ISSUE 11

WAVEFORM

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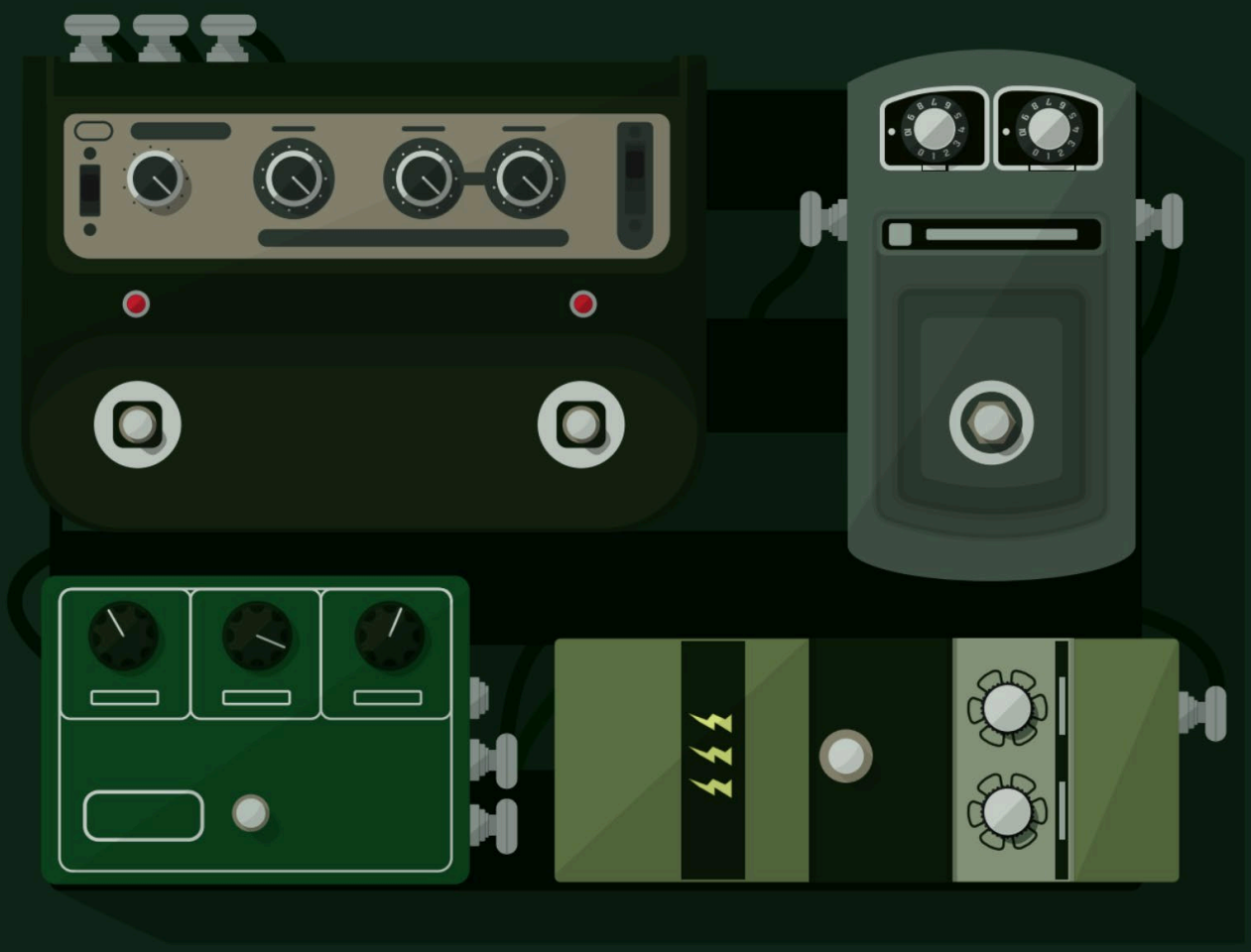

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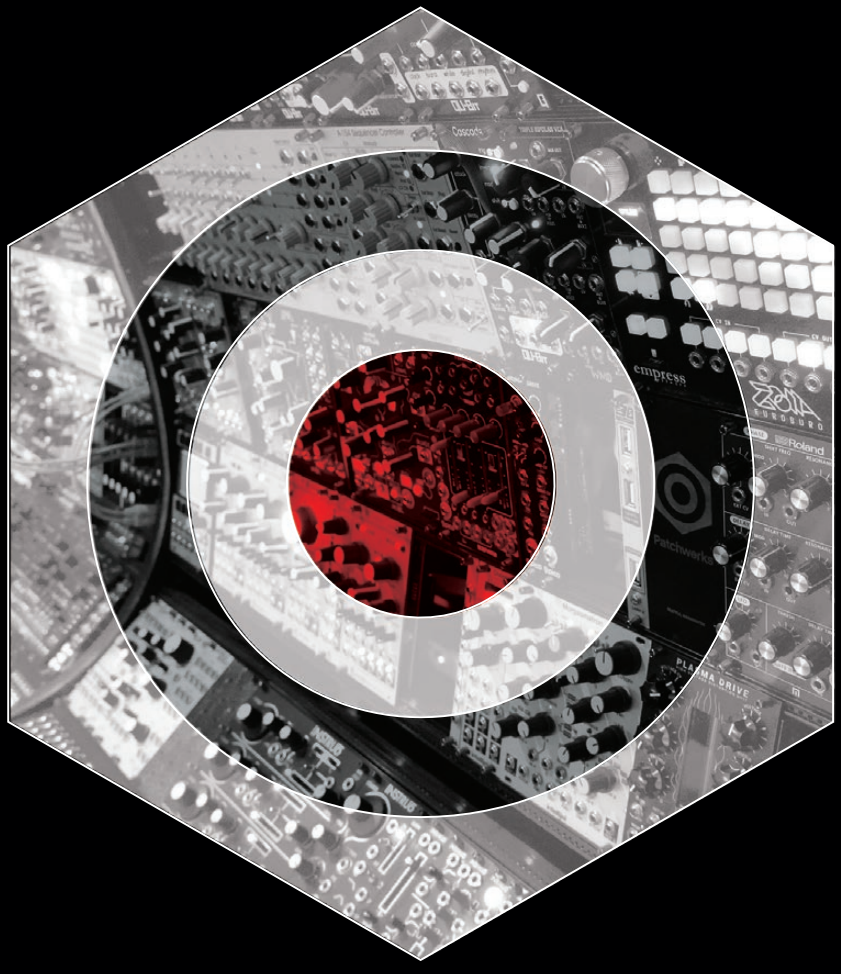

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Senior Editor - EM MASLICH
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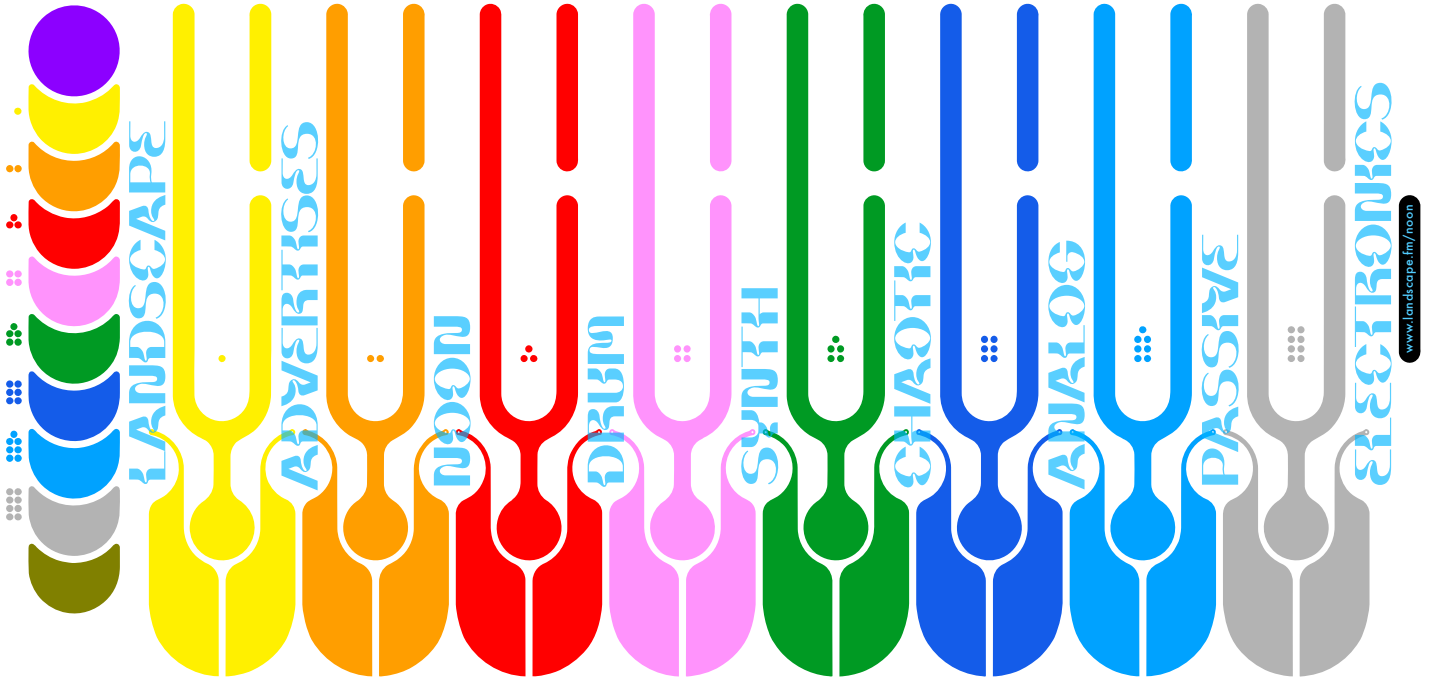
TABLE OF CONTENTS



CONTRIBUTORS

DAVID BATTINO'S DIY approach to music began at the Oberlin Conservatory in the days of quadraphonic tape loops. He's the founding editor of Music & Computers magazine and co-author of The Art of Digital Music.
batmosphere.com

EM MASLICH is an editor, artist, and musician, not always in that order. She plays a modified Fender Rhodes, drums, synths, and sings in the band Secretary. She likes floor toms with tea towels and foraging for plants to make ink.
secretaryband.bandcamp.com

IAN RAPP likes hiking up Tuckerman's Ravine with his Husky, Sandor, and cooking with fennel. He is a graphic designer and music maker and composes under the name No Reliable Maps.

SAM CHITTENDEN is a designer, musician, and composer based in Colorado. He has some new music in the works under the alias Tuesday Adventure, but don't hold your breath awaiting a release.

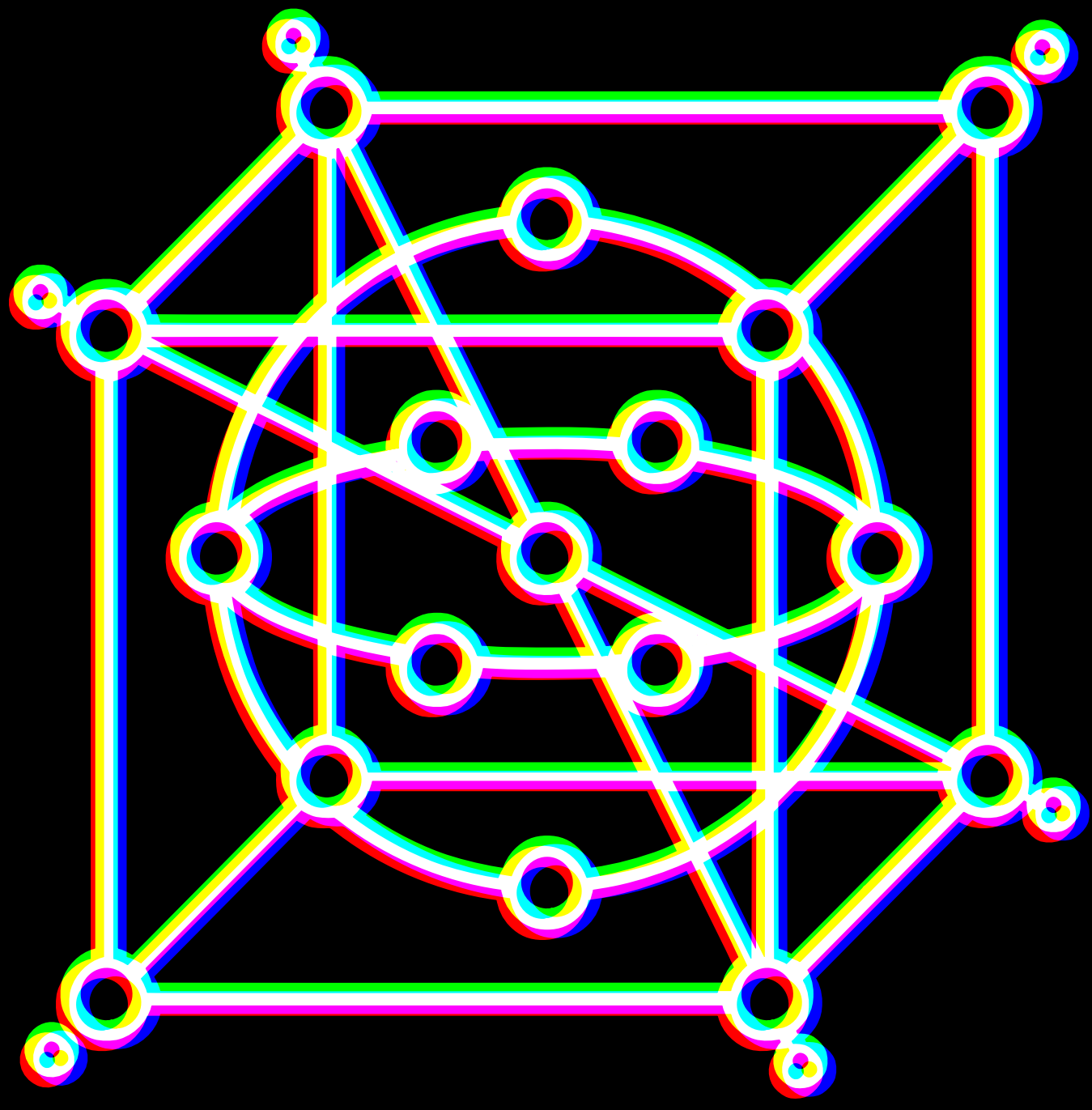
ELLISON WOLF likes words, cold water swimming, and making music. He plays in the band Secretary and makes pottery when he can.
secretaryband.bandcamp.com

TOM OJENDYK likes music. He is co-owner of the Seattle, Washington record shop Hex Enduction, and also owns the record label Dirty Knobby.
discogs.com/seller/HexEnductionRecords/
dirtyknobby.com

EVAN MORROW got his pilot's license before he was twenty five and took up fly fishing right after. His first synth was a Realistic Moog that an ex-girlfriend left behind when they broke up, and he still has it. He's currently trying to combine two of his top hobbies; RC planes and modular, by building a modular that flies. It's proving to be more difficult than he initially thought.

JASON CZYERYK is an avid synth collector, player, and builder. He designs psychedelic beverage coasters, binge watches "How-To" car repair videos, and does indoor Parkour to stay in shape. He lives near Atlanta with his wife, kids, and his two beloved Blue Healers; Indigo and Sharkskin.

WILLIAM STOKES is a writer and musician in three-piece avant-psych band Voka Gentle. He has written on music and music technology for *The Guardian, Sound On Sound, The Financial Times* and more. You can find his music at www.vokagentle.com



WORNG ELECTRONICS
MODULAR FOR THE
SONICALLY ADVENTUROUS

The first time I interviewed someone for a publication that people would (supposedly) read was for a Los Angeles-based website long since vanished into the 1s and 0s of the cyberspace trash bin. I was interviewing Amedeo Pace, the drummer for the band Blonde Redhead, a band I still love to this day. Formed with his brother, Simone, in the late 90s after they moved to New York from a small town in Italy, they recruited Kyoto-born singer/musician Kazu Makino, and have been making music ever since. I was nervous about the interview since it was my first, and though I knew how to write—I had studied it at university and had won a writing award (it might have been in the 2nd grade, but I hold that plaque close to my heart, and it actually set me on the path for writing)—I had no idea how to ask questions, how to conduct an interview, how to inquire enough to discover what a person's thoughts and actions were, and the reasons are behind those thoughts and actions.

MOST RECENT STACK, 2023.
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This was evident during the initial battery of questions I posed to Amedeo. I didn't get very far into the conversation, maybe two or three questions, when I asked, "How long has the band been together?" He was curt, but gracious, offering—correctly—that all of this information could be found (already) on the somewhat nascent internet.

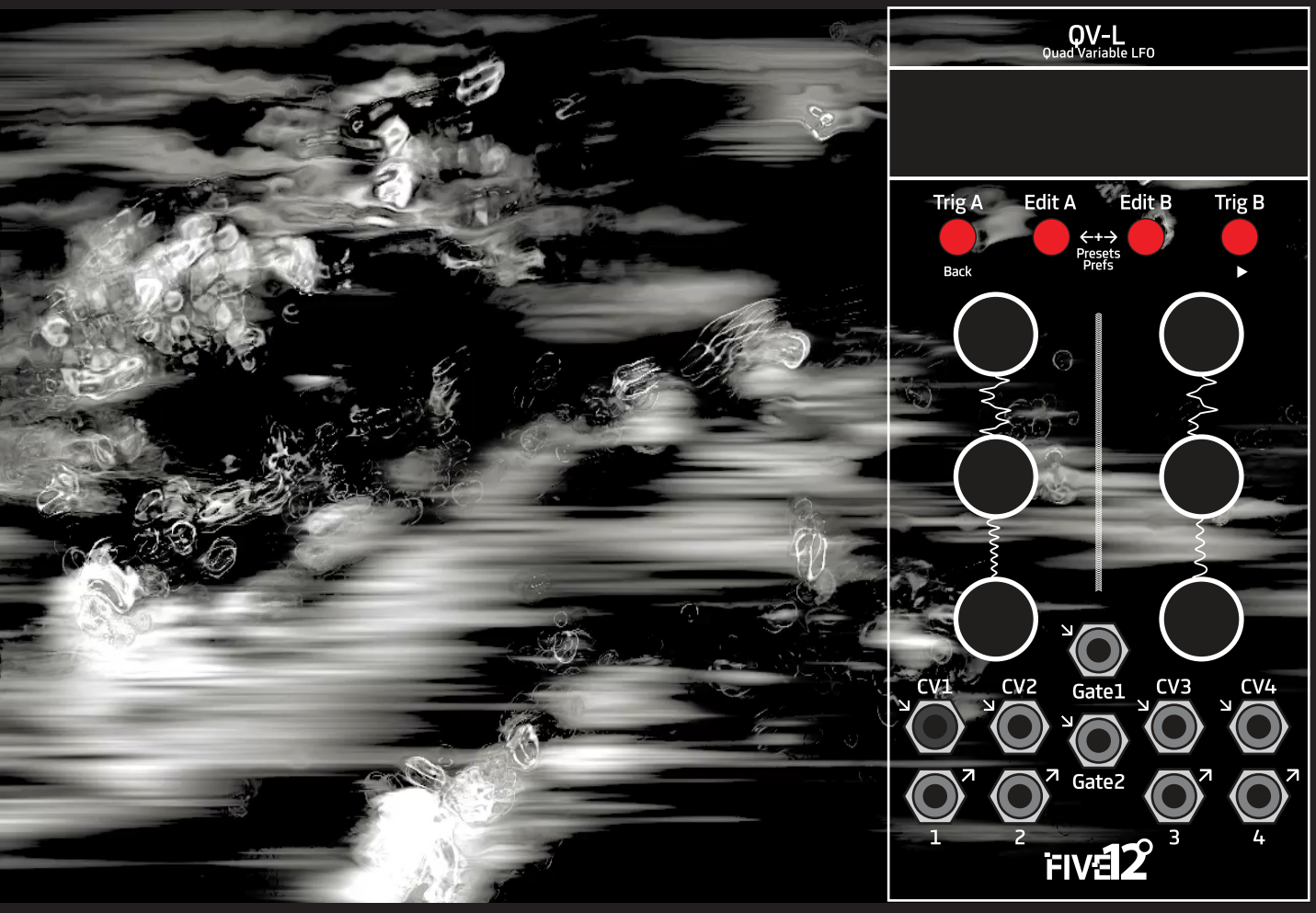
"What do you really want to know?" That was his question to me. His question was much better than any of the questions I'd prepared to ask him. I didn't quite panic, but my heartbeat was elevated as I realized the rest of my questions weren't going to cut it, and I thought about his question to me: What did I want to know?

The question that Amedeo posed has driven me ever since, not just in interviews, but in my everyday life: What do I want to know? It was through that question I realized that as a writer, an artist, and a person what I needed to cultivate in myself was curiosity and focus. Listening is such a skill, an art...and a virtue. Sometimes I'll catch a social media post by someone, perhaps in the midst of recording bugs (or making noises that sound like bugs) and be inspired by their curiosity, their ability to listen, to really hear the world around them. That curiosity, the ability to tune out the buzz of the world and isolate—not to mention the fact that they might drag fifty pounds of equipment to record what most people would consider noise (if they notice it at all)—is something I consider remarkable.

After Amedeo asked me what I wanted to know, I quickly switched gears and asked him about leaving Italy for the US, what he hoped to accomplish, and other such questions. I remember thinking that even with the rocky start, the interview went well and when I wrote the article my editor seemed pleased enough to give me another assignment. By then I was off to other publications, and my interviewing skills were getting better.

It made and makes sense that I'm this path. Long before I thought about Waveform, I was a voracious reader of biographies and autobiographies of musicians and artists. Thick stacks of books sat on bedside tables, and usually covered half my bed along with a guitar (and probably a few crusty dishes, if I'm being honest). All of those books helped shape me as a person and as a writer, and some made their mark on my psyche, such as a thick biography of the sculptor Alberto Giacometti. I've always found inspiration in the lives of artists of all disciplines; their reasoning, their creativity, their determination, and their tenacity to find their place in the world and make it something unique, personal, and beautiful. This inspiration, this knowledge, has helped me find my place in the world and we hope that the interviews contained within an issue of Waveform do the same for those who read them.

- Ellison July, 2023



The QV-L is a quad low-frequency oscillator with a variety of waveforms, flexible modulation options, clock sync and presets. Waveform rates can be set via two wide-range logarithmic modes, or beat-sync'd via tempo based rate modes. Sync via clock in or backplane to Vector Sequencer. The QV-L supports extensive modulation via 8 modulation busses. Sources include 4 CV inputs, all 4 LFOs, and two internal envelope generators. Waveform shapes include: Lorenz attractor and Logistic Map chaotic waveforms • Sine, Triangle, Saw Up/Down, Shark Left/Right, and Square, all with variable shape controls • Sample & Hold with selectable source • Stair-step up/down/up-down • Three morphing waves: Sine/Tri, Saw/Tri, Saw/Square.

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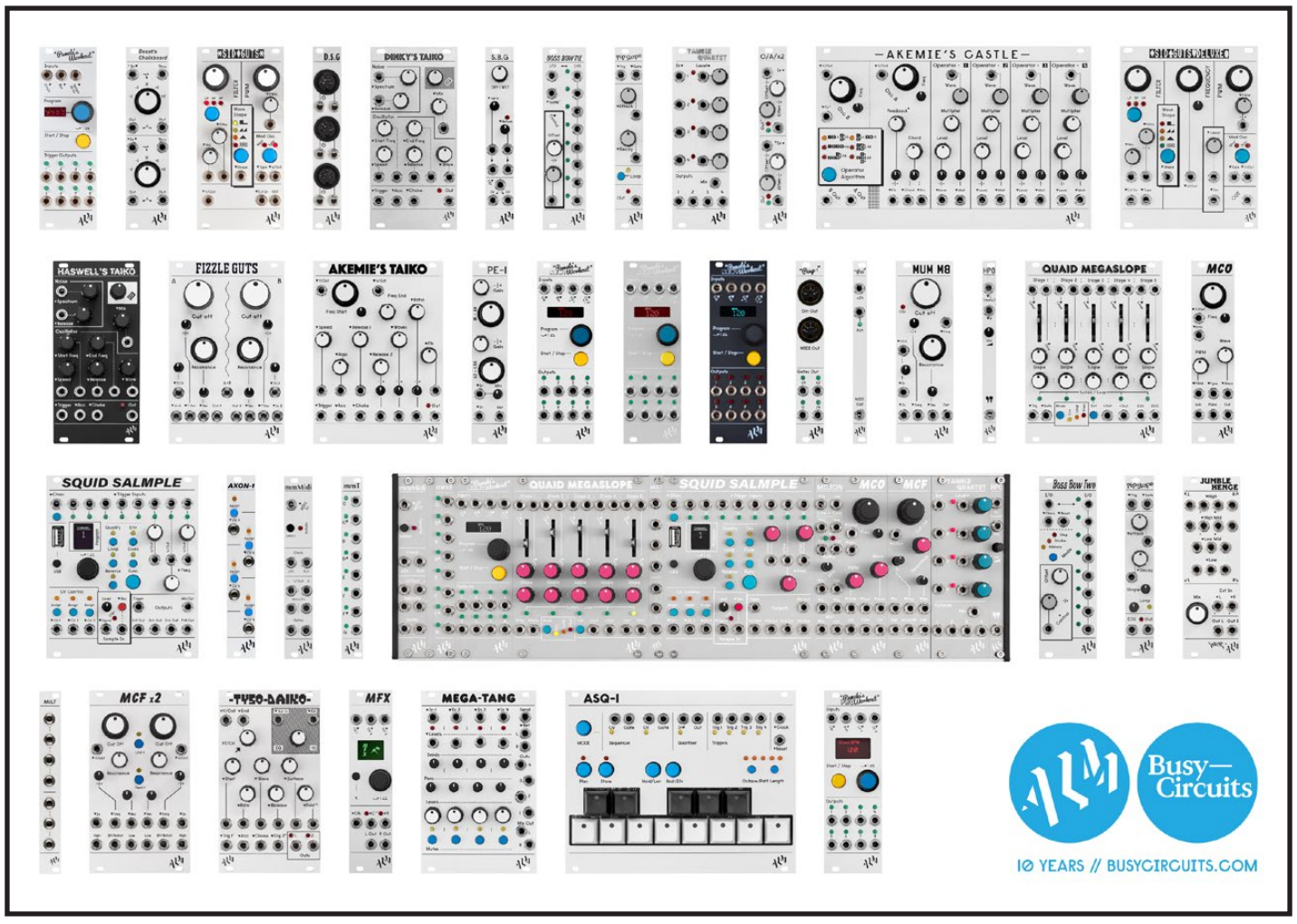


It's ironic that what diverted much of ALM/Busy Circuits' Matthew Allum's attention while studying at university and would derail his studies—music, specifically the enthralling scene of 90s Bristol, England—would end up as a throughline in his life, serving him so well later on. After leaving music behind to focus on his career, Allum worked for various corporations until starting his own technology company. He would come back to music through a renewed interest in modular synths, eventually forming ALM/Busy Circuits.

Celebrating their 10th year in business April of 2023, with a pop-up shop in London, ALM/Busy Circuits has made a name for itself with innovative, striking, and idiosyncratically-named modules such as Dinky's Taiko, Akemie's Castle, Sid Guts Deluxe, and of course, Pamela's New Workout.

Allum has done well by noticing what is around him, where the openings are, and what people respond to, turning ALM/Busy Circuits into a recognizable force in the modular landscape. It's a perfect illustration of what you pay attention to is what ultimately defines you.

Sometimes something that derails your life may in fact be one of the things that makes it fulfilling. Allum is now immersed in a life full of music, sharing it with the synth community, friends, and family—his kids enjoying some of the same songs and artists that made him miss his studies in Bristol.

Waveform: ALM / Busy Circuits...are they two different businesses? What's the deal with the name?

Matthew Allum: It was a kind of nod to EMS, ARP, that kind of thing, and I wanted a simple name that I wouldn't end up hating, and I wanted to go with ALM, but there are a lot of other ALMs out there, like big, massive companies called ALM. So I tacked on the Busy Circuits because I liked the words "busy circuits," I liked the two names together. I figured I would eventually drop one or the other, but then we ended up sticking with them because I also liked the kind of the confusion it causes. Someone will say, "Are they two separate things?"

I like the Busy Circuits part, too. It sounds very hi-tech in an atomic, nostalgic sort of way, like old operating systems or phone lines being jammed…What does the ALM part mean?

It doesn't really stand for anything, I just like the letters together and had been doodling the logo before we had the name and thought it looked good. It's visually the way the letters go together that I like.

What about module names, like Pamela's Workout and Dinky's Taiko? Who are all of these people that the modules are named after? Is there a Pamela?

I didn't like the way that we'd put so much hard work into this stuff and it was very throw away, like it would disappear and then be gone forever.

Well, that's a trade secret.

Is it really?

All the names…they're just silly sort of in-jokes. We keep them a mystery. I love the artwork on Tamiya remote control cars and how they were always named "somebody something," like "Vanessa's Lunchbox"…that's where the idea came from.

You said you had been sketching the logo before the company started. ALM's been around now for over ten years, how long had you been thinking about starting a modular company before that?

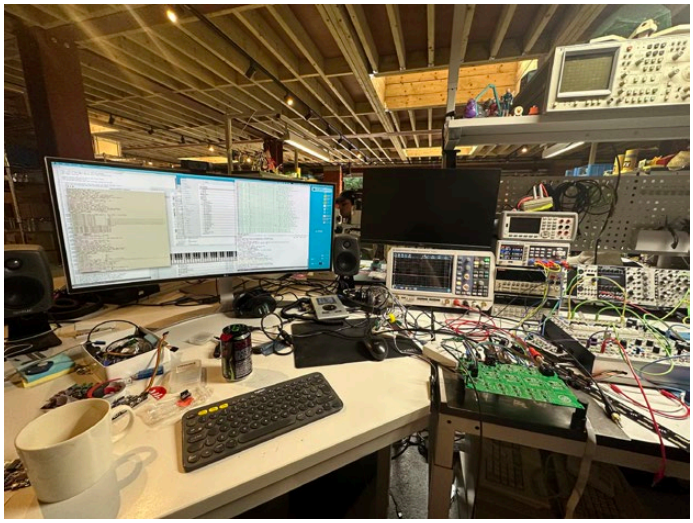
It wasn't like I went out and started a company, it was more that I'd always been into music and music technology since I was a teenager. Through university, I was making music all the time and I loved it.

Where did you go to university? Were you studying music and technology there?

I was doing physics at Bristol. I was the first person in my family to go to university, and Bristol was a very cool city with good music and everything. I wanted to stay there but things didn't go too well for me. I enjoyed myself a bit too much and had run out of money so I had to go back home to my parents who were just outside London. I'd majorly screwed up. I thought I'd just about scraped through, but I didn't, I got a third class honors, a "Richard the Third," we used to call it. I remember seeing my results and suddenly thinking I'd let everyone down, all my family. My parents had to pay for me to go through university and I felt really bad. I thought, "I've got to sort myself out. I've got to leave music, get a job and work hard." So I got away from music. I kept some of my synths, but I sold most of them and got a job.

You had to gain the trust and support of your parents back, to redeem yourself….

It's been quite a long arc (laughs). This was like the mid-90s, so it was around the beginning of the internet. At university we knew how to make web pages and that kind of thing, we knew a bit of technology. I'd always been interested in computers, and I could use Cubase and eventually, I got a job at a design company that did CD ROMs. The company wanted to get into internet stuff, and they used a software called (Adobe) Director, and because I could use Cubase I got the job.



Was this in London?

No. I wanted to move into London but I didn't have the money so I ended up working in Slough Trading Estate. I just worked and worked and worked, and then within a couple of years I moved to London and did well with different companies in software and the internet, and that culminated in me running my own company.

How long was it from getting that first job in Slough to running your own company?

I got my first job around '95 and I started my company in 2002. It seems like a long time thinking back now. We were doing software, embedded Linux, really early on before anyone else. People thought it was bonkers that we were running Linux on these Compaq iPaqs, which was way before the iPhone and all that sort of stuff. It was when color screens came out and you could run a full OS on a handheld device, but people at the time thought it was completely stupid, like, "Why would you do that?" For whatever reason, it completely gripped me. Then I started this company and we did a lot of work for Nokia R&D. My company grew to thirty people and we were doing work for all sorts of people. It was very successful and we ended up getting acquired, so it all ended quite nicely. It was pretty cool.

At this point, when your company got bought did your parents finally give you the thumbs up? Did you feel that you'd redeemed yourself since college?

They never held it against me, it was more that I had now validated myself. I had been successful, but I was working sixteen-hour days when I was running the company. It was just constant firefighting and it was nonstop, relentless with no holidays… nothing. I was a mess.

That must have been nice to get acquired then, less stress.

Yeah, but the whole process of selling the company was very stressful in terms of dealing with lawyers and that kind of thing, and another stressful thing was that one minute you're the boss of a thirty person company and the next minute you're working for a company that's exponentially larger than that, and you've suddenly got bosses and you're in a very different environment that you don't necessarily understand, and the rules are very different.

Did you have to stay on with the company afterward?

For a couple of years. I'd thought that I would stay longer, and it started off okay, but it just didn't work, I didn't enjoy it at all. I'd had enough of tech and the whole world of it. I was really disillusioned. I saw where it ended up.

What were you disillusioned by?

I didn't like the way that we'd put so much hard work into this stuff and it was very throw away, like it would disappear and then be gone forever.

That it's all so disposable?

Disposable, exactly. I wanted the company to succeed and had dreamed of it being acquired and being successful, but I thought it would take a lot longer, like twenty years, and it happened much quicker, over six months. When the iPhone got announced, everything just went bonkers for us because we had similar technology. All of the sudden, everyone needed it. It was a very specific technology that we did, and this was around 2008, just before the financial crash. I was at my limits in terms of needing a break, and I had taken the tech as far as it could go so it was good from that perspective. I took some time off and thought, "I'm gonna be a carpenter." I just wanted to do something completely different…

I remember seeing my results and suddenly thinking I'd let everyone down...

I get it. Building something with your hands. There's something about the work that seems deeply satisfying. How did your experience as a carpenter go?

I discovered that I was absolutely useless at that. (laughs) I didn't have the ability to measure by eye... I enjoyed it for a bit, but it definitely wasn't where my skills were.

That must have been hard, figuring out what was next.

I didn't know what to do. I did a little bit of consulting and bits and pieces of things. I'd always loved music and music technology, and the (Teenage Engineering) OP1 had just been announced and I was quite excited about it, and then I saw that you could get these modular systems. When I was younger that kind of thing was unimaginable, so I got a Doepfer system

Page 8: **ALM/Busy Circuits 10 Year Anniversary Poster.**
Page 9: **Modular Installation in Pop-Up Store, London 2023.**
Previous Page: **Matthew's Workspace.**
This Page: **ALM/Busy Circuits vending machine from Pop-up store.**
Photos provided by ALM
Pop Up Photos by Rob Jones
Soundcloud photo taken off of internet

I took some time off and thought, "I'm gonna be a carpenter." I just wanted to do something completely different…

and I loved it. I still had my SH-101 from years ago, and my 606 and I started hooking it all up and it was so much fun. I looked at the Doepfer modules and thought, "I could do this." I had electronics knowledge from when I was a kid, a physics degree, and I'd messed around with Arduinos and stuff a little bit. I wanted to sync my 606 with this weird MFB drum machine that had like a X12 clock, and I wanted to sync it with a modular as well, and there was nothing that would really do that. So this was kind of the first version of Pam (Pamela's Workout), just this simple thing that synced them together. I started working on that, but the main thing I was working on was the ASQ1, an SH-101 style sequencer. It was going was originally going to be a standalone sequencer, a separate thing and not a module, and it was technically challenging. I had a prototype of that and had a prototype of the Pam, and then I found the little screens that the original Pam used and I got the UI working nicely and I was like, "Oh, this is actually pretty cool."

When I first got Pamela's New Workout, I was like, "Why didn't I get this earlier?" It really brought my system together.

The original Pam was just clocks and then the second Pam was technically much better. It was what I wanted the original Pamela to do but just didn't have the capability through the hardware or the software. We updated almost too much over time—there's no space left on it for anything else—which makes it really difficult to debug.

Did you know when you were working on Pam's that it would resonate with people, would really fill a need?

I still thought the ASQ sequencer was kind of the main thing, but then I went to one of the first Brighton Modular Meets and I had both of them there to show people what I was working on, and I was like, "Look at this SH-101 sequencer thing I made!" And everyone was like, "What's this clock thing? What's this doing?" Nobody was that interested in the ASQ, everybody was interested in what would become the Pam, so I thought that I should work on that because it seemed like the more interesting thing, and I'd go back to the SH-101 idea later. So I started working on Pam, and I found a place locally that would manufacture them for me. I figured out I could do a run of fifty, and as long as I sold half of them, I'd cover my costs. I got them made and I contacted Analog Haven and Postmodular and I said, "I've made this module, will you stock it?" And they were like, "No." (laughs) So I announced it on Mod Wiggler and I put it up there and the fifty sold in a week and it just grew from there. The first few years it was still a hobby, a nice kind of sideline, but it wasn't really making enough

money to be a business. Gradually, it grew until it was a business and now we've got a small office in Chicago and one in South London.

Are you still the only designer for all the modules?

I do the bulk of it. There are eight of us now, and we all do a bit of everything. It's a nice team.

As ALM grew and you started adding employees, did you seek out people for specific positions/skills or was it more organic?

It was definitely more organic. The company's always been run quite organically and with a drive to grow, but definitely at a pace that's comfortable, rather than any sort of aggressive growth. I don't think we've ever advertised for a role for hiring. That's been more organic as well, where people have done bits of freelance work for us and then that's grown into working full-time. Also, we've had some really good interns, which has worked really well. It's still very small.

