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Non-Standard-Sequencing

Written explanation of the bachelor thesis

Illustration 1: Graffiti that appeared in summer during the uprisings after the death of George Floyd and was redistributed later as meme online.

(photo by Esmat Elhalaby (@thaqafatalhind)
https://twitter.com/thaqafatalhind/status/1299035542760206336)

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Graz, den 18.1.2021

Lain Iwakura

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When I asked Schoenberg to teach me, he said, "You probably can't afford my price." I said, "Don't mention it; I don't have any money." He said, "Will you devote your life to music?" This time I said "Yes." He said he would teach me free of charge. I gave up painting and concentrated on music. After two years it became clear to both of us that I had no feeling for harmony. For Schoenberg, harmony was not just coloristic: it was structural. It was the means one used to distinguish one part of a composition from another. Therefore he said I'd never be able to write music. "Why not?" "You'll come to a wall and won't be able to get through." "Then I'll spend my life knocking my head against that wall."

I found dancers, modern dancers, however, who were interested in my music and could put it to use. I was given a job at the Cornish School in Seattle. It was there that I discovered what I called micro-macrocosmic rhythmic structure. The large parts of a composition had the same proportion as the phrases of a single unit. Thus an entire piece had that number of measures that had a square root. This rhythmic structure could be expressed with any sounds, including noises, or it could be expressed not as sound and silence but as stillness and movement in dance. It was my response to Schoenberg's structural harmony.

(in: https://johncage.org/autobiographical_statement.html)

‚Qui le croirait! On dit qu‘irrités contre l‘heure,
De nouveaux Josués, au pied de chaque tour,
Tiraient sur les cadrans pour arrêter le jour.‘
Hierzu die Anmerkung: ‚C‘est un trait unique dans l‘histoire d‘une insurection; c‘est le seul acte de vandalisme exercé par le peuple contre les monumens publics, et quel vandalisme! qu‘il exprime bien la situation des esprits au 28 au soir! Avec quelle rage on regardait tomber l‘ombre, et l‘impassible aiguille marcher vers la nuit comme dans les jours ordinaires! Ce qu‘il y a de plus singulier dan cet épisode, c‘est quon a pu le remarquer à la même heure, dans différens quartiers; ce ne fut pas une idée isolée, un caprice d‘exception, mais un sentiment à peu près général.‘ (Barthélemy et Méry: L‘insurrection Poème dédié aux Parisiens Paris 1830 p 22 u 52)

(in: Walter Benjamin „Das Passagen Werk II“, p. 895, Detlef Holz Verlag Muri, Februar 1982, Frankfurt am Main)

Diese Art Klang ist in unseren Ohren zweifellos rhythmisch, wir empfinden ihn als rhythmisch, er geht uns als Rhythmus ein, so unwillkürlich, wie uns eben das ***tok tok*** *gehender Füße mit einem leichten Abwechseln nach* ***tik*** *und* ***tak*** *ins Ohr geht. Aber: Was wir auf diese Weise als rhythmisch empfinden und was Canetti auf diese Weise beschreibt, das – der Leser mag es mir zunächst einfach glauben – ist nicht etwa ein für allemal Rhythmus, ist nicht Rhythmus im allgemeinen, nicht an und für sich Rhythmus, sondern es ist die einfachste Spielart nur einer* ***ganz bestimmten Art*** *von Rhythmus: des* ***Taktrhythmus****.*

Und diesen gibt es nicht seit Menschen- oder Tieresgedenken, sondern erst seit Beginn der Neuzeit. So spät erst, und zunächst nur in den Gesellschaften Mittel- und Westeuropas, beginnt man ***dies*** *als Rhythmus zu empfinden, beginnt Taktrhythmus >>der<< Rhythmus zu werden, setzt es ein, dass Menschen Rhythmus unwillkürlich nach dem* ***tik-tak*** *von betont und unbetont, nach gleichen Zeiteinheiten und das eben heißt: nach* ***Takten*** *hören – so wie Canetti und so wie wir heute recht ausnahmslos alle.*[1]

(in: Eske Bockelmann „Im Takt des Geldes – Zur Genese modernen Denkens“, p. 20/21, zu Klampen Verlag, 2004, Hannover)

Non-frequency-politics opposes the inscriptions of the value, which, as differentiator of capital, is the condition for money in all its registers; it opposes the semiotic value or the blows and beats of the signifiers which count the tic, tic, tic of the striking difference as price. In standard music, the dotted production time of the Codes is implanted in the Body-of-the-Music, which the non-frequency-politics in turn knows and therefore allies itself with the pulsating Rhythmic force, making use of an anti-causal method of percussive concatenation that is supposed to lead out of the spell of time (and-when-you-hear-in-Rhythm-you-are-the-co(s)mic-warrior-with-the-golden-imperative-in-the-last-instance: tic-toc – fuck the clock). You now hear tic-toc instead of tic-tic. The Rhythm in this context can be described as stress that arises in the confrontation, shifting and superposition of various Clicks, Pulses and Beats, whereby each coming pattern is even more stressed than the previous one already was. But the pattern as a singular temporal event can also swim, even blur, when it becomes this series of retreating echoes… the Rhythm becomes a tail of sound (Eshun 1999: 064): stretches of the Rhythm and rhythmic debris which themselves become rhythmic again and lead to sound textures.

[...]

The power of Rhythm generates tension and solidification at the same time; the non-frequency-politics now becomes aware that this power is withdrawn from measure or simply bulldozes it: tic-toc -fuck the clock! is the principle.

(in: Achim Szepanski „Ultrablack of Music“[2], p. 26, Mille Plateaux / Non, Frankfurt 2020)

1 English translation:
„This kind of sound is undoubtedly rhythmic to our ears, we perceive it as rhythmic, it enters our ears as rhythm, as involuntarily as the toc toc of walking feet with a slight alternation of tic and tac enters our ears. But what we perceive as rhythmic in this way and what Canetti describes in this way - the reader may simply believe me at first - is not rhythm once and for all, is not rhythm in general, not rhythm in and of itself, but it is the simplest form of a very specific kind of rhythm: the beat rhythm. And this has not existed since the dawn of man or beast, but only since the beginning of modern times. It was only at a late stage, and initially only in the societies of Central and Western Europe, that this began to be perceived as rhythm, that tact rhythm began to become >>the<< rhythm, that people began to hear rhythm involuntarily according to the tic-tac of accentuated and unaccentuated, according to equal units of time, and that means according to beats - just like Canetti and just like all of us today without exception.“ [translated by the author, using DeepL]

2 See also: https://non.copyriot.com/mille-plateaux-the-ultrablackness-of-clicks-cuts/

‘Time is that which ends. Time is limited time experienced by a sentient creature. Sentient of time, that is - making adjustments to time in terms of what Korzybski calls neuro-muscular intention behaviour with respect to the environment as a whole [...] A plant turns towards the sun, nocturnal animal stirs at sun set [...] shit, piss, move, eat, fuck, die. Why does Control need humans? Control needs time. Control needs human time. Control needs your shit piss pain orgasm death.‘

(William Burroughs as cited in: CCRU „Writings 1997-2003“)

Time is everything, man is nothing; he is at most the empty carcass of time.

(Karl Marx)

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1. Introduction

„The future is dark,
which is best thing the future can be, I think.“
Virginia Woolf[3]

„A call to arm

Ain't gonna fight no more
Done fought the kitchen clock
And the master's clock
And the work clock
And the god clock
And the tax clock
And the witch clock
And I ain't gonna fight no more
Already fought for the rich clock
The poor clock
The city clock
The country clock
And I ain't gonna fight no more
Ain't gonna fight no more
Already fought the doomsday clock
The clock of hell
The clock of democracy
And I ain't gonna fight no more
Me after me
Ticking right after me
In the swoop over me before
And the world will be one with God
Before anybody else
Me
Ain't gonna fight no more
Ain't gonna fight no more“[4]

3 Virginia Woolf as cited in: Black Quantum Futurism, *Theory & Practice*, 75.
4 Lyrics of *Clock Fight* by Moor Mother, https://genius.com/Moor-mother-clock-fight-lyrics . All following lyrics will be aligned right.

The title „non-standard-sequencing“ is a reference to french philosopher Francois Laruelle‘s work around the concept of so called non-standard-philosophy.

> „Ultimately, I see non-philosophers in several different ways. I see them, inevitably, as subjects of the university, as is required by worldly life, but above all as related to three fundamental human types. They are related to the analyst and the political militant, obviously, since non-philosophy is close to psychoanalysis and Marxism – it transforms the subject by transforming instances of philosophy. But they are also related to what I would call the ‘spiritual type – which it is imperative not to confuse with ‘spiritualist. The spiritual are not spiritualists. They are the great destroyers of the forces of philosophy and the state, which band together in the name of order and conformity. The spiritual haunt the margins of philosophy, gnosticism, mysticism, and even of institutional religion and politics. The spiritual are not just abstract, quietist mystics; they are *for* the world. This is why a quiet discipline is not sufficient, because man is implicated in the world as the presupposed that determines it. Thus, non-philosophy is also related to gnosticism and science-fiction; it answers their fundamental question – which is not at all philosophys primary concern –: “*Should humanity be saved? And how?*” […] When all is said and done, is non-philosophy anything other than the chance for an effective utopia?“[5]

Non-standard-philsophy or non-philosophy is not so much a new or different philosophy, but rather a shift in approach to philosophy. It tackles a wide range of different fields & topics, as the prefix ‚non-‘ again invites us to reexamine things anew[6]. With „non-standard-sequencing“ I hope to inspire to rethink concepts of (space-)time, timing, temporality, history (or rather histories), rhythm & sequencing. Rather than proposing another superior new theory – ‚the next big thing‘ –, the following is intended to give voice to a variety of influences and positions, remixed and cut-up with each other, in polyphony.

Therefor in this thesis I‘ll draw from a wide range of different material between so called fictional or non-fictional material, as well as different fields of sciences, as well as found material from the depths of the world wide web, and try to put them on the same level in terms of their importance and weighting. Quotes which are completely in italics are usually from fictional material; books, mangas, lyrics of songs, or the like. Lyrics on top are right aligned.

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5 Francois Laruelle, *A New Presentation of Non-Philosophy* ; italics in the original text, https://web.archive.org/web/20090716225745/http://www.onphi.net/texte-a-new-presentation-of-non-philosophy-32.html .

6 i.e.: Francois Laruelle, *Photo-Fiction, a Non-Standard Aesthetics*, Jarrod Fowler, *non-musicology,* https://jarrodfowler.com/JMF075.html , Achim Szepanski, *Der Non-Marxismus*, Inigo Wilkins *Irreversible Noise – Non-Standard Aesthetics and Irreversible Noise*, Katerina Kolozowa, Tero Nauha From Schizoproduction to Non-standard Artistic Research, and many more

The first part „2. [Exposition] About Time“ is a basic theoretical introduction into a philosophical framework. It is at once providing insight into socio-philosophical conceptions of time and the claim that it‘s finally time to readdress rhythm & tempo in musical composition practice. Following and developing the postmodern critique of the metanarrative, the conception of history as polychronic is applied to the individual voices in compositional practice in order to do justice to the multiplicity and autonomy of voices. While Western/European music history can be characterized by the development from monophonic to polyphonic to harmonic conception of tonality to conceptual composition, i.e. a turn towards centralization, I am concerned with the development of a new polyphonic music in which the interaction, or rather entangled intra-action, of individual voices and overall composition is taken into account. At the same time, the frequencentric, i.e. tonal, harmonic, frequency-dependent, view of music is criticized. This is opposed by an emphasis on rhythm, speed and temporality. Both in globalization, i.e. the global networking of production and the accompanying logistics infrastructures, the connection of local history with (universal and imperial) human history or the history of social movements, as well as in the synchronization through computers and internet culture, phenomena can be found that correspond to this changed conception of space-time. Of particular importance is the crucial position that time, or temporality, occupies in theories and practices of resistance and revolt.

The second part „3. [Case Studies I] Analysis“ analyzes works of different artists and their influence on the development of my ideas. In no way is this a comprehensive listing of all composers or tracks that deal with polymetric, polyrhythmic or polytemporic, but rather a subjective selection.

In the parts „4. [Development] Definitions, Implementations, Tools & Code“ & „5. [Recapitulation] Imaginary DAW-functions – (im-)possible applications“ each chapter starts with the theoretical founding and definitions of necessary terms used in the thesis and is afterwards followed by examples of code developed for my tools. As this thesis is part of an ongoing work in process I‘ve added problems I‘ve stumbled into, while writing the code and/or ideas for further development of the ideas and concepts, even though I haven‘t always had time to test them yet. Most of the tools were developed

explicitly for my liveset, so usability in a generative livesettings was a priority. Thus, in most cases, adapting them for fixed composing is still pending.

The part „6. [Case Studies II] in Practice“ provides explanation and material used for certain live-performances using the tools developed in & for this thesis. An exemplary videorecording of my liveset is provided as part of my bachelor work, as well as insight in reusing my sequencing techniques in combination with Korin Rizzo’s “The Glove”. Followed by an analysis of several works produced during the period of study. They show how the concepts developed here and their making were already mutually influencing each other.

The last part „7. [Coda] Conclusions“ gives a brief overview of the developed. And summarizes the concepts for further development, as well as the problems I‘ve had in the process. Generally speaking it provides an outlook on future explorations.

2. [Exposition] About time

„Neither hyperstitition nor hauntology. Neither utopia nor the death drive. And certainly not a messianic time. To make a situation sideways in time, together.“[7]

„[statics]
present day. heh.
present time. Hahahahahaha.
[statics; indistinct voices in the static]“[8]

Presented is the question of digitalized time, but instead of suggesting the merging of past & future into a permanent-cyclical present(-ism), which combines esoterics with capitalist notion of availability, the idea of ‚present‘ itself is rendered laughable. ‚Present‘ or ‚presentism‘ are a naive hope for falling back into a time before the invention of universal time, but in effect act as the subordination under paradigms of linear-production, yet what we experienced recently is the derailing of universal-linear-time into an ubicomp non-linear-polychrony.[9] Universal-linear-time seems to fracture into synchronized multiplicities of times. While this understanding might suggest a certain ahistoric understanding of or in time, it is to note that, still underlying this process is the assumption

> „that the historical present contains all the unconquered fragments of the past, so the theoretical mode of presentation of that present also must contain all the fragments of its past:
> ‚In order to develop the laws of bourgeois economy … it is not necessary to write the real history of the relations of production. But the correct observation and deduction of these laws … always leads to primary equations … which point toward a past lying behind the system. These indications … then offer the key to understanding the past – work in its own right.‘ (G, 460-461)“[10]

The historic-materialistic approach, as outlined in the quote above, assumes that

7 McKenzie Wark (@mckenziewark) on Twitter: https://twitter.com/mckenziewark/status/1470044141228859400 .
8 Opening theme of the Anime *serial experiments lain*
9 In more detail in chapter „4.8 Ubicomptime“
10 Thomas Nail, *Marx in Motion – A New Materialist Marxism*, 77.

> "[m]en make their own history, but they do not make it as they please; they do not make it under self-selected circumstances, but under circumstances existing already, given and transmitted from the past."[11]

The present is always defined by what has happened before, and by visions of potential futures[12]. It is not a self-contained moment in time, but always already mediated, and in intra-active relation with past and future. And so every moment in time consists of more than one temporality. It is therefor‘ necessary to understand every moment in time as polychronic underlying polytemporal and divergent time-rules, while at the same time relatively situated in the observed space-time, yet every view in the past or future is limited to being the presents view of and/or at it.

> „Was >>ursprünglich<< einmal Rhythmus war, ist es also für uns *nicht mehr*. Und umgekehrt: Was für uns Rhythmus ist, war es *nicht schon immer*."[13]

It follows that: What is rhythm for us will no longer be. What will be rhythm >>in the future<< hasn‘t been yet.

This is how this opening quotation by Eske Bockelmann could be continued, evoking the grammar of hauntology - that which is not yet/not anymore.[14] Or speaking more

11 Karl Marx, *The Eighteenth Brumaire of Louis Bonaparte*.

12 Through debt, derivatives, and other financial machines, these futures are already predetermined to some degree. Likewise, the past is continuously rewritten, while the material conditions it produced determine the present.

13 Eske Bockelmann, *Im Takt des Geldes – Zur Genese modernen Denkens*, 30.
engl.:
„What >>originally<< once was rhythm is therefore no longer so for us. And vice versa: What is rhythm for us, it has not always been."

14 I‘ve published my personal take on a brief history of time, teleology, hauntology, retromania, and the ‚end of history‘ already as: Bill B. Wintermute, *Sidesnotes to hauntology // Randnotizen zur Hantologie* (german only).

See also: Jacques Derrida „Marx Gespenster":
„*Three things*, then, would decompose in analysis this single *thing*, spirit, or specter—or king, for the king occupies this place, here the place of the father, whether he keeps it, takes it, or usurps it, and beyond the return of the rhyme (for example "The Play's the thing,/Wherein Ile catch the Conscience of the King"). King is a thing, Thing is the King, precisely where he separates from his body which, however, does not leave him (contract of secession, necessary pact in order to have *more than one body*, that is, in order to reign, and, first of all, to inherit royal dignity, whether by crime or election: "The body is with the King, but the King is not with the body. The King, is a thing").
What, then, are these *three things of the thing*?
1. First of all, mourning. We will be speaking of nothing else. It consists always in attempting to ontologize remains, to make them present, in the first place by *identifying* the bodily remains and by *localizing* the dead (all ontologization, all semanticization— philosophical, hermeneutical, or psychoanalytical—finds itself caught up in this work of mourning but, as such, it does not yet think it; we are posing here the question of the specter, to the specter, whether it be Hamlet's or Marx's, on this near side of such thinking). One has to know. *One has to know it. One has to have knowledge* [Il faut le savoir]. Now, to know is to know *who* and *where*, to know whose body it really is and what place it occu- pies—for it must stay in its place. In a safe place. Hamlet does not ask merely to whom

clearly of the future of rhythm: "Catastrophe is the past coming apart. Anastrophe is the future coming together. […] This is an age of crackups and melt-downs."[15] While our understanding (of rhythm) crumbles, is breaking away from the past, destroying our present perception, future (of rhythm) is coming together. This future is polyvocal, polytemporal and non-linear, it is – going full circle back to what it never has been – the emancipation of the voices in polyphony as plurality. If we understand poly- or plural in a playful way, and think of composition and form as always related to the social, it is linked directly to diversity (in a broad understanding of that term). Diversity as heterogeneity.

> „But what if the emancipation of trans people cannot be won through the securing of ‚rights'? What if, however, smoothed-over the process of state validation were to become, a meaningful liberation remained out of view? What if even the most thorought going political defeat of fascism would not be guaranteed to achieve our social liberation?
>
> It's the questions which Transgender Marxism will begin to answer.
>
> **We offer our answer as a polyphony.** There is no authoritative approach to Marx and his legacy, and nor have we sought to impose one. Marxism is a broad and living tradition, defined by its continual internal disputations, its varying schools, and its contested orthodoxies.
>
> Each of these finds inspiration in a different facet of Marx's practice."[16]

If we are to take this serious, it's about the emancipation of each single voice, while not forgetting that they – together – form the composition. And as plain composition it's still lacking the lived-experience, that's a part of sonic practice.

Aesthetics would have to develop how the artistic idea of a work of art

> „is constituted in the life of its elements working off each other and entering into constellation. To choose as a model for this the dimension of counterpoint, that is, the simultaneous leading

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the skull belonged ("Whose was it?" the question that Valéry quotes). He demands to know to whom the grave belongs ("Whose grave's this, sir?"). Nothing could be worse, for the work of mourning, than confusion or doubt: one *has to know* who is buried where—and *it is necessary* (to know—to make certain) that, in what remains of him, *he remain there*. Let him stay there and move no more!
2. Next, one cannot speak of generations of skulls or spirits (*Kant qui genuit Hegel qui genuit Marx*) except on the condition of lan- guage—and the voice, in any case of that which *marks* the name or takes its place ("*Hamlet:* That Scull had a tongue in it, and could sing once").
3. Finally (*Marx qui genuit Valéry* . . .), the thing *works*, whether it transforms or transforms itself, poses or decomposes itself: the spirit, the "spirit of the spirit" is *work*. But what is work? What is its concept if it supposes the spirit of the spirit? Valéry under- scores it: "By 'Spirit' here I mean a certain *power of transformation . . . the spirit . . . works*.";
Mark Fisher, *Ghosts of my life*.
Frederic Neyrat, *Hosting the Ghost: On Limbo Aesthetics*, 2021, https://alienocene.files.wordpress.com/2021/05/fn-ghost.pdf .

15 Nick Land, Sadie Plant, *Cyberpositive*, http://www.sterneck.net/cyber/plant-land-cyber/ .

16 Jules Joanne Gleeson & Elle O'Rourke, ed., *TransGenderMarxism*, 6. bold-highlightings added by author

and joining of relatively independent voices, may seem strange. After all, the objective tendency of new music since Schönberg has been to aim for through-construction, for integral form. Therefore, it no longer leaves to the individual material dimensions, such as harmony, counterpoint, form, color, the independence from each other which the traditional subjects of musical school discipline assigned to them. It strives to unify all these dimensions, especially the horizontal and the vertical, and to derive them, where possible, from an identical core. The move towards this is by no means limited to the Schönbergian twelve-tone technique and the efforts stemming from it towards a serial design that also includes time in the total organization. […] Generally speaking, every independence and intensification of a musical means affects all the others, so that that balance, that homeostasis, is formed between them, which the late Schönberg once defined as the goal to be achieved anew in every composition.

If, for example, the many-tone, complex, articulated individual sounds release articulated voices from within themselves, then, conversely, the chords also require consistent voice leading for their own justification, as the result of which they can be heard logically. [...] Since the early days of the new music, harmony and polyphony have been rubbing against each other, and the one element increases by virtue of the demands of the other. The definition of the new contrapuntal thinking as one demanded by the relationship of the compositional moments to each other reaches into tangible practical rules of thumb of composing. [...] Every instrument, every group of instruments must have something musically resonant, a real "voice" and not, apart from the melody, mere foundation or filler notes to play, so that it comes to sound. Even the latest achievement of traditional music, the emancipation of the color values, can only be realized with the treatment of the simultaneous voices unfolding freely in the tonal space. It thus requires counterpoint, however much this may still be bound by the relationship to a principally tonal-harmonic reference scheme and therefore be merely ornamental. One encounters a related moment with Schönberg. The more complex composing becomes from its own impulses, from within, the more urgent becomes, as a corrective, the demand for compositional clarity.

[…]

While all moments interpenetrate to the integral unity, they remain nevertheless differentiated from each other, and only by the function, which each of them exercises and with which it affects the others, the unity is founded. It is one in the opposites, mediated by them, not an immediate one. But it is precisely this that awakens the constant concern for clarification. Only when every formal part, every phrase, every half-phrase, every note unmistakably declares what it is for as a whole, is the well-organized work protected from falling back into its own opposite, into chaos. Therefore, also in the relationship of the voices to each other, nothing may remain unarticulated; they must stand out clearly and distinctly from each other, attain full plasticity. Likewise, it requires a polyphonic thinking that is awake at every moment, as well as that ability for transparency, for the gradation of the weights of the individual voices according to main event, secondary event and mere background, which identifies the polyphonic composer Schönberg as a contrapuntist in the narrower sense. All counterpoint also has an analytical

function, the decomposition of the complex into distinct partial moments, the articulation of the simultaneous according to the weight of its constituent parts and according to similarity and contrast. Its external sign is the designation, introduced by Schoenberg, of main, secondary and completely receding voices. [WS, 18 SEP 2019].“[17]

These remarks of Th. W. Adorno seem to remain valid until today, and are applied, sometimes more and sometimes less consciously, in the concepts of the avant-garde, but a twist would have to be made at a crucial point: Children of their time, Adorno and Schönberg, correlate totality, in music and society, with homeostasis (negative feedback), a notion that is so close to Norbert Wiener‘s cybernetic work. Cybernetics, as developed by Norbert Wiener and others, did not develop in empty space, but under the impression of two world wars. They were at once models to understand neuro-

17 Translated by the author with deepl from the german original:
„Der Ort der Philosophie der Kunst sind deren technologische Kraftfelder: die Spannungen, die jedes Kunstwerk objektiv in sich verschließt, sind zugleich das Medium seiner Wahrheit und damit der philosophischen Interpretation. Triftige musikalische Ästhetik hätte zu entwickeln, wie der geistige Gehalt eines Kunstwerkes − das, was in der Sprache der traditionellen Philosophie künstlerische Idee hieß − sich konstituiert im Leben seiner aneinander sich abarbeitenden und in Konstellation tretenden Elemente. Als Modell dafür **die Dimension des Kontrapunkts, also der gleichzeitigen Führung und Fügung relativ selbständiger Stimmen**, auszusuchen, mag befremden. Denn die neue Musik hat es ihrer objektiven Tendenz nach seit Schönberg auf Durchkonstruktion, auf integrale Gestalt abgesehen. Daher beläßt sie den einzelnen Materialdimensionen, wie Harmonik, Kontrapunkt, Form, Farbe nicht länger jene Unabhängigkeit voneinander, welche ihnen die traditionellen Fächer der musikalischen Schuldisziplin zuwiesen. Sie trachtet, alle diese Dimensionen, vor allem aber Horizontale und Vertikale, zu vereinheitlichen, wo möglich aus einem identischen Kern abzuleiten. Der Zug dazu beschränkt sich keineswegs auf die Schönbergische Zwölftontechnik und die von dieser herstammenden Bestrebungen zu einer seriellen, auch die Zeit in die totale Organisation einbeziehenden Gestaltung.
[...]
Allgemein tangiert jede Verselbständigung und Intensivierung eines musikalischen Mittels alle anderen, damit zwischen ihnen jenes Gleichgewicht, jene Homöostase sich bildet, die der späte Schönberg einmal als das in jeder Komposition aufs neue zu erreichende Ziel definierte.
Wenn also etwa die vieltönigen, komplexen, in sich artikulierten Einzelklänge aus sich heraus artikulierte Stimmen entlassen, so bedürfen umgekehrt die Akkorde zu ihrer eigenen Rechtfertigung auch konsequenter Stimmführung, als deren Resultat sie sich logisch hören lassen. [...] Seit der Frühzeit der neuen Musik reiben sich Harmonik und Polyphonie aneinander, und das eine Element steigert sich kraft der Forderungen des anderen. Die Bestimmung des neuen kontrapunktischen Denkens als eines vom Verhältnis der kompositorischen Momente zueinander geforderten reicht bis in handfest praktische Faustregeln des Komponierens hinein. […] Jedes Instrument, jede Instrumentengruppe muß etwas musikalisch Ausschwingendes, eine wirkliche »Stimme« und nicht, außer der Melodie, bloße Fundament- oder Füllnoten zu spielen haben, damit es zum Klingen komme. Selbst die späteste Errungenschaft der traditionellen Musik, die Emanzipation der Farbwerte, kann sich realisieren nur bei frei im Tonraum sich entfaltender Behandlung der Simultanstimmen. Sie bedarf damit des Kontrapunkts, wie sehr im übrigen dieser auch noch durch die Beziehung auf ein prinzipiell tonal-harmonisches Bezugsschema gefesselt und daher bloß ornamental sein mag. Man begegnet einem verwandten Moment bei Schönberg. Je komplexer das Komponieren von seinen eigenen Impulsen, von innen her sich anläßt, um so dringlicher wird, als Korrektiv, die Forderung kompositorischer Deutlichkeit.
[…]
Während alle Momente zur integralen Einheit sich durchdringen, bleiben sie gleichwohl voneinander unterschieden, und erst durch die Funktion, die ein jegliches von ihnen ausübt und mit der es die andern affiziert, wird die Einheit gestiftet. Sie ist eine in den Gegensätzen, durch sie vermittelt, keine unmittelbare. Gerade das aber weckt die stete Sorge um Verdeutlichung. Nur wenn jeder Formteil, jede Phrase, jede Halbphrase, jede Note unmißverständlich bekundet, wozu sie im ganzen da ist, wird das durchorganisierte Werk vorm Rückschlag in sein eigenes Gegenteil, ins Chaos behütet. Daher darf auch im Verhältnis der Stimmen zueinander nichts unartikuliert bleiben, sie müssen klar und distinkt voneinander sich abheben, volle Plastik erlangen. Gleichermaßen bedarf es eines in jedem Augenblick wachen polyphonen Denkens wie jener Fähigkeit zur Transparenz, zur Stufung der Gewichte der einzelnen Stimmen nach Hauptereignis, Nebenereignis und bloßem Hintergrund, die den Polyphoniker Schönberg als Kontrapunktiker im engeren Sinn ausweist. Aller Kontrapunkt hat auch eine analytische Funktion, die Zerlegung des Komplexen in distinkte Teilmomente, die Artikulation des Gleichzeitigen nach dem Gewicht seiner Bestandstücke und nach Ähnlichkeit und Kontrast. Ihr äußeres Zeichen ist die von Schönberg eingeführte Bezeichnung von Haupt-, Neben- und ganz zurücktretenden Stimmen. [WS, 18.09.2019].“ (Th. W. Adorno, *Die Funktion des Kontrapunkts in der neuen Musik. Für Rudolf Kolisch in treuer Freundschaft*, https://www.merkur-zeitschrift.de/autoren/die-funktion-des-kontrapunkts-in-der-neuen-musik/ . Bold-highlightings added by author

psychological structures, as they were tools for techno-(social-)control[18]. From a contemporary point of view his rather simplistic understanding and plain positive reception of 'homeostasis' as a metaphor for totality is problematic as it lacks in complexity. Therefore it would be necessary to rearticulate totality using the 'cyberpositive'

> „twist on Norbert Wiener's ideas of 'negative feedback' (homeostasis), and 'positive feedback' (runaway tendencies, vicious circles). Where the conservative Wiener valorized 'negative feedback', Plant/Land re-positivized positive feedback--specifically,: the tendency of market forces to generate disorder and destabilise control structures. [sic]"[19]

Yet again while appreciating the re-positivization of 'positive feedback' and its runaway tendencies, its proto-accelerationistic concept seems to be naive nowadays in times of illiberal democracy. Market forces indeed generate disorder and destabilise control structures, but its results are not by any means necessarily positive, progressive or liberating, in contrast the result most of the time is overpowering, violent, and part of reconstitution, or can even reintroduce new control structures; an example for those emerging control structures are filter bubbles driven by 'positive feedback'.[20] This shows us that in many cases positive feedback, won over negative feedback as general means of control and cybernetically organizing totality. Therefor its necessary to adjust Th. W. Adornos claims on composition, to set his statement right: When Th. W. Adorno via Arnold Schoenberg refers to compositions being in homeostasis, it is due to this historical moment in time and the emergence of cybernetics. Contemporary philosophical thinking and thinking about compositions has to be informed by a wider range of contemporary events, sciences and historic studies, in particular historic materialism, as well as by recent developments: cybernetics, digitality, globalization, finance, thermodynamics, quantum mechanics, chaos theory, ecological- and environmental-science, among many more. But at the same time being out of joint, untimely, historically informed, as to not forget about religious systems, heretics,

18 See: Hans-Christian Dany, *Schneller als die Sonne: Aus dem rasenden Stillstand in eine unbekannte Zukunft*. And Hans-Christian Dany, *Morgen werde ich Idiot: Kybernetik und Kontrollgesellschaft*.

