efficient fashion. Thankfully software developer (and proud 8-Voice owner) GForce has finally got round to emulating this complex synth – no mean feat – and OB-E is now available for Mac OS X (AU, VST, AAX, standalone).

Nitty Gritty

OB-E is arranged with all eight SEMs and their outputs and pans simultaneously visible. SEMs are also grouped for the Split keyboard mode – Lower (SEMs 1 to 4) and Upper (SEMs 5 to 8). The bottom section of the window includes the preset browser, global controls such as playback mode, Portamento, Vibrato and global editing options. On the lower right

is a 49-key keyboard and the corner icon switches this to show the MIDI Sequencer and Stereo Delay. SEMs also have more parameters on a Rear Panel view and can be flipped individually or collectively. A Zoom option places one SEM – front and rear views – across the whole SEM section. There are no further hidden panels, which is great, but the interface is quite busy. Thankfully, the window can be accurately resized to work best with your screen resolution.

Sound Generation

Each SEM has two main oscillators (VCO1 and 2) with either sawtooth or pulse (with adjustable pulse width) and two ADS envelopes. A third oscillator (VCO3) adds sawtooth, sine or square wave shapes and can be used for audio (as a sub oscillator for example) or as another syncable LFO using either its wave shape or pink noise. Meanwhile the main syncable LFO (LFO1) has six shapes (including noise) and adjustable onset delay. VCOs 1 and 2 can choose from three hardwired modulators (envelope, LFO1 and VCO3) and these can modulate either pitch or pulse width (if used). Each SEM also

“GForce has finally got round to emulating this complex synth – no mean feat”

has dedicated controls to assign velocity to up to 11 parameters and aftertouch to up to five parameters. For ease of use, target controls are color coded and it's good to see plenty of aftertouch assignments in the presets.

The 12dB/octave filter is based on both GForce's 8-Voice filter and a modern reissue SEM. In addition to cutoff, resonance and modulation (ENV2, VCO3 and LFO1) you have a knob to adjust smoothly between low-pass, notch and high-pass. A further switch selects a dedicated band-pass mode. At the bottom you balance the VCO levels into the filter.

Massive

Conjuring some rich fuzziness from one of OB-E's SEMs is pretty easy. But what we're really interested in is how those eight SEMs work together. To GForce's credit, OB-E is still very much led by the original 8-note polyphony limit, but you have a variety of ways to use it. First up, successive notes can either Reset or move through (Continuous) the SEMs, and this ties in with the chosen playback mode (Mono, Poly or Legato). So, in Poly mode with Cont selected each time you play a three-note chord it shifts three SEMs along. Unison mode, much like the original 8-Voice unison, plays all SEMs together and on OB-E, one MIDI note puts 24 oscillators at your disposal, so you can build massive chords across the eight SEMs. Finally, Split mode adds an adjustable key split with four SEMs per split.

The massive sonic potential could require quite a bit of knob twiddling, but thankfully you have many efficiencies including SEM-

Double Feature

OB-E's MIDI Sequencer is inspired by Oberheim's original add-on eight-step sequencer module (MS-1) and to be true to the original, OB-E's SEM 8 Output mode uses the eighth SEM for your sequence, leaving the remaining SEMs to play live. However, far more interesting is All mode, which, if used in conjunction with the Cont playback setting, activates all eight SEMs in order, one-SEM-per-sequence step.

Whichever Output mode you use, each sequence step has a dedicated Gate and Velocity setting, and there are five overall sequence styles (Modes) including a chord option. There are a few ways to input sequence notes, including manually and via MIDI. You can also control the sequence starting pitch using a DAW MIDI part or drag the MIDI for the sequence from OB-E back into your DAW. Further overall sequence options include Swing, Rate, Octave, number of Steps, Start step and Start SEM. Finally, the Rhythm knob selects one of 14 presets (these affect the Velocity and Swing settings). So still very much a programmable analog-style sequencer, but one designed to showcase the eight-SEM design. If we have one gripe, it's simply that you can't zoom the sequencer window.



specific copy, paste, solo, mute, save and load as well as global editing (Group and Offset). All this makes OB-E easy to program.

OB-E has dedicated Mono and Poly starter patches, but for a quick fix head straight for the 600 categorized factory presets. The Alpha Patches showcase 30 of the best presets and beyond this, basic folders (Bass and Effects) give way to type-driven categories (Mono, Poly Pad, Sequence Poly, Unison Chord and so on). Among these, OB-E delivers characterful basses, great mono leads and

honest, straight-up pads. However, we are fundamentally drawn to the big track-filling patches, as these are what set OB-E apart from other synths. From the Unison folders, many patches deliver harmonically rich sounds from the Holdsworth-like Epiphany with Inversion 01 to the portamento beauty of Ice Cold From Alex 01. For sheer fatness, Unison Sync is hard to beat and there are also some great splits (Triumphant Unison Split).

GForce has always developed software versions of the synths the developer likes and, in that respect, OB-E is no exception. However, the 8-Voice is itself a truly exceptional synth and OB-E a particularly good emulation that not only does justice to the original sound but also enhances it in ways that are both useful and sympathetic to the original. We would love to see a PC version. ■

THE ALTERNATIVES

ARTURIA SEM V2

\$204

Arturia's SEM-inspired synth includes an 8-voice programmer to help emulate the multi voice sound