There is a certain type of mystique to ALM/Busy Circuits. Your whole aesthetic is unique with the names, and even the gray panels. Nobody really does gray panels, which look really sharp, especially in the System Coupe. Do you come up with the aesthetic for the company as well as the faceplate designs, or do you have somebody that does that for you?

No I do it all myself, though nowadays there's input from other people within the company, but I think pretty much all of them have been done by me. It's funny because when I did the original Pam I came up with a plan in terms of what knobs I was going to use, what sort of styles of switches I was going to use—a kind of rule book—and I've stuck to that, and am still sticking to it, but I would really like to break out of the rules and do something that looks very different, but within the rule book. We've had a lot of fun playing with things like the Coupe, the colors and that kind of thing. It's fun to play within the limitations and also sticking to a set of rules means they all look great together and it can be quite unique. I like the way they all have their own kind of character, their own kind of little soul, which is what the names give them. Also the choice of fonts and whatnot I find fun. It's fun being able to do things that are incredibly technical but then at the same time visually very fun.

When you came out with the System Coupe you had a Speed Racer type of ad for it by a Chilean artist José Salot (PEPEGRΔPHIX), and you mentioned the Tamiya remote control cars that you were into. Are you big into cars? Do you collect them or anything like that?

The Coupe is car based because it's quite difficult to come up with a name for a system and it really fits with the logos being like racing logos and that kind of thing. It seemed like a quite fun concept for it. When I was in my early 20s classic cars were still quite affordable and I tried to collect various ones, but it was a disaster. I had a Karmann Ghia where the engine blew up, a 66 Mustang that died on me, and a (Toyota Land Cruiser) FJ 40—which was my favorite—and the engine blew up on that as well.

Wow. So how many cars have you blown the engines up on?

Only two, but it was more bad luck than anything. The Karmann Ghia was beautiful, this champagne silver color and it was so nice to drive, but it was air-cooled and since I was sitting in traffic a lot I thought I'd get a bigger fan, because in Mexico they drove Beetles with bigger fans. So I got a bigger fan for it, but what I didn't notice was that there was a paper towel stuffed down the side of the battery that had been there for years and the big fan sucked that into the engine and that was that.

That is bad luck.

And then the FJ died. That was the worst because I'd literally had that a week. I drove it out on a cold morning and because it had come from Portugal or somewhere hot it didn't have any antifreeze in it. All of a sudden smoke started pouring out of it and it cracked the block. Those things are meant to go for years, they're meant to be indestructible. The Mustang was alright, but when I had kids it just got left in the garage. Occasionally I'll see a nice car and go, "Oh, I could get one of them," and my wife goes, "No way. No more. No more classic cars."

She knows. How many kids do you have?

I have two daughters.

What do they think about ALM/Busy Circuits?

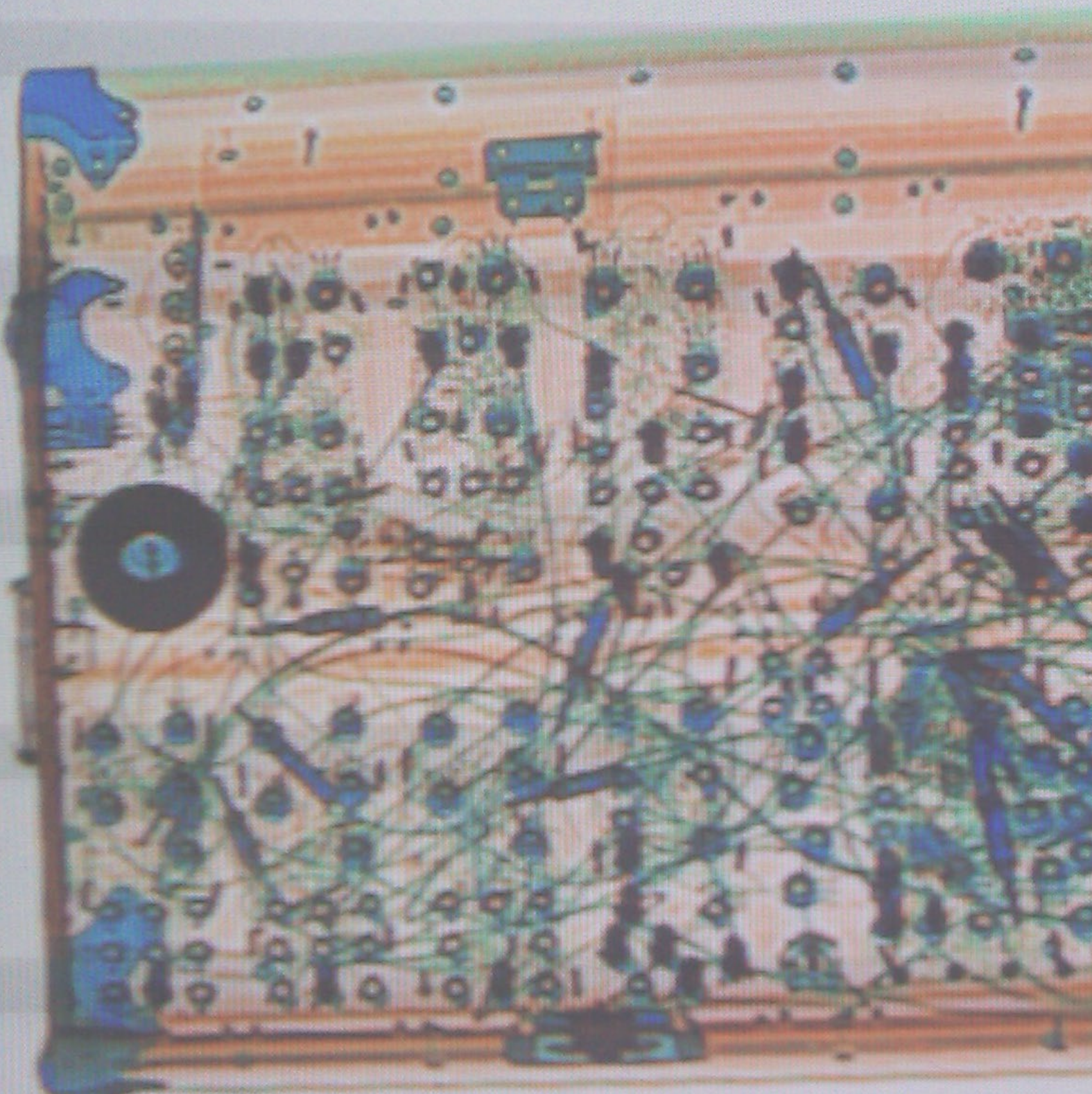
They like it, they think it's cool. They call it pots and pans music. (laughs) My older daughter is into guitars and started getting into effects pedals. It's funny because sometimes I hear her listening to music that I grew up liking. I find that really strange.

Like what music?

When she was younger, I would play her Aphex Twin tracks that I liked, so she's grown up liking them, and she plays Grand Theft Auto—though she shouldn't—and the music on that she puts into Spotify, and so then other stuff comes up. I came into her room once and she was listening to this really old, UK techno and I'm like, "This is B12." And she's like, "Yeah, I really like this one." (laughs) Other things, like when you have a secret song that you wouldn't tell anyone you like, like pop songs, but she listens to them. There's this Lily Allen song that I really like, but I would never admit it to anyone, and she keeps listening to it. I think that's really weird.

It's the algorithm. What's your process for designing something?

Pretty much every module has been me going to patch something and getting frustrated and then I spend the next six months or a year developing something. When I was younger and making music it was all about the sampler, but it was a lot more basic then. It was working with the limitations, not that much sample time and quickly messing with sounds and making new sounds. I missed that from Eurorack and I'd been thinking about a sampler, thinking about how I could do it. I wanted something that had the kind of spirit of a rackmount sampler—it wasn't trying to be a really complicated **Continued on page 74**



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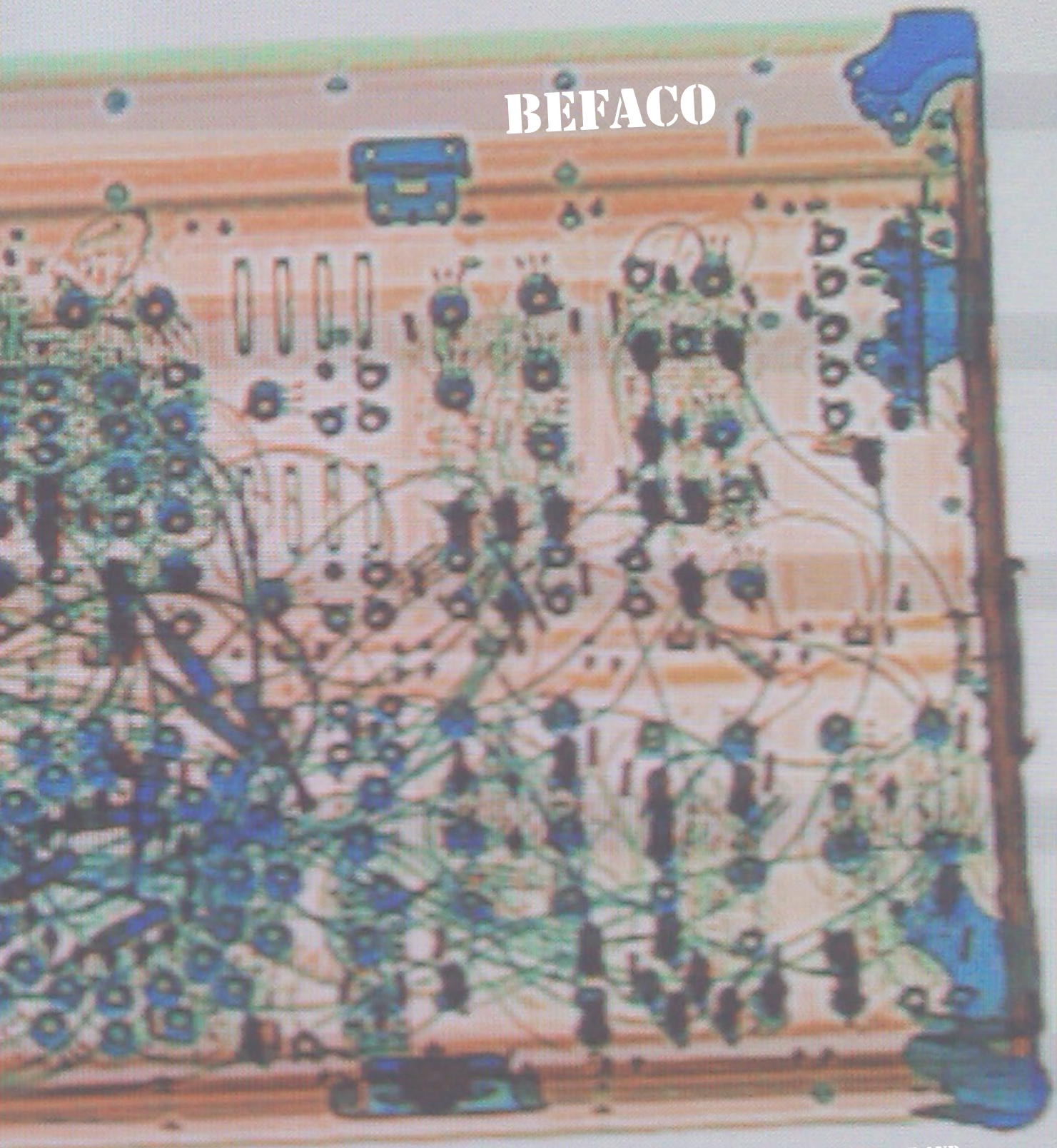


BY ELLISON WOLF AND
SAM CHITTENDEN

It's a matter of having a crazy idea and having someone close by that tells you, "Fuck yeah!"

The theory of six degrees of separation posits that we can trace connections through six (or fewer) links that ultimately tie us and everything together. It's been studied and utilized over the years as a tool to map everything from sociological data to epidemiology; and there's usually some great visual that conveys what it all really comes down to: connection. Imagine plotting the small and large things we do and how they interlink, overlap, and become links for others. Barcelona-based Befaco would have an interesting diagram: Talk to almost any manufacturer, especially those that offer anything DIY, and Befaco is bound to come up during the conversation. Trace their trajectory and input and you'll start to see all the links throughout the community and how those links branch out and connect other communities. Connection and a staunch DIY-philosophy has been key to the spirit of Befaco, beginning with workshops in Barcelona, then growing to other cities like Madrid, London, and Berlin.

For the duo of Manu Retamero and Diego de León, forming a modular company was not something that either of them originally envisioned for themselves. De León worked in restaurants, and Retamero in IT, and neither knew much about electronics, running a business, or modular synthesis. They had never even seen a modular synth until they built their own 5U system. A love of organizing and hosting events such as Tramuntana Festival at Cap de Creus Lighthouse and Familiar Fest, a noise festival + DIY workshops in Sevilla, as well as an innate sense for community and people have shaped their lives and the company.

In September of 2022 some of the Waveform team traveled to Barcelona to attend Modular Day, an event Befaco has been organizing in the city for ten years. Walking into the crowded hangar, we were greeted by de León who talked animatedly about the day as he made us a vermouth. We later chatted with Retamerowho also made us feel welcome. Their conviviality, hospitality, and generosity were felt immediately and it was easy to see why people have gravitated towards them, how they connect people, and how they foster and feed that spirit. They've become a cornerstone in the Eurorack world and are emblematic of so many of the great things about the community.

WAVEFORM: So many other modular companies that we talk to bring up Befaco: "Befaco helped me out. Befaco got me into this. Befaco gave me information about manufacturing..." It seems you've helped and inspired a lot of people in this community. What inspired you to start? Was there anyone there to help you in the beginning, or did you just have to figure it out as you went along?

Opening Spread: **Airport X-ray of original DIY 5U system.**
Previous page: **Manu and Diego, Barcelona, Spain 2023.**
Following page: **Befaco workshop.**
Photos provided by Befaco

In a parallel universe we are roasting chickens.

Manu Retamero: The story of Befaco is a story like a weed, and if you leave a weed alone it will grow and take over your whole garden. As children of the internet we saw the forums' birth, people out there spending time answering all sorts of questions, sharing schematics and documentation for the sake of knowledge, and caring and it was super inspiring and enabled us to be here. Befaco has only been a company since about 2016. It was initially a noise workshop thing called "Oscilaciones de Verano" (Summer Oscillations) that started in 2010 by Diego and Jano (Bizzotto) in an artistic center in Barcelona called Hangar. When I joined Befaco there was not even a name, but when the modular workshops started, the Befaco name came out. After doing a few workshops there we asked for a bigger space.

You outgrew the original space that fast?

Diego de León: Yeah, we put all our stuff there, and we got to take more and more space until they didn't have any other option than giving us a proper space to work.

M: At some point, the director of the center tried to put a name on what Befaco was doing there, apart from doing workshops and having a corner full of synthesizers and things. They generated this intern project, and basically allowed us to be there in exchange for Befaco doing an open day once a week, and we were offered a space to work on the development of the new modules that would be offered in the workshops. The agreement with Hangar was to provide support for local artists that had electronics and sound needs, and after a few years they officialized what we were doing as a kind of creative project residency that needed an application and to be selected by a jury. This is how Open Thursdays were born.

D: Open Thursdays was where people could come and do stuff, not only synthesizers, but whatever was related to audio: song projects for artists, sound art…many synthesizers too. We also kept doing the workshops, and we'd have workshops one weekend per month and then Open Thursday and we met all these people.

How many people would normally show up?

M: At the beginning maybe one or two. Some people were completely lost like, "I want to fix my heater." The way that the Thursday workshop was conceived was that it was free, so you could come and follow instructions and learn the basics and do your thing, but it was open for people to generate questions from the process of building,

Did you guys know that much about electronics then, enough to answer questions? How experienced were you?

D: Manu has a proper technical background, but I'm self taught so I only know what I know. Things are very complex and on any level you might not have all the answers.

M: I went to college, but I didn't do anything with electronics. Other people from Befaco used the internet and forums and a million hours of work to learn. That's a very valid way of education and the goal of DIY, so I think that the success of this thing is that it was very honest. Telling people, "You want to do this? Okay, put some hours in it. Here is a proto board, here is the schematic. This is a resistor, this is a capacitor, this is a transistor... Go to this forum, do the proto board and then come back." That's a filter of who is really into it and who is not. When I say it's honest, I say, "Guys, this is a matter of hours. It's a matter of reading, it's a matter of patience." In the end it's the people that put in the hours, the time, the interest, and the suffering (laughter).

D: In the beginning of Befaco, modular synths were not a big thing. We didn't even know anybody with a modular synth, we'd only heard of one guy who had a modular synth. It was like a magic object, mythical stuff, so we built one because I wanted to have one and buying one was not an option; they were too expensive. I didn't even know what Eurorack was at the time. We did our first modular in 5U and then I saw a smaller format modular and I said, "Wow, you can make it smaller, you can fit in a suitcase." But we didn't make it into Eurorack format because we didn't know what that was, so we did it in 3U and for random

reasons we put in a 15 volt power supply. We did our own format because we just didn't know.

M: Diego and Jano organized a workshop and I attended it and I remember speaking with Diego who said, "The next thing we're gonna do is a workshop of modular synthesizers. Every month we're going to do a different module and then after a year, we're gonna have our modular synthesizer!" I was like, "Count me in!" The idea was to design and produce one module a month for a year.

That's a lot of work, especially if you have limited knowledge and experience.

M: The first bunch of modules released in workshops were reworks of Music From Outer Space (MFOS), designs with modifications made thanks to electro-music forum. Ray Wilson's (Ed. - MFOS creator, RIP) website was so helpful.

D: It was a workshop for fifteen people and at that time, our economic situation was disastrous, so we asked all the future attendees of the workshop to give us the money in advance so we would have the money for the parts. It was kind of like crowdfunding, and ten or fifteen people put in 80 euros each and that was the budget.

For one module, or the whole series?

D: For the first one.

M: So we made the first one, we bought some parts, and then with the money from these we made the second one.

How did you make the circuit boards?

D: We just designed them in Eagle, and sent them to an Italian place. It (the PCB) was only one layer because it was cheaper.

M: The first workshop I did with Pascual (Rocher, the main electronics force in Befaco) we thought we could do our own workshop as well, and so we did. We did the PCBs by hand, one by one, ironing and drilling all of them and I spent, I don't know how many hours with the acid, drilling them and hoping that they were fine to do a workshop with that was coming up in a week's time.

It's an interesting process, to make your own circuit boards. I think it's really cool.

M: That's willingness to do stuff and a lack of resources.

D: Until five years ago, all Befaco module prototypes were printed by hand. We decided that all of the boards for the prototypes we would print by hand, and only when the product was finished did we send it to a place to print. The Rampage for instance, I did like five prototypes by hand.

M: Dual layer prototypes, transferring one side, then drilling to put them on the other side with nylon...

D: Soldering the vias one by one.

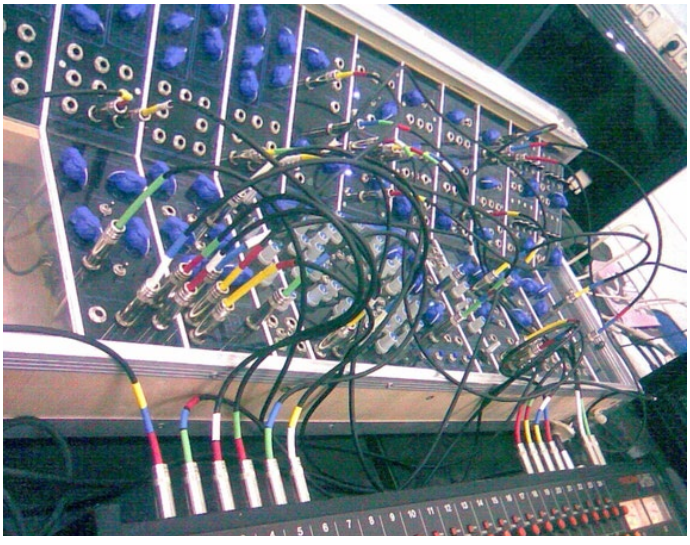
That sounds crazy.

D: Vias were less possible because you have to solder a wire from the top and the bottom. So first you make the board, second you solder all the vias, and then you begin to solder the components. It was the worst thing. No vias please!

I'm still amazed by vias, when you see them on a circuit board…

D: It's tiny.

It's a real clusterfuck of life, so having someone close to you that listens to the problem and actually has the same problem like you really helps.



It's smaller than a pinhead. I can't believe that they can even make that happen. I have to say that I'm a fan of the via.

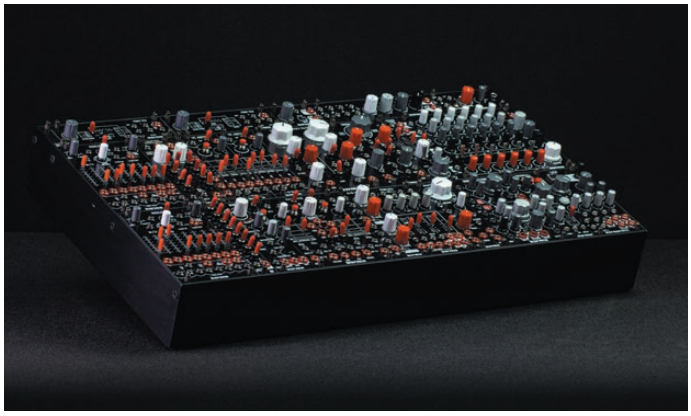
M: I'm like, "No. No vias!" Now it's trying to convince yourself that vias are fine, but it's been so difficult to change, you get on some kind of fixations. I don't want anyone to see this design if we use a lot of vias.

You've been burned by bespoke, hand-wired vias.

D: Talking to each other when we finish a design it's like, "Only three vias!"

It's an accomplishment, and kind of the fun of circuit board layout design. Now that Befaco is much bigger I assume the handmade vias are pretty much over, but are you still doing workshops in Barcelona? I know you've been doing them in other cities.

Previous Page: **Then: First DIY project, 5U system.**
This Page: **Now: Befaco system in their 7U case.**
Page 32: **Boxed Befaco modules.**
Photos provided by Befaco



Suffering is a vital part of the process, and the key point is being able to know that it's a part of the process and to keep on doing it.

D: Sure. We love doing it.

M: Workshopping has always been key for the spirit of Befaco because back in the beginning it was workshops in Barcelona, then workshops in Madrid, and then workshops in London and then workshops in Berlin. At the beginning, we needed to do workshops in order to survive. Now it's like rock and roll, but with electronics. You go on the road, go to places and sleep, you don't know where, and then the locals are going to take you out... Well, lately it's not that rock 'n' roll, we go to a hotel now.

D: Early on the only income we had was the workshops. We didn't sell kits, because we were not prepared for selling. Sometimes some parts were missing or you don't have a proper manual. The kits were designed for our workshop, not for selling to somebody else. In a workshop you can always explain the manual yourself. It's a very different thing.

M: Coming to Germany with a manual in Spanish…

D: I took a lot of time with the manuals so we can feel comfortable to sell this to somebody. And now we are selling more assembled modules, so to keep the DIY alive, the only possibility is to have two boards per design; one an SMD for assembled modules, and one a through hole for DIY kits and workshops. Every new design is two. It's double the work, but...

M: Double the fun!

I'm sure it makes the production easier, but that's a lot of work.

M: Yeah, big time. Everything has been brute forced. Like the designs, we don't have the means to make all the prototypes in a factory, we do everything by hand, it's craziness. For a while we were even assembling the through hole modules to sell to shops ourselves. "Befaco, the story of brute force." (Laughter)

I imagine the workshops must feel good. You've created a strong community in Barcelona, on top of a successful business.

M: It is a great satisfaction to watch so many people doing great things and giving back what was given to us is the way to keep the ball rolling, by enabling others to do nice stuff so that they can help future generations of Eurorack enthusiasts.

Did the workshops lead directly to you putting on Modular Day Barcelona?

M: We always loved to do events and back in the day Diego and Jano were doing Tramuntana Festival at Cap de Creus Lighthouse, a Pharo-Phonic event in nature, and Pascual and I used to organize Familiar Fest, a noise festival + DIY workshops in Sevilla. Once we were all together it made sense to organize more events. We have been doing Modular Day for ten years now, and we also did One Drone Day ((ODD)), a drone festival that happened in total darkness for twelve hours straight.

That's a lot of organizing. Were you both doing other things for work before Befaco took off, or just the events?

D: I was a cook, working in restaurants for many years and really fell on it just to pay the bills. It was very hard and stressful but I slowly got interested in gastronomy while doing it and now I love to cook for my close ones. My perfect weekend is going to a market just to see what looks appetizing and cooking it. A lot of stuff learned from cooking is still in my mind and I find myself many times thinking in restaurant terms of some of the Befaco stuff.

Was it a thing where you were just cooking all day in the restaurant and then doing the Befaco workshops, too? When were you able to just do Befaco?

D: In the early Befaco years I was still working some weekends in restaurants, but at some point I decided to just do electronics, no matter what happened. I began to make some workshops and have time for learning faster. This was around 2009.

That's impressive to be able to actually switch like that and have electronics be your main focus. It seems like the workshops

really worked for you.

M: It's rewarding. When we go and do a workshop, it's like touring with real income. Have you ever had a van and you tour? The normal thing is to come back with nothing.

I know that well. You usually leave for tour and expect to lose money. Was that kind of the mindset when you did the workshops like, "Alright, this is kind of like a band but we actually need to make some money to survive?"

D: We did this because it was inevitable, because we just had to make it. It was our obsession. The money was not the main thing, and it came in a very natural way because we were very focused on it, but we were not chasing it. We did some stuff like the workshops, trying to survive, but only to keep doing this. We didn't think about making a company. For me it was enough to pay my bills, it was not possible in our minds to be able to live from this in a proper way. To have a good job with all the things that we had to have, for us was not possible. When we went for it, it was very suicidal thing, there was not much of a market. At one point people stopped coming to the workshops and we thought, "This is over. We already sold the workshops to anybody who wants to make it, so now in Barcelona everybody who wants to have a modular already has it. This is finished." There were like two guys at the workshop, three guys on Open Thursday. It was very quiet so we thought it was drying out and we'd have to find other things. In that time Jano was even thinking to buy one of these machines for roasting chickens.

A rotisserie?

D: Yeah. We were gonna sell roasted chickens or something like that. We were looking.

M: Befaco could have been chicken roasters. In a parallel universe we are roasting chickens.

D: We keep doing it because we love it, so we kept doing the stuff for ourselves, to make music. I want to have the thing (modular) anyway, so I kept doing it and then…modular synths exploded. From nothing, then the next week three guys, four guys, ten, fifteen and it just went up again. It was quite weird.

When was that?

M: 2013.

I remember the first instrument I ever built was an optical theremin with a nine volt battery. It was pretty simple, but I was like, "I built something. It's an instrument. I can play this." It was exciting, even though it sounded completely annoying!

D: The raw sound of a crappy device and it's like, "This is better than any plugin I have, it's just the sound I was looking for!" I remember going into an electronics shop in Barcelona after going to a workshop and telling the guy, "I want parts like these, but a little bit different so I can make a different sound." (Laughs) Of course, the guy tells me that this is not possible, this will not sound at all, it doesn't work like that. It's not that you put a different part in and you get a different sound. A very naive approach, like, "Give me more of that…but different!"

The first time I ever met someone who had done DIY electronics built guitar amps out of old tube stereo amplifiers and I was so curious. I asked him how he learned to do it, and he said just by messing around and reading old electronics magazines. This is way before the internet and I just couldn't grasp it. It took me about fifteen years before I actually started to kind of understand it a little bit, how to begin the process. When you take apart a radio or something and you don't know anything, it's a completely foreign language. I could only recognize the speaker, the battery, a knob, but none of the other components until later on, and even then…

M: I really love this trial and error way of approaching electronics, this naive way of doing things, and seeing what happens. When I went to college, I hated it. Like many youngsters in the early nineties in Spain, going to university was what was expected from me. There was pressure coming from our parents seeking for us to get some education and not pass through what they had to pass when they were young, and it felt like I had to go to the university or I would not get a job, so I went. Unfortunately, the university experience was quite stiff, discouraging, and in general terms, not cool. The people that taught just went onto their high stand and pontificated,"Buy my book. You are going to learn with the book I wrote." It's not very appealing. I was lucky enough to find nice people in the university that were real people, but the ambiance was competitive bullshit. I spent my time at university playing video games and connecting computers to play online with my flatmates and after I left to work in Amsterdam and ended up working in IT and then with synths. When you meet this world (modular synths), and it's this workshop where it's more experimental, where you try and see without knowing exactly what the circuit is doing, and then they give you a bunch of capacitors and tell you to try the capacitor you like the most and leave it because the capacitor will give you a different range of frequencies or stuff like that. That approach was fantastic, and then there were also internet forums. "I've tried this and it seems not to work. Can anyone help?" Then the guy that actually made the thing replies and takes the time to explain how to actually do it. It was mind blowing.

D: This was the reason we wanted **Continued on page 76**

Befaco 7U Case

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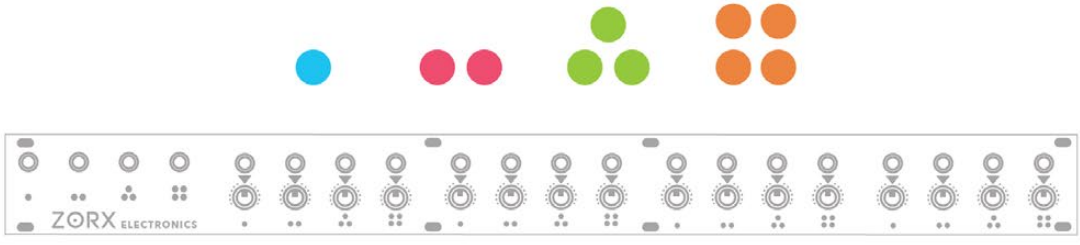

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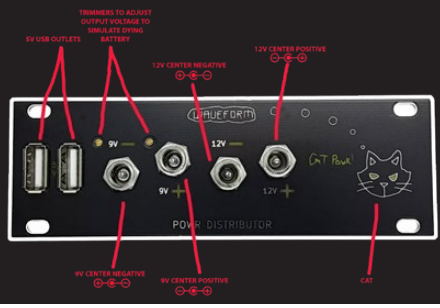
DIY PROJECT: 1U/3U CAT POWR & 1U EFX PEDAL ADAPTER

BY IAN RAPP



1U/3U CAT POWR

The array of delay, reverb, fuzz, phaser, etc., effects pedals that are available has meant that I've always used pedals with my modular. I realized though, that when I'm jamming with friends, playing a show, or traveling, that bringing along the numerous power supplies, cables, adapters, and power strips can be a hassle. In the effort to consolidate, free up space, and ease my mind I wanted a simple way to integrate pedals from my rig in a 1U space, hence the Cat Powr Power Distributor and the 1U EFX Pedal Adapter were born! Cat Powr also comes as a 3U module.

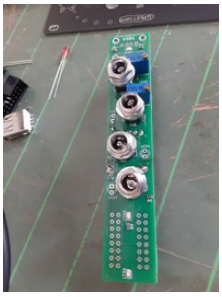
Taking power from your existing power supply, Cat Powr supplies +12V, -12V, +9V, and -9V to power your pedals and other external devices. Both of the 9V outputs also have trimmers so that you can adjust the output to simulate dying batteries—a fun trick with certain fuzz pedals—for more sonic possibilities.

Cat Powr also has two USB power outlets to run low-powered devices like a Teenage Engineering Pocket Operator (I use a +5V MyVolts RipCord and a MyVolts AAA ReVolt), to charge your phone, or run some LED lights to brighten up a space.*

The 1U EFX Pedal Adapter helps you send the modular signal out of your rack and into your pedals and bring it back, allowing you to tweak the levels at both steps so as to not overload your signal going into your pedals, and to be able to boost the signal to modular level on the way back in. We've also used 1/4" jacks going to and from your pedals so no adapters or special cables will be needed.

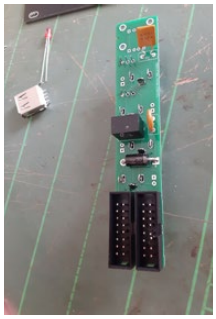
***Don't exceed 1A with the USB outlets. Also note that your Eurorack power supply must have +5V for the USB connectors to work, and the USB outlets do not pass any data. If your rack doesn't supply the +5V, there are available adapters that you can find to do so.**

First, mount all four of the DC barrel jacks on the top side of the PCB and solder into place. Make sure they are perfectly flat on the PCB.



Solder in the diode on the bottom of the PCB, making sure the orientation is correct. The indicator line on the diode needs to line up with the line on the PCB. Clip the excess leads. Solder in the 9V regulator on the bottom of the PCB, making sure that it's facing the correct way. It should fit perfectly in the outline indicated on the PCB.

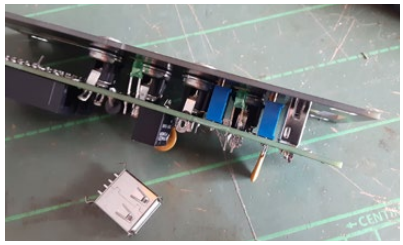
Place the trimmers (RV1 and RV2) on the top of the PCB, confirming that they are in the correct orientation. The screw of the trimmer should match with the screw outline on the PCB and should be near the edge of the PCB. Solder in one leg of each trimmer.



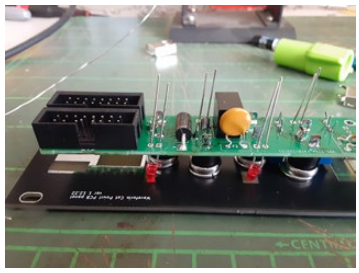
Insert the two shrouded headers on the bottom side of the PCB and make sure the gaps in the headers line up with the GAP on the outline of the PCB. Carefully solder each header into place, making sure to avoid contact with the surface mount components.

Insert the fuses into the bottom of the PCB (the square fuse into F1 and the round fuse into F2) and solder into place. Clip off the excess leads.

Insert the LEDs into their respective spots, with the red LEDs going into the 9V and 12V center positive holes to illuminate the "+", and the blue LEDs going into the 9V and 12V center negative holes to illuminate the "-". Use the faceplate for reference if needed. The short leg of the LED goes into the square pad on the PCB. Double check this. DO NOT SOLDER THE LEDs INTO PLACE YET.



Remove the nuts from the DC barrel jacks, but leave the washers on. Attach the faceplate and screw the washers back onto the jacks as much as you can. Maneuver the trimmers so that the screws go into their respective holes and the faceplate lies flat. Solder in the trimmers and cut the excess leads. Now that the trimmers are properly



seated, Tighten the jack screws fully.

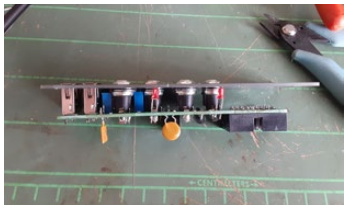
Position each LED so that it points into the center of the bare yellow part of the underside of the faceplate that it will be illuminating, and solder the LEDs in place. You may want to just solder one LED leg at first, and then use the LED leads to maneuver the LED into the correct place, melting the solder as necessary to get the correct placement. Solder all of the LEDs into place and trim their excess leads.

At this point, plug in the module to make sure all of the LEDs light up. Using one of the supplied DC extension cables, test each output using a a digital multimeter to make sure that each of the DC outlets have the correct voltage. Note that since we have trimmers on both 9V outlets, they will need to be adjusted to 9V, if desired, and will therefore probably read less than 9V at this point. This is normal.

Once confirmed that the unit works as it should up to this point, unplug the module and solder in the USB connectors. With needle nose pliers slightly straighten out the side prongs of the USB connectors so that they will fit through the slots of the faceplate. Maneuver the USB connector into place on the PCB, being careful not to bend any of the thin leads. You may need to bend the side prongs a little more, and maybe back again, and use some finesse to make this happen. Once properly inserted, carefully solder the prongs into place, and then the middle four pins. Do this for both USB connectors.

Double check your work carefully. Look for solder blobs, unsoldered pads, bridged pads, etc. Neatness counts…make it neat.

Plug the module back in, check that your USB connectors are supplying 5V by plugging something in, and away you go. Remember, if your Eurorack power doesn't supply +5V then the USB connectors will not work.



Always make sure to double check your pedal/device's polarity before you plug it into the Cat Powr. Make sure you understand what center positive and center negative mean. The red "+" means center positive, and the blue "-" is center negative. Again, double check all of this. You don't want to fry your sweet gear!

* This project is availabe as a 3U module as well.

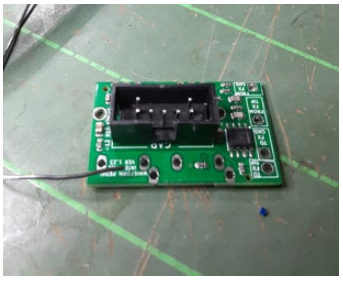
1U EFX PEDAL ADAPTER

The Waveform 1U EFX Pedal Adapter solves a few problems we kept encountering when trying to interface our pedals with our rig. The first is that sometimes the modular level is too hot for pedal input. The 1U EFX Pedal Adapter solves this by using an attenuator to tame this when needed, as well as a boost (when needed) to go back from your pedals to your modular.

The other problem is that we are drowning in cables and adapters of all sorts already, so we made it easy to interface our adapter with our pedals by using 1/4" jacks to go to and from your pedals.

The Pedal Adapter is 14HP, and has a black and silver faceplate. Instructions on how to build this are located in our Build Guide section.