19 Simon Reynolds, *RENEGADE ACADEMIA: THE Cybernetic Culture Research Unit*, https://energyflashbysimonreynolds.blogspot.com/2009/11/renegade-academia-cybernetic-culture.html .

20 An in depth take on contemporary self-governance can be found in my previous text: Bill B. Wintermute, *(Cybernetic-)'Post-Pop': Affect Art(s) & (Emotional) Self-Governing*, in Achim Szepanski, *Ultrablack of Music*. Available online via: https://non.copyriot.com/cybernetic-post-pop-affect-arts-emotional-self-governing/ .

magick and demonology, or other systems of knowledge and wisdom discarded over time or by discourse.[21]

What seemed irrational and incomprehensible at a time, nowadays has changed. It might still be difficult to acoustically grasp the concept of chaos theory by plain hearing, yet it can not any longer be dismissed as ‚chaos' in a classical sense (pre-Chaos Theory). To understand totality, as an entangled interplay of negative and positive feedback, will bring us back to polyphony, but not as we used to hear and compose it. It is a compos[t]ed polyphony, just as ‚cyberpunk' was originally termed ‚Neuromancer'[22] bearing the marks of ‚romanticism', ‚neurology', ‚necromancy' and ‚neu' (the german term for 'new') at the same time. This reemerged polyphony assumes that the universal (standard) time, underlying the principle of the metronome, is always already at place, that human intraaction is always already synchronized by networks of communication, and always already conducted by the power of state and capital. Every voice always already is integrated into the totality, but not without force and violence. To liberate those voices from within this totality is what is at stake, as is the liberation (of humanity) of mankind and (non-human) from mankind. The trick is difficult as the underlying concept of time(-tracking) became some sort of fetishized 2nd nature[23], a human made thing perceived of as natural pregiven, and is integrated in many other machines.

Ernst Bloch, Walter Benjamin and Herbert Marcuse, just as Th. W. Adorno part of the so called ‚Critical Theory' or ‚Frankfurt School', develop a similar concept of multiversive polychronicity:

> "Philosophically speaking, it is about the critique of universal history as a critique of progress, without giving up the universal utopia of a humanum. Here there are two points of contact for Bloch's theory of history - mediated via Benjamin - with regard to the historical process logic of non-simultaneity: Bloch grasps this once in the later 'Tübingen Introduction to Philosophy' with the concept of multiverse, of multi-spatiality, respectively in reference to modern physics as multi-temporality, against mere multiculturalism, against linearity of progress. Bloch secondly grasps this with the concept of the carpet with regard to art developments and their historical meaning in the early writing 'Spirit of Utopia'. - First, on the multiverse:

21 As already explained in the initial remarks on non-standard-philosophy by Francois Laruelle. Similarly in the schools of new materialism or speculative realism.

22 See: William Gibson, *Neuromancer*.
Mark Fisher, *Flatline Constructs: Gothic Materialism and Cybernetic Theory-Fiction.*

23 See: Critical Theory, Frankfurt School

‚The concept of progress does not tolerate 'cultural circles' in which time is reactionarily nailed to space, but it needs instead of unilinearity a broad, elastic, completely dynamic multiverse, a continuous and often intertwined counterpoint of historical voices. Thus, in order to do justice to the vast non-European material, it is no longer possible to work in a unilinear way, no longer without bulges in the series, no longer without complicated new time manifoldness (problem of a 'Riemannian' time).‘29 As for the many voices, Benjamin noted a similar picture: ‚The multiplicity of histories is similar to the multiplicity of languages. Universal history in the contemporary sense can only ever be a kind of Esperanto. The idea of universal history is a messianic one.‘30 - Second, on the concept of carpet: messianism is materialistically mediated in Benjamin, in Bloch materialism is mediated with concrete utopia; the multiverse weaves the red runner of human history; its fabric is the red thread, its pattern aesthetic pretense of real humanism. Bloch takes the image of the carpet from Lukács and uses it to grasp the basic sound of history, against art-historical, chronological succession thinking.3”[24]

A polyvocal-polyphonic, polychronic, polytemporal, polyhistoric, multiversal, understanding of space-time and reality develops from combined ‚classical‘ and quantum physics, as kinetic materialism.

Just like the proponents of Critical Theory’s Frankfurt School make use of quantum theoretical understanding of time in combination with messianic thought in judaism, the afrofuturist art group “Black Quantum Futurism” provides a beautiful example of combining quantum theory with spiritual thinking with their „BQF Correspondence Chart“ by Rasheedah Phillips in: Black Quantum Futurism „Theory & Practice“. It is provided in the “Appendix”.

Or in the terms of a non-standard marxism following Francois Laruelle:

24 Translated from the german original, using deepl.com:
„Es geht, philosophisch gesprochen, um Kritik der Universalgeschichte als Fortschrittskritik, ohne die universale Utopie eines Humanum preiszugeben. Hier gibt es für Blochs Geschichtstheorie zwei – über Benjamin vermitteltbare – Anknüpfungspunkte in bezug auf die historische Prozeßlogik der Ungleichzeitigkeit: Bloch faßt dies einmal in der späteren ›Tübinger Einleitung in die Philosophie‹ mit dem Konzept Multiversum, der Vielräumigkeit, beziehungsweise in Anlehnung an moderne Physik als Vielzeitigkeit, gegen den bloßen Multikulturalismus, gegen Fortschrittslinearität. Bloch faßt zweitens dies mit dem Begriff des Teppichs in Hinblick auf Kunstentwicklungen und ihre geschichtliche Bedeutungsstellung in der frühen Schrift ›Geist der Utopie‹. – Erstens zum Multiversum:
»Der Fortschrittsbegriff duldet keine ›Kulturkreise‹, worin die Zeit reaktionär auf den Raum genagelt ist, aber er braucht statt der Einlinigkeit ein breites, elastisches, völlig dynamisches Multiversum, einen währenden und oft verschlungenen Kontrapunkt der historischen Stimmen. So läßt sich, um dem riesigen außereuropäischen Material gerecht zu werden, nicht mehr einlinig arbeiten, nicht mehr ohne Ausbuchtungen der Reihe, nicht mehr ohne komplizierte neue Zeit-Mannigfaltigkeit (Problem einer ›Riemannschen‹ Zeit).« 29 Was die vielen Stimmen angeht, hat Benjamin ein ähnliches Bild notiert: »Die Vielheit der Historien ist der Vielheit der Sprachen ähnlich. Universalgeschichte im heutigen Sinne kann immer nur eine Art von Esperanto sein. Die Idee der Universalgeschichte ist eine messianische.«30 – Zweitens zum Begriff Teppich:
Messianismus ist bei Benjamin materialistisch vermittelt, bei Bloch ist der Materialismus mit konkreter Utopie vermittelt; das Multiversum webt den roten Läufer der menschlichen Geschichte; sein Stoff ist der rote Faden, sein Muster ästhetischer Vor-Schein des realen Humanismus. Das Bild des Teppichs nimmt Bloch von Lukács und gebraucht es, um den Grundklang der Geschichte zu begreifen, gegen kunstgeschichtliches, chronologisches Abfolgedenken.3“
(Roger Behrens, *Aktualisierung des Ungleichzeitigen. Anmerkungen zur Prozeßlogik einer mehrschichtigen Dialektik*, https://www.rosalux.de/fileadmin/rls_uploads/pdfs/Utopie_kreativ/153-4/153_154_behrens.pdf .)

> "Quantum theory substitutes for the old dialectic, superposition substitutes for totality, and the quant substitutes for the commutativity of philosophical dialectic"[25].

In a similar fashion kinetic materialism[26], is a dynamic study of movement(s), of relations and powers that are in constant flux.

> „Whence the importance of scales, proportions and rhythms. To conceive physical reality and its relation to the sensible and physiological reality of human being, modern philosophy proposed two schemas: the Kantian, or neo-Kantian, and the empirical, or positivist. According to the first, phenomena – the flux of sensations – are classified, arranged and organised in accordance with a priori categories, which is to say categories interior to the subject and consciousness, including time and space. The in-itself (the noumenal) eludes the grasp of the ‚subject'. According to empiricism and positivism, sensible facts are arranged of their own accord in relations of simultaneity, implication and causal entailment. ‚If A implies B and B implies C, the A implies C.' No need for categories other than those of logic (the logical), which are anyhow not so much categories as self-evident experiential data, transcribed in a formal language.
>
> But knowledge, from Newton to Einstein and contemporary physics, has followed another path, equally demarcated by certain philosophies, such as that of Feuerbach. It is correct that we only perceive our relation to objects of nature as we do our relation to objects of production or in a word, to realities; in such a way that we have to distinguish between appearances – which are themselves a reality – and what is actually inside these things. For example, they seem inert (this wooden table, this pencil, etc.) and nonetheless they move, albeit only within the movements of the earth: they contain movements and energies: they change, etc. The same goes for social relations as for physical reality: this immobile object before me is the product of labour; the whole chain of the commodity conceals itself inside this material and social object. As a consequence, it is necessary to go beyond facts, phenomena and the flux of immediate sensations, but neither the inside nor the beyond of the phenomenon and the sensible fact are determined internally and purely a priori as was believed in the Kantian tradition."[27]

Although 'rhythm' was an important term during the last century, it was widely ignored in compositional practice, even though it's a time-based art, we're still missing a solid basis of it's understanding:

> „In the late nineteenth and early twentieth centuries, rhythm attracted considerable interest and even became a ‚fetishized keyword of modernism' (Cowan 2012: 18-19 in Henriques, Tianen and Väiliaho 2014: 7). This period was marked by significant shifts in the pace and reach of

25 Achim Szepanski, *The Quantum Marxism Of Laruelle*, https://non.copyriot.com/the-quantum-marxism-of-laruelle/ .

26 See also: Thomas Nail (i.e. *Marx in Motion – A New Materialist Marxism*) or Frédéric Neyrat *Literature and Materialisms*.

27 Henri Lefebvre, *Rhythmanalysis – Space, Time And Everyday Life*, 82.

> everyday life such as the development of mechanized transport and associated processes of industrialization, changes which gave rise to considerable anxiety and increased awareness of rhythm. The appeal of rhythm was in its capacity to capture the dynamism and fluidity of the times, and as a potential force for transformation. There are some interesting parallels between this earlier period and the global and fluid character of society and economy in the present day. Thinking with rhythm may have something to offer debates on the excessive pace of life and the attractions of lower living.“[28]

With ‘rhythmanalysis’[29] the french marxist thinker Henri Lefebvre developed a historic-materialistically informed understanding of space, time and rhythm(s) in his book „Rhythmanalysis – space, time and everyday life“ for his analysis of everyday (urban) life, that bears lots of similarities and some differences to the already outlined concepts, and until today is still providing a solid structure and lay ground for contemporary ‚rhythm studies‘. His basic vocabular is summarized in the following illustration:

28 Dawn Lyon, *Rhythmanalysis – Research Methods*, 6.

29 „a) repitition (of movements, gestures, action, situations, differences);
b) interferences of linear processes and cyclical processes;
c) birth, growth, peak, then decline and end.“
(Henri Lefebvre, *Rhythmanalysis – Space, Time And Everyday Life*, 25.)

Table 2.1 Lefebvre's vocabulary of rhythm – summary of key terms.

Linear rhythm	Quantified and fragmented time, imposed by technology, industry and consumption The time of the city and urban life Closer to repetition than rhythm per se, for example dripping of water, the beats of a hammer In musical terms, measure and beat
Cyclical rhythm	The time of nature, 'cosmic and vital', evident in seasons and day and night In biology and the body, for example heart beats and eye movements Characteristic of rural life – cyclical rhythm is destroyed by capitalism Includes repetition *and* difference In musical terms, melody and harmony
Polyrhythmia	A multitude of rhythms; the effects of different configurations of rhythm
Eurhythmia	When rhythms combine smoothly, for example in good health
Arrhythmia	Discordance between rhythms, being 'out of step'
Isorhythmia	An 'equality of rhythms' beyond *eurhythmia*, for example in the coordination of an orchestra
Dressage	Process of bodily entrainment and repetition through which rhythm is learnt and becomes evident in the body over time, for example in military drills

Illustration 2: Lefebvre's vocabulary of rhythm by Dawn Lyon "Rhythmanalysis - Research Methods".

While he uses these in a broad context for analyzing socio-spacio-temporal relations in dynamic fluidity.

> „**Temporality is not chronology,** Ingold reminds us (2000: 194). **Chronometric time both misses the lived experience or ‚texture' of time** (Flaherty 2011) **and what Mark Harvey** (1999) **calls ‚economies of time'.** Economies of time suggest that the coordination, sequencing and articulation of work/other activities produce particular temporalities – and rhythms.
>
> […]
>
> He explores **synchronization in time** and **sychorization (coordination in space)** among three groups of workers subject to the disruptions of flexible capitalism:
>
> [...]
>
> Lefebvre and Régulier point out how we largely become aware of our rhythms ‚when we suffer from some irregularity' or disorderliness (2004a: 77). Indeed, disruptions and crises have ‚origins in and effects on rhythms', Lefebvre notes. They produce a kind of ‚hole in time' which can be filled by a creation or an invention (Lefebvre 2004:44).4 While Lefebvre was keen to see

> the transformatory potential of these ‘cracks‘ and opening in the flow of spacetime (his ‚moments‘ discussed in Chapter 2), he argues that *disruption* reveals thythm, rendering visible what was previously unnoticed and under the surface. **‚The value of disruption‘ is as a site of politics and a space of possibility for newness, different actions and interventions**; and it is also a ‚heuristic device‘ for doing research into rhythm (Edensor 2000:135-7).[30]

It is important to notice the difference between physical temporality (‘Zeitlichkeit’) and historical chronology, as well as chronometric time (time in a measured and measureable grid of time). The chronometric time, exemplified by clock-time, may not be confused with (subjectively) lived experience (of time). On the meeting point between those two forms of time (lived experience and chronometric time), we struggle with an ‘economy of time’ as everyday life is turned into a commodity among others. In the division between synchronization in time and sychorization (as coordination in space), we find great tools for understanding space-time in capitalist society. Rhythm therefor can be understood as a measure for smoothness and tempo of this process. Rhythmanalysis provides tools for understanding organization of everyday life in micro- and macroscale, in the social and nature, and for breaking down meta-rhythms into sub-rhythms (or vice versa)[31]. Irregularities produce holes and cracks in rhythm(s) that open up transformative potential for intervention.

It’s the logic of revolt and resistance to undermine certain regimes of time:

> „The revolt ought to be considered on its own terms, in its autonomy, in its intensified experience of time. If the revolution prepares tomorrow, the revolt evokes the future that comes after tomorrow. It is thus a moment of striking consciousness, for it opens up a passageway into the future. This explains why it is of step with the present: whoever has no today can be driven to

30 Dawn Lyon, *Rhythmanalysis – Research Methods*, 86. Bold highlightings added.

31 „We can suppose that the western order established since Latinity and the Roman Empire could not easily have broken-in Orientals and Africans. After the efforts that history calls colonialism, not without notable effects, the failure of this occidental dressage is today evident on a world scale. It finds ways for those who escape our conjoined models (dressage-identifications-reduced and stereotyped differences).
The substance [matière] is the crowd (or molecules, corpuscles), it is a body.
The crowd is a body, the body is a crowd (of cells, of liquids, of organs).
Societies are composed of crowds, of groups, of bodies, of classes, and constitute peoples. They understand the rhythms of which living beings, socials bodies, locals groups are made up.
The concept passes from vague and confused representations to a grasp of the plurality of rhythmic interactions; to diverse degrees and levels: from corpuscles to galaxies, one more time!
If there is difference and distinction, there is neither separation nor an abyss between so-called material bodies, living bodies, social bodies and representations, ideologies, traditions, projects and utopias. They are all composed of (reciprocally influential) rhythms in interaction. These rhythms are analysed, but the analyses in thought are never brought to term. No more so the analysis of precise social facts like dressage than the analysis of the theatre, of music, of poetry as rhythms.”
(Henri Lefebvre, *Rhythmanalysis – Space, Time And Everyday Life*, 42.)

> become the protagonist of the moment, to suspend historical time. This is an attempt which both forces things, like a sudden attack, and on the other hand neglects the question of the results, for it does not tend to its own survival. Constitutively out of step with the present, the revolt is an impatient epiphany of the future that comes after tomorrow.“[32]

To disrupt a linear process, to slow something down, and accelerate something else, to find niches, to follow underlying currents, to undermine domination by clock time, … these are fundamentals of revolt, resistance and destitution.

> „Destitution therefore also names that mechanism that deactivates temporalities and causal regimes, the codes that, in the past, allowed one to decipher the movements of struggle, to predict and explain their motivations. In this way, multiple temporalities are liberated, the "fibers of time"17 that lie beneath the crust of a capitalist domain that acts precisely by absorbing the chronological fragmentation of experiences into the regulatory framework of a single, abstract, spatialized time. It is these fragmentary experiences and "worlds" that contemporary struggles serve to reopen. In fact, according to the philosopher Bernard Aspe, every authentic "collective" — philosophical, artistic, but above all a political collective of a revolutionary kind — takes shape through the affirmation of a "common time" which, in order to flourish, must escape the synchronization apparatus of the economy and capitalist synthesis.
>
> So long as the boundary of individual existence remains limited to the private isolation of subjective time, so long as every intensive, lived and concrete connection to the times of others is annulled, the only foothold for organizing our existence lies in the reference to abstract time. For Aspe, it is the alliance between the private time of, let's say ‘daily activities,’ and that of abstract time that prevents the formation of *shared* times: I am so isolated in my personal time that I have no connection except to the clock face. In this sense, the work of "synchronization" between discordant times becomes a function monopolized by capitalism, expropriated from our spectrum of existential, and hence political, capacities. The world of economic domination is the time that imposes itself on all others, the extraneous and artificial articulation of multiple temporalities:
>
> > Contemporary capitalism depends upon the articulation between the empty form of clock time and the disparate multiplicity of temporalities that the latter subsumes. In other words, it rests on a monopoly of synchronization that remains external to the processes and activities whose coordination it makes possible. This synchronicity does not occur solely through the ticking of the clock, even if this continues to epitomize the primary resource of capitalism. This synchronicity also occurs through the necessity imposed on all of us to remain in sync with the evolution of the apparatuses of communication by means of which the space of planetary synchronicity is deployed.18

32 Donatella Di Cesare, *The Time Of Revolt*, 55.

> The destituent violence of uprisings unleashes these previously bridled and compressed plural temporalities, it gives them a chance not only to manifest themselves, but also, consequently, to harmonize and resonate with one another, to break out of their autistic isolation, without being reduced to a pure cacophony. As the Invisible Committee writes in a suggestive passage, the way revolt expands and mutates into a revolutionary dynamic does not resemble a forest fire, since its 'contagion' does not follow a linear chronological process that, however rapid, would be continuous and gradual; rather, there are moments of resonance and vibration that connect distant places through a rhythmic correspondence that has something "musical" about it:
>
> > Revolutionary movements do not spread by contamination but by *resonance*. Something that is constituted here resonates with the shock wave emitted by something over there. A body that resonates does so according to its own mode. An insurrection is not like a plague or a forest fire — a linear process which spreads from place to place after an initial spark. It rather takes the shape of a music, whose focal points, though dispersed in time and space, succeed in imposing the rhythm of their own vibrations, always taking on more density. To the point that any return to normal is no longer desirable or even imaginable.19
>
> In 2001, *Tiqqun* had already observed evocatively that, "in a sense, the revolutionary question is now a *musical* one."20"[33]

The author uses the term 'destitution' to provide a counterprocess to constitution. Destitution is not so much the idea to set something into place as to abolish something that is already in place. In this concept constitution is not the basis, the point of departure, but retroactively debasing the actually preceding destitution. Furthermore they extend the analysis, already provided earlier in this text, of how capitalist economization of time constitutes a time-regime that synchronies multi-temporalities to a universal (standard) time and provides basis for unified measurement of different activities, subsuming them under generalization of measured clock-time. Against superimposed universal time they propose 'common time' as a shared time using the sonic/musical metaphors of resonance, rhythm and vibration to understand those processes.

33 Michele Garau, *Without Why: The Existential A Priori Of Destituent Action*, https://illwill.com/without-why .

Lisa Robertson tackles our underdeveloped understanding of rhythm, providing a much broader and generalized concept beyond metrics and regularity:

> „Rhythm, an expression of form, *is* time, but it is time as the improvisation that moves each limited body in play with a world. Not necessarily metrical or regular, it‘s the passing shapeliness that we inhabit. It both has a history and *is* the history that our thinking has made. As I achieved the apex of excitement in my rereading of this beautiful document, attempting grasp anew how a concept becomes quite literally a landscape (for only much later in the history of this word had rhythm come to articulate and even make perceivable the repeating or cycling patterns we attribute now to nature), I felt the tick on my neck.“[34]

As we see rhythm in music is not so much happening in time, as it is at the same time producing time:

> „Drum your fingers on the table when bored and the rhythm seems to speed the waiting on. Sing a favourite old song to recall happy times past or ward off fears of things to come. In countless similar ways, music has long been used to provide structure to the day, the year, or even longer periods of time: music for harvest time, for remembrance, to augur or forestall. [...] Music is a machine for producing anticipation. Over the course of about three hundred years, from the end of the renaissance to the turn of the twentieth century, the tonal system of Western classical music was gradually engineered to become an extraordinarily sophisticated system for managing that anticipation. Certain chords would seem to beckon other chords to follow them. A sonata theme looked forward eagerly to its own recapitulation. Every note, every phrase would be precisely tailored to set up particular expectations that would either be fulfilled or frustrated, producing specific sensations in the listener.“[35]

When we listen to a single note, we anticipate its repetition. The introduction of the musical measure coincides with the scientific concept of measuring and the building of bourgeois capitalist society. To analyze the repetition of a sound 1 1 1 1 as divided into groups of 2 or 3, of accented and unaccented notes, therefor counting **1** 2 **3** 4 or **1** 2 3 (…), is not a given, but developed[36].

> „Quantity alone is just the „oneness“ or unity of the object. Measurement, however, links one thing (a quantity with qualities) to another thing (quantity with qualities). […] This practice of comparing two or more thing through a third thing is already the basis of exchange-value, […] This is what Marx means when he says that measurement, of which exchange-value is one type, is defined in part by natural qualities of sensuous objects but also in part by social convention.“[37]

34 Lisa Robertson, *The Baudelaire Fractal*, 184.
35 Robert Barry, *The Music of the Future*, 117/118.
36 For an in detail analysis see also: Eske Bockelmann, *Im Takt des Geldes – Zur Genese modernen Denkens.*
37 Thomas Nail, *Marx in Motion – A New Materialist Marxism*, 70.

Today a generaly assumed (Universal Standard Time) and a digitaly produced (the grid of datasets, i.e. samplerate) are two hegemonic forms of time-regimes. Those are the exchange value of time. An empty potential event in time. The abstract equivalent of time, its conceptualization as thing for measurement. So forcefully felt in counting the hours of work and leisure time, of leisure time and ‚lost hours'.

It also seems necessary to differentiate between human[38] and non-human[39] time. With developement of technological tools ‚non-human' time becomes especially interesting as machines (clocks, metronomes, timecodes, or DAWs) take over or add (their perspective) to our very own subjective experience. They add to our experience because they are either in another place (i.e. livestream or radio), on a micro- or macroscale (i.e. samples and subatomic or generative music and universe)[40] or in another time (i.e. a played back recording).

This becomes aware easily when we think about recordings (a technical side of time):

> „*TIME MOVES IN ONE DIRECTION, memory in another. We are that strange species that constructs artifacts intended to counter the natural flow of forgetting.*
>
> *I sometimes think that nothing really is new; that the first pixels were particles of ocher clay, the bison rendered in just the resolution required. The bison still function perfectly, all these millennia later, and what screen in the world today shall we say that of in a decade? And yet the bison will be there for us, on whatever screens we have, carried out of the primal dark on some impulse we each have felt, as children, drawing. But carried nonetheless on this thing we have always been creating, this vast unlikely mechanism that carries memory in its interstices; this global, communal, prosthetic memory that we have been building since before we learned to build. We live in, have lived through, a strange time. I know this because when I was a child, the flow of forgetting was relatively unimpeded. I know this because the dead were less of a constant presence, then. Because there was once no Rewind button. Because the soldiers dying in the Somme were black and white, and did not run as the living run. Because the world's attic was still untidy. Because there were old men in the mountain valleys of my Virginia childhood who remembered a time before recorded music. When we turn on the radio in a New York hotel room and hear Elvis singing "Heartbreak Hotel," we are seldom struck by the peculiarity of our situation: that a dead man sings. In the context of the longer life of the species, it is something that only just changed a moment ago. It is something new, and I sometimes feel that, yes,*

38 ‚Bio-Psycho-Social' as human-being. Including making of history, books, etc. In general human (inhabitational) experiences, theories & practices. As well as technology under certain aspects.

39 Geology, animals, plants, matter & technology (the last one under certain aspects).

40 Also see following illustration.

everything has changed. (This perpetual toggling between nothing being new, under the sun, and everything having very recently changed, absolutely, is perhaps the central driving tension of my work.) Our "now" has become at once more unforgivingly brief and unprecedentedly elastic. The half-life of media product grows shorter still, till it threatens to vanish altogether, everything into some weird quantum logic of its own, the Warholian Fifteen Minutes becoming a quarklike blink. Yet once admitted to the culture's consensus pantheon, certain things seem destined to be with us for a very long time indeed. This is a function, in large part, of the Rewind button. And we would all of us, to some extent, wish to be in heavy rotation. And as this capacity for recall (and recommodification) grows more universal, history itself is seen to be even more obviously a construct, subject to revision. If it has been our business, as a species, to dam the flow of time through the creation and maintenance of mechanisms of external memory, what will we become when all these mechanisms, as they now seem intended ultimately to do, merge? The end-point of human culture may well be a single moment of effectively endless duration, an infinite digital Now. But then, again, perhaps there is nothing new, in the end of all our beginnings, and the bison will be there, waiting for us."[41]

41 William Gibson, *Distrust That Particular Flavor*, 74.

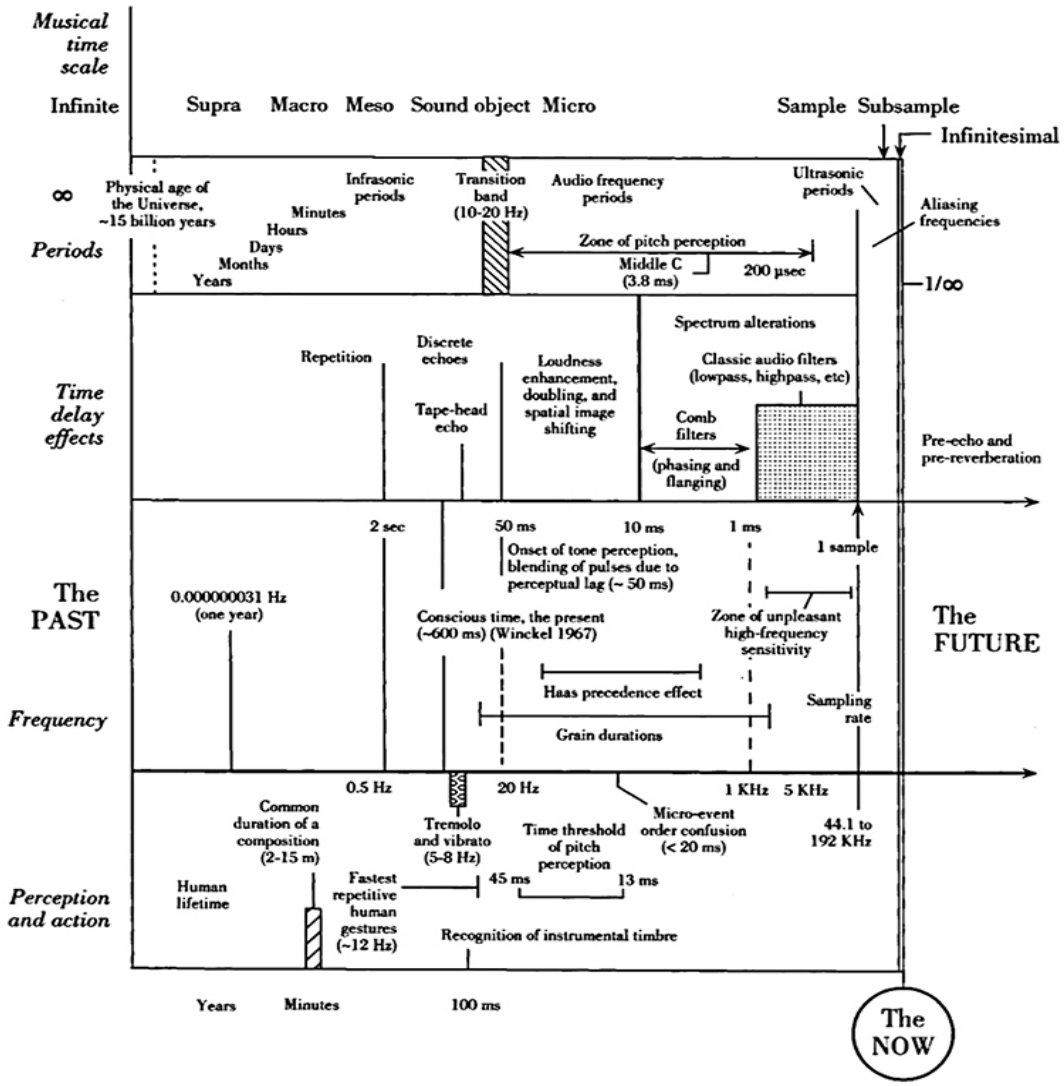

Figure 1.1 The time domain, segmented into periods, time delay effects, frequencies, and perception and action. Note that time intervals are not drawn to scale.