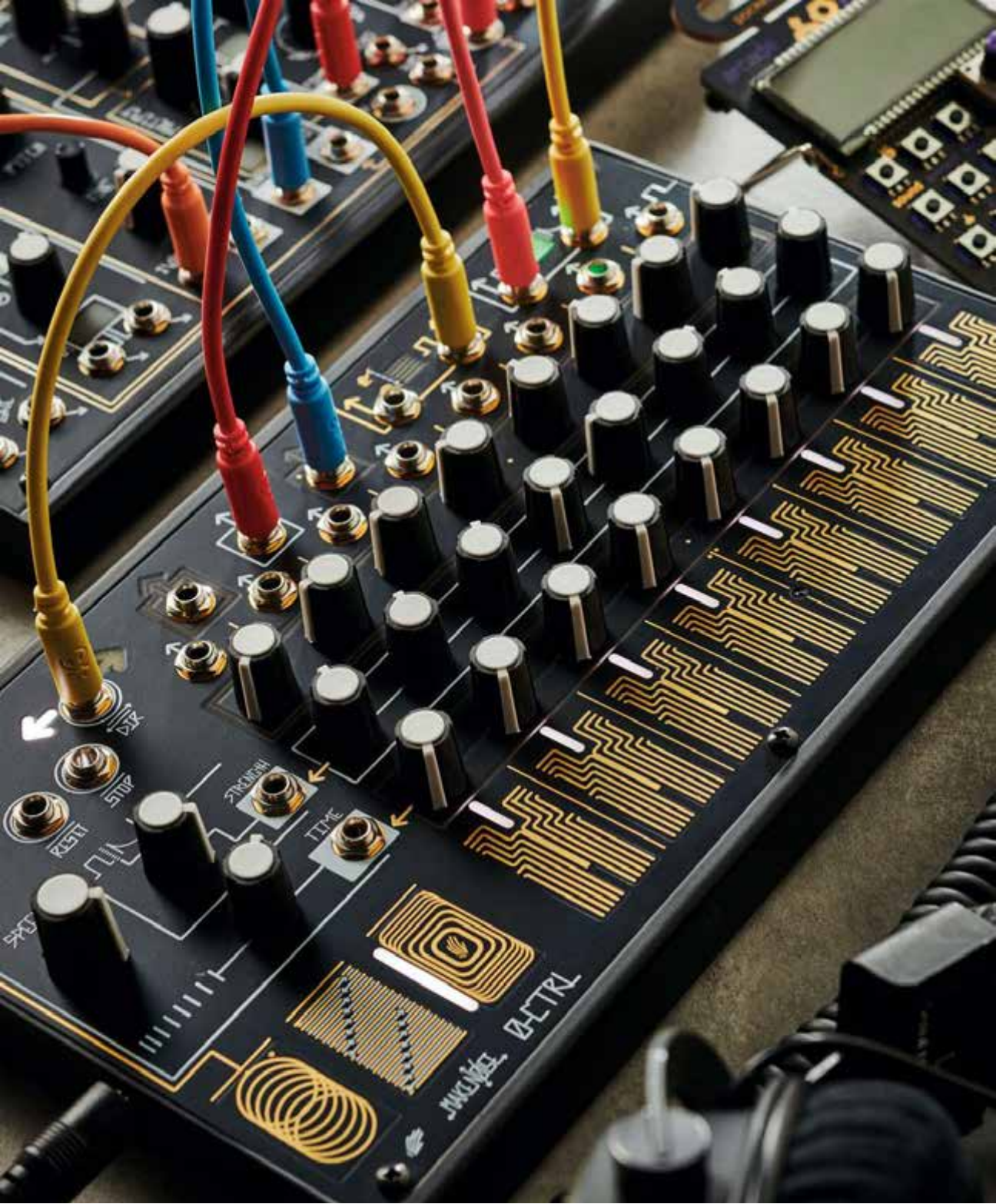
BRAINWORX bx_oberhausen

\$249

TMT modeling, 32-note polyphony and a powerful unison mode deliver great sonic flexibility



Combine the SEM zoom and the global edit options to make editing all 8 SEMs quick and clear



Make Noise
Ø-CTRL
 \$399
 makenoisemusic.com



By Phil Wise

Strengths

- + Flexible, experimental and very playable
- + Fully patchable, no screen or menus
- + Lots of CV ins/outs

Limitations

- No MIDI control
- No pitch quantization
- Needs a third-party power adaptor to work in a Eurorack case

The excellent O-Coast gets a new counterpart in the form of this tabletop controller. Time to patch in

If you know Make Noise, the O-CTRL will feel familiar, as it's basically two sets of the Pressure Points plus Brains combo, brought up-to-date with a few very handy extra features.

An eight-step analog sequencer designed to pair with their O-Coast tabletop synth, it can, of course, also be used to control a Eurorack system but it has no MIDI capabilities built in. Each of the eight steps has a touch-sensitive pad and three knobs that output CV, Pitch, Strength and Time. Each step also has an individual gate out and there are sequencer stop, reset and 'change direction' inputs.

As it's an analog sequencer, the Pitch CV outputs continuous values, so you must either tune each step by ear or use an external quantizer. Once you've twiddled the pitch knobs and got a sequence running, get involved with the strength and time controls. Simply put, these control when, how long and how hard each note sounds. Sadly missing from a lot of the simpler Eurorack sequencers these allow you to breathe so much life and groove into your sequence.

The Time control works very differently depending on how you clock the sequencer. Under the internal clock, Time is an unquantized start point for each step, allowing interesting swing and rhythm to be created. The only problem is trying to sync that crazy rhythm to anything else in your track! If you use an external clock, the Speed knob becomes a gate or envelope length master control with the

Time row controlling Gate/Envelope length per step. If you turn the Strength right down, it creates a rest on that step.

Note that the Clock Out may not be what you'd expect, giving a mix of the external and internal timings; better to view it as an extra rhythmic modulator signal.

Strength and Time produce CV at their respective outputs but also work together to control the dynamic gate and envelope. This envelope marries perfectly with the O-Coast's Dynamics input leaving that synth's Contour and Slope outputs free for other purposes.

Of course, the three main CV outputs can be patched to anything in your system if you want to play about. It can be useful for dialing in precise slice timings with the Morphagene. With a multi-voice module like Plaits, you can use a different voice per step.

Without running the sequencer you can also just play the O-CTRL like a keyboard; the pads are pretty responsive though maybe a little close together if you have fat fingers.

As well as the three CV outs, there are 'touch' outputs that produce a CV and a gate. This touch control can also be detached from the main sequence control and used elsewhere.

This is not a sequencer you just press play on; think of it as a performance interface for your synth voice. With no screen, all control choices are made via patching and to this end the unit ships with some stack cables to get you on your way. ■

Spitfire Audio

Contemporary Drama Toolkit

\$232
spitfireaudio.com

By Andy Price

Strengths

- + Novel, speedy approach to scoring
- + Incredible-sounding evolving textures
- + Simple GUI

Limitations

- Occasional lag when loading larger patches
- Pros may consider it a cheat



Spitfire invites you to enjoy a world of effortless, feel-based scoring. But are these simple routes to sonic success just smoke and mirrors?

With the majority of modern television, cinema and trailer scores, epic bombast and size has been supplanted by subtler arrangements. These more delicate undercurrents weave throughout the drama, enhancing tension, underscoring emotional upheaval and keeping our focus squarely on the screen. This amorphous sound that organically shifts in tandem with the visual action is increasingly in vogue.

Spitfire Audio has had its fingers on the pulse of the ebb and flow of the scoring world for 14 years, with founders Christian Henson and Paul Thomson both reeling in awards for their respective compositions. The company's releases have provided deep access to the sonic universes of Hans Zimmer, Eric Whitacre, Ólafur Arnalds and a variety of other figureheads. With 2018's British Drama Toolkit, however, Spitfire chose to provide a route that forewent the recommended grounding in musical theory, and built a pack that shifted focus on the velocity at which you played, triggering the performances of ensemble players, that had been crafted into pre-determined textures.

While an excellently effective, and refreshingly simple toolkit, BDT was merely the first of these forays, and Spitfire has refined the series further with Contemporary Drama Toolkit, again in collaboration with

respected composer Samuel Sim. In lieu of the former's leaning toward traditional instrumentation, CDT melds synthesizers, vocal sounds and heavily processed electric instruments — and it conjures up something quite uncommon.

Settle the score

The interface is comfortably simple to grasp, comprising of three switchable screens — the General Overview, Expert View and Velocity Layer Display View, while to the left of the interface, we can choose between ten instruments. Opening any of these umbrella patches reveals a selection of curated articulations in the main panel, clickable by selecting any of the Semibreves that appear lined up beneath whichever of the three views you have currently open. Though you can open up the individual articulations by clicking on the Advanced folder, it's the specially-assembled magic of the different combinations that we're most excited to wallow in.

Cycling through these, we're granted immediate musical color with the intensity of our performance revealing or obscuring elements of the mixed articulation. It results in us approaching the keyboard as quite a different tool to what we're used to, as we're not 'composing' in the traditional sense here. Often, we're triggering atonal, fluttering

textures that flit around the soundstage. In the General Overview panel we're also presented with a low-pass filter, an Expression controller and a Reverb controller. These can be able assistants for merging articulations (which is possible via the Expert view).

There's a spectrum of sounds on offer, each yielding new sonic fruit depending on how we play them. Combi Textural and Combi Pads are a safe port of call, and the package's pro-sounding chops are ably demonstrated across some scintillating articulations, labeled suggestively with such monickers as 'Haywire' 'Fireflies' and 'Frozen Textures'. Switching through some of the Guitar, Electric Cello and Violin patches results in some reverb-saturated, spine-tingling tones. In isolation, any one of these is enough to heighten the emotions of a scene, so when stacked up with the other articulations, or sprinkled through a mix, the options become pretty immense.

