“FEATHER TIGHTS”, or patching *seances* with eurorack

Contents

FEATHER TIGHTS

The title of this essay, and its accompanying EP, is “FEATHER TIGHTS”. This derives from a medieval tendency to depict angels wearing feathered tights or full body suits in stained glass windows, illustrations and statues. This references costumes worn by contemporary actors of the period, pyjama-like garments covered in cloth rags to evoke a being covered in feathers (1). The clear artifice of an angel depicted as a mortal wearing a mortally-constructed suit of feathers, rather than a supernatural being sprouting their own, humanises the divine and makes heaven attainable, a human interpretation of the supernatural where the fiction is obvious.

Was this stylisation to make heaven easier to comprehend? More familiar? A contemporary caricature to ingratiate the people of the time, to make angels more recognisable for church attending serfs whose only reference point was these theatrical costumes? Or was it the only reference point the artists themselves had in depicting the angelic? Is it a hyperreal interpretation, more correct to the audience than the biblical description (as it is what was expected from plays)? Or were they aware of the stylisation? I’m more interested in these questions as questions, as there’s many layers of interpretation to explore. All can be true simultaneously, the resulting web of overlapping perceptions a rich chaos to explore in eurorack, like the following topic.

Background on John Dee and Edward Kelley's seances

I was introduced to John Dee (2) and Edward Kelley's (3) seances through the use of Enochian scripture in the letters between Count Orlok and Herr Knock in the 1922 German silent horror *Nosferatu: A Symphony of Horror*. A quarrelsome, tense but closely working pair of alchemists, they moved from England to Třeboň, CZ in 1586 to deepen their research in contacting angels. I myself moved from Brighton, UK to Brno, CZ in the summer of 2024.

In their seances, Kelley was conduit for the angels, scrying with a crystal ball and receiving messages in a language the pair termed Angelical, later known as Enochian. Kelley would translate these Angelical messages into English for Dee, acting as divine interpreter. Dee believed that by learning the universal language of heaven, and with the angels as his guide, he could bring about the betterment of humanity.

Kelley's intentions seem less noble, as when he apparently got fed up of the intense fasting and praying in preparation for these seances, and when his other supposed alchemical skill of turning base metals into gold seemed the surer route to wealthy patronage in the courts of Europe, he expressed desire to stop. When this was ignored, he told Dee the angels ordained they should sleep with each other's wives. This bothered Dee, but he obliged, and stopped the seances soon after.

The two parted ways: Kelley plied his alchemy in the court of Holy Roman Emperor Rudolf II, with much stalling, several counts of imprisonment after failing to deliver the goods and death by a broken leg, acquired during a failed escape attempt. Dee returned to England to a life of relative destitution, where 9 months later Dee's wife likely gave birth to Kelley's child.

This dynamic between the two men, and their seances, is ripe for metaphorical exploration through eurorack patching.

Explaining Phase-Locked Loops

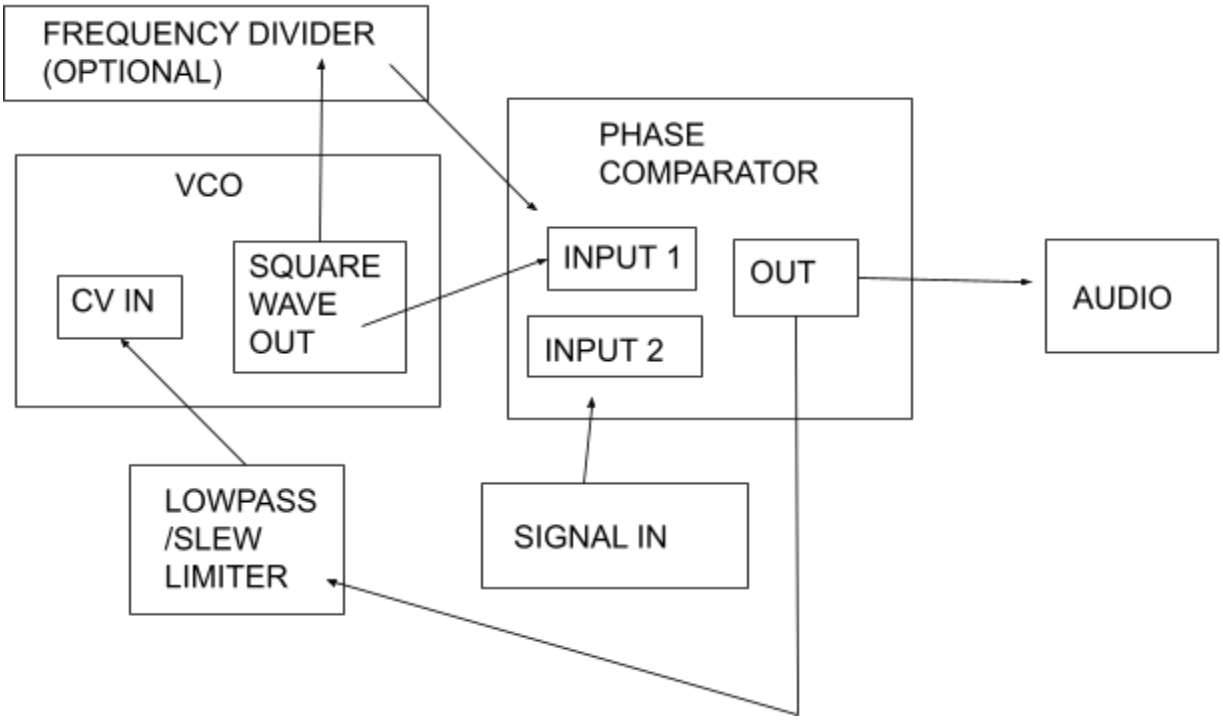
In a phase-locked loop or analogue pitch tracking patch the phase of an audio signal is compared against a square wave oscillator. The compared signal of the two is sent through a slew limiter, then looped back into the pitch CV of the square wave oscillator, creating CV feedback that “locks” the phase of the square wave oscillator onto the phase of the original audio signal.