Illustration 3: originally published by Curtis Roads "Microsound"

3. [Case Studies I] Analysis

In the following I‘ll briefly summarize some experiences with examples of music exploring polymetrical, polyrhythmical and/or polytemporal structures. An underlying current in my studies were different noise and industrial artists, which offered a different take on time as well:

> „This auscultation is also present when noise stretches or compresses itself, making it a questioning of time, as opposed to music which is the structuring of time into clock time. Vomir‘s mass of noise endlessly recycles and never attains a moment in which it can dwell. The listener is brought to the idol of music which was supposed to help reveal time through chronological development, periodicity, narrativized sound sequences, and invited to touch ‚with a hammer as with a tuning fork‘ (ibid.). This empty time is brought out as always already having been the condition of music through the empty and emptying saturations of noise. Not that this will change anything, or provide a cure. Noise has not brought us to time, to a time or out of time. This is in fact time as a rejection of ‚being in time‘, noise becoming time that smothers the listener while fending him or her away.“[42]

Conlon Nancarrow „Studies for Player Piano“[43] was an interesting finding for me especially as he provided possibilities to rethink the relation of pitch and time or more specific melody line and the possible variations that occur by playing two or more melodies in different tempo at the same time. While we are used to hear polyphonic melodies in relative and synchronized tempo they will produce a certain harmonic structure that, most of the time, is conceptualized beforehand, exploring the realm of polytemporic-polyphonic melodies may result in unexpected relations between the melodies and their notes.

On a sidenote the incredible tempo that some of these melodies were played in reminded of the possibility to think of melodies less in the succession of singular notes than they proved to produce sound quality. As Karlheinz Stockhausen said in his „English Lecture“[44] they provide an example for the continuum of sound between the low frequential rhythmic qualities of frequency and the high frequential tonal qualities

42 Paul Hegarty, *a chronic condition: noise and time* in *reverberations – the philosophy, aesthetics and politics of noise*, 25.

43 Listen: Conlon Nancarrow, *Studies for Player Piano*, https://www.youtube.com/watch?v=1mKfQYzfduY&list=PLC82C02554EEEB986&index=1 .

44 See: Karl Heinz Stockhausen, *English Lectures (1972)*, as watched in: https://www.youtube.com/watch?v=lYmMXB0e17E&list=RDlYmMXB0e17E&start_radio=1

of frequency. Therefor „Studies for Player Piano“ provided a link between ‚classical contemporary music‘ and ‚speedcore‘[45], a genre that emerged from 90s ‚rave‘ – more specifically ‚gabber‘ and ‚breakcore‘ – by speeding up the tempo to an extreme degree. In ‚speedcore‘ its mostly breakbeats, heavy bassdrums and noises that are played at an tempo so fast that they develop qualities more similar to ambient- or drone-like music.
This observation again gives a little twist to Karl Heinz Stockhausen[46] for when he speaks of the fundamental link in music between tonal frequency and rhythm frequency as a continuity from a to b[47], he seems to still imply the supremacy of the tonal(-ity).
It seemed necessary to – at least ironically – inverse his phrase. Read it backwards.
Instead of reading:
the slower a tone/frequency becomes the more it becomes rhythm,
we have to read:
The faster a rhythm becomes the more it becomes tonal/frequency.
Therefor a rhythm can‘t be defined in simple frequency, as it is reductive to the rhythm itself, but we will define frequency by rhythm – the wandering in the phase of a waveform. Yet rhythm can not be reduced to repetition.

In contrast to Conlon Nancarrow‘s work Elliot Carter‘s „Piano Sonata (1945-1946)“[48] was especially interesting, because of two things:
First of all it‘s played by a human being. Therefor it is limited to some degree by playability.
But most importantly it has several points of synchronicity. It is polytemporic, but not permanently. It has points of departure and arrival, points of synchronization and of shifts. The interesting thing about these is, that polytemporic, polyrhythmic or polymetric changes, also change the alignment of melodies and with it the harmonic quality of each tone.

45 A possible example of this is the last minute of ‚Spiral Tribe‘ affiliated R-Zac „Nazi Europe Fuck Off“ produced in 1993. ‚Spiral Tribe‘ a collective of people travelling around europe in modified trucks doing ‚free tekno‘ events at every stop. They are an especially interesting sidenote as they produce ‚free tekno‘, which avoids genre classification, may include jumps or changes in tempo, employ unvoncentional combinations of sounds and much more.
46 See: Karl Heinz Stockhausen, *English Lectures (1972).*
47 As it is a question of time, as shown in illustration 3, originaly published by Curtis Roads *Microsound*.
48 i.e.: Elliot Carter, *Piano Sonata (1945-1946)*, https://www.youtube.com/watch?v=SZxp8O_Lvyg .

It seems that an ‚inverted' relationship of rhythm and frequency is not the only thing we end up with by using polytemporic, in addition the monochronic, a mono-causal-linear history, is replaced by polychronicity. Some decades later postmodern philosopers announced the end of the metahistory[49] and the beginning of a plurality of histories.

> „First performed in 1946, it is a strange and sinuous piece of music [Elliott Carter's Piano Sonata], marked by dramatic changes of tempo and metre that somehow never feel abrupt or forced. For Carter, the piece marked the tentative beginnings of a new approach to music. At the time of its composition, Carter wrote to Edgard Varèse explaining that the piano sonata represented his newfound interest in "the plastic flow of music and in contrasting rates of change … My music," he explained at the end of the letter, "is essentially a kinetic projection of ideas, using perspectives of time."
>
> The technique he employs in this work, later dubbed "temporal modulation" to indicate the way the overall structure is determined by changes in time rather than harmonic colour, would find an even clearer exposition in his string quartet of five years later. Much of the tension in this later work derives from the feeling that the different voices are sometimes slipping away from each other or rushing to catch up, such that at times all four string instruments are effectively operating in entirely separate time zones, one surging forward towards the change of metre that's just about to happen, another still dragging its feet mid-twentieth century. Each are possessed of a flow that feels mysteriously unquantifiable and indivisible.
>
> It starts me thinking about Robert Hassan's idea of "network time" as "a smashing of the uniform and universal linearity of the clock into a billion different time contexts within the network." In a strange way, Carter's music seems to anticipate the "connected asynchronicity" of Hassan's networks, notes pressing forward in dynamic disequilibrium, each instrumental "character" occupying its own distinct time context. Carter's many-stranded musical narratives point forwards from cinema's montage of attractions towards a temporal montage. Slowly shifting plate tectonics erupt, here and there, into explosive sonic volcanos where the different instrumental lines collide and break apart again. A sudden chord can seem like an earthquake on the International Date Line, tearing time apart at the seams."[50]

With her album „Black Origami" Jlin produced a polymetric, polyrhythmic and in some moments and levels even polytemporic ‚bass music' with pop-appeal. While using difficult time-signatures and rhythms, her music never puts it in the forefront. Unlike most of the music that is featured in the context of so called ‚IDM (intelligent dance music)' or academic contemporary music it is complex without being pretentious and need to prove it. The loopy melodies provide a backdrop to fall in.

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49 Jean-Francois Lyotard, *libidinal economy,* and *the postmodern condition*.

50 Robert Barry, *Music Of The Future*, 166/167.

The whole body of Sun Ra‘s work has over and over again being of interest to me. Not only to the fact of its musical qualities in a classical sense, but especially as afro-futuristic sonic-fiction. The sonic-imagery told by Sun Ra of other worlds free of domination, the mothership connection, his critique of his-story, and many more. It was this underlying philosophical and social concerns informed by being black and queer that were of particular interest.

On the level of music and sound itself Sun Ra‘s exploration of ‚Free Jazz‘ provided a huge variety of qualities in which the sonic experience and narrative seem to inform the musical structure and vice versa.

Polyrhythmicality and polytemporic structures are employed freely.

To use a term coined by Steve Goodman Sun Ra‘s music is an example of „Black Noise“[51], which is the criticism of (White) Noise music.

> “There is an interesting contrast between futurism’s celebration of the art of war in the noise and Afrofuturism’s art of war in the art of rhythm.”[52]

White Noise tends to focus on the frequency spectrum for producing extremities between loud-/full-spectrum-sound and quiet-/minimal-spectrum-sound or between order and disorder.

Black Noise is the criticism of White Noise music.

> “The futurist legacy, the art of war in the art of noise, aside from widely debated questions of its cryptofascism, misogyny, and contemporary influence on a sonic avant-garde, is, in addition, chrono-strategically compromised. The future it wishes to speed off into rests on a unilinear notion of history, of technological progress and the enhancement of the human condition by prosthetic append- ages. Man, for futurism, is not truly mutated, but is only upgraded in a white, metalicized übermensch. The futurist legacy has usually meant “white noise.” Meanwhile, the Afrofuturist version of this futurist tendency, especially as formulated by Kodwo Eshun, remains the most compelling surviving strain. Notably, here, the focus for Eshun crucially shifts from noise to the futurhythmachine and from fastness to a complex ecology of speeds. This spectral presence of the futurhythmachine haunts the this book. Eshun’s mutation of futurism immedi- ately moves it to a much more sophisticated temporality, polyrhythmic instead of unilinear, a cyclical discontinuity in which there is a virtual coexistence of both the past and the future in the present.”[53]

51 Also see: Steve Goodman, *Sonic Warfare*.
52 Steve Goodman, *Sonic Warfare*, 114.
53 Steve Goodman, *Sonic Warfare*, 59.

Black Noise[54] tends to focus on rhythm as tool for producing noise, it tends to be polyphonic on a level of the intradependency of voices, it is often combined with ((afro-)futuristic)-narration/-storytelling or more specific „sonic fiction“[55] and „sonic thinking“[56].

> “In its most convincing formulations, the negativity of the politics of noise is twisted into an engine of construction, and noise becomes a reservoir of rhyth- mic potential, a parasitic probe beckoning the future. Usually noise here, in a nontechnical sense, is black noise—the black noise of what Kodwo Eshun calls the futurhythmachine. It is to black noise that twentieth-century popular music owed most of its innovations. Black noise, painstakingly crafted in the context of enforced migration, depressed urbanism, and ethnic suppression, becomes a locus of affective collectivity. Feeling around in the dark, in the toxic smog of megalopian pressure, when no hope seems to exist, when no stability persists, rhythmic decisions still get made, collectives mobilized, and potential futures produced. The rhythmic breakthroughs of the electronic musics of the Black Atlantic have been countless.“[57]

DJ335[58], 6SISS[59] or Grischa Lichtenberger[60], too, produce polymetric and polyrhythmic music using a certain signature sound aesthetic of glitch/clicks‘n‘cuts that holds everything together. The most of the time rather minimalistic set of instruments/sounds make it possible to explore different rhythms while still being consistent in the ever-changing process.

Kynan Tan[61] was one of the musicians I found in my research for this thesis and polytemporic music. He is one of the few who actually produced their own software/patches for a deep dive into polytemporic possibilities. Many of his productions work with glitchy, minimalistic sound aesthetics and loopy rhythms. These loops are polytemporic beyond simple polyrhythmic or polymetric structures. The ‚simplicity‘ of the structures allows for continuous observation of changes.

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54 i.e. Sun Ra, Public Enemy, Lee ‚Scratch‘ Perry, SubDub, Mykki Blanco or….
55 Kodwo Eshun, *More brilliant than the sun*, or based on it Holger Schulze, *sonic fiction*.
56 Bernd Herzogenrath, *sonic thinking.*
57 Steve Goodman, *Sonic Warfare*, 192.
58 Album by DJ335 on the label „no-ware“: https://no-ware.bandcamp.com/album/when-pressure-goes-pleasure
59 Album by 6SISS: https://6siss.bandcamp.com/album/prisma
60 Grischa Lichtenberger, *Spielraum-Allgegenwart-Strahlung*, http://www.grischa-lichtenberger.com/spielraum_allgegenwart_strahlung/
61 Homepage and examples of music: https://kynantan.com/polytemporal-2/
Bandcamp for more examples: https://kynantan.bandcamp.com/

4. [Development] Definitions, Implementations, Tools & Code

The terms polymetric and polyrhythmic get confused a lot. Polytemporic is even widely unknown.[62] And non-linearity more or less unthought in terms of musical timing. In the chapters about Poly-Werk and Werkform we‘ll discuss the notion of time beyond singular pieces. Therefore in the following chapters I‘ll try to find working definitions for each, as well as displaying mathematics and possible implementations[63].

As implemented in Max/MSP (or gen~) the general assumption is, that (step-)sequencers are based on the principle of reacting to a phasor~/saw-waveform as controlsignal. The lowest accessible level in audiosoftware is the underlying samplerate itself.

4.0. Tempo-Control

Already beginning with my studies I‘ve implemented an LFO control for the BPM in Ableton-Live via Max4Live. It allowed to change the Tempo from -100 to +100 BPM in x Hz frequency with a continuous shape from sine over noise to sample-and-hold. And/or use the heartbeat measured via bitalino[64] to generate the basic BPM instead of heaving a static one. Although this approach, from today's perspective, seems insufficient to me, or does not go far enough, it provided the basis to explore further steps towards a non-static tempo. The reversibility, or rather the possibility to return to a static tempo, remained a constant concern. It should be noted that what is practical about this approach is that the tempo changes can be recorded as automations and accordingly proved useful beyond the live set-up.

62 Martim Schneider Galvão *Metric Interplay: A Case Study In Polymeter, Polyrhythm, And Polytempo* describes the theoretical outlines, providing a comparison of those different metric concepts.
Peter Alexander Thoegersen *Polytempic Polymicrotonal Music: „A Road Less Traveled“* analyzes a variety of polytempic compositions from a musicological point of view. Understanding polytempic music as a paradigmatic shift for a new musical aesthetic.
Also: Peter Thoegersen, *Polytempic Polymicrotonal Music and Freedom*

63 The implementations are based on my liveset and explorations done in Max/MSP. Many of those are based on the effort of others, who‘s papers will be cited accordingly.

64 *bitalino* is an arduino board especially designed for measurment of biomedical data: https://bitalino.com

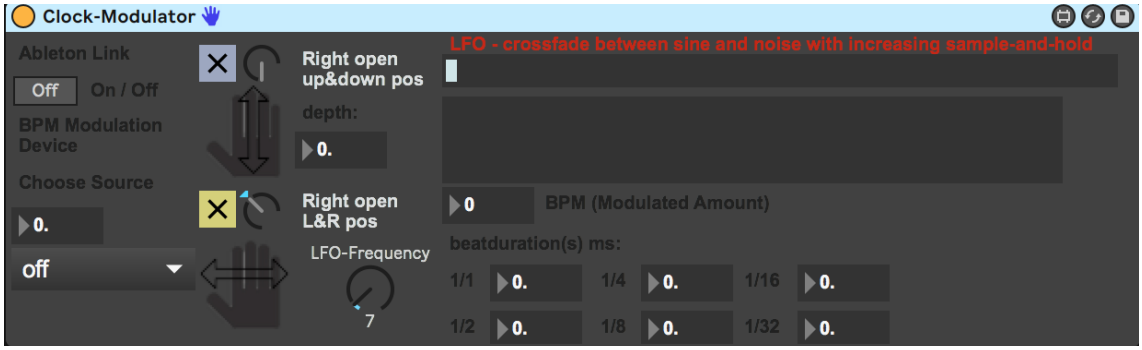

Illustration 4: Clock-Modulator - Interface

With VCV-Rack-2 a similar feature was implemented by Jeremy Wentworth as VCV-module called „STR1KER“[65] and is also useable in Ableton Live.

Which inspires to update my very own module for some new features.

- Add a synced function for the frequency of change in BPM. The main idea behind this is to get a recursive function, that is kind of chaotic, but maintains a certain stability as a system in itself, as each change in BPM will change the frequency of the synced-LFO.
- Add a % function to the BPM adjustment to make it relative, with the possibility to switch between baseBPM and current/liveBPM, while the second will again introduce recursive behaviour. As well as enhancing the range beyond +/-100BPM for the fixed BPM adjustment.
- Extend the LFO, as well as adding a step sequencer, and similars
- Use it to directly generate signals for tempo generation

4.1. Polymetrik

Polymetrics basically is the simultanity of (at least) two different metres at the same time, that will synchronize again at the least common multiple (LCM).

65 Peter Kirn, *Here's a free custom VCV Rack module controlling tempo and time in Ableton Live,* https://cdm.link/2021/12/heres-a-free-custom-vcv-rack-module-controlling-tempo-and-time-in-ableton-live/ .
Jeremy Wentworth, *JW-Modules,* https://github.com/jeremywen/JW-Modules#str1ker .

If we speak of polymetrics in relation to an underlying clock, the polymetrics are two different slaveclocks, that relate to one another on the basis of multiplications by natural numbers of a masterclock, therefore not concerned with the synchronicity inside one bar, but have different lengths beyond that.

4.2. Polyrhythm

Polyrhythmics basically is the simultanity of (at least) two different divisions of a bar. In stark contrast to polymetrics, polyrhythmics generally are synchronized per bar.

If we speak of polyrhythmics in relation to an underlying clock, the polyrhythms are two different slaveclocks, that relate to one another on the basis of divisions by natural numbers of a masterclock, therefore depending on the same length of a bar.

For generating rhythms in Max/MSP I originally used ‚metro', ‚counter' and ‚bang', while Gregory Taylor[66] introduced me to using ‚phasor~', ‚rate~', and ‚edge~' instead. Even later I learned that it needs to be processed in gen and/or as signal – not entering the message domain at all – to maintain sample accuracy. But we'll come back to this.

Another or rather a derivate of the same technique is explored by Tom Hall for his „MaxMSP Livestream #1"[67]. By sending several numbers generated in harmonic-ratio to each other to a ‚mc.rate~'-object, using the message ‚harmonic $1 $2', he manipulates the rate of several phasors at the same time and in (abstract) harmonic relation to each other. Which is especially interesting if we take into account relations of tempo (in frequency) and harmonics (in frequency)[68]. These relations of tempo and harmonics is also one part of what is by Conlon Nancarrow as described above. Although this is an interesting approach, which needs more exploration, it didn't prove

66 Gregory Taylor, *Step by Step – Adventures in Sequencing with Max/MSP.*
67 On: https://www.youtube.com/watch?v=oXAdajWXjzk or via his homepage: https://tomhall.com.au/project/maxmsplivestream1/ .
68 Also see: John Greschak, *Tempo Scales in Polytempo Music*, https://polytempomusic.blogspot.com/2007/09/tempo-scales-in-polytempo-music.html .

generalizable enough to me. Yet it provides strong relations between the different tempi and therefore is useful for immediate interesting results.

Slightly different is the technique used by Mark Fell[69], who divides a set amount of time by x to generate ‚normal' to very fast rhythms. This seems useful if you're less concerned with classical rhythmic structures, or think about dividing time again inside the rhythmic structure to produce some sort of substructure. I.e. while generally maintaining a division in 8th notes each note can further be subdivided for the actual events/triggers to happen.

To think of polyrhythm in relation to an underlying phasor~ that's manipulated with a rate~ object is especially useful, as it allows for the combination of polyrhythmic and polymetric procedures at the same time.

4.3. Polytemporik[70]

Polytemporic basically is the simultaneity of (at least) two different clocks. They can be independent from one another or relational to each other. Therefore one of the main problems concerning implementation is synchronicity: How to end up with a point of synchronization after x-beats.

Figure 2: Example of ramping from 90 bpm to 120 bpm in exactly 20 beats. Notice how the tempo transition finishes on beat 20 of the changing tempo and beat 16 of the static tempo.

Illustration 5: Taken from Bryn Bliska & Charles J. Holbrow "Tempo Toy: A System for Composing Dynamically Polytempic Music"

69 Explained in: Mark Fell, *Works in Sound and Pattern Synthesis ~ Folio of Works.*

70 Polytemporik or Polytemporic is used to express the necessity to differentiate between Polytemporik, as musical category for several clocks at the same time, and Polytemporality in a broader sense, which is even closer to the Chronological or Philosophy of Time.
Also see: Karin Wetzel, https://karinwetzel.de .

Polytemporic structures do not so much relate to an underlying masterclock, but produce a metaclock based on the synchronization points of the used clocks. i.e. if you're using 2 or more different clocks they get out of and back in phase over a course of time. The masterclock (or samplerate) underlying is not so much defining the polytemporic-clocks, but is defining the accuracy of the multiple clocks.

Several papers on calculating dynamic tempo changes and polytemporic composition more generally exist.[71] In all of them Kurt Mikolajczyk's Master Thesis „Dynamic Polytemporality" is outstanding in outlining the mathematics (for a straightforward implementation in MaxMSP). His MaxMSP implementations for generating polytemporic grids inside Ableton-Live „geocalcedit", „nminusone" and "BezierAccel" are available for free online[72]. The following mathematic equations, which I used for implementing a real-time dynamic-tempo clock generator, are heavily based on his paper.

Tempo generally is measured as beats or units of time, which in a DAW is referenced as Beats per Minute (BPM). To calculate the duration (b) of a given BPM (T) we use the following formula:

$$b = \frac{60}{T}$$

Which can be reformulated as, for BPM with a given duration:

$$T = \frac{60}{b}$$

71 Jan C. Schacher & Martin Neukom, *Where's the beat? Tools for dynamic tempo calculations.*
Philippe Kocher, *Polytempo Composer: A Tool For the Computation Of Synchronisable Tempo Progressions*.
Christopher Dobrian, *Techniques for Polytemporal Composition.*
Bryn Bliska & Charles J. Holbrow, *Tempo Toy: A System for Composing Dynamically Polytempic Music.*
John MacCallum & Andrew Schmeder, *Timewarp: A Graphical Tool For The Control Of Polyphonic Smoothly Varying Tempos.*
Kurt Mikolajczk, *Dynamic Polytemporality.*

72 Max4Live, profile, https://www.maxforlive.com/profile/user/kurtmiko .

For dynamic tempo changes, we have to account that each beat has a different duration. This can be achieved by

> „using a geometric series, where successive durations of notes are recusively modified by a constant rate of change.
>
> To create a geometric series, shown in equation […], a rate of change *r* must first be determined. To calculate this, the composer is required to select a start (T_1) and ending tempo (T_2), and a number of notes [until ending tempo is reached], *n*, to be articulated in a dynamic tempo.

$$r = \sqrt[n]{T_1 / T_2}$$ „[73]

Although Kurt Mikolajczk provides further mathematics for the implementation of different curves besides linear tempo change, I'll leave it out at this point, as it wasn't necessary for my implementation.

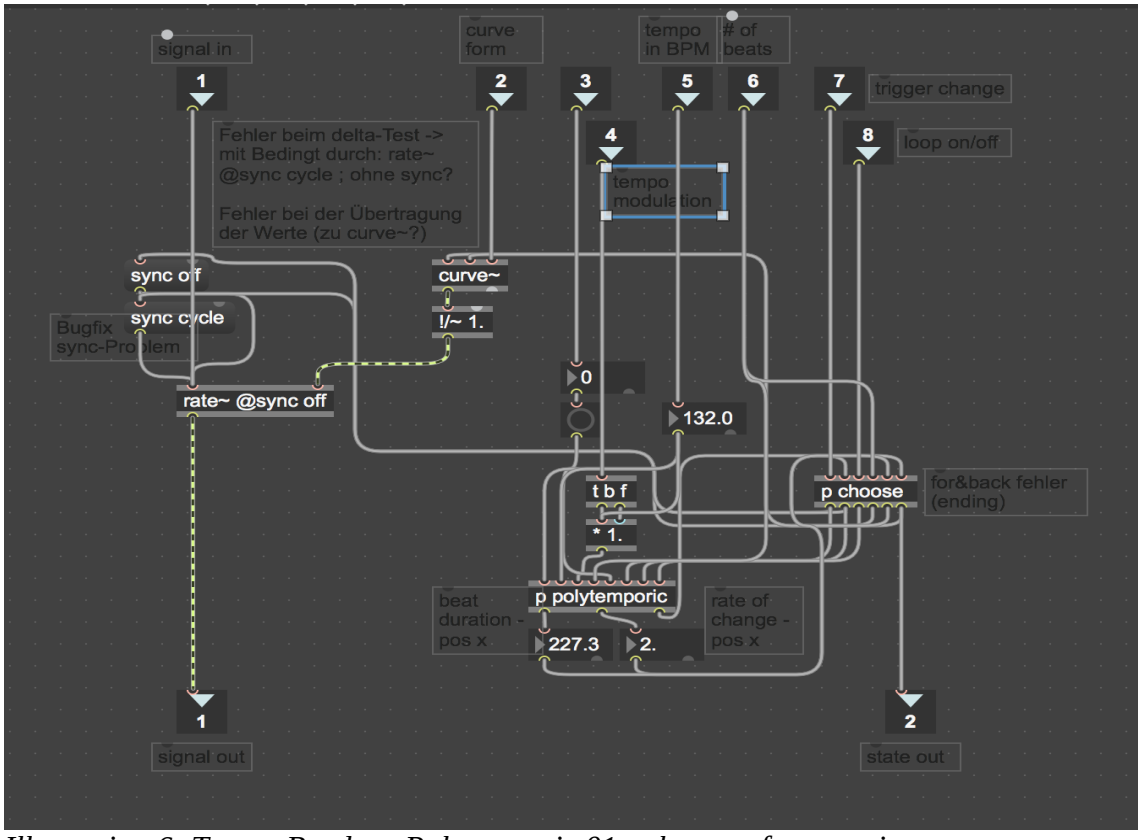

Illustration 6: Tempo-Bender - Polytemporic 01 ; change of tempo via rate~

73 Kurt Mikolajczk, *Dynamic Polytemporality*.

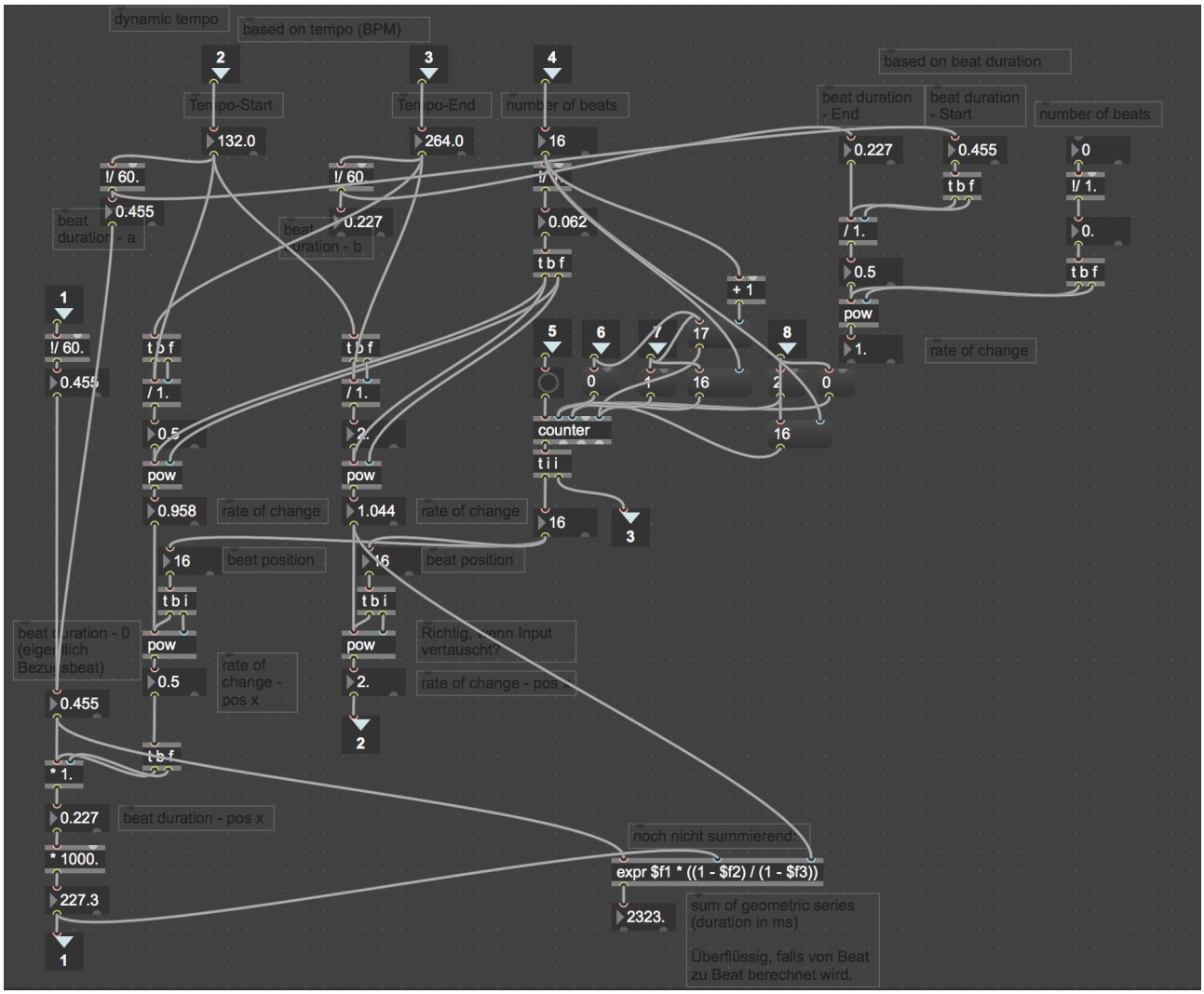

Illustration 7: Tempo-Bender - Polytemporic 02 ; implementation of mathematics

So far, as a work around, the automatic re-synchronization of rate~ has to be turned off for a smooth transition between the different tempi, while it has to be turned on when arriving at the destination.