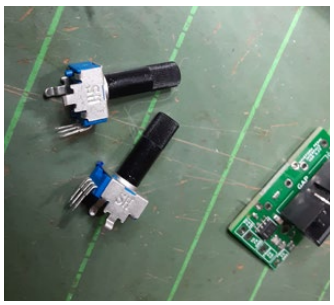
First, we need to pull a few pins out of the shrouded header. This is so that the potentiometers can fit nicely on the other side. Using small pliers, pull the three middle pins in the back row out of the header, the row furthest from the gap. The pins are not glued in or anything, and should come out fairly easily with a confident tug.



Next, solder in the header on the bottom side. Make sure to solder it in the correct orientation, with the gap in the header matching the gap outline on the PCB.

Solder in the jacks on the topside (the side with the outline) of the PCB. Make sure they lie flat on the PCB.

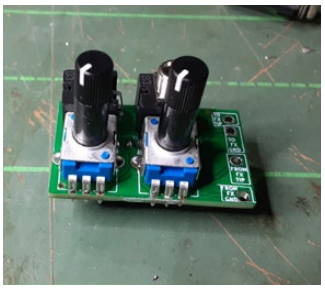
Next, we need to clip one of the side tabs on each of the potentiometers; the left tab on one pot, and the right tab on the other pot. These clipped pots will face each other when the potentiometers are put into place. The idea is to make sure the pots sit perfectly flat on the PCB and you'll want to leave a bit of the tab to be able to solder in from the top side. It's better to clip less at first, so you don't clip too much.



Snap the potentiometers in place, one at a time, and solder them. Make sure they are flat on the PCB, and solder the clipped tab from the top side. This will be a little tricky to do for the second pot, but it's doable.

Attach the PCB to the faceplate using the jack nuts.

Solder wires to the ¼" jacks. The angled side of the jack is the ground lead, and the side opposite to the right is the input. You can insert a ¼" cable and do a continuity test to make sure you're soldering to the correct lead, but use the photo for reference. Insert the ¼" jacks



Continued on page 28

Continued from page 27

into the faceplate and secure with their nuts.

All that's left to do is solder the wires from the ¼" jacks to the appropriate pads on the PCB. The "TO FX TIP" goes to the input of the "Send" jack, and the 'FROM FX TIP" goes to the input of the "Return" jack. The ground wires attach to the Ground pads on the PCB, and conversely, you can solder the ground lead from the Return jack to the ground lead of the Send jack, as long as one of those also connects to either of the Ground pads on the PCB. This is shown in the photo.

These projects and many others can be found at:
www.waveformmagazine.com/shop

1U CATSN BANANAS

The Waveform 1U Cats N' Bananas Eurorack/Banana Jack Format Jumbler Passive Module is 14HP and lets your Eurorack rig and your Banana Jack rig be friends. What could be better than that?

1U CATTENUATOR

The Waveform 1U Cattenuator module is a 12HP dual passive attenuator utility.

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1U RIBBON CONTROLLER

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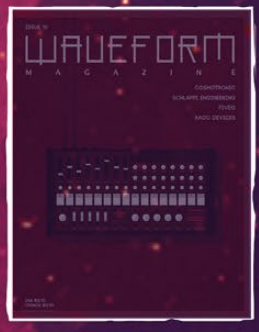
WAVEFORM magazine STUFF

T-SHIRTS

Only available here in our web shop, these shirts feature the designs of various Waveform covers. These are soft and on the thin side. We're super picky about t-shirts and we love these.



WAVEFORM MAGAZINE BACK ISSUES

Limited quantities of back issues are available on our website. Get 'em while the gettin' is good!

DIY EURORACK OSCILLOSCOPE

Easy to build, inexpensive Eurorack oscilloscope. The instructions on how to build this are detailed in issue #2. Faceplate width is 14HP and is black matte with a copper color trace.

SOUND OF MEWSIC EURORACK SPEAKER

Waveform DIY Project #7. Faceplate is black with silver and is reversable for those who don't like cats. Heathens. While the Sound of Mewsic probably won't crumble the walls of your synth cave, we sourced a pretty decent sounding speaker—especially for the size/cost—and have been very happy with it so far.

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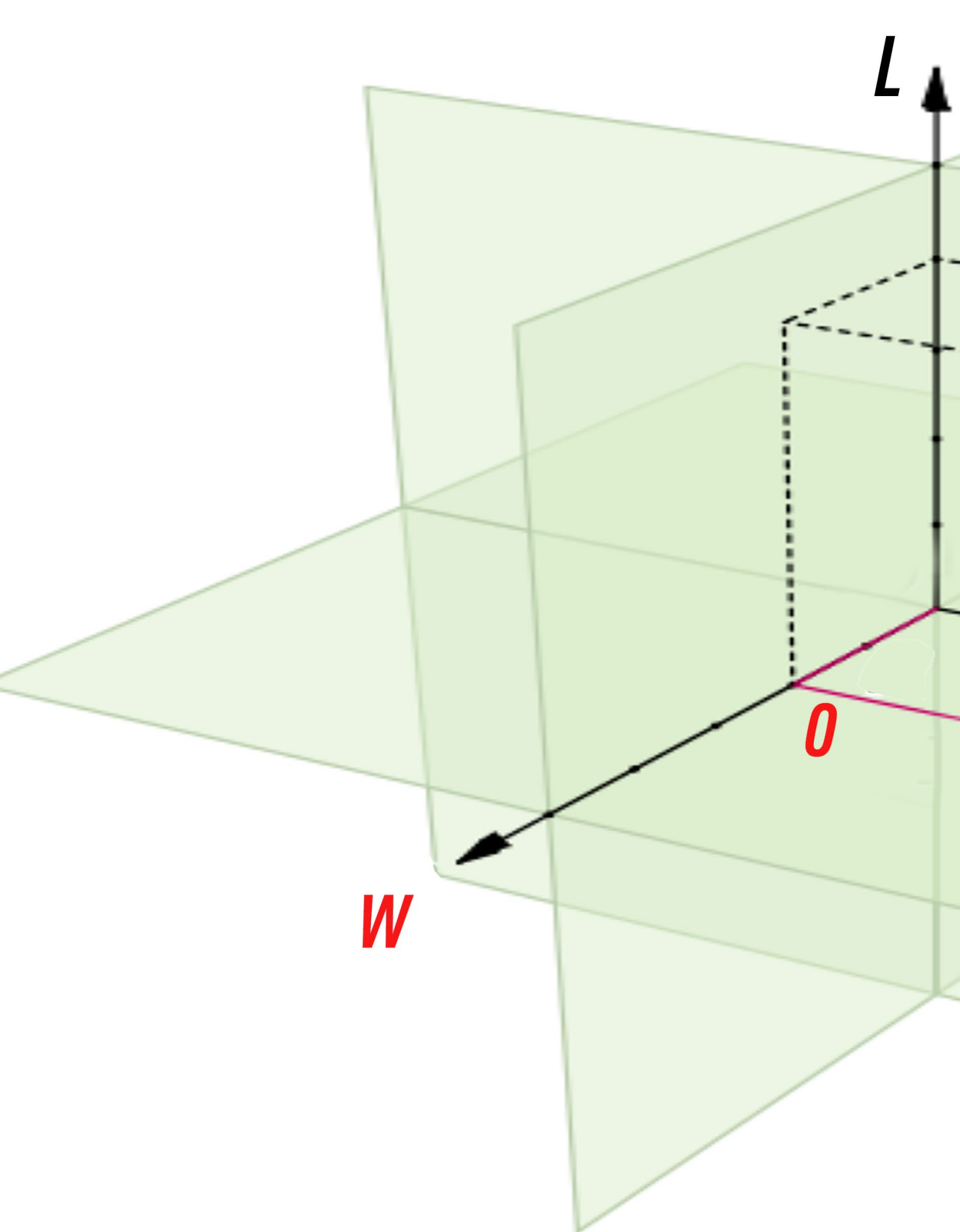
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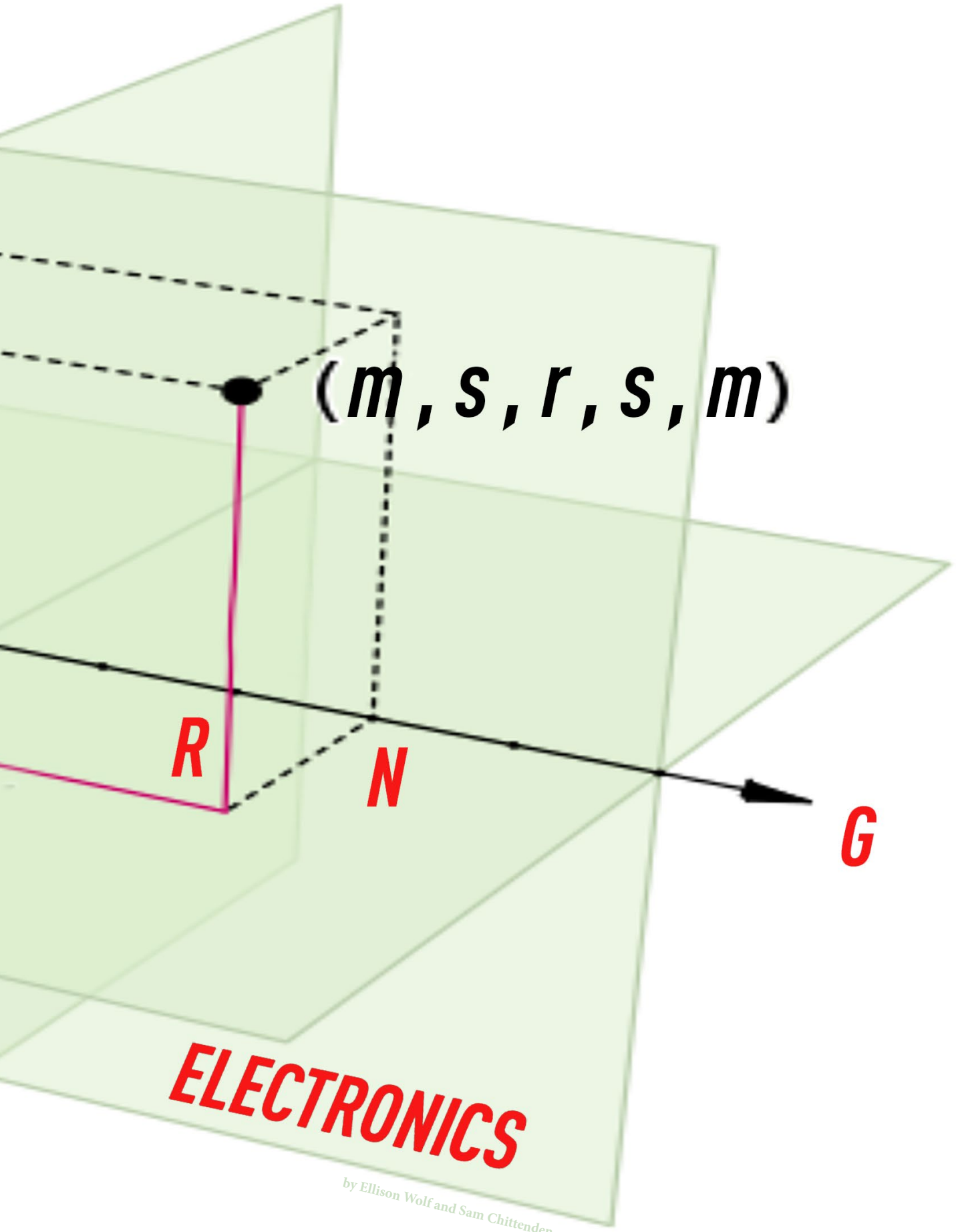


by Ellison Wolf and Sam Chittenden

I thought if I did that, I'd be forty by the time I finished, but I figured I was going to be forty someday anyway...

For a long time, I wasn't sure how to correctly pronounce the Australian modular company "WORNG Electronics," as I'd only seen it in print. I'd been going more phonetically, saying it "warr-ung," but it turns out that how I was saying it was…wrong, and it's actually pronounced, well…"wrong." WORNG founder Morgan McWaters likes the confusion. WORNG is misspelled on purpose, with humor, but also with the recognition that names often take on their own meaning, independent of standards and definitions.

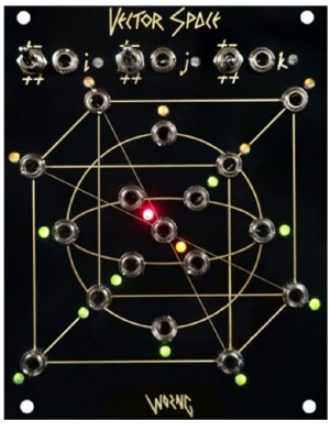
Waveform: WORNG is the name of your solo music project? That's how you came up with the name for the company?

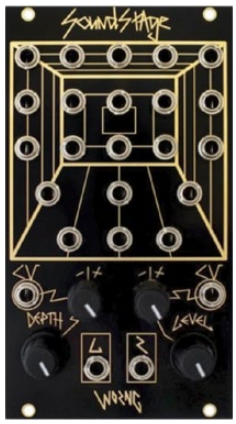
Morgan McWaters: Yeah, I needed a name for a gig and I thought it would be funny to spell "wrong" wrong so that if anybody Googled it, they would just get a bunch of websites where people had spelled "wrong" wrong, and then it kind of kept going and now it's the company. I think it's funny. Names end up meaning what they are rather than what they literally are.

Has music always been a part of your life? Did you play any instruments growing up?

I always wanted to. I had trumpet and guitar lessons, but my guitar teacher was my grade five teacher and she couldn't play guitar either. Then in the mid-90s when Prodigy, Fat Boy Slim, Orbital, and bands like that were getting big, I was like, "I want to learn how to do that." I didn't do it until a friend started a band as a media school project and it turned into a real band called The Emergency. They used to practice at a shared house that I lived in and one time they had a show in a venue that only had two DIs and they had four keyboards, so they hired a little mixing desk and nobody knew how to use it. I was like, "I think I could work out how. I read the manual. This is the volume and then this is what EQ does..." I would just stand there mixing on stage and pressing play on the MiniDisc player, which had the backing tracks. I started playing around with effects and eventually learned how to play keyboard. I had an MPC and I would just

Previous Page: **Morgan at Superbooth, Berlin, 2023.**
This Page: **WORNG Vector Space, Soundstage, and LRMSMSLR Modules.**
Pages 34,35 Bottom: **Morgan Backslide Slappy Tailslide.**
Page35: **WORNG ACRONYM, Parallax, and Vortex Modules.**
Photos provided by WORNG Electronics
Skateboard sequence stills taken from Tired Skateboards "The New One" video





I had the idea for the Vector Space when I was sitting in math class.

put the notes I wanted on the pads and play stuff on that. That's how I got in the band. We went through a few different personnel changes, but the main guy and I were there through the whole thing, for thirteen years and we toured, and played shows in Vietnam and a festival in Portland (Oregon). I'm still not great at playing, but I really hadn't played any instruments before that.

You found your way on stage.

Yeah, and then my way off stage (laughs) to the mixing desk where the person always gets paid! I don't like touring and it got to the point where I thought there were but two choices; I could be the grumpy sound guy that the people in the band would be like, "You don't even understand music," or I could buy a PA and be one of those "PA for hire people."

Working live sound is so taxing. I couldn't do it, but that's what you chose.

I find the good bits that I like and then make the good bits louder. I always try to be as excited as the bands are because if they're not feeling comfortable and happy on stage, then they can't play well, and if you think something's terrible, you can't make it sound good. I put a lot of effort into trying to make everybody feel at home, but it gets hard when you're doing it all the time. It can make you a bit jaded. So that was my day job, for like fifteen years or so, until quite recently, though I still do a bit of live sound for fun. I also worked at this studio and synth museum in Melbourne called MESS (Melbourne Electronic Sound Studio) for a while, doing repairs for them and trying to maintain everything. It was fun, but I never meant to be a vintage synth-restoring guy. The cost of vintage synths has gone up so much now that you can't pull apart an old one to fix another one, and you've got to be really careful when you're working on something that is worth ten grand. There was a guy named Steve Jones who was a keyboard tech for INXS in the 80s and has a website called "Secret Life of Synthesizers" and who knows everything about fixing old synths. He started working on some of the things there and when Covid happened and it just seemed like a good time for me to not do that anymore.

Did working at MESS get you into modular?

I'm a person who fiddles with stuff and makes things and about eight years into The Emergency I started getting into modular. We had a drummer for a little while, and I put triggers on her kit and ran them into a modular, and made this big digital patch that she would play by playing the drums. There are a lot of bands that have electronic stuff and a drummer, but the drummer is just playing along to a click or whatever, and I was like, "That's not why you have a drummer." Drummers are cool because they speed up and slow down at the right time so I made it where the bassline would be triggered by the kick drum and stuff like that.

That's pretty cool, letting the human dictate the flow instead of the computer. Have you always liked making things?

Yeah. When I was a kid I had little screwdrivers and I would take things apart. In the 80s my mom went to Hong Kong and brought me back a little watch that had a radio in it, but the reception was really bad. I took the watch apart and put it back together and worked out how to run a wire to the metal screen on my bedroom window and attach it to the watch so the reception was better. It was fun.

I did that with a crystal radio when I was a kid, and at first attached the ground to the heating vent in my room, but then thought it might work better if I put the wire in the electrical socket, to give it a little extra juice! That was the first—but not the last—time I felt what a shock was. So how did you go from randomly sticking wires into working electronics to building your own?

Me and one of the other guys from The Emergency were drunk one night watching bands and we were like, "We should make effects pedals." They were really expensive and we thought we could make them, that it would be easy.

Did you have any idea what you were talking about when you said that, or was it just drunk talk?

No. I'd made a Theremin kit and a really crappy mixer from the

Australian version of RadioShack. It was one of those things where I said that I was going to do it, but I didn't know how. I started making modules when I got into modular and then I started learning. The very first module that I made didn't work properly, but I changed a few things on it and managed to make it kind of work. I really wanted an Oberheim four-voice, but they're expensive, so I tried to make a big modular keyboard instead. I bought a key bed, and a friend of mine who was a woodworker made the case and I started trying to make the circuit for the chip to read the keys and make the voltages. I started doing an online course to learn to code for that and my partner at the time was like, "Why don't you just go to uni to learn?" I thought that if I did that, I'd be forty by the time I finished, but I figured I was going to be forty someday anyway, so I went back and studied electronic engineering. I didn't finish because there's so much math and things like doing the calculations to work out how much radiation comes out from an antenna for a mobile phone.

Which doesn't really apply to what you wanted to do anyway…

I was just like, "I'll learn everything I need to make modules." The (LRMSMSLR) MidSide module I made after three months of studying. I also looked at the Music Thing stuff that Tom (Whitwell / Music Thing Modular, Waveform #5) put online and saw how he laid out a circuit, and then I taught myself how to use Diptrace to make circuit boards and from there just kept going. The first circuit board that I made for the MidSide didn't work properly because I decided I could do some shortcuts to use fewer parts. I tried to do it with four op-amps instead of eight and that was wrong. I had made it on a little perf board thing, and it was all janky, but eventually it worked and it's still basically the exact same circuit. I wanted one to use for my solo project and that's why it's got "WORNG" written in janky letters on the front because that was the name. I wanted it to look like the Metallica logo but because it's on a grid there's not enough resolution to be able to do that so it came out looking like it does, and that's the same logo that I still use.

When you came out with the second iteration, the eight-op version of the MidSide, and you were happy with it, did you just start sending it around to see what people thought?

I was like, "Maybe I'll just have two," but then the shortest production run I could get was ten, so I posted on a forum, "Hey, I made these. I've got eight. Anybody want to buy them?" They sold really quickly and then there were a bunch of people who sent me messages that wanted one too, so I got another twenty made and they sold. Then towards the end of 2015 Steve from Thonk sent me a message, "I'll buy a 100."

That's cool. Did having Thonk place that order give you the confidence to keep going with it because you came out with the Vector Space after that?

I had the idea for the Vector Space when I was sitting in a math class at uni when I was studying engineering. We were doing vector math and I just started thinking about modules and I was like, "How can I do three-dimensional vectors in a module?" One of the things that made me think of doing Vector Space was that I had three MidSides and I was patching CVs into them and then cross-patching between them to mix a whole lot of stuff and I got some cool things, and when I was sitting in that class I put the ideas of them together and was like, "I could just have these three inputs and use three-dimensional space." It's based a little bit on the J.A.G, the Grant Richter Wiard module that has gargoyles on them. I wanted a J.A.G. but you couldn't get a new one anymore and I couldn't find one. I'd never used one so I didn't really know how it worked, and I was imagining how that would work in 3D. Eventually, after Vector Space came out I found a J.A.G. second hand and I bought it and it didn't work at all how I thought it would.

So you were wrongly inspired by it. It's always interesting when you have your own original idea due to a faulty interpretation of someone else's design.

When you base something on something else, you are a little bit worried that someone's going to say that you just copied that thing. After Soundstage came out, Grant Richter messaged me and posted on Facebook, "This guy's making some wild modules." We wound up chatting about some circuits and stuff and he told me that the J.A.G. was originally a quad-panning circuit that he made for somebody. Vector Space took me two years to finish because I tried to do it all through-hole, and just laying out the circuits and everything was a nightmare. At one point, it was going to be three circuit boards.

Three boards could have been cool in a meta sort of way, kind

I always thought I would...get a boring job, like designing microwaves or something, and eventually...I would learn enough skills to make synths.



of mimicking an actual 3D vector space in its physical form. That maybe would have been a lot of work to actually make, though. Was the manufacturing something you were thinking about at that point?

Yeah. At the first Superbooth I came to in 2017, I talked to Malekko because they did production for other people and I was like, "I've got this design and I can't make it fit on one thing." And they were like, "Yeah, you can." I realized then that I just needed to get better at this.

So that's when you started doing things with surface mount components? Did you have any experience with SMD stuff before that?

I had an MPC and I would just put the notes I wanted on the pads and play stuff on that.

No, and I wasn't using hot air or anything, and was doing it with the crappiest five-dollar soldering iron for kids that I bought years ago from Dick Smith, which is like RadioShack.

(laughter)

SMD gets such a bad rap. It can be hard, especially at first, but as long as you can get that first side into place…

Yeah, just get the corner, and then if it's not straight just give it a wiggle. When you're just learning how to do something and you're not very good at it, you don't realize how annoying it is and you have a lot more patience for it. When I was studying sound engineering and first started using audio software, I used to make songs by cutting up beats and editing everything manually. There's absolutely no way I would ever do that now, it just sounds boring because it's the same thing over and over again.

With Vector Space, once you got the SMD down and everything, did you wind up manufacturing that yourself?

No, I get production prototypes, but usually the first time I see a production module is when they get it in at my friend's shop (Found Sound) in Melbourne. I changed over to the matte faceplates a couple of years ago and didn't see a matte Soundstage until they'd already been out for like a month or something.

I was going to ask you about that because the Parallax and Vertex that I have are almost a different color matte. Is it the same manufacturer?

The circuit boards and the panels are made by one manufacturer, but they'll farm it out sometimes. The Parallax came out a little bit lighter and I've tried talking to the factories and asking if we can get it done at the same place with the same stock and they're like, "No, we can't do that." Then there was an issue with the new Vector Space. The old one had the LEDs poking through the panel and with the new ones they're backlit. The very first production prototypes had a UV-resistant coating as part of the PCB, and it filtered out the purple light from the purple LED, and when I got the production prototype and I plugged it in, it looked like they were two white LEDs. I was like, "What's going on?" I thought I was going crazy. I pulled it out while it was still plugged in and I saw that it was purple underneath, so we ended up changing it for a pink LED, which when it goes through that coating, comes out looking exactly the same as the purple one does. But then with the production ones, there was no UV coating.

So they're wildly inconsistent with small things that make a big difference. It's still the only way to go if you want to do see-through stuff, using PCBs for the panels.

One of the reasons that I did the Vector Space like I did is because now I can do short-run one-off panels. I've done that for a few shops like Found Sound, Signal Sounds, and Midwest Modular. I

make like fifteen of them for the shops as a way to say "thanks for buying my modules." I'm planning on doing a few more.

I know that the Jumble Henge module that was released by ALM was a collaboration with you. How did that come about?

I had met Matthew briefly at Superbooth and he sent me an email to see if I would be interested in doing a collaboration. The thing that's amazing about modular is people from different companies can do things together and it's not a competitive thing. Doing that was amazing because they're very big and I'm very small. The circuit is just the Soundstage circuit that I changed a couple of things on, and I think it was like maybe a working prototype in two weeks.

had already done. I really like wavetable oscillators but they can have some nasty unwanted sounds due to being digital so when the 2130 chip (Ed. - Sound Semiconductor SSI2130) came out I immediately saw how I could do something wavetable-ish with it but keep it all analogue. I always design the front panel first, as the human interaction part of the design is the most important, and that initial design is the one that made it to the final version, but there were a couple of issues with the chips. I discovered a situation where they would lock up if the power came on in with a particular delay on the negative rail, and it took a while to design a solution to that which was simple, cheap and reliable. Then there were a few delays and redesigns due to parts issues from the pandemic, so it ended up taking a lot longer than expected, but I'm really happy with the way it came out. It's really usable

...it was a revelation, like you can just start a band, nobody will stop you.

What is it with you and stereo? All of your modules except ACRONYM have stereo capabilities, or some sort of spatial sound movement, as a main feature. Why are you so focused on bringing stereo and that multi-dimensionality to modular? Is it because of your live sound background? Did you just see an opening like, "Hey, this doesn't exist. This needs to be here."

Yeah, a bit, but most of it's like, "I wish there was something that did this," and then I make it. Also, I'm learning how different circuits work all the time, and thinking, "What can I do with this thing that I just learned how to do?" I never really think about where there's a gap in the market or anything like that, and there are enough people that ...well, actually, I do have to spend a lot of time convincing people why stereo is cool.

(laughter)

What's your reasoning? So many audiophile people want surround and yet modular is like, "Nah, mono. Maybe stereo." Why is stereo cool? Convince me.

The first proper synth I bought was the (Dave Smith Instruments) desktop Evolver, back in 2004, and that's all stereo. I really liked playing around with stereo and being able to do FM, having the two voices and stuff. And then I had the Evolver keyboard, which I was playing in The Emergency. I had a (DSI) Tetra that I was controlling with the Evolver and running that to the audio inputs, doing a lot of processing, patching stuff around, and when I started in modular I just missed doing things in stereo.

ACRONYM is your newest module, but your first that is actually a sound source, if you except for your filter Parallax, which can self-oscillate. Why did it take so long to make a VCO/sound source? For a lot of companies, that's one of the first modules they make. What was the design process for that one? Were there any complications?

I wanted to do something that had a very WORNG character to it, rather than just make something like what other people

and musical and has a big timbral range.

You mentioned that you've made special edition versions of modules for shops, and I got one of your special Superbooth edition dual LPG DIY kits that you gave away a few years ago and I use it all the time in patches. Have you released any WORNG modules for the DIY market?

Just the original MidSide and a Turing Machine low pass gate expander. I got the Mix Expander (for the Music Thing Turing Machine) and realized that if you change a couple of resistors to capacitors in the circuit, it turns them all into low pass gates. I did that and then I added a little circuit so you can flip some switches to change the order that the LEDs go.

I love that there's such a strong DIY component in the modular scene. It's a really important part of the community and a great way to learn about electronics and gain confidence in that realm.

Yeah, everybody starts out somewhere. I emailed Dan from 4ms (Waveform Issue #1) once because I wanted the footprint for the right-angle jack that is in the (4ms) Rotating Clock Divider to use for the MidSide, and he was like, "I could give it to you but it's really easy to work out how to do it yourself." That was good advice.

Yeah, it's better to learn. Was that the first footprint you had ever made yourself?

Yeah, and now I don't trust anybody else's footprints. I make them all myself because you don't want to get a whole bunch of circuit boards made and somebody else's fucked up footprint causes your thing to turn out wrong.

You mentioned earlier that you studied sound engineering as well as electrical.

It was a vocational education **Continued on page 78**

DIY SPOTLIGHT: AI SYNTHESIS

BY WILLIAM STOKES

Speaking to me from his workshop in Portland, Oregon, Abe Ingle makes no song and dance of the DIY business, wryly gesticulating to the modestly-sized room behind him when describing his company's design, assembly and warehousing operations. Shrewd, sharp yet urbane; Abe is a musician who demonstratively appreciates having and using good tools for his craft, and ostensibly it's that simple adage at the heart of AI Synthesis. "If you need support, I'm here. I'm fairly approachable and I *try* to be nice," he grins.

Hi, Abe. Tell us about how you got into DIY.

I was interested in DIY in the late 90s and early 00s, when I was in college. I went to Evergreen, which had a number of Buchlas and ARP 2600s. The electronic lab was based on 70s style, West Coast stuff, but there was no way I could afford or even find a Buchla at that time so I got interested in DIY, but I was a college student without a lot of space, and just kind of gave it up. Then, sometime later, this local guy had a half-working Music From Outer Space system that he had cobbled together and put on Craigslist, and he had made his own faceplates, super-DIY. So I emailed him and we worked out a deal. Half of it worked and half of it didn't, and there was a MFOS Wave Freaker PCB, which I built. It worked immediately and I was like, "Oh! Maybe I should have been using PCBs!"

How did that lead to AI Synthesis?

Just because it's DIY doesn't mean it has to look bad.

I thought I could do it a little better than what was going on, so I started AI Synthesis. AI are my initials, and it's kind of a throwback to, DSI (Dave Smith Instruments), ARP (Alan Robert Pearlman) and all those companies. I put out a passive mult as my first product and bought fancy aluminum panels and did the whole thing. And the idea was that it's DIY, but when it's done, it should look just as good sitting next to something by Intellijel, or whatever. Just because it's DIY doesn't mean it has to look bad. There was this weird stigma against DIY versus commercial builds, but even if you get an SMD build, it still has to go to an actual person to do the jacks and the pots, so everything you get is kind of DIY, you know?! Anyway, the mult sold and then I came out with a mixer right after that, and those sold. Then I grew the company and I had to choose between AI Synthesis and my day job, and I chose to quit my day job. It's been six years since that happened.

You've chosen to remain in the DIY world instead of making ready-built modules. Why is that?

I operate in the DIY world because I come from that. And I know it. When you operate a business like this—a one-person business—you don't have a marketing team, there's no intelligence. I've got my sales numbers and I've got friends here in Portland who are also Eurorack makers, and we get together and have beers and talk about how things are going, but we know nothing compared to a guitar manufacturer where there are industry reports and real numbers. But I know what it's like to be a DIY-er, I know that in my heart, and that takes away a lot of questions. I can make decisions easily and with a high degree of confidence, because I am a synth user and a maker. It's certainly not no-risk. It's not like everything you put out is going to make a ton of money. None of us make a ton of money, but it's less risky.

Tell us about the AI018 Stereo Matrix Mixer.

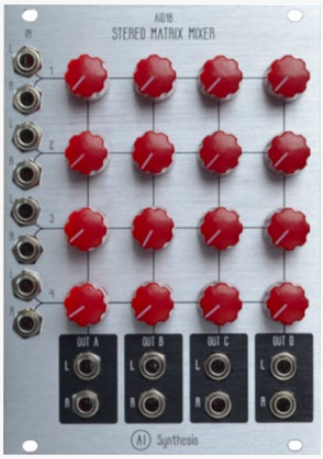
I put out a mono matrix mixer a year or two ago, which is the AI008 Matrix Mixer, and that's been popular because it's a little smaller than a lot of matrix mixers out there, but it's still ergonomic. Electronically, it's basically the same concept as the Stereo Matrix Mixer. I'm a musician, too, so a lot of things I make are things I want, and I was trying to put down a synth bed to be interspersed by a kick drum. I was routing stuff using two mono matrix mixers through some of my Strymon effects and I was like, "I guess I need a stereo matrix mixer!"

Can you give us an example of how you might envisage the AI018 being used?

Matrix mixers are great in performance for creating builds. If you've got stuff going into a delay and you're doing that end-of-measure build, you can start sending the delay back into itself, creating these feedback segments that cause so much great audible tension, and then you can just end that at the beginning of the next measure with one knob. It's terrific for that. One thing I want to make is a percussion video with the Stereo Matrix Mixer. Let's say you put in a stereo hi-hat or something and you want to pan it, you just take the side you want less of and put an attenuator in there. And by putting less of it in the left, there's more on the right. So you can easily pan drums and stuff with passive attenuators, or any single source for that matter.

BUILDING THE AI SYNTHESIS AI018 STEREO MATRIX MIXER

BY WILLIAM STOKES



Above: **AI Synthesis AI018 Stereo Matrix Mixer**
18HP, +12V = 20mA, -12V = 15mA
Photo provided by AI Synthesis

Matrix mixers are proof that math can bring out new worlds of sound in your system. In many ways they encapsulate much of what we love about modular: lateral thinking, patching things in ways they're not "supposed" to be patched, turning gestures into sounds. AI Synthesis' AI018 Stereo Matrix Mixer adds another level of mind-bending to the equation, with four sets of stereo inputs and four sets of stereo outputs to play with, and normalled left/right connections allowing for mono inputs to be expanded into the world of stereo. A grid of sixteen knobs allows for attenuation of the signal between any or all of the above.

The AI018 kit is one of the finest examples I can give of an easy build that simultaneously comes with a healthy dose of challenge. Its bill of parts is simple: six capacitors, four integrated circuits, two spacious PCBs, and...(coughs) sixty-six resistors. Taking the AI018 out of its packaging, a roll of 100K resistors unfurled across my table like a chain of ammunition. "It's a lot, but after this it's really easy," Abe assures us in the build guide.

"Accidents happen," he shrugs when I fret to him about my IC mounting skills.

Of course he's right. This is a great training ground for entry-level solderers keen to improve their skills, so put some music on, get a cup of coffee, and get soldering. If any more persuasion is needed, Abe's written instructions are very clear and easy to follow, and the man himself is famously responsive and helpful. "Accidents happen," he shrugs when I fret to him about my IC mounting skills.

After some healthy soldering and a bit of fairly fiddly knob alignment, I was ready to go. Everything here feels firm and well-built and there's decent margin for error if some of your resistors stand a little prouder on the PCB than you'd like. I tested the signal paths by sequentially patching a single sine wave into each input and testing the attenuator while metering each level, then switching my mixer input from one output to the next.

In use the AI018 is a joy. Let me give one simple patch example as succinctly as I can: First, I patch a simple drone out of Xaoc Devices' Sofia with just a little modulation of its Warp parameter for some subtle timbral shift, into the AI018's Input 1. We'll call that Oscillator 1. I then patch Output D of the AI018—both left and right—to my main mixer. Turn up the Input 1/Output D—knob 1D— and we hear Oscillator 1's dry signal. I then patch Output A to the Sofia's FM input. Output B, both left and right, goes to a stereo Qu-Bit Aurora Spectral Reverb. I then patch back the left and right outputs of Aurora into both sides of Input 2 on AI018. Output C of the AI018 goes to a Modbap Hue, a mono insert effect I'm using for distortion. Hue's output is then patched back into the AI018's Input 3. Lastly, I patch a second mono oscillator into Input 4. This patch is a combination of stereo and mono, all feeding each other, expanding and contracting the stereo field as they stretch and squeeze each other. From here it's a sonic playground, one that rewards rule-breaking. If I turn up knob 1B then I feed Oscillator 1 to both sides of the Aurora. If I then turn up knob 2D then I hear the output of my drone signal going through the stereo reverb and into the mixer. With the reverb set to fully wet—like a send—I can mix the wet and dry signals to taste by adjusting knob 1D relative to 2D. If I turn up knob 2C then I simultaneously send the left output of Aurora to the mono Hue, leaving me free to send its right output elsewhere. I could choose to patch the left and right channels of my mixer to two different output channels, meaning I can also adjust panning with the AI018's attenuators.

This is the magic of the Matrix Mixer. I can turn up 4A to have Oscillator 2 modulate Oscillator 1 at audio rate and generate some angular harmonics to feed my distortion, or I can mix it into the signal path as source audio—or both. I can have it stand clear of the whole mess and go completely dry into my mixer if I want to, and if I want even more variation I can always patch two different mono oscillators per stereo input on the AI018. I'm beginning to play some serious games with my routing.

The beauty of the matrix mixer kit is its simplicity. It's a cinch to construct and there's a genuine feeling of accomplishment when you get to the end of that chain of 100k resistors! It's a beautifully simple design, allowing the modules around it to literally become more than the sum of their parts. I still haven't gotten far beneath the surface of this thing.

touellskouarn

by Ellison Wolf and Sam Chittenden

It was too dangerous to play with tubes because I didn't know what I was doing.

Gaël Loison fell in love with the sound of tubes after finding a small amp from the 60s in his father's basement that needed repair. Although there were no schematics, and it was a rather dangerous undertaking due to the high voltages inherent in tube circuits, he was intrepid and wanted to make it work, teaching himself electronics in order to restore it. He still uses the amp to this day.

In 2010 Loison would go on to start TouellSkouarn, which translates to "ear candy" in Breton, the language of his native Brittany. With an ideology that leans towards preservation and reclamation, Loison finds inspiration from the golden era of tube design to utilize his store of vintage tubes, which vary wildly in shape, size, and function, with many of Loison's designs built around circuit basics that have remained nearly unchanged for over half a century.

Talking with Loison it becomes obvious that history and place are important, and being able to work, live, and manufacture locally in the Brittany region of France is a source of pride. It's all part of the aergelc'h ("atmosphere, vibe" in Breton) that makes Touellskouarn so intriguing.

Waveform: Your introduction to tubes and electronics seems almost predestined.

