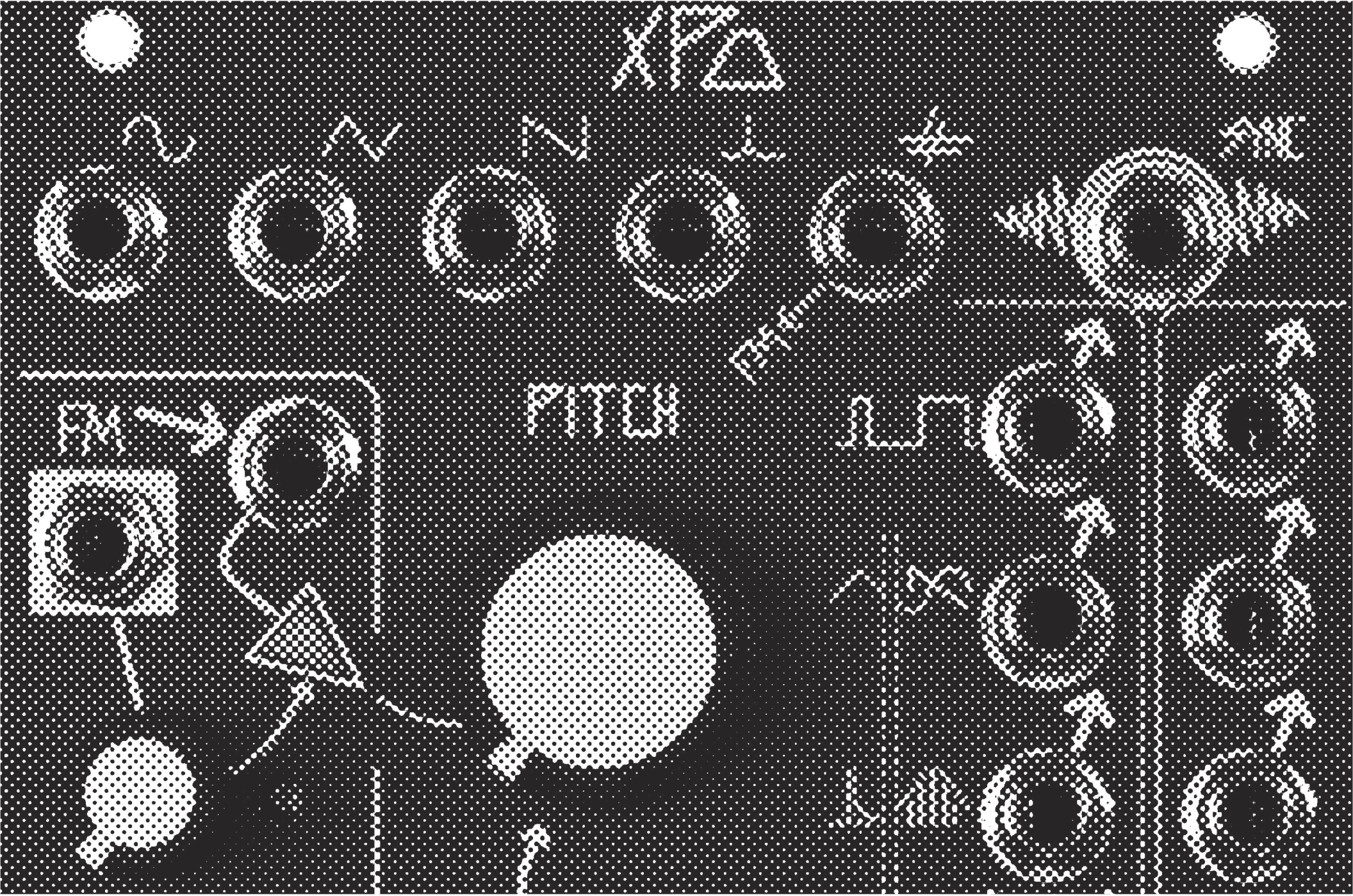
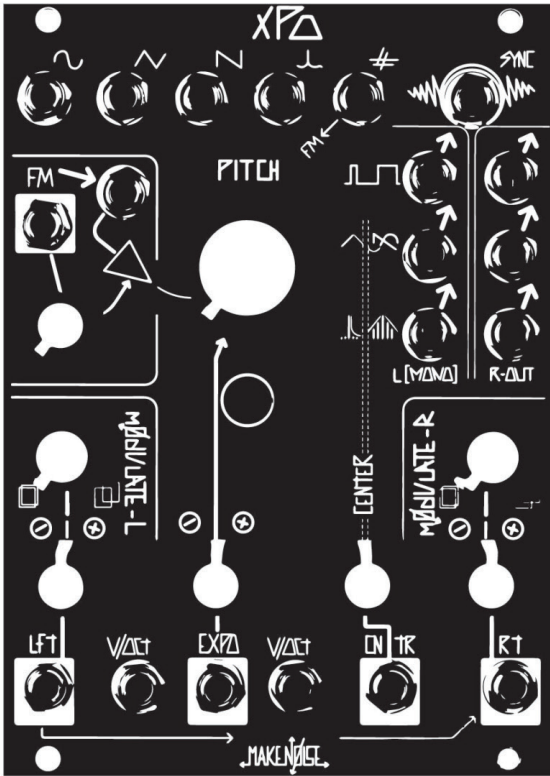