Elsewhere we have some tension-heightening vocal samples, that range between the haunting and the breathy to the angelic high end. Many of the rippling synth textures that resonate throughout the Combi patches can be individually explored, too. These sound really tremendous, which is to be expected, wrought as they are from the legendary Juno 6 and MS-20, and processed via Eurorack modules and analog effects.

Make some space

Though Spitfire's aim here is squarely on providing the user with instant access to some of the typical textures of modern

Meeting of minds

In making the Contemporary Drama Toolkit, Samuel Sim and the team at Spitfire have carefully harnessed some astoundingly rich textures from a range of instruments. Sim's range of award-winning scores have included the recent Netflix fantasy epic *The Dark Crystal: Age of Resistance* and British drama series *The Vicar*.

He has long been aware of the deadline-pressure that this is aimed to alleviate. Working at Tileyard Studios in North London, Sim would regularly discuss the state of the industry with the neighbouring Thomson and Henson, and the three ultimately decided to collaborate. Their first project, the delightful, harp-bending *Chrysalis*, was released in 2016.

The team's next foray introduced velocity-triggering. British Drama Toolkit was unveiled in 2018, and its success led the team to spend the next three years expanding on that approach with CDT. Allowing for these articulations' curated layers to be armed and ready to go with a simple key press really does change the previously time-demanding game for modern composers, and it's likely that Spitfire will continue this novel direction in the coming years.



scoring via velocity, there are still some deeper options that can help to wrench it into something a little more unique. The Microphone Mixer grants greater control over the microphone positions, and allows for you to load and unload different microphones. Making adjustments here can have some major effects on how the triggered patches move around the virtual space. Also within this section are settings for adjusting Velocity Response (which you can fine tune to suit your controller), a Pan Mic Collapser, which enables width sculpting, and Mic Mix to Articulation Linker which affixes any adjustments to the currently selected articulation. Envelope adjustment can also affect decay and attack times, too.

Instant drama

Though certain seasoned pros may scoff at the hassle-free simplicity of the library's instinct-based approach to scoring to picture, CDT undoubtedly opens up many time-restrictive doors for those finding their feet in this world, as well as enabling a swift workflow for those under deadline pressure or prepping a pitch. Additionally, if you're interested in peppering your mixes with some lush, evolving colors, pre-layered, then this will hastily plug those gaps.

This new Contemporary Drama Toolkit provides an immediate route into a beautifully nuanced style of soundtracking. It would have been an added pleasure to have discovered just a few more individual samples, considering the price point of the title. Nonetheless, what the pack amounts to sounds sublime and pushes us to re-think what we know about modern soundtracking. Instant drama! ■



The Velocity Layer View in Contemporary Drama Toolkit displays each note as a rising black bar

THE ALTERNATIVES

SPITFIRE British Drama Toolkit \$232

The same theory-free principle – with luscious sounds fashioned by a small chamber ensemble

ZERO G Etherea Soundscapes \$90

All you need to build evocative textures for soundtracking – a bit more like work though

Lindell Audio 50 Series

\$349/subscription
plugin-alliance.com

By Jon
Musgrave

Strengths

- + Choice of three EQ modules
- + Choice of two compression modules
- + Analog saturation on either Channel or Buss plugin
- + Handy Unity gain compensation option on both plugins
- + Subtle channel to channel variations using Brainworx's TMT

Limitations

- Original features omitted



Classic hardware emulation combined with Brainworx's component modeling? Should make the perfect couple! Let's see how it fares...

Over time, channel strip plugins have developed to accurately emulate more subtle aspects of the analog signal flow including saturation, noise and even stereo image. Plugin Alliance offerings from both Lindell/LSR and Brainworx combine excellent modeling and Brainworx's Tolerance Modeling Technology (TMT) to deliver awesome results.

Lindell Audio 50 Series (AAX, VST, VST3, AU, Audiosuite) is the latest offering from the Lindell Plugins/LSR Audio collaboration and we've found that it follows a similar path to the Neve-style 80 Series.

Modular

Inspired by API's classic designs, 50 Series is actually two separate plugins – Channel and Buss. Channel is a fully featured 5-stage modular-style channel strip with preamp, EQ, compressor, expander/gate and master sections, with a choice from three different EQs (50A, 50B and 60) and two different compressors (FET and VCA). Meanwhile Buss is a much simpler 2-stage summing plugin, incorporating line amp alongside fader modules.

The preamp and line amp stages include adjustable harmonic distortion. Meanwhile the main menu provides op-amp clipping options (Hard, Soft and Off), circuit noise (On/Off) and oversampling (2x to 16x). You can also choose the plugin side-chain target (gate/expander or compressor). As mentioned, both plugins incorporate Brainworx's TMT (Tolerance Modeling Technology) system, which has impressed us in the past. In the 50 Series you have 32 different TMT channels to play with. The channel-to-channel variances that TMT introduces are great for adding analog desk authenticity across multiple channels. But even on individual stereo channels you can choose identical left/right TMT channels (Digital) or adjacent ones (Analog), and with the latter, each channel pair influences the audio slightly differently, so it's great for adding vibe.

VCA or FET

50 Series includes two API-style compressors based on two classic units – the 525 FET and a favorite of ours, the 2500 VCA. The 50 Series VCA really captures this wonderfully

“The chosen frequencies work so well, you can see why the original designs remain so popular”

flexible unit. With switchable feedforward and feedback topologies we found it easy to get highly responsive behavior perfect for snappy drums and punchy vocals, or achieve a more vintage glue effect perfect for mixes and sub mixes.

Your results can also be finessed even further using the soft knee (SOFT) and Niveau (NIV) sidechain EQ options. We really like this module, but it's worth saying it's not quite as flexible as the original hardware, which includes two sidechain EQs and three knee settings.

The FET design is a great retro compressor (2:1) and limiter (20:1) emulation. Like the hardware, attack time is fixed and fast, and there are four release time settings. Further options include an adjustable sidechain filter (20 to 400Hz), global Mix (0 to 100%), De-esser mode (D-S) and a rather handy Ceiling feature. This combines gain makeups and threshold in one control, and is used alongside the main Input and Output controls. The FET compressor is ideal for bringing out the flavour on drum overheads,



The Buss plugin is ideal for adding subtle saturation to submixes or the master output

Subs

The subscription has quickly become a major force throughout the audio plugin and soundware ecosystem, with early adopters including many of the key players, such as Slate Digital and Plugin Alliance.

Offerings vary considerably and if you have multiple subscriptions the monthly costs stack up. But thankfully many, including Plugin Alliance, have no minimum tie in period so signing up isn't necessarily a major commitment.

Plugin Alliance launched its subscription scheme a couple of years ago and it's developed over time so that there are now four options aimed at different monthly price points – Mega Bundle (\$24.99), Mix & Master (\$19.99), Musician (\$14.99) and Essential (\$10). There's a discount for paying a year up front, but whichever way you pay, each completed subscription year earns you a use-once voucher, which we think is a major sweetener.

Mega Bundle is the premium option, includes all plugins (currently 126) and the inclusion of all new plugins as they are released. If you're not interested in amps and instruments then Mix & Master could be a better option. Meanwhile Musician offers the amps, instruments and effects in a smaller, focused pack, and Essentials is a budget option with 40 plugins. Lindell 50 Series is included in both the Mega and Mix & Master bundles.



or for adding punch to beats. We found its slower release settings also handle bass frequencies very well.

The EQs

The three EQ options are 3-band, 4-band and 10-band graphic. The two parametric designs include selectable high and low shelf, and the 3-band also has a gentle band pass filter. Gain is +/-12dB across all three plugins. The EQs are incredibly easy to use and with a 12dB gain limit it's hard to go wrong. The curves are musical and, like the hardware, the Q narrows slightly with gain, but this is quite subtle. Frequencies and gain are both stepped, although you can make the gain continuous in the menu should you wish, and there's some frequency overlap, so you can get some extra gain in key areas.