The Ableton M4L-Device „Tempo-Bender“ interface looks as follows:

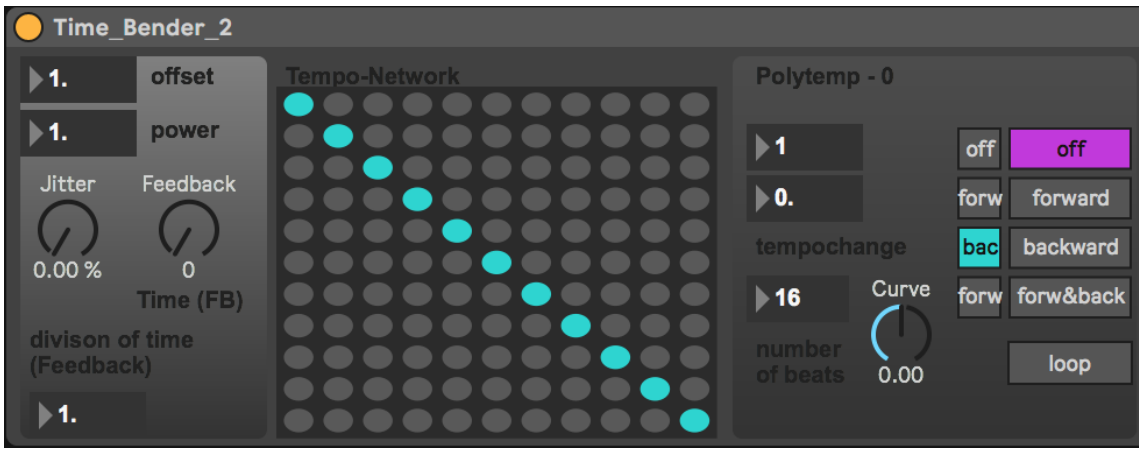

Illustration 8: Ableton M4L-Device - Tempo-Bender

- On the left are different tools for non-linear-time-distortion affecting the masterclock, which will be explained in the following chapter.
- In the middle is a ‚Tempo-Network', that allows for the distribution of each of the 11 clocks to be send to 11 sequencers (in this example every clock is send to its respective sequencer).
- On the right side is one exemplary ‚Polytemp - #'-Node, that allows for the change of tempo over time:
  - The two numbers in the top left corner are the amount of tempo change that will be changed and allow for integer (top), as well as floating point (below).
  - On the bottom left is the number of beats (currently 16) that it will take to arrive at the destinated new tempo.
  - Next to it is a curve function enabling non-linear tempo changes.
  - Visible on the right side are the buttons (bigger ones) and status symbols (smaller ones), as well as the loop function (bottom right).
    - The buttons trigger the tempo change, going either
      - from the basic tempo to the destinated tempo
      - from the destinated tempo back to the basic tempo
      - or forward and backward between basic and destinated tempo
      - the loop state, obviously, turns on or off a loop for these changes

4.4. Non-linear-time(s)

We can speak of non-linear-time, if the clock function is switched from linear behaviour to non-linear behaviour. In common step-sequencers each step takes as long as the other, or at most is behaving in a proportional ratio. With non-standard-step-sequencers the length of each step is not relating to the basic tempo in a linear, but in a non-linear fashion.

In the most extreme case, we introduce this on the level of sample-rate itself, in which case it might be interesting to explore sample-rates beyond the commonly used 44.1kHz or 48kHz as it will allow for different variation(s) and higher accuracy.

Essentially non-linearity in the time-domain of music struggles with the grid of digital music production itself. A DAW is unable to function without a defined masterclock, yet, it is possible to redefine it anew by producing a non-linear clock on top of the original samplerate, which is used as masterclock afterwards.

One of my earlier and very fruitful inputs into what and how non-linearity can be introduced into music sequencing was by Michele Zaccagnini‘s paper „Non-linear Sequencing“[74] published 2020 and implemented in Max8. „In particular, the paper explores ways of breaking away from the linear nature of the sequencer’s time function, one that has characterized it from its inception.“[75] He‘s making a distinction between two types/techniques of non-linear sequencing:

a) Sequencer Distortion:

Sequencer Distortion is based on the idea of waveshaping. He basically plays a buffer table that is based on a nonlinear function back via the wave~ object synchronized by an underlying phasor~ object. The wave~ object then plays back a buffer table that includes the sequence pattern via index~.

74 Michele Zaccagnini, *Non-linear Sequencing*, https://michelezaccagnini.wpcomstaging.com/wp-content/uploads/2020/05/Non-Linear-Sequencing-05_05_2020-2.pdf .
Recently his project „non-linear-sequencing“ became available as package for MaxMSP.

75 Ibid.

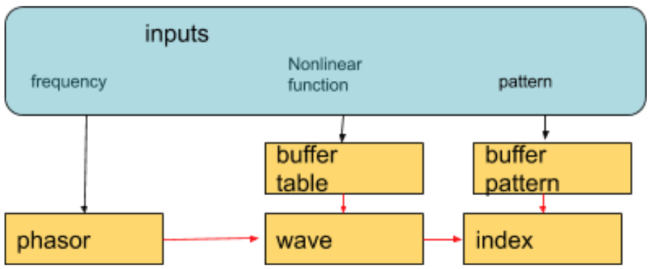

Fig. 1- Sequencer Distortion: Max diagram. Yellow boxes are signal rate objects.

Illustration 9: Michele Zaccagnini "Non-linear Sequencing", Sequencer Distortion

The ‘Sequencer Distortion’ technique seems promising to also be implemented as a tool for producing non-linearity for playing back midi-sequencing produced in Ableton-Live. The schematic would be: Midi (Ableton) → M4L-Device → MidiOut (i.e. Instrument in Ableton)

This solution would be more practical for composition, as the sort of generative approach used by Michele Zaccagnini seems to be fitted better for live situations.

On top using two buffers, with one having a regular saw waveform and the other having the ‚distortion‘, would provide the possibility to have some sort of dry/wet control over the ‚Sequencer Distortion‘, therefore you could go to a non-linear-sequence and back again. Interesting about the technique of ‘Sequencer Distortion’ is, that it’s easily accessible and adjustable: Any mathematical waveform function can be used as material for the buffer(s).

A still open question to me is how to make it useable in hectic live-situations in which time is crucial and replacing the buffer-table with a new table, to get a new, different non-linear-distorted sequence.

A possible solution would be to use interpolation between different buffers could provide for a great variety of non-linear sequences, while at the same maintaining more control over the results.[76]

76 Gregory Taylor, *Winter‘s Day gen~: The Wavetank*, https://cycling74.com/tutorials/winters-day-max-msp-gen-the-wavetank .
In this tutorial Gregory Taylor transfers the concept of a 3D wavetable from the analog/modular world into Max/MSP (or rather gen~).

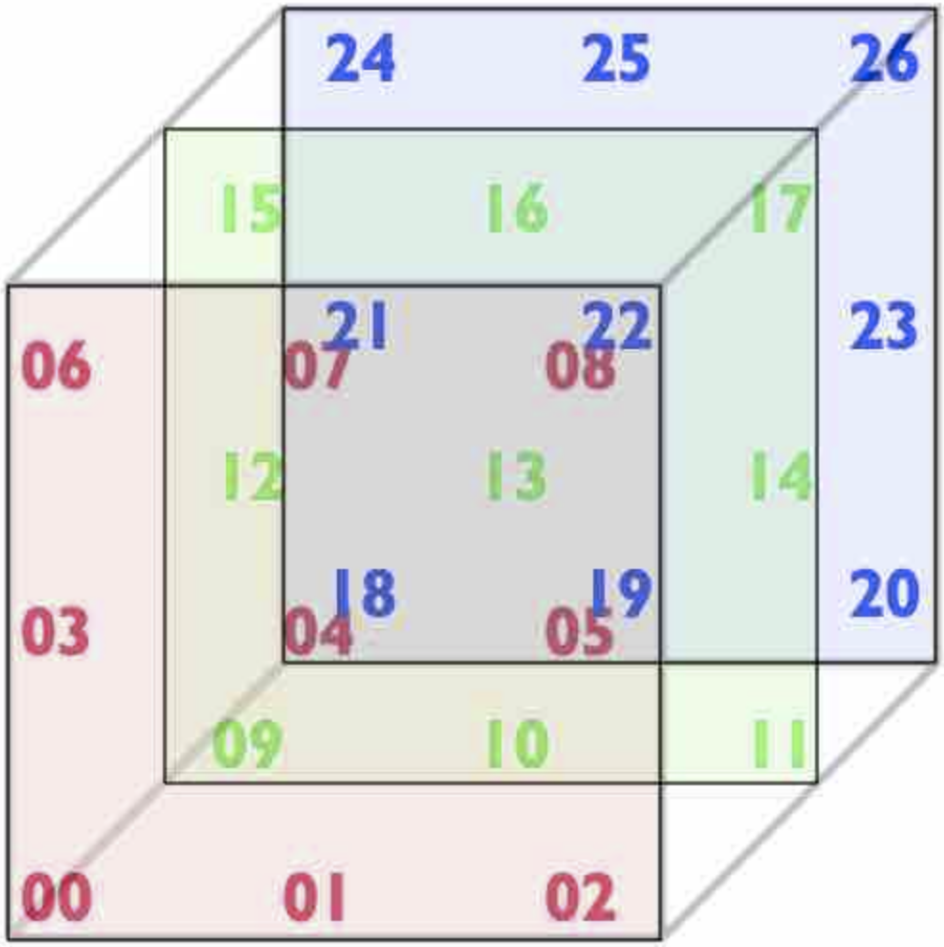

Illustration courtesy of Darwin Grosse

Illustration 10: 3D-Wavetank ; a 3D wavetable ; https://cycling74.com/tutorials/winters-day-max-msp-gen-the-wavetank

b) Fluctuating Sequencer:

The Fluctuating Sequencer is a little bit more complicated as the fluctuation around the actual tempo is being compensated to „maintain a predictable behavior of the sequencer over time“[77].

77 Michele Zaccagnini, *Non-linear Sequencing*, https://michelezaccagnini.wpcomstaging.com/wp-content/uploads/2020/05/Non-Linear-Sequencing-05_05_2020-2.pdf .

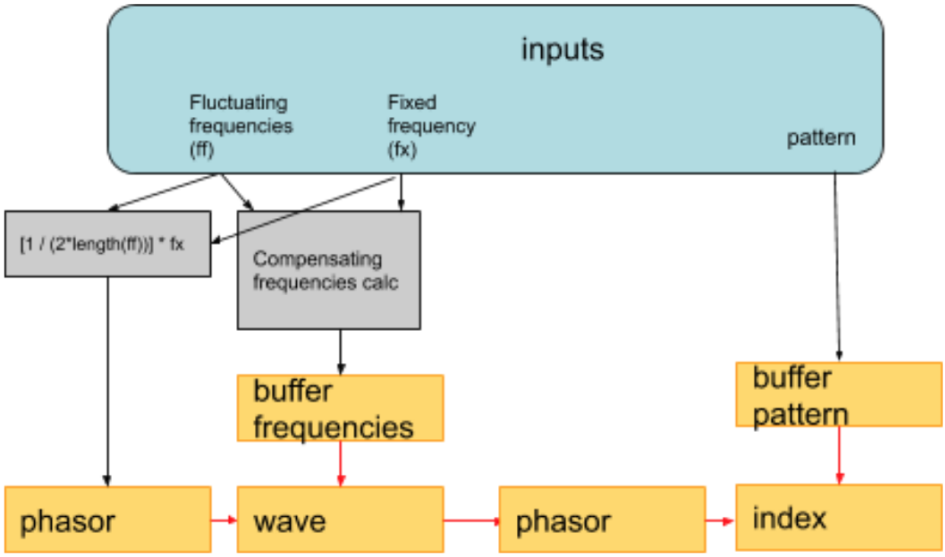

Fig. 2- Fluctuating Sequencer: Max diagram. Yellow boxes are signal rate objects.

Illustration 11: Michele Zaccagnini "Non-linear Sequencing", Fluctuating Sequencer

Through a talk with Daniel Mayer during my studies he provided a quick reimplementation of the „Non-linear Sequencing“-techniques to SuperCollider. Please find the SuperCollider code in the Appendix (unfortunately the annotations are in german). It is still a work in progress and in the future possibly be included in his “miSCellaneous lib”[78], a program library for SuperCollider.

Both of us were curious if and how it might be interesting and useful to adapt these techniques to control the playback of audio directly instead of using it for generating sequences. The output would probably sound a lot like ‘scratching’ with vinyl does[79].

4.4.1 Tempo-Distortion/-bending

Generally speaking, derived from usage of Max/MSP, counting in DAWs or sequencers is driven by the repetition of Saw-Waves (i.e. Sample-Rate or an Oscillator). One completed cycle corresponds to a bar or a step. This saw-wave is then again processed via bitcrushing (like in analog/modular environments) or directly used to drive a counter (like in digital, message based, environments).

78 Daniel Mayer, *miSCelleaneous lib*, https://www.daniel-mayer.at/software_en.htm .

79 „TimeShaper 2“ by cabelguys seems to function in a similar fashion: https://www.cableguys.com/timeshaper.html .

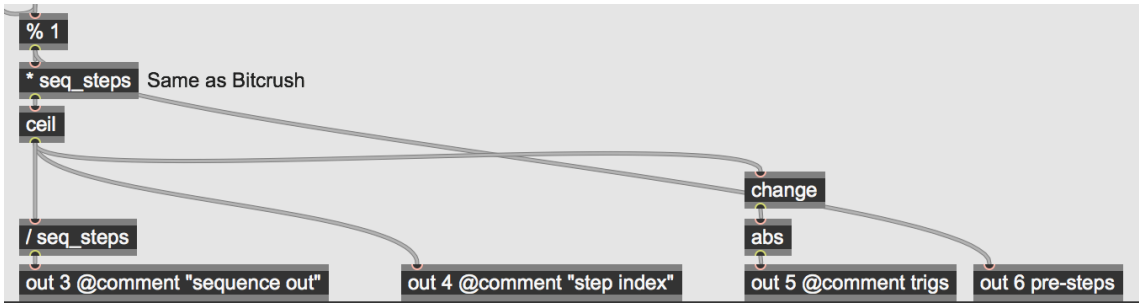

Illustration 12: generate steps out of an oscillator in gen~ (MaxMSP)

By misusing the functionality of Max/MSP‘s ‚rate‘-object, we can produce non-linear-progression by distorting the input signal. This process is some sort of glitch-technique. Manipulating the source input of the masterclock (provided by a ‘phasor~’-object) with introducing offset, get the power of n of it or sending it into a feedback loop before the ‘rate~’-object generates a non-linear, yet still working control-signal (‘Illustration 13’ for detailed implementation).

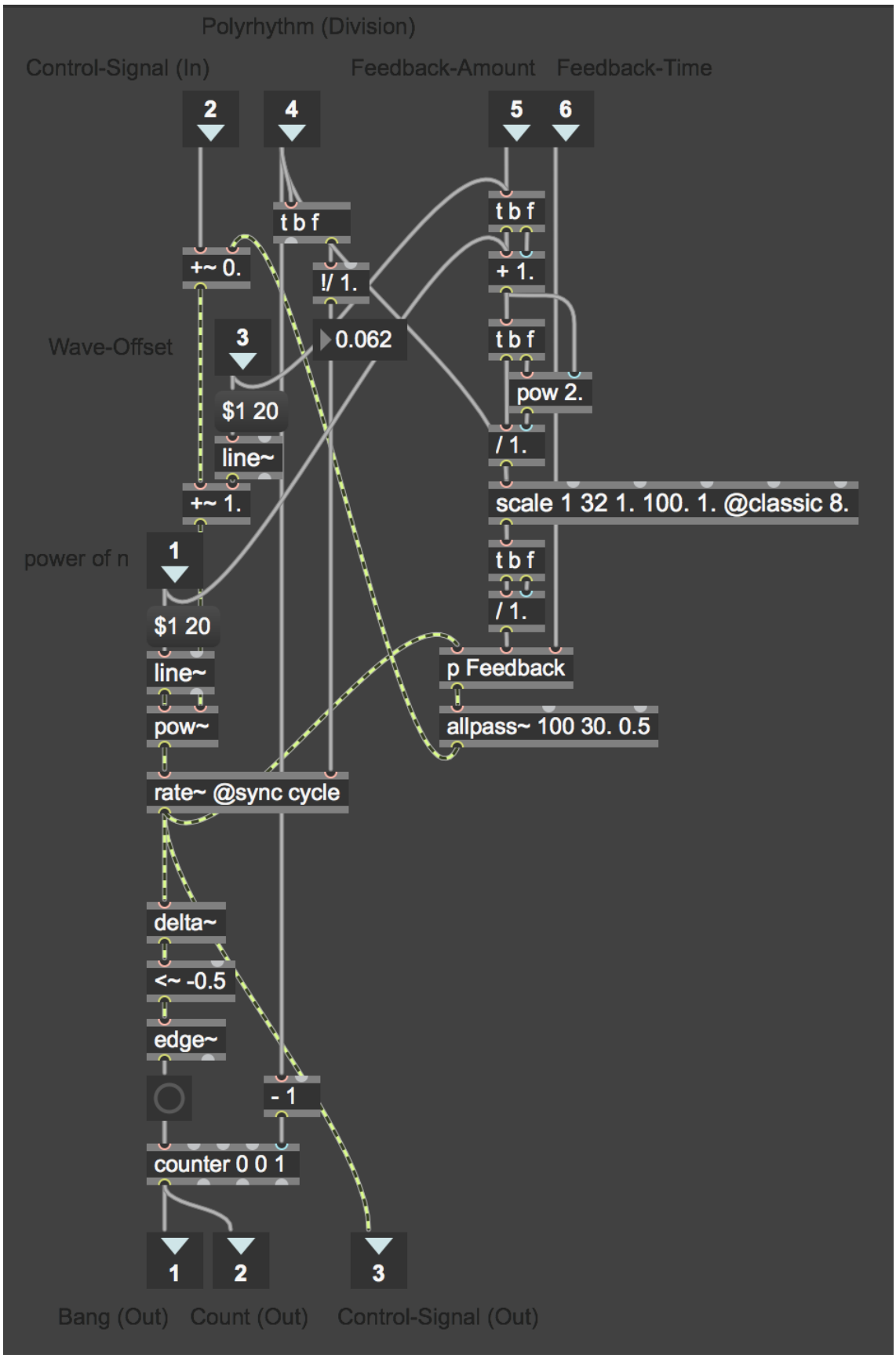

Illustration 13: Inside the polyrhythm and sequencer distortion (of the 'non-standard-sequencer')

4.4.2 Tempo-Synthesizer/-Machine[80]

If we continue this argument, what can be developed is a ‚tempo-synthesizer' by changing certain aspects of an original waveform to produce counting.

Different possibilities open up, by employing different techniques to achieve it…

a.) … by using functions other than the saw-waveform to begin with:

b.) … by employing buffers:

Using a buffer allows to move in, jump in-between, or chop the used waveform. Therefore producing progressions in time, that are not necessarily bound to follow the waveform from 0 to 1 in a linear fashion.

c.) … by modulating, similar to using modulators/LFOs for soundsynthesis:

- either modulating the input signal with another modulator-wave (LFO)
- or modulating the input signal with itself

d.) … by applying saturation/distortion/functions to change the original waveform:

This concept is already explained in „4.4.1 Tempo-Distortion/-bending".

e.) … by applying mathematics/synthesis techniques to the different timelines:

So far, sequences are thought of as being either: independent or, more often, slaves to the master clock. Combining the output of different clock-generators opens a completely different way of generating time in music. Think of two different clocks that are used for two different sequences, by i.e. multiplication (FM-/AM-synthesis) we produce a third, resulting, clock derived from the input.

f.) … by using feedback-loops:

Using feedback-loops for generating or bending clocks is a little bit more tricky, than the other approaches. One of the main problems is that the resulting amplitude of the waveform needs to be kept in a certain range, while at the same time higher feedback amounts are interesting as they produce more non-linearity.

80 In analogy to Kodwo Eshun calling the drummachine a rhythmsynthesizer or rhythmachine to emphasize the difference between a machine simulating actual drumming and what those rhythmachines actually produce, I use the term Temposynthesizer/-machine to amplify the imagination to go beyond (or sometimes even against) the clock.

Tests for these ideas need to be continued, but for many of these ideas I‘ve found solutions now by moving to gen~. More details in Chapter „4.5.0 Re:Create – gen~ification“

4.4.3 Self-organized dynamical systems (placeholder for future studies)

This is more or less a placeholder for future studies as it is a whole other field for-itself. Nonetheless, it should be briefly mentioned here.

Self-organized dynamical systems (i.e. relativity, gravitation, etc.) occur in many disciplines ranging from physics, to chemistry, biology, robotics, cognitive studies, or social sciences and have a vast field of applications including “crystallization, thermal convection of fluids, chemical oscillation, animal swarming, neural circuits, and black markets.”[81]

The Kuramato Model, or phase locked loops (PLL), may provide a promising basis for rethinking time-based structures along the already examined tools for introducing non-linearity in music[82].

4.4.4 Audio to Sequencer – FX

If we follow the idea described so far, it is possible to produce a generative sequencer that uses any audio-input-signal for producing accompanying steps in gen~ (MaxMSP)[83]:

audio in → sample & hold → output steps index

For example you can use the Audio-Output-Sum for producing the sequence, which again will influence the Audio-Output-Sum, which causes recursivity in a strange and kind of displaced way. Or you can ‚automatically‘ produce a sequence based on any audio-recording. Or… any audio-/signal-input.

81 Wikipedia, *Self-organization*, https://en.wikipedia.org/wiki/Self-organization .
82 Scholarpedia, *Synchronization*, http://www.scholarpedia.org/article/Synchronization .
83 also see: Chapter „4.5.0 Re:Create – gen~ification“

In the first tests an occurring problem is that audiosignals change to fast, therefor the generated sequences produce rather glitchy results. To integrate the audiosignal over time, i.e. RMS, or limiting the used bands might prove useful.

4.4.5 Ornament: Risset-Rhythm-FX

Illustration 14: Risset-Rhythm (Interface)

The „Risset-Rhythm“ was originally discovered and developed by J. C. Risset[84] and is analogous to the „Shepard-Tone“. Both are acoustic illusions: When listening to the „Shepard-Tone“ you‘ll perceive the tone as permanently going up or down in pitch, and while listening to „Risset-Rhythm“ the same perception is happening in the time domain and the sound is perceived to endlessly become faster or slower. Both effects are produced by mixing the original signal with duplications that change in volume in relation to the level of pitch/tempo they have[85]. The tempochanges have to be in a certain range otherwise the results are unrealistic and lose the illusionary effect, instead

84 J. C. Risset (1986) “Pitch and Rhythm Paradoxes: Comments on ‘Auditory Paradox Based On Fractal Waveform’,” *Journal of the Acoustical Society of America*, 80(3): 961–962.

85 Dan Stowell, *Scheduling And Composing With Risset Eternal Accelerando Rhythms*, https://c4dm.eecs.qmul.ac.uk/papers/2011/Stowell2011icmc.pdf .

the technical processing is becoming obvious – see the range set to 0.007 in illustration 15.

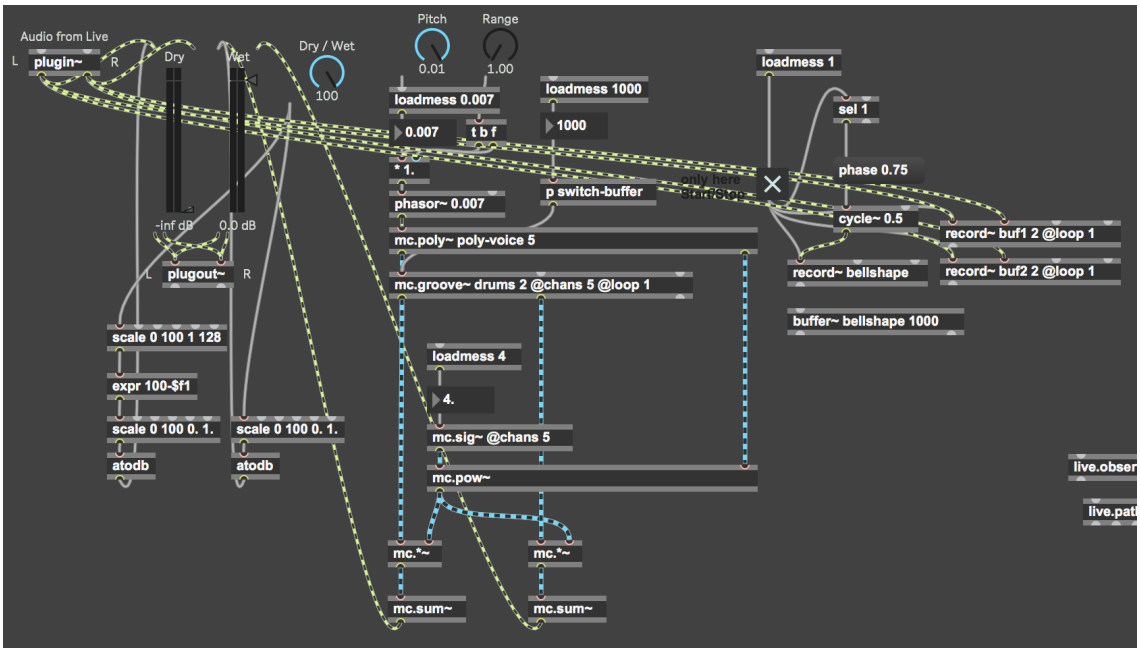

Illustration 15: Risset-Rhythm (inside the patch)

So far two things have to be redone in this patch:

1. As with the other projects it might be more efficient to transfer to gen~.
2. The Dry/Wet amount needs to be pre-FX otherwise the buffer is constantly re-filled which makes the effect a) less efficient (processing wise) and b) to abrupt, when introduced as the FX is already running in the background with a preloaded buffer.

A general problem of the risset rhythm is that it doesn‘t work well if the loop of the buffer is not inline with the duration of the whole underlying groove; i.e. if used in combination with polymetrics the buffers won‘t loop at the right moment, therefor destroying the illusion.

To reproduce the „Risset-Rhythm“ as MIDI-FX might prove useful for better sounding results. On top it allows for combining „Risset-Rhythm“ and „Shepard-Tone“ into one MIDI-FX.

4.5. The Non-Standard-Sequencer

For my current live-set the drum-sequencer looks and works as follows:

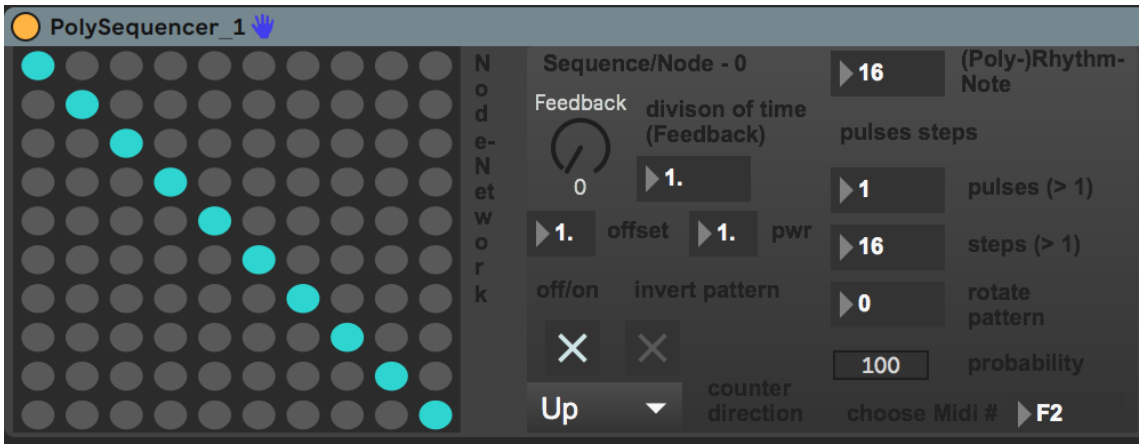

Illustration 16: Non-Standard Sequencer ; Entangled-Sequencer

- The matrix on the very left side, allows to send triggers from each sequence node to another sequence node. Explained in more detail in the chapter „4.5.3 Ornament: Feedback-Synthesizer“. And the center to accept or not accept the clock input received from the ‚time-bender / tempo-synthesizer‘ described above.
- The other side represents an exemplary Sequence-Node-# (10 in total) consisting of:
  - a non-linear-time-distortion (as described above)
  - a rate~ change to allow for polyrhythms
  - a euclidean algorithm
    - pulses (per sequence)
    - steps (of the sequence, for polymetrics)
    - rotation of the pattern
    - pattern inversion
    - probability (of the trigger to pass through)
    - change of counter/sequencer direction
    - and a MIDI-#

4.5.0 Re:Create – gen~ification

As the current version of the ‘non-standard-sequencer’ didn‘t prove to be a 100% sample-accurate, but actually might introduce jumps as it is working in the message domain of Max, I was looking for a way to recreate it. After long search and being kind of stuck with developing, I‘ve found out that it was possible to do all the procedures in gen~. Therefore it became necessary to rethink sequencing as signal processing and understand that it is actually similar to a modular synthesizer[86].