While this patch has practical uses for stabilising oscillator pitch when appropriately tuned, I favour it for creating wholly inaccurate synthesised interpretations of a complex external signal, such as turning a field recording, acoustic instrument or microphone input into an imprecise and erratic square wave. I use eurorack primarily as a processor of external signals, such as field recordings, phone recordings or microphone inputs, as I find the open architecture and wide range of control in patches such as this both economic in producing a huge textural variety of sounds and invaluable in the sonic extremities it can reach.

The inaccuracy of analogue pitch tracking is the whole point of this patch for me, larger phase mismatches between external signal and square wave introducing the most instability and error, a welcomed organic chaos. The phase of a more complex signal is also harder to lock onto than the constant cycle of an analogue oscillator, resulting in greater pitch aleatory and chaos, though this can always be reigned in via smoothing the feedback CV with the low pass filter or slew limiter.

Error and imperfection is the goal. This is not a realistic rerendering of the external input, this is an analogue square wave caricature, or when mismatching signals and chaos is embraced, a *seance*-like discovery of information.

Phase Locked Loop diagram:



The Phase Locked Loop Patch as a metaphor for Dee and Kelley’s seances

My interest in Phase Locked Loop patches is the intentionally imperfect interpretation of a signal. Dee and Kelley’s seances were also imperfect interpretations. First we must consider the intended outcome of these seances, the angelic messages Dee thought he experienced through Kelley. We can view these as inherently imperfect as translated through a human, the divine tarnished by its attempted interpretation through a mortal conduit. Dee required Kelley to contact the angels, and the messages he received were always going to be influenced by his translator, a mortal caricature of the divine.

Assuming no angels were actually contacted during these seances and Dee’s questions for the angels were merely answered by Kelley under the guise of interpretation and glossolalia, all angelic responses are further made imperfect as being entirely mortal and fabricated. Not only this, but, assuming Dee wasn't also in on the grift, these divine messages are Kelley performing for Dee, messages contrived to convince Dee of their legitimacy and to keep up the farce of these seances. That is until Kelley wanted to stop the seances, after which he used the divine messaging to communicate his own desires - to sleep with Dee’s wife, thus spoiling the work and allowing him to move on to alchemy. So Dee and Kelley’s seances, supposedly channelling the divine, actually end up exposing Kelley’s hidden human intentions. Kelley sullies Dee’s utopian goals of using the angels for guidance by instead furthering his own mortal agendas.

As conduit, the vessel channelling the divine ought to be a passive, but interpretation always reveals something of the interpreter - there is no neutral translation, it is always stylised and caricatured. As Kelley legitimised his flawed human desires through their presentation as angelic

commands to Dee, by obscuring his wants through the supposed act of interpretation, he communicated them more effectively. Dee didn't listen to Kelley's mortal requests to stop the seances, but he listened to these supposedly divine messages and obeyed them, even to his own disgust at the adultery. Obfuscation was the truer/more effective form of communication here, like the hyperrealism of foley, or the potentially frightening biblically accurate angel obfuscated into the friendlier mortal feather tights. The technical imperfection of interpretation communicates better in its tailoring to the audience's expectations.