The EQs sound great and are really transformative, just like the hardware. We particularly like them for adding crack to beats and snares, body to basses and kicks and all-round sparkle. They won't perform surgical tasks or notch out nasty frequencies, but the chosen frequencies work so well, it's easy to see why the original designs remain so popular.

Rounding things off for the Channel is the gate/expander. This is a highly responsive fully featured design with Fast attack, Range and even an Inverted mode (INV) for ducking effects.

The Buss plugin is much simpler than the Channel plugin but still includes the very handy Unity gain option. In our tests, both the Channel and Buss plugins imparted some odd harmonic distortions in their default settings, and we found increasing the THD control boosted these and introduced some even harmonics as well. Neither is particularly extreme but for subtle harmonic enhancement it's a useful inclusion.

Overall, 50 Series delivers emulations of key API processors coupled with some very handy extras including TMT, adjustable op-amp clipping and harmonic distortion. It may not be endorsed by the original manufacturer and a couple of the hardware features are omitted, but this is one of the best API-inspired emulations we've used, bringing together the classic sound in an easy to use package. Great stuff. ■

THE ALTERNATIVES

SOFTUBE American Class A \$299

A contemporary take on the API design with a channel strip layout

WAVES API Collection \$599

Long established and officially-endorsed API plugin pack



Austrian
Audio
OC818
 \$1,237
 austrian.audio



By Jon
 Musgrave

Strengths

- + Multipattern mic with four patterns
- + Extensive on-body filter and pad settings
- + Additional output for recording rear diaphragm independently
- + Optional Bluetooth LE pack for remote control of settings
- + Plugin for adjusting polar pattern from dual diaphragm output

Limitations

- You'll want the optional extras to get the most out of it

Mics are rarely judged by their extras, but there is innovation in this new design from Austrian Audio

OC818 is a multipattern phantom-powered large-capsule condenser mic from Austrian Audio. It uses their own handbuilt CKR12 dual diaphragm ceramic capsule, heavily influenced by the classic AKG CK12. The mic has four pattern options (figure 8, supercardioid, cardioid and omnidirectional) with on-body high-pass filter and level pad. The Studio Set kit on review included a foam windshield, shockmount, regular mic clip, mini XLR cable and lightweight flight case.

The OC818 has a number of interesting design features. First, there's a second mini XLR output. When in cardioid mode this provides an output from the rear diaphragm so you can record both diaphragms independently and combine them later to create a tailored pattern. To facilitate this there's a plugin called PolarDesigner. Next up, OC818 incorporates microprocessor control. Used in conjunction with the OCR8 Bluetooth LE Dongle and PolarPilot app (Android and iOS), this allows remote control of the filter option, pad settings and most significantly the diaphragm polarization voltages and hence polar pattern.

OC818 also has some useful trad features. First, the high-pass rumble filter has two steep second order options (40Hz or 80Hz). Meanwhile the third setting adds a first order filter at 160Hz, great for taming proximity. For level control, the -10dB pad reduces the capsule bias, so it can handle higher levels, while the -20dB option adds in a 10dB cut to the output stage.

Get yodeling

Sonically, OC818 is not super bright, but clearly has some additional presence in the upper mids. The frequency charts reveal a boost at 5kHz across all except the omni pattern and some air at around 12kHz. Meanwhile the mid to low frequencies are pretty flat. The directional patterns have a decent, though not dominant, proximity and the capsule is tolerant of plosives. The included windshield allowed us to get in close and significantly reduced plosives. Understandably the dual capsule configuration means the omni pattern has a curtailed high frequency response at 90 degrees off axis.

PolarDesigner is a powerful plugin and in low-latency mode allows you to change the overall polar pattern smoothly from figure 8 through cardioid to omni and then reversed with the rear diaphragm as on axis. But switch low latency off and you gain multiband (up to five bands) pattern adjustment with band solo, mute and level (+18/-24dB). This is powerful stuff. Further features include adjustable proximity, two preset EQs (free field and diffuse field) and two source dependent algorithms – terminate spill and maximise target – that automatically change the polar patterns to provide different types of focus. Rounding things off is save and recall of presets and also settings sync across multiple plugin instances.

Overall, the OC818 is an incredibly flexible mic, and with Bluetooth, very innovative too. ■



Korg Nautilus 88 Music Workstation

\$2,699
korg.com



By Dave Clews

Strengths

- + 2,000+ inspiring sounds and nine different synth engines
- + Powerful 32-track sequencer, split between 16 MIDI and 16 audio tracks
- + Excellent, weighted hammer-action keyboard is a joy

Limitations

- Long startup time – takes almost three minutes to boot up from power-on
- Touchscreen can be complex and fiddly
- Lacks aftertouch – strange on such an upmarket machine

The Nautilus promises Kronos horsepower in an affordable package. Where do we sign?

Since Korg's M1 first spearheaded the keyboard workstation revolution in 1988, it's fair to say things have moved on a bit, a statement borne out no more clearly than by its newest arrival, the Nautilus.

Available in 61, 73 and 88-key versions, the Nautilus slots into Korg's product range below the flagship Kronos, offering a more streamlined feature set at a more affordable price. That's not to say the Nautilus is lacking power: it packs the same impressive array of nine different synth engines that you'll find in the Kronos. In fact, the main differences between Kronos and Nautilus seem to be a more sparse front panel and the replacement of Kronos's Korma arpeggiator with a less complex model. On the plus side, we get a smattering of new sounds and tweaks to the central touchscreen interface.

All three sizes of the Nautilus feature velocity-sensitive keybeds, as you'd expect, but curiously no aftertouch, unlike the Kronos. We tested the 88-key Nautilus, which has the same internal spec as the two smaller models, but boasts a fully-weighted, hammer-action RH-3 keybed sourced from Korg's premium digital piano range. It's a beautiful instrument to look at and to play, with its chamfered, wooden end cheeks and acres of brushed black metal, but the tradeoff is its weight. Lighter than some competitors but still tipping the scales at a whopping 23kg, it makes it a two-person job if you're thinking of moving it around safely. The

keyboard is weighted heavier at the low end than at the top to emulate the action of an acoustic piano.

The rear panel sports no fewer than six audio outputs, three MIDI DIN sockets (In/Out/Thru), three foot pedal inputs for damping and expression pedals and footswitches, two audio inputs for sampling and recording, and two USB ports – one for connecting MIDI controllers or QWERTY keyboards and another that sends and receives MIDI and two channels of audio.

The synth engines are modelled on Korg's legendary MS-20 monosynth, plus the equally iconic Polysix six-voice analog synth, while the new AL-1 modern analog synth engine has been engineered from scratch for more contemporary synth sounds. You'll also find the STR-1 plucked string module, HD-1 sample-based engine and MOD-7 FM-based synth engine in there too.

The central 8-inch (800 x 480 pixel) color TouchView resistive display has gesture control, enabling you to touch and drag items like, say, opening and closing the lid of your grand piano. Unlike a mobile phone screen, it needs a firm, positive pressure to respond. It generally works well despite a small degree of lag, although it can sometimes be a bit hit and miss, and with such a lot of information to convey, many of the controls are small enough that they can easily be mis-hit if you don't judge the strike angle just right.

Pia-no worries

If the driving force behind the decision to go for the 88-key version is the piano sounds, you won't be disappointed. The 88-key Nautilus delivers these in spades, with one of its nine synth engines – the SGX-2 – devoted entirely to premium sampled pianos.