Gaël Loison: Yes, I found a small amp, a prototype of something from the 60s in my father's basement. It was for a project for school and, it was built with tubes and it was not working. I wanted to repair it, to make it work, but there were no schematics or anything and. It was too dangerous to play with tubes because I didn't know what I was doing so I decided to learn electronics. I spent two or three years making every pedal I could get my hands on the schematic for, and built them to learn some skills and. Then I fell in love with the sound of tubes and built my own amps.

Had you experienced soldering and doing stuff like that before that?

Oh no. Straight from scratch to building very small pedals just to learn the process until I found myself confident to put my hands on the amplifier and the 200 or 300 volts.

Photo Spread: **Celtic Sea, 2022.**
Photo: Gaël Loison
Previous page: **Gaël performing in Brussels, 2018.**
Photo by Zark_be
This page: **Gaël's Touellskouarn setup.**
Page 40: **Touellskouarn modules.**
Page 41: **Fuzz PCBs, tube amp project.**
Photos provided by Gaël Loison

I'm looking to the 50s and 60s to find some types of inspiration.

When you finally started trying to repair your father's amp, how long did it take you to diagnose what was wrong with it?

Well, nothing was wrong, really. I just had to change some parts because it was very old. I had to change the capacitors and find the right tubes. The tubes were missing and I didn't know what type they were. It was very simple, like a guitar amp and so I reverse-engineered it, I followed the topology and the circuit and wrote out the schematic so I was able to repair it.

That must have felt pretty great. Do you still have that amplifier?

Yes. I still use it.

Was TouellSkouarn born through that process?

I was making for myself some DIY pedals and synthesizers, they were metal boxes, really weird shape,, and I posted on social media. Someone saw it and reposted it and then some shops asked me to make them.

So you started making them for yourself, for your music?

Yes. I play in different bands, and I made them because I wanted to play with them live and in the studio. After I built some pedals, somebody said to me, "Why don't you make a Eurorack system because you can use it directly with your synthesizers?" So I made Eurorack just after. I had some Doepfer stuff before I started making modules, when I was making the pedals, but I couldn't make modular synths because it was too complicated. Then I began working with small projects and growing the sizes, and then at some point I could do modular.

When you started making pedals, were you doing it with tubes?

I started with tubes, repairing tube amps and making tube amps for myself.

Were you doing this as a profession?

I am an independent graphic designer and I switched activities ten years ago when TouellSkouarn started to take its place. Now it's mostly TouellSkouarn and a little graphic design.

Did you ever think you'd ever be a musical instrument maker?

No, I never thought that, but it's nice.

When you're working on a tube circuit, do you think of one that you want to make and find the tube and build around that, or do you have a tube and build a circuit around it? Do different tubes inspire different ideas?

I don't know…I have the idea and then I look for the tubes, or maybe I see some schematics. There's a lot of schematics on the internet, so basically when you see transistors and see the circuit you can adjust the device and use tubes instead.

Is that a hard thing to switch?

Sometimes. Depends on the tubes, and on the different diagrams.

Have you had it the opposite way where you have a tube and look for a way to use it?

Yes. I have so many old tubes and not common ones. Some are very, very strange tubes. I have plenty of tubes, all sorts.

Is there a module of yours that you found particularly hard to make because of using tubes? I know not everything you make is tube-based.

Yes, the Ring Modulator (Blokañ) was tricky because normally, when you have a Ring Modulator you have a ring of diodes that have to be matched, and when you use tubes, you can't match them exactly so it's always bleeding. The Ring Modulator I made with diode tubes and it's very leaky because you can't match them.

It's making a noisy type of sound and the curves of the diodes are not the same as silicon or germanium diodes.

So you get variances with the tubes. That's what gives them the mystique, right? Do you ever find yourself being frustrated with the process of creating a circuit around tubes?

Yes, sometimes. I'm looking to the 50s and 60s to find some types of inspiration…I have so many old tubes, some uncommon ones and an old tube might have a very strange circuit, but I will find a use for it sometimes. I have to see the characteristics to figure out what I can do with them and sometimes to find the right tube is difficult. You will find a tube that is very nice for the circuit but you can't find a lot of them so you can only make a personal project.

I imagine that you're probably getting vintage tubes wherever you can find them.

Yes. A friend came by some while ago with boxes full of tubes, his father was a radio repairman back in the 60s. Some are very good for making HiFi amps.

Have you built a tube HiFi stereo for your house?

Three, actually. I like to research tubes so I have some very small tube amps for my office when I'm working on the computer made with spare parts from an old television and an old radio. I salvaged parts from there and then built my own from that.

When you say that you salvage parts, which parts are you talking about? Resistors? Transistors?

Sometimes, if they're good. I measure them and if they're in spec I keep them.

Capacitors, too?

The electrolytic capacitors go in the bin directly. Some of the ceramic ones are still good so I keep them. Tropical capacitors, those are nice. Transformers you can salvage…I like the look of the old stuff. Sometimes you have an old radio that's not working, and I can retrieve parts for making something else, for a pedal maybe, but just one pedal, not a series. And when I find another part, I can build another one.

Do you look around and collect old stuff so you can salvage the parts later and build stuff out of them?

I did, but I stopped because stuff is getting expensive. I do collect synthesizers, though.

What's your favorite one?

Korg MS 50.

Those are cool. Have you designed any products for sale, one-off, special ones where you have used some of those salvaged parts in?

No, it's for my personal use and for friends.

You said that when you started building pedals it was to use in your own music. What kind of music do you play?

T: I have a jazz band, Dale Cooper Quartet & the Dictaphones. It's a mix between jazz and doom and metal music. We are three, but when we play live,we can be five, six, and seven…We have a saxophonist and the rest are guitars and three singers; two female and one male vocalist. We're good friends. We play a lot in Europe; Germany, Romania. Eastern Europe. I also play a lot of ambient and experimental, and I have an electroclash band (Maman Kusters).

Do you play synth in Dale Cooper Quartet & the Dictaphones?

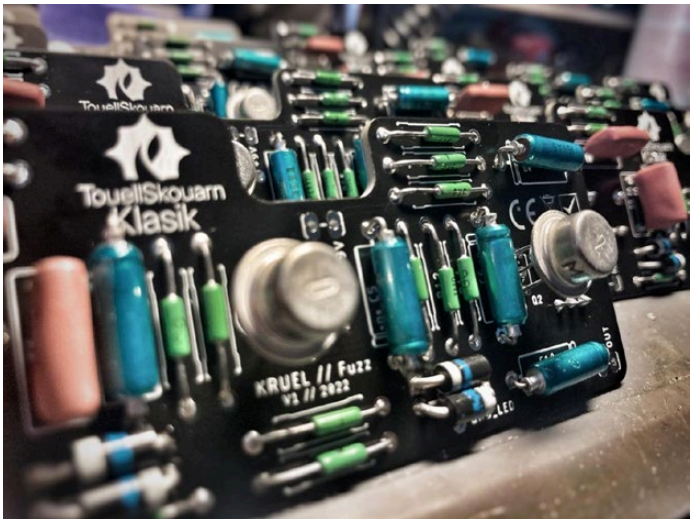
Yes, but sampler, mostly.

Have you been playing together for a long time?

Over twenty years.

Wow. Have you been a musician your whole life?

I have to see the characteristics to figure out what I can do with them and sometimes to find the right tube is difficult.



Sometimes you have an old radio that's not working, and I can retrieve parts for making something else, for a pedal maybe, but just one pedal.

Yes, since I was seven, eight.

What instruments?

Floor organ, with the two keyboards.

What originally sparked your interest in synthesizers?

Just making noise. I grew up listening to Depeche Mode (Gareth Jones's albums), Kraftwerk…

There was a prototype of a synth you are making with eowave (OSTILH) at Superbooth a few years ago. How did that come about? Is it close to being released?

Yann Tiersen, who is a good friend, said that it would be very cool to make a synthesizer —a Breton one—so I talked with Marc (Sirguy) from eowave about making a new four-voice analog desktop synth that you can put also in your Eurorack case. It took time because of the Covid and just being very busy building our own modules. We had to go to Yann's place on an island near Brest to see what he likes about the synthesizer and listen to him play with it; then we would make some adjustments. It's between paraphonic and polyphonic.

How is it "in between"?

In between because each VCO has its own VCA, but it shares one filter and one final VCA. The audio path is analog, and all the commands like envelopes, LFOs, sequencer, and delay, are digital. They are from Marc because he's very good at making them. You can store a sequence, but you can't record everything, you have to take a picture of your settings.

I remember when I used to sketch out my pedal and synth settings for shows and when the technology came and you could take a picture with your phone it felt like the future had arrived. How was the collaborative process with Marc?

Good. We exchange ideas, schematics…we share everything, and then we split the manufacturing.

Do you enjoy working with other people?

Yes, normally it's just me, but I work with other manufacturers, like Befaco or Endorphin.es. Andreas from Endorphin.es and I, we are helping each other. He's better than me at designing devices and I sometimes send him my schematics, my designs, so he can correct them or say what I'm doing wrong. This kind of exchange is really nice. Also, I've made three records with Julia (Bondar, Endorphin.es), and some mastering and some mixing for her. I have a studio where I make recordings for my bands and also mix for other people. I have some really good outboard gear with tubes, some preamps for microphones. The PA in my studio is tube-based…

Did you build that as well?

Yes. It's not that powerful but it's enough…it has very efficient speakers.

When you build a microphone preamp and things like that, do you follow a schematic?

The one I have has a very nice high-end French transformer from the 50s, that was found by a friend. I don't remember the name of the brand, but they are very famous in France for making transformers for the radio station, Radio France. He had this transformer and sent me some schematics from the 50s where the transformer was used in a microphone preamp, so I made it exactly with the same tubes and transformers.

Continued on page 79

Looping Delay and Sampler
4ms
4mscompany.com

Having been a longtime user of both 4ms' DLD (Dual Looping Delay) and STS (Stereo Triggered Sampler) it's easy to see that there is probably no way that either could be viable DIY modules. I've looked at the PCBs, and unless they came with everything but the jacks and switches soldered in, they'd be much too dense, complicated, and SMD-based for even the most diehard DIY-er. Not so with 4ms' new Sampler and Looping Delay, single-channel DIY-focused versions of those classic 4ms modules that bring most of the fun and functionality of their longer-named antecedents. While these arrived for review fully assembled (whew!), and can be purchased assembled as well as in kit form, a quick look at the 4ms website shows the parts bag, and it looks like a totally doable affair. While these new modules are sans the cool palindromic monikers, the mirrored left and right sides, and the mostly white faceplates, they look exceptional…really. There's something about them, perhaps a lack of fussiness or busy-ness that is very appealing, a simplicity to the layout and design that speaks well to 4ms design aesthetic.

It can be used in mono or stereo and it offers up to 87 seconds of maximum delay/loop time when in mono, with about half of that time (43 seconds) available in stereo mode.

First up is the Looping Delay. As with the DLD, this is a modern digital delay with a crystalline sound and perfect sounding repeats. While I'm also a fan of more vintage style delay tones, and definitely the machines that make them—basically any tape machine ever made and things like the Binson Echorec and the Morley Oil Can Delay—I find myself wanting more and more something with cleaner repeats and flexibility than a lot of the older delays offer. A clock-based delay, LD has a 48kHz/24-bit sampling rate at 16-bit recording for the looper, and while a single-channel delay it may be, it can be used in mono or stereo and it offers up to 87 seconds of maximum delay/loop time when in mono, with about half of that time (43 seconds) available in stereo mode.

The LD is almost exactly one half of the DLD—it's one copied channel of the DLD—and in some ways is kind of like the kid brother, but it's the kid brother with a smaller, surprisingly cool record collection, the kid brother who will shock you with his ability to make a decent home-cooked meal out of kitchen remnants, the kid brother who's on his way to being Most Likely To…well, Most Likely to Something.

Same as the DLD, the Time knob is broken down into both divisions and multiplication of a clock signal, and sets the loop in a number of beats. This is set by the 3-position Time toggle switch, which controls the functioning of the clock. In the center position, it makes it so that the Time control dial is the exact number beats for the loop or the delay time. The +16 (up) position on the toggle means that 16 beats are added to the number on the Time knob, so if the Time knob is pointing to 4, 4+16=20 beats. If the toggle is down in the 1/8 position then the Time is divided by 8. If you are mathematically challenged and your eyes are glossing over and you're about to give up on this review let me just assure you that this is as simple as throwing an "8" in fractional form under whatever

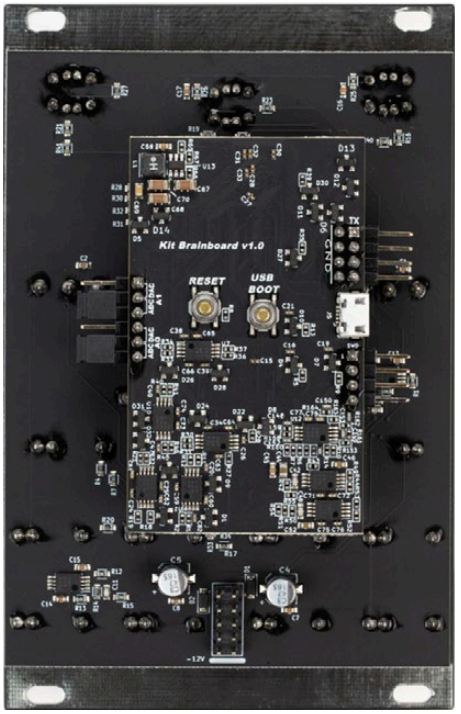
number the Time dial is pointing to, so if the dial is pointing to 3, then we're looking at ⅜ and the output will echo 3 beats per eight loops. Math. You can do it.

This Time function (along with all of the controls on LD) is CVable, which can make for some interesting delay options. A fast LFO (or audio rate CV) patched into the Time CV in, and the time swings rapidly from one setting to another, and acts frantic, out of control, and unpredictable, like it's had too much caffeine. Patch in a slow moving sine wave—really slow if you have the patience—and the change in delay time can be glacial.

The other controls are really straightforward and as self-explanatory as can be: Feedback amount, Mix, and Delay Feed (the delay record level). Again, these are all CVable and patching in CV to modulate any of these opens up so many creative ways to shape the output. I really like subtle modulation so I found myself patching in random attenuated LFOs (there's no attenuation on board the LD for incoming CV) to every parameter to give the output a nice, light movement and flavor, and then I started thinking about that guy who cut me off in traffic and almost t-boned me the other day and I scratched that attenuation, sped up the LFO and destroyed some sh$t. Felt pretty good.

There are a couple of light up buttons at the top of LD: Infinite Hold, Reverse playback, and Ping, where you can tap your tempo in to set the main clock. Ping lights up with the main clock signal, and this is a good visual for seeing what tempo you're clocked at. You can patch in CV to clock LD here as well, if you want to control it with something else, or if you're just tired of the responsibility of pushing the button to set the base clock. No judgment here. You can also pair LD with other 4ms modules, like their QCD and connect them behind the (scenes) module for a more streamlined approach to clock syncing and management. I've had the QCD for years and love it, so I'm a bit partial.

Inputs and outputs at the bottom of the module are easily recognizable with the Outputs (Audio Out, Send, Clock Out, Loop Clk Out) in a white area, and the Inputs (In, Time, Feedback (which goes to 110%!), Return, Delay Feed, Hold, Mix, and Reverse) in a black section outlined in white. Again, for such a simple aesthetic, both LD and the SD look chic…timeless.



Putting Looping Delay and Sample side by side, next to each other to work in tandem is where it's at.

The thing you need to know first about LD's operation has to do with the Infinite button and how it basically controls the two modes: Loop and Delay. When Infinite Hold is disabled, LD acts like you would expect a delay to act. When Infinite Hold is active (it will light up), then LD turns into a looper, disabling the ability to record, and plays back what's been recorded into memory. You can move the start and end recording points around, reverse it, and tweak it in various ways, and looking at the module it seems simple enough, but it's deeper than it seems. For example, the Reverse function is pretty simple…it has your loops/delay play in reverse. The delays that are already in the loop will be in reverse, but new delays will be played forward, since they're being recorded in reverse, then reversed into being forward; that's the new normal, the new reverse. Got it? When you exit reverse those new ones will now be in reverse, even though you're out of reverse mode.

While there are no menus on LD, there is some advanced functionality, some button presses and such, the most interesting being the ability to "window" or "scrub" through the recorded loop, which is a way to pinpoint and play back certain points in a loop. It's easy enough to do by holding the Infinite button (while in Infinite Mode) and turning the Feedback knob. As far as deep button presses and combos and such, 4ms makes it as easy and thematic as possible. It didn't take me long to remember this one, mostly because

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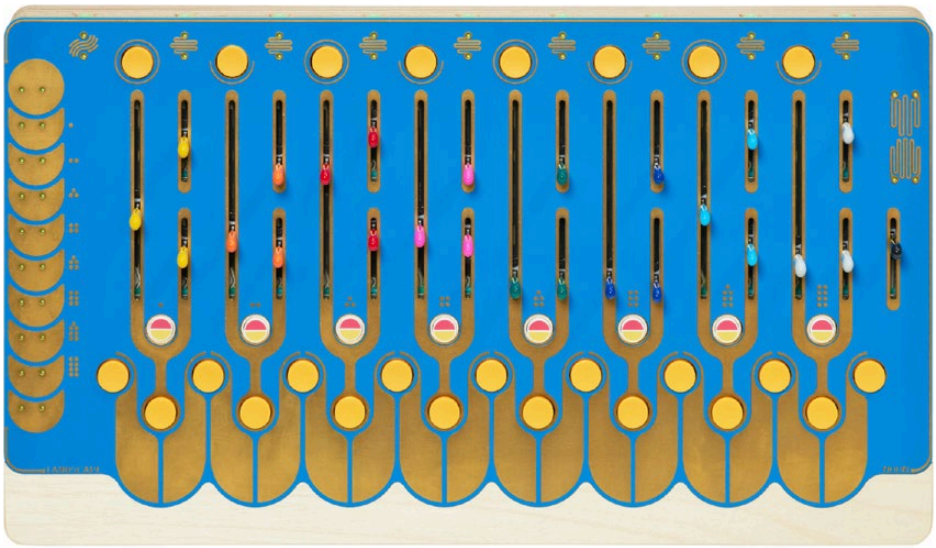


Noon
Landscape
landscape.fm

When we interviewed Eric Pitra of Landscape (Waveform, Issue 9), he spoke about his fascination with how a synthesizer is a sculptor of the electricity that comes out of your wall, the very same electricity that powers your blender and desk lamp. Noon, Landscape's new passive drum machine, is a continuation of this line of thinking in that it it sculpts (what is primarily sculpting voltages: CV, gates, etc) electricity that comes out of your wall and runs through a synthesizer or some other synth-adjacent electronic device. It's the sound of control voltage gone…well, not necessarily wild, but more like free. Finally gates, triggers, envelopes, LFOs and the like are free from their patch cables, free from their predefined roles, free to be heard. No longer relegated to being the helpers, the sidekicks, to the more heralded voltages that come out of your synths and drum machines, we can finally hear what all of that CV sounds like, hear their voices. Noon is a conduit to another world, a hidden life. It's the closet in C.S. Lewis books, the Rabbit Hole in *Alice and Wonderland*, the creepy needle that goes into the back of Neo's head in *The Matrix*.

Born from a collaboration with Eli Pechman of Mystic Circuits (also Waveform, Issue 9), Noon is described as "a passive drum machine/synthesizer." If you type "passive synthesizer" in a search engine (or ask your local synth wizard) only one thing comes up: Noon. There's been nothing like it before, there's no real precedent. While there are passive modules, passive pedals, and plenty of passive circuits and devices, until now nobody has come up with an entire synthesizer that's passive. With an Art Deco meets Buchla blue and gold PCB faceplate and housed in a light wooden enclosure with buttons and multi-colored sliders galore, Noon doesn't look like any drum machine, rhythm generator, or percussion making device that's ever come before it. It's most certainly a beautiful looking thing that always draws questions whenever someone sees it, if not an enigmatic one when one tries to play it without an understanding of what it does/can do, but it's a pretty easy thing to get into and one that offers up sounds and rhythms that you probably won't get anywhere else.

Noon doesn't look like any drum machine, rhythm generator, or percussion making device that's ever come before it.

As for its passivity, Noon might technically be that, but it still needs power to do its thing, it just outsources that job to other devices. Whatever you patch into Noon—gates, triggers, CV…whatever provides voltage it can handle (up to +12V, but…)—it transforms that voltage ultimately into sound. As for the "drum synthesizer" part, if you're looking for an 808/909 sound/clone…well…you should definitely get this!

Landscape's instruments have always been cryptic to play, and other than "Landscape" and "Noon" written in tiny print at the bottom of the instrument, there are no words, arrows or other help or instruction on Noon as to how this instrument operates. For sure this is about aesthetics—and there is in fact a well-written manual for Noon available—and this mystery has never been a deterrent for me when it comes to playing any Landscape instrument. My Stereo Field has aged well with constant playing and is a cherished studio tool and instrument; I foresee the same with Noon.

Noon has eight odd, yet descriptively-named channels (Dot, Dual, Sys, Plast, Cympath, Cyrinx, Lyrinx, and Bacid), their names giving a hint at what their audio style is. To whom that nomenclature makes sense I have no idea as it was a bit lost on me, but no matter. For controls each channel features three sliders: a long one for Pitch One, a smaller slider at the top of each channel for Volume, and another small one below the Volume for Pitch Two. These sometimes work as you'd think, but not always. There are many reasons for this, and Noon keeps you guessing in every way possible.

There is a Gate/CV input for each channel on the left side of Noon with a conductive touch pad for messing with each input by touching them to other conductive touch pads located on Noon's front panel (or something else conductive), and there's also an Odd and an Even Gate/CV input which can be switched on or off for each channel with a button at the top of each to

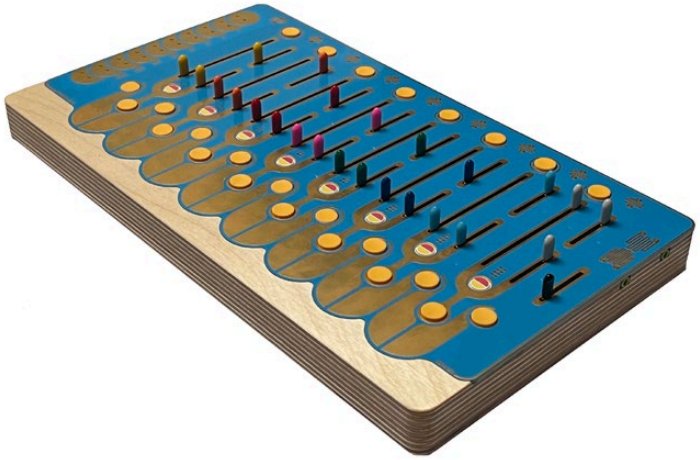
do so. Each channel also has a Mod button, which changes its character, both in the way it acts and the way it sounds, and there's a two-colored button for Muting the channel that lights up showing that channel's Gate input signal, if any. There's also a Link button between adjoining channels, linking two channels, which means that one channel's behavior will affect its neighbor, and this highlights one of the most important and interesting aspects about Noon: linkage of channels, where each channel can/may/will? (sometimes) effect its neighboring channels and therefore those down the line. This makes Noon really interactive, and really unpredictable, in the greatest of ways for those who love sonic exploration/experimentation. All of the buttons at the bottom are surrounded by more conductive touch points in a flowy, flowery layout that reminds me of tulips, and all of these touch points on Noon make it a very playable machine. Absolutely unpredictable for the most part, but very interactive and playable.

As for outputs, next to the Odd/Even CV Mute button at the top of each channel you'll find individual outputs for each, so it's easy to obtain more detailed mix opportunities. Each output has its own small squiggly touch point next to it so you can alter the outgoing voltage/sound. There are also outputs for Mono or Stereo on the right side of Noon, accompanied by more squiggly-lined touch points for mussing up the output there, too.

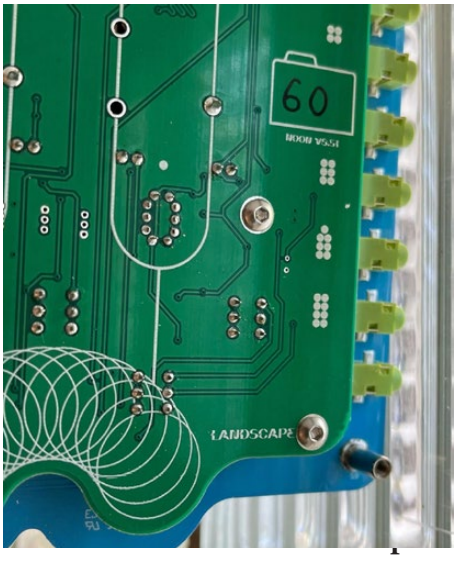
While each channel is passive and looks the same (minus the different colors for the slider caps) they aren't identical and each responds differently to incoming CV. This means that if you patch one flavor of CV into two different channels, or use the Odd and/or Even Gate/CV input on various channels, you'll get different results from each channel. Patching an LFO into Cympath (Channel 5) did very little, but that same sawtooth into Cyrinx (Channel 6) and that channel came screaming to life.

At its most basic, a square wave going to Input one (Dot!) and a mono output and you've got a click. Hit the Mod button for Dot and you've got a toned and tunable kick drum sound. Using the Pitch sliders can change the pitch from a recognizable-ish kick to something outside of an audible range, and touching the Output and Channel 1 Gate Input touch points gives you a click along with the kick that's in sync. At least that's what I got. Noon changes with…well, it changes with a lot of things and I imagine it's very different from person to person and day to day. It's personal, slightly temperamental, and…touchy. With that one input it sounds simple, and it is, but multiply that by eight…Patching a ramp LFO into Dual (fine, Channel 2) and tweaking that channel's parameters a bit, and linking Dot with Dual introduces crosstalk and more complex sounds for both channels. Do this on all eight channels and you're off to the races.

Once it's all patched up, Noon is a groove machine that takes center stage. Yes, you can dial in an interesting rhythm, track, etc. and move on to other musical matters, like sweeping a filter or something, but you can just as easily lose yourself to experimentation with Noon. Oh, how you can. Buttons, sliders, touch points, oh my! Not all of my experimentation was immediately satisfying, and there were many times where I'd have something pretty cool dialed up and would hit a button or change a slider and Poof! it'd be gone forever. Then I'd wander around for a bit, touching this, sliding that, and randomly stumble into something perfect, something impossible, without knowing what I did and without any preparation whatsoever. This luck of the draw made me very aware to hit record everytime I stepped behind Noon, especially if I was looking for something to build around/off of. It's a fine line between creating something unique and genius and creating something very much not so. A lot of this has to do with Noon being pretty hard to tame, though not impossible once you get to know it. It just takes some time, sometimes. With the Main Outs and every channel going, it's hard to tell what's doing what, and it's not easy to isolate a track without altering what you've got. The illuminated Mute button helps identify Gate/CV patterns to give a little idea of **Continued on page 82**



Noon is their open road with a full tank of gas, their ticket to freedom.



Razzmatazz
1010 Music
1010music.com

1010music's third entry in their Nanobox series is the snazzy looking hot pink Razzmatazz drum synth and sequencer. Like its fellow Nanoboxes the Razzmatazz is a super compact unit with a large touch screen, two multi-function knobs and a single row of four soft-touch buttons on the top, and a USB-C port, a micro-SD card slot (card is included) and 3.5mm jacks (for MIDI IN and OUT, CLOCK in, and stereo LINE IN and OUT) on the rear of the unit.

Razzmatazz is powered via USB and once powered up, the default screen is the drum pad view, arranged as eight pads in two rows of four with each pad being able to be loaded with a different drum sound. It's a familiar drum machine/pad look, and can be used for performance, auditioning kit sounds, and recording patterns into the step sequencer. If (no judgement here!) you don't have the patience or precision to work with the small pads, the Razzmatazz MIDI integration makes it easy to utilize an external controller to play, enter, or sequence (if you don't want to use the internal sequencer) patterns. Navigation is generally a combination of touchscreen and the physical controls and is relatively easy to grasp once you get the hang of where things are. If you're familiar with the other Nanoboxes you'll be right at home with navigating Razzmatazz. There's a "teleport" function where by holding down the HOME button will bring up a screen with touch points for all the main areas of the interface is shown, making it simple to jump between different sections of the unit, which really helps if you are popping around a bunch or get lost in the machine.

Loading up different kit presets is easy and similar to the process for the other Nanoboxes and saving changes to kit presets or saving to a new kit preset is also intuitive. Individual drum pad presets can be swapped out as well, by touching the three-line hamburger menu while the pad you want to load into is highlighted and in addition to loading in new pad presets, the menu is where you can save pads as well as copy, paste, and rename them. Saving, loading, integrating, swapping…1010 has made this all really intuitive in all of their devices, Razz included.

In Razzmatazz each pad is associated with a different percussive instrument model and each model has its own prescribed set of macro controls so you can really tweak the sound the way you want. They are slightly different depending on the model and are laid out on a MACROS screen. Each model has up to eight macros controlled by the two knobs in groups of two (top knob = top macro, bottom knob = bottom macro) and there is a little pad trigger at the top on this screen so you can trigger the sample while adjusting the macro parameters to audition the sound. It is a really small button and I found it difficult to trigger the sample without accidentally selecting the macro column directly below the trigger even though I was able to circumvent the need to manually trigger by running a sequence while I tweaked the parameters.

Razzmatazz has a step-sequencer on board and sequences can be entered either one step at a time or by recording a pattern into a sequence while playing the pads with your fingers. It's a pretty familiar process if you've ever used a programmable sequencer. Each preset can store up to 16 sequences and the step length and number of steps—up to 64 max— can be adjusted, from a step length of 64th notes all the way to 8 bars per step, so it's really flexible. Additionally, each sequence can have different step lengths and step counts for more fine tuning. Editing sequences takes place on a screen that has grouped boxes that represent each of the 8 available pads with each group of 8 pads representing one step and you can add or remove notes on a per-step basis and each pad has its own separate screen for editing. The advantage of this approach is that you can see where you have triggers set for other sounds while editing one pad at a time, and it's a great visual representation of your pattern and makes what can be a somewhat tedious process that much easier. There's even a secondary screen in the sequence editor that allows you to edit per-step velocity to add more dynamics.

The Razzmatazz comes with 120 great sounding preset sounds to get started with and tweak to your tastes or aims and using the presets is a great jumping off point for learning about the different sound sculpting options that the Razzmatazz has on board. Each pad's sound can use a combination of two FM oscillators and a WAV file as the sound source and additionally there are two filters, two envelopes, a resonator, a snap generator, along with distortion, bit crusher, and rate crusher effects, and each pad also has a dedicated LFO to modulate various parameters, so the sonic possibilities are immense. That's a ton of features to have on board for crafting your sound, and additionally, there are six different percussive models available. When creating a new pad you choose between models for kick, snare, closed or open hat, tom, or sample, and depending on which model you choose, the Razzmatazz will populate the Macros screen with a preset selection of controls.

There are also Clip and Slicer models which can be used only on the top left pad (one per kit) and the clips play WAV files and have beat sync and looping capability. The Slicer plays back a sliced WAV starting at different times in the file. There's no way to do onboard slicing or loop point adjustments like you can on 1010's Blackbox, so both clip and slice require files to be prepared outside of the Razzmatazz, though you can record WAV files from external sources for use in pads using the LINE IN. This isn't really that big of a deal since this isn't a sampler, but maybe in the future there will be a way to edit/prepare the files inside of Razzmatazz.

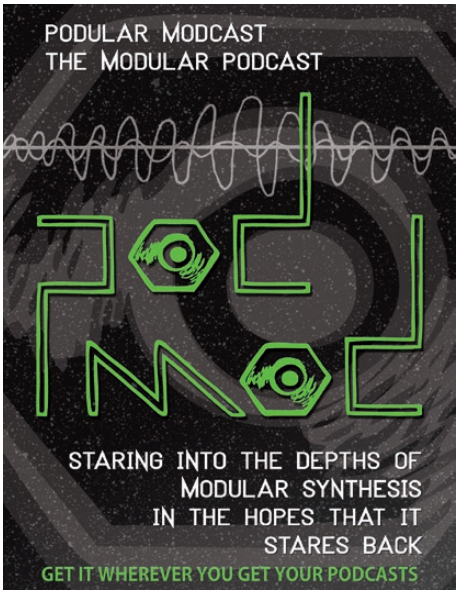
Once you've chosen a model you can dive into selecting and modifying any combination of the two FM oscillators and sample WAV available on board. The oscillator options are well laid out and offer a great palette for creating interesting and varied percussive sounds and when the synthesized options aren't doing it for you, layering in a WAV file is fantastic. Going the other way is super fun too, and starting with a drum sample and layering

in the oscillators over the top can add great subtle color and punch—or total wildness—to a sound.

Razzmatazz sounds excellent on its own and shines as an on-the-go drum synth, especially for sketching out beats or song ideas, though I wouldn't hesitate to use it as a studio tool as well—it sounds that good, as the real strong suit of the Razzmatazz is in its sounds and sound design feature set. As a drum synth it offers a fantastic amount of depth in a super compact format and 1010's user interface for the Nanoboxes is fairly intuitive and provides a very manageable workflow, even when adjusting multiple parameters across multiple pads. The flexibility of coupling FM based sounds with layered WAV files is great and I love the ability to mix and match the two and blend them together. The send effects and global cab simulation sound excellent with the latter being great for dialing just the right amount of grit, and being able to pan individual pads is great for giving some spatial depth to a drum track, and the muting capabilities are nice for getting more mileage out of your sequences. It would be great to see a few more modulation targets in the voice architecture, but given 1010music's track record for firmware upgrades, it's a good bet that there will be continued additions and improvements. As for the size? In use the size rarely becomes a hindrance. The Nanoboxes are charming, intriguing, and surprisingly powerful little boxes and the Razzmatazz is a great addition to the burgeoning Nanobox family.

- Sam Chittenden

Price: $399



Triphase Oscillator
New Systems Instruments
nsinstruments.com

San Francisco-based New Systems Instruments makes some very cool and interesting modules, and we've favorably reviewed a few of them in previous issues. Their take on modular synthesis is definitely inspired, and there's a sort of mellow scientific approach that goes on with each; they're always good for experimenting so they work well as more advanced modules, but are also good learning tools for indoctrinating those not yet in-the-know. Their latest module, the all-analog Triphase Oscillator, is one of their most straightforward to date and is exactly what is stated by its name: it's three phases of an oscillator—a sawtooth, to be exact—although there is a little bit more to the module than that as it also has a Moog CP3 style bipolar mixer on the back end.

With a 1V/Oct input, Hard Sync, and linear FM on all three waves, main Coarse and Fine tuning dials, and a Main Output that's a combination of all three phases, the features get you off to a good start. It's when you start isolating the phases, each with an individual output and a Phase offset (with CV In) and the bipolar Mix control where things really get interesting. There's plenty to play with here, and this thing has the ability to sound huge…really HUGE. It's kind of a take on the classic three-VCO monosynth a la the Minimoog, but a slightly different variation in that instead of altering the tuning and waveshape of the VCOs to get phat (or whatever you're looking for), you're phase shifting. And who doesn't love phase shifting?

The obvious use for Triphase is to get something fat right out of the gate, and I gotta tell ya, it ain't too hard to do. Just mess with the mix of each wave to taste and you're off and running. Patching in a sequence to the 1V/Oct input and putting some slowly moving CV into each of the phase inputs (P1M, P2M, P3M) to hear each instance of the sawtooth morph was intensely gratifying. That comb filter-y thing it does is mesmerizing. Triphase really does have the ability to get gargantuan and throwing a VCO in to hard sync it, using it for bass cut through everything in my patch; it felt so powerful and succinct. Ditto as a lead line, where there was no problem determining who was in charge, even with a dense patch full of complex percussion, noise, and some drones. I really wanted to test it and created a ridiculously thick patch and, except for where I had something competing in the same frequency, it was never an issue making itself heard, and whether you patch in FM or not (I prefer Hard Sync with just a touch of FM coming from another complex oscillator), Triphase stands firm without needing much help.

After playing with it for a bit I wondered how Triphase would work as a modulation source. You can slow the frequency down to the top end of LFO range and use it this way, and with the separate outs have four different, but related, instances of modulation, with one being the sum of the three outputs in the Main Out, so I patched all four outputs into various CV inputs on SSF's Ultra-Perc which I'd pitched high, using the Main Out of Triphase as the trigger signal to see how it would go. I can't say that what I got was super useful as a drum track, or that I was able to really discern the relationship of the Triphase's four outputs in relation to Ultra-Perc's output signal as thoroughly as I'd hoped, but in terms of a rhythmic anomaly, it was pretty interesting and reminded me of a Smurfy version of the famed Buchla bongo sound, like a cartoon drum circle with three small toy drums.

While you can't tune each phase separately, as there's only the one main 1V/Oct, by adjusting the phases for each wave and adding or canceling certain harmonics you can get some synchronous tones to the main tone. They're more like undertones, not at the same volume, or as clear cut as the main tone, but it can thicken or thin out the sound as desired, and then by throwing in some CV to modulate the

phases you can destroy all of that sync work you just did to make it sound less harmonious and "pretty," though pretty is a pretty relative term. The CV for each takes any rate of input, so patching in audio rate to modulate the phases can get a blown up saw wave of some sort. While this was interesting, after a certain point it just sounded like an FMed saw wave and not the best way to use Triphase. Really though, I'm just partial to the slower rates of modulation for the phases. Fault me if you must, but it just sounds so good.

With the mixer on the back end being bipolar, you're able to not only pick and choose how much of each phased instance you want in the final mix, but also remove it from the final mix, which is a cool feature.