We can overlay the compellingly imperfect seance dynamic to the PLL circuit in a few different ways:

1. The divine is made imperfect as it is made mortal. This would make the external signal the angelic message and the human interpreter the PLL circuit. The divine message will always be changed by the inherent pitch inaccuracy of a PLL circuit attempting to comprehend it, a synthesised caricature.
2. The divine is interpreted imperfectly as being entirely fabricated by a mortal - angelic messages invented by Kelley to convince Dee, or by Dee and Kelley to convince others. Kelley is the PLL circuit itself, attempting to generate content unknowable to him in a fake interpretation of the divine, resulting in pitch tracking imperfections. Hyperreality, invention for the benefit of an audience.
3. Kelley uses the guise of divine messaging to further his own imperfect mortal ambition and foil Dee's utopian dreams. In a PLL circuit this would be the ability for each function block to overpower the original signal, such as extreme square wave pitches making it harder to compare the original signal against it, even though the original signal (Dee's search of angelic messages) is inherently impossible to interpret accurately, as it is so much more complex than the squares (Kelley's base mortal desires) it is compared against. But there are no angels to contact, it was always all a farce, there is no accurate interpretation, this mix of contradictions is a *seance* patch.

The metaphor I favour is this: if we look at the entire seance dynamic as our PLL, Dee is our external signal, asking questions of the angels. Kelley is the square wave, interpreting Dee's questions. The comparison of the two signals via XOR gate is the seance itself, the two men's motives mixed in ritual and producing content influenced by both. The two men's mismatch in intentions and quarrelsome relationship is the phase mismatch between our two signals as they are compared, which accounts for much of the instability and chaos within the patch, their relationship. The feedback loop makes the entire patch function, so it is therefore the supposed divine messages - this is what makes it more than just a faux Arp 2600 ring mod, of two inputs run through an XOR gate to produce a comparison of the two. Kelley's fabricated divine was encouragement for Dee to keep the seances going, the affirmation of actual contact with angels created the feedback loop of more sessions, new questions for Kelley to invent divine responses to, the answers convincing Dee more, his resolve in their work deepening, utopian aspirations and the pretence for the whole experiment validated.

If one's expectation of an angel is an actor in feather tights, of snow crunching as the hyperbolic cinematic rendering, of a chase between orcas and seals caricatured into a showdown between Luke Skywalker and Darth Vader, comparing this unrealistic expectation with the uninterpreted reality is the PLL - finding the difference between two signals and using that as a control voltage for your thoughts through the feedback loop of analysis. Dee and Kelley's seances were this feedback loop of expectation and result. Did Dee expect his angels to be in feather tights? Did he expect that because it is what Kelley delivered him, or was Kelley presenting Dee with exactly what he expected - the stained glass caricature of an angel in pyjamas? What is the true form of an angel, other than this contemporary human interpretation of the mythical? And in a feedback loop of expectation and reality, what new ideas can be generated, the caricature torn apart into a *scrying*, heavenly information gleaned entirely through a process of deception and misunderstanding? Exploring the myriad interpretations of the PLL circuit overlaid over Dee and Kelley's relationship is a scrying practice in itself, a confusion that spawns inspiration.

Breakdown of my specific PLL patch

This patch first requires patch programming Maths into an XOR gate (4). Inspiration for this patch otherwise came from this modwiggler thread: (5). A mono channel of cicada audio goes out the preamp into the input of Maths Channel 1, with Rise and Fall down and a normal response (not Logarithmic or Exponential). Patch a square wave VCO into Maths Channel 3. Attenuverters for Channel 1 and Channel 3 should be fully clockwise. Patch the Maths OR output into Maths Channel 2, and set the attenuverter fully counter clockwise. Patch the INV mixer output into the Channel 4 input for slewing, Rise and Fall down to start with (adjust once the patch is set up). Take Channel 4 unity or Channel 4 mixer output (though it's a good idea to put a dummy cable into the Channel 4 mixer output to remove any potential signal there if not using this output) and patch into the V/oct or pitch CV input of the square wave VCO used before. Take the audio output from this VCO.

Note: usually I use a Sport Mod channel for slewing, as slewing is done on one knob and I like the sound of it, but for this patch I wanted to do as much with Maths as possible, since many more eurorack users will have a Maths and a square VCO than a Sport Mod.

A note on cicadas

In The Lily Voice of the Cicadas by W.B. Stanford (6) explains why Homer compared the constant rasp of a cicada to the beauty of a lily in The Iliad. The negative connotations of incessant machinery, mechanical clamour and obtrusive power tools that modern listeners may associate with the loud and insistent chirp of a cicada obviously didn't exist for the Ancient Greeks. They may have admired the consistency and clarity of sound a cicada produces, as it would have fit many of their ideals of beauty, comparable to the white purity of a lily in their shared cleanliness and uniformity, the lily visually and the cicada sonically.

