fluctuating random voltage, CV sequences, complex envelopes, and so on, the voltage monitor is excellent for gaining a bird's eye view of a complex patch. A killer feature of this mode is the ability that DATA has to output four separate CV or Gate signals simultaneously while monitoring incoming signals. Fixed DC voltages can be dialed in along with latched, momentary, or toggled gates. The gates are generated by pushing the respective channel's button and as a bonus, the fixed CV output in this mode is available in the oscilloscope mode—as well as both the tuner and spectrograph modes. Running the four different DC voltages into a switch is a great way to transpose a sequence or run precise offsets to other modules in your system, all while monitoring four separate parts of your patch.

DATA is a module with a lot of depth and a long feature set but all of its programs are interesting, informative, and become vital in short order. Whether for learning, experimenting, calibrating, or even just for pure eye candy, having an oscilloscope as part of any system is invaluable. When integrated into the tangled web that even a relatively straightforward Eurorack patch can become, the DATA is akin to a lantern in a cave. With its packed feature set and smart utilities, DATA more than earns its space in any sized case.

- Sam Chittenden

16 HP   +12V 250mA   -12V 60mA
Price: $395

Stasis Leak
Frequency Central
frequencycentral.co.uk

Stasis Leak is the name of an episode of the cult British sci-fi comedy [complete with canned laughter] TV show, *Red Dwarf*. In the show, *Red Dwarf* is the name of a spaceship, an odd name due to the fact that as I watched the episode [I'd never heard of the show before, but you've got to do your due diligence when it comes to research, right?] it's pretty apparent at the outset that the ship is pretty damn huge, and not Dwarf-like at all. Early on in the episode, the character known as Rimmer accuses another character, Lister [the last human alive, by the way—Rimmer evolved from a cat, but is in human form?!], of smuggling hallucinogenic mushrooms on board the ship, ingesting them, and going to the proverbial "Trip out City".

I'm not sure if the ship was the inspiration for the name given by Frequency Central to its 48kHz DSP based Eurorack effects module, which, unlike the spacecraft the *Red Dwarf*, is not huge at all—residing at only 6HP—or maybe the inspiration is the hope of going to "Trip Out City" in a musical sense by using this module. Either way, this module is indeed inspired. Note that there is also a pedal version of this [minus the CV control], but as it was, I was to spend time with the module only, so this review will consist solely of that overview.

Stasis Leak is a mono in, mono or stereo out effects unit with a tap tempo delay, plate reverb, and chorus. This unit is based around a Coolaudio V1000 chip, utilized by Belton in their ABE-FX sub board. If you're familiar with the Belton Brick [which you most assuredly are, at least in sound—it's in an incredible amount of reverb units] then you know that Belton knows how to pack up effects quite tidily for ease of use for builders and manufacturers. Lucky for us, they know how to pack it to sound quite good as well.

The two main knobs, TIME and DENSITY control different functions for each effect. For ease of clarity, I found this chart describing this on the Frequency Central website.

Knob Functions	CHORUS	DELAY	REVERB
Time Knob	LFO rate	Time subdivisions	Pre-delay
Density Knob	Depth	Repeats	Decay

Additionally, both knobs also have their own CV in, and when patched, the knob attenuates the incoming CV, which handles 0-5V, a great implementation.

There are also two smaller knobs, TONE and WET. TONE is a LPF, handy for keeping the signal from losing its coherence. The WET knob is the amount of effect combined with the dry signal. Fully counter-clockwise is 100% dry, and fully clockwise 100% wet. If you use Stasis Leak in a send/return situation, there is a Dry Lift

jumper. To round out the features, there is a SYNC in as well as a TAP TEMPO switch, for manually setting the tempo for the delay, with a blinking LED indicating the tempo in quarter note denominations.

While this is a mono in/stereo out effect, the delay is only mono. I'm a fan of Ping-Pong delays, and that would have been a nice feature, but the delay sounds good, so I wasn't too bummed. The delay times range from 50-1000ms, and setting the tempo via the TAP TEMPO or CV in for the TIME, changes the function of the TIME knob to where it dictates the tempo's subdivisions, the options being: 8th note triplet, 8th note, dotted 8th, and quarter note. There is no CV in to modulate the amount of the effect in the mix, so to get close to being able to turn the delay on and off, I used a square wave LFO to control the DENSITY [in effect turning the effect on and off] and that yielded me what I was looking for, though it took a second for the delay to kick in after the LFO went high. There was always some delay present in the signal, meaning that I wasn't able to turn the delay effect fully off via this way of modulation–not surprising as I was again, controlling density and not mix amount– but I was pleased that it got close overall without having to use other modules to split the signal to create the same result.

It is suggested by Frequency Central that when using the chorus effect in mono, that you should combine both the left and right output of Stasis Leak as they are 90 degrees out of phase with each other. I am in full agreement with this suggestion as without doing so, you will not get the full chorus effect. Using the TONE knob in Chorus mode, added some hiss when fully open, but also had more high end detail, and ultimately a much more noticeable chorus effect and so I preferred not to cut anything and let the Stasis Leak's freak flag fly. Using an LFO synced to a master clock to CV the TIME and DENSITY proved a very worthwhile tactic for syncing up the Stasis Leak to play nice with a patch. I was almost shocked to realize how much I liked the chorus effect on, as historically I've strongly disliked the effect—probably a hangover from my guitar playing days when every chorus pedal sounded cheesy to my ears. I must have turned over a new leaf as the Stasis Leak's chorus fattened up my leads while adding horizontal [that's how it felt, at least] movement. Panning hard left and right added some nice stereo imaging ranging from soft and subtle,

to the soundtrack of being on the verge of a nervous breakdown. Processing drums through it was a lot of fun as well.