Switching to gen~ solved many of the problems I had so far, while introducing some new ones as well. A new problem was how to play sample while maintaining in signal-domain? Luckily it has already been solved for the ‘Sequencer Distortion’: use a buffer for the step-index.

Pictures and some previews from the work in process gen~-transition are on the next pages. But the patches aren‘t cleaned up so far and some ideas are only ideas and/or are tested, but not implemented in the bigger set-up, as it will involve rebuilding everything anew:

- with sample-accuracy
- with new features
- with the possibility to build some of the modules that are outlined in this thesis, but I haven‘t been able to build so far (many of them became possible), i.e.:
    - understanding the sequence as a signal as a synthesizer
        - using synthesize techniques for changing the sequence
            - wavefolding
            - distortion
            - feedback

86 The tutorials of ‚lysdexic‘ got me started and on a little detour answered a question I‘ve already had for quite some time: How does the rate~ object actually work? Find the video-tutorials online: https://lysdexic.com/tutorials/ .
For another inspiration also see: http://blog.synthesizerwriter.com/2018/04/four-step-sequencer-in-gen-for-owl-pedal.html .

        - …
    - combining two or more sequences on signal, instead of event level (any mathematical function can work, i.e. addition, subtraction, multiplication, division, etc., with providing some interesting results) and will produce a new, combined, tempo-sequence
        - while combining the trigger of sequences became more difficult on the other hand, a problem yet to solve
- So far I haven‘t found the time for reproducing the bjorklund-algorithm (and other distributing algorithms) inside gen~ in signal-rate as to skip one buffer for sequencing.

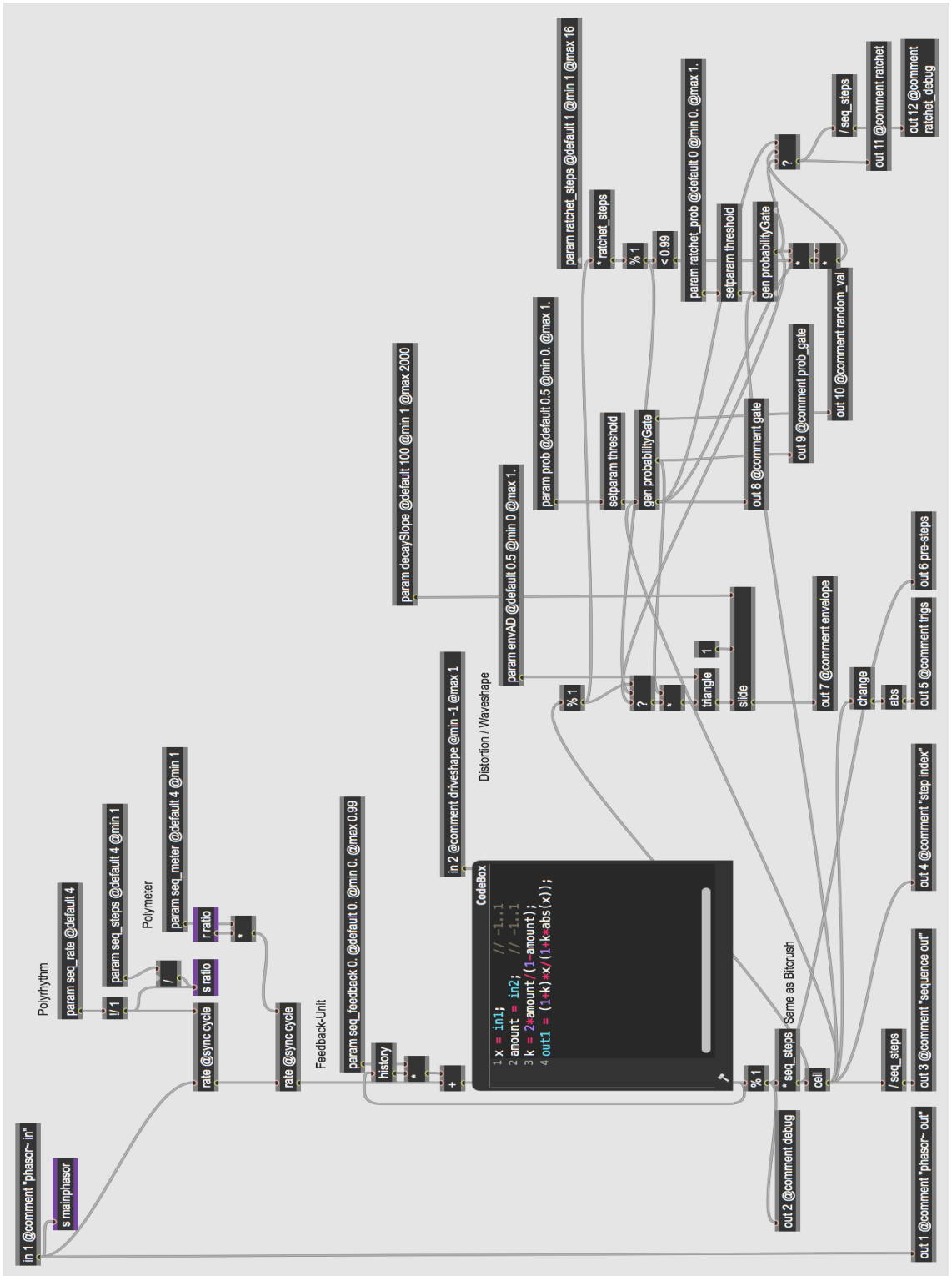

Illustration 17: Re:Create - non-standard-sequencer in gen~ ; feedback, wavedistortion, bjorklund, polyrhythmic, polymetric

4.5.1 ‚Standard'- or ‚Manual'-(step-)sequencer

a.) Step-sequencer

A step sequencer divides a given duration t, into x steps. The most common step-sequencers consist of 16, 32, or 64 steps, while some polymetrical or even polyrhythmical step-sequencers exist that allow for different distribution or alignment of steps in time.

The most popular examples are probably the Roland TR-808 and Roland TR-909:

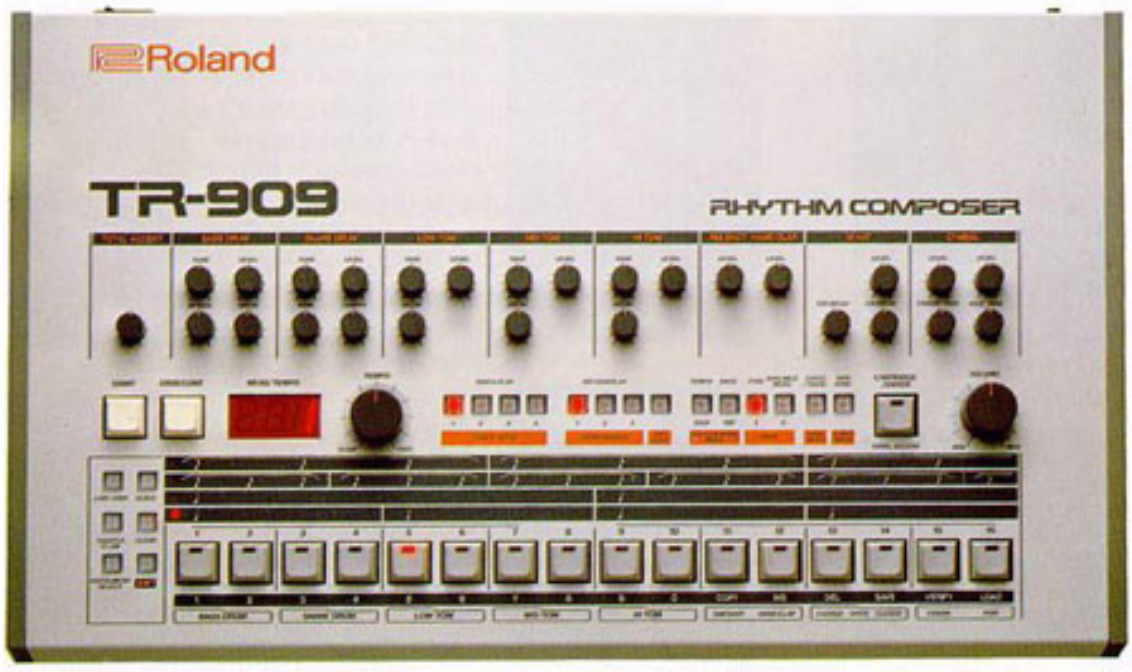

Illustration 18: Roland TR-909 ; Rhythmsynthesizer with standard step-sequencer
By Eriq at Dutch Wikipedia, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=3218655

b.) The piano-roll

Although the piano-roll in DAWs allows to go beyond the grid it generally assumes that a grid is or will be used. In these cases it's not much more than an enxtended step-sequencer, extended in so far as it allows for different midi-note-#s for each step, and for combining different step-lengths.

Generally speaking they are not perfectly suited to be used for producing polymetrical or polyrhythmical structures, although it's non the less, more or less easily, possible to

do so. For some tips on producing complex polyrhythms inside DAWs piano-rolls see chapter “5.4 Open Grid”

4.5.2 Algorithmic-sequencing

Algorithmic-sequencing allows for using different (mathematical) methods for generating sequences. In the following examples I’ll focus on step-based sequences that are commonly generated by using a distribution algorithm over a certain amount of steps.

a.) Bjorklund / Euclid

We‘ll start this list of (distribution-)algorithms for producing sequences with the ‚bjorklund-‘ or ‚euclidean-algorithm‘, which became quite famous in the last years after a paper published by Godfried T. Toussaint[87]. The bjorklund algorithm, a euclidean algorithm, seeks to distribute a division – a number of pulses in a number of steps – as evenly as possible.

„The algorithm may be described succinctly in a recursive manner as done in [8]. Let m and k be the input integers with m > k.

EUCLID(m, k)

1. if k = 0
2. then return m
3. else return EUCLID(k,m mod k)

Running this algorithm with m = 8 and k = 5 we obtain:
EUCLID(8,5) = EUCLID(5,3) = EUCLID(3,2) = EUCLID(2,1) = EUCLID(1,0) = 1“[88]

It can be build directly in Max/MSP like this:

87 **Paper:** Godfried T. Toussaint, *The Euclidean Algorithm Generates Traditional Musical Rhythms,* http://cgm.cs.mcgill.ca/~godfried/publications/banff.pdf .
Also see:
Godfried T. Toussaint, *The Geometry of Musical Rhythm – What Makes a „Good“ Rhythm Good?, Second Edition,* https://www.routledge.com/The-Geometry-of-Musical-Rhythm-What-Makes-a-Good-Rhythm-Good-Second/Toussaint/p/book/9780815370970 .
Godfried T. Toussaint, *Computational Geometry: Theory and Applications,* https://core.ac.uk/download/pdf/82289779.pdf .

88 Ibid.

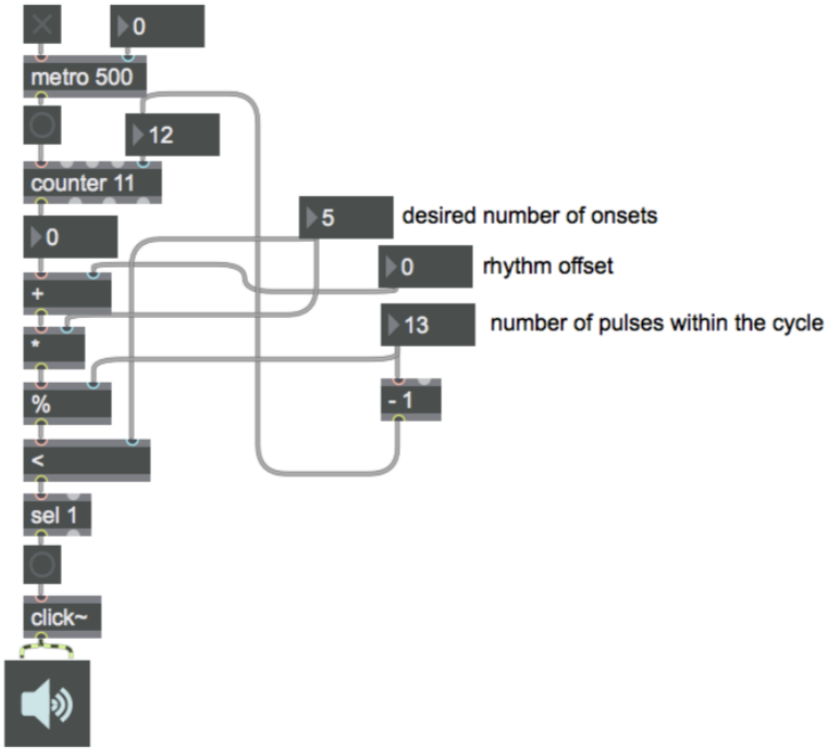

Figure 1. Euclidean rhythm generator in Max/MSP

Illustration 19: by Jonathon Kirk & Neil Nicholson "Visualizing Euclidean Rhythms Using Tangle Theory“

Almost the same distribution, only some variances in the on sets of the pattern, as with the bjorklund algorithm can also be achieved using Bresenham‘s Line Algorithm[89].

The Bresenham‘s Line Algorithm looks like this:

```
”
func bresenhamEuclidean(onsets: Int, pulses: Int) -> [Int] {

   let slope = Double(onsets) / Double(pulses)
   var result = [Int]()
   var previous: Int? = nil
   for i in 0..<pulses {
      let current = Int(floor(Double(i) * slope))
      result.append(current != previous ? 1 : 0)
      previous = current
```

89 See: Jeff Holtzkener, *Euclidean Rhythms*, https://medium.com/code-music-noise/euclidean-rhythms-391d879494df .
or in detail: Stephan Hollis & J. Richard Hollis, *Creating Rhythms*,
via: https://www.facebook.com/groups/maxmspjitter/permalink/10161238816384392/ .
https://github.com/tmhglnd/th.euclid
https://en.wikipedia.org/wiki/Bresenham%27s_line_algorithm
https://twitter.com/mmalex/status/1177617079119286272

```
    }
    return result
}
```
“[90]

Slightly simplified, numbers in euclidean geometry,

> “were real multiples: nothing more than the rote repetition of a basic unit. Digital computation thrives in such conditions of real multiplicity.“[91]

They can be assumed as an repetitive addition of 1 + 1 + 1 + 1 … = x. For Lefebvre this repetition of the same is what essentially produces difference. Every 1 for it-self might be identical to each other 1, but in effect (it’s position, as part of the sum, etc.) it is not.

> „This reveals a basic tension. In its tessellations and permutations, the multiple seems to promise difference and variety. At the same time, the multiple entails repetition, and thus always refers back to some elemental sameness. So does the multiple entail the blank repetition of habit?** Does it mean cloning? Or does the multiple disrupt and enliven, opening up new lines of flight, new modes of experience? Multiplicity, it seems, is rife with contradiction.“[92]

This contradiction is also what we notice when listening to minimalistic 4 to the floor music. We hear the repetition of one and the same bassdrum, but we’re not (necessarily) beginning to count it as 1 + 1 + 1 + 1 to combine them in a 4/4 measurement, neither do we endlessly sum them up (1 + 1 + 1 + 1 + … = ∞), we rather tend to hear 1 and 1 again and 1 again and 1 again, and .... What we hear is the repetition of the same, yet it changes, as we change, while listening. We hear all of these concepts, as well as their contradictions at once.

To implement more and different algorithms besides the bjorklund / euclidean algorithm is planned, but yet postponed. A quite inspirational device is the „Quad Algorithmic

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90 Ibid.
Another detailed explanation of Euclidean Algorithm and its applications: https://www.lawtonhall.com/blog/euclidean-rhythms-pt1 .

91 Alexander R. Galloway, *Multiple, Multiplicity, Multitude*, http://cultureandcommunication.org/galloway/multiple-multiplicity-multitude .
Alexander R. Galloway, *General Formular For The Digital And The Analog*, https://non.copyriot.com/general-formula-for-the-digital-and-the-analog/ .

92 Alexander R. Galloway, *Multiple, Multiplicity, Multitude*, http://cultureandcommunication.org/galloway/multiple-multiplicity-multitude .

Rhythm“ by FrozenWasteland implemented for VCV-Rack[93]. They provide a huge list of distribution algorithms.

Potential examples of other algorithms are:

b.) Golomb-Ruler

The Golomb-Ruler is the oposite to the Euclidean-Algorithm. Instead of seeking to distribute the divisions as evenly as possible, it tries to ensure unequal distribution.

c.) Well Formed Rulers[94]

d.) Perfect Balanced Rulers[95]

e.) Boolean Logic[96]

Combine 2 or more sequences with boolean logics (AND, OR, XOR, NAND, NOR, NXOR), to trigger only those steps that are equal or unequal between the sequences.

f.) combinatorics

Combine 2 or more sequences together to build a new sequence. Similar to the „Chained-Sequencer“ or „Stealing-Sequencer“ described in chapter „4.5.3 Ornament: Feedback-Synthesizer“.

g.) Fibonacci or similar series of numbers

Generally speaking: Every generateable series of numbers is usable for calculating pulse and step relations.

i.e.:

- Fibonacci: 1, 1, 2, 3, 5, 8, 13, …
- Infinite addition of all numbers: 0, 1, 2, 3, 4, 5, 6, 7, …
- Primes: 1, 3, 5, 7, 11, 13, 17, 19, …

93 Github. almostEric, *FrozenWasteland*, https://github.com/almostEric/FrozenWasteland .
94 Andrew J. Milne, Steffen A. Herff, William A. Sethares, Roger T. Dean & David Bulger, *XronoMorph: Algorithmic generation of perfectly balanced and well-formed rhythms*, https://www.researchgate.net/publication/302345911_XronoMorph_Algorithmic_generation_of_perfectly_balanced_and_well-formed_rhythms .
95 Ibid.
96 Github. almostEric, *FrozenWasteland*, https://github.com/almostEric/FrozenWasteland .

- etc.

h.) Aaron Levisohn, Philippe Pasquier „BeatBender: Subsumption Architecture for Autonomous Rhythm Generation“[97]

This technique is based on several layers. Each layer subsumes the previous layers to produce a new one. Simply speaking it bears similarities with digital neuronal-networks based on layer systems.

4.5.3 Ornament: Feedback-Sequencer

a) Entangled-Sequences[98]:

Each sequence may send +1 to the counting of another sequence, which should work both directions. Implementation via a matrix with probability.

The implementation is different if implemented in control- or signalrate, i.e. as message in Max or as signal in MSP, or preferably in gen~.

- For the first one it just sends it‘s trigger to the counter of another sequencer and increase it by +1.
- To implement it in signalrate it would be necessary to introduce an offset to the signal that controls another sequencer and produce a continuously accumulated offset (based on the assumption that each added offset will produce add (0...1)/steps), before the signal is wrapped to produce the actual steps.

b) Stealing-Sequencer:

The basic idea is quite straightforward:

> „Ions is a two voices sequencer. While each voice has its own sequence, they can exchange their steps as easily as an electron can jump from one atom to another.[99]

97 Aaron Levisohn, Philippe Pasquier, *BeatBender: Subsumption Architecture for Autonomous Rhythm Generation,* https://www.academia.edu/209901/BeatBender_Subsumption_Architecture_for_Autonomous_Rhythm_Generation .

98 Already implemented in Max, so far unsure how to transfer it into gen~/signal-domain.

99 Via Facebook: Jacopo Cenni .
Open code & more ideas: https://github.com/MarcBoule/Geodesics .
Transcode of some VCV-Rack-Devices: https://github.com/xnamahx?tab=repositories .
This technique could be expanded for any number of voices or in reference to sequences that already trigger something else.

With each step of the currently active sequence it provides a probability to jump to the other sequence and continue there. So far I've only tested it for pairing two sequences, yet it can be expanded to x sequences each having their own metric, rhythmic division and/or tempo. Although simple in concept the complexity of the potentially resulting sequences is huge. Also note that statistical probability is only the easiest and straightforward approach to determine when and how to jump to another sequence.

c) Chained-Sequencer:

At least two sequencers (i.e. A & B) get chained. If one of the sequences ends, it will trigger the start of the next one and vice versa. Personally I'd suggest using small sequences, as they function as atoms for building molecules of sequences.

d) No-Clock-Sequencer:

A different concept of Feedback-Sequencer in the analog world "Ornament – 8, Organismic Sequencer" was developed by SOMA.

> „A regular music sequencer tends to produce user−defined sequences of musical events (notes and control parameters) that play at a given speed (tempo). Different sequencers differ mainly in how this sequence of musical events is set and what modifications are possible. But even in the most advanced and complex sequencers, there is still some memory containing the given events which are reproduced at the given speed. This memory can contain many options and patterns with a flexible system for switching between them and have various playback algorithms, but the basic principle remains unchanged.
>
> The fundamental difference of the ORNAMENT is that it has no clock generator and lacks the very concept of tempo (playback speed). There is no memory that stores musical events and there are no global control elements. Instead, we have a fully horizontal structure consisting of 8 identical and equal cells. Each cell is a controlled delay line that receives a pulse, which it holds for a certain time before it passes the pulse on. Each cell has two pulse transmission modes, several control inputs and several outputs. By commutating cells (see below for definition) in different ways, you create a dynamic structure in which pulses that wander in the system are transmitted, added and subtracted, generating behavior that you can transform into various musical events and controlling voltages.
>
> We can say that the ORNAMENT is an electronic micro−model of an anarchist society. When you experiment with this system you can observe and explore the process of life arising in incredible structures which have no discernable order other than the direct relations between its equal members.

There is no Holy Book in which the events of the future are recorded. There is only the ever-present and continually arising "now" that flows and develops from moment to moment, according to the relationships established within the system.

The ORNAMENT is similar to an organism where an ensemble of interacting organs cov- ered by various connections, generates the resulting behavior, which is a dynamic sum of interactions. This behavior is not stored in any memory and does not follow directly from the properties of individual organs, but is a meta-property of the system as a whole.

There is no main organ in the body, although for some time in some circumstances one of the organs may turn out to be the leader and determine the behavior of the system. Similarly, in ORNAMENT, in some patches, individual cells can have a dominant influence on the system, but this will always be a property of the patch, and not a unique property of the cell itself.

Depending on the switching scheme and settings, the ORNAMENT can generate both stable, strictly repeating oscillations, and very complex, time-evolving sequences close to pseudo-chaotic. The 100 percent analog nature of the ORNAMENT, sensitive to environmental changes and the saturated life of the microworld, introduces an element of real chaos and unpredictability into its behavior, which is especially evident when the system is not stable and has many quasi-stable states between which it can switch from the slightest changes in the flow of pulses. In the extreme case, the ORNAMENT is able to generate entire comopsitions with specific dramaturgy, pauses and developed structure. [sic]"[100]

4.5.4 Ornament: Concatenative Synthesis Applied to Rhythm[101] (placeholder for future studies)

In concatenative synthesis the properties of one signal are applied to another signal.

"The main goal of this thesis is to create an Audio Effect that seamlessly recreates a given drum phrase automatically and intelligently, including coherent rhythmic variations according to the controls of the user. This involves a system that is capable of translating the sound input into a sequence of meaningful drum units and reuse those units as a sound source for a rhythmic recreation. It is not intended to create music on its own, but to compliment the electronic music creative process."

100 SOMA, *Ornament – 8, Organismic Sequencer, User Manual*, note that they also produced an ‚organismic synthesizer' (Lyra – 8) and an ‚organismic drum machine' (Pulsar – 23) to go along with it.

101 Francisco Monteiro, *Concatenative Synthesis Applied to Rhythm*.

4.6. Poly-Werk

The so called „Poly-Werk“[102] consists of at least two works that can be performed solo as well as simultaneously. It is the transplantation of the idea of polyphony onto the field of works.[103]

This idea is especially interesting as it opens up new dimensions of aesthetic production and perception, performance, consumption and reproduction of art. An artwork is not anymore closed in and on it-self, but opened up for combinations with other works of art. The research by Karin Wetzel is pioneering, yet, at the same time, already reducing the concept to music, while actually it could be – in the tradition of the „Gesamtkunstwerk“ – a multi-aesthetical Poly-Werk including other disciplines as well.

„Ghostproducer“ (a.k.a. SubDub, Badawi, Raz Mesinai) is at the same time a Marvelcomic, by Raz Mesinai, as it is a Moniker for Raz Mesinai‘s musical and visual releases. In this dystopian world musicians/artists rule the world with their sonic-mindcontrol. „Ghostproducer“ fights against the so called „Soundboy“. In a way those releases are sequential, each release is abstractly related to the same world in the Marveluniverse.

The two releases „Freakatone Beats“ and „Freakatone Drone“ are supposed to be listened to together producing a third release. More or less the same thing a DJ does in mixing, but in this case intentionally composed to be played together.

4.7. Werkform

Simon Reynolds even proposes another new time-form for contemporary ‚conceptronica‘ music:

> „Immensity of scale applies not just to the physical dimensions of these virtual worlds, but their propensity to extend themselves through time. In his book *Digimodernism*, the critic Alan Kirby

102 Wetzel, Karin. *Polytemporalität in der Musik*. Interview by Adrian Kleinlosen, https://www.schloss-wiepersdorf.de/de/showcasereader/polytemporalit%C3%A4t-in-der-musik.html .

103 See also: Zürcher Hochschule der Künste. Institute for Music Research. *Konzepte des Polywerks in der Musik des 20./21. Jahrhunderts,* https://www.zhdk.ch/forschungsprojekt/konzepte-des-polywerks-in-der-musik-des-20-21-jahrhunderts-434799 .

> identifies ›onwardness and endlessness‹ as hallmarks of 21st century culture: page-turning propulsiveness, the unfolding of saga-like narratives teeming with plotlines, characters, and locations, spawning prequels and sequels galore.“[104]

While Simon Reynolds is right to ‚recently‘ notice this shift[105], especially in contemporary electronic music or so called ‚conceptronica‘, it is completely wrong to assume that this is something completely new. Actually one of the most famous figures of Pop music „Bob Dylan“ is a perfect example of an ever changing, but at the same time continuously evolving and coherent, narrative; as musicologists have stressed over and over again when comparing the star „Bob Dylan“ development with Ovid‘s „Metamorphosis“. More generally the development of a pop-star over the course of their career already works as an unfolding narrative with several sequels.

Basically all this is what a fan or even an academic does, when thinking about or working with sonic material:

> „There is no sonic fiction.
>
> There has always been sonic fiction.
>
> Sonic fiction consists not just of one written account of sonic experiences and imaginations alone. Any small note, any aphorism or fragment of sound can qualify as sonic fiction. Any small musical piece or skit on an album, any ever so small performative gesture by an instrumentalist carries at least certain remnants, trace elements, nuclei or mycelia of a very specific if not highly idiosyncratic sonic fiction. So too can any bit of liner notes or cover design, any bit of stage clothing, new instruments or pieces of software contribute to a sonic fiction. And, obviously, any gossip about performer or musicians, programmers or composers, fan extravaganza and upcoming new styles contribute to the ongoing and plastic, the malleable entity that one might call indeed: *a sonic fiction*.
>
> **Sonic fiction *is* everywhere. Where one can find sounds one will also detect bits of fiction.**
>
> As a consequence sonic fiction might then *mainly* be found in the tiny and ephemeral, often rapidly vanishing intersections and interferences *between* texts and lifestyles, between a given recording medium, its material properties, its design and process of storing, retrieving and reproducing sound – as well as all listeners appropriating all these qualities of the recording medium to play an intrinsic and radiating part in their lives. A sonic, ephemeral fiction emerges between existing apparatuses for sound reproduction on the one hand and on the other hand all

104 Simon Reynolds, *The Rise of Conceptronica*, https://pitchfork.com/features/article/2010s-rise-of-conceptronica-electronic-music/ .

105 Nowadays the shift to ‚sequels‘ is especially noticeable in the shift from films to series. Series provide a basis for long term engagement with and immersion in an ‚art-ificial world‘.
Also: Diedrich Diederichsen, *The Sopranos*.