My personal interpretation of the divine is the incomprehensible power of the sublime, raw natural processes to be revered, revelled in and feared, especially as they become more wrathful due to our changing climate. Cicadas are one of the many messengers of this primal power and are thus the divine external signal of my PLL patches, representing the voice of an angel.

Notes on the EP “FEATHER TIGHTS”

When my research began and the ideas were first forming, I was experimenting with my eurorack system, as always. The first expression of the ideas explained in this essay is therefore the EP “FEATHER TIGHTS”, constructed out of patches from this time period of early thought. This essay started life as liner notes for this EP, quickly growing into a deeper exploration and later requiring a video project to explore PLLs further. Here is an explanation of the 4 tracks of the “FEATHER TIGHTS” EP, and their connection to the ideas in this essay:

Track 1 - DIVINE GUIDANCE from the mouth of a JUMPING SNAKE

This track was made when the ideas were in their absolute infancy, my primary goal was to make a cacophonous industrial noise piece. This track is distinct from the others in that it is largely composed of hyperreal eurorack-processed field recordings from a summer holiday to Croatia and Kromeriz (the other 3 are near entirely synthesis). Field recordings used include a fortnightly Czech siren test, hard rain against a window, buzzing generators and pitch shifted electrical whine in Baska Voda, fierce winds in a harbour, drips from the overhanging tree roots of a hidden cove and lots of cicadas.

Cicada parts were run through modular, in hyperreal patches thought up whilst baking on the beach after expeditions searching along tree lined beach paths for critters. The main eurorack processing was tonal shaping from the Res EQ and a massive gain boost from the Jolin Labs Ascolta to clip a self-gating/ducking Sport Mod patch, a hard squared, low dynamics noise wall interpretation of the stridulations. I find EQ-ing field recordings to be one of the single most enjoyable activities in music, redistributing the frequencies of a complex natural recording is pure audio magic to me.

The industrial pulse throughout the track is mostly Res EQ self oscillating feedback, with a separate feedback loop sent through a VCA modulated by a Maths patch, which was patch programmed as a looping EMS Synthi-style trapezoid generator (7). This VCA is also sent through a DIY built Herzlich Labs Gabor octave bandpass filter (thanks Thom Isaacs for the build), which has a large stepped knob that allows for distinct octave jumps in the pitch of the enveloped feedback.

A lot of the character of the track is an intense Logic master bus of compression, saturation and high frequency sizzle via drastic automated eq boosts. There's also a ring modulator fx send, which all channels are routed to in various groups and buses. This creates a subsonic beating, modulated by an envelope follower for subtle shifts of pulse rate, which, also jammed through the compression/saturation bus, sidechains the whole mix and imposes a rhythmic feel on the otherwise chaotic naturalistic soundscape. I consider this track hyperreality, as though the extremities of its audio processing bring it to the cusp of caricature, each field recording is still recognisable.

The title comes from the venomous jumping snakes our hotel in Baska Voda warned us about to keep us off the mountain. A "JUMPING SNAKE" delivering "DIVINE GUIDANCE" references the Garden of Eden or the snakes on Hermes' caduceus - divine messengers, like the lily-voiced cicadas.

Track 2 - GLOSSOLALIA

“GLOSSOLALIA” means speaking in tongues, which Dee believed Kelley’s Enochian writings and angelic interpretations were a true form of, so the formant feedback sounds of this track were an attempt at both capturing the frightening otherworldliness of a human conduit overtaken by the divine and the terrifying unknowable inhuman voice of the heavens.

The patches of this track were made soon after seeing Pharmakon live at Kabinet Múz in Brno. The hammering dirges of her 2024 record Maggot Mass (8) ragefully lament humanity’s separation from nature and pines for a reabsorption into the naturalistic through death and decay - eschewing wooden boxes to rejoin the ancient cycles of renewal by being devoured by critters. This is a true voice of the divine under my definition - not the expected reverberant assonance of a church choir in a cathedral, no better than feather tights, but the raw primal power of the existentially incomprehensible sublime, evoked by Maragret Chardiet’s singular intensity.