Again, Triphase really does sound BIG. I know you can do all sorts of sound shaping, and exploring and such with it, and that's fun, but really, those comb filter-ish super-sawy waves that come out of it sound so good as a bass or lead with each waves phase being oh-so-slowly modulated (and with some sync and a smidge of FM thrown in), that's all I really want to hear from it. I could listen to it all day long and I think you'll probably feel the same once you hear it.

- Ian Rapp

18 HP +12v 50mA -12v 50mA

Price: $385

SED
Rides in the Storm
rides-in-the-storm.de

Rides in the Storm makes feature-packed and great-sounding modules out of Berlin and is headed by Uwe George, who used to develop products at MFB and is half of IO Instruments, so it's no surprise that RITS modules are well-designed. Their modules have a gray, understated look to them; and something else that's understated is the description of their new SED module, as they call it a "High End Discrete Voltage Controlled VCF & VCF." Maybe understated isn't the right word, perhaps they're just being modest because along with the VCF and VCA, this thing sports a three-channel mixer, and overdrive, all in 8 HP and for under $150 (US). The whole RITS line of modules is like this; gray, well-priced, and well-designed, and though I'm not 100% on the gray faceplates—like nearly everyone else I'm a fan of black—I still like the way they look and I'm rather fond of their knob choice.

The bulk of SED is based around its filter, a 4-pole 24dB/oct low pass type. There are all sorts of ways to change the character of the filter and it can get really cool and gnarly by adding overdrive via the Overdrive button, cranking the Resonance, and/or the Resonance Boost, which works to maintain your low end while the filter's doing its magic. There are four CV inputs for modulation as well here, three for cutoff CV and one for resonance CV; Key (which is the 1V/Oct input), Resonance, Lin (for linear FM), and Env for envelope CV input. It was interesting to see how each input would affect the shape and sound of the filter, and it's nice to be able to inject various flavors and speeds of modulation into the filter to combine them, just as cool as it is to mix three input signals into the filter and have it mix down to SED's lone output. Patching in some fast-moving sawtooth LFOs—not quite audio rate—into the Env and Lin FM and this thing got nasty. Not to say this can't be smooth and silky as well; it can and does it well, but I have other filters for that, and none that were quite like SED, with its combination of modulation inputs and sound.

I had a lot of fun playing with the filter with the resonance up high, just tweaking the Cutoff knob with the Boost cranked and the Overdrive on, using the Fundamental output of Xaoc Device's Odessa patched into the input. The way it tracks reminds me of jazz sax/trumpet/etc. I'm sure that sounds odd, but it's got a stepped pitchy feel, so that it's stuttery and kind of twitchy when changing pitch and it really reminded me of some free jazz music (Miles Davis comes to mind), players blowing their horns, really on top of their game, producing abstract, wayward melodies and squawks. I tried this same effect and patch through other filters and couldn't quite replicate the sensation I was achieving with the SED. It was more than the effect of just knob twisting; something was happening in the machine that had a real human performance vibe to it.

I also added a sequence coming from the Joranalogue Generate 3's Full output into Input 1 of SED, and a slightly detuned instance of the same sequence coming out of a heavily modulated Expert Sleepers Lorelei VCO into Input 2 of SED, while throwing that same sequence into the Key (1V/Oct) Input of the SED with a slow-moving sine LFO modulating the Env of SED and it was awesome. Really, the envelope's modulation of SED stole the show, going from buzzy but subtle filtering to laser-focused grit, but the movement and change of the filter with the various inputs…really gnarly stuff.

The Resonance and Resonance Boost work in tandem and it was interesting how changing one affected the other. Just as I would tweak the Cutoff while the filter was self-oscillating to change pitch, tweaking the Res/Res Boost interactively produced some interesting distortion. SED is a great howler (and whistling whiner, too), with way more flavor than one might expect from this. Riding the various controls in combination with modulation only added more spice, more options to sculpting the sound, and once I pushed the Overdrive button down it basically never came up. Why sound nice when you can sound… not so nice?!

The discrete VCA section consists of an Input, CV In, and Output. It's at the bottom of the module and the filter's output is normalled to it so that you can have two outputs of the filter if you want—the Filter out and the VCA out—and add elements of the filter's inputs, like a different waveform output on a VCO feeding an input on the SED and combine to taste. The VCA is adaptable to various voltages and has a jumper on the flip side of the module that lets you choose 5V, 7.5V, or 10V CV input for it. There are so many options within this module it's impossible to outline them all.

The only thing that nags a bit about SED

is that the bigger knobs feel loose, not so solid. They are quality Alpha pots, and the module itself is of nice quality overall, but the pots are the plastic-stemmed type with slip-on knobs, which don't give a sturdy, quality feel to them and I feel don't live up to the rest of the module's top quality build and design. I understand the price point and all of that, and again, this module is very well-priced, but I'd like to see a more burly pot.

That aside, I'm really impressed. SED is a killer module that I've had a ton of fun with and gotten a lot of intense sounds out of and I think we're going to be seeing this one in a lot of racks. I'd search this one out for sure.

- Ellison Wolf

8 HP +12v 100mA -12v 100mA

Price: $145

Entity Ultra-Perc
Steady State Fate
steadystatefate.com

When not using a drum machine of some sort and wanting to sculpt and control specific tones and shapes, you'd usually think that you need a snare module, a kick module, a hi-hat module, and maybe a clap or clave module, etc., but you don't. Not really. To keep some space in my tracks I almost never have my kick and snare hitting at the same time, so theoretically I could modulate various parameters on one percussion module with some gates, triggers, and LFOs for both kick and snare. And if there's space in between those two, it's possible to add something else like claps, clave, bell, etc., with some creative and thoughtful CV input, even for a single-voice module, provided the module has those capabilities. Steady State Fate's Ultra-Perc does and is made for doing exactly this, but excels at many other tasks as well.

The newest addition in their Entity line, and successor to the original Entity Percussion Synthesizer, Ultra-Perc is an all-analog full-voice module geared towards creating percussive sounds and is really flexible with a lot of sound sculpting capability, so much so that even calling it a percussion module seems a bit of a disservice. There's a twin resonant core signal generator and a customizable noise circuit as well. The noise circuit is great for layering snare hits or to use separately as another sound source, and there's also an external signal input so Ultra-Perc can be used for layering more sounds, as another trigger input along with the main trigger, and you can even use it to surprisingly great success to process incoming signals, something not too many (um…none?) percussion modules tout as a feature. There are a ton of modulation inputs (twelve, to be exact) for shaping and triggering both the main circuit's signal and the noise, and a Duck output (think avoidance, not animals) to go along with a Main out. There's even a V/Oct input to track those resonant filters and get some bass or melody lines going, or just to change the tuning of percussion hits.

Looking at the flowchart to track the signal routing is really helpful in understanding what's going on here, and where what's going on is really going on. The first thing to do is start triggering Ultra-Perc, and with a light-up eye that's a manual trigger button as well as a Trigger In, it's easy to get started twisting knobs to hear what this module is capable of. In terms of shaping the basic internal sound, it's created with those two resonant multi-mode VCFs and a wave folder and has a host of other basic synth features that you'd usually need extra modules for (VCAs, envelopes, noise). There are numerous controls to shape the central sound: Length, Master Tune, Detune (with selectable Lo, Med, and Hi settings), Body Bias, Harmonics, Body Decay, FM Depth, and Trigger Delay. Most of these (Master Tune, Body Bias, and FM Depth excluded) are CV controllable, which right off the bat shows how much control you have over shaping…well…everything.

It's one thing to talk about the sculpting possibilities and completely another to hear it. Ultra-Perc can go from the lowest, shortest clicky electronic bass drum to an incredibly rich and complex synth voice, full of FM goodness, that, with the V/Oct input, can snake its way through a mix as a bass or melody line. In terms of straight kick duties, using the parameters to create whatever sound you're looking for, whether it's a more electric sound (acid-y, 808…) or even acoustic drum sounds—which Ultra-Perc does well—is just a matter of tweaking the knobs.

For snare, adding the Noise to layer on top really adds to the depth, and gives it some impact. The internal Noise really adds a ton to this module as you can shape the Noise sound with the LP/HP/Body (the latter, which routes the Noise's LP response to the input of the two resonators and filter with no noise at the output) switch, the Decay, and the overall Frequency, along with the Bias, and CV all of it. It's like having an extra module on hand, a way to accent hits, add a completely separate element, or even just to add some random background noise to your track, and with independent controls, including a VCA, you have a lot of useful options.

Sometimes I wonder how specific to get in reviewing something, like why or how something works as opposed to what it does, but in this case, I think it's important to explain how the controls work in order to understand a bit more of the design and design philosophy SSF employs. Really, when it comes to percussion modules, a good question to ask is how would YOU want to tweak or control a drum sound. As I mentioned, the main sound is produced from the two resonant cores, and Master Tune is the overall pitch tuning for those two cores, while the Detune spreads those cores apart from each other, like siblings that can't get along. There are three tuning modes (Lo/Mid/Hi) for choosing the overall tuning range, and this detuning helps thicken the sound for percussion, but also when Ultra-Perc is pitched higher, it starts to create a more complex tone, whether it's the metallic clank of a broken cymbal or a folded, mangled synth line. In conjunction with the Harmonics and Body Bias (which is kind of the volume/transient shaper of the main sound as it works with a few of the dynamic parameters of the sound simultaneously), and Body Decay/FM Depth, things can be tweaked

very particularly. FM is an attenuverting control so you can bring in positive or negative frequency modulation to further sculpt your sound and there's also a Trig Delay, with up to 75ms of delay which can be layered for flams, off rhythms, and even ghost hit type of things.

As mentioned, patching it up so it can be used simultaneously as a kick and snare, and maybe something else too, becomes an interesting challenge, a sort of game in planning and preparation, and an excellent lesson in economy and patch management. To make your percussion track work well sonically in a mix, and to be able to do it in a variety of styles for different purposes and genres, seems like too much to ask for in a module that isn't a small computer loaded with samples masquerading as a Eurorack module. I was interested to see if I could make it work if the patch junky in me could indeed utilize all of those modulation jacks in a respectful and responsible manner! It wasn't necessarily easy to get all of those elements in one patch all the time, but with some trial and error, I was able to get a few different instances where it worked well. Usually, I'd start with the kick sound and dial in the right amount of modulation to pitch that to a snare sound. Then I'd add modulation to the noise so it would trigger at the same time as the snare, and I'd tweak the noise to my liking. From there, it was a lot of patching, tweaking, and a bit of thinking to be successful in this manner. It was quite fun, and though Eurorack rigs seem to keep getting bigger and bigger, the challenge of doing something like this made me think of the joys of problem-solving and coming up with something other than what you'd hoped or planned, but something surprising and inspiring, like I did with Ultra-Perc.

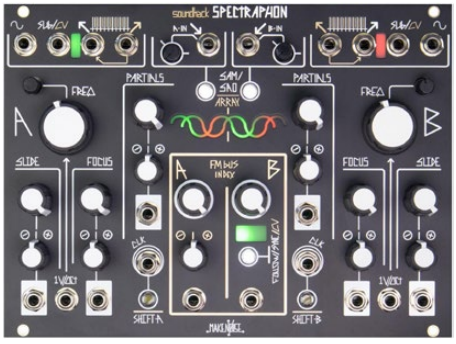
As for using Ultra-Perc to process external signals, there was a bit of massaging—really just knowing how to use it—that needed to happen to get the most out of it, and there were times when I'd have something patched in there, say a melody from Joranalogue's Generate 3, and unless I had the settings on Ultra-Perc a certain way, the sound from G3 wouldn't be audible. Usually, this had to do with the Length and Master Tune controls and with a little exploring I got back into sonic destruction territory, which Ultra-Perc does very well. I found myself using it as a processor for audio almost as much as for drum duties because it was so fruitful to explore in this realm. I used it quite a bit for acid-y basslines so much that at times I was hard-pressed to switch it over for percussion detail. I even got some staccato woodwind-style tones out of it with just a square wave sequence patched into the Ext In, but that's just one of numerous surprisingly cool and useful sounds and instances that Ultra-Perc produced or processed.

This is a dense module. It's not confusing or mysterious at all—quite the contrary—just incredibly open to sonic possibilities with a lot of inputs. While it's set up to be used for percussion—and it's great as that—and is able to produce massive kicks, impactful snares, hi-hats, toms, etc., it's also a marvelous tool for sculpting sounds for leads, basslines, and overall distorted madness, and it makes me marvel at the fact that it's all analog.

- Ellison Wolf

14 HP +12v 125mA -12v 125mA

Price: $379



Spectraphon
Make Noise
makenoisemusic.com

The Make Noise/Tom Erbe of Soundhack collaboration has a pretty stellar track record. Echophon, tELHARMONIC, Morphagene, Mimeophon, Erbe-Verb, and now the Spectraphon…it's an impressive handful of modules to say the least.

A dual Spectral Oscillator, Spectraphon seems a little less cryptic than some Make Noise modules—at least to my eyes—and resembles your typical complex oscillator, both in format and function, which is not surprising as Make Noise says that it's inspired by the Buchla 259, as well as the Buchla 296, and the Buchla Touché synth, a veritable unicorn among vintage synths. Where there were about 13,000 MiniMoogs made, there were only four Buchla Touchés. I've no idea if Make Noise or Tom Erbe (Waveform, issue #5) got their hands on one to help with Spectraphon's creation, but along with those instruments, others such as vocoders, other spectral processors, and the like helped inspire Spectraphon, and when you get behind the wheel, you see where and how that inspiration is implemented.

Spectraphon uses real-time spectral analysis and resynthesis in order to make new sounds from existing ones, and does this by taking incoming audio and analyzing it, then taking the information gained from that analysis and puts it on an input, combining, manipulating, and modulating those specific elements of the analyzed sounds. It's quite a finessed way to implement a complex oscillator-ish dynamic between two signals, and in practice Spectraphon acts sort of like a highly intelligent being souped up on massive amounts of caffeine, able to read minds and stay one step ahead. To do this, the processing speed needs to be impressively quick and still work well on a sonic level, so much so that Make Noise (with engineer Jeff Snyder) devised a new hardware platform in order to lower the noise floor and attain higher resolution at the in and outputs, to get everything out of the Spectraphon that it could. It does indeed sound great, clear and defined in the ways that it should, though when a sound is distorted (and is supposed to be), really, how to tell? The processing speed of Spectraphon is impressive, and if there happened to be any sort of processing lag, or artifacts or anything, I couldn't detect it with my ears. I still can't wrap my head around the speed it would take to analyze an incoming signal and then use that information to control a digital synth engine, but then again it takes me twenty minutes to make a peanut butter sandwich.

Spectraphon, like most (all?) complex oscillators, is divided into two sides: A and B. At the top of the module are inputs for each side and four outputs for each as well; a Sine out (which outputs a sine wave of the selected core frequency), a Sub/CV out (an Envelope Follower in SAM mode, or a Sub-Oscillator in SAO mode; the modes we'll get to in a second), and an Odd and Even harmonic output. The last two are the ones you really want to play with to

hear Spectraphon work its magic and the differences in tonality between the odds and evens are large. If you think there's not much difference between 1,3,5,7 and 2,4,6,8 etc., this will make you think again.

Both A and B have a 1V/Oct input and give you control over Frequency, Slide, Focus, and Partials, with each of those parameters able to take incoming CV and attenuate/vert those signals. There's also an FM Bus Index in the middle of the module and with that Spectraphon can work just like a normal complex oscillator, frequency modulating each side in the typical fashion, which is fun to do. As Spectraphon has two sides, each side also has two modes: SAM (Spectral Amplitude Modulation) and SAO (Spectral Array Oscillation). SAM mode takes sound at the input and uses it to modulate the level of a set of harmonics, and any current spectrum can be saved as an Array, to be used when switched to SAO mode. SAO mode can take those stored Arrays (up to sixteen for each side) of spectral information of incoming sound taken at the inputs in SAM mode and use that information to modulate and shape sound. In essence, it's kind of like SAM is a sampler of spectral information and SAO is/are the cache and playback of spectral samples made in SAM.

I wanted an easy way to hear an example of how this would work and sound, so at first I used Spectraphon as a vocoder since I know my voice and what it should sound like. Patching in a microphone via the Joranalogue RX2 and getting my voice into Euro world, I heard the shifts in tonality using the Slide to alter the fundamental frequency and the Focus to choose the harmonic emphasis (like Q on a compressor, or filter resonance, to a degree), while pitching up and down my vocal with the Frequency knob. Super trippy. Changing some of the other parameters on the B side, as well as the FM Mod Index and my voice sometimes disappeared, and mostly became unrecognizable, a digitized raspy version of my usual, wonderful, harmonious self. It was definitely different from your typical vocoder, and honestly, after just this initial test period I realized how fun and powerful Spectraphon could be. You may be hearing Spectraphon on all hit records (or at least all of my records) for the next decade if it goes the way that Autotune did in the 90s, as I predict.

A button at the top of each side selects from SAM or SAO mode (along with other alternate combo duties) and when in SAO mode, Slide and Focus change functions. It's a lot of duality, this new Make Noise module, and a lot of changing, and this compounded duality equals large numbers of options, features, and sounds.

Slide sets which harmonics are emphasized and works with the Focus to mold the spectrum of the outputted signal. Focus is a sort of an audio offset, shifting the time of the input and output, creating a lag that can conjure up odd overtones and at times gave me a light case of vertigo. It's interesting how sound can cause feelings of displacement that manifest themselves physically, and Spectraphon has the capabilities to make you feel off-kilter.

All is not just blasting and analyzing, however. There's what's called the Tuning Beacon that displays tuning information and tells you the tuning relationship between the two sides of Spectraphon. It's enough to wrap your head around Spectraphon's capabilities without feeling like you need to remember which color of the lit beacon is for major sixths, and similar to that is the Array Binary, a four-colored LED display used to show the Slide and Focus values and which stored Array is selected. It was a bit too much for me, and I couldn't remember all of it, but in no way did it matter with how much I enjoyed Spectraphon.

I messed with Spectraphon a lot while wearing headphones and sometimes I would take the cans off and my hearing would be altered for a small time afterwards, similar to when a light is flashed in a completely dark room and whatever you were looking at leaves a visual impression long after the light is gone. There's some sort of sonic residue there that I haven't experienced with any other module, some kind of Make Noise magic leaving its imprint.

Spectraphon is a really unique module and even though I know I'll never remember which Array setting is stored where, and I won't be able to commit to memory the Tuning Beacon information, there's no doubt this is a special module that will be seen and heard everywhere for the foreseeable future.

- Ellison Wolf

34 HP +12v 230mA -12v 55mA

Price: $599

Pivot 2
Joranalogue
joranalogue.com

When I think of the word pivot, I always think of a specific scene in the movie *Million Dollar Baby* where the narrator is describing boxing mechanics, specifically how a boxer moves left and right while maintaining their balance and keeping their core strength intact. It's a beautiful shot, a close up of a leg in a boxing shoe pivoting (naturally), and the image defines one meaning of the word to me, and the brief cinematic instance has lent a certain lasting amount of grace to the word.

Not that Joranalogue modules are in need of extra gravitas, but the well-named Pivot 2 perked my ears from the start. Just like a boxer, Pivot 2 is about movement as well, and is an analog CV or audio signal router that has a send and return loop that can both be used in series, reverse series, or parallel. One of the many things I like about Joranalogue modules is that they can make something that would normally be a utility, somewhat mundane even, and give it a very usable twist, usually unique to them. Pivot 2 is no different, and while its function is pretty simple—patch a signal into the Input and have it routed to either of the Send/Returns or both and bring it back to its respective input—how it does this is what really makes it stand out.

There's an Input and an Output with two sets of Send/Return channels; a Left channel, and a Right channel. There's also a knob for Pivot, and another knob, which is an attenuverter, for Pivot Modulation amount. Depending on the Pivot knob position, the input flows from one Send/Return into the next, so with the Pivot

knob fully CCW, the Left side is normalled in series into the Right side's Input. If you turn the knob fully CW, then it reverses and the Right channel flows into the Left. A centered knob gives a 50% ratio between the two sides/channels for a parallel routing situation. It's a pretty clever way to go about doing all of this, and actually quite convenient. Being able to audition signal chains, including the in-between positions, not just the more absolute signal paths, and being able to modulate this is signal routing nirvana.

Changing the routing between two parameters without the need to patch/repatch is a dream. It's one thing to see if delay always sounds better going into reverb as opposed to the other way around, and completely another to hear the difference from having a signal go into a wavefolder before another wavefolder, have that second wavefolder go first in the chain, or have them in parallel, all just by twisting a knob, and to be able to adjust the balance of the two. Sometimes when I'm processing a bassline through two separate distortions, with one feeding the other, it's hard to dial in the right amount to hit the sweet spot of the first in order to feed the second and get its sweet spot, and Pivot 2 makes it pretty easy to do this. It seems like it would be similar to attenuating the signals, but it produces a totally different result than doing that, and being able to hear the two distortions in parallel, or switching the order of the two was really helpful in finding what I was looking for and being able to dial it in. Most of the time it was just confirming the order I already knew worked best, but not always, and there were some surprises that were easily achieved because the functionality of Pivot 2 made it so.

Outside of the utilitarian use cases that I used Pivot 2 for, there are some—what I'd call tricks—you can do as well, like patching in CV and using Pivot 2 as a dual ping-pong VCA, which can act like both a VC panner and a VC crossfader, depending on what shape of CV you patch into it.

Even with something as everyday and utilitarian as signal routing, Joranalogue manages to bring something new to the table with Pivot 2 and rises above the rest.

- Jason Czyeryk

4 HP +12v 60mA -12v 60mA

Price: $160

Two Bits
Klavis
klavis.com

I admit that I'm a bit gun shy when it comes to logic and overly math-y modules, but the Two Bits from Klavis—a dual-channel logic module in compact 5hp—makes it all better... Not (that's a logic joke)! Actually, Two Bits has a fantastic feature set and is fun to learn logic on for the beginner or skeptic, with an excellent manual to dig into if you need it. It's a real swiss-army knife of a module and offers a total of fifteen different logic functions—some even have CV control over the conditions.

The two channels are arranged vertically and have the same basic control layout: a function selection knob (and indicator LED—handy for knowing when you've selected a new function) above A and B inputs. Below that is the channel's normal output and an inverted out. Between the top and bottom sections are buttons for chaining functionality and for accessing and editing some of the settings for various functions.

Both the top and bottom sections have the same three boolean logic functions of AND, OR, and XOR (with the inversions of these—NAND, NOR, and XNOR available on the inverted output), and each channel has a few unique functions. The top channel includes SR (Set and Reset), -A and B (Minus A and B), Alternate, and three variations on edge detection: Pulse on Rising Edge, on Falling Edge, and on Change.

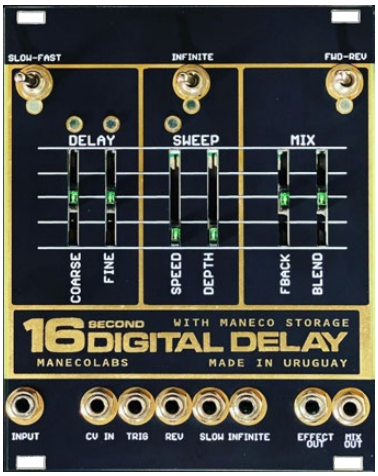
Channel B's unique functions include a gate merger (similar to the OR function but the output will be retriggered even if it is already active), a Vote function wherein the inputs have to be the same for the output to take that value (and can be used with the chained 3rd input from channel A). Channel B also has four functions that accept CV control over some of their conditions (Channel B's second input is also used for CV input). A Random function determines by chance whether to allow a signal at the Channel 2 input through (when detecting a rising edge on that same input). The random percentage can be set from 1 to 99 and adjusted via the CV input in real time. There is a pulse Delay Line, an analog Comparator, and a clock divider / multiplier with realtime CV control over the division / multiplication ratio as well.

The Set and Reset is a pretty handy toggle output, where the inputs A and B set and reset the output respectively. So a rising edge into A will send a positive (gate on signal) to Out A and a rising edge on B will close (gate off) Out A. Feeding two disparate signals into the A and B inputs, I found a lot of fun to be had with the toggle output used as a semi-random gater to open up a VCA in a less predictable, but not totally random way. I also found immediate uses in my patches for the different edge detection options available in Channel A, particularly to trigger different envelopes on key up events (falling edge) from my Intellijel Tetrapad Gate Out or both Key Down and Up. You can get even deeper into logic madness by feeding the outputs to one or both of the Channel B inputs. Combine them in the Gater function and run those pulses out to even more VCAs.

The fact that the functions can be triggered by any signal, not just pulses and gates, is great for experimenting with all sorts of input signal types. Half the fun is putting different waveforms in and seeing what comes out. Sometimes it's noise, but you can stumble into all sorts of interesting rhythms, pseudo-random pulse streams, and other goodness, and it's always good to remember that one man's garbage noise is another man's treasure melody.

Before playing around with the Two Bits, I definitely underrated utilizing logic for making interesting things happen in a patch. I still haven't come close to wrapping my head around all the different patching possibilities present its various functions, and I could read the logic truth tables until

my ears bleed but that doesn't mean that I could tell you what the response would be when I plug a sample of a birdsong on one side and a sawtooth wave on the other, but overall the Two Bits is pretty easy to use and damn fun.
- Sam Chittenden
5 HP +12v 31mA -12v 1mA
Price: $149



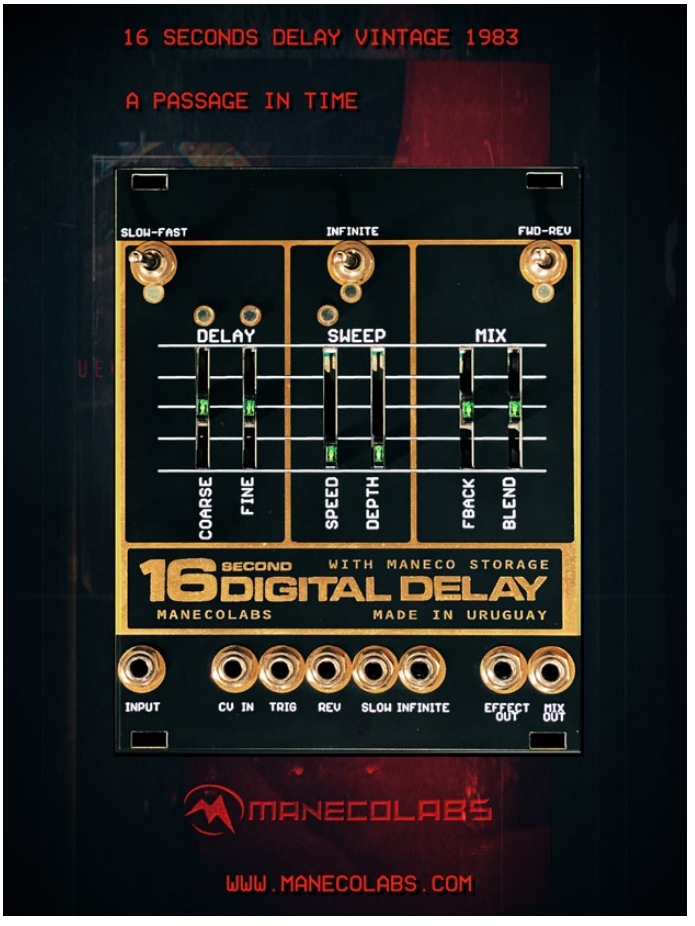
16 Seconds Delay
Maneco Labs
manecolabs.com

I have a friend who does prepared guitar and swears by an 80s Electro Harmonix 16 Second Delay that he bought new almost forty years ago. It's seen its fair share of abuse and even though it's had its switches and jacks replaced a few times and sliders taken apart and Deoxited, it doesn't always work quite right and is inconsistent. Still, he says that when it does work correctly there's nothing better, and that its "personality" is part of its charm. I'm not one to argue, and to each their own, but as for a guitar pedal, I never felt that a delay with that type of layout would benefit my style—problems or not. When it comes to Eurorack, however, it's a different story, and Maneco Labs Sixteen Seconds Delay Vintage (SSDV) module has helped me understand what made my friend suffer through his EHX pedal's bouts of inconsistencies. There's no fickle performance here, and a delay/looper with sliders is a fun thing to tangle with.

With a layout and overall aesthetic inspired by EHX's original pedal, Maneco's Eurorack adapted version of their own pedal version of the original, is almost identical, though the SSDV doesn't sport the footswitches or Vent section and ups the delay time to thirty-two seconds, making the name of the module a beautiful lie (the horror!); however, it retains the core sections with corresponding parameters adjusted via light up LED sliders: Delay (Fine, Course), Sweep (Speed, Depth) and Mix (FBack, Depth) with CV inputs for CV In (which controls the sample rate), Trig (for synching the delay line), Reverse, Slow, and Infinite. Manual toggles at the top of the module for some of these parameters (Slow-Fast, Infinite, Fwd-Rev) with light up indication are also on hand, and for interfacing there's Input, Effect Output, and a Mix Out.

As the name suggests, this is a digital delay, though the digitalness is only in regards to AD/DA conversion and memory, and happens vintage-style in eight bits, just like the original. Also in keeping with the original, everything else is all-analog, including the signal path, and the sound it produces is wonderfully primitive. This is an interesting module for a delay, and I'm not sure there's anything else out there like it. It certainly takes up more real estate—20 HP—than your average delay, but it screams for a hands-on approach, what with those well spaced out light- up sliders it reminds me of the ARP 2600. Once you get behind an intuitive and pleasing interface that's designed to be experimented with, like the 2600—or this delay—to be a canvas on which you create, you understand the allure. And, having had in my possession a KARP 2600 FS for the past month, the SSDV paired wonderfully with it, both in terms of sound/features, and the playing field.

And speaking of playing, I'm not one to normally "play" a delay. I usually patch it up, tweak it until I find the sound I like, and move on, but with the SSDV I spent a lot of time sliding, tweaking, and toggling, seeing what it's capable of, where it can go. When I first started testing this out, having had no hands-on prior experience with the original version, I just did the ol' patch and tweak and couldn't really make heads or tails with what was going on—there was too much happening too decipher—so I decided to try it with a clean slate; no CV patched in, and all of the sliders in their down position except for the Blend, which was at max, and just a little amount on the Feedback control, so that I could hear distinctly what was happening, what SSDV was doing to the sound. This helped, and with a little bit of movement on



the Coarse tuning, SSDV sounded great, adding a slightly distorted, squared and grainy delay. Moving the Coarse control and the thing went haywire for a moment, adjusting its tempo/pitch before settling in a bit. Switching the speed with the Slow-Fast toggle changed the overall sound and feel quite a bit, and this is CVable, so that's nice. I boosted the Feedback to near max and and indeed, SSDT did start feeding back, more and more as time went on until the original sound going through had a distorted feedback tail, growling and following the simple three note sequence I was feeding it and adding a pleasing, nasty ambience to the overall sound. To CV control the delay time, I patched a square wave LFO into the Trig in, as it syncs to tempo with an LFO, or clock or whatever, but if you wanted to recreate the haywire chaos you'd be good to patch in a stepped random LFO or a stepped sample and hold for that, which worked quite well when I did that with ALM's Pamela's New Workout. There's an internal triangle LFO for modulating the delay time and pitch, which is where the Sweep section and its Speed and Depth controls come in. With the patched-in stepped LFO and CVing the Slow-Fast, it was a whirlwind of grainy looping delays. Adjusting the Fine control added to this as I was adding more change, and while I couldn't control what was happening—it's not the type of looping delay that you can build up a song around or anything—it was fruitful to give in into the magic of SSDV, to let it do its thing. One thing I found interesting is that with CV patched into the CV In and the Feedback control all the way down (at zero?) and the Blend control at max, SSDV behaved as a sample and hold, though once I started adding some feedback that wonderfully distorted mess started filtering in. Another thing I found interesting is that the Effect Out and the Mix out have a different sound when the Blend was at max position, with the Effect Out having less overall volume and a slightly more veiled sound. I would have thought that max Blend would be 100% effect—which I think it was—and the same as the Effect Out, but it wasn't the same. Either way, I'm happy for this as it gives more options for outputs.

This is a bizarre delay, unlike any I've come across in modular form. It's more playable than most delays out there, yet mostly unpredictable, and dirty sounding; three of my most favorite attributes when it comes to my modular. I highly enjoy the Sixteen Second Delay Vintage, though I do wish there was a way to bypass the effect, either with an actual bypass switch, or even being able to CV the Feedback or Mix amount (thereby bypassing the effect), even though it's easy enough to manually pull the Mix slider all the way down to do just that. Other than that minor detail, Maneco's SSDV is a really fun delay/looper and I love the form factor for Eurorack. There's plenty of tweaking to be had, whether by CV or by hand, and it's easy to do so with the latter as the light up green LED sliders are an easy visual to spot. If you're tempted by a more hands-on approach for a delay/looper and you can let yourself yield a little control from time to time, I would definitely seek this out.

- Ellison Wolf

20 HP +12v 95mA -12v 10mA

Price: $395

107 Acid Source
ADDAC System
addacsystem.com

Acid house has a debated history, from the purported derivations of the term itself (a drug reference/homage? An anti-political term?) to its origins, usually tied to Chicago, but in some circles to India and a man named Charanjit Singh. There may never be 100% agreement on origination, but there's no debate as to its influence and what its signature sound is—the wompy, squelchy sound attributed to the Roland TB-303, a sound cemented in acid house music history, and as identifiable as it is ubiquitous.

From its birthplace of Chicago or India, to its popularity in the 80s/90s in the UK, to, well…just outside of Lisbon, Portuguese outfit ADDAC Systems have taken the inspiration and the sound for their new Acid Source 107, a complete single voice Eurorack module that brings all of the melted smiley faces and lollies to your modular rig. I decided to write the bulk of this review while listening only to Sleezy D's "I'm losing Control, Phuture's "Acid Track", and Singh's "Synthesizing: Ten Ragas to a Disco Beat," on a loop, and while I had to do some muting and pausing here and there to gather my thoughts together, the tracks still sounded pretty fresh to these ears, and it definitely brought back some hazy memories of late nights/early morns in the 90s.

Conceived as a source for complex percussion, that use was shelved when the folks at ADDAC started using 107 as an acid synth voice and realized that's where it excelled. And does it ever. It's got everything you need in its 9 HP frame. It starts with a VCO (either saw or triangle) that's tunable to four octaves and has Frequency and Fine Tune controls and a CV Input with attenuation. The signal is then mixed with a square wave en route to the filter, a mutli-mode type that's switchable between Lowpass, Bandpass, and Highpass, and which has controls for Cutoff and Resonance and a CV input/attenuator for Cutoff. From there it's onto the VCA, and this is where 107 gets interesting. The VCA has a small Gain knob that can go past unity gain up to double the amplification, lending the sound a some not-so-subtle distortion when pushed. Depending on the mix of the signal (saw/triangle + square), the instant I passed unity gain on the Gain Input I quickly found myself in distortion territory, so you don't have to work hard to get there. The Input can take any signal, whether it be Gate, Trigger, or CV, and whatever signal is patched in goes through the VCA, which is an AD (attack and decay) type with a toggle to determine the Decay length (the attack length is a short fixed length), that being short/off/long. The Decay is CVable and has an attenuverting control, and the slew signal at the VCA output is copied to the CV Out for use as a way to add modulation from 107 to other modules in your setup. There is a CV Out, which is a combination of the Frequency CV and Cutoff CV, and

there are jumpers beneath the faceplate on the side of the module that will take the normalizations of these particulates out of the signal for the CV Out if you just want only one of those. Even though this would be better served if it was accessed on the top of the module, it's completely understandable why ADDAC designed this the way they did, and I think it's to their credit that they give the option; they could have just as easily hardwired the normalizations in there.

There's also an Accent Input which can add some dynamic juice to the VCO by patching in CV, and this input can also be used as an external input for another VCO or sound source by removing a jumper that's in between the VCO and the filter, which takes the internal VCO out of the signal path. The jumper is placed in a circuit-bendy kind of way on the front of the module, and it's a little odd—you don't see jumpers on the front much—but it works fine and is an interesting way to add options without taking up too much space, but for the most part I found no need to un-jump/unhitch the VCO as the onboard VCO section is fine, and most of us have other synth voices for other sound sources. Another thing that's interesting about this section of 107 is that the Input allows for more than the usual +5V and won't clip at above that, which is what most modules do at this point. Patching in CV over +5V can send the sound into saturation via the Gain, and as such, amounts to a sort of a CVable distortion/boost, kind of a two-in-one deal, and it brings more animation and movement to a patch. It wasn't hard to get the acidy sound this was designed for, a bit of patching here and tweaking there, and I can see why ADDAC changed their tune on this, but I thought I'd give 107 a whirl as a percussion source, since this what it was originally created to be. While I got decent enough kicks and some other percussive sounds, there's no question that I wouldn't use this module as anything but an acid source as it's really quite enjoyable to easily pump out the squelch and twist a few knobs to bring out its full potential. I found that while mixing in another sound source obviously added to the impact on the resulting filter, I preferred 107 solo; adding more seemed to hide the essence of what makes it work so well.

107 has got some quirky flexibility options (the jumpers, that unmarked toggle), but it also highlights ADDAC's working sensibilities; focused , somewhat whimsical, but always musical. There's a sense of humor to this, they even put the ubiquitous smiley face on the bottom, but nothing lacking in the seriousness of sound and possibilities it delivers. This is also available as a full DIY kit, so if you like dropping acid—music, that is—the ADDAC107 has got you covered.

- Ian Rapp

9 HP +12v 80mA -12v 80mA

Price: $249

Tone Science Triple Cross
AJH Synth
ajhsynth.com

When this module came in for review there was a nice handwritten note from Allan Hall, proprietor of AJH Synths (if you haven't guessed, those are Allan's initials), wishing us well, among other niceties. When I wrote back (via email; shame on me, I know) thanking him for his thoughtful note and for sending the module he replied:

"It's a vintage-style module, so it's only right that it has an old-school hand-written analogue note with it:)."