> the idiosyncratic and incessantly transforming practices related to one material sound performance – be it live or recorded. A sonic fiction is just there. As soon as you listen, experience, digest or anticipate a given sound event, there are some germs of a sonic fiction planted in your sensory imagination, your reflection and desires. **Sonic fiction is sensory sensibility.**
>
> > 'Now the story goes that Robert Johnson sold his soul to the devil at the crossroads in the DeepSouth. He sold his soul, and in return, he was given a secret of a black technology, a black secret technology, which we know now to be the blues.'
> > („The Last Angel of History" 1996)
>
> Sonic fiction is, therefore, not at all ephemeral. It is not all *merely* imaginary – even if the word *fiction* might attract such a notion, reduced to merely amateurish if not privatistic reflections; and even if the word sonic still might evoke some vague ideas of cryptic niche practies: ‚At what point had the novel become such a small thing that it dwelt on the domestic problems of fictionalised characters?' (Kraus 2017). At what point had sound become such a small thing that it seemed only to be capable to represent exclusively privatistic urges and desires?
>
> Sonic fiction is material and it is historical. Sonic fiction represents a thick cultural amalgamation of meanings and practices, sensibilities and techniques, represented not only in Kodwo Eshun's original *More Brilliant than the Sun* (1998) but also in John Akomfrah's famous visual essay *The Last Angel of History* (1996; cf. Gunkel, Hameed & O'Sullivan 2017: 249-267) or in Alexander Weheliye's concept of *Sonic Afro-Modernity* (2005)."[106]

Sonic fiction thus describes an approach to music that goes beyond the purely sonic material and instead mixes all available material from interviews, social media output, album covers and video clips, liner notes to subcultural codes and clothing styles, etc. and combines them into a narrative. In this concept, therefore, continuations (or sequels) are virtually laid out from the very beginning.

4.8. Ubicomptime

Just as William Gibson writes his story about the bison waiting at the end of all our beginnings. The following parts will describe how media and digitality have changed our perception of time and use of historic and/or prerecorded material. Similar to the introduction of global logistics (i.e. train, transport, etc.), the universal application of digital technology or ubicomp (ubiquitous computing) is not only a new machine, a productive force, but essentially also a restructuring of space-time.

106 Holger Schulze, *Sonic Fiction*. Italics are preserved from the original text, bold highlighting added by myself.

The three following excursions „Queer-time - Clubs, DJs and Turntablism“, „“Fan-Fiction“ as Ubicomptime“ and „Meme-ification“ observe the emergence of what can now be called ubicomptime-production and its implications in different practices.

4.8.0 Ornament: Queer-time - Clubs, DJs & Turntablism

> „Though disco DJs spun prerecorded tracks, invoking the voices of physically absent people lodged in the recent past, they made active, dynamic live edits to their chosen songs. A disco set drew upon the sounds of the past to reinscribe the living now. House added another temporal dimension to this arrangement. Prerecorded voices and live edits mingled with live drum machines and synthesizers, whose transparent roboticism tugged dancerrs to the precipice of the future. The past, the present, and the life yet to come all converged on the house floor, inflating the moment with time that blazed in all directions. […]
>
> ‚Queer time perhaps emerges most spectacularly at the end of the twentieth century, from within those gay communities whose horizons of possibility have been severely diminished by the AIDS epidemic,‘ wrote Jack Halberstam. ‚The constantly diminishing future creates a new emphasis on the here, the present, the now, and while the threat of no future hovers overhead like a storm cloud, the urgency of being also expands the potential of the moment and… squeezes new possibilities out of the time at hand.‘32“ […]
>
> If the straight world collapsed time in the ‚80s, marking even healthy gay people as already dead, then house music helped queer communities reclaim the present tense. In the now of the dancefloor, gender and sexuality have no eventualities. The music does not break for hours on end, and it has no interest in consolidating its pleasure into a hook. The timekeeping of a normative life – birth, puberty, marriage, childbearing, death – falls away to the glow of the infinite moment. A room full of strangers turned family pulses to an unceasing beat.“[107]

Although as idealizing and romanticizing the quote above is, it describes how DJ sets used to mess with space-time, offering a heterotopia[108] – meaning a temporary place in time with utopian quality, a possibility to get lost. The social necessity for an alternate reality in the here and now, a messianic nowness or ‚Jetzt-Zeit‘[109], and the atmosphere inside the community seem to be reflected inside the musical practice of long on going events, repetitive and horizontal musical structures, that do not allow for linear

107 Sasha Geffen, *glitter up the dark – how pop music broke the binary*, 158/159.
Although it can not be examined in detail at this point it is worthwile to note that transgender (by transitioning) defies the generaly assumed linear development of sex & gender from childhood over puberty to adult (from girl/boy to woman/man) by disrupting and disintegrating this line, producing superpositions of different sex & gender on top of each other, as well as rewriting the process of growing up. Past, present and future become realigned differently.

108 In detail: Michel Foucault

109 Walter Benjamin

orientation in time, and combinations of futuristic sounds with prerecorded materials from the past: a dystopic, yet hopeful mourning.

> "There is no causal nexus, no linear direction, or even the semblance of a beginning. [...] That which is not granted historical dignity disrupts the flow of historical becoming."[110]

It is the need for other realities, for a different life, that is worth living, of the oppressed (minorities) that produces disruptions in history. It struggles with contemporary times and therefor almost automatically falls, out of joint[111], into alternate historic timelines.

> "It [the Revolt] is not anachronistic but anachronic, for it is the result of a different experience of time."[112]

While the virtual narration in house music is basically the story of utopia or paradise on earth (via the so called 'house-nation'), techno offered alter-realities with different futuristic and often dystopic stories.

In parallel to house and techno different techniques for remixing music on the fly and reinterpreting time emerged in hip-hop.

> „Though initially an expression of straight masculinity, hip-hop, like house, grew from the margins of normative society, in a black and Latino borough feared and neglected by the rest of New York, and so it developed its own rebellions against standard progression of time. Straight time and normative gender both take root in whiteness, whose dominant ideologies press against every expression of otherness in the United States. Black men, whether gay or straight, were marked for death just as gay men of all races were: not an emblem of creeping disease but a cipher for violence and urban decay in the minds of white Americans.
>
> From that racialized margin, new strategies for making art and music thrived throughout the ‚70s. In addition to Herc's „Merry-Go-Round," early hip-hop DJs developed the „scratching" technique, rubbing a record back and forth against the needle so it would produce a distinctive skidding sound. In an interview with Mark Dery, science fiction author Samuel R. Delany noted that the hip-hop techniques of „scratch and sampling begin . . . as a specific miss-use and conscientious desecration of the artifacts of technology and entertainment media."5 The turntable carried with it a specific logic of time as a unidirectional phenomenon. By looping, scratching, sampling records, hip-hop DJs defied that baked-in ethos. They would delete music from the

110 Donatella Di Cesare, *The Time of Revolt*, 9.

111 "The time is out of joint: O cursed spite That ever I was born to set it right" (William Shakespeare, *Hamlet*)
Also a book by sci-fi author Philip K. Dick, *Time Out Of Joint.*

112 Donatella Di Cesare, *The Time of Revolt*, 11.

> flow of a song via direct physical intervention (scratching and looping) or invert tangential sounds into a track (sampling). With a careful hand on the needle, DJs imposed their own authority over the sequentiality of a prerecorded piece of music.“[113]

Scratching a sound offers a direct accessibility to it, playing it back or forth, faster or slower, producing a wide variety of sounds from drone to percussive noises based on some prerecorded material[114]. Sampling and looping gave access to re-using material and re-writing a pre-recorded piece of music just like the history of mankind had to be re-written.

> „Such a narrative [of linear-progressing History] runs counter to the philosophy of Afrofuturism, which distrusts models of progress and development, prizing instead time-traveling leaps, sidesteps into alternate universes, and the reanimation of history. in what follows, i trace an alternate history of Afrofuturism, one that explores a Pan-African psychogeography, resists the framing of Africa as a latecomer to science fiction, and attests to the continued relevance of Afrofuturism for both Africa and the diaspora. i proceed not like a development theorist, but like a data thief.
>
> The data thief is the central figure from John Akomfrah and Edward George's 1996 video essay *The Last Angel of History*. A time-traveling trickster, the data thief leaps through cyberspace seeking signs of collective memory. Akomfrah and George explain in their pre-script for the film, published in the South African magazine *Chimurenga*, "S/he knows the nature of his/her quest: surf the closed rooms of the internet, unlock the vault of racial memory, find the black futurologists and their arcana, interpret them, and bring their visions home. . ."Akomfrah and George emphasize access and freedom of movement: "on this future-internet, the space-time continuum has been realigned so that each image holds multiple traces of its past, held forever in a state of suspension." The suspended, preserved past responds to the data thief's touch. The recovery of "racial memory," a painful, at times impossible project in the postcolonial era, becomes almost effortless as the data thief flits through time, gathering sights and sounds from the pyramids of Egypt to the techno-beats of Detroit. "All the data thief has to do is follow the flashpoints, arrive at the locations, and make the connections." The rhythmic prose of the pre-script, the recurrent images of floating, surfing, and flight, and the data thief's fluid gender and cyborg consciousness, all underscore the unfettered ease of movement that is the dream and engine of Afrofuturism. There is no division of sight and sound: cyber technology stores both types of information. There is no break in time; all times are available.
>
> The only danger to the data thief is "a virus called History." The data thief must avoid being infected with this capital-H history, opposing it with lowercase histories drawn from popular forms such as computer games, science fiction, hip-hop, and graffiti art. The depiction of History as a virus mounts a critique of progress, a refusal to accept the dominant narrative of History as a march from primitive savagery to enlightened civilization in which the black peoples of the world have been left behind. Afrofuturism insists on lowercase histories as a means of unlocking

113 Sasha Geffen, *glitter up the dark – how pop music broke the binary*, 162/163.
114 In detail: Kodwo Eshun, *More brilliant than the sun.*

other futures, which are always located, like a secret code, in sounds and images from the past.“[115]

4.8.1 Ornament: „Fan-Fiction“ as Ubicomptime

„I‘m different from the other characters here.
I don‘t belong to any story.
However, that‘s exactly why my dear friend gave me an endless story.
She gave me an everlasting universe of freedom.
Even if I don‘t belong anywhere.
It‘s a universe that extracts desires without limit and lays emotions bare.
It‘s a fragmented piece of poetry.
My existence is sustained by the infinite number of Creators who add to this poem.
The power of Creation gets handed off to someone.
That person feels it and thinks about it.
Then those thoughts give birth to the power of Creation again.
It‘s emotion.
It‘s passion gone mad.
Clever logic is nothing but a slave to emotion.
Even though you‘re caught up in the middle of a storm of emotions,
you unterestimated its power.
That is why you lost“[116]

Even before speaking about fan-fiction, we have to think of the fan(-girl-)s[117]. Art, almost exclusively thought from the position of the artist, the critique, or other professionals in ‘the business’, can not be without its fans. What would ‘The Beatles’ have been without ‘Beatlemania’? Actually what would any artists work have been without people who passionately get involved in and with it? What would art be without being receipted?[118]

115 Sofia Samatar, *Toward a Planetary History of Afrofuturism.*
116 The character ‚Altair‘ of the Anime *Re:Creators*, as transcribed in: https://imgur.com/a/bGce2G7 .
117 Hannah Ewens, *Fangirls: Scenes From Modern Music Culture*.
Sasha Geffen, *glitter up the dark – how pop music broke the binary.*
Diedrich Diederichsen, *Sexbeat.*
118 Probably just like the penetrating phallus, without being circluded: pathetic. Circlusion (or old: ‚Circumclusion‘) describes the more or less same, material, process as penetration, but with reversed roles; it describes it from the the perspective of enclosing, encircling or wrapping. The term was pitched by transgender-theoretician Bini Adamczak to rewrite the process with changed roles of activity and passivity, and openly welcomed in queer-feminist theory.

Fan-Fiction, which is common in Manga and Anime culture, leaves the realm of Poly-Werk or even an extended definition of Werkform. If we speak of Fan-Fiction the ‚Werk' is beyond the scope of an author, even beyond what was described as the death of the author[119], it's closer to what Jacques Derrida describes as a specter[120], yet without its obsession with heritage, occupation, lineage, and mourning, simply without *replacement*. The closest description so far is probably in another anime „Ghost in the Shell – Stand Alone Complex"[121]:

The ‚Stand Alone Complex' is a

> »Phenomenon where in behavior by unconnected individuals creates a seemingly concentrated effort.
>
> This behavior is copied from a previous source without an original. In short Stand Alone Complex is multiple copies of a behavior, object, view, act, existing without an original.«[122]

119 See: Roland Barthes, *The Death Of The Author.*

120 „*Three things*, then, would decompose in analysis this single *thing*, spirit, or specter—or king, for the king occupies this place, here the place of the father, whether he keeps it, takes it, or usurps it, and beyond the return of the rhyme (for example "The Play's the thing,/Wherein Ile catch the Conscience of the King"). King is a thing, Thing is the King, precisely where he separates from his body which, however, does not leave him (contract of secession, necessary pact in order to have *more than one body*, that is, in order to reign, and, first of all, to inherit royal dignity, whether by crime or election: "The body is with the King, but the King is not with the body. The King, is a thing"). What, then, are these *three things of the thing*?
1. First of all, mourning. We will be speaking of nothing else. It consists always in attempting to ontologize remains, to make them present, in the first place by *identifying* the bodily remains and by *localizing* the dead (all ontologization, all semanticization— philosophical, hermeneutical, or psychoanalytical—finds itself caught up in this work of mourning but, as such, it does not yet think it; we are posing here the question of the specter, to the specter, whether it be Hamlet's or Marx's, on this near side of such thinking). One has to know. *One has to know it. One has to have knowledge* [Il faut le savoir]. Now, to know is to know *who* and *where*, to know whose body it really is and what place it occupies—for it must stay in its place. In a safe place. Hamlet does not ask merely to whom the skull belonged ("Whose was it?" the question that Valéry quotes). He demands to know to whom the grave belongs ("Whose grave's this, sir?"). Nothing could be worse, for the work of mourning, than confusion or doubt: one *has to know* who is buried where—and *it is necessary* (to know—to make certain) that, in what remains of him, *he remain there*. Let him stay there and move no more!
2. Next, one cannot speak of generations of skulls or spirits (*Kant qui genuit Hegel qui genuit Marx*) except on the condition of language—and the voice, in any case of that which *marks* the name or takes its place ("*Hamlet:* That Scull had a tongue in it, and could sing once").
3. Finally (*Marx qui genuit Valéry . . .*), the thing *works*, whether it transforms or transforms itself, poses or decomposes itself: the spirit, the "spirit of the spirit" is *work*. But what is work? What is its concept if it supposes the spirit of the spirit? Valéry underscores it: "By 'Spirit' here I mean a certain *power of transformation . . . the spirit . . . works*."7" (Jacques Derrida, *Specters of Marx.*)

121 *Ghost in the Shell – Stand Alone Complex*, anime series.

122 As in: UrbanDictionary, *Stand Alone Complex*, https://www.urbandictionary.com/define.php?term=Stand%20Alone%20Complex .

Yet again the ‚Stand Alone Complex' describes „copies of […] without an original", while fan-fictions add onto an existing original. If we are to really grasp fan-fiction, we have to imagine the production of alter-realities – of alternate space-times, or even alternative universes –, therefor we could say it's multiversing[123].

The reality effect of (fan-)fictions is summarized again quite accurately in another dialogue in the anime „Re:Creators", in which the character ‚Meteora' – herself being a gamecharacter inside the anime that came alive – describes their situation:

> *„We exist in this world because we are described in stories.*
> *She transcended the yoke of her world…*
> *...even though we are not supposed to even be able to recognize its existence.*
> *And then by breaking through to the land of the gods, the starting point of all worlds….*
> *...she succeeded in making the story worlds and the land of the gods collide."*[124]

The ‚land of the gods', for Meteora, describes our world, our reality, it is the perception of our world, as perceived by the character of a story, the storyteller is a god – or simply the almighty narrator. Described is the entanglement of fiction with everyday material reality. The wall between these worlds is not as solid as expected. Instead they are linked to each other. One, the fiction, is situated in our everyday life experience, while the other, our everyday life experience, is itself informed by the fictions and narrations we know, understand or believe. Therefor

> *„Books are not just a string of words.*
> *They are also a tool for adjusting one's senses."*[125]

This account is inline with Michel Foucault's analysis of the power of discourses as systems of thought, knowledge or communication that construct our experience of the world. Especially Yuk Hui's comments on „The Question Concerning Technology in China"[126] and „Art and Cosmotechnics"[127] take it even further, argueing that our contemporary understanding of technology derives from the greek term ‚techné' and therefore no non-European technology can exist so far. A new or different understanding

123 ‚Multiversing' is used as a verb to highlight the activity in this process, as with the term ‚musicking'.
124 The character ‚Meteora' of the Anime *Re:Creators*, as transcribed in: https://imgur.com/a/YJvxj .
125 Shogo Makishima is a character of manga & anime *Psycho-Pass.*
"Words are events, they do things, change things. They transform both speaker and hearer; they feed energy back and forth and amplify it. They feed understanding or emotion back and forth and amplify it." (Ursula K. Le Guin, *The Wave in the Mind: Talks and Essays on the Writer, the Reader and the Imagination.*)
126 Yuk Hui, *The Question Concerning Technology in China.*
127 Yuk Hui, *Art and Cosmotechnics.*

of technology would have to work inside the framework of another, different cosmological perception of the world.

The question concerning the entanglement of (fictional) superstructure and (materialistc) base is tackled by a wide range of contemporary philosophers and scientists around the fields of Object-Oriented-Ontology (or: ‚OOO'), Speculative Realism[128], Magical Realism or Magical Materialism[129], New Materialism[130] or Non-Standard-Philosophy[131].

Cosplaying and LARPing are common practices and imply blending, bleeding or blurring of lines between the realities even a few steps further.

> „If a game is pervasive, it is said to blur the boundaries between itself and the real world, therefore blending with it (Montola, Stenros & Waern 2009). In Live Action Role Playing (LARP) terminology, the word "bleed" represents a gray zone somewhere between fiction and reality, where the border between player and character becomes transparent (Omsk Social Club, 2019). This relates to the theoretical concept of trans-reality, referring to experiences whereby a player moves seamlessly through various physical and virtual realms, brought together in one unified game space (Lindley, 2004)."[132]

In her essay „On the Concept of Moe", Natalie Terezi Rei Watts[133], develops a theory for ‚schizophrenic gender terrorism' or more accurately of ‚becoming anime'[134] crossing a gap between transgender studies and research in manga and anime culture. Her observations and outlines of theory are strangely in line with my general assumptions regarding the relations of time, ego and society, and offer insight into fan-fiction and its effects beyond (mere) writing.

„15.

There will be no resistance.

OUT OF TOUCH → LOSS OF TIME → REMOVAL FROM t-AXIS → DISSOCIATION INTO UN-TEMPORALITY → UNIVERSALITY → THE TOTAL LOSS OF EGO → BUT THAT'S NOT THE POINT → WE'RE NOT HERE TO DESTROY OURSELVES → YOU ARE A NEW CREATURE, WITH NEW LEGS AND NEW FINS AND SQUIGGLY NEW 2-DIMENSIONAL LINEWORK. YOU

128 Mainly associated with the publishing house ‚Urbanomic'
129 https://0ct0p0s.net/Day-2
130 Karen Barad, Thomas Nail, and more.
131 Francois Laruelle, and more.
132 Symposium, *Blend & Bleed*, https://0ct0p0s.net/Symposium-Blend-Bleed .
133 Affiliated with the zine YONG; http://yonqzone.com .
134 Referencing Gilles Deleuze & Félix Guattari's concept of ‚becoming' developed in depth in their book *Anti-Oedipus: Capitalism and Schizophrenia*.

ARE SWIMMING IN THE WATER AND EATING FISHERMEN. THE MILITARY IS CALLED TO SEARCH AND DESTROY. YOU HAVE NOTHING TO FEAR. YOU HAVE ALREADY BECOME

I *don't want to be human. I don't want to be human. I don't want to be human. There's a way out. There's a way out. I've always wanted to be her. I've always wanted to be her since as long as I knew she existed. So why can't I? Why can't I? Why can't I reach out and*

just

16.

We will become a siphonophore breaching the clouds and the constellations—

schizophrenic gender terrorism"[135]

4.8.2 Ornament: Meme-ification

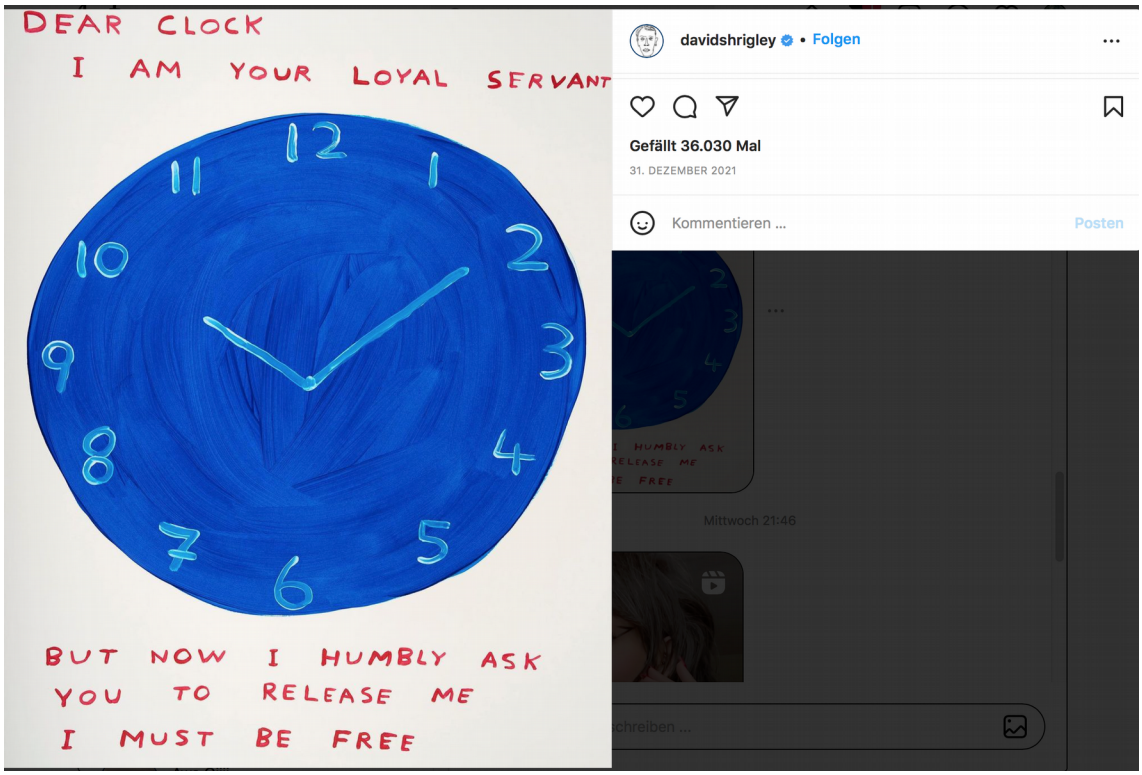

Illustration 20: Meme found on Instagram via @davidshrigley

135 Natalie Terezi Rei Watts, *On the Concept of Moe*, https://www.urbanomic.com/document/moe/ . Highlighting and formatting preserved of the original.

Meme‘s are „[a] genre of internet humor that combines language and text towards ambiguous ends, memes create endless variations from a relatively limited number of variables.“[136]

The arguably oldest predecessor of meme‘s might be the ‚nam-shubs‘ as derived from „The Nam Shub of Enki“, an ancient Sumerian text, which is a story that closely resembles the Christian ‚Tower of Babble‘.

> „In todays world there is no faster way to spread information or ideas than the internet. This is the world where todays nam-shubs thrive, reaching millions of users all over the world. Todays nam-shubs, though far from reprogramming peoples brains, and forcing them to forget a language, or invoking mind control in an instant, they do show many of the same characteristics. They can convey ideas, or portray any number of characteristics that compel massive numbers of people to watch them, and share them with friends. Todays nam shubs are mainly meme's and viral videos for those who don't know what these are, simply follow the links. Meme's are usually pictures or images that have, for whatever reason, taken on a viral like quality. Most meme's contain humor or irony.“[137]

This connection was closely examined by the Cybernetic Culture Research Unit (CCRU) in what they called the „Lemurian Time War“[138] or ‚hyperstition‘[139].

> „Fiction with a strong enough impact imparts a *hyperstition* on reality — an idea that makes itself real through the sheer nature of its spread, a pan-informational conjuring that loops itself around people's beliefs until it transcends from belief into Fact. Any number of ideas can count as hyperstition (among the myriad memetic packets flowing through our perception at any given time — reality is nothing but the sum of what we see, think, feel) but fiction is unique in that it offers one of the most engaging, *directed* informational vectors to spread an idea to us. […] Hyperstition as a word is an etymological rewiring of superstition: instead of denoting a b e l i e f bound to one or a scattered few it turns so ascendant that it's oft compared to a self-fulfilling prophecy. Once a hyperstition is created it births itself, and once it is born it always has been. Genesis loops around the clock. The past is reconfigured and the present entered into a new set of variables, the future encoded by a different probability array.“[140]

136 Geert Loving & Marc Tuters, *Rude Awakening: Memes As Dialectical Images,* https://non.copyriot.com/rude-awakening-memes-as-dialectical-images/ .

137 Victoria Van Cleve, *Nam Shubs - >>‘This Snow Crash thing – is it a virus, a drug, or a religion?‘ Juanita shrugs. ‚What‘s the difference?‘<<,* http://pages.erau.edu/~andrewsa/NamShubandCode1.html .

138 CCRU, *Lemurian Time War,* http://www.ccru.net/archive/burroughs.htm .

139 I‘ve already written a detailed description of the relation between control, cultural industry, meme-warfare, hyperstition and its predecessors in: Bill B. Wintermute „(Cybernetic-)‘Post-Pop‘: Affect Art(s) & (Emotional) Self-Governing“ in Achim Szepanski, ed., *Ultrablack of Music,* available online at: https://non.copyriot.com/cybernetic-post-pop-affect-arts-emotional-self-governing/

140 Natalie Terezi Rei Watts and the YONQ Esoterica Research Society (YONQERS), *Osaka Azumanga Daioh Isn‘t Human: A Hypnabiological Investigation,* https://www.yonq.zone/yonqblog/natalie-terezi-rei-watts/osaka-azumanga-daioh-isnt-human-a-hypnabiological-investigation .

One of its predecessors is found in the cut-up-technique[141] and collaging, which became a general design industry standard with image-, video- and audiosoftware[142], that used already preexisting material and combined it in new and unexpected ways. This hybridization or syncretization is also at the core of the emergence of new genres in music nowadays since the 80s and was accelerated in the 90s. Another predecessor is the détournement – „the diversion of already existing cultural elements to new subversive purposes“[143] – of the french artist group „Internationale Situationniste“. Détournement therefore can be understood as a way of feeding back into the ‚spectacle‘ to change it. Probably one of the most well-known, and musical, examples of détournement is the band Sex Pistols and with them the Punk-movement, that tried to use the spectacle as a means to turn it against itself. Their manager Malcom McLaren is known to be influenced by the works of the „Internationale Situationniste“ himself. And its latest predecessor is that of sample-culture, as developed in Hip-Hop and House. Sampling in contrast to cut-up or détournement is more pragmatic in its approach to the material. Sampling doesn‘t necessarily aim to ridicule or subvert the used material, while some uses of sampling are doing exactly that. For some time sampling used to be historicizing, but this kind of eclectic use of sampling made way for a more general use of the material. Nowadays, these concepts seem to stand side by side equally. Similarly plunderphonics as concept and compositional technique mainly use found material to produce new derivative works. Some artists imply a criticism of copyright law, while generally it‘s not the main purpose.

Memes repurpose existing material to new ends. Most of the time we only think of images, like the famous „Pepe the Frog“-memes produced in the 2016 Trump campaign, but during the Corona-Pandemic and with platforms like TikTok musical memes[144] became as important.

Holger Schulze describes three constituents of meme music:

141 For more information check: Brion Gysin & William Burroughs, as well as more recently Kathy Acker.

142 i.e. the interface and functioning of Adobe Photoshop, Premiere, DAWs, GIMP, etc. and also the general looks of advertisements (so to say: image layer + colored layer + text layer)

143 i.e. *Can Dialectics Break Bricks* by René Viénet a movie that replaced the audio of a kung fu flick with marxist theory. Available online at ubu: https://ubu.com/film/vienet_dialectics.html .

144 In musical memes the same song is used to produce a second and most of the time kind of ironic meaning with the recorded video. For more information see Holger Schulze: https://norient.com/index.php/holger-schulze/seduction-meme-music .

„First are the users and producers of meme music and memes in general, who cannot any longer be described simply in terms of influencers (Galeotti and Goyal 2009, Uzunoğlu and Kip 2014, Stubb, Nyström, and Colliander 2019) or prosumers (Toffler 1970). Instead, you and I serve as involuntary Memecubators, contributing to a meme in a wider variety of ways: our attention, recommendation value, sharing, clicks, comment value, and even the more direct work we do on memes, altering them to produce new examples, interpretations and variants. As wetware on the web, we all incubate memes and foster their future circulation – in particular at the points when we are not even aware of a meme's presence.

Next are the Memblematics that structure meme music. The traditional triad of constituents that make up the so-called emblem, an artistic form with its origins in 16th century literature, can also serve as an analytical matrix for memes. In this matrix, a GIF is the pictura, the insriptio takes the form of a brief catchphrase, and a subscriptio further explicates, interprets or even adds sound to the meaning of catchphrase and GIF (Schulze 2021). The parallel is clear in silent memes, and becomes even more obvious in meme music: here, the interpretation by means of an added soundtrack, sonic reference or sample cut-up provides additional meaning and interpretation with a stronger impact – as in the famous examples of the so-called Spencer Punch.

[...]