SEPTEMBER 2022

MAKE NOISE ZINE
ISSUE #4





- Stereo Analog VCO with eleven simultaneous outputs (five mono outs and three stereo pairs)

- Modulate Timbre via Stereo Pulse-Width Modulation, Stereo Vari-Timbre, and Stereo Wavefolding

- Sine, Triangle, Sawtooth, Spike, and SUB mono outs

- Unique Mono versions of all Stereo Waveforms via Left output normalizations

- Modulate Left and Right channels together or separately thanks to normalization and attenuverters

- Center parameter adds additional timbre control to both sides of Vari-Timbre and Wavefolded outputs

- Linear FM Bus features voltage-control over FM depth and a normalization of SUB to FM input for easy GROWL

- Hard SYNC circuit

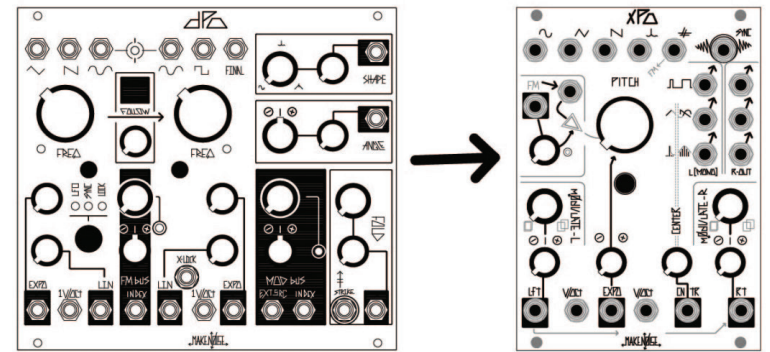
- Two 1v/oct inputs for transposition, melody stacking, or richest FM

- Expo FM input with attenuverter

- Designed to pair well with QPAS, Mimeophon, and X-PAN

The **XPO** (or Stereo Prismatic Oscillator) music synthesizer module is a Voltage Controlled Analog Oscillator designed for generating Sine waves, Triangle waves, Sawtooth and Spike waves, Sub-Octaves, Stereo Timbre Modulations (including Pulse Width Modulation and Wavefolding), Oscillator SYNC, Linear FM and more in the analog domain.

The XPO is designed to be the Stereo VCO complement to our Stereo Filter, the QPAS. The two modules share the core idea of complex circuits being controlled in multiple dimensions in the stereo field by a few powerful parameters. The Stereo Prismatic Oscillator also makes a particularly useful patch buddy for the STO, Mimeophon, and X-PAN.