While the AJH Synths Tone Science Triple Cross Xfader and Panner (AJHSTSTCXaP!) might be a "vintage-style module," it's undeniable that its many uses are timeless. The first module in a planned series of collaborations between AJH synths and UK synthesist/musician/composer/DiN Records label boss Ian Boddy, the idea for the module came about due to a patch Boddy had created on his vintage Serge modular for his 2016 album *Tone Science,* (also the name of a sub-label he runs) for a slowly morphing panning mix; a shapeshifting ambient chordal generative drone that needed three separate crossfader modules and a plethora of patch cables to realize. Somewhere down the road the idea for one module to take care of the bulk of this duty was born, and the AJH/Ian Boddy team created, with the end result being a module that does perhaps more than Boddy or Hall imagined at the outset of the design process.

The Triple Cross consists of three channels, each with the capability to be used collectively or independently as either a VCA, crossfader, panner, as a crossfader with a reverse panning function, or even for three channels of basic attenuation. In and of itself, this would make it a very useful utility module, but it's when you start mixing the functionality of the three channels, or "misusing" it in some way, like feeding the VCA an audio rate signal for ring modulation, that it becomes much more interesting.

Each of the three channels consist of a Fade control and CV input with CV Level attenuverter, two inputs (A and B) and two numbered outputs (L-#, R-#). The CV controls are attenuverters with a center-point zero, which means that you can patch in a directionally-shaped envelope or LFO (basically just not a square, sine, or triangle wave) into the CV In for VCA use and depending on the output (L or R) and the knob position, get an ascending or descending envelope. This can create some cool effects, like when multing an envelope and running instances into each of the CV input for two tracks—one attenuated, and one attenuverted—so that there's a bit of a lag between the two channels as one will be opening as the other is closing, to create some delay, a stuttering effect, or a hacked rhythm, among many other uses.

There is some normalization occurring here, to where the outputs from the first two channels are normalled to the inputs of Channel 3, (which has an input level control for both L and R), so you could also see use for this as a crossfading VCA-controlled four-channel mono or stereo mixer. Try saying that fast fifty times! For audio sources as the inputs, Triple Cross is really useful as a CVable panner/mixer—how Boddy first envisioned it—and

patching the first two channels all up with audio rate signals (so they're normalled to the Channel 3's output) in every jack (CV included), and a chaotic and gnarly output was had. After clearing my head of this I started to understand Boddy's desire for slowly morphing change, so using two different barely moving LFOs for the CV ins on both channels and patching up in this way got me closer to what I believe was the initial vision, and made for an interesting listen. Throw those inputs through some modulated filters beforehand and you'll never hear the same thing twice.

Triple Cross is DC coupled, so it excels in creative CV mixing/combing use, and with two different (and random) CV inputs for each of the first two channels and patched into the SSF Entity Ultra-Perc (see review this issue) to control Length and V/Oct on the Ultra-Perc, it created excellent morphing CV, and being able to control the amount of the modulation at the output of the Triple Cross before it reached the Ultra-Perc was a nice bonus.

Vintage, old school…however you want to say it, the usefulness of Triple Cross and modules like it will never go out of style, and while he's known for his music and composition, perhaps one day Ian Boddy will be equally known for being the inspiration behind the Triple Cross.

- Ellison Wolf

14 HP +12v 80mA -12v 72mA

Price: GBP 216.67

TAPS, Halo Mult, ReVolt
myVolts
myvolts.com

Is there any worse feeling than throwing a fistful of dead batteries away (at the proper disposal facility, of course)? Just a short time ago those very same batteries were shiny, standing at attention in their cardboard display, so full of life, vigor, and voltage. And now…dead. Useless, except for maybe in use in some terrible art installation or as part of a display for rechargeable batteries (they're still batteries, people!). While we as synthesists, music makers, and sound sculptors can't single-handedly banish batteries from the planet yet, we can be more conscientious of our battery usage and myVolts have a pretty good solution in their ReVolt kit, which consists of fake batteries and a cable to plug in for power. I've been rocking them for use in my Teenage Engineering Pocket Operators for a while now and I love the fact that I don't need to recharge—or worse—use conventional batteries anymore and while I'm not able to go running through the neighborhood waving my PO 12 above my head, annoying neighbors with my killer beats, it's been a nice way to say goodbye to the batteries. With their Ripcord system that connects to the fake yellow myVolts batteries, it enables you to plug them into any USB-C port, which makes them universal and universally awesome. There are so many devices—and modules (Five12 Vector!)—that have USB ports you won't need to look far or run a long cable to power your stuff up. They have replacements for batteries of all sizes, even giant D batteries for powering…heck, what takes a D battery anymore? A1970s camping torch?

Speaking of Pocket Operators, myVolts also sent over some of their TAPS Audio Flow adapters. These are cool add-ons that make it easier to adjust some of the parameters on Pocket Operators. They can be used in other devices too, basically anything with a stereo 3.5mm audio jack, but they seem tailor-made for POs. Their Pots & Pans device plugs into the POs and let's you easily adjust the volume or pan (via a small selector switch) as well as quickly and easily mute the sound, and their Beat Splitter model has two switchable channels and is a single to dual stereo splitter. It isolates your channels and allows you to choose where they go, and is one of those two-way things where, since it's passive, it can merge inputs by plugging Beat Splitter into the input or copy outputs by plugging it into the output of your Pocket Operator. This is a great way to route your signals and solve some problems, like if you've ever been annoyed at not being able to split a stereo signal for sending each channel off to different places, or if you want to isolate or combine channels. They're pretty handy, especially if you've got multiple Pocket Operators and are using them simultaneously, and these also can be used with the compact 5-channel myVolts MickXer (Waveform, Issue #6).

Lastly, myVolts sent over some of their Halo mults to check out and these—surprise!—mult your single signal offering up two outputs in a small, convenient illuminated adapter. These are really handy, a nice way to quickly copy your signal without needing a module or split cable or whatever to do so. They plug right on in your module, and while you might have to finagle some cables out of the way, I didn't find too much of an issue with that, and was impressed at the build quality. I'm always afraid that something like this, anything with a 3.5mm plug, will accidentally break off in a jack, but these are nicely made and the positive/negative green/red lights that flash with your frequency/tempo are a sweet touch.

myVolts basically defines what it is to be problem solvers, and have made life a little bit better and easier—and with less battery waste—something I'm appreciative of.

- Jason Czyeryk

Prices starting at $10

Polyphrase
Vongon
vongon.com

Right out of the box you know you've got something special with Vongon pedals. I mean, sure, they're always great looking—the nice hand-sanded and polished walnut enclosure, the Rogan knobs (in this case white), the attractive faceplate, but it's oh so much more than a fancy-looking pedal, and their latest pedal, Polyphrase, is

knocking my Birkenstocks off. (I live in the Northeast, no shame in my footwear, ok?)

Polyphrase is a digital delay/echo and looper that claims inspiration from vintage digital delays like the Lexicon Prime Time and such. I've only been fortunate enough to use vintage digital delays sparingly, and that particular Lexicon once, at a friend's studio years ago. Though I remember thinking it was cool, and we messed around with it a bit on guitar, I couldn't figure out how to make it shine and I don't remember too much else about it, other than the name. Good names will go far. Well, if it's part of the inspiration for Polyphrase then shame on me, because looking at it now, it looks amazing, and again, so does Polyphrase.

Polyphrase is an easy pedal to jump right into for anyone that's ever spent time with a delay pedal; there's nothing mysterious or hard to decipher here. The first thing you notice, other than the beautiful craftsmanship and design, are the two sliders in the middle of the pedal that break up the pedal into two sides and determine delay times for each channel. They can be synced or not, and this opens up just a huge amount of crazy delay options. With the Echo controls and a mixture of tone sculpting options on the right, and a Tap Tempo/Infinite control on the left, it's an easy tour to take.

The right side of the pedal has controls for Time, Mix, Echo Style, a soft switch for engaging the effect, and a 3.5mm MIDI In jack for syncing to other devices, and for MIDI control for all of Polyphrase's parameters, and storing some presets, too. With some button pushing on power up, Polyphrase can be set for various gain levels, so if you're feeding it a guitar, synth, or whatever else, you don't need anything else to get the right level.

Polyphrase can be run in mono or stereo and there are three echo modes to choose from: Dual Stereo, Ping Pong, and Mono w/External Loop. There are four ¼" interface jacks at the top of the pedal (In L/Mono, In R/Return, Out L/Mono, and Out R/Send), and plugging Polyphrase in (to the new Waveform Cat Powr, no less!) and taking the grand tour in mono mode of the Echo side of the pedal found me in pretty good shape in terms of dialing things in quickly. From slow, druggy rhythmic repeats to stainless steel bathroom slapback, there is a beautiful surround to the sound, nothing nostalgic or dirty, just clear and clean, and it was as simple as turning the Time dial (with a total of nine maximum delay times ranging from 85 milliseconds to 22 seconds!) and sliding things around to see what could be had.

Since I was in mono, I decided to use the Send/Return function to tweak Polyphrase's repeats. Really, with Send/Returns the sky's the limit, and I patched into the Strymon Starlab to add some spacey reverb to the repeats, and then to Weston Precision Audio's SF1 Filter to sculpt the tone further. I kind of like running reverbs into filters as opposed to the other way, as it sometimes opens up a different sonic palette doing it like that, reacting with the inputs in a way that running a dry signal into filter input doesn't always do, even though my mind feels like it's doing something wrong—like running delay after reverb—which is something I did also, with Starlab going into the 4ms Looping Delay (still in the Send/Return on Polyphrase). It's just nice having that Send/Return option to get crazy with the delay line or sculpt the tone of the delays and it can be really interesting when the Mix is at 100% wet—no dry signal allowed!

I was digging the Mono mode but was antsy to get into Stereo Mode and give that a shot, of which there are two options: Dual Stereo mode gives two separate echoes that can—yes—be run in stereo—with each echo sent to separate outputs, but the two echos can also be stacked for a mono output and can make some rhythmically bizarre delays. Ping Pong mode is a stereo/headphone lover's dream, which has the delays for each side feed into each other's inputs and acts as a multi-tap delay when in mono mode.

The left side of the pedal is where the sculpting of the delays takes place. There's a Feedback knob that goes to 110%, a bi-polar Tone knob to cut low or high end, and onboard pitch modulation with Rate and Depth controls. The Depth control—like Tone—is bi-polar as well so that in the middle position there is no depth—no modulation added to the signal—but turning the control left of center adds sine wave modulation and turning it right of center adds random modulation. I like this bi-polar stuff, it's a smart and interesting way to add numerous options in one control, and I like that it still allows for how much of something you want to add, it's not just a fixed amount. The modulation is really versatile, going from 0.1 Hz to 10 Hz (so close to audio rate), and the two waveform choices—sine and random—are exactly what I like to modulate delay repeats with when I do so with an LFO.

The left side has a soft footswitch for Tap Tempo and Infinite, for infinite feedback, with a small button selector to switch between the two. I like it because you can tap your tempo if you're not syncing to anything via the MIDI in, and then switch to Infinite with the tempo remaining how you set it. This dual-functionality of the switch is a good way to avoid having three switches

instead of two, and using Infinite mode and mixing that into the background (or foreground) with whatever the input is and manipulating the various parameters, shaping, tweaking, scurrying the sound is inspiring. It can be anything from a subtle pad to a dominating mechanical wash, wiping out the input entirely. Throw in some onboard slow sine modulation and you're in Boards of Canada territory, with that creepy detuned sadness; the soundtrack of perfect lawns, stiff G&Ts, and ridiculously organized garages. The Infinite output can be isolated to the OUT R (essentially bypassing the Return part of the Send/Return) with the unaffected mono signal going to the OUT L so you can process each in other ways, and you can play with just the Infinite and use this as a sound source. It would be ideal if you could isolate the Infinite output on one side and the delayed signal on the other, but I'm not sure how that could be done with only one delay line. Magic, I suppose? Two Polyphrases? Hmmm….

One of the really cool things about Polyphrase is that changing the Time parameter doesn't alter the pitch, but moving the sliders does. If you have a fast delay time going you can effectively pitch the delays and use Polyphrase like an instrument all to itself, as a sound source. Mostly I did this with one signal but with the stereo out. It's just way too cool to use Polyphrase in stereo, tweaking the delays for each side, then hitting the little Sync button to quickly sync them, then undoing that. And setting each delay to opposite extremes—one fast and one slow—in either stereo mode configuration was awesome.

While I can't imagine seeing Polyphrase on too many pedal boards—it's a work of art not destined for the floor—I imagine there will be a lot of these front and center—or maybe a little off-center to leave room for a MIDI controller of some sort—on desks, and with serious staying power. It's beautiful to look at, incredibly fun to play and has a ton of possibilities in which to explore. I do wish the modulation could go a little faster so there could be audio rate modulation, and of course, CV control would be great (though you can use the MIDI to control the parameters), but overall I'm very into this pedal. Yes, there are plenty of delay pedals out there, some with many more features and tweakable parameters, but I'm not sure there are any that I enjoy playing as much as Polyphrase. I've spent plenty of time with an array of delay pedals and if I could only have one delay to sit on my desk (thankfully that's not the case), this would be the one, without question. Polyphrase may be my favorite Vongon release yet.

Wherever Vongon finds their inspiration, whether it be from vintage effects or in the water they drink, they inspire others through their pedals.

- Jason Czeryk

Price: $449

Arkan
Malstrom Audio
malstromaudio.com

Malstrom Audio has released two modules so far: Mandrake, their impressive kick drum module (Waveform, Issue #10), and Arkan a dual voltage polarizer. Mandrake gets more of the attention, but Arkan isn't one to be overlooked, even though utility modules sometimes have a tendency for that to happen.

While Malstrom calls Arkan a dual voltage polarizer, I'm not sure that description does it justice, though it's easier and more efficient than listing all of its potential uses. In the way that Serge's DUSG (and similar modules that have followed) is a powerhouse masquerading as a utility module, so is Arkan. Arkan is a tale of two identical halves; a top half, and a bottom half—Channels A and B, respectively—with each consisting of three sections: Input, Bias, and Modulation. The sections are only an input and attenuverter, but there's a lot of potential there.

Each channel's Input section has an Input jack, a Gain control, a toggle for inverting the input signal, and an Output. Any input can be attenuated or amplified (up to +12dB) with the Gain control and you can use this to boost and/or distort your input signal. The Bias section contains a Bias input and a bipolar attenuverting controller, and when a signal is patched into the Bias input, it gets mixed in with the main Input signal, so Arkan can be used as a mixer in this fashion. When nothing is patched into the Bias input the attenuverter adds offset to the input signal. The Modulation section consists of a CV input with a modulation strength control that acts like a crossfader—mixing in the amount of modulation—and a Curve trimmer that goes from linear to exponential. This section modulates the mix of the Bias and Input section with 100% mix output fully CCW and with the mix being fully affected by the modulation at full CW. This means that if there is no CV (0V) patched in, the strength control basically attenuates the mix since there will be 0V at full CW, though this is backwards from what we're used to with a volume knob at full volume turned all the way CW. If there is CV patched in, say an LFO, any positive voltage will amplify the mix in a positive way, and negative CV will amplify the mix in a negative way. By using the strength control you're effectively turning the modulation section into a VCA, but patch an envelope into the main In and use a slow moving LFO to modulate it and Arkan turns into a polarizer, attenuating the signal as the LFO sweeps and flips it negative, and vice versa when it flips the signal positive. While there is already a lot of functionality here, it's the Curve control that is the difference maker. It can shape and drastically change the tone by setting harsh or mellow modulation curves, and in this way the Curve control is really useful.

Lastly, Channel A's Output is normalled into Channel B's Output so that you can use Arkan as a dual channel module or one single channel behemoth that can even be used as a four-channel audio or CV mixer, though Arkan really wasn't born to just be a mixer and I never used it as such.

Using Arkan to process CV in order to modulate filters or FM inputs on VCOs can really bring a lot of expressive possibilities, and while it can get a little crowded when all patched up, Arkan would be a great module to have in a live rig since it's so

versatile. You could use each channel for separate tasks; one for audio to shape and distort a signal, and the other channel for processing CV, maybe the audio that you're distorting with the first channel. Arkan, with just its three small sections—Input, Bias, and Modulation—gets you a lot of mileage. You can mix, attenuate, attenuvert, offset, distort, clip, waveshape, ringmod, polarize, tenderize, and 1-hour Martinize. Well, not the last two, but...

I really like using Arkan for ring mods and as a VCA where you could tweak the Curve to get a variation in the sound. Stacked and patched into itself, Channel B for modulating duties into Channel A, into Channel B's CV and Bias in, and it could—and did—easily get out of control and into runaway noise territory, but doing so I got some really cool percussive pulses—with a ring mod chaser if you will—that I'm not sure how I could have gotten otherwise, though I seemed to get more usable results when I kept at least one of the three inputs (using one channel here) to a simple, somewhat recognizable, waveform instead of using three of the four main outputs.

Arkan is another impressive release from Malstrom and I'm looking forward to what they come out with next.

- Evan Morrow

8 HP +12v 90mA -12v 85mA

Price: $199

ACRONYM
WORNG Electronics
worngelectronics.com

Reading through this issue's interview with Morgan McWalters of WORNG Electronics before it went to print, I lost track of how many times his comments made me laugh. Morgan obviously has a good sense of humor—and a good sense for the absurd—and both are on display with the naming of his newest module, ACRONYM, which stands for "Analogue CoRe Oscillator New tYpe: Morphing." I mean, it's a bit of a stretch, but it works, right? Besides, it's just a name, whether one finds it right or...you know…WORNG. Somewhat strangely, ACRONYM is the first module released by WORNG that actually produces sound; every other WORNG release either shapes, routes, filters, EQs, spreads it out, or does something else to it.

ACRONYM is an all analog triangle-core-based VCO that tracks over eight octaves and has waveshaping capabilities. It can morph between four waveforms (triangle, square, saw, and a folded sine wave) via a knob or CV, and with five outputs—a main Wave out, a Sine out, a Triangle out, and two Sub outputs (one at -1, and one at -2 octaves)—there are plenty of options for syncing, layering, and self-patching. As for the Subs, they're reminiscent of a 303, with a curved square wave that produces a somewhat aquatic toothy sound. There's a Sub-Level control to mix the Sub outputs into the main Wave output to create really unique waveshapes with a lot of heft, and this is just one of many ways to get your waveshaping on in ACRONYM. The Subs also work great for modulation duties as they provide more animation than the usual on/off functionality that a square wave provides, which is normally the shape you get for a sub out, if you get one at all.

As for features/controls, there's also Fine and Coarse tuning, a V/Oct input, Hard Sync—which syncs the negative part of the incoming wave—and a Through-Zero Phase Modulation (TZPM) CV input with attenuverter for phase modulation that tracks in key. Yep, phase—not frequency—modulation. Always their own thing, that WORNG. ACRONYM is a nice looking, sturdy module with all of the usual WORNG flourishes and aesthetic properties: angular, scribbled heavy metal-ish text, a spacious and ergonomic layout, and animated light-up panels—three in this case—one for indicating the main waveform in the Morph CV section, another that shows the -2 Sub frequency speed, and a small circle with a slash through it that shows the TZPM strength. WORNG modules are inviting, both in terms of how they look and how they play, and their functionality is displayed entirely on their front panel, meaning that there's nothing to memorize or look up. I actually don't mind menus/memorization, but it's nice to have a mix of modules with different levels of playability/depth/diving.

The lack of menus/memorization does not mean that ACRONYM is a shallow module, by any stretch. It's a beast that sounds huge and is packed with a ton of sonic and modulation possibilities. The self-patching possibilities are immense, and modulating the main waveform, cycling through the waveform options with either Sub out or Sine or Triangle out via the Morph CV input, brings some nice movement to output, creating interesting changes to the timbre. I like to cycle through slowly to hear how smooth the transitions are, and what kind of in-between shapes are made. The Morph CV input was made for a voltage range from -5V to +5V, and is an attenuverter, so it can be tweaked to accept almost any Euro signal, but this input can be also pushed with a voltage greater than +5V or -5V. Of course, what kind of waveshapes it outputs depends on a few factors, but this only adds to the surprising and fun qualities that ACRONYM exhibits; it's kind of like an easter egg, a hidden secret/tactic that some modules (and a lot of video games) have, and it contributes to the sonic palette and exploratory excitement on hand here.

The Sub Outs are particularly cool, and since they're not identical in octaves, but tied to the main frequency, you can put them in a stereo situation, and with some modulated panning—I liked putting one hard left and one hard right—with the main output (with some reverb and delay) in the center. By modulation of the panning, you can get a lot of really cool stereo movement. I bring up this stereo aspect, not only because there are two Sub Outs and it seems like a somewhat obvious thing to try, but because WORNG is obsessed with stereo; this is their only module that either doesn't offer stereo ins and outs specifically, or warp the stereo space in some way.

Using another VCO (I used the Blue Lantern TPC Slim VCO) running with the same V/Oct sequence as the input to the TZPM can bring about some really odd atonal pitch shifts. Like ACRONYM, the TPC VCO lets you CV through the

waveforms and I did that for the input into ACRONYM's TZPM CV input, while—of course—slowly modulating through ACRONYM's waveforms as well, and I synced everything up so that the changes would be happening in tandem. It made for some very cool sound transformations, from 80s video game sounds beeps to robot vocals to fat acid basslines and far, far beyond. Being able to watch where the ACRONYM's waveform was shifting to via the light-up LED panel made for some quick and easy light show entertainment, and being able to attenuvert the Morphing CV meant that you could subtly switch between two waveshapes, cycle through all of them, or inject more than the +5/-5 voltage and fritz out the Morph.

Why it took WORNG so long to come out with a VCO is beyond me, but it was worth the wait. I really love their stuff and this is a great VCOt. I've always felt an affinity for the hands-on experience that WORNG modules offer up, and ACRONYM follows that tradition. There's something intrinsic about their modules, part of their being that makes them fun to play and experiment with, and I find myself reaching for them A LOT.

- Ellison Wolf

12 HP +12v 95mA -12v 72mA

Price: $399

Misha
Eventide
eventide.com

I would have loved to have been a fly on the wall in the Eventide board meeting when Misha, their generative Eurorack sequencer was first brought up. Having dealt with mainly effects units, nothing in the company's illustrious history would have suggested that they would ever produce something like this.

Inspired by, and based on, Leon Gruenbaum's Samchillian Tip Tip Tip Cheeepeeeee (most call it Samchillian for short), a MIDI interface that uses a spread-out split PC computer keyboard, like a modern day digital accordion (sans the squeezing) and implementing Austrian Josef Matthias Hauer's tone row technique (yes, Arnold Schoenberg is mostly credited with developing this system, but according to extensive and exhaustive research [exhaustive because I was tired when I looked it up] Hauer developed this technique a little before Schoenberg) where the notes of a scale are fixed in a certain order and each note of the scale is used only once before the tone row (either user definable, or not) is repeated, Misha is indeed a unique sequencer.

While the Samchillian also uses the tone row technique, Gruenbaum's is a bit of a home brew affair, and this is where Misha takes the baton and runs with it, because Misha is streamlined and mainstream-ish; anything but a DIY type of affair. I watched a few videos of Gruenbaum performing with the Samchillian as I always find it interesting to see inventors playing their own instruments, and it clearly shows the mastery he has over his controller, though it's hard to imagine it being utilized by many, the same way Misha probably will and/or can be. Misha is a special sequencer and Gruenbaum's layout and playing approach and Hauer's melodic design translate perfectly, and to modular synthesis as well.

Being a CV/MIDI controller, Misha makes no sound of its own other than a basic tone at its audio output, so like the Samchillian it's how it controls melodies that sets it apart from other CV/MIDI controlling devices. Really, any sort of controller could work in implementing this interval-based generative tone row approach, and while Misha takes a bit of inspiration from the Samchillian with its split symmetrical layout, and does offer the opportunity to sport a QWERTY USB keyboard to control it with—a nice homage to the Samchillian—it's much more playable and economically sized—a necessity if it's going to be housed in a Eurorack setup.

Misha's layout—nine numbered light up push buttons [-4 to +4 with a 0 center point] that form a "V" under a multi-color LCD screen—sounds the alarm that traditional keyboard playing will not be happening here. Each of the push buttons represents movement from the note that's currently being played. For example, pressing +1 moves the current note one forward, +3 moves the current note three notes forward, -2 moves the note two notes backward, and 0 means the same note is played; no melodic movement. Granted, the notes played are dependent on what scale is selected (Misha comes with plenty of pre-loaded scales, and you can save and load others as well, with 200 slots available), but it's a pretty intuitive melodic approach to grasp, if not one that's immediately easy to master.

There are a couple of pushbutton encoders [Key and Scale] that flank both sides of the screen, and this is where the menu diving starts, though you can circumvent the need for going to the main menu by using two Shift buttons found at the bottom of Misha that will scroll through and display the more commonly used functions and parameters. Tempo, scale, key, octave, global stuff…all of the things you'd expect to find in a sequencer are user configurable, and the screen itself is nicely sized and easily legible. Menu selection isn't too painful and is more for setup type stuff, and for the most part maneuvering through it is easy and sensible.

There is a Record/Stop button, Play/Pause, four User buttons for user-defined functions that amount to programmable shortcuts, the previously mentioned two Shift buttons [Up and Down] at each lower corner for quickly moving through screens, and an Undo button. At the top of the module are MIDI In and Out, a mini USB input for firmware updates and to control Misha with an external device, and three identical channels [X,Y, and Z] each containing CV In with a user configurable input range, CV Out, and T/G [Trigger/Gate] In and Out. There is also a main Clock In, Audio Out, and a MicroSD slot to save and recall presets and store other information. Misha can use MIDI, CV, or its internal waveform (the only sound it makes by itself, mostly used as a reference) to make sound. I primarily used it in my rack with CV.

Misha is really a performance-oriented machine and with that in mind, it's how I'm basing my perception of it as a whole.

For the most part, any sequencer can be programmed with any combination of sequences/notes, so really it's *how* Misha gets to its melodic output that really sets it apart. Overall the layout works pretty well as there's enough room to move around, plenty of quick, easy options for changing things up on the fly, and a somewhat intuitive approach. There are some button combos that need to be committed to memory, lest you need to go into the menu during a performance, but that's par for the course. While I think of Misha as an alternative way to play scales, had I no background in music, I would probably see it as an easy way to play (potentially) interesting musical-sounding scales and melodies, and Misha works just as well—and is [probably] just as fun—for musically well-seasoned synthesists as those who are not. You can have no idea whatsoever what you're doing, and get something nice and musical out of Misha. Music school grads might scoff at this, but it's pretty enabling, and it makes it easy to jam with other musicians. If you throw some CV into Misha you can bring a lot of variation to the intervals, thereby creating moving, generative patterns (again, in key) and freeing you up to mess around with other modules in your patch. While that can be said for many modules and sequencers out there already, the way Misha does it is surprisingly fresh. I do wish that the three channels of Misha could be sequenced with different scales/tempos/etc., so that you could maybe play Channel X live, have Channel Y running a bassline, and Channel Z some kind of ambient pad at different tempos and scales or something. With the three channels, Misha really seems primed for polyphony, and since Misha probably wouldn't be the only sequencer in your rack, you can get that other stuff from more traditional sequencer modules or devices.

Using Misha for chords is a good exploratory experience and you can select from many included scales and chords. It can be very interesting to mix up the routing of the three channels and by using a few switchers and mults you can send the CV outputs for each of Misha's channels into various VCOs or other sound sources and switch up the root/3rd/5th of a typical triad to keep the chording consistent while the sound for each note/chord changes. Misha makes it quite easy to use and create chords in your patch and potentially offers up easy ways to do so that really only exist in modular. The Klang by Elektrofon (though Klang is four-voice) comes to mind when I think of quick and intuitive ways to create chords with this kind of flexibility, so that's a pretty compelling feature for Misha to have in-house.

In terms of using Misha as a controlling instrument to play melodies in real time, it wasn't easy. Not that I was hoping to use this to play Rachmanioff or anything, but still, something as simple as "Mary Had a Little Lamb" took a good solid fifteen minutes to play once through, and I was only successful when I cheated and played it off of the chart in Misha's manual. Other songs were much more tedious. "Axel F."? "Hey Ya!" by Outkast? "Sweet Dreams" by the Eurythmics? Forget about it! Like I said, this isn't your traditional keyboard, so this was no surprise and isn't the point of Misha, but still I thought I'd give it a shot.

After decades of playing Western-scaled melodies on traditional keyboard-based instruments, I found Misha to be great at breaking out of old melodic tendencies and habits, discovering new territories, and changing things up in unexpected ways. Mostly this was because my processing speed would not allow me to reconfigure to Misha's method of playing and I simply could not just play songs on it well. Thankfully. Altering keys, scales, note length, tempo, etc., in combination with the idiosyncratic (to my conditioned, Western-scaled brain) melodic functioning of Misha on the fly, can crack the code, can open your mind. It's strange; its methodology is simple in concept, if not merely novel, and yet its newness won over my old ingrained tendencies. Again, it's because I couldn't play it as I was used to playing a keyboard-based instrument that set me free, but whatever the case, the price of admission any time you can see, experience, or become something new is invaluable. Dare I say that Misha can be a growth experience.

I even like Misha's name. It reminds me of an old friend, one that would give you a homemade loaf of rye bread and some fermented something or other every time you visited. There's love there…and true passion. While Misha is great for jamming and experimenting—and I view it equally as a controller and a sequencer—it does have its shortcomings and I wouldn't want it as my only sequencer or controller. The buttons aren't velocity sensitive, so there's a limit to the expression one can have with Misha as a controller, and the difficulty in learning its scaling for playing it as a known instrument would be a real commitment, there's no question about its uniqueness to any musical landscape and worth as an instrument. A tip tip tip of the cap to Eventide for taking a chance and hitting a bullseye with Misha.

- Jason Czyeryk

28 HP +12v 105mA -12v 5mA

Price: $599

Aloysius and Amelia
Expert Sleepers
expert-sleepers.co.uk

Continuing their line of all-analog modules named after tracks from the Cocteau Twins album *Treasure*, Expert Sleepers have released Aloysius and Amelia, a pair of good/evil sounding twins that are actually quite similar, enough that they could be siblings.

The youngest of the two—having been most recently released into the world—is Aloysuis, and is an AHDW (say what?!) envelope. It's almost like a trick on the mind, right? We're so used to AD, ADSR, even DADSR envelope generators, what the heck is AHDW? Well, it stands for Attack, Hold, Decay, and Wait. The "Wait" part is interesting on a feature level as the module's namesake, Aloysius, was an aristocrat who gave up his inheritance to become an ascetic member of the Society of Jesus in Rome, and who wound up dying at age twenty-three while caring for patients during the plague in Rome. If

anyone knows about patience it seems like he would, and it only seems appropriate that he has both a song and a Eurorack module in his honor.

I'd never heard of an AHDW envelope before, though according to the Expert Sleeper's website that shape of envelope is known for being able to make a trapezoid shape (which will always make me think of a Simpsons episode where Homer almost falls victim to—not a pyramid scheme, but a trapezoid scheme! Season 3, episode 12 if you need to know.) Aloysius has all of the trappings you'd expect from a full-featured envelope; a Gate Input, an Output, and CV control over each of the four stages of the envelope, those being the previously mentioned Attack, Hold, Decay, and Wait. There is a way to set the shape of the attack and decay part of the envelope shape via two small knobs on the module and the small Attack shape knob goes continuously from exponential to logarithmic, with a linear shape in the center position, and the Decay works in the opposite fashion. The features on Aloysius are rounded out by the three small toggles at the bottom; the top switch for the Mode (Auto, Hold,and Gated), with the middle and bottom switches setting the ranges for the Attack/Decay and Hold/Wait times, those being Med., Slow, and Fast.

While the Wait and maybe the Hold functions might be unfamiliar to some, the operation of Aloysius is straightforward to anyone that's ever used an envelope generator and it just takes a little bit of scouting around to see what makes this an attractive EG. There's a lot of flexibility in the shape and times, with the ability to control the time for all of the stages—either manually or with CV—as well as tweak the Attack and Decay stages to your liking.

The three modes are really what set the tone of versatility here. Gated mode is when the inputted gated length determines when the envelope starts to decay, while the Hold stage has the Hold control itself determining when the shape goes into the Decay mode. You can get bonkers CVing the Hold, no matter what signal you have at the input. It's a kind of hierarchy of sorts, with Hold having seniority, so watch out!

When running in Auto mode, Aloysius triggers itself and becomes a very flexible LFO with the ability to make some complex and interesting waveshapes (like trapezoids!), and this is where the Wait makes its presence known as it determines the space between the shapes. It was definitely helpful to run Aloysius into the Mordax DATA (what else) to see the shapes taking place and how to space them out via the Wait control. It was pretty wild to see how interactive the controls were, and it can be confusing at times not understanding why one parameter would have no effect, due to another stage hogging all the available time.

Amelia, the good-natured sounding envelope generator is very similar to Aloysius, and is just as idiosyncratic in nature as it's an ADBR (huh?!). Yep, it seems Expert Sleepers has an aversion to, or just rather prefers something different, to your everyday, run-of-the-mill ADSR. For the most part, this EG is the same as an ADSR, with the Break stage being the tattoo, the pink hair, the bad attitude, that sets it apart from the din of other generators de envelope. Again, CV control over the entire stage set is provided, as are the two shape controls for the Attack and Release Stages. There are two switches this time; one for Mode (Auto, Break, Gated), and another for Time (Med., Slow, Fast) for control over all phases of the waveform.

Expert Sleepers notes that Amelia was designed for using with sequencers that don't have an adjustable gate length out, only simple trigger outs—of which there are many—to be able to create complex shapes from that basic trigger, and that's all well and good, but the real question, the difference maker, is the Break function. Is it better than the normally found Sustain stage? What does it do differently?

Well, while all three modes are somewhat similar, when Amelia is in Break mode the envelope falls at a pace set by Decay to the Break level, whereupon it goes back to zero at a time set by the Release function, so in essence, Break is when the envelope change from the Decay to the Release stage. With this, if you max the Break level for all purposes, you eliminate the Decay stage, and vice versa, you can eliminate the Release stage by setting Break at the minimum setting. Some of this feels like envelope generator calisthenics, and I suppose it is, but it 's interesting in practice as well as theory and gives Amelia the ability to be very complex in its waveshaping capabilities, and also simple, just your little ol' AD envelope.

Aloysius and Amelia are good fun, very functional, flexible, and a nice change of pace. Slightly different than pretty much any other EG's out there, they offer pinpoint control over almost every aspect of the shape, time, and length, stage of an envelope, and you can really create some unique envelope shapes and LFOs with both. I do wish there were inverse envelope outputs available on both modules, though I was easily able to do this using an attenuverter (I used the Zorx 1U CV bus, which is a four-channel mult/attenuverter).

Expert Sleepers have three more tracks (Cicely, Otterley, and Donimo) to go before they run out of tracks (and modules?) for their Cocteau Twins *Treasure*-themed line. It's really coalesced into a great series and I'm excited to see how it rounds out.

- Ian Rapp

Aloysius
8 HP +12v 43mA -12v 25mA
Price: $185

Amelia
8 HP +12v 33mA -12v 33mA
Price: $185

M1 Mix
DPW
dpw.se

DPW's M1 Mix is a surprisingly deep module that is a DC-coupled four-channel stereo mixer, but can also be an eight-channel mono mixer with crossfading. It has an onboard limiter for some control of the output and adding color to your sound, and is super flexible, sounds excellent, and is incredibly compact at only 9HP.

Sporting four identical stereo channels, each with Volume and Pan and divided

into Channels 1 + 2, and 3 + 4, with each set having an "M" switch, which turns both channels (1 and 2, or 3 and 4) from Stereo to Dual Mono. In Dual Mono mode the Volume controls both channels inputs and the Pan acts as a crossfader between the two, so with all four channels in Dual Mono, you get two levels of mixing; one at the channel level on the inputs, and one for each channel. This opens up some creative mixing possibilities for a live performance, like putting a melodic sequence (or bassline, or whatever) through two different sound sources and patching both into a channel in Dual Mono and you can alter the sound of your melody by switching from one to the other or by mixing the two together. And you can switch easily from Dual Mono to Stereo for another viewpoint. Do this with all four channels and you could essentially play this mixer as a four-channel crossfader.

Both L and R of each channel is normalled to each other so if you're using a channel in stereo, it doesn't matter which one you patch into. If you only have one signal patched into any given channel, the only difference between Dual Mono and Stereo mode is that in mono your signal is straight up the middle and can't be panned anywhere. I noticed that if there's a discrepancy between the incoming signal level for each input into one channel, the loudest signal can really overpower the channel, to where it's hard to mix between the two, so no matter if you're in Dual Mono or Stereo mode, you may need to attenuate one signal in order to get the most out of a given channel when two signals are patched in.

At the output stage the soft-knee compressor limits the output to +/-5V, so anything above that will get gently shaped back into the allowed voltage realm, and this can sometimes bring a subtle warmth, and other times a fizzy distortion, so there's a range of tones that can be had. This is a nice addition, the soft knee shaping just enough to keep the output from being too hot. The threshold is set really low and the compression is active any time the limiter is activated, which can be a little limiting (pun intended) depending on how tweaky you want to get, but I found it to be really useful, even without any control over the parameters of the limiter, and if nothing else it protects your other gear down the line that you might be running your sound into. Overall it did a nice job of melding the overall sound coming out of Mix and giving it a more cohesive output. It's not going to glue your mix together like running it through a Fairchild 670 or anything like that would, but it helped my sub-mixed drum patches live a little better in the maelstrom of dense patches. For visual indications of levels, there are two LEDS on Mix, two for the output to signify when you are at 5V, and two for the limiter, where their brightness indicates how much compression is happening. This is helpful, though mostly I just used my ears to determine whether or not the sound was what I was looking for.