As well as the excellent German and Italian grand models, there are also some upright piano programs making their debut here, along with a new 'small grand' and some 'prepared' piano sounds. In general, the piano sounds are rich, full and detailed, with plenty of scope to adjust damper and string resonance and pedal noise. New for Nautilus are the Dry/Amb Grand Piano programs, sampled using both close and ambient microphones, whose signals can be blended directly from the touchscreen for a more or less ambient sound.

Similarly, the EP-1 engine serves up satisfying Rhodes and Wurlitzer sounds, while organ tones are capably handled by the dedicated CX-3 engine.



Overall, the controls are laid out logically and the architecture of the Nautilus will be immediately familiar to Korg workstation fans, retaining the same Combi, Program and Sequence mode terminology they've used ever since the M1. Program refers to individual sounds (of which there are more than 2000 to choose from), while Combis are stacks of up to 16 programs which can be split, layered and overlapped to your taste. Sequences are complete songs created using the onboard MIDI sequencer and audio recorder, and stored on the internal 60GB SSD. This provides 16 MIDI and 16 audio tracks, which are tapped into via the twin audio inputs on the back panel.

Meanwhile, the Set List page lets you assemble up to 128 combis into 4x4 grids to be called up per song at the flick of a button. Other thoughtful live-centric details include the ability to enter large-font text into a 512-character note field to be displayed prominently above the setlist, a feature called SST (Smooth Sound Transition) that enables sounds to be switched without reverb and release tails cutting off abruptly, plus an onboard EQ to let you tailor the sound of your Nautilus' output to the environment you're playing in.

On the front panel, six real time rotary controls can be used during performance to adjust parameters like filter cutoff and effect depth. Uniquely, you can push these down so that they click into place almost flush with the casing when not in use, then click again to bring them back up when required. The knobs are a little plasticky and lacking in grip, but useful nevertheless. A separate dynamics control, which offers direct tailoring of the current sound's velocity response on the fly, is perfect if you want your sound to cut through onstage without the need to pound the keys overly hard, a useful addition on a performance friendly keyboard.

It's clear that the Nautilus is primarily intended to be a performance instrument. Whether you're a hobbyist, pro or semi-pro keyboard entertainer or are simply looking for something to noodle around on at home without having to hook up to a computer, the Nautilus should be high up on your list, especially if you've been lusting after a Kronos for a while. It sounds fantastic, plays beautifully and, with some effort, the onboard sequencer can be used to produce an entire finished song from scratch. And with a name like Nautilus, it should go down well with everyone. ■

THE ALTERNATIVES



YAMAHA Montage 8 \$3,848

The Montage range are Yamaha's flagship performance keyboards, with the Montage 8 the weighted 88-key version. Even heavier than the Nautilus at 29kg, it features high build quality and stunning sounds, but lacks a dedicated tonewheel organ engine, VA engine, direct sampling and deep sequencer.

yamaha.com



ROLAND Fantom 8 \$4,535

An expensive but versatile powerhouse with bags of connectivity, the Fantom 8 is Roland's top-of-the-range workstation keyboard. Offering heaps of controls and multi-channel audio streaming over USB, the Fantom is well built with a clear, snappy touchscreen. Powerful step LFOs and great sequencing, sampling and effects are just some of the highlights.

roland.com

Audiotent Discovery

\$50



A top-rank indie-dance sample library, with more than 700 sounds for the discerning beatmaker.

Dented techno bells and lofty chord stabs join pounding kicks and trippy percussion layers, as baggy bass grooves and taught synth lines flap your trouser creases.

The drums race along at a fair clip, too, with choice claps and snare sounds ringing out proudly from within the loops. Chemical pad swathes and retro analog atmospheres are a sweet topper, delighting the senses with their throwback charm and pin-point execution.

It's top-to-tail goodness, throughout. Everything has been recorded at 110 and 118BPM, and you can tell that each of the crates has been crafted with knowledge, care, and a fair amount of joy. Well worth your time.

Roy Spencer
audiotent.com

REVIEW



Loopmasters
Vibes 14 Bluegrass
\$35

Grab your DAW, pardner, and do-si-do up your dance tracks with a dash of roots music. This updated take on fiddle stick pickin' and banjo twangin' is as infectious as a tick bite, and sure to get under your skin just as much. The six country and western song kits here are broken down and ready to be pulled apart. From sweet strummed gee-tars, through skippy live drums, and tinkled ivories, everything is tight, punchy, and hoedown ready in another cool kit from the Vibes series, which always deep dives into wacky and wonderful sub-genres. So, if you want to mess around with some hayseed flavours, this set of square dance samples might be right up your street. **Roy Spencer**
loopmasters.com



Field & Foley
Barn Percussion
\$7.99/mo

On this quirky release, two virtuoso drummers stroll the great outdoors of the Catskill Mountains, capturing any fun and funky rhythms they can find in nature and farmland. Armed only with mics and a sense of adventure, they record everything from the crunching of leaves underfoot and the rushing of rivers, to tree bark drum kits and the splash of rocks in ponds.

It sounds like a hoot (or perhaps an actual owl) as they uncover some real rustic tones for you to play with. Great stuff, if you're tired of the same old electronic samples. So, why not swap the sounds of Traktor for the sound of a tractor? And get out of the studio and into the countryside with this weird and wild crop of barnstormin' samples. **Roy Spencer**
splice.com



Element One
'96 Jungle
\$20

Pull up and come and come again, my selector. It's time to go back to the dawn of DnB. Props, too. While most packs cover this style in the broadest way ["Old Skool Jungle" etc] the Element One posse gives you the sound of a single year. And what a year! The Ganja Crew was cranking the bass while Photek was chopping the drums. Bukem's Good Looking sound warmed the soul, as Goldie and Dillinja experimented across many a white label... This retro sample bank is an ode to that era, and the producers that pushed forward those new steps of change. It's full of the kind of strings, breaks, loops and bass that sounded like a bright future over two decades ago, and even better today. **Roy Spencer**
loopmasters.com



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We're taking sampling back to its foundations, when beatmakers would mine dusty wax for dope grooves and breaks. The SM crew's fierce stock of crackly soul riffs, jazzy bass notes, and funky drums are exactly the kind of solid gold bits and hits you'd have loved to have found, digging, back in the day.

The production process at the heart of this pack captures that 'ripped right from the record' tone and vibe of old school sampling. Some percussion loops feel like they've been panned out of a full track and EQ'd to give you that phat authentic vinyl-sampled sound. A great library, then, for locked down boom bappers who can't quite make it out the door to the local record store. **Roy Spencer**
splice.com



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NOVATION CIRCUIT TRACKS

Praised for its great value and accessibility, Circuit Tracks is a groovebox worth getting to know. Let's take a tour

As was true of the original Circuit, you could make convincing arguments for calling Novation's Circuit Tracks an entry-level instrument. Little to no music theory or production knowledge is required to get to grips with its two polysynths and sample drum machine; simply select a pre-defined scale, load a preset then push the pads and tweak the macros until something sounds

good. Novation have clearly put a lot of thought into making the design approachable for even the newest of music makers, meaning you can coax quality sounds from Circuit even if you don't know your wavetables from your wavefolders.

To think of Tracks as a purely entry level instrument would be to do it a disservice though. The beauty of this Circuit – as with its predecessor, at least

after multiple firmware updates – is that there's real depth here when you want to explore further. Tracks offers more functionality than ever, thanks to its new external sequencing channels and advanced tools such as sequencer sub steps and probability. Let's explore some of these tools and see how Tracks can go beyond simple preset playback and hold its own against gear from the likes of Elektron and Arturia.