I also took inspiration from the rare and revered ERD/WORM eurorack module (9), which contains software to emulate vintage speech synthesis. The effects are uncanny and quaint, a lo-fidelity interpretation of the human, a mimic with an obvious aspect of artifice. A caricature, closer to the divine in its inhumanity and exemplified techniques of sound generation. To recreate some of the charm of this module with my own system, I ran narrow Sport Mod pulse waves in a feedback loop with the Res EQ for primitive formant synthesis akin to 70s vocoders - I discovered and cleaned a DIY Powertran vocoder at my old job as technician for the Electronic Music and Sound course (formerly Digital Music and Sound Art) at the University of Brighton. The EQ then goes through a Make Noise Moddemix, exploiting the unique distortion of panel controls near 0 to square off the distorted sine wave resonances.

This patch is very far from human-sounding, proudly dry and synthetic. It is closer to cicadas and crickets - my heralds of the sublime, caricatured here as entirely generated through synthesis.

The harsh noise patch that fades in towards the end was also inspired by ERD eurorack modules, specifically the shift register feedback and modulated noise of All the Colours of the Noise (10) and caput draconis (11). My interpretation used white noise sampled to the Phonogene (my only digital module), modulated through a CV feedback loop of its audio and gate outs patched through Sport Mod back into its own CV inputs. The resulting audio was run through a Maths patch programmed as a (very linear and strange) bandpass filter - Channel 1 as a lowpass filter, with the input signal multed into Channel 2 and inverted for a highpass filter. The mixer Sum out goes into Channel 4 to lowpass filter the signal again for a bandpass filter. I then used Channel 3 as an offset, multed to the Both inputs of Channels 1 and 4 for a single cutoff control. I also modulated the Rise/Fall for more filter movement.

This noise patch is not hyperreality or caricature, this is a *seance* - pure electronic otherworldliness, multiple feedback loops producing information through a complex ritual.

After all the mushy organic chaos of the processed field recordings of Track 1, I'm a big fan of the immediate contrast the clean and direct synthesis of this track provides. For a long time I had Track 4, "ANGELICAL ACID" in 2nd, thinking it'd carry the momentum over, but seeing as the structure of "JUMPING SNAKE" is all build up (and that it's actually chopped in half - the industrial pulse overstays its welcome in the full version), switching to something equally manic and rhythmic spoiled this ramped up tension in a failed attempt to sustain it. Immediately cutting to something completely different suspends the drama.

Track 3 - BICKERING RACKETTS, conducting a SEANCE

The main component of this track is a choppy cross modulated Maths and Sport Mod bass patch. I had a brief fixation on attempting to synthesise a Renaissance Rackett (12), a mini proto-bassoon with a very low pitch and fantastic nasal, buzzy tone, which included a lot of square and pulse wave bass patches. I'd like a Renaissance style Rackett one day.

I can't remember the specific routing, but the CV pitch staircases of the Sport Mod are very recognisable, and gates are being traded between the two modules to both gate Sport Mod channels and switch Maths cycling on and off. One of the two stereo outputs was taken from the CUPL out, the other from an individual Sport Mod channel's END output. The two signals are hard panned left and right for a pair of bickering square waves vying for attention, hence the title.

While these basses are caricatures of the Rackett as simplified synthetic reinterpretations, the cross-patching and interrelationship of these two signals makes these basses a *seance* patch, more than the sum of their parts.

The "SEANCE" that this quarrel generates is my second attempt at a PLL patch, fed by cicadas and slipping into much noisy chaos throughout as I manipulate it. I'm a big fan of its drifting mosquito movement, enhanced by some automated panning and perhaps inspired by summer 2024's mosquito plague in Czechia. This PLL patch was the inspiration for the whole essay, this entire track a metaphor for Dee and Kelley's seances - two closely related parts (the basses) locked in dispute, their fraught relationship fuel for a complex ritual to contact the divine, the results (the PLL squall) not truly from the beyond but a feedback transmutation of their differing agendas and manipulations.

My first version of this track had much more distortion and compression, as is my usual approach on Mummer tracks, but I stripped it back, as I felt the

original patches had all the bite and texture they needed as relatively pure squares, with only EQ and saturation to compact the frequencies a bit. The main processing was a saturated mono bus fed by both bass signals, to ensure centred and consistent bass frequencies anchoring the track across different speakers or headphones, plus to remove some of the edge of an otherwise uncomfortably stark stereo image.

Track 4 - ANGELICAL ACID

Enjoying Track 3's bass too much for one patch, I wanted to use the left and right channels separately to trigger and modulate two distinct percussion signals sampled by the Phonogene, which I had plans to also hard pan, imitating the choppy stereo image of the bass in a more rhythmic reprise of Track 3.