In Dual Mono mode the pan acts sort of like a volume, though it's technically a crossfader, as you can combine the two signals into any configuration volume-wise between the two with the Pan knob, and the overall volume of the track output with the Volume knob. It's a really clever use of space and technique, though it's good to remember there's no stereo separation (duh?!) in Dual Mono, so it's really a mix/combiner in this mode.

One thing I liked using Mix for was as a crossfader to blend two different effects to taste. With a signal multed and patched into both the Meris Mercury 7 and the Echo Fix EF X2 tape delay and in Dual Mono mode I could get the perfect blend of the two using the Pan control, and change it on the fly to "mute" the delay by panning hard towards the Mercury 7 side, and vice versa when I only wanted tape delay and no reverb. You could do the same with distortions, blending to get the perfect distortion sound, or two filters, or a filter and a delay, and on and on. I did the same with two sound sources slightly detuned from each other and mixed and switched between the two. That brought on cool results and by blending the two signals I got a nice subtle phasing effect, though the further apart the tuning the heavier the phasing became. Doing this was also a good way to tune two oscillators by finding a balance between the two via Mix where you could hear both and listen for the beating of frequencies to die down between the two, so there was a perfectly synced fluctuation of waveforms. Using the same two oscillators, but the second one pitched at a desired interval of the first, such as a fifth, brought in a fuller sound, and transitioning between the two was an interesting way to change a bass or melody line, or even just two distinctly different types of noise for background. The same two signals patched into the same channel in Stereo mode brought out one distinct sound, and was less pronounced than in Dual Mono.

Mix is an interesting module. In a smaller case this would be a great end-of-line mixer, taking up little space, but offering up great flexibility and sound; however, in my larger setup I found myself using it for a percussion sub-mixer, combining snare sounds to fatten it up, and like I mentioned, as a performance-type of mixer where I used the first two channels for melody and bass and the other two for pad/drone duties. With the ability to

hone in mixes between two signals, mix eight mono signals or four stereo, or just to get some stereo spread with the flick of a switch, DPW's M1 Mix delivers the goods. - Ellison Wolf
9 HP +12v 25mA -12v 0mA
Price: $149

Mercury 7
Meris
meris.us

From spring to software, I've got too many reverbs on hand to count. Heck, I have three different sizes of spring reverb tanks in my modular case, from a large one that spans almost 100 HP to a tiny blue one that looks like it came out of a vending machine. It's not that I'm on a quest for the perfect do-it-all holy grail reverb (which, of course, doesn't exist) the way that a guitar player might seek out the perfect fuzz, it's just that reverb—almost no matter what type—can always find an application in my music, whether it's for lead vocals, synth snare, or just ambience. While it's fun to try out different ones, the ones that I normally reach for are the reverbs that have a vibe of their own right out of the box. Such is the Meris Mercury 7.

Inspired by the movie *Blade Runner*, with the famous soundtrack by Vangelis, the Mercury 7 has a mood all its own. I must admit that I hadn't seen the movie until a few years ago, and I watched it because of the pedal. I grew up in a household with no TV, computer, video games, etc., which I suppose is why as an adult I'm obsessed with TV, video games, etc., and until my mid-thirties hadn't seen too many movies. I've been on a tear ever since, probably watching too much of everything, and after my initial viewing of *Blade Runner* (I've seen it twice now), I fell under the spell of its soundtrack, much like the folks at Meris must have, finding enough inspiration in it to create their only reverb pedal to date as an homage.

Mercury 7 is a lovely-sounding pedal. With two modes, Ultraplate and Cathedra, it covers a surprising amount of ground. Ultraplate is a go-to for me when I want more grounded, earthy reverbs, but it's Cathedra (yep, no "l") that gets me every time. Putting it on almost anything takes me somewhere, and puts me in a particular headspace and zone that I just don't get with any other reverbs that I've tried. It's a magical, mysterious, slightly metallic sound and it's very engaging with plenty to shape the sound with as well.

Six interactive controls (and two footswitches), each with an alternate function that you can tweak by holding down the light-up ALT button, let you sculpt. There's nothing noting the alternate functions on the pedal itself (or any of Meris' pedals), but they do offer helpful, inexpensive overlays ($7 incl. shipping in US), which I purchased for this pedal directly from their website to help me with my sometimes fatigued memory, as well as to please the completist tendencies in me.

Space Decay controls the overall space of the effect, the size of it, and at its largest setting is like staring into the haunting neverending vastness of space. If you've ever wondered what it must feel like to float in space, tethered to nothing, slowly drifting into infinity (or until you burn up or get obliterated by flying space garbage), this is the soundtrack, and it stretches and stretches and stretches…The alt function for Space Decay is Pre-Delay, something I always seem to avoid, but is actually a cool feature. I guess I'm impatient; I don't want to have to wait for my reverb to kick in, I want it now! I'm being serious.

The Modulate control sets the reverb depth and its alt function is Mod Speed, which sets the modulation speed of the reverb. In some ways, I feel like the Mod Speed is a more tweakable parameter and I really like it cranked as it adds a bit of uneasiness to the feel of the sound. There's a Mix control with an alt function of Pitch Vector Mix, and Pitch Vector (alt function Attack Time) adds either an octave down, a little pitch up or down, a 5th up, an octave up, or shimmer to the modulated sound. This works in conjunction with the other controls, as well as the ones that flank it, Lo Frequency and Hi Frequency, to shape the sound further. I swear I hear a chorus of Replicants on the Shimmer setting, Sirens calling me to walk down a dark, empty, sad alley. But why would I do this? And yet…There's a lot here to add to the sound, and depending on how other parameters are set you can run the gamut from low gurgling, moody reverb (with the octave down) to the aforementioned Sirens.

The Lo (alt function Density, which sets the amount of buildup for the reverb echoes pre-reverb) and High Frequency controls are really helpful in getting the most usable sound out of Mercury 7, but they don't operate as EQ controls as I expected. When turned up, the Lo makes the room seem bigger, the reverb a little more heavy-handed. You can almost visualize the air moving harder throughout the space with a certain amount of propulsion. The High Frequency is a little more what you'd think, setting the high frequency duration for the reverb space. The alt function for this adds a vibrato to the reverb tails and it's a nice way to add more movement to the reverb, though I wish there could somehow be a little more control over the speed of this as a super slow vibrato is something I love.

The Swell button serves dual functions, as with a press it stays on and engages the auto swell and when held down it sustains the Space Decay. I'm a sustain junkie and when running a more performative patch, I found myself constantly reaching for the swell to stretch out the space.

Running my vocals through Mercury 7 in both Ultraplate and Cathedra settings proved to be more than worthwhile, especially with the hands-on tweaking you can do while singing (or looping/running a vocal sample through it) and the availability to EQ and add a lower octave, 5ths, etc. I used to sing in a band and used one of those vocal floor pedals that I thought sounded great, but the reverb didn't sound anywhere near as magical as the Mercury 7. I didn't have a band to sing with this time, so I'm not sure how well it would sit in a mix since I sorta drenched it in the reverb, but singing along and ad libbing vocals to whatever current patches I had going was pretty cool, and I was able to customize the tone to make it work quite nicely with various patches.

Something I really love about Meris

pedals is that there's not a ton of text, knobs, switches, DIP switches, etc., and that the global settings work the same from pedal to pedal. Like the rest of the Meris line, Mercury 7 can be configured as a mono or stereo effect, and you can adjust the input level to suit guitars or synths so you don't need to attenuate the incoming signal to avoid clipping at the input (thank you, Meris!). In the Global settings, you can also assign an expression pedal destination, though I do wish there was some way that the MIDI/Exp jack could work with CV for more integration with my modular. In Global, you can do other setup type of stuff to make the pedal as you wish, and I really like how they do this. No screen, no app, just some buttons and the manual to get your pedal setup the way you want.

I'm in love with the sound of this pedal. It brings something that I haven't found in any other pedal, software, or module, and I find myself using it so much for my mix reverb in many of my patches, so much so that it's become a large part of my sound.
- Ian Rapp
Price: $299

Basil
Bastl
bastl-instruments.com

Those familiar with Bastl's Pizza, which we reviewed in issue #10, might do a double take when they see Bastl's new stereo delay module, Basil. It looks very similar and is built on the same hardware platform as Pizza, which means that anyone with Pizza can have Basil by uploading the firmware for it. With the same jack/slider/knob placement as Pizza, if it weren't for the different text and graphics on the faceplate, you'd be hard pressed to tell the two apart if you came across both of them at twenty paces in a dark back alley somewhere, or even a local synth meet with bad lighting.

Just like Pizza, the controls on Basil have dual functionality, where the left and right sides of center offer up different parameter controls. It's a great way to save space while offering up vast functionality, and Bastl uses this tactic to great effect here, and in quite a few of their modules.

Basil is touted as being flexible—it even says so on the faceplate—and boy is it. With controls over Delay time, Stereo parameters, Mix, Speed, Feedback, Freeze, a Lo-fi setting, Filter, Space, Blur and Taps, and with a user assignable control (CTRL) to modulate any of these, Basil bends over backwards to offer up mass control and features, all in a very Bastlian way.

Basil can operate like your standard delay, with delay times ranging up to four seconds, and you can sync by patching in a clock to Basil's Sync input. With the Delay knob in Time mode you can choose from synced divisions of 32, 24, 16, 12, 8, 6, 4, 3, 2, 1, ¾, ½, ⅓, ¼, , ⅛. That's a lot of divisions and it'd be pretty hard to dial in a specific one on the fly by eyeballing it, but you can get pretty close by listening and it's a great attribute to be able to have this at your disposal. There are Coarse and Fine modes, to fine tune the delay and pitch—depending on what's happening.

Just like Pizza, there is a CTRL function, a user-definable control that lets you map pretty much any function/feature on Basil for CV and knob control, and by mapping the CTRL to Fine, you can modulate the delay tails with an LFO and detune to varying degrees; a slow sine wave LFO brought a syrupy, kind of sad dimension to my patch, while patching in a VCO gave me some FM on the delay with the ability to tailor the amount using the accompanying attenuverter. Adding FM to the tails was awesome, with the Mix fully wet and the Stereo at full CW, the resulting ping ponging of harsh and gurgly FM playing in my ears was a lot of fun and with just slight tweaks on the CTRL I was able to get a large diversity of sound.

The stereo spread configuration is such that when in stereo mode and the Delay knob is fully CCW, the two output channels have the same delay, so in effect if patched into your mixer right from there it sounds like a mono signal; the output is identical. If you turn the knob fully CW then the left delay time lengthens while the right delay shortens. This gives a classic ping pong effect and is a trip in headphones. With a mono signal for an input, but with both outputs panned hard each way, shifting the stereo field around was interesting, and CVing it via the CTRL input brought about expected results except that when using a square LFO to alternate between the two extreme sides I got a pop with each change. Getting rid of the right angles—using any CV other than a square/pulse/etc., and the pop naturally disappeared but the tuning became warped and unstable as the stereo effect changed. This wasn't all bad, and if you have a programmable LFO or EG (like the Xaoc Zadar) you could build specific envelopes to manipulate this to however you'd like. Switching the stereo spread really slowly from mono to stereo is a really fun effect.

The Feedback control's dual functionality is such that right of center both output channels have the same amount of feedback, and moving the control to the left of center creates a ping pong routing in the delay so that the channels cross paths each time they feedback. It can be bizarre, and the differences between the two methods can sometimes be subtle, but also sometimes really extreme. Basil does have the ability to get out of control and could be in danger of blowing out eardrums and speakers, so in order to keep things tamed Basil has a built-in compressor and overdrive in the feedback path.

There are other ways to shape the sound in the Space section, and to the left of the diagonal slider is where you can select Blur, Filter, or Taps and control that with the (again) dual-functioned Space slider. Blur acts as a diffuser and either affects the signal before the feedback and adds a little LP filtering, or diffuses in the feedback path. More or less, this translated to a brighter signal with the slider fully right, and a more muted flavor when the slider was left, a helpful utility to sculpt the tone.

Filter mode was a different story. Having a built-in filter (fully left for LPF, right for a HPF) for controlling the overall sound of a runaway-ish (the "ish" is because of the taming compressor) delay is a gem. Factor in the ability to CV this via the CTRL and

you can automate some sweet sweeps of your delay line.

The last of the Space modes, Taps adds in signals from delay times shorter than the main delay time, thereby creating a multi-tap delay. If you think of this as a tape delay, it's an extra play head between the other play heads. Moving the Space slider to the left adds odd and even divisions, while to the right and you only add even divisions. If you want to get extreme, moving the slider to either extreme puts the Taps into the feedback route (controlled by the feedback knob). Since there's only the one Space slider for the three different parameters every time you switch from one mode to the next it resets the previous mode back to zero, its center position. This means that if you want to crank the LPF but also want to add some even taps, you can't do it, right? Bastl…they've got you covered. There's what's called the Hyper-SPACE mode where all of those three parameters are active at the same time, their states saved so that you can layer these effects on top of each other. It's not the default state of the module, so you'll want to enter that when you power up.

While Basil is honed to near perfection, when changing the parameters, like changing the delay speed by long pressing its button, you can get some fun in-between sounds while the software makes the change and this is interesting to CV control by using the (again, brilliant) assignable CTRL input and attenuverter. By patching in a random LFO, Basil became a jerky, drunken delay machine.

Using the Freeze function as a sampler was really entertaining, especially in conjunction with the Speed button, which, by changing speeds enables you to pitch/speed up or down a frozen section while it all stays in tune. Pitched using the Delay knob and using the Make Noise Spectraphon as a vocoder and patched in as the input source for Basil and I got some pretty way out sounds as Basil now had a voice of its own—a Spectrapone-hacked version of my own! It was all very meta. Spectraphon was resynthesizing my voice and Basil was resynthesizing that. Pitch tracking didn't always work on Basil, and sometimes the signal would go beyond its range in a shorter span than I would have thought. There was definitely a sweet spot for each signal I patched in, but mostly if the Delay control was turned too far CW I only got a solid stable high frequency at the output. With Delay turned too low there was no pitch tracking, just a low stable frozen section of the input. Though it was a bummer that I was never able to hear a frozen vocoded sub-bass spectral-sampled portion of my voice, it's a lot to ask, and probably just as well! On the other hand, by slowing or speeding up the delay range—via the Speed section—I got some excellent drones, my favorite being a slow, late night frog/cricket din that pulsated with a tempo that the Freeze provided via its sampling. Depending on the Mix setting you can have a looping drone as a background and play on top of that with the input. Really cool stuff.

Bastl has a clear winner with this whole Pizza platform thing. Once you get the hang of the how one control can tweak two things with the L and R sides for every controller, and you understand how easy it is to use CTRL to CV map almost anything on board, navigating Basil (and Pizza) becomes a breeze.

Basil's sound is versatile; from dreamy to glitchy to lo-fi, pretty much any way you want it to sound can happen. There's so much interplay on hand here, or on CV, that it's amazing it's only 8 HP. Basil can flange, chorus, phase, do karplus-strong, and yes, even do some reverby things too, kind of smearing of delays to conjure that up, and I'm sure I'm missing some other things it's capable of. I'm really curious to see if Bastl keep going with this Pizza platform, and if there's a Mozzarella or Roasted Garlic or Anchovy (my favorite pizza topping) module in the pipeline to go with Basil and Pizza.

- Jason Czyeryk

8 HP +12v 90mA -12v 20mA

Price: $283

Missing Link Junior
Circuit Happy
circuithappy.com

I've been using Ableton for well over a decade, and ditto for modular, getting my first Doepfer module in about 2011. I really resisted the urge to combine the two, as one of the reasons I got into modular when I did was to get away from the computer screen, and screens in general. In my mind, the tactile and immediate experience of modular and the sedentary synthetic nature of making music on the computer just wasn't something I wanted to mix, like chocolate and say, peanut butter. Gross, right? Some things take me a while to catch on to (like delicious Reese's peanut butter cups), but once I do there's no going back. Of course I eventually did team up my computer, electronic devices, and modular (which has plenty of screens on its own), syncing them up in various ways. For a long time it felt a little hacked; long cable runs and MIDI to CV to Din to ¼" back to MIDI to some vintage Russian cable system back to CV to whatever converters were needed to hook everything up together. At times my setup felt like it was made up more of adapters than instruments, and even though it was kind of fun figuring it all out and getting my studio to sync together—when it worked—it also seemed silly. Sometimes there's so much syncing, maintaining, moving, rearranging, and reading of manuals that I wonder how anyone finds time to actually make music. Can't I just flip a switch and play some music for once?! (Deep Breath)

Well, Circuit Happy must have felt the same because a few years ago they came out with the Missing Link, a little box that hooks up to a wireless network and wirelessly syncs up devices running on Ableton Link, and brings us one stop closer to syncing nirvana. Due to the

parts shortage over the past few years, and releasing the ML:2, a Eurorack module version of the Missing Link, the Missing Link has been out of production and sold out, which brings us now to the Missing Link Junior. Redesigned from the ground up (so hopefully no more parts problems) Junior continues where its senior left off; seamless integration with Ableton Linked devices.

Junior's a nice looking tabletop device made of black PCB material with some happy blinking lights—one to display network status and another that flashes to the current tempo. There's an LCD display, and a few buttons (+,-, Play/Pause, and TAP). On the back of the unit there's a USB-C power input, a 3.5mm MIDI input and two SYNC channels, A and B. It took me all of three minutes to hook it up to my local WiFi network and start syncing my modular and Ableton, and for the ease of that setup I have to give Circuit Happy major props. There's a Missing Link Jr. web browser page that lets you adjust the BPMs, Loop Size, Latency Offset, and MIDI Shift as well as configure the two Sync outputs to your needs and this is also easy to navigate. Both Output A and B are identical and each can be customized to suit your needs with Clock, Loop, Reset, and Gate options. Depending on what you select, there are various parameters to tweak to further set up your sync integration and again, it's simple enough to see and do. You can also adjust these parameters on the unit itself by holding down the TAP button for three seconds to enter the Menu mode, but I found it easier to do it on the web browser than on Junior. On power up, as a default Output A generates a pulse width square wave for clocking at four pulses per quarter note (PPQN), while Output B puts out a 5ms trigger at the rising edge in the beginning of each loop for reset duties. For almost all of my needs that worked fine as I was mostly using my MLJR to sync up my modular and Ableton, and syncing with other modular setups.

Once I set everything up I used Output A as a clock source, to control my Pamela's New Workout, which I then patched into my Vector for sequencing, Batumi for LFOs, etc., and it worked great as a main clock source. I did have to change the settings on Vector to accept Pam's new clock signal from RC24 to CR1, but other than that the whole operation was pretty seamless and once synced up I didn't experience any noticeable lag. Once I got all set up it was plug and play every time. Super easy.

Since I had two MLJR's on hand, I synced two systems far apart from each other, yet in the same house and on the same local WiFi network to see how it would work, and once I got them both set up it was great. Overall I was really impressed with the connectability of MLJR and it was quite fun running the two systems without the need for a physical connection. This would obviously be made even easier if the two systems were in the same room and wanted to share a clock and be synced, but it was interesting to hear the rhythmic and melodic time lag created due to physical distance, not technology (for once!), by being far apart and tweaking that within the Menu mode of Junior's browser page. Any time I changed the tempo in MLJR it changed immediately in whatever was linked to it without issue.

I had no problems staying connected (once I had the right WiFi settings) and I have yet to be kicked off of my local network while using MLJR, so after setup I haven't needed to enter Access Point Mode at home. In a club or other setting that could be a different story, and so I decided to take a trip to the great outdoors (my backyard) and see how everything would work if I used a hotspot on my phone as well as Access Point Mode instead of a home network. It helped to load the hotspot information on the MLJR web browser page while I was already connected to my home WiFi so I didn't have to enter Access Point Mode to do that, and once connected MLJR will let you know by scrolling the connected network across its LED screen.

Everything worked the same outside as it did indoors with no lag, easy connectivity, and in no time I was synced and back in business. It worked the same using MLJR's Access Point Mode to create a WiFi network to connect all of my devices as well. I would always use this for performances as I would never rely on networks where the WiFi might be sketchy, unavailable, or not powerful enough. I don't even trust power from venues and other places and bring my own power conditioner to plug everything into because I feel like any time you can solidify or get rid of potential performance issues it's that much less stress and you can focus on the music making at hand that much more.

Junior's Access Point Mode defaults anytime it can't find a known network, so it may take a minute or so of waiting while it searches around but you can also configure it to automatically boot into Access Point Mode so there's no waiting. On top of that you can also hide the network so nobody can join or interrupt Junior's WiFi network while you're on stage.

As for syncing something via Junior's 3.5mm MIDI sync out with my modular and Ableton, I hooked up my Sequential Pro 3 using CME's WIDI Master (review, issue 6), a wireless MIDI connectivity adapter that works over Bluetooth since my Pro 3 was in a different room from my modular. I wanted to see how that would work, how it would sync up and for the most part it worked great, eliminating the need for yet another cable. The initial setting up was just a matter of changing the Global MIDI input setting on the Pro 3 and making sure I plugged WiDiMaster in correctly to both Junior and the Pro 3. There was some lag, but that was due to the WIDI Master's range and the Pro 3 being so far apart initially (I moved it closer and the lag disappeared). There were times where the Pro 3's sequencer would stop, without anything changing, but Junior (and my modular) was chugging along nicely, so it was obviously something with the Bluetooth connection going through a wall or something, and its connection to the Pro 3.

Once you start integrating more stuff into your setup, it's just a matter of making integration cleaner, easier, and more streamlined. You'll probably always need cables, but that's par for the course. Circuit Happy's ML:2, their 2HP module is worth checking out if you're mostly syncing a Eurorack system to Ableton or other Linked stuff as it might suit your needs better in terms of space and setting, but if more table top stuff is your game The Missing Link Junior is one step closer to seamless integration and has been rock solid ever since I got it set up and into my workflow and system.

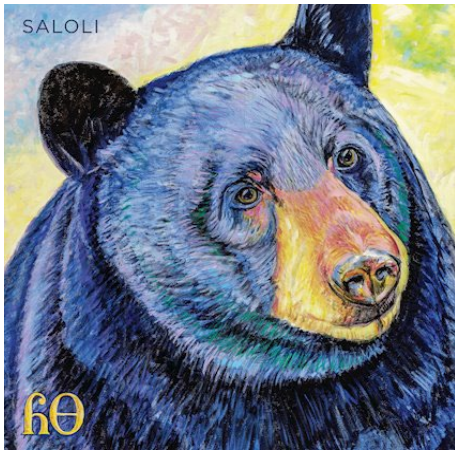
- Ellison Wolf

Price: $240

MUSIC REVIEWS by Tom Ojendyk

4th World Magazine III
Neoplatonic Aquatic Symposiums
Poole Music

Spencer Clark is an experimental musician who first came onto the scene in the early 2000s as part of the fine noise band The Skaters, and has been a prolific solo artist over the years, recording under such guises as Monopoly Child Star Searchers, Typhonian Highlife, Vodka Soap, and several others. His latest release as 4th World Magazine is an ambitious double album of expansive ambient and trippy electronics, which also comes with a 12-page magazine. Both relate to "a juxtaposition between the growth of ancient and modern Neoplatonism and the enlightenment of Holographic Theory." While that subject or theme might seem academic, the music isn't dry, and feels warm and blissed out. Perhaps the 4th World project name pays homage to Jon Hassell's great works, and there are some similarities in the sounds, but everything is filtered through Clark's unique and modern vision creating an engrossing and rewarding release.

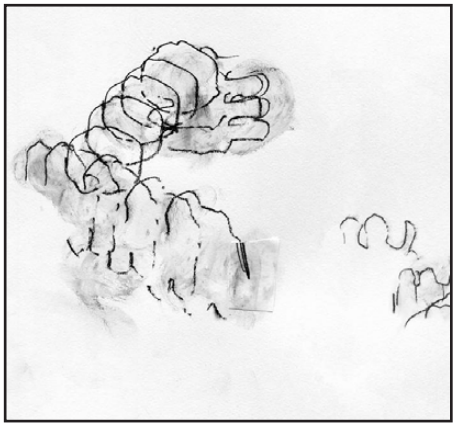


Saloli
Canyon
Kranky

Saloli is Portland-based pianist and synth player Mary Sutton and this is the follow up to her excellent 2018 release also on Kranky, *The Deep End*. For this record, the compositions are meant to "evoke a day in the life of a bear in a canyon in the Smoky Mountains," and the music was recorded live using a Sequential Circuits MultiTrak synthesizer. The eight tracks show a diverse range of sounds from spirited to grand, and are thoughtful with articulate themes, expressive eloquent melodies, and tight arrangements that capture *Canyon's* concept well. While it's instrumental, the music still seems lyrical, and each piece flows nicely together as a whole. Saloli obviously spends a lot of time and consideration with her recordings and all of the sounds are well-placed with a sense of purpose. The music is personal but also rich and inviting, and *Canyon* is a nice reminder that Saloli is one of the most talented composers in the Pacific Northwest.

Boodaman
The Ninth Planet
Self-Release

Swiss artist Boodaman's (Stéphane Caviglioli) latest release, the thirteen track *The Ninth Planet*, is an amalgamation of ambient textures with New Order-ish electronic grooves, and patterned counterpoint melodies that weave throughout, rewarding multiple listens. The album's theme, things which seem attainable but are always out of reach, sets the melancholic tone. Opener "First Movement" is a dance track that shows off a flair for moody melodies, and "Maxity" does the same, building a beautiful sequence to a fervor before dropping off and starting over again and again. Title track "The Ninth Planet" is a Carlosian 2023 space venture, a signal to the cosmos with nary a reply, but a beat for sure, while "Hope" is a standout dance track enveloped in sadness. *The Ninth Planet* struck a chord with me and made me wonder what it is about the unattainable that makes it so desirable?
- Ellison Wolf



Jake Meginsky
Trinities
Poole Music

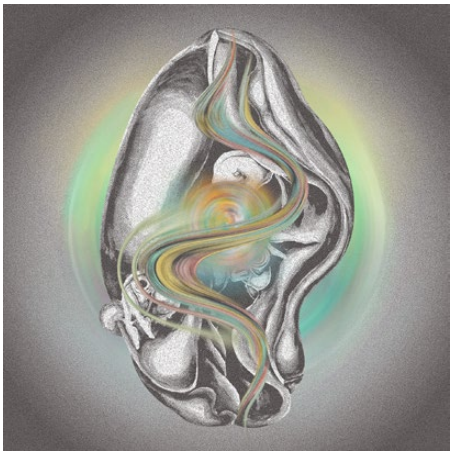
Jake Meginsky has released several solo albums and has an impressive list of music collaborations, as well as directing the 2018 documentary on drummer extraordinaire and overall amazing person, Milford Graves, who sadly passed away in 2021 and who inspired this great and gorgeous new release of experimental electro-acoustic music. According to the record's bio, the music was inspired by Milford's notion of the primacy of threes as "a fundamental pattern in the universe—and the lowest, strongest and most generative structure in rhythm." The music is very free, immersive, and intriguingly mysterious. The sounds on *Trinities* are echoed out and Meginsky utilizes space to create a lot of breathing room that adds to the feel of the pieces. The music is highly experimental and not centered around traditional pillars of music, but it's truly wonderful, engaging, and original and should appeal those with open ears and an open mind.

JakoJako
Verve
Mute Records

After releasing her own debut album and a double album collaboration with Rødhåd last year, Berlin-based modular synthesist JakoJako, aka Sibel Koçer, is back with a four-song EP of deep techno blasts on the legendary Mute Records. The record starts with "Impetus," using strong kick patterns pushing out a dance-friendly rhythm while synths float above, creating a hard-hitting yet dazed electronic track. It's followed by "Opak" which uses majestic and almost angelic overtones that swish around an evolving beat and works as a nice counterbalance to the opening track. "Auris" brings back the strong beat for a fine slice of trance-inducing techno and JakoJako closes it out on a high note with "Nexus," which might be the most involved and dreamiest track on the release. *Verve* is hopefully a sign of more great things to come from this very talented artist.

Paco Maddalena
Itinere
Histamine Tapes

Histamine Tapes has been a reliable purveyor of experimental releases over the past several years and this very cool release from Italian artist Paco Maddalena is a wonderful mix of electro-acoustic and field recordings that's mellow yet captivating, highly focused and concise. Using a Soma Lyra8 and a modular system, Paco creates pensive and melodic pieces that wisely don't overpower the listener with any unnecessary clutter and instead include many welcome subtleties and nuances that add to the compositions. The field recordings complement the sound and are strategically placed without being distracting or sidetracking the music. Paco's also a filmmaker and while the music would work great as part of an art installation or a soundtrack, it really does stand on its own and is quite a successful release.



Baldruin
Relikte aus der Zunkunft
Buh Records

Debuting in 2009, Baldruin has released a steady stream of DIY projects on various labels like SicSic, Wounded Knife, and Ikuisuus, and his impressive latest album, *Relikte aus der Zunkunft*, on Peruvian label Buh Records is forty minutes of mysterious and modern experimental music that's full of ideas and contrasts. German-based Baldruin (aka Johannes Schebler) used acoustic instruments as the basis for the tracks and then added electronics and synths to create sonic atmospheric jams that range from murky and enigmatic to lively and futuristic. Schebler's ability to capture so many moods and sounds and present them in a focused and coherent manner is commendable, and gives the listener a wide ranging and enjoyable listening experience. Another fine release on Buh Records.

Video-Aventures
Musiques Pour Garçons Et Filles + Inédits
SouffleContinu

Originally released as a 10" record in 1981 on Chris Cutler's Recommend Records, Video-Aventures debut release *Musiques Pour Garçons Et Filles + Inédits* is now thankfully reissued and expanded upon. This highly recommended French experimental music mixes electronic and avant-garde rock that's challenging, yet welcoming, and even playful. Formed by Dominqiue Grimaud after the awesome Paris-based music collective Camizole broke up in the late 70s, this loose collective was co-led by synth wiz Monique Alba and on these recordings featured guitarist Cyril Lefebvre (Maajun), Gilbert Artman (Lard Free, Urban Sax), Jean-Pierre Grasset (Verto), and Guigou Chenevier (Etron Fou Leloublan), a who's who of the 70s French underground movement. The band created mostly short, yet fascinating instrumental pieces that showcase a variety of moods and styles, but still work cohesively as a whole. The record originally only had eight tracks and with this release the label has added a full albums-worth of extra rare tracks from the same time period that are making their first appearance on vinyl. While 70s and early 80s underground German and Japanese music is well-known at this point, it's great to see SouffleContinu focusing on reissuing such great and obscure 70s and 80s French music that should appeal to people interested in experimental music from this classic period.

Continued from page 14

type where you're carefully editing—I wanted something more immediate and fun, and that's how the Squid came about. I took some of the ideas from how Pam worked but made it a bit more immediate. It's kind of weird with Eurorack because people don't like menu diving—or they think they don't like menu diving—but in moderation, it's actually pretty useful. I see a lot of modules where people go the opposite way and avoid having a menu, they make it more complicated by having hundreds of buttons, a bajillion different things. It's almost more confusing. I try and design so you can get 80% of the module's functionality without looking at the manual. It'll be stuff that hopefully you'll remember easily, where you won't need to refer to a cheat sheet, that you can get the core of it, but then if you want to go further and dip in, it will do a lot more. You get to a point now, especially with the Squid, where the features get so dense, that it might be that you do need a cheat sheet, but I'm desperately trying to avoid that. It's more specific kind of features, the really advanced stuff, not the core functionality, that maybe 1-5% of your user base will use, and I don't think that's too bad if that's kind of hidden away, but 80 or 90% of the functionality I want immediately. I want it so you can pick the thing up and within five minutes, you're having fun. I want to make people smile and make noises they wouldn't expect, and with the names, there's the humor in there where it's not being taken too seriously. One of the great things about Eurorack is, it's a little bit of the wild west in terms of the standards being all a bit loose and whatnot. It's kind of annoying in some ways, but then you are really free to do whatever you want. It allows for all of this amazing creativity and the range of modules you can get, the things that they'll do, and the designs…I can't really think of another kind of thing that's like it.

Do you feel that it's an accessibility issue? It's easier to find information, order parts, get things made; it's definitely become more democratized now. You can make a DIY system that as little as ten years ago would have been nearly unthinkable.

It's become so much easier to manufacture things, especially electronics in the last sort of ten, twenty years; it's more like running a record label compared to running a technology company. It's not impossible to do small runs, and we've done odd modules, where there's only a handful that exist, but it's feasible to do it. You might not make much, but you won't lose money, you can cover yourself.

I've never thought about the parallels between the modular scene and a record label, but you're right, it is like a small record label where you can do small numbers, and really take chances, follow your passion, and find your fanbase.

Yeah, definitely, though as we've taken on employees and responsibilities, it becomes slightly tougher. There's got to be a bit more of a plan to it, but we can still do that. There are definitely some fun, interesting projects in the works that are sort of bubbling away.

Was the ASQ-1 something like that, something that'd been in the works for a while, in the back of your mind, that finally bubbled up? Why did it take so long to release it?

I don't know what happened with it, I just got sidetracked with other stuff and it got shelved because it was complicated to build in terms of it needed a case as a stand-alone thing. I had it at the first Superbooth, and it got some interest, but the software then was quite buggy and I wasn't that happy with it. I wasn't quite sure how to make it strong enough and there were some issues with some of the parts , but then Zoey (Guyette, ALM Chicago office) came over to visit our office in the UK and he found a box of prototypes and was like, "What's this? You've got to finish this." I was like, "I don't know." And then Jack (Adams) Mumdance came into the office and saw it and said, "What's this?! You've got to do this." So I was like, "Well, maybe."

It's similar to what your experience was with Pamela's when it first came out. You noticed what people paid attention to, where the interest was, and you went with it. It almost just seems like a timing thing, where back when the initial Pam's was released people were more drawn to something with dense, compact functionality, but now a larger, more unique looking module that's maybe more performative and less programmy draws the attention.

Yeah, definitely. It actually uses the same processor that's in the Pam's. I like the way that it isn't trying to be complicated, isn't trying to do anything. It's not cramped, it's very nice to use, to plug away at the keys. I like the sort of 101 style sequencing, where you don't really know what you're doing, but always comes out good, there's always a nice surprise to it. I added a little bit more functionality so you can save and load efficiently, so that you can use it more in a live context, and I've added some extra things here and there, like overdub. The thing with the 101 was that I always had to count what I was putting in, so it would be like sixteen steps added…(ASQ-1) shows you the length and where you're at, and then with the extra space, we've got the four trigger pan channels, which is like a regular drum machine, as it uses the eight white buttons to represent eight steps and kind of cycles through them. With the Quaid Megaslope (review Waveform Issue #3), we always wanted a quantizer for that. You can kind of run things through Pam as a quantizer but it's not ideal, and Pam's doesn't have super high resolution on the CV outs, whilst the ASQ-1 is 16 bits. It's a nice resolution for a quantizer and also it's very easy to program in the scales you want very quickly, and you can load and save them as well. ASQ-1 fits well without other stuff. I was thinking people would be a bit like, "That doesn't do much. Where's the screen?" But people seem to love it.

I think the timing was right for those type of keys and playability. Mechanical keyboards are big now with gamers and coders. Even electric typewriters are making a comeback. Was it hard sourcing they keys for this?

No, surprisingly not. We found really nice key mechanisms, which I didn't have in the original, and that made it a lot nicer. They make a really nice sound and the

caps are nice as well with a little round LED, which just fits with everything. They come from the company that supplies our knobs and I think it was more fluke than anything because I was thinking that there must be someone doing the 909 style with the square cutout (for the LED), but they had these with a round cut. It was perfect. Sometimes modules just kind of come together, and other times they're like… Akemie's Castle was hell developing. That had so many problems.

What kind of problems did you have with that?

Just weird problems. It just wouldn't hold pitch. I had all these funny problems where it would do these little wavers in pitch, this minor kind of drift and it turned out the reason why had to do with how the components were laid out on the board. It was just so unlucky. I was sort of banging my head against a brick wall for six months.

That's a large module. Did you have to reroute the whole thing?

No, it was literally—if I remember rightly—a trace going under a high impedance input. 99% of the time the things that go wrong are that you've put the power the wrong way around, or you've just miswired something. It's not some mystical electrical, electronics issue, it's something silly and obvious and stupid. But then occasionally it is this electronic weird voodoo stuff. It was driving me mad because everything else worked and I loved the way it sounded. I was excited, because it was a big module and I knew there was nothing else like it, and everyone that was playing it was having so much fun with it. Even now, it's probably still my favorite module. I'll play with it and still find sounds in it. It's endless the sounds that come out, and they're unusual.

It's interesting that you used "new-old-stock" Yamaha ICs for Akemie's Castle. Like they didn't take their FM technology in a way that you thought it could go, so you took it into your own hands.

I find it fascinating why Yamaha never released something with knobs, because it's just so much more fun to explore the sounds like that. I met John Chowning (Ed. - He developed FM synthesis and licensed it to Yamaha for use in the DX7) at Knobcon. I had the Akemie's Castle with me and I wanted to get him to sign the back of it, and I did chat with him a bit, but I didn't bring the hex tool, so I was desperately running around looking for one, but because it was a European size nobody had one! That was quite funny.

When you think of the Yamaha DX7, it's somewhat exhausting to think about programming it, but it obviously didn't seem to matter in terms of its popularity.

I guess they were selling so many of them, and it was almost a luxury to have the screen and those kind of controls because it was very modern back then. Now you get an iPad and you've got this amazing control surface, but it's so commodified—everyone has one in their pocket so that now that kind of luxury is the knobs. It's kind of flipped around.