DPO TO XPO BY KELLY KELBEL

XPO's got me looking back, thinking about the beginnings of our DPO, our first oscillator (yep, I'm talking about Dolly Parton's Oscillator). I started working at Make Noise in 2011. Sure, I had been stamping boxes while watching movies since 2008, and I told Tony to quit his job, to really go for it, that the risk was worth it, that I could take care of us on my 27K teaching job. No, I didn't totally get what he was doing, but Tony has always been special. Truly, his brain is like no other brain I've encountered.

Just before we released the DPO (and Echophon) in 2012, we knew we needed to get Make Noise out of our house, to reclaim our kitchen table for meals instead of test fixtures, to use our living room for hanging out instead of box building.

The best thing about Westwood Place was the rent- cheap. Almost no sunlight, the one window blocked by an AC window unit that whistled tepid air. Another busted heater. Outlets every five inches. Most of them worked! Wall to wall carpeted plywood, 700 square feet of it, with dingy yellow walls would become Make Noise HQ #2. The door locked. We could fit Tony's workbench, a big production table, and a tiny desk for me in the front, plus 4 metal shelves for parts and ship ready items in the back, across from the mini-fridge.

A former student helped us move, complaining of itchy legs throughout the day. We all assumed it was poison ivy. When we walked in the next day, we were greeted by fleas! A little business down the road removed these interlopers. While they fumigated, I interviewed strangers who responded to our Craigslist ad for a production tech at our local punk rock coffee shop (once Izzy's, now Battlecat). One person COMPLAINED about the local music scene so vivaciously that I reconsidered hiring anyone. But then I met Dash, a person I figured Tony and I could spend 8 sweaty hours with in a cramped room.

Our long-time Chicago friend, Erik, crafted a gorgeous metal cutout sign of the Make Noise logo, which Tony drew in the same program he uses to lay out circuitboards. The sign, too impressive for our space, hung just inside the door with Tony's personal modular below it in case someone dropped in for a demo. {No one ever dropped by for a demo! Today that sign hangs in our courier pick up station, which we hope will someday return to our demo area}.

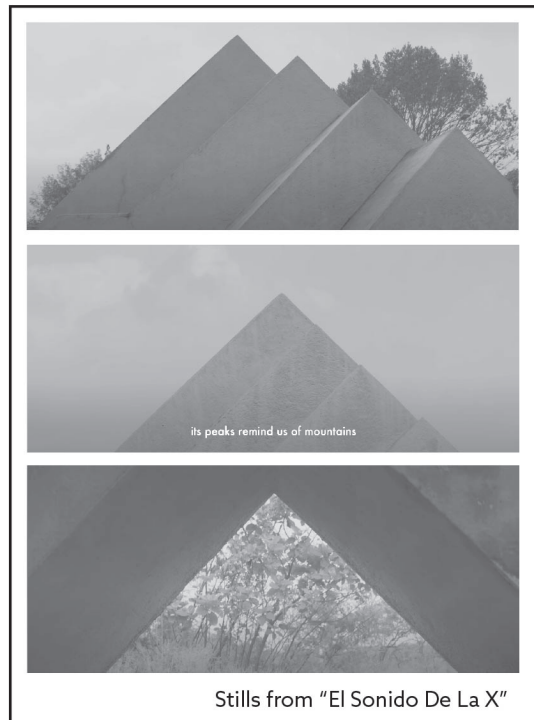


Tony took a pic of our new space once we were set up, and shared it. Some friends made jokes. Clearly unimpressed! Family questioned our sanity, moving this small synth hobby out of the house. We were excited, despite their apprehensions, and nervous as hell, maybe because of their misgivings. We didn't know what we were doing and we knew exactly what we were doing (still the same-we know nothing, but we know something. Argh).