Each bass was routed through the Sport Mod to generate CV and gates for Phonogene. The left bass triggers and modulates a sampled loop of Res EQ pings, the right bass triggers a sampled loop of an acoustic drum break, which I recorded myself in summer 2023 in my parent's loft. The relationship between each bass and the percussion it triggers/modulates is more like a flat out argument than the ritualistic seance of the PLL, though I still classify it as a *seance* patch. There is no even comparison between the two audio sources like in a PLL, there is a clear dominant/submissive relationship between the bass-derived CV and the Phonogene-sample percussion it triggers and modulates. The bass disrupts the percussion, both audio signals saturate one another as routed through the Res EQ. Any CV feedback that does occur is entirely in CV that manipulates the Phonogene. I often like to create relationships between audio channels akin to bickering or jostling for attention when mixing, making use of noise gates and extensive automation to create the bustling feeling of a lively ecosystem of interconnected sound.

I wanted low-fidelity artefacts from Phonogene, so I recorded samples in at a low sample rate. After Phonogene, both percussions and basses (recorded one at a time as I only have one Phonogene) were sent through the Res EQ. I'm a big fan of acoustic drum kit through the Res EQ, often with a stereo image set up via the Comb Outs (alternating bands of 5 grouped together) as it pans individual drums and boosts certain room resonances in a great spatialising/faux reverb effect.

Granularisation and CV modulation of parameters is one way of transforming and reinterpreting material sampled into Phonogene. Modulating samples with CV derived from another part of the track is a further reinterpretation, of both the bass, the part of the track reinterpreted as CV, and the samples themselves as they are affected by that CV. This track is therefore a whole conversation about reinterpreting sonic material and *seance* patch interrelationships.

This overall talkative feel to the track, of each of the parts conversing with one another, both in their CV relationships and in the ducking and gating of the master bus processing, led to the title "ANGELICAL ACID". The gurgly Phonogene modulated Res EQ pings and voicelike resonances of the Res EQ processed acoustic drums also suit a naming after Dee and Kelley's invented language. The "ACID" part relates to the overall percussive and resonant qualities of the track bearing a passing resemblance to acid house, which I emphasised in the extra layers of crunchy subs and liquidus delays in the first section. These FX buses also serve to heighten the manic clatter of jostling parts and give another moment on the EP as full as Track 1, balancing out the more metaphorical Tracks 2 and 3.

PLL YouTube video

This PLL YouTube video project started life as a straightforward patch tutorial, sharing the knowledge of how to use the Make Noise Maths and a VCO as a PLL. I thought this was important information to share as many eurorack owners have a Maths and VCO, so this patch could be of great use to many. I recorded voiceover and video footage demonstrating the patch on my phone and simultaneously recorded direct demo audio with my Zoom F8n. I edited the audio in Logic before editing the video, as I knew I wanted some musical backing tracks and to make it sound somewhat more polished and decent than a dry demo.

I had too much fun processing the audio and the idea for the video became more and more obfuscated. I had the idea to run my talk track back through a PLL patch, blending this with the dry speech to spice up explanation portions of the video and demonstrate more sound capabilities of the PLL circuit. This would turn the video itself into a meta-PLL patch, with the viewer in a feedback loop of understanding with the video, forced to compare the obfuscated PLL-ed talk track and subtitles to fully understand the demonstration, rather than just have a clear talk track that's easy to follow.

At first I transcribed my entire talk track, planning to add this as hyper-accurate subtitles to the video. My patience for video editing is minimal however, and the quality of the footage leaves a lot to be desired, so I decided to generally go down a more experimental route, inspired by Dr Weiner's Serge videos (13) or the vintage YouTube aesthetics Peter Blasser embraces on his channel - lo-fidelity, odd video diaries, fishing trips, hanging out and making cool videos for cool videos' sake (14). My ethos is often "if you can't do it polished, do it unique", or "as long as it's an honest oddity, it's worth sharing".

So I processed the "dry" layer of talk track further, obfuscating it with pitch shifting and EQ, turning it into a more textural element than an informative

one, embracing the project as an art film rather than a tutorial. I also gave the PLL speech more precedence in the mix and decided to make the whole video audio more musically focused, as it was all sounding pretty wicked already.

To obfuscate the poor quality phone footage to the same extent as the audio I first attempted an object tracking effect on Adobe After Effects, which produced a great glitchy jerking inertia on my music video for “~ swim in my bin ~ {gurgle punk epic}” (15) off the album “bear cult booze up” (2024) (16). The plan was to keep the centre of frame locked on Maths and Sport Mod, counteracting the wandering camera and introducing erratic stuttering movements for visual interest and abstraction. After the first 15 seconds of object tracking took After Effects 5 minutes to trundle through the program crashed, and I decided to relieve my ageing laptop of the burden.