When I think about what the word luxury means, it's almost like luxury versus technology. Like the light bulb? That's technology. The candle. That's the luxury now. Light bulbs are cheap, but a beeswax candle is not.

Yeah, and with the modules, the electronics are cheap compared to the controls. The same with all the other components and even getting them made…. The cost is in the electromechanical stuff and the jacks, and then getting them all soldered and that kind of thing.

It's like 80% of the module is done for 20% of the cost. Do you manufacture ALM modules in-house?

No, we use contract manufacturers in the UK. We do all of the R&D and the design and everything and on the lower run stuff, we'll do the final assembly in-house and some of the testing, but we don't have our own pick-and-place machines or anything like that. In the UK there are very good contract manufacturers, where almost all the work they do is small runs for MOD (manufacturing on demand) or very specific industrial equipment, so if you come to them with something interesting they seem quite up for doing it.

We talked to Morgan from Worng and he was talking about the collaboration you guys did together on the Jumble Henge, and that he couldn't believe this bigger company like ALM was interested in working with him.

It's funny because I was thinking, "Oh, he won't want to work with us!" I love the Worng stuff, and I had chatted to Morgan before and we exchanged emails and there's mutual respect. I love the Soundstage, but I wanted a smaller version, so I said, "What do you think of doing an 8HP version together?" It went really smoothly, he was great to work with. He's a lovely guy.

He was talking about people working together and collaborating and it's pretty cool that throughout the history of synths there's been an undercurrent of people from other companies working together, that it's not this cutthroat thing like in a lot of other industries.

We've always been pretty careful not to step on people's toes. We're definitely not trying to make products that directly compete with others. There's always going to be some overlap, especially on bread-and-butter-type modules, but we try and add our own spin. We're not aggressively trying to compete or outprice anyone or anything like that. We could have gone off and made our own Soundstage but it was cooler to work with Morgan. Although the brands are different, I guess they're kind of similar in a way.

Was that your first collaboration?

We've done fun collaborations before. We did a Haswell version of the Dinky's Taiko with Russell Haswell, who's a noise artist. He's a real character and a lovely guy, and has been a real cheerleader and friend since I started ALM. He'll make sounds out of our modules and I haven't a clue how he's doing it. He liked the Dinky's, but he had to really process it to get it sounding like his kind of sound, and I mentioned that we could put an alternate set of waveforms in. He was like, "Can I draw them?", and so we did that, and that was a really fun project. When he plays, he'll always want a really clean system because he's getting a physical effect, he's pushing it, taking that further and further. I find that really interesting. You don't just listen to music, you're feeling it.

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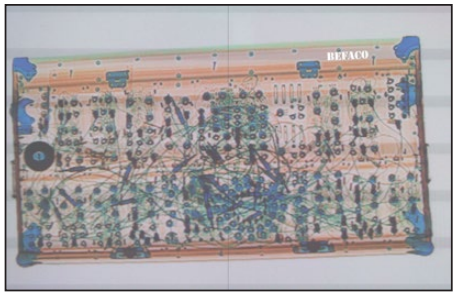

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to make (our modules) with available schematics. When I finally learned something, the little I knew I wanted to put it on the internet. Back then it was only Music From Outer Space and Ken Stone and that was about it, so we built whatever was out there, and of course we printed the boards by hand...

That's right. A lot of the older DIY sites have the PCB layout on the website so you can do that, you can print your own circuit board.

D: The first synth we did was all the possible modules from Music From Outer Space. We did this in series and we spent a week just printing all the boards first, and then two days drilling with a Dremel, and then we soldered all the vias and then we did troubleshooting. We did it all at the same time. It was like a production line and it took a month. It was the most efficient way to work in series.

How is it now when you guys are designing modules? What's the process when you want to come up with a new one? Is it just the two of you?

D: It depends on the module.

M: I like to say that it's a matter of having a crazy idea and having someone close by that tells you, "Fuck yeah!" (Laughter)

D: You put as many features as you can, then you make a front panel and now you have a new problem for the next three years. (Laughter)

M: You're screwed!

D: Yeah, we always do the functionality and the panel and then solve what is behind it.

So you work from the top down in a sense?

D: Yeah.

M: It's more or less like this crazy idea and then you do a panel. Before we didn't make proper manuals, but the focus now is to have the front panel on the manual.

Before you even make the module?

M: Yeah.

That makes sense because then you've laid out what you want it to do.

D: Yeah, the feature set, and also we are not programmers, so if it's a module that has some digital part at some point you have to tell somebody how to make the hardware, or make a simple code just to test all the boards. The best way is by just giving the programmer the user manual and telling them, "Please program this. Do the magic."

Do you have somebody in the company that does programming for you?

D: We don't have a programmer in the company, but we have some people around that can do stuff for us. It depends on the project.

M: Martin Klang from Rebel Technology moved to Barcelona and we are working together, so we take care of hardware and he takes care of software. Also, my brother codes stuff in his free time.

That's convenient. How many people are involved in Befaco now?

M: At the core we are three. In the beginning it was Diego and Jano. Then Pascual and I joined the team; then Jano left so it was Pascual, Diego and me. It was like a breaking point because before we were doing work between four people, suddenly it's between three. We survived and then at some point we decided we needed to find someone that helped us with things that are absorbing all of our time. At the beginning it was one of the guys from the workshops. A good thing about the workshops is not only that other people made friends, but you see who in the community....

You can scope out talent.

D: Kind of. You (spend) time with the people so you learn who is the geekiest one, or the one who has a good vibe, because it's very important to be able to collaborate when you put somebody in the team. The human part is very important for us and in the workshops we spend a lot of time with the people. You always find someone that you'd love to have on the team, even if you don't know exactly for what.

Anybody that's smart and motivated, you can teach them pretty much anything. You just have to make sure they fit in.

D: Yeah, exactly.

M: That's what happened to us. It was a matter of time, energy, and suffering. (Laughter)

Manu, you've brought up suffering a couple of times now…

M: Suffering is a vital part of the process, and the key point is being able to know that it's a part of the process and to keep on doing it. People that have been with us for more time are evolving and are starting to do their own designs, they are doing modules now. Some people are taking care of all the logistics and all the mayhem of automated systems.

Do you feel you have a local community to share ideas and information with?

D: All the information is shared a lot of times. Problems you have, ideas, problems you have solved with some creative solution you'd like to tell others…

M: Before the (pandemic) we changed (the workshop) to Fridays and most of the people coming were manufacturers so they came to Hangar. They have this vending machine full of beers and we were just having beers and talking, nobody was actually doing anything like soldering. It was like this therapy, you know? It can be lonely and frustrating and you have to spend many hours at home in front of something that doesn't work, (working with) a factory that is fucking up, and shipping is fucking up, and then you have to pay taxes and they are fucking up, and it's a real clusterfuck of life, so having someone close to you that listens to the problem and actually has the same problem like you really helps. Most of the time the solution is there, only because someone tells you, "Why don't you call this guy..." We were here for fun and then

suddenly you need to deal with....

D: Taxes, a team that is growing...a lot of legal stuff.

Do you enjoy those aspects of the business? Structuring it and figuring out that stuff?

M: In a perverse way, yeah. I suffer big time with all that, I really suffer. An example is that we implemented this automated system that takes care of our stock. It was a painful thing to do and we spent many mornings with a consultant and spreadsheets, but in a way it was satisfying because we were deconstructing the whole thing and then putting it together again in the way we wanted it to be and that was nice.

D: Also designing the working space. The key to enjoying these things that are not very nice in the beginning is to look at this as another machine like, "My company is a machine. I have to design this machine in a way that works well." From this point of view it became more fun.

It makes sense that you'd have to backtrack a little because the way you started Befaco was organic, and you didn't really put thought into how you wanted to structure it, how to lay the best foundation, because at first there was nothing to structure.

M: Yeah, the accounting was a box with the money.

D: It was like that for five years and finally we got an accountant and he saw the system we had and was like, "Guys, do you have a book or something where you have numbers?" We were like, "We have the money here, and if we need money we can take it out to buy something."

You had to become responsible business people.

M: It had to change because by the time that this was going down, Steve from Thonk was asking us to sell kits to him and the kits were not ready. At some point there was an intention, an effort to make the kits better, to make them presentable because we started selling stuff and then you have an email from some guy, "Hey, I received a bag full of resistors, and a build document in Spanish..."

D: All the manuals were in Spanish, because we were doing the workshops in Spain so it was difficult to sell outside.

That's kind of funny, but I can imagine how frustrating it would be to order a kit from you back then, and be all excited to put it together, and not be able to understand the instructions. Did you have to find somebody to translate the manuals for you?

M: We already spoke English, so we translated it ourselves. I spent seven years doing technical support on the phone and speaking with people from all over the world with so many different accents so that helped. When Thonk approached us there was a need to improve things and convert them into products, so it was the beginning of converting objects that were made in our workshops into a product. It was a new approach to product design, like if we're going to sell stuff it needs to be sellable.

D: We began to have a more industrial approach.

You have these sorts of points at which you could have gone either way, you could have continued just doing workshops and keeping it local and small. Was it a conscious choice at that time to try and grow? Did you have a plan for that?

M: I don't think that was like a real decision or choice, it was just going with the flow. The Barcelona workshops started to be organically better with time, and we also were looking for more workshops in different cities, and then when Thonk came we started to consider selling assembled modules because there was a market there, too.

D: At the time we had an online shop on our web page without any sales for more than a year because there were no products there, everything was out of stock. At that time when somebody bought something we just checked the address to see where they were. For us it was like magic.

M: "Somebody in Australia bought something!"

D: It was like one customer per week or something. We were recycling the packaging from other stuff, going to the post office and filling by hand the paperwork…Of course with time we improved. One of the first things that we asked someone to do for us was to prepare packages for shipping because at some point, especially when we were only three people, you're trying to finish something, you want to reply to all these emails, and then you need to stop spending the day preparing packages and going to the post office. And then there's making kits. At the time we were having many workshops and it was already at capacity, and in between you have to design stuff and take care of the shop. At some point we were like, "Okay, we need somebody."

With all of this going on do you ever find time to actually make music?

M: Not as much as we would love to. I released an album last year (https://synthvicious.bandcamp.com/album/gg) and it took me way too long to get to the studio, mix it and get it pressed. I enjoyed it but was quite energy-draining so currently I'm just performing about three to four times a year.

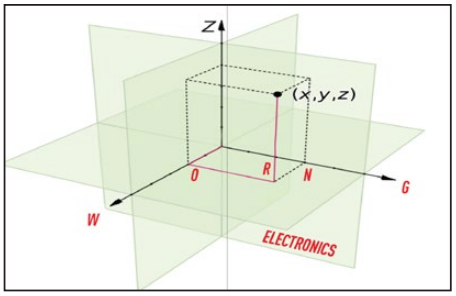
D: I play the synth only from time to time just to have fun, but I'm not recording what I do nor do I play live. I would like to get back to composing, but I need a more relaxed life than I have for this. My last album (https://gotilikum.bandcamp.com/album/trainer-breakfast) recorded was from many years ago (2014).

M: We used to have a project together, Thunderdrone, that we used to perform when we were traveling while doing a workshop, but unfortunately, the last time we performed together was 2019.

You've been busy with the business and creating a strong community in Barcelona. I imagine that the sacrifices you've made to succeed feel worthwhile to you.

M: It is a great satisfaction to watch so many people doing great things and giving back what was given to us is the way to keep the ball rolling, by enabling others to do nice stuff so that they can help future generations of Eurorack enthusiasts.

-befaco.org



Continued from page 36

thing. In Australia, it's called TAFE (Technical and Further Education) and it was supposed to be a one-year course, but then they introduced a second year. The first year was all the basics and the second year was surround mixing and doing stuff for TV and that sort of thing. It was interesting. I suppose I use some things from that.

You've studied quite a bit of stuff that you probably use in WORNG.

Yeah, weirdly, I guess. I never meant to. I studied electronic engineering because I wanted to make modules. I always thought I would study it and then go get a boring job, like designing microwaves or something, and eventually, sometime in my 40s or 50s, I would learn enough that I would be able to have the skills to make modules, and I would be able to get rid of the day job and make some synths.

Did you ever design a microwave?

(laughter)

I did not.

But you did go to two different kinds of engineering schools…

I've also studied marketing and science…

A habitual student.

Well, I failed in marketing, because everybody that I was studying with was all like, "I'm an entrepreneur!" It's like, "Oh, what are you interested in?" "Making money. I'm going to become a landlord and exploit people who rent!" It was shit like that. I found the accounting subjects interesting and economics was really interesting, but the marketing stuff…There was one day when we were going to do environmental marketing and I was like, "Cool, this will at least be interesting because they'll talk about the environmental impacts that you can't measure in money," but it ended up just talking about how if you make your logo green, more people will buy it. I was like, "I'm out of here." When I was a nihilistic early twenty-something, I thought that getting people to buy things that they didn't need would be hilarious, and that's why I decided to study marketing.

Are you no longer nihilistic? How old are you?

I'm 44. I'm middle-aged.

That's not middle age.

That is literally middle-age! When I turned 40 I was going to accept that I'm middle-aged now, and I went through that middle-aged man thing where you go from playing synthpop to noisy beats/industrial stuff and then into just drone things. I also started skateboarding again, though I mostly skate curbs now. I learned how to do slappies in lockdown so all I need is just a nice little curb and some wax. Maybe I'm just in denial and having an extended midlife crisis.

I remember when I was younger, there were no 40-year-old skaters. Maybe Stacy Peralta (skateboarding legend) would do a 360 and we'd all think that it was amazing that he could still skate at that age.

There was a demo in Melbourne that I went to in the late 90s and Tony Alva (another skateboarding legend) was there. We were like, "Who is this fucking old man?" He was doing headstands on his board and he seemed so old! I was thinking about that a little while ago, and he was probably like, 35. I thought he was ancient!

(audible groans/laughter)

Do you know Tired Skateboards? It's this Dutch dude (Ed. - Piet Janssen) who has this skate company that's all about being old and too tired to skate. He does a video every year that comes out at Christmas and it's a group of old dudes who try and like kickflip a three-stair and try it twenty times. They'll put in every single try and they're just getting destroyed, but eventually they'll land it and have a huge toe drag and they'll show it in slow-mo. Well, they did a call out for footage and I'd learned to slappy nollie back tail (Ed. - cool skate trick at any age), and the very first one that I filmed with my phone, where I kind of got into it and slid probably that far (shows about a foot length with hands) and just kind of fell off at the end, I sent them that and they put me in the video. It was up on the Thrasher Magazine website, so I'm in a Thrasher video.

That's fun. Hopefully you've re-entered the skateboarding world without too much damage.

Well, I have broken my ribs twice since I started skating again.

How?

Once I was skating home and I went to flick my board up into my hand and as I was stepping off, my front foot caught on it and I fell and elbowed myself in the ribs and broke my ribs with my elbow. The second time I fell onto a curb and I think I hit the same spot as the first and it was weak or something. I kept skating for another hour or so after that and didn't really feel it til the next day. I went to the doctor and they were like, "Try not to breathe too deep but make sure that you breathe deeply because otherwise, you can get a lung infection."

And they're like, "Don't laugh."

"Don't sneeze as well."

That's helpful. Were you a fan of the old Aussie skaters like Lee Ralph and Jason Ellis?

Yeah, and Renton Millar, too, who was a vert guy that rode for Think. Once I was in Vancouver for the Slam City Jam skate competition, and I knew Renton from Melbourne and he was in the vert competition, and I ended up hanging out with him and Pat Duffy and the rest of the Think team. And Pat Duffy is like….

A god.

Yeah! We went to Subway and I was thinking, "I'm at Subway with Pat Duffy!" He turns to me and says, "What are you gonna get?" And I'm like, "I don't know. Maybe turkey?"

(laughter)

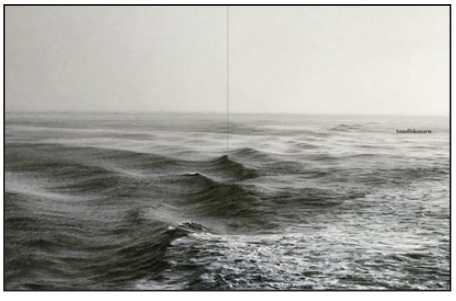
Amazing. What were you doing in Vancouver?

I spent a season in Canada snowboarding. I went with friends and we were living in a house where ten people were in two rooms. We had a hot tub on the balcony, and sitting in the hot tub when there was a blizzard, drinking beers…it was awesome.

Were you pondering the potential for stereo in synths when you were drinking beers in the hot tub in BC? When did music take over your life?

I've always been very into music, there's a really great scene here in Melbourne and I've been going to shows since I was a teenager in the 90s. Back then it was more guitar based, punk kind of stuff, but I got more into electronic music from skate and snowboard videos. I didn't really think about making music myself though until The Emergency; it was a revelation, like you can just start a band, nobody will stop you. I think that DIY spirit helped when I started making modules.

-worngelectronics.com



Continued from page 45

Those vintage transformers are…

Huge. Very, very heavy.

Yeah, it's a lot of metal. You've got some nice friends…tubes, transformers… they're looking out for you. Was that preamp a hard circuit to replicate?

No, it was very simple. I always want to keep it simple with tubes. I like to play live so I don't like to have many sub-menus or muscle memory, things to remember. One note per function, straightforward on stage.

Is that "keeping it simple" philosophy that you like for your performance equipment something that pertains to TouellSkouarn products as well?

I wish. A new synthesizer is very complex, it's not simple. You learn a lot.

Have you ever made a full tube synth?

I did one for myself, but it was pretty crude with VCA distortion and some VCOs. I was too scared because I had small kids and tubes use high voltage. It was fun but dangerous. Also, I don't want to use high voltages for performing live because the tubes are fragile.

Do you still have it?

No.

You had to take it apart…it was that dangerous?

(Laughter)

No, just because I needed the parts for other projects.

You said you like to keep your performance gear simple, do you perform in France often?

No, not too much.

Is there any place in Brittany to play?

We play at Yann's (Tiersen) place because he lives on an island. He built a studio there, and a venue with a nice stage. It's super nice.

That sounds fun. Do you stay over there, too? Is it hard to get to?

You can if you have your own boat. You have to stay on the island all day long and overnight because there's not a boat after 4:00 in the afternoon.

Do people that live on the island come out to see you all?

There's not that much on the island to do at night and this is a small venue. People can come and it's not that crowded. It's nice because you can have a drink with everybody. It is very nice.

That sounds so charming. Do you have your own boat?

Yes, I have a small sailboat in the harbor. Where I live, it's near the sea in the south of Brest, the western part of France. It's five minutes by car to the harbor from my place so you can take the morning and then go back in the evening.

Can you sleep in it? Can you go out for a day or two?

Yes, but it's small and we can't find the time.

I have a friend in Seattle where I live who has a boat, but it's a motorboat. It's a different thing. It's loud. I like motorboats fine, but I think sailing is kind of more my thing. I like quiet.

Yeah, it's noisy. We have to use a motor to go out in the harbor but when we are in the open, we can put up the sails and there's no sound.

Brest sounds lovely.

Yes, I love the countryside. One km around my place I have some woods so I can go outside with the kids.

When you would go to the island and see Yann, or talk to somebody else who is using your stuff, how important is their feedback in your designing process?

I'm glad to see clients, musicians who are playing with my instruments and to have some feedback. It's super important to listen, to hear how they use them, what they like and what they don't like.

Are they pretty open about giving you feedback like that? Do you make adjustments based on the feedback that you get from people?

Not very often but yes. For me, for the modules, it's my personal taste. I know everybody's not going to like it, but I listen to critics, and to see some great artists use my stuff is very nice. I was in Yann Tiersen's studio once and he said, "Come listen, I made this track with three of your modules." The beginning of the song was with my modules and it was very inspiring to listen to a guy like Yann making music with my instruments. I was very proud and it was very nice music. I never thought you could make music like this with my modules because mostly it's distortion. Mostly it's noisy, and he's making very fine

music with it. I also get feedback from Marc Caro. He's a well-known French film director who worked with Jean-Pierre Jeunet on *Delicatessen* and *City of Lost Children*. He lives in the south of France and he's a good friend of mine. We play music together and have recorded an album (*Exorganics* by MonoB vs NoroE). I met him in 2017 because he was looking for the guy from Brittany who was making distortion…We exchanged thoughts on distortion, what we like and don't like. He's very curious about my new stuff so when he comes to my place he's like, "Do you have any prototypes I can listen to?" He tells me if he likes it or not. I also send modules to him, and I make some of them DIY just for him and circuit bend them for more distortion. He sends me the music he makes with my modules, and when we play together, he always plays with my distortions. I have a triple distortion and feedback module and there are seven germanium transistors per module. I made a special one for Marc with a different type of transistor for each channel. There are three channels that have different characteristics so you can choose which distortion you want. There's a very nasty one, a gentle one, and one that's in between. Marc really likes distortion and tubes, he wants to build an all-tube studio for himself. Everything with tubes; modular, preamps, microphones, effects…. Crazy.

That'd be a lot of voltage running around.

Yeah, he could heat up the whole city.…

Sometimes when I look at tubes I think about that process and everything that goes into making them and think it's no wonder why they were excited to finally come up with the transistor.

Do you know the video with a guy on YouTube, a French guy (Ed. - Claude Paillard) who's making the tube from scratch? He explains every tube, the making of the tube, the filament, and the cathode…it's impressive.

That seems like a life goal, like a lifetime's pursuit to build your own tubes. Tubes are pretty fascinating… a box of transistors would never be that exciting.

Sometimes, like old germanium ones.

That's true. We were talking about Thomas Thwaites, who made a toaster from scratch. It took him almost a year and he spent thousands of dollars to build it, but he mined the ore, melted it, made the plastic, and then shaped it and built it. I think it only worked for like a minute, and then it basically melted itself. It's fascinating to see how far manufacturing has progressed, and keeps on progressing, and how that's spread to our industry as well.

Yes, it was nearly impossible fifteen years ago to make electronic instruments as a small manufacturer. Before the internet, it was so difficult. Now you can talk to people instantly. The factory that's building my modules is fifteen kilometers from my place and we make mostly everything there I can bring them my PCB and watch the pick and place process. I like to be able to speak to people and to make it in my area. It's nice to be able to live, work, and make modules in Brest.

Yeah, and then you can go boating at the end of the day.

Yes. It works well.

-touellskouarn.fr


GEAR REVIEWS

Looping Delay and Sampler
4ms
4mscompany.com

Continued from page 47

I used it frequently.

There's a lot to discover here, and using the Send/Return function to throw the delay/loop into a resonating filter, another delay, and a phaser was a lot of fun. I couldn't always tell why something was playing back since LD's playback can go as far back as about three minutes, so I would sometimes hear something I did a while ago, sometimes something from another module that I'd patched and already unpatched in the Send/Return channel. The manual explains this well, and there is a button combo that you can do to clear the buffer, to erase the memory, to start from a clean slate, and this is another thing that's good to have memorized. Looping Delay is a lot of fun, and offers a lot of sample mayhem.

The 4ms Stereo Triggered Sampler is another module that belongs in the Eurorack canon. It's an amazing module, really a performance-based system all to itself, that can go back and forth between two samples, mixing, modulating, recording, and so much more. I've seen Daedelus rock this thing so hard that I liken it to flying to the moon on a paper plane; straight up magic. I've messed with the STS a bit and am pretty familiar with how it operates so the learning curve for the new Sampler wasn't steep at all, and I was able to get a handle on it quickly. Having said that, though it doesn't quite have the STS' ability to play two sides off of each other—it's a single channel after all—but still retains the same core elements, flexibility, and feature sets that STS has, can still do stereo, and can still be magic.

Like the Looping Delay, there are four controls; Pitch (with an 8 octave range), Start Position, Length, and Sample, and each has a CV Input for modulation. Sampler can store up to ten samples per bank for up to 600 high quality stereo WAV files (it comes with 200 pre-loaded samples), so you're not going to run out of material due to any lack of storage. It plays the samples back at 32-bit/96kHz, and it sounds great, though I've never had an issue with any 4ms modules when it comes to quality of any sort, so this is no surprise. Without a menu it will be nary impossible to remember what your 482nd sample on file is, so if you go that deep, well… you'll figure it out. Cheat sheet, printout, screenshot…Me? I stick to four banks of samples divided by duties; percussion, vocals, found sounds, and drums, so I only used forty samples in four banks (banks are denoted by color via a light up LED Bank button, and the first four are 808 button colors; easy to remember), but I also left the fifth bank open for on the fly recording as I would record patch loops and snippets—as well as vocals—into that bank. I think it's helpful to have a system for storing the samples like that, and on other modules that need it I use the same system (PVFD: percussion, vocals, found sounds, drums) so I can easily remember it from module to module. Yes, PVFD sounds like some sort of physical affliction, but it works pretty well for me. Anyway, loading the samples into the provided 16GB microSD is straightforward—though you do need access to a computer to do so—and you can separate your files into categories within the file system for easier management. We all know how fun file management can be, but this is pretty painless and well thought out, so fear not Sampler user.

Again, just like the Looping Delay, inputs and outputs are at the bottom (Out Left, Out Right, End Out) in a white area, and the various Inputs (Pitch, Start Pos., Length, Bank, Sample, Left and Right Record, Play/Record, Reverse) in an black section outlined in white. There is also a Play/Record button and a Reverse button at the top of the module along with the Bank button that I mentioned already, and as noted with the L and R outputs, Sampler can be run in mono or stereo.

Jumping in at its most basic, by pressing the Play button (or CVing it), you can play and retrigger the current sample at any point in the sample, and by holding the Play button until it's blue you can loop a sample. It's easy to see that by looping you could effectively use Sampler as a songwriting tool, or a drum machine, switching between samples/parts by hand or CV. It makes for an interesting performance instrument in this way and with the ability to pitch, reverse, change the start/end positions, etc., makes it so you can potentially make a compelling performance out of just a few samples. Switching into Record Mode (hold Play and Reverse for two seconds until Play blinks red) I attempted exactly this, with a couple of drum loops that I sampled from my *Drum Drops Volume 2* LP, a decades-old thrift store find. I did so pretending that I was performing live with no predetermined movements, and much of my tweaking and CVing was just a forced fast-paced frenzy of turning knobs, changing parameters, and patching/unpatching CV, seeing how musical or interesting I could make a performance with Sampler. Even though it was less than perfect, it was fun, effective, and I think somewhat musical. At the very least it was definitely interesting and seeing the rhythmic possibilities in something like this was eye opening. There were a few ways to glitchify a sample and when I got off track—which I did many times—it wasn't hard to find my center again. Since the Pitch knob is center detent it was always easy to return to my starting pitch and like that, everything else on Sampler is well-labeled and easy to navigate. I'm sure to anyone that might have heard it that it was just a messy mashup of drums and noise and a lot of off-time head bobbing, but it gave me a glimpse into the potential of how Sampler could be masterfully played as an instrument. Like LD, Sampler has some button-push higher advanced features, so there's even more beneath the faceplate here.

Putting Looping Delay and Sample side by side to work in tandem is where it's at. Not only do they look sort of badass together, but they work together extremely well. I recorded a vocal drum track (it sounded as awful as it sounds here!) in Sampler and ran it through the LD, on a fast, basic ⅛ delay setting, so the delay was like a slap back, and it gave a robotic drum sound, and made my mouth drummiing actually sound cool. Patching a ton of CV into both (while still trying to keep the pitch and tempo somewhat consistent) brought out a somewhat chaotic, but interesting rhythmic wonderland and I ran it through some spring reverb and modulated that Wet/Dry mix with the Loop Clk Out on Looping Delay.

One thing I thought turned out really cool

was to record a different but related vocal tone in each of the ten slots in one bank on Sampler. Changing from sample to sample, with a long enough sample playing for each, it was kind of like a Mellotron. Modulating the various parameters and I was in Meredith Monk territory. Doing the same with spoken word (I recited ten different passages from an article in a travel magazine that was sent to me by accident) was also really interesting I'm not sure why it always seems creepy to put spoken word into a music setting and chopping it up (maybe it's the word "chopping" that is creepy), but doing so and giving the sample a short length, I was in granular synth territory. Of course, all of this—Length, Start Pos., etc.—is CVable and I would just put the Playback on loop and change from one tone to another, adjusting the sample position start and length to a very short time, and then a long time, to constantly change and bring variation to the length and playback area of the samples.

The CV In for all of the parameters on both modules goes from 0 to +5V, so for some things, like modulating the Sample, since there are ten sample slots that need to be modulated over five volts (CV from 0-5V=5, 5/10 slots=0.5), that means that if you want to go through all ten sample slots, you need to inject CV that changes by 0.5V for each particular slot. This isn't necessarily easy to do, but with stepped voltage going in I had pretty good results. Plus you can math out again and figure that out, so say if you want to alternate from sample 7 to sample 2 to sample 4, you'd need 3.5V, 1V, and 2V, preferably in square waves so there are no in-between voltages. There are many ways to do this (programmable LFO, EG, etc.) and part of the fun of modular for me is figuring out solutions like this, problem solving.

I could go on and on about the sounds and rhythms I discovered, the movement that can be had, separately or together with Looping Delay and Sampler. These modules are mesmerizing, and if you're a DIYer, does it get any better than being able to make modules of this caliber?

- Ian Rapp

Looping Delay

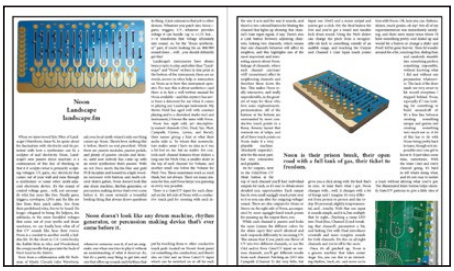
16 HP +12v 125mA -12v 45mA

Price: DIY kit $175, Assembled $275

Sampler

16 HP +12v 145mA -12v 41mA

Price: DIY kit $199, Assembled $299


Noon
Landscape
landscape.fm

Noon doesn't look like any drum machine, rhythm generator, or percussion making device that's ever come before it.

Noon is their prison break, their open road with a full tank of gas, their ticket to freedom.

Continued from page 49

what's causing what, so at least there's that, but it's pretty easy—not so much to get lost—to diagnose and tweak something you want to change in the slightest. And good luck with that.

When you patch into a channel's output it takes that channel out of the Main Out signal path, and I found that on the whole I enjoyed not doing so as it's a domino effect and I liked seeing the interaction between the channels in the final output, how changing the Mod in one affects the nature of the overall sound and stuff like that. At one point I patched each of the Main outputs into various delays (4ms Looping Delay, the Maneco 16 Digital Delay, and Joranalogue's Delay 1) and I couldn't believe what I was hearing. There was no way I would have, could have, ever patched something like this in some other machine. I wouldn't have even thought to try. It had a melodic bassline, a shuffling rhythm, and some loud squelching from a wayward LFO that I'd patched into Plast.

Noon is an experimentalist's dream, and the sound sculpting world is better for making its eight voices heard. Whether or not you learn to love (or already do) or not, the hidden nature—the true voice/s—of the CV that's locked away in your modular rig, sequencer, or whatnot, Noon is their open road with a full tank of gas, their ticket to freedom. For control voltages, gates, LFOs and the like; their time is now, so be prepared.

- Ellison Wolf

Price: $770

SYNTH HACKS #11
VISUALIZE *THIS*

BY DAVID BATTINO
BATMOSPHERE.COM

Why are people who show us the future called *visionaries*? It seems to me like there should be an audio component to that, and now there is: I recently got a gadget that lets me connect my phone to a projector and generate swirling, wall-size videos as I play. The Apple Lightning Digital AV adapter (Figure 1; $49) has a Lightning plug on one end and an HDMI jack on the other. Wire it to a TV or projector, fire up a music visualizer app, and you've added a whole new dimension to your sound. These adapters are also available from third-party manufacturers and with USB-C plugs for Android devices.

Fig. 2

Vythm JR offers bountiful controls, including a tempo-synced LFO and MIDI Learn. When you record a performance, the app captures just the visuals, not the control overlays.

As for music visualizer apps, there's a plethora out there. Typically, they measure the amplitude of several frequency bands in the audio and use that to modulate shapes and colors in the generated video. What's astonishing is that almost fifty years after the original Atari Video Music visualizer came out, many of these apps are still crude and artless. Most look like jiggling oscilloscopes or a spilled box of Trominoes and pick-up sticks, so I was excited to discover an iOS/Android app called Vythm JR that was clearly designed by musicians (see Figure 2).

Turns out that the "JR" stands for Jordan Rudess, the virtuoso synthesist and longtime iOS enthusiast. I contacted him and developer Marvin Krüger and asked what inspired them to create this. Rudess said two features he thought were missing from other visualizers were deep, hands-on control and a variety of graphic styles. Vythm has a monstrous number of parameters, but you can easily assign them to macros and MIDI events so you can play the app like an instrument. Or you can simply call up the numerous presets Krüger releases as paid upgrades, (the basic app is free), which offer entirely new looks, from fractals to fluids.

Fig. 1

With an HDMI adapter and a visualizer app like Vythm JR, you can drive a projector from a smartphone, creating visuals that respond to your music.

Since I was using my phone's Lightning port for video output, I grabbed a Bluetooth MIDI controller to shape Vythm JR's visuals. The response was instant and expressive, which got me thinking it could be cool to set up a dedicated phone for every player in a band, each feeding a different projector or screen. Or going in the opposite direction, I thought about projecting randomized text from the raunchy Inspirobot (inspirobot.me). Since our brains love to seek out patterns, the random words will invariably sync up with the music—or at least function as oblique strategies, prompting the performers to react.

Another favorite app highlights a new direction in visualizers: augmented reality. Beatsy for iOS (see Figure 3) manipulates video from your phone's camera rather than synthesizing it. You select a flat surface, which the app then extrudes and animates to match the audio. Both Beatsy and Vythm can render their output to video files, so you can quickly turn your songs into stylish movies for sites like Instagram, YouTube, and Facebook that snub audio files. With these tools literally at your fingertips, you can make an audinary world...visionary.

Fig. 3

The free Beatsy app warps the camera signal to match incoming audio. On devices with LiDAR like the iPhone 12 Pro, it can even mask out foreground objects.

SHOP TALK

ESCAPE FROM NOISE

ROSLAGSGATAN 19
11355 STOCKHOLM
SWEDEN
WWW.ESCAPEFROMNOISE.COM
OWNER - ULF LUNDBLAD
DATE SHOP OPENED - OCTOBER 14, 2010
SPECIALIZATIONS - EURORACK AND WEIRD SYNTHESIZERS

Why did you open your shop?

Back in those days it was hard to find Eurorack modules here in Sweden. No music shops here where selling them, so if you wanted to buy anything you'd have to get it from Germany or the UK, so I made a web page and mailed a bunch of manufacturers, and that was that.

What were you doing before you opened your shop?

I'm a journalist, and still work as journalist in the mornings before I go to the shop. Its great to be able to do two things, it keeps the routine at bay.

When you first opened, what were your goals, and have they changed?

When I started the web shop my main goal was to be able to get my hands on modules that I wanted myself and hopefully cover the costs by selling a few modules to other people. Then it just snowballed. I make a part time living off of this since 2015 and opened the store about four years ago. Nowadays I spend a bit too much time with paperwork and not nearly enough time playing with modules.

What is your greatest extravagance?

I guess that would be the Analogue Solutions Colossus we have in the shop. Other than that I like to indulge myself in a nice Buchla module now and then.

Any crazy store stories?

The weirdest request I have got is probably from a guy here in Stockholm that wanted to hire my demo cases to have in the background when he was performing with his Jupiter-6.

How many employees do you have?

Its just myself, but I share the store with another company, JAM (www.jam.se) that specializes in vintage synths and they help me out when it's too much to do, and together we are four people in the shop.

What is your motto?

I don´t know, but if I had one it should probably have the word distortion in it.

What's the most challenging aspect of running your shop?

Its probably the stress, to be honest. Both to manage the store and financially.

Which talent would you most like to have?

I guess it would have been good if I where able to play the keyboard, but I've never got around to learn that.

What are your plans for the future of the shop?

Me and JAM, who I share the store with, are planning to work closer together on a few things. Among other things we will start to carry more effects pedals and perhaps some pro-audio equipment.

Do you have musical projects that you're involved in?

I play in an EBM band called Severe Illusion, and I try to make noise under the moniker of Two Dimensional Skull.

Favorite synth?

It changes from day to day. I used to love my Macbeth Elements but the Metasonix S-1000 Wretch Machine is a monster. Is Soma's Pulsar-23 a synth? Then I would probably say that, at the moment.

Favorite module?

I love Buchla and Serge and I'm really happy that TipTop has started to make the 200 series in Eurorack format. I still use a lot of the modules I started out with; Pittsburgh Modular's LPG is fantastic, as well as Flight of Harmonys Plague Bearer.

Dream synth/setup?

It would be fun to have a Synthi VCS3.

Favorite synth artist?

I like a lot of old EBM, like Klinik and Portion Control as well as artists like Trepaneringsritualen, MZ412 and Brighter Death Now.

What's in your pocket right now?

Apple AirPods and my car key. Nothing fun.

Who are your favorite writers?

Neal Stephenson, William Gibson, Charles Stross and lots more that I cannot remember at the moment.

What's your favorite part about owning your shop?

The fun people, both customers and module makers, that I have gotten to know through this.

Upgrade the nerve center of your studio with a unique piece from the maker of the world's finest handmade studio cases, paired with Eskatonic Modular hardware and power.

Erik Needham WOODWORKS

Inspiration is in our grain.

needhamwoodworks.com

eskatonicmodular.com

ESKATONIC MODULAR


EXPERT
SLEEPERS