Finally, consumption of and conversation through memes operates within what I call the Meme Vortex. A Meme Vortex is entered every time the endless scroll that is fostered by most social media platforms leads us down the proverbial rabbit hole. The seductive and addictive quality of memes and of social media feeds serves primarily to guide us towards consuming even more seductive memes with similar qualities, from comparable sources, and with a generally comparable audience. The meme vortex is prolonged, suspended satisfaction commodified, digital seduction without end. This is even more the case with musical memes and their potentially endless sequence on an app like TikTok. This is a situation of use and consumption that is inherent to contemporary memes in 2021. To stay for a prolonged moment of time in the self-sustained and supposedly inconsequential pleasure zone of the Meme Vortex might just be the inherent goal of producers and users of memes – indeed, of all of us Memecubators.“[145]

The social use of memes in the so called meme-warfare has been described by the italian ‚Gruppo di Nun‘ as „occultural politics“[146]. They describe our current time as „[t]he Digital Middle Ages“[147] and with this description are close to what Holger Schulze observes as the historical predecessor of Memblematics. This bears similarity to what I suggest when speaking of ‚going full circle‘ to polyphony, not the historical

145 Ibid.

146 See: Gruppo Di Nun, *A Manifesto For Revolutionary Demonology,* https://www.neroeditions.com/a-manifesto-for-revolutionary-demonology/ .

147 For their upcoming publication: https://mitpress.mit.edu/books/revolutionary-demonology .

polyphony, but one re-shaped by digitality. It also points out the link between contemporary (digital) technology and occultural/esoteric practices of magic(k). This link was already described by Mark Fisher as "Gothic Materialism" that means it

> „is interested in the ways in which what would appear ultramodern – the gleaming products of a technically sophisticated capitalism – end up being described in the ostensibly archaic terms familiar from Horror fiction: zombies, demons. But it will resist the temptation to think of this >>demonization of the cybernetic<< as the revival of something >>something familiar and old-established in the mind.<< (PFL 14 363), preferring to think of it as the continuation of a nonorganic line that is positively antagonistic to progressive temporality. As Iain Hamilton Grant puts it, >>the Terminator has been there before, distributing microchips to accelerate its advent and fuel the primitives' fears.<<4 As we shall see, the nonorganic line as occupied by Gothic Materialism is to be distinguished both from >>the supernatural<< (the supposed province of Horror fiction) and >>speculative technology<< (the home of Science Fiction).“[148]

Besides what was most interesting to me, is that memes, just like sampling or fan-fiction, produce a multiplicity of voices. Material is used and changed over and over again, everytime contributing derivatives to the same basis: either an ‚original' recording, text, manga, picture or movie.

4.8.3 Ubicomptime as „Digital-Production“

„1. It is no coincidence that we are re-sampling ourselves
2. collecting sounds for the mother ship
3. The last century has been about recording
4. documenting our evolution throughout the past few centuries
5. to better understand and isolate strategies for refinement
6. However, now we are at the stage where we only play back those memories
7. blending them to create new ones.
8. Zero Fuck House“[149]

Music production, especially using DAWs, became increasingly a sort-of-collective network productions. People share VSTs/AUs, patches and code, presets, samples online. Samples and loops in particular via cloudbased infrastructure. Therefor they

148 Mark Fisher, *Flatline Constructs: Gothic Materialism and Cybernetic Theory-Fiction*, 3.
149 Tracktitles of Ghostproducer's release *Beware of the Genres of the Future, they will be used for Mind Control.*, https://ghostproducer.bandcamp.com/album/beware-of-the-genres-of-the-future-they-will-be-used-for-mind-control .

reproduce and replicate in some sort of viral behaviour, as they not go against certain underlying trends but using them, as most tools and sounds are shared again and again.

> „In contemporary pop production, the use of samples and prepacked loops has been taken to a new level in cloud-based music production. When producers across the globe can access and use the same downloadable presets, samples and full loops (for instance through subscriptions to services such as Splice, Noiiz or Loopcloud) the creative emphasis is put on their use and relation to other parts. Fundamentally, this is a shift to processual interconnectivity. In a sense, this is a practice or logic that is already embedded in the modularity of sound synthesis. Essentially, analogue soundsynthesis is based on fluctuating voltage used to shape and control other kinds of fluctuating voltages. In other words, it is a system of signal processing through the interconnected modelling of sound across parameters. From this perspective, music production is a macro-synthesis of sound works as a hybrid algorithmic structure. It is not just in its basis on loops, but in the conjunction of multiple automated functions that interrelate and define each other mutually. Processes affect the processes of other processes.“[150]

150 Anders Reuter, *Pop Processing – The Digitalization of Musical Time and Space*, 60, https://kunstogkulturvidenskab.ku.dk/Kalender/pop-processing/Ph.d.-_afhandling_2021_Reuter.pdf .
„At least within the art world, where the idea of creativity is almost embarrassingly juvenile, the slur hurled against those perceived to lack this ineffable quality is the accusation of being “derivative.” In other words, rather than originating something “new,” and thus being “creative,” the artistic effort in question is seen to be overly dependent on the style or idea of another work, from which its artistic impulse “derives.” For artists, the line between “creative” and “derivative” is fraught and anxious, with other artists, curators, critics and buyers acting as tastemakers who (often, it seems, entirely arbitrarily) can decide on which side of the line an effort might fall (see Thornton 2008).“ (Max Haiven, *Cultures of Financialization.*)
and:
„Everyone is supposed to recycle; no-one, whatever their political persuasion ought to resist this injunction. The demand that we recycle is precisely posited as a pre- or post-ideological imperative; in other words, it is positioned in precisely the space where ideology always does its work. But the subject supposed to recycle, Jones argued, presupposed the structure not supposed to recycle: in making recycling the responsibility of 'everyone', structure contracts out its responsibility to consumers, by itself receding into invisibility. Now, when the appeal to individual ethical responsibility has never been more clamorous - in her book Frames of War, Judith Butler uses the term 'responsibilization' to refer to this phenomenon - it is necessary to wager instead on structure at its most totalizing. Instead of saying that everyone - i.e. every one - is responsible for climate change, we all have to do our bit, it would be better to say that no-one is, and that's the very problem. The cause of eco-catastrophe is an impersonal structure which, even though it is capable of producing all manner of effects, is precisely not a subject capable of exercising responsiblity. Yet the appeal to ethical immediacy that has been in place in British political culture since at least 1985 - when the consensual sentimentality of Live Aid replaced the antagonism of the Miners Strike - permanently defers the emergence of such a subject. [...] The problem is that the model of individual responsibility assumed by most versions of ethics have little purchase on the behavior of Capital or corporations.“ (Mark Fisher, *Capitalist Realism.*)
and:
„Die potenzielle Virtuosität des Perkussions-Geräuschapparats ist längst ins Innere der Maschinen (Software und Hardware) gewandert, wo auch alle Soundcards, Presetsounds und Soundfiles abgelegt sind (ebd.: 036); es ist ein Möglichkeitsraum, durch den der Produzent zu navigieren hat. Die Kopie authentifiziert nun das Original. Aus der Beschränkung, die Programmen wie Cubase etc. inhärent ist, soll aber gerade ein Möglichkeitsraum oder ein virtueller Raum erwachsen. Er ist einerseits Zeichen der Technik und andererseits dient er der Simulation von natürlichen Objekten (zerspringendes Glas, Toilettenspülrauschen, raschelnder Wind, etc.) - als Sound aktualisiert, mutieren die sonischen

The interconnectivity of production, the synchronization of its tools, produce not only another social relation, but are responsible and representative for another space-time understanding.

> „The intensification of migration, economic integration, and political contacts [in 1876 to 1913] led contemporaries to establish several international organizations, agreements, and institutes that would govern this globalized world. Internationalism, in its several hues uniting socialists, women, eugenicists, and statisticians, to name but a few, aspired to mirror this interconnected world by operating beyond the level of the nation-state.7 As one such international agreement, universal and uniform time, hailed as a lubricant for a highly interconnected world, was to permit the seamless flow of people, goods, and ideas. Like uniform weights and measures based on the decimal system and standardized rates for mailing letters and sending telegrams, uniform time would establish commensurability and comparability and allow for commodification and exchange.“[151]

With global economy and worldwide telecommunication technology the synchronization of different moments in space-time became crucial. Not only for logistics, which made the invention of the universal standard time necessary, but also in

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Exkursionen zum Spiel-Objekt der Produzenten. Das Geräusch entsteht vielfach nicht mehr aus dem Spiel mit oder dem Missbrauch der Maschine, sondern es sind die Maschinen selbst, die die Musik in einen neuen Inhumanismus drängen: Acid hört die Frequenzen der TB303, genau so, wie sie sind. (Ebd. 022) Der Produzent folgt nur noch der Spur, die die Maschine gelegt hat. Damit wird die rigide Funktion des digitalen Studios akzeptiert, gleichzeitig sollen dem digitalen Studio durch Optimierung weiterhin neue Möglichkeiten abgewonnen werden. Allerdings führt diese musikalische Praxis heute eher zu einer rigiden Standardisierung, dem naiven Auf- und Abrufen der Preset-Sounds und der Metriken. Das Lineare definiert sich hier als die gleichförmige Abfolge bzw. als die Reproduktion eines vollkommen oder nahezu identischen Phänomens, und dies in mehr oder weniger kurzen Intervallen – wie bei einer Reihe von Hammerschlägen, einer repetitiven Serie, in die aber auch stärkere und schwächere Schläge und Pausen in regelmäßiger Folge eingehen können. Das Metronom gibt uns ein Beispiel für den harten linearen Rhythmus. Es bildet dem Ausgangspunkt alles Mechanischen. Das Lineare baut auf die Identität des Wiederholten, auf die Stereotype, und seine eher extensiven und symmetrischen Rhythmen neigen dazu, sich dem Differenz differenzierenden Werden querzustellen.“ (Andrzej Steinbach, Achim Szepanski, *Ultrablack of Music: Feindliche Übernahme*, 27.)

„DRITTER EINWURF:

Gerade mit den musikalischen Funktionen des Remixens und der Rekombination findet aber auch eine Mimesis an die derivativen Preisbewegungen statt. Analog befindet sich der Musik-Markt heute immer schon im Prozess des Re- der Rekombination. Und der Ursprung, nach dem wir uns so sehr sehnen, ist und bleibt in einen endlosen Prozess der Rekombination bzw. des Sampling im und am Musik-Markt eingebunden, i.e. der Markt ist der Fall einer originären Wiederholung, er besitzt den Charakter einer Spur. Die Originalität des Marktes impliziert das Verschwinden des Ursprungs à la >>am Anfang war der Markt und dann kamen die Musik-Werke<<, sodass letztere eben heute nals nichts weiter als Derivat-Simulationen fungieren, die gehandelt werden, um das Re- der Rekombination zu prozessieren.“ (Andrzej Steinbach, Achim Szepanski, *Ultrablack of Music: Feindliche Übernahme*, 33.)

151 Vanessa Ogle, *The Global Transformation Of Time (1870-1950)*, 22. Bold-highlightings added by author.

cultures flattening polychronic history into one uniform, linear-narrative and its failure, as well as the polytemporal structuring of finance and IT.

> „Yet in ‘rockstar’,suspended difference seemingly defies this. Static or circular music is far from new, but ‘rockstar’ is innately digital from inception, distribution to reception. It gains a different value coming from the inside of the digital’s topological nature. From this perspective, the trap track begins to exemplify what Wolfgang Ernst (2018) calls the true luxury of today’s temporal economy: the resistance towards permanent change. Instead, this ‘suspension from mobility’ reflects a ‘katechontic impulse of pausing’ (Ernst, 2018, p. 173). In other words, the excessive difference-defying sameness afforded by digital music production and exhibited in ‘rockstar’ not only connects with a societal shift towards precision and synchronisation. It is at the same time an aesthetic opposition to society’s topological flux. As music as well as an algorithmic structure, the excessive negation of difference in ‘rockstar’ bends and negates its doubled topological nature.The substantial differences and embedded temporal ambiguities of the pop tracks seems to reflect similar ambiguities in new media networks ’temporalities. They are defined by a duality between a relentless presence and a constant evolution. ‘Contents of the media seem to oscillate between process and stasis, rigid and fluid, storage and transmission/processing in a regular manner’ (Winkler, 2009, p. 9).Ephemerality and ubiquity. **Concurrently, our access to the past and its juxtaposition with the present is changed by the expansion of information. We work polychronically, engage in multiple activities simultaneously and place less value on temporal order**(Lee & Sawyer, 2010, p. 301)**. Temporality becomes heterogenous as it is both defined by a pluralization and at the same time new levels of coordination and synchronization** (Couldry & Hepp, 2016, p. 107). Again, like gridded pop prehensions, the ambiguous meets exactness and precision.“[152]

Timecontrol, as cultural-, scientific- and politicalproblem, became solved by institutionalizing a universal standard time, based on a network of atomic clocks, producing a measureable timegrid. The process was and is not without problems and a new plurality of heterogenous temporalities seem to take place.

> „Twitter presents itself as a flowing stream in real-time. But in fact it’s a far weirder mesh of many different times in uneasy counterpoint. People around the world in different time zones, hooked up via different connection speeds, some with super-fast broadband, others on a sluggish dial-up connection, or waggling their device in the air searching for 3G. There are posts generated automatically by bots, or scheduled in advance by client software, referring to things that will happen in the future, or commenting on events happening now, replying to other posts from days or weeks ago. But the whole thing is able to co-exist on a single scroll bar, unfurling like train tracks over a horizon.

152 Anders Reuter, *Pop Processing – The Digitalization of Musical Time and Space*, 63/64, https://kunstogkulturvidenskab.ku.dk/Kalender/pop-processing/Ph.d.-_afhandling_2021_Reuter.pdf . Highlightings added by the author.

Bong, "We are now arriving –" and suddenly I'm jolted out of my social-media haze. Hurriedly I start gathering up my things "– at Reading." What had felt like a few seconds must have been more like twenty minutes. The time just seemed to get swallowed up. Any thought of the work I'd intended to get done on this journey now out of the window, I rush down the aisle to the exit. Brushing past seats too tightly-packed, an Age of Earthquakes, coauthored by Douglas Coupland, Shumon Basar, and the curator Hans Ulrich Obrist. "But the more you offload your memories onto hard drives and into the Cloud, the more your memory becomes, in a very real sense, artificial. Technically, someone who spends all day in front of a screen has no memories of their own except for going to the fridge for a Coke…

These days, my music collection – like the Elliott Carter track I had on until just a moment ago – is stored, alongside all my other documents and photos, on a Cloud storage site. For a small monthly fee, I have a virtually limitless space to keep stuff in, and access it whenever I need it. But somehow it doesn't quite feel mine in the way it did when it was stored on discs of black vinyl or shimmering plastic on a shelf in my room. Everything is there, nothing need be thrown away, but lacking a sense of dimension, it seems also to lack any sense of protension. "Imagine hypothetically that I have an infinite memory," Bernard Stiegler writes in the third book of his Technics and Time. "I thus remember every second and fraction of a second exactly identically … There is no longer any difference, because there has been no selection: time has not passed. Nothing has happened nor can happen to me … no passage of time is possible. Time has ceased to exist."

This is the condition of the online world, in which every trace is meticulously preserved, but web pages start to mysteriously disappear after an average big and what's in there isn't sorted, or indexed, or catalogued in any of the many ways in which a paper archive is organized; it's not ordered in any way at all, except by url and by date." History, as a story that means something, is replaced by the blunt accumulation of data points, like mp3s on a Napster user's hard drive. Time becomes directionless, incapable of formulating its next chapter. The machines grinds on but the world stops.

Now I'm in the vestibule between coaches. The train pulls into the station. I press the button to open the doors, and step out onto the platform."[153]

I hope to have shown that the disintegration and intertwining of space-time under the sign of digital technologies can be found again in the integration of these technologies into everyday life as well as in their application interfaces. It is at once exercised in using communication networks like twitter, as it is part of how we work inside contemporary multi-media software like DAWs, editing tools for graphics and film, etc.

153 Robert Barry, *The Music of the Future*, 168/169.

5. [Recapitulation] Imaginary DAW-functions – (im-)possible applications

The following ideas are propositions for an ‚imaginary DAW'. They help both to accelerate the imaginary and to make its potential visible. In addition, it will be made clear at various points to what extent DAWs blindly reproduce social structures in their design. Most of the described functionalities, algorithms, techniques should be relatively easy to implement into general functionality of DAWs.

5.1 „master-slave dialectic"[154] or „break the chain"[155]

„That's the dead clock
It's colored people's time
No more master's clock
We travel space waves
What the fuck you say?
Fuck you say?
We kept the ghosts (fuck you say?)
We didn't let em out
The haunting's real
They tried to smoke me out
They Jim Crowed the air
I couldn't scream or shout
All I could do was stare
Make my great escape
That I was never there
Yeah I've been erased
And you don't fucking care
And you was never there
And when the beast came
It was the coldest winter
Love couldn't move
Couldn't even whisper
They tried to take me out
They tried to take me out

154 Georg Wilhelm Friedrich Hegel, *Phänomenologie des Geistes*.
155 KRS-One, *Break The Chain.*

Sharks in the drought
Cameras all about
But y'all was never there
And y'all don't fucking care
Yeah your body's here
But your minds all mime
And your memory's faded
And your heart flatline
That's the dead clock
It's Zamani time
No more master's clock
We travel space waves
What the fuck you say?
Fuck you say?
Fuck you say?
I can't hear you
I'm one with god
And I'm too fucking high
Yeah I cry with angels
So now we're start spangled
Yeah I need strength

Now we can all die in the name of
Neck-broke, head scrapped and green
Cause the shame was so
So so fucking slow
Now we can all die in the name of
Neck-broke, head scrapped and green
Cause the shame was so
So so fucking slow"[156]

On "rapgenius"[157] someone added this comment:

> „What's a dead clock? Ask your employer. Our life is measured in time. Our freedom should afford s the ability to do what we want with our time."[158]

In short: The „master-slave dialectic" is a famous of G.W.F. Hegel's „Phenomenology of Spirit" for describing his idea of the development of self-consciousness from

156 Lyrics of *Zami* by Moor Mother, https://genius.com/Moor-mother-zami-lyrics .
157 Rapgenius, https://genius.com/ .
158 Ibid.

consciousness. For Hegel and later Marx it describes the difference between being in-itself and for-itself, while the later is self-conscious. This state of self-consciousness must be considered as social phenomenon therefore a true self-consciousness can only be developed by leaving the division of master and slave behind.
Following the french philosopher Alexandre Kojève argues that, „in order to end this interaction, both must be dialectically overcome. For the slave it requires revolutionary transformation or the negation of the world as it is given. In the process, he does not only transform himself but also the world by creating new conditions. History comes to an end when the difference between master and slave ends, when the master ceases to be master because there are no more slaves and the slave ceases to be a slave because there are no more masters.“[159]

So far mankind hasn‘t left this stage, insofar the master-slave dialectic is far from disappearing, rather it has to be extended upon the relation of human and non-human. In this specific case to the machine:

> „In capitalism, says Simondon, „The machine is a slave that serves to make other slaves.“22 This statement places us on the decisive path of power relations. For if the machine is a slave, it has an autonomy and independence that are completely relative; it must have a boss, a slave master, someone for whom it works and whose orders it executes. Simondon doesn‘t reveal to us the identity of that master, but Gilles Deleuze and Félix Guattari give us part of the answer: „We are always slaves of the social machine and never of the technical machine.“ The technical machine would therefore be subordinated to the war machine. It is the latter that gives form to the man-machine relation, for it precedes both the man and the machine, transforming the first into „variable capital“ and the second into „fixed capital.““[160]

Even though some technical machines suggest a certain use or are limited in their usability. Like the unidirectionality of the radio, the television or interestingly and superfluously the stream, that could have been something completely different, but is used as if it were simple television broadcasting. It follows that this relation is not

159 See: wikipedia, *Master-Slave-Dialectic*, https://en.wikipedia.org/wiki/Master%E2%80%93slave_dialectic .
or in the original: Alexandre Kojève, *Introduction à la lecture de Hegel.*
An interesting sidenote is that the master-slave-dialectic is assumed to be developed under the impression of the Haitian Revolution. (As in: Susan Buck-Morss *Hegel and Haiti* and Philipp Hanke *Revolution in Haiti – Vom Sklavenaufstand zur Unabhängigkeit*)

160 Maurizio Lazzarato, *Capital Hates Everyone – Fascism or Revolution*, 156.

necessarily implied in the technical-machine, but the social-machine, that produces certain technical-machines and their means, as well as as well as the corresponding subjectification.

The recent history of ‚time' developed in a process of universalization and centralization. A process of linking slave-master relations. This resembles also how time was formalized and standardized across space:

> „Besides such national and regional designations of time [like i.e. CET], mean times were contrived to fulfill local functions. Efforts to streamline bureaucracy and improve populations withing political and geopolitical units seldom emanated from the top alone. When it came to implementing uniform time withing single states, the variety of actors who simultaneously took an interest in abolishing local times is striking. From the 1870s through the 1890s, national or federal governments were not the only ones preoccupied with creating landscapes of uniform clock time. There were municipal authorities, for instance, in cities such as Paris, Vienna, and Berlin, officials began to ponder solutions for synchronizing the numerous public clocks on display throughout these metropolises. **Most solutions to the problem of synchronization consisted of a so-called master clock**, corrected via electricity by a nearby observatory, **and numerous connected clocks often referred to as ‚slave clocks.**' One promoter of a system of city clocks for Vienna described such installations as method by which ‚as many clocks as possible cease being independent clocks when they give up their individuality and become part of a whole, a big **‚clock state' (Uhrenstaat)** with a head of state at the top.'25
>
> The local synchronization of time in cities provided important impulses for the unification of time on the national level."[161]

Until today every DAW works by using a masterclock, as well as a master metre, but it is simply speaking not necessary. The real masterclock and grid underlying music in the digital realm isn't the masterclock, but the samplerate, therefore each track could have their own BPM, as well as metre, and/or could be coupled to a masterclock as mathematically derived from it, which is – to a certain degree – already doable, although employing workarounds by (mis-)using the notegrid.

Adding a feature to automate the BPM for each track independently from the others should be quite simple. With some effort it is possible to implement a similar feature for sequencers, as shown in this thesis, but it doesn't offer the same accessibility as when

161 Vanessa Ogle, *The Global Transformation Of Time (1870-1950)*, 29/30. Bold-highlightings added by author.

provided in house and although highly flexible is more suitable for live-generative production then composition.

5.2 Tempo-Synthesizer in DAW-Environment

A next, slightly more complicated, step would be the implementation of using mathematical functions, as well as modulation or other forms of manipulation[162], for non-static tempo. Ideally using an accessible UI to generate the individual clock like adjusting a synthesizer, as well as having a codebox to enter mathematical functions directly.

5.3 Entanglement – Intradependence of Tracks

As described in „4.4.2 Tempo-Synthesizer“ and „4.5.3 Ornament: Feedback-Sequencer“ the interdependency of tracks and/or sequencers is an interesting feature enabling musical composition beyond the usual scope.

a.) Combination of different clocks could be easily achieved on an extra track using the same techniques described above[163].

b.) More complicated though maybe achievable in the same way, as arpeggiators are implemented so far: Each time a note is triggered in Track A, the count of the sequence in Track B moves forward (+ 1 step). The routing can be easily done in a matrix, idealy combined with a probability how likely it is that the trigger will be forwarded to the other Track.

5.4 Open Grid

So far the note grid in DAWs is either free or fixed in divisions of 2 or 3. This could be applied to any given number: divisions of 7 or 11 or 21 or even floating numbers. By,

162 Different ideas and possibilities are already conceptualized in „4.4.2. Tempo-Synthesizer“

163 i.e. sending two ‚metro‘ or ‚phasors‘ to one sequence in Max/MSP, expanded by a matrix of x nodes (of clocks & sequences).
The idea of using nodes is also used for signal routing in the M4L device *Nodes*:
https://maxforlive.com/library/device.php?id=7746

again, using a codebox it would be possible to make other divisions, i.e. fibonacci-sequence, etc. visible. As I suppose it is not interfering on a low level, but ‚only' an UI thing to change the appearance and therefore its functioning, it should be implementable.

A limited, yet simple and effective work around (at least in the DAW Logic Pro X[164]) for integer divisions, is to make your own grid by making x quarter notes and then ‚timestretching' them into one bar length. As shown in the following pictures:

Illustration 21: Make your own grid: 5 quarter notes

Illustration 22: Make your own grid: 5 notes in 1 bar

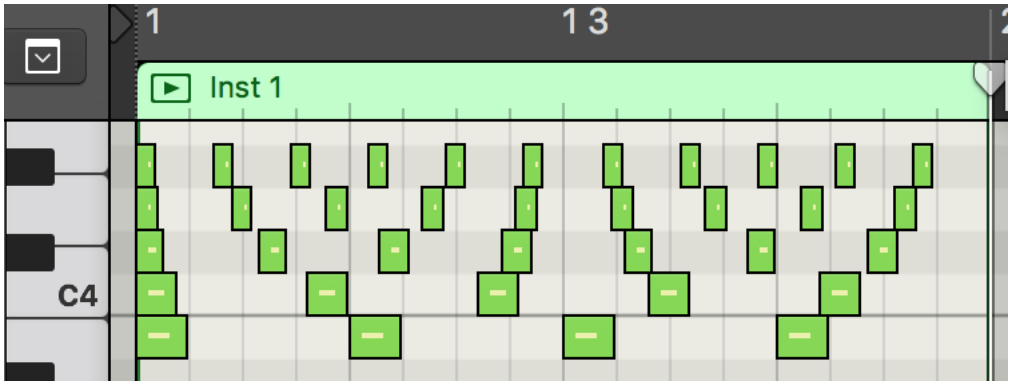

Illustration 23: Make your own grid: Guide for several divisions

This technique allows for using odd beat divisions for composing in DAWs. Which I've used in several of my compositions already.

164 I haven't yet been able to test it in other DAWs, but it should be possible in most.

6. [Case Studies II] in Practice

> „The BQF Creative becomes the active agent in the synchronicity/focal point, instead of time being the active agent defining the synchronicity.“[165]

The non-standard-sequencer functions as construction in which synchronicity is controlled rather than events in time. In this sense, like for other live-performed-generative music, the artist becomes the produced-producer, that is affected by the possibilities of the situation [code] set-up beforehand, and influencing the coming.

> „[...] Music is a machine for producing anticipation. [...] Every note, every phrase would be precisely tailored to set up particular expectations that would either be fulfilled or frustrated, producing specific sensations in the listener.“[166]

6.1 Live Set-Up

Generally the Live Set-Up is developed for solo audio/video live performances under the moniker „Lain Iwakura“. For live performances I'll combine the above described techniques of 'non-standard-sequencing', controlled via TouchOSC[167] and MIDI, with live synthesis (i.e. a special FM-Synthesizer that is based on multiple, combinatoric sequences; Feedback-FM-Synthesis; etc.), all passing through an analog mixer that is used with several feedback-loops. This provides the possibilities to go back and forth between experimental, open form music, as well as sticking to more 'conservative' club patterns and sound. On top added is a technically simple layer of video to add to the feeling of being overwhelmed with information, while at the same time providing another layer of coherent material.

A video example of this is provided as part of the practical bachelor exam.

At the same time it was used for the performative-installation „In Erwägung“ [168] developed at „Champ - dAction.LAbO'21“ together with Maze and Tommaso Settimi and performed in DeSingel Center, Antwerp 29.08.2021. The collective performance

165 Black Quantum Futurism, *Theory & Practice*, 28.
166 Robert Barry, *The Music of the Future*, 118.
167 The layout of the TouchOSC interface is added in the „Appendix“.
168 Videorecording of the performance: https://youtu.be/TKHxotjgB_A

allowed for adapting and testing out my live set-up as an instrument among other artists, while so far I've mainly used it for solo performances. It proved to work out quite well and shows how wide the range of applicability is.

6.2 Korin Rizzo's „The Glove"

For Korin Rizzo's bachelor thesis „Tangible Computermusic: Exploration of a Glove as Musical Interface"[169] we tested the applicability of „The Glove" as an instrument used by other artists, while at the same time using the current version of my sequencer to control it. Some tiny adjustments were necessary to get the midi messages produced by the sequencer to send control messages for the solenoids via arduino.

To generate sound we used different physical materials that were excited by the solenoids attached to „The Glove". It was interesting to observe how my concept of rhythmical layers was to be transformed by using „The Glove" as in instrument in contrast to the synthetic sounds I normally use. Especially as our interest moved to observe fast and non-linear rhythmical structures mainly, which is the opposite to what I tend to use it in my very own performances. Also the tactility of „The Glove" itself become much more a part of how to play with the sequences themselves, i.e. getting closer or further away from the material or quickly moving away the finger instead of muting or changing the sequences in the software. For a more detailed description and a recording see the thesis of Korin Rizzo.

6.3 Drop [Beyond the 'non-standard-sequencer']

In the following I'd like to briefly provide some insight into compositions, tracks, performances and works that I've developed in the last years, during my studies. It shows that the underlying reflections influenced my work beyond the development of tools or my live-performances, but resonate deeply with it.

They will be discussed in chronological order (of production).

169 Korin Rizzo, *Tangible Computermusic: Exploration of a Glove as Musical Interface*, https://phaidra.kug.ac.at/view/o:122424 .