That space contained lots of big things for us: Hiring our first production tech who was a stranger, wrestling with our number one nemesis Quickbooks, balancing my transition from production to shipping/sales/supervision/growth of Make Noise while working multiple jobs-coordinating internships at Bookworks, teaching printmaking at Echoview Farm Camp, serving as interim co-executive director of the sexual violence prevention center Our VOICE, and creating a line of letterpress goods as tiny story factory. Tony designed Function and blanks, developed test procedures for other people to use, and learned to let go of control of some parts of the business. We had our first disagreement about how to prioritize the workload, hosted the first folks who wanted to see our space (there's a video out there somewhere), managed to work around piles of boxes, and released the DPO and Echophon.

In July, Tony drove up to Chicago to sell the first of the DPO at a Trash Audio event at the Empty Bottle. Two momentous things happened that weekend: a growing pulse for the company beyond our comprehension was evident in the fervor for our DPO and the Shared System Record Series was conceived. All of the excitement gave me the confidence to start looking for a bigger space. About 4 months into our lease, we moved to Carolina Lane.

*Note: some brilliant folks added windows and now Westwood is a lovely plant store, Palm & Pine, where we got our plants for the pop-up. Before that, former students had a Riso Shop-see Make Noise building postcard for an example of their work.



Stills from "El Sonido De La X"

WALKER FARRELL IN CONVERSATION WITH LEO MENDEZ

The continuing "Sintes Con Leo" series on the Make Noise YouTube has always tended toward an experience of synesthesia, as Leo has explored the relationships between sound, color, shapes/forms, and now even ancient and modern symbols, logos, from art and nature to the rich meanings held within words and individual letters. As we watch "El Sonido De La X", everything begins to look like visual representations of what we are hearing. Architecture, sculpture, and even mundane sights like tiles all begin to look like waveforms. Arbitrary shapes in dirt begin to look similar to the slowly eroding ancient statues we see in other shots.

WF: Thanks for your beautiful work and for taking the time to answer a few questions for us, Leo! As long as I've known you, you've emphasized a connection between the auditory and the visual in your work, from light and shape to symbol and meaning. What is your history with art and music? Have these different elements of art always been intertwined for you?

LM: First of all let me say that I'm super pleased and feel really thankful for being invited again to the Make Noise YouTube Channel, it's indeed a challenge for me to create new ideas every time but also a way to inspire myself to try new things.

Getting back to the question I do believe that my auditory system is bounded to my vision system; When I first approached to the music making, I made it through the "eyes of a graphic designer" (my main profession and daily activity) even though I had a couple years of music theory studies on my early years, everything made sense as soon as I started to think on music as a metaphor for visual ideas.

I must say that "creating symbols" is really the core of my work, mainly because sometimes this could hold plenty of meanings, and also could be timeless. By saying this I mean that in order to create a symbol you need to create a context, a narrative and sometimes a use for it, so in my view create a track is not enough

I do believe that video killed the radio star mainly because sounds are usually in a visual context and the symbolic part of the music is evocative, ceremonial and part of the world view, so there's always this mixed and diluted lines between the vision and sound that I really love to cross.

Then as a graphic designer, It's really hard for me seeing my body of work as "art" because I sometimes get super involved in the communication, the look and the writing, these creations always felt more like projects instead of "art", I believe that I'm just



rambling but surely that's my feeling, I've always portrayed myself something more like an "Audio Visual Creator" but yet I'm still not sure what's the best title.

WF: The new video El Sonido De La X is about the XPO - but even more than that, it is a love letter to your country, Mexico. Can you tell us a little bit about your creative process and how you came up with this idea?

LM: As soon as I read the title of the new module I was struck by lightning and thought about the X as a symbol of Stereo. Again the symbolic part of the Make Noise modules is something that really inspires me, not only because of the meaning, but also because there's this "timeless" narrative that could be applied to.

Getting back to the city, It only felt as a love letter as soon as you mentioned it, but I must say that like every other inhabitant of Mexico City, there's a big love/hate relationship with this huge and roaring city. I was born in Mexico city but I was raised in the suburban metropolitan area, about 40 minutes from the downtown area, so my first encounters as a kid with this huge city were always a little bit touristy, a visit to the Zocalo on a sunny Sunday with my parents, a school visit to the amazing museums, so I guess even though I've lived in the city for the last 14 years now, I've never ceased to be amazed by the beauty of it. As many other places it's also a dangerous, vigorous, crowded city but also it's hard to be away from it.