Beyond the basics

For deeper elements, Circuit Tracks is a tale of two halves. The first is the sounds themselves, coming from the two polysynths and the sample engine. In hardware control terms, Novation have kept things very much surface level. While the synths have an expanded bank of preset sounds on offer, editing of parameters is still limited to use of the eight pre-defined Macros – although the fact that these are now labeled makes it easier to see what you're adjusting. The samples tracks are a similar story – samples are selected from two banks of one-shot sounds, with just four Macros used to adjust playback pitch, decay length, distortion and a basic high/low-shelf EQ.

For true control over your sounds you need to turn to Novation's tool at components.novationmusic.com or downloaded as a standalone application. This acts as librarian, sample uploader and editor all at once. Here users can access the full range of synth parameters as well as adjust and assign the Macro routings to tailor what can be achieved with the hardware. Components doesn't offer any additional editing tools for Tracks' sample channels, but allows users to upload their own one-shot sounds and organise samples into Packs. With

a microSD card inserted into Tracks' rear port up to 32 Packs can be stored within the hardware at any time, which substantially expands your available library.

Once you've got to grips with the basic step-sequencing workflow, one of the first elements worth exploring is Tracks' micro step edit capabilities. These let users nudge individual notes off the grid to manually create swung grooves, create 'strum' chords or add rolls and trills. Another handy tool within the synths' gate view is the tie forward/drone mode. To create synth sounds that don't re-trigger each time the sequencer cycles, add a note or chord to the first step of a synth sequence, extend its gate length to the full duration of the sequence and then select the single orange pad in the Micro Step view to engage tie forward. This is particularly useful when creating ambient sounds and drones, especially as these tied notes can be output via MIDI to external gear. Polyphonic velocity is another powerful feature of Circuit Tracks' synth sequencers. When Fixed Velocity isn't active, Tracks will register the velocity of each manual note input in a sequence. Varying the force applied to individual notes in a chord can have a major impact on its overall feel.

Probability and mutations

Per-step probability and the semi-random Mutate function are great for auto-generating variations on a theme. Let's take a look...

By incorporating sequencer probability and the Mutate function found on the Launchpad Pro, Novation have brought an element of controlled randomisation to Circuit Tracks' workflow that rivals similar tools in gear by Elektron, Arturia and others.

Probability lets users assign a likelihood that each sequencer step will trigger each time the sequencer cycles. In the Probability view, each step can be assigned one of eight probability levels, ranging from 100% probability (all eight pads lit), to 12.5% probability (only one pad lit). As probability is calculated each time the sequencer cycles, these levels are an average rather than a guarantee – ie a probability of 25% doesn't necessarily mean a note will always sound one out of every four times.

Mutate is another new tool offering an element of limited randomisation, this time affecting the rhythm of a whole pattern. Let's see how it works.



Let's use Mutate to create some baseline variations. Start by programming a 16-step synth riff – any pattern and sound will do, just find something you like as a starting point. We'll try this on a melodic riff, but it works great for drum variations too.



Be warned! Mutate is destructive with no undo. Before using it, save your project. Better still, in the Patterns view, duplicate your starting riff and use these as variations. With one of the duplicated versions selected, shift-press the Duplicate button to activate Mutate.



Hear how Tracks creates a new pattern, using the same notes but shuffled to create a new rhythm. Mutate keeps parameters such as velocity, gate length, micro-steps and automation intact, and these will shuffle along with the note they were originally attached to.

QUICK TIPS

1 Since there's no screen, remembering where your favorite synth patches are found amongst the four banks of pads isn't easy. Use Components to organize the sounds in a way that makes the most sense to you – eg by type, genre or tonal qualities.

2 31 extra packs can be stored using the microSD card. Not only do these contain samples, but also full banks of synth presets and projects. Try creating packs around different genres – eg an ambient pack, a drum & bass pack, a techno pack, etc. Alternatively, you could use different packs for different settings; one for the studio, one for live performance, one for jamming with friends.

3 When creating synth patches, your Macro assignments don't have to adhere to the labeling on the hardware. Trying to match these where possible is a good idea though, as it can help jog your memory later on when you've forgotten what parameter you have assigned to each control.

Exploring the synth engines

There's not much detail on the engines behind the two polysynths. Connecting to Components lets us edit them in full though...

Oscillators

Circuit Tracks' synths each have two oscs, offering a selection of virtual analog waves and wavetables. Index controls the pulse width of the VA waves or the position of the wavetables. Interpolate affects the transition through a wavetable as you adjust or modulate Index - at minimum setting, sweeps sound stepped and abrupt, but at max sound far smoother. Each osc has its own level control in the mixer section, where they're joined by a separate noise source.



Sync and detune

VSync creates a classic hard sync sound, but instead of syncing one oscillator to the other it uses an additional virtual oscillator, the tuning of which is controlled by the VSync dial. Create classic sync sweep sounds by modulating this with an LFO or Macro. Density works like a unison effect, creating duplicates of the wave. Use Detune to spread the pitches of these duplicated waves. Over in the mixer section we can also apply Ring Mod.



Filter

Each synth has a filter that can function in low-, high- and bandpass modes with two slope options for each. As well as a standard resonance control for adjusting the peak level at the cutoff point, Circuit's filter has a Q parameter, which can alter the width of that resonant peak. The filter has a multi-mode distortion effect built into it too, which offers the same range of drive models as you find on the master distortion, but operates independently from that.



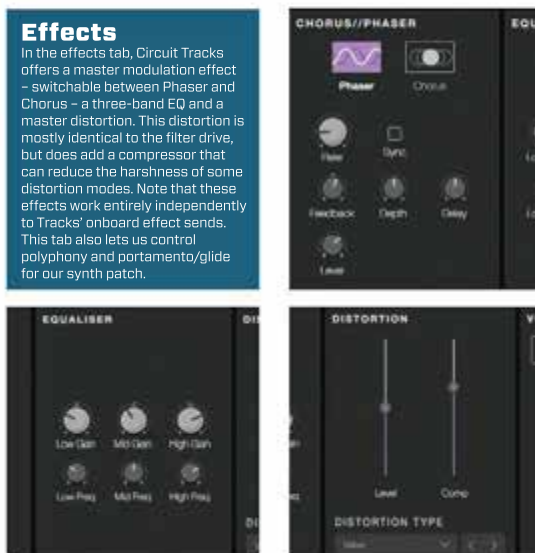
Modulation

Modulation is provided by three ADSR envelopes, two LFOs and the eight Macros. In the editor, mod routings can be assigned by dragging a modulator onto an available control, or using the mod matrix tab. The list of available destinations isn't as exhaustive as some digital synths, but each mod routing can combine two inputs, which can have interesting results. Each Macro, meanwhile, can be routed to up to four destinations at once, with varying depth and direction.



Effects

In the effects tab, Circuit Tracks offers a master modulation effect - switchable between Phaser and Chorus - a three-band EQ and a master distortion. This distortion is mostly identical to the filter drive, but does add a compressor that can reduce the harshness of some distortion modes. Note that these effects work entirely independently to Tracks' onboard effect sends. This tab also lets us control polyphony and portamento/glide for our synth patch.



How to...

Use drum micro steps

Micro steps are programmed in two ways – by live recording with Quantise turned off, or input manually in the micro step view. Implementation in this view works differently for synth and drum tracks. Selecting a sequencer step using one of the top two rows of pads displays six micro steps along the third row. These micro steps represent equal divisions between the selected sequencer step and the one after. With the left-most micro-step selected, the hit lands on beat, but the further right you go, the more off-grid it sounds. Working with drum tracks, multiple micro steps can be selected to create quick drum rolls.

How to...