Lastly, the plate reverb effect sounded nice, and completely usable. There was some nice subtle shifting between the right and left channels when in stereo mode, and unlike the other modes, I actually preferred to cut some of the high end out of the mix with the TONE knob to control it a bit. Cranking the DENSITY knob fully clockwise got a decent amount of feedback. I would say this is more of a handy reverb to have than something that will blow you away with its sound sculpting possibilities, and overall, that's kind of the gist of this module. While it is an effects module, I almost see it as a utility module, and an extremely useful one to have in your kit. A perfect fit for those with smaller systems: easily accessible, excellent sounding, and without the option paralysis causing bells and whistles a lot of effects modules have, Stasis Leak does what it professes to do, does it well, and won't break up your workflow.

- Ian Rapp

6 HP   +12V: 96mA   -12V: 14mA
Price: $15-$183

Odessa
XAOC Devices
xaocdevices.com

As Eurorack continues to explore and embrace forgotten forms of digital synthesis, XAOC's long-awaited Odessa oscillator seems to have come around at just the right time. The Odessa employs an old but underdeveloped form of synthesis known as 'additive', where sine waves are added together to create a series of harmonic overtones. It can be hard to wrap one's head around, but the most primitive version of additive synthesis is the trusty Hammond organ. Not that the Odessa sounds anything like a Hammond, but both use a sim-

ilar trick: by stacking many sine-like tones on top of each other, you end up recreating the harmonics of more complex, unique waveforms.

The first time I ever tried additive synthesis was on a Kawai K5 years ago, and it felt like discovering some ancient, ultra-sophisticated technology. Glassy, FM-like ambiance is the typical additive sound, but so are noisy, atonal screeches and alien gamelan clangs. People generally tend to associate these sounds with artists like Boards of Canada and other lo-fi atmospheric producers, but in the realm of modular, I think there's a whole other world of exploration to be had with the Odessa.

First and foremost, the Odessa is quite large at 24 HP. I wouldn't want it to be any smaller, though, because there are a ton of crucial controls on it that would be horrible if cramped into a smaller space. The main, central knob that's impossible to miss is for "partials", which govern how much harmonic density [aka how many sine waves] you want, from 1 to 512. As you turn this knob up, the glassy, icy sound of additive synthesis swells upwards. This 'partials' value is CVable, like most other controls on the Odessa, so you can easily modulate the swell. I found just playing with this knob by itself was a good way to kill a couple hours.

Forming a half-circle around the partials knob are controls for spread, tension, bank, harmonic factor, and peaking [with two closely-related controls: density and warp]. The Odessa manual does a fantastic job of outlining how each of these controls works and what they do, as they use a very different technique than your typical subtractive or FM style patch. For example, one of the more dramatic controls is 'tension', which moves the components of a harmonic series closer or farther apart. The overall effect creates something akin to noise when the harmonics are close together, and tonal as the components spread apart.

The closest thing to a standard filter on the Odessa are the warp, peaking, and density controls. Together, these create a complex, pitch-relative comb filter that has zero to 256 notches. When used in combination with the 'partials' control among others, you can highlight certain partials, allowing you to create sawtooth and square waves and all sorts of other waveforms in between.

Other critical controls include exponen-

tial and linear FM inputs with attenuators, allowing you to obtain many classic FM sounds when the partials value is set low. There's also a 'voices' button, which allows you to stack one, three, or five voices together. An Odessa expander called 'Hel' exploits these multiple voices, effectively giving you a paraphonic oscillator.

Finally, you have three main outputs: even, odd, and fundamental. You can get some unusual, morphing textures by running each output to a modulated VCA, as the outputs mix in interesting ways. A jumper on the back of the Odessa enables you to set the fundamental output as a square wave [rather than sine], allowing for some interesting self-patching ideas for the adventurous.

I'm not trying to sound hyperbolic, but I haven't heard anything quite like the Odessa before, and that includes the Kawai K5 and software additive synths like NI's Razor. However, I'm 100% sure that any good additive synth can do any of the sounds that the Odessa can do. So what's the feat here? One, the controls are really well laid out and easy to understand. Two, this style of synthesis fits very well into modular, making the outer realms of additive a lot easier to explore. Most additive synths in the past have gotten bogged down by clunky interfaces and difficult-to-use modulation, which is not the case here. The Odessa is surprisingly immediate with a ton of sweet spots, and I suspect we'll be seeing a lot of Eurorack copycats in the future.

- Brandon Ivers

24 HP +12V 110mA -12V 80mA Price: $499

Anima
Ritual Electronics
ritualelectronics.com

There's the old saying, "Never judge a book by its cover", and that's sage advice for the most part, but when applied to synthe-