Now that you're more in context, this city was founded 501 years ago, and has been the center of many cultural, political and religious movements on the continent, and this fact also hit me hard and inspired me as soon as I read the word "center" on the XPO faceplate, and maybe this was a long shot, but that was the main reason to film it in the city "center" instead of the commodity of my studio.

Then as soon as I had those two ideas, I wanted to portray the "plethora of sounds" that you can get from the XPO, it felt like a new module every single time that I approached to it, and also I want to keep talking about the "stereo" possibilities and the "two sides of this story" (Left & Right Channel).



So this is getting confusing but bear with me... remember the center? Ok so Xictli means navel, center, and the name Mexico "in or a the center of the moon " BUT the word Mexico is written with X not only for the anthropological and etymological reasons that might be so apparent now, but also part of a cultural resistance.

Almost at the same time that we were at the independence process (1810), La real academia de la lengua suggested that the word Mexico, should be written with j, and many words with x use the phonetic sound ji (like in he) but should use the phonetic pronunciation shi (like she) Mee - she - co, and that's even the profound symbolism of the city (and maybe the module), as a Mexican we are always tied to the two sides of our cultural history and heritage, always getting back to the past to understand the future, always trying to re-interpret the many visions and positions that this city has, a real stereo or wider point of view.

Then I started to hunt like crazy with my camera all the visual elements and forms that resemble the XPO sounds and waveshapes, again "hunting the symbol" was my main guide on this "video essay", but usually focused on the center, symmetry, and stereo vision.

WF: MEXSYNTHCO 2022 is coming up! Will there be any online documentation of the event for folks who can't make it to Mexico City that weekend?

LM: As a founder of Mexsynthco, I'm pretty excited to have the Make Noise team for the first time in this 2022 edition, so I'm really hoping that everybody can come and visit this "stereo" city, full of contrast, but if you don't make it no worries, we will have online content on the official website www.mexsynthco.com and also on the official channel.

Mexsynthco is going to take place at the Centro Cultural España en México from 20th to 22nd and we are going to have a special presentation of Tony Rolando. So the team behind and myself are super excited about it.



Be sure to check out Leo's work online:

<https://www.youtube.com/c/SintesconLeo>
<https://lefantomonde.bandcamp.com/>
<https://www.sintesconleo.com/>

Throughout the month of our Pop Up, Make Noise will be hosing four Resident Artists in the space, over which time they will create new pieces of music with our modules and desktop instruments. Their work will be shared on our YouTube and Instagram channels-- stay tuned!

RESIDENTS!

THOM NGUYEN



Thom Nguyen is an Asheville-based improviser and drummer of MANAS, Nest Egg, We Bow To No Masters, etc. Producing energetic bursts and invoking a sensitivity to space that one often associates with Free-Jazz and New Music percussion, Nguyen's approach elegantly bridges works of sonic sculpture with a punk aesthetic of immediacy, of aggression and playfulness. He also runs a drum rental business, Batteria Backline.

<https://thomnguyen.bandcamp.com/>

FAREWELL PHOENIX



Lynn Fister is a Vietnamese-American experimental musician, writer and visual artist residing in Asheville, NC. She has been making drone-pop and ambient music for over a decade. After taking a long hiatus from their own music, Lynn has recently returned to creating solo music once again as Farewell Phoenix. These next explorations concentrate on choral soundscapes manipulated by and integrated with modular synthesizers. She is now particularly interested in how installations, space and environment firm music-making. Although there are no releases to date under this name, Farewell Phoenix recordings should be available in the near future.