Edit pattern length

Circuit Tracks' Pattern Settings menu lets us do a range of things, one being to adjust the start and end points of a sequence. In the Pattern Settings view, the top two rows represent 16 steps of the current sequence. Selecting any step will set this as the new end point for your sequence, while shift-pressing will assign a step as a new start point. This lets us do two things. Firstly, create patterns with lengths other than 16 or 32 steps, which can result in cross rhythms when played against other sequences in the project. For example, try a 12-step synth riff over a 16-step drum pattern for some instant rhythmic variety...

How to...

Use synth micro steps

Synth micro steps work the same as drums, with some key differences. Unlike the drums, you can't assign a note to multiple micro steps at once. They can, however, be input polyphonically, letting users assign the individual notes in a chord to different micro steps. With a step selected, the bottom row of pads light up to correspond with the number of programmed notes, from lowest (left) to highest (right). Assign a note to a micro step by pressing one or more of these pads, then the desired micro step on the row above. Spacing notes like this can create 'strum' sounds, great with short, perc synth tones.

How to...

Edit pattern position

This also lets us experiment with a new start point for our patterns, even if we don't want to change the length. For example, you might like the overall sound and rhythm of a bass riff, but want to try changing its position in relation to the rest of your groove. To do this, select a new end point then shift-press and create a new start point in the next step directly after it – moving the start/end of the pattern but not changing the length. It should be noted though, that doing this will always make the pattern loop for 32 steps, so if your original pattern was just 16 steps long you'll need to duplicate it across.

Setting up external gear

Broadly, the two new MIDI tracks function identically to the existing synth sequencers, so any techniques used with the synths – such as micro steps or per-note velocity – also apply to these too. There are a few setup matters worth noting though. By default, the MIDI tracks output on MIDI channels 3 and 4, the two synths output to channels 1 and 2, and the four drum tracks output on MIDI channel 10. These can be reassigned in the Setup menu though. Over in the Advanced Setup menu – accessed by holding shift when you turn Tracks on – you can configure the MIDI Thru port to duplicate the MIDI Out. This is handy for simultaneously sequencing two instruments that don't have Thru ports of their own. The MIDI tracks' Macros output CCs too, letting users control and automate external gear. By default, these are assigned CC numbers commonly used for useful parameters such as mod wheel, filter cutoff, portamento amount, etc. These can be edited using the Components app though, where you can also access templates for a lot of popular hardware instruments.



Creative drum programming

Let's combine some of Tracks' more advanced sequencing tricks to create a short, 16-step drum groove that still has unpredictability

01

We start by programming a four-to-the-floor kick using Drum 1. To make the most of the limited tracks, we'll have Drum 1 double up as a percussive bass part. By holding a sequencer step and selecting a new sample, we can insert a 'sample flip' to have some low toms sitting amongst our kicks.



02

Next we refine this kick/bass groove by adjusting the velocity levels of our toms. We also use the Micro Step mode to nudge some of the toms off the grid slightly, all of which results in adding more groove and feel to the part.



03

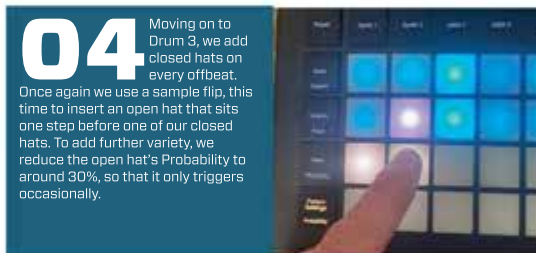
On the Drum Track 2 we add a clap on beats 2 and 4. To add movement to this, we can automate its decay time. To do this we just hit Record and adjust Macro 2, so that the first clap has a short decay and the sounds are longer.



04

Moving on to Drum 3, we add closed hats on every offbeat.

Once again we use a sample flip, this time to insert an open hat that sits one step before one of our closed hats. To add further variety, we reduce the open hat's Probability to around 30%, so that it only triggers occasionally.



05

Finally, with Drum 4 let's create some random ghost notes. Firstly, we head into Pattern Settings and change playback order to 'random'. We now program a few short, low velocity percussive sounds – it doesn't matter where we place these since playback is randomized.



FREEWARE COMPRESSORS

Want more squash for less dosh? Check out these dynamic freebies



Tokyo Dawn Molotok

Previously available as the freeware Molot compressor, this tool has been adopted by Tokyo Dawn and given a facelift. Threshold, Ratio, Attack and Release are here, as well as a Knee control for smoothing out that transition around the threshold. You also get a sidechain high-pass, and a Dry Mix parameter for the ol' New York effect. One unique feature is the Delta button, which lets you hear the gain reduction in isolation. There's a separate Output Gain as well as Makeup, which is nice.

The key feature behind Molotok is the 11 types of compression algorithm, moving from alpha to gamma, and getting progressively more characterful and heavy-handed as they do so. There's just enough character to tailor your compression exactly how you like it.

Attack ranges from 0.1ms to 0.6s; Release goes from 5ms to 2s; Ratio goes up to 10.9, so not quite to 11.

tokyodawn.net



Tokyo Dawn Kotelnikov

A free compressor that's suitable for mastering applications, Kotelnikov offers the usual functions but some more expert ones too. As well as Threshold, Ratio, Attack and Release, you get sidechain high-passing (or 'Relaxing'), which is pretty highly customizable, being editable graphically or using Slope and Freq parameters.

Going even further than simple stereo linking/unlinking, there's a Stereo Sensitivity control that lets you drive the compressor either from the summed Mid signal (0%) or from whichever channel is running highest at any given point (100%), or anywhere in between. Peak Crest lets you specify a higher Threshold for transients than triggered by RMS, with either extreme reverting to Peak or RMS only. You also get to specify the Release for both peak and RMS events, which we think is a brilliant touch.

Attack goes down to 0.02ms and up to 250ms; Release goes from 10ms (for peaks) up to 2 seconds (for both peaks and RMS). Ratio maxes out at 7dB. No sidechaining. Wonderfully in-depth. tokyodawn.net



Audio Damage RoughRider 3

RoughRider 3 has all the basic compressor functions and a couple more controls, but doesn't stray any further from the remit of being the archetypal compressor. If you're looking for analog character, this ain't it; if you're looking to compress a signal with no fuss, RoughRider is going to be

the one for you. In addition to the very basics, you can high-pass the sidechain, and there's a 'warming filter' to access by switching off the Full Bandwidth control. There's input and output metering here, too. RoughRider is simple, and all you'll need for nine out of ten compression tasks.

Attack goes from 0ms to 100, Release from 10ms to 1 second, and the Ratio goes all the way to 1000! Sidechaining is possible. Deadly simple and cheap!

audiodamage.com



Klanghelm DC1A

A very simple character compressor with one main control over gain reduction: the Input control lets you drive the signal harder while compensating for the level under the hood. The Output control is more a final output than something you would adjust in response to Input gain changes. Four extra settings let you customize the compression response: Deep switches in a fixed sidechain high-pass; Dual Mono treats left and right signals separately; Relaxed lets you compress based on RMS levels rather than transients; and Negative switches in a far more smash-worthy compression response – the handy Mix control can help compensate for that.

If you're looking for a nice character compressor DC1A will help out a lot.

klanghelm.com



MeldaProduction MCompressor

The main draw of MCompressor is its custom curve shape editor. Once this is enabled, you can create a bespoke transfer curve for your compressor. You could define multiple points above the threshold for two-stage compression, build your own knee around the threshold, bring on expansion or gating instead of compression, or increase the gain below the threshold to bring about maximizing. Custom curves can eke out loads more power and make MCompressor very useful at the mastering stage too. You've also got standard Threshold, Ratio, Attack and Release controls – Attack and Release both go from 0ms to 1000ms; Ratio goes up to 20:1 – Input and Output Gain controls, and a lot of Knee flexibility. There's a sidechain input, too. A very worthy download.

meldaproduction.com



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Frozen Effects

Micro looping aids guitarists with piano envy

By Michael Ross

Much as we love our guitars, there have always been things to envy about other instruments: The lengthy sustain of violin or saxophone notes and the ability of keyboardists to play a chord with one hand, while adding note extensions or playing a solo over it with the other.