5/10 years ago I had a battered Samsung smartphone I’d take photos and videos on. For stubborn luddite reasons I refused to access the internet on this device, so to transfer photos I’d simply photograph the scuffed and cracked screen with my ipad. This created a wonderfully pixelated, purple/green flared look I really enjoyed. Remembering this, I had the idea to replace After Effects object tracking by simply filming the laptop screen with my phone, keeping the camera trained on the eurorack by moving it manually.

This screen filming did steady the footage somewhat, but added its own instability of handheld shakiness and slow human reaction times. It also gave me more desired low fidelity, the already low resolution and unstable phone footage obfuscated as displayed on a 10 year old laptop screen, then imperfectly captured once again in that same poor phone quality, adding new layers of digital degradation - screen pixels, low resolution squares of low resolution squares, screen reflections of myself, sunlight and trees through the window behind me, the occasional glimpse of laptop screen edge or room. The low fidelity is now a consciously wielded aspect

of the piece, rather than a byproduct of the poor means of recording at my disposal, a full, intentional choice.

The regular patch tutorial, hyperrealistic through various states of quality (either a quick amateur shaky cam clip or a multi-camera professional YouTuber production present a recognisable and realistic depiction of the eurorack user's experience, despite their varying amounts of equipment, editing and processing), is surpassed into a surreal caricature of the YouTube patch tutorial, a piece that embraces its imperfect communication as a feature.

This pushed further: like a PLL, the imperfect tracking (object tracking effects or screen filming) of a complex source (the initial footage, itself a digital interpretation of a lived reality) is a ritual engaged entirely to produce a degradation of an initial material. A viewer deciphering the digital murk simulates scrying with a crystal ball, glimpses of the real through obfuscations of pixelation and reflection, the cut to black and reveal of my silhouette at the end conclusively betraying the logic of the filmed screen: Kelley invented the divine messages, they are not broadcasts from the beyond, all is mortal invention and interpretation.

As well as a combination of primal distrust and piqued curiosity the obscured and unknown thrive on in the horror genre, visually distorted glimpses of an object or figure warped in a scrying mirror or crystal ball enforce a conceptual/aesthetic connection between the intellectual mystery of the beyond and the visual mystery of a murky image. Reducing visual clarity can suggest something that exists beyond the perception of human eyes, of glances that "pierce the veil", allowing us to peer into places not usually perceivable to us. But this association is entirely in the presentation; a clear long look often reveals the less tantalising reality - something familiar, or something we can make sense of.

The less we see of it, the truer the angel then? In ramping up intrigue or otherworldliness, visual obfuscation is a form of hyperreality, an exaggerated emotional truth. Analogue horror uses dead media, such as

VHS, as a scrying mirror, here my phone is the scrying mirror for the information on the laptop screen, to obscure it into the heavens.

A viewer can still tell it's a patch demonstration under all this abstraction, but surely a demonstration less concerned in explaining what cable goes where, as a hyperreal video would, and more so the audio potential of the patch. Even though I abandoned adding my own subtitles, I still included patch guides in the video description. My personal preference for recreating someone else's patch is a written out step by step guide, as I feel the video should be more about sonic potential.

I want my viewers to become PLL circuits themselves, deriving meaning by comparing each of the sources I provide them with:

1. PLL obfuscated talk track and abstracted video
2. Audio capability of the patches showcased in the video
3. Patch guides in the description

This entire video has many layers of material being interpreted and reinterpreted:

1. The Phase Locked Loop interprets the material fed into it, in the PLL patches demonstrated in the video I use field recordings of cicadas
2. In the tutorial I include a dry channel of the cicadas fed into the PLL so that the viewer can compare the dry and affected signals, perceiving how the eurorack interprets it
3. My specific PLL patch interprets the circuit with the modules I have, Maths and Sport Mod
4. I reinterpret my talk track through a PLL patch, also pitch shifting it in Logic, drastically condensing it into patch guides in the video description
5. The viewer is a PLL - they derive meaning through comparing the seemingly abstract square waves, low fidelity video and the video description

The video all in all is more focused on seance than explanation, generating sublime *scrying* chaos rather than demonstrative meaning.

I modified my PLL patch described earlier in this essay when running the talk track through, both to demonstrate a patch variation and because I wanted a grittier texture.

Sport modulator Channel 2 is the square VCO, Maths Channels 1, 2 and 3 are patch programmed as the XOR gate and Sport Mod Channel 1 is the slew limiter, forming my PLL circuit with a mult for the feedback. After the PLL VCO output is first processed by Maths Channel 4 to gate it and narrow the pulsewidth, the signal is then sent through Res EQ for distortion, resonant squeal and signal splitting via the Comb outs. These outs then go into the two channels of Dynamix, which low pass gates the audio via CV from Maths Channel 4. The output is a mono signal taken from the Dynamix sum out.