Sarah Louise is interested in how music can help us remember what kind of animal we are. Likewise, she is interested in what synthesis can reveal about the natural world. On her two most recent albums, she uses electronics to create organic sound environments for inner journeys. Her newest as-of-yet unreleased music is joyful and danceable, revealing the importance of embodiment and collective energy to her ever-evolving sounds. Believing that everyone's expression is as important as anyone else's, she is also branching into facilitation, helping to create nonhierarchical safer spaces for group singing, celebration and whatever else may arise. Having started as a solo 12-string guitarist and singer of traditional songs, she brings a unique sense of rhythm, harmony and emotionality to her electronic music.

SARAH LOUISE



<https://sarahlouise.bandcamp.com>

Sleep Number, a solo project by Asheville based musician Sophie Froehlich Hull, was born out of brief moments of exploration between band practices. It wasn't until her bands Axxa / Abraxas and Gold Light took a break in 2020, that Sleep Number was able to take a more concrete form. Invigorated by hours of experimentation in her home studio, Sophie sought out a way to dive even deeper into Sleep Number. She drove out to a cabin on Lonesome Mountain, where she spent a week with only her music gear. As snow fell in the woods, fueled by many cups of tea and nothing to distract her, she was finally able to cultivate her solo project into what it is today.

SLEEP NUMBER



<https://sleepnumber.bandcamp.com/>

THE STORY OF THE XPA

by TONY ROLANDO



I was lying awake in bed at 3 am thinking about music and synthesizers, on this early morning specifically, the voice panning of the OB8. So simple, so effective. A bank of 8 analog pan-pots is tucked into the side of the instrument to let the musician choose the exact placement of each voice in the stereo field.

As you play the instrument, notes may dance around your head. This led me to think about how Oberheim and most other synthesizer designers through the 70s and early 80s primarily used Pulse Width Modulation for waveform animation. Don Buchla's wavefolding techniques had not caught on. PWM has been more or less the same for decades and there is not a whole lot of difference between PWM in one instrument to another. Some allow you to modulate further than others. A few even allow you to go all the way to 0% or 100% Width. PWM was usually generated from a Saw or Triangle core, and while I tend to prefer PWM generated from a Tri-Core, the difference is subtle. The bigger difference is the filter that follows. PWM has a way of tickling the resonance of a filter that can really make the sound come alive.

This led me to think about Stereo filtering. How could a synth sound more stereo? At Make Noise we have voice panning with the XPAN, stereo filtering with the QPAS, and stereo echo verb with the Mimeophon. Surely, this was enough stereo modulation.

Then it occurred to me, why couldn't PWM be stereo? It would be very effective at creating a stereo image since the amplitude of both Left and Right would be almost identical, while still offering dramatic stereo timbral shifts. I thought to myself, surely somebody has done Stereo PWM already. I needed to research this idea. So I wrote about it in the notepad I keep on the nightstand and I eventually fell back asleep.

I woke up the next day and I immediately saw the note, I tried to read it..

It was very hard to make out what I had written, but it seemed like it said:

"The planets of our solar system, incinerating. Like flaming globes, Sigmund." After a cup of coffee, I was finally able to make out what the note actually said.

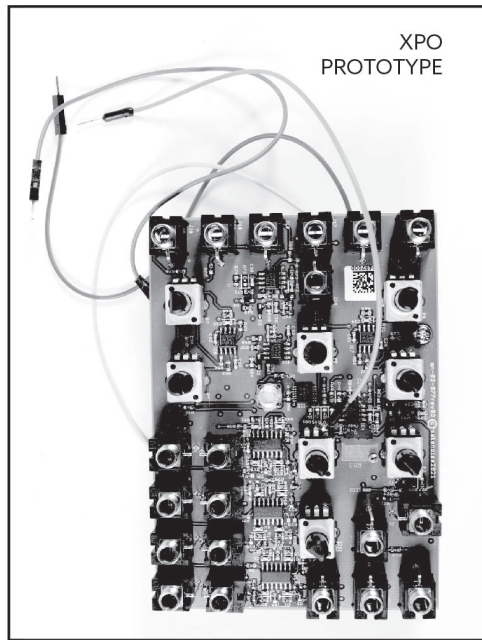
"What could make the QPAS and Mimeophon sound even more stereo? Stereo Pulse Width Modulation?"