With the advent of electric guitar, we have begun to address these concerns.

Compression, overdrive, distortion, and fuzz, whether from a cranked amp or a pedal, have given guitarists much of the sustain available to other instruments. The EBow allows us to hold notes as long as any organist or synth player. When it comes to piano envy, looping has allowed us to stack voices or solo over an initial chord since the days of early Fripp and his tape machines, or Jaco Pastorius's excursions with his MXR delay. There are limitations however. Trying to grab a quick chord with a hold function on a delay pedal, or even a dedicated looper results in an audible turnaround point that sets up an implied rhythm. This is not necessarily desirable when you want to perform a rubato solo for an intro.

A decade ago, Electro-Harmonix created the Freeze pedal, a looper of a different sort that samples short snippets of sound and holds them infinitely in latch mode or, in momentary mode, until you take your foot off the switch. Rather than creating a loop with an audible turnaround point, the Freeze pedal sets up a smooth pad that is more like the hold function on a guitar synthesizer, or a reverb.

The Freeze pedal's more complex cousins, the Super Ego and Super Ego Plus, allow you to stack extensions over chords.

For example, you could play an A major triad, latch it, and then step on the footswitch again to add a B major triad, creating a full Amaj#4add9 chord — a hugely difficult task with just your fingers. Using the switch in momentary mode, the Freeze starts to resemble a piano's sustain pedal, allowing you to extend the decay of chords as long as expression demands.



Loops created by the Freeze et al can sound cold and metallic. Fortunately, all three offer an effects send and return into which you can plug an EQ, delay, reverb, or other effect to make the held notes warmer and more interesting. You can even plug a Red Panda Tensor, Montreal Assembly Count to 5, Hologram Electronics' Microcosm, or other granular pedal in the effects loop to randomly modulate the held note or chords, creating an improvisation partner to feed you surprises.

The EHX pedals were a game changer, and speaking of game changer, a Latvian company by that name introduced their version of this sampling effect a few years ago. Like the EHX

effects, the Gamechanger Audio Plus pedal uses an algorithm that samples bits of your signal in real time. Like Freeze and friends, it offers volume, fade-in and fade-out speed, and layers, but also its own quirks and possibilities. It looks very cool (like a piano's sustain pedal), but is less pedalboard friendly than the Freeze, or even the basic Super Ego. The sound is similar to the EHX products, if somewhat less synthetic.

If you are missing the ability to quickly create chordal beds over which to add parts or solos, one of the four pedals featured above, or a reverb pedal with a hold switch, may be the answer. ■



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Sheep, Dog & Wolf

Auckland-based multi-instrumentalist Daniel McBride broke through with his debut album *Egospect* in 2013 at the age of just 17. Combining influences from pop, rock, R&B and electronics, it won him acclaim in his native New Zealand and beyond. He now returns with his long-awaited second album, *Two Minds*, a reflection on a period of mental illness and physical pain that temporarily halted his creative output. We caught up with McBride to find out more about his creative process.

When did you start making music?

I first started writing my own music when I was 16. The band I'd been drumming in, an extremely fun, bratty punk thing called Bandicoot, had just broken up and I felt like I had a whole lot of ideas swimming around that didn't fit the mold of that group. So I bought some truly awful off-brand mics and a small mixer on TradeMe (NZ's eBay) and started recording tracks in my room after school. They were kinda folk, kinda math-rock, kinda jazzy – just a weird collision of all the things I was listening to and loving most at the time: Mouse on the Keys, Hella, Joanna Newsom, Grizzly Bear, Active Child, and heaps more. Those tracks eventually became my first EP as Sheep, Dog & Wolf, *Ablutophobia*.

Tell us about your studio...

My current studio is a little not-quite-a-shed-not-quite-a-sleepout in my garden. I run an extension cord out to it from the basement, so I have to be careful not to plug too many things in at once! I've squeezed most of my instruments in there: saxophones, guitar, amp, pedals, bass, keyboard, drums, clarinet, and a few other things. As for the hardware – I have a MacBook Pro, a Native Instruments Komplete Audio 6, some Yamaha HS8 studio monitors, and a Rode NT1-A microphone. No room for much else!

What DAW (or DAWs) do you use?

Reaper. I picked it up because I was broke, and it's extremely cheap – but I've come to love it. It's the most flexible and powerful DAW I've ever used. It can be convoluted to figure out, but really can do almost anything that other, more expensive DAWs can do if you put in a bit of time and watch tutorials. I also find the basic workflow a lot more intuitive than other similar DAWs, like ProTools and Cubase.

What was your latest studio addition?

I've recently picked up a Behringer Poly-D, my first analog synth. I'd been dreaming of getting one for years, but I wanted something with polyphony, full-sized keys, and a sequencer, and everything was way out of my price range. Then Behringer started producing Moog clones for a fraction of the price, and I couldn't help myself.

Sheep, Dog & Wolf Tips

Subvert your habits

"It can add a lot to your songwriting if you're aware of your habits and try to deliberately subvert them from time to time. For instance, I love a busy drum beat packed full of ghost notes and tricky rudiments, but some of my favourite songs have been the ones, like my latest single 'Fine', where I've worked against that impulse and created a really sparse, angular beat with heaps of space."

Get inventive with stereo space

"A lot of artists, at mixing stage, tend to focus mostly on shaping the levels and frequencies. But don't forget about space. Stereo placement of instruments is a crucial and super creative part of the mixing process which is often given a rather by-the-

I frankly can't quite believe how great it is. I've mostly just been jamming with it so far. I've got a few new tracks that I can't wait to try it on. I'm excited to try some melding of synth and saxophone textures, Kaitlyn Aurelia Smith style!

What dream bit of gear would you love?

I know it's a bit boring, but I would love a couple of Neumann U87 mics. Most of what I do has instrumental recordings as the base, so having some workhorse mics of that quality that I could put on pretty much anything and know that I'd be getting a beautiful, crisp recording would be the dream. Of course, I'd need to have a much nicer recording space before I'd be getting the best out of a mic like that... but I'll get there!

How do you usually start a new track?

Usually I'll begin with a series of chords. Sometimes from piano, sometimes guitar or from vocal or saxophone improvisations. I'll play those chords over and over, getting a loop going. After a while a melody starts to form in my head, or a drum beat, that makes sense with those chords. If it's a melody that comes, I'll start trying to fit lyrics in like a puzzle, usually just free-associating words to begin with, to see what the chords will bring up. And after the chords, the melody, and the beat are all firmly stuck in my head, I'll start imagining arrangements, layerings, harmonies.

Then, after months, occasionally years – I'll start recording. Recording is always an iterative process; I'll get a more-or-less fully recorded, arranged, often even demo-mixed section of the song going and listen to that over and over, until it becomes clear what needs to happen next. ■

numbers, left-center-right treatment. Don't be afraid to try out unusual techniques! One of my favorites is to record the same part a heap of times and pan each take to a different part of the stereo field, at slightly different volumes. It gives a real ensemble feel to an instrumental part, and can provide wonderful choral textures to vocals."

Wrote it on one instrument? Arrange it for another

"An easy way to get some variation in your instrumental parts. Got a great guitar part? Arrange it for piano. One of my favorite melody lines ever was a long-form vocal improvisation that I transcribed and learnt on saxophone – it sounds so different from my usual saxophone lines!"



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