I chose two Res EQ percussion experiments for backing tracks. The first patch is a self oscillating Res EQ with feedback both from its own panel control and with the Comb Outs looped back into the inputs. At one point a riff of three distinct pitches occurs, which was made by manually switching the feedback on, off and inverted. The main outs are processed in stereo with the two channels of Dynamix, each enveloped by an exponential Maths pluck triggered by a different channel of Sport Mod, for a different type of decay than just pinging with resonance. This track has a plucky, upbeat character to introduce PLLs.

When I get into demonstrating my specific PLL patch the second drum track comes in, a more sinister stereo subsonic thud. This patch used rhythms from a cross patched Sport Mod to ping the Res EQ, with some soft compression and low pass filtering from Dynamix on the Comb Outs.

I mixed the audio in Logic before editing the video, employing some of my usual production techniques for the talkier parts of the video, such as saturation buses, clipping compressors and intricate networks of noise gates, for instance slightly ducking demo audio for explanation, which in this case appears in its obfuscated PLL form. This is all generally to give

the video musical merit, so that it can be enjoyed sonically independent of its demonstrated content.

Bibliography:

1. Examples of feather tights https://colonelunthanksnorwich.com/2016/08/18/angels-in-tights/
2. John Dee https://en.wikipedia.org/wiki/John_Dee
3. Edward Kelley https://en.wikipedia.org/wiki/Edward_Kelley
4. Make Noise Maths Logic Patches video https://www.youtube.com/watch?v=n_1bBTPBpxg
5. Modwiggler Phase Lock Loops thread https://modwiggler.com/forum/viewtopic.php?t=255107
6. The Lily Voice of the Cicadas ("Iliad" 3.152), W. B. Stanford https://www.jstor.org/stable/1086564
7. Modwiggler Make Noise Maths Trapezoid Generator thread https://modwiggler.com/forum/viewtopic.php?t=77350
8. Maggot Mass by Pharmakon https://pharmakon.bandcamp.com/album/maggot-mass
9. ERD/WORM eurorack module https://modulargrid.net/e/erd-worm
10. ERD All the Colours of the Noise eurorack module https://modulargrid.net/e/erd-all-the-colours-of-the-noise
11. ERD caput draconis eurorack module https://modulargrid.net/e/erd-caput-draconis
12. Example of the Renaissance Rackett https://www.youtube.com/watch?v=S20gR0kI3H4&list=PL5752BCF4569DBDD6

13. Dr Weiner RES EQ video
    https://www.youtube.com/watch?v=DpAQvUff8nI
14. Peter Blasser's YouTube channel
    https://www.youtube.com/@petermopar
15. Music video for "~ swim in my bin ~ {gurgle punk epic}"
    https://www.youtube.com/watch?v=vSDArkjqOjQ
16. Bear cult booze up
    https://mummer.bandcamp.com/album/bear-cult-booze-up

My eurorack and equipment at the time of writing:

1. Serge Resonant Equaliser (a DIY build with styrofoam capacitors, bought second hand)
   https://modulargrid.net/e/random-source-serge-resonant-equalizer-eq
2. Toppobrillo Sport Modulator 2
   https://modulargrid.net/e/toppobrillo-sport-modulator-2-both-panels
3. Make Noise Dynamix https://modulargrid.net/e/make-noise-dynamix
4. Make Noise Maths
   https://modulargrid.net/e/make-noise-maths-white-knobs
5. Make Noise Moddemix
   https://modulargrid.net/e/make-noise-moddemix-2014
6. Make Noise Phonogene
   https://modulargrid.net/e/make-noise-phonogene
7. Herzlich Labs Gabo Passive Octave Bandpass Filter
   https://modulargrid.net/e/herzlich-labs-gabor
8. Jolin ASCOLTA https://modulargrid.net/e/jolin-ascolta
9. ADDAC605 VC Spectral Tilt
   https://modulargrid.net/e/addac-system-addac605-vc-spectral-tilt
10. Intellijel Line-in 1u (x2) https://modulargrid.net/e/intellijel-line-in-1u
11. Intellijel Line-out 1u (x2)
    https://modulargrid.net/e/intellijel-line-out-1u

Field recordings were recorded with a Zoom H1n
Studio recordings were recorded with a Zoom F8n
All recordings arranged and processed with Logic Pro X
Video edited with Adobe Premiere Pro 2025