I spent the day searching for Stereo Pulse Width Modulation. I did not limit myself to modules. I read manuals of synthesizers from the 70's into current times. I found nothing of the sort. Perhaps there was a reason it did not yet exist? Perhaps Stereo Timbral Modulation prior to a Stereo Filter and Stereo DSP was just too much Stereo.

It seemed to be worth at least exploring so I built up a circuit to test it. The sound was OK, it was definitely stereo, but it was not incredible. I patched it into the QPAS. It deepened the stereophonic effect of QPAS in a meaningful way. The two pairs of filter cores were having their resonant peaks excited independently. I felt very connected to the modulation of the stereo field, too. All of this came without having to worry about tuning between two oscillators.

So I looked to our STO for further inspiration. I tried the STO Variable Shape circuit in stereo and it sounded great, but it could get pretty unbalanced from left to right as it was modulated. I re-designed the circuit to compress the sound in order to get it to be more balanced. I called the new circuit Stereo Vari-Timbre.

I tried stereo sawtooth animation and it was less effective. The sound was very balanced (like PWM) but it was not as dramatic and powerful. Also, It took a great deal of analog circuitry to create the effect. I figured if I was going to put that many parts on the design, I might as well look to the DPO for inspiration. Stereo Wavefolding! It was wonderful, especially when patched into the QPAS.



The Stereo VCO was a new or at least uncommon concept, why not tie it to an existing framework to ease the learning curve. I looked to the QPAS for conceptualizing the user interface. I figured that if somebody could learn the QPAS Stereo VCF, they could use similar techniques for the modulation of a Stereo VCO. The QPAS form factor of dedicated Left and Right modulation parameters normalised from left to right. Pitch control in the middle. Stereo outputs along the right side, so as to be in line with the QPAS stereo inputs. Then there was the QPAS "Q" parameter.

I had wanted the XPO to have a center parameter. Something that modified both sides of the sound simultaneously, just as the "Q" parameter does on the QPAS. What is nice about the Q parameter is that it affects ALL 4 cores in the QPAS. The center parameter needed to vary the mono waveshape in a way that would make the stereo waveshaping circuits that follow it even more interesting.

This was easy with the Stereo Wavefolder as I already had a unique circuit to do this in the DPO. The Shape parameter from DPO was excellent as a center parameter.

For the Stereo Vari-Timbre, I looked to the STO, but there was nothing that would work as a center parameter. So I looked beyond the STO to the modules that inspired and informed it. The early Buchla Oscillators 158 and 258 where they allow for crossfading between Sine and Saw. This is such a simple circuit, but it sounds so wonderful and it is extremely useful.

The Stereo PWM channel which sparked this whole module idea did not comply with the Center parameter. I struggled for months trying to figure out some way I could modulate the PWM circuit through the Center. Everything I tried was either too dramatic, making PWM no longer PWM, or easier and better achieved with commonly existing modules. I finally convinced myself that having one set of outputs that is not influenced by the Center parameter could be functionally advantageous. You could Audio Rate Modulate (FM) Center and get more harmonically rich Folds all while PWM remained clear of these harmonics, for example.

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With the stereo elements designed I still had plenty of space left. I put as many mono waveforms as I could fit. Since I had to create many waveshapes to do everything I wanted to do with the Stereo outs, I had many to choose from. I feel having many, simultaneously available waveform outputs exponentially increases the functionality of the module. Covering the standards, SINE, TRI, SAW... I did a more traditional SAW as opposed to the weird wiggly SAW from the DPO. I figured you could get something like this from the Vari-Timbre outputs. Instead of the Square, I added Spike, since it is a less common wave shape and also works great with a BP filter as found in QPAS. Once again looking to the STO, I put a variation of the SUB.





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