6.3.1 vienna unground

„vienna unground“[170] (originally for 12 tapedecks) combines a cut-up text on the topics of trauma and plot holes with an audio-piece that reprocessed a recording of Arnold Schönberg's "A Survivor From Warsaw". It addresses psychological influences on our perception of history as it is (re-)written. In this sense showing how history is never finished, but an ongoing process, in which what is past reemerges and influences present and future. And how, ignoring history, as well as trying to complete or end it, inevitable leads to repeating the same patterns on the small scale (in the behavior of subjects and their corresponding autonarratives) and large scale (i.e. national and human history). It exemplifies how history and memory do not process in a linear fashion, but like tectonic movements, operate sub-surface.

6.3.2 society is ripping itself apart

"society is ripping itself apart"[171] starts with pure sinetones, that get layered to produce beatings, and after subtly introducing field recordings of firecrackers a few minutes in the first beat emerges accompanied by an interview from the London riots (2011) disrupting the tense, yet open, atmosphere from before. When the beat has developed a little, it makes place, for a break in which a newscaster among other things says the following sentence "you can see the police here running […] trying to reestablish order", which is accompanied by an acid-synthesizer, followed by an interview with a police officer. Afterwards the beat is reestablished, but has changed the rhythm, giving way to polyrhythmic structures. From this point on the atmosphere gets intensified, noisier, by dense layering of recordings of the London riots – found footage from YouTube. With some time the beat gets more and more wonky as each singular hit gets delayed, until synchronicity is lost and only the underlying bassdrum groove continues its unforgiving rhythm.

The ending shows how the title "[…] ripping itself apart" is over and over again exercised in the temporal structure of this work until at the very end, it rips through the synchronization necessary in club-music. At several moments in this track it is taken from one stable state into another in a disruptive manner. How expectations are disrupted closely resonates with what was described in Chapter 2 as time of revolt and resistance: breaking the flow of history.

170 Published by ‚mille plateaux' in cooperation with kunstraum_8020: https://forceincmilleplateaux.bandcamp.com/album/vienna-unground .

171 Published by ‚mille plateaux': https://forceincmilleplateaux.bandcamp.com/track/society-is-ripping-itself-apart-binaural .

6.3.3 Monokultur

"Monokultur"[172] is a minimalistic track for 24 bassdrums. Each bassdrum has an underlying pattern based on the euclidean algorithm, yet, each pattern influences the others by using the technique described above as "entangled-sequencer". Therefor, whenever one bassdrum is triggered it might influence another pattern as it moves the counter of its sequence forward (+ 1). The network that decides which pattern influences which, is controlled by a 'game of life'-algorithm, providing even more continuous change. On top the clock underlying the sequences is split into 4 groups controlling the mastertempo of the sequences, and is itself modulated by an LFO.

The outcome is a meditative focus on rhythms and temporalities, similar to Terry Riley's "In C", but reducing the recognizable sound even more.

6.3.4 _art (underart) / _kunst (UnterKunst)

The "_art manifesto"[173] by the 'committee for the abolition of the arts'[174] was an unlisted performance during the semester concerts. Disrupting the concert, with a staged protest, and reading the manifesto provided a setting of unexpected disruption. It made necessary to pause for a minute or two, and instead of continuing the expected program get confronted with a critique of (contemporary) art(s). While at the same time inviting the audience to drink a 'Cosmopolitan' to change the general atmosphere of this concert series.

Unexpectedly it also proved to test out the limits of what is possible in the context of institutionalized art(s) as the initial idea of having the performance accompanied by listening to a lighted microphone burn, was forbidden by fire protection reasons.

6.3.5 Poly

"Poly"[175] is a collaborative work by "niko mas" and one of my alter-egos "Ezili-i Sabbah". This EP includes 6 tracks, consisting of 2 original tracks per person + 1 remix each. The tracks produced for this release "Ströme", "Leaving Shores", as well as the remix of niko mas "Polyrhyzome" all play with polymetric, polyrhythmic and (from

172 Not yet released or publicly available, for listening so far use the following private link: https://soundcloud.com/bill-b-wintermute/monokultur-binaural/s-vIwteKr7Ee0?si=f449455615d441ddb0943100b396cbab&utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing .

173 Text & videorecording available: https://derayling.copyriot.com/_art-manifesto .

174 The ‚committee for the abolition of the arts' will continue in collective effort using different forms in, beyond or under_art.

175 Published by and for the fanzine „Crossdressing Diogenes": https://crossdressingdiogenes.bandcamp.com/album/poly .

time to time) polytemporic composition practice. And at the same time were the first tracks that completely aware explored the concepts described in this thesis.[176] As the title “Poly”, the tracktitle “Ströme” (as plurality), and even more “Polyrhyzome”, already suggest this take, they all essentially aim at losing the center/core and delving into a more open form that is provided, when each voice is as important as any other. How one voice develops may essentially change the w_hole structure of all other voices and with it the track. The voices are perceived as intraactive, crossbleeding from one into the other. Less conceptual and more on the level of a play with forms and structures those tracks work as a first step into transforming the experiences gained by developing and listening to the “non-standard-sequencer” into composition.

176 First steps in this direction have already been taken before the studies under the moniker „DeRayling“ on the self-titled EP and were published by „Force Inc. / mille plateaux“: https://forceincmilleplateaux.bandcamp.com/album/derayling .

7. [Coda] Conclusion

> "I would go as far as to insist that more than any other time in our brief history on Earth, we are experiencing a clash of temporalities: geological time, the deep time of those processes that fashioned our terrestrial home; historical time; and experiential time. All these times now fold in on one another. We are not used to thinking of time as simultaneous. We think of time as linear: past, present, future. So how do we begin to think about time in a way that takes these concatenations seriously?"[177]

The problem, as the quote already makes clear, is of urgency, and it is not by random chance that it reemerges at this moment, but that it is directly linked to changes by globalization, cybernetic-infrastructure, logistics, as well as in climate, our perception of history, the understanding of time in physics, and many more. More so that the development of concepts of time, as well as the use of time we make, is directly linked to questions of economy, imperialism and colonialism, gender, technology, history (studies), in short: techno-social practices of domination and class struggles[178].

It also points towards what I was trying to address in this thesis: that it is necessary to think temporality in plural, as simultaneous temporalities, and that it is not moving in a linear fashion, from past to present to future, therefor to be understood as non-linear movement. Movement, in this case, means at the same time thinking in movement, being moved, thinking the connection of (social) movements, as well as thinking history and music in movement, it points towards movement by migrants in a globalized world, or tectonic movement, as it means the movement of products and resources via logistic and cybernetic networks. Pluralities of movements that are not separate, but intraactive and directly linked to each other.

Therefor it seemed necessary to develop tools, of thought / in code / as compositional practice / for (social) movements / …, that can grasp non-linear poly-temporalities, and to provide a basis for further exploration.

Although this thesis, already quite extended, uses material from a wide range of (scientific) disciplines and beyond, from sciences to humanities, from fiction to non-fiction, from academic to objet trouvé, from rational to irrational, from enlightenment to mythology, and tries to consider them as equal observations, it seems that the concepts

177 Achille Mbembe in an interview for ‚Noema' *How To Develop A Planetary Consciousness*, https://www.noemamag.com/how-to-develop-a-planetary-consciousness/ .

178 Class struggles in the plural to highlight how different struggles are intrarelated.

need to be further developed. And moreover, as the amount of material and access shows, in a collective process.

And even though so far the developed tools work as means for doing (solo-)live-performances, yet again, as this thesis has shown, there's a huge field of things left for study and exploration. Many of the tools still need further development, will have to be optimized, or transported into another language. On top of that I've noticed, while developing these tools, that I'd like to break them up a little more, to make them work like singular modules that are openly accessible; which is a first step into the direction of implementing those ideas into regular DAW-Environments. To provide 'easy to use' modules seems crucial to my goal of reestablishing our notion of time in music, as it will need collective effort to address this problem. The point is that only through the application of these new techniques and concepts by a variety of musicians can habits be broken.

I hope to have provided material that proves the lack of in-depth engagement with sequencers and timing and opening up questions for re-addressing these problems, that are essentially not only technical or musical ones, but also go to the core of social struggles for liberation and the placement of mankind in the world. In musical form, as in social structure, a recompos(t)ed polyphony may provide the means for rethinking the relation between the singular & totality, subject & objectivity, stories & History, voice & composition. As a practice of sonic-thinking/-fiction producing and listening to non-linear, poly-temporic music can help understanding how these relations function, while the socio-philosophical & scientific critiques re-articulate possible lines of flight for further exploration. It's about thinking in motion as well as thinking (social) movement(s) at the same time.

„>>We are the wretched of the planet Earth, we are the proletarians of death. Space-time is endangered and we ask for the politicization of the transcendental. We don't want to be lost in the mine of time: we need an art of impossible communications, revealing death in life and life in death without confusing them; we need hosts; we need living bodies able to repeat what they already said when the world collapsed; we need to record right now what will never happen.

Ghosts of all futures, unite!<<"[179]

179 Frederic Neyrat, *Hosting the Ghost: On Limbo Aesthetics*, 2021, https://alienocene.files.wordpress.com/2021/05/fn-ghost.pdf .

8. Appendix

8.1 Black Quantum Futurism - Chart[180]

Quantum Phenomenon	Description	African Spiritual / Religious Phenomenon	Real-world Correspondence
Wave-Particle Dualism	Light exhibits both eave and particle like properties, opposing classical/Newtonian definitions of matter as either/or	Ancient Egyptian concept of the Tuat, Ka, and Qeb (Ankh Amen)	Optical illusions; mind-body duality; figure-background duality, „the two facets, figure and background, flow into each other to bring off a moment of maximal seeing, albeint one limited by the way each facet takes from, cedets to, and offsets the other“ (Grandy); Dubosian double consciousness
Superposition	A particle exists partly in all its theoretically possible states simultaneously, but, when measured or observed, it give a result corresponding to only one of the possible configurations;	Concepts of rhythm and pattern	Photosynthesis; the process of embryogenesis/fetal development (Bynum); white light simultaneously containing all colors; magnets (Grandy)
Wave-Function Collapse	The phenomenon in which a wave function – initially in a superposition of several states – apppears to reduce to a single state after being measured or	West Afrcan [sic] disciplines deriving from lfa model, Orisha possession (Bynum)	Illusions (where an image presents two possibilities, deciding on one) (Grandy)

180 „BQF Correspondence Chart“ by Rasheedah Phillips in: Black Quantum Futurism *Theory & Practice*, 76/77.

	after interaction with an observer. It connects the wave function with classical observables like position and momentum.		
Non-locality and Entanglement	Two entangled particles behave as a single physical object, no matter how far apart they are. If a measurement is performed on one of these particles, the state of its distant twin is instantaneously modified.	„Personalized, spiritual inform each other within a nonlinear causal matrix of space, matter, intentionality, and time;“ Ex. Orisha or Loa is unfolded into local reality, emerging from a higher order enfolded reality, Olorun as unmanifest, nonlocal realm of intelligence (Bynum); magic or witchcraft	Human consciousness, dreams, neurons firing has nonlocal correlations (Bynum); speed of light, vision/ visual process (Grandy); music= „ a pluralistic succession of individual tones, each distinct in time acts on and is reached on by an emerging musical whole“ (Grandy)
Time Symmetry and Retrocausality	Time is symmetrical for particles, meaning events happen the same way if time progresses forward or backward. For example, a video of two particles coliding and scattering off each other can be played forward or backward, and makes sense either way.	African oral tradition defines time in relation to interpersonal events in the past and future (Bynum); notions of deeply ingrained rhythms and patterns to nature, events, time.	Cosmology; length of time it takes light to reach eyes;
Heisenberg Uncertainty Principle / Quantum Uncertainty	These are fundamental limits to what can be known about nature and quantum matter; „the more precisely the position [of a subatomic	The Orisha, in probabilistic fashion, manifests dynamic pattern between physical world and human consciousness (Bynum);	Psychodiagnostic assessment procedures relying on probability of dynamic personality patterns and associated behaviors (Bynum); Paul

	particle] is determined, the less precisely the momentum is known in this instant, and vice versa.“ - Werener [sic] Heienberg. Heisenberg‘s Uncertainty Principle implies an open future and open past.	the concept of potential time (Mbiti) (the future is in a potential state, creative and created, flowing backward into the present & past)	Davies‘ concept of nature as inherently indeterministic.

8.2 Non-Linear-Sequencing in SuperCollider

Following is the SuperCollider Code for ‚non-linear-sequencing‘ as provided by Daniel Mayer.

A.) Make a file called ‚NLSeq.sc‘ in the SuperCollider extensions folder with the following (for generating a Pseudo-UGen):

```
NLSeq : UGen {
	*ar { |bufnum, timePoints, rate, reset = 0|
		var indices = (0..timePoints.size-1);
		var thr = 1e-6;
		var phasor = Phasor.ar(
			reset,
			rate * SampleDur.ir
		);
		var points = timePoints.every { |x| x.isKindOf(UGen) }.if { timePoints } { DC.ar(timePoints) };
		var shaped = BufRd.ar(1, bufnum, phasor * BufFrames.ir(bufnum), 1);
		var trigs = HPZ1.ar(shaped - points - thr > 0) > 0;
		var trig = trigs.sum;
		var indexTrig = (indices * trigs).sum;
		var index = Latch.ar(indexTrig, trig);
```

```
                // gibt Trigger und index in Array aus
                ^[trig, index]
        }
}

NLSeqB : UGen {
        *ar { |bufnum, timePoints, rate, reset = 0, thr = 1e-4|
                var indices = (0..timePoints.size-1);
                var phasor = Phasor.ar(reset, rate * SampleDur.ir );
                var points = timePoints.().collect { |x| x.isKindOf(UGen).if { x }{ DC.ar(x) } };
                var shaped = bufnum.notNil.if {
                        BufRd.ar(1, bufnum, phasor * BufFrames.ir(bufnum), 1)
}{
phasor
};
                var trigs = HPZ1.ar(shaped - points - thr > 0) > 0;
                var trig = trigs.sum;
                var indexTrig = (indices * trigs).sum; var index = Latch.ar(indexTrig, trig); // gibt
Trigger und index in Array aus
                ^[trig, index]
        }
}
```

B.) Use the following code in a supercollider file:

```
/////// General
s.boot;

(
// fülle Buffer mit Funktion
~trFunc = { |x| x ** 2 };
u = Signal.newClear(4096);
```

```
u.waveFill(~trFunc, 0, 1);
u.plot;
b = Buffer.loadCollection(s, u);
)

b.plot


//////// VERSION 1
// ohne Pseudo-UGen

(
x = {
	// input, es ist wahrscheinlich praktisch reset und rate unabhängig steuern zu können
	// das ist eine ähnliche Idee wie beim "Hard-Syncing" (Synthese)

	var reset = Impulse.ar(2);
	var rate = 2;
	var n = 4;
	var indices = (0..n-1);
	var timePoints = indices / n;
	var vals = [60, 65, 67, 74];
	var thr = 1e-6;
	// original Phasor
	var phasor = Phasor.ar(
		reset,
		rate * SampleDur.ir
	);
	// Waveshaping mit Buffer
	var shaped = BufRd.ar(1, b, phasor * BufFrames.ir(b), 1);

	// Die nächste Zeile ist etwas schwieriger, ein Multichannel-Trigger für die Events:
	// shaped - DC.ar(timePoints) wird positiv wenn die (Sequenzer-)Zeit überschritten ist
	// Schranke thr ist notwendig weil sonst bei t = 0 kein Trigger
	// HPZ1 misst die Differenz zum letzten Sample und HPZ1 > 0 produziert einen
	// "echten" Multichannel-Trigger, der immer nur zu den jeweiligen Zeiten 1 ist
```

```
		var trigs = HPZ1.ar(shaped - DC.ar(timePoints) - thr > 0) > 0;
		// zeigt, dass zumindest ein Index getriggert wird
		var trig = trigs.sum;
		// aktueller index (aber als Trigger)
		var indexTrig = (indices * trigs).sum;
		// sample and hold index
		var index = Latch.ar(indexTrig, trig);
		var env = Decay2.ar(trig, 0.01, 0.1);
		// da vals ein Array ist (und kein UGen) braucht es hier DC
		var freqs = Select.ar(index, DC.ar(vals.midicps));
		SinOsc.ar(freqs, 0, 0.1) * env ! 2;
}.play
)

// nach reboot (und Laden des Buffers)
(
x = {
		var vals = [60, 65, 67, 74];
		var nlSeq = NLSeq.ar(b, (0..3) / 4, 2);
		// nlSeq ist stereo: [trigger, index]
		var env = Decay2.ar(nlSeq[0], 0.01, 0.1);
		var freqs = Select.ar(nlSeq[1], DC.ar(vals.midicps));
		SinOsc.ar(freqs, 0, 0.1) * env ! 2;
}.play
)
x.release

// unterschiedliche Raten (Polyrhythmus)
(
x = {
		var vals = [60, 65, 67, 74];
		// 2 x stereo
		var nlSeq = [
			NLSeq.ar(b, (0..3) / 4, 2),
			NLSeq.ar(b, (0..3) / 4, 3)
		];
```

```
		// nlSeq.flop[0] gibt [trig0, trig1]
		var envs = Decay2.ar(nlSeq.flop[0], 0.01, 0.1);
		// nlSeq.flop[0] gibt [index0, index1]
		var freqs = Select.ar(nlSeq.flop[1], DC.ar(vals.midicps));
		SinOsc.ar(freqs, 0, 0.1) * envs;
}.play
)

x.release


// timePoints kann UGen sein (Mouse-Control), die konstante Rate garantiert aber Synchronisation
(
x = {
		var vals = [60, 65, 67, 74];
		var nlSeq = [
			NLSeq.ar(b, (0..3) / 4, 2),
			NLSeq.ar(b, (0..3) / MouseX.kr(4, 10), 1)
		];
		var envs = Decay2.ar(nlSeq.flop[0], 0.01, 0.1);
		// hier geht (glaube ich) keine MC-expansion, da Select selbst Array als 2. arg braucht
		var freqs = [vals, vals.reverse + 14].collect { |vs, i|
			Select.ar(nlSeq.flop[1][i], DC.ar(vs).midicps)
		};
		SinOsc.ar(freqs, 0, 0.1) * envs;
}.play
)
x.release


// values in Select können UGens sein
(
x = {
		var vals = DC.ar([60, 65, 67]) ++ SinOsc.ar(1.2).range(74, 80);
		var nlSeq = [
			NLSeq.ar(b, (0..3) / 4, 2),
```

```
                NLSeq.ar(b, (0..3) / 4, 3)
        ];
        var envs = Decay2.ar(nlSeq.flop[0], 0.01, 0.1);
        var freqs = [vals, vals.reverse + 14].collect { |vs, i|
                Select.ar(nlSeq.flop[1][i], vs.midicps)
        };
        SinOsc.ar(freqs, 0, 0.1) * envs;
}.play
)
x.release



// rate variabel, Synchronisation ist nicht garantiert
(
x = {
        var vals = [60, 65, 67, 74];
        var nlSeq = [
                NLSeq.ar(b, (0..3) / 4, 2),
                NLSeq.ar(b, (0..3) / 4, MouseX.kr(1, 10))
        ];
        var envs = Decay2.ar(nlSeq.flop[0], 0.01, 0.1);
        var freqs = Select.ar(nlSeq.flop[1], DC.ar(vals.midicps));
        SinOsc.ar(freqs, 0, 0.1) * envs;
}.play
)
x.release


// rate variabel, Synchronisation durch reset gesichert
// (Sequenz kann aber natürlich unvollständig sein)
(
x = {
        var syncs = [
                TDuty.ar(1),
                TDuty.ar(Dseq([0.5, 1], inf)),
```

```
		];
		var vals = [60, 65, 67, 74];
		var nlSeq = [
			NLSeq.ar(b, (0..3) / 4, 2, syncs[0]),
			NLSeq.ar(b, (0..3) / 4, LFDNoise3.ar(1).range(1, 2), syncs[1])
		];
		var envs = Decay2.ar(nlSeq.flop[0], 0.01, 0.1);
		var freqs = [vals, vals.reverse + 14].collect { |vs, i|
			Select.ar(nlSeq.flop[1][i], DC.ar(vs).midicps)
		};
		SinOsc.ar(freqs, 0, 0.1) * envs;
}.play
)

x.release

/////// VERSION 2
// ohne Buffer, lineares Sequencing
( x={
		var vals = [60, 65, 67, 74];
		var nlSeq = NLSeqB.ar(nil, (0..3) / 4, 1);
		// nlSeq ist stereo: [trigger, index]
		var env = Decay2.ar(nlSeq[0], 0.01, 0.1);
		var freqs = Select.ar(nlSeq[1], DC.ar(vals.midicps));
		SinOsc.ar(freqs, 0, 0.1) * env ! 2; }.play
);
x.release



// Waveshaping mit Transferfunktion ist aequivalent der Anwendung der inversen Transferfunktion auf die Zeitpunkte // bei linearem Sequencing
// d.h. dieses Beispiel mit linearem Sequencing und der Wurzel angewandt auf die Zeitpunkte // entspricht der Transferfunktion y = x^2
(
x={
		var vals = [60, 65, 67, 74];
		var nlSeq = NLSeqB.ar(nil, ((0..3) / 4) ** 0.5, 1);
```

```
		var env = Decay2.ar(nlSeq[0], 0.01, 0.1);
		var freqs = Select.ar(nlSeq[1], DC.ar(vals.midicps));
		SinOsc.ar(freqs, 0, 0.1) * env ! 2; }.play
)
x.release


// das hat die interessante Konsequenz, dass die Transferfunktion dynamisch variiert werden kann
(
x={
		var vals = [60, 65, 67, 74];
		var nlSeq = NLSeqB.ar(nil, ((0..3) / 4) ** SinOsc.ar(0.35).range(0.2, 1), 1.5);
		var env = Decay2.ar(nlSeq[0], 0.01, 0.1);
		var freqs = Select.ar(nlSeq[1], DC.ar(vals.midicps));
		SinOsc.ar(freqs, 0, 0.1) * env ! 2; }.play
)
x.release
```

8.3 „Representation Environment of European Modernity Through the History of Music“

The following illustration (Illustration 24) shows a socio-historical development of major musical types in a certain period in relation to its accompanying categories of subjectivation and social control, the ideological idea of freedom and a possible position to be taken for functioning as ‘free observer’ inside this structure.

music type (selection & organization of sonic objects)	social-communicative organization	object of control & alienation	representational environment dominant structure	subordinated subjectivity	idea of freedom	free observer
church tradition (until XVI)	feudal tyrranies	life	religious myth	slave	philosopher	ascetic
secular composers (until XVIII)	vassal empires	body	patriarchal colonisation	soldier	citizen	author
academic, written (until XX)	bourgeoisie republics	time	echno-scientific democratisatio	worker	bourgeois	flaneur
rock-n-roll, popular song (until 1990-s)	capitalist democracies	voice	totality of tele-spectacle	consumer	star	situationist
electronic underground (until 2005s)	global market	desire	media-marketing	spectator	designer	anarchitecht
experimental non-academic (unti 2020s)	network international	identity	techno-social communications	avatar	blogger	semiomaut
rhythmanalysis	non-local microcultures	connections	augumented everyday	ID/IP	artist	spectre

Fig. 2. Sergey Ogurtsov (2019). *Representation Environment of European Modernity Through the History of Music*. Rights given by author to publish here for the first time.

Illustration 24: originaly published by Nikita Safonov "Sonorous Deserts: Schizoanalysis, Sound Studies, and Inhuman Ecology"

8.3 TouchOSC-Interface

As it provides some more insight into how I organize my set-up, on the following pages are screenshots of the TouchOSC-Interface used in performances.

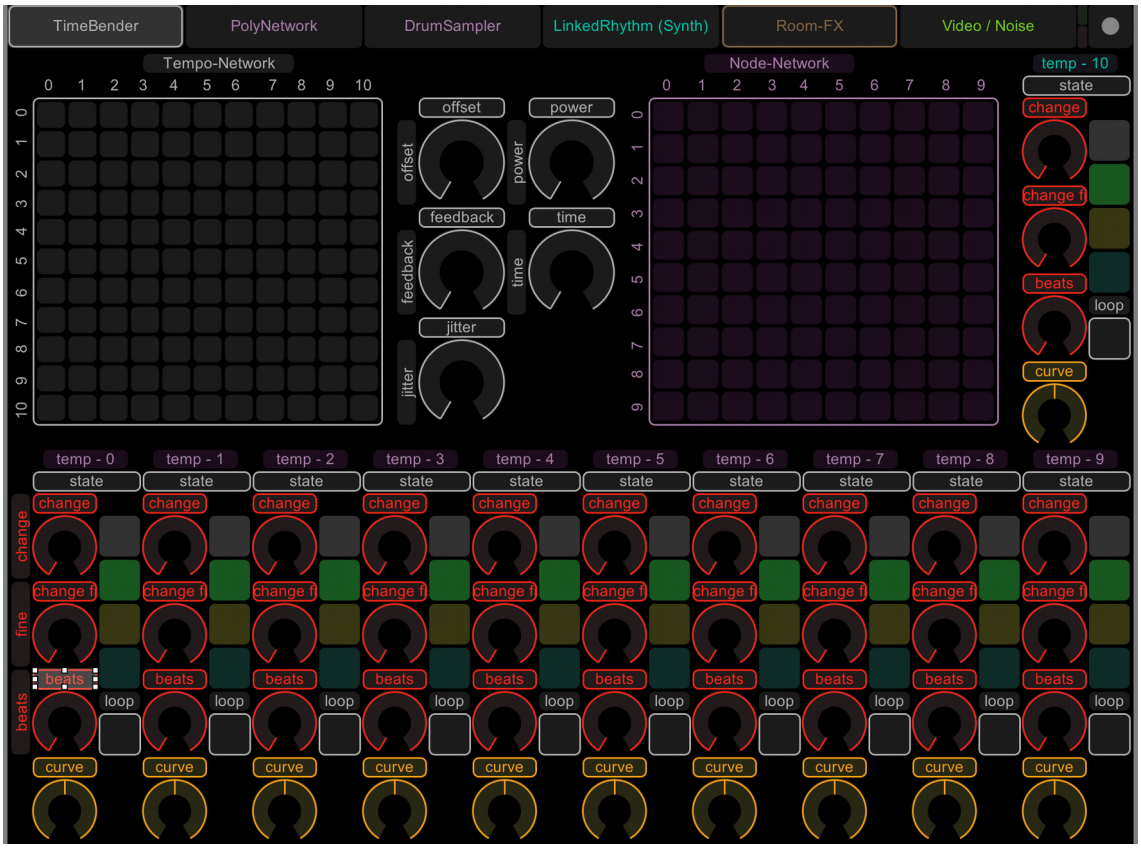

Illustration 25: Page 01 - 'TimeBender'

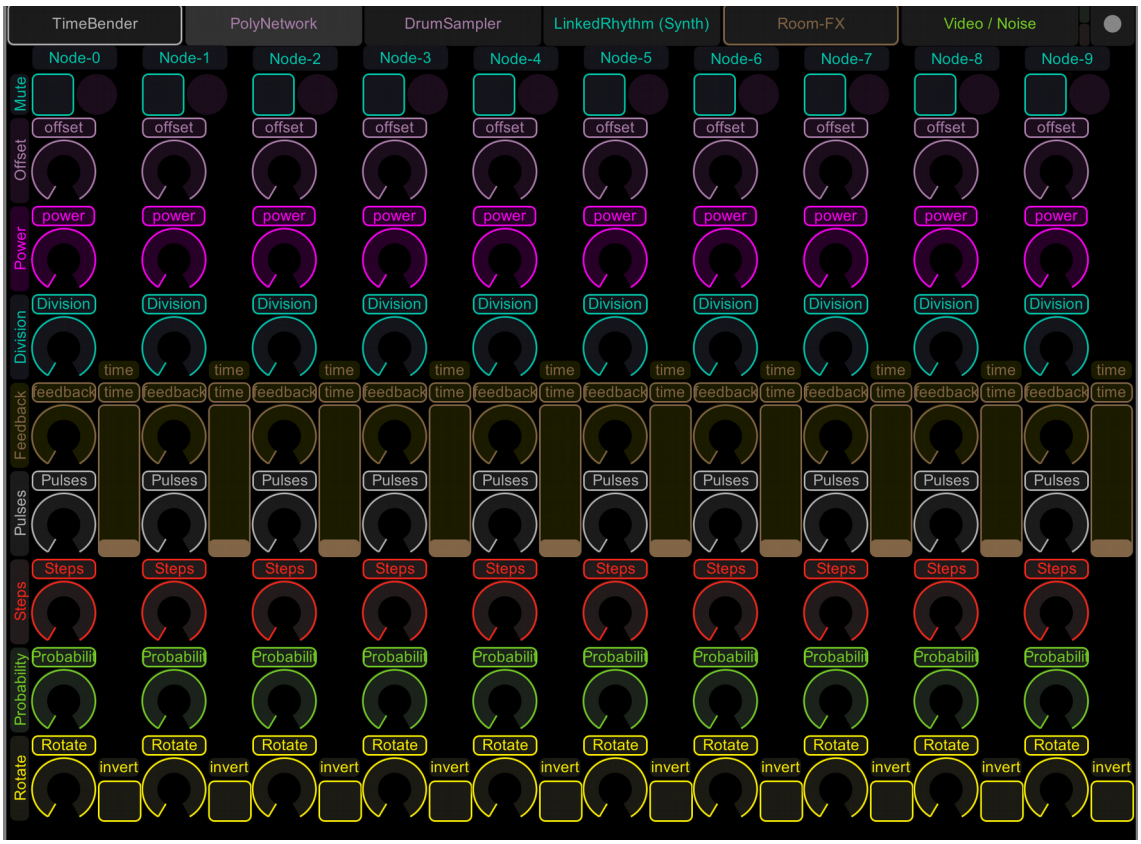

Illustration 26: 'non-standard-sequencer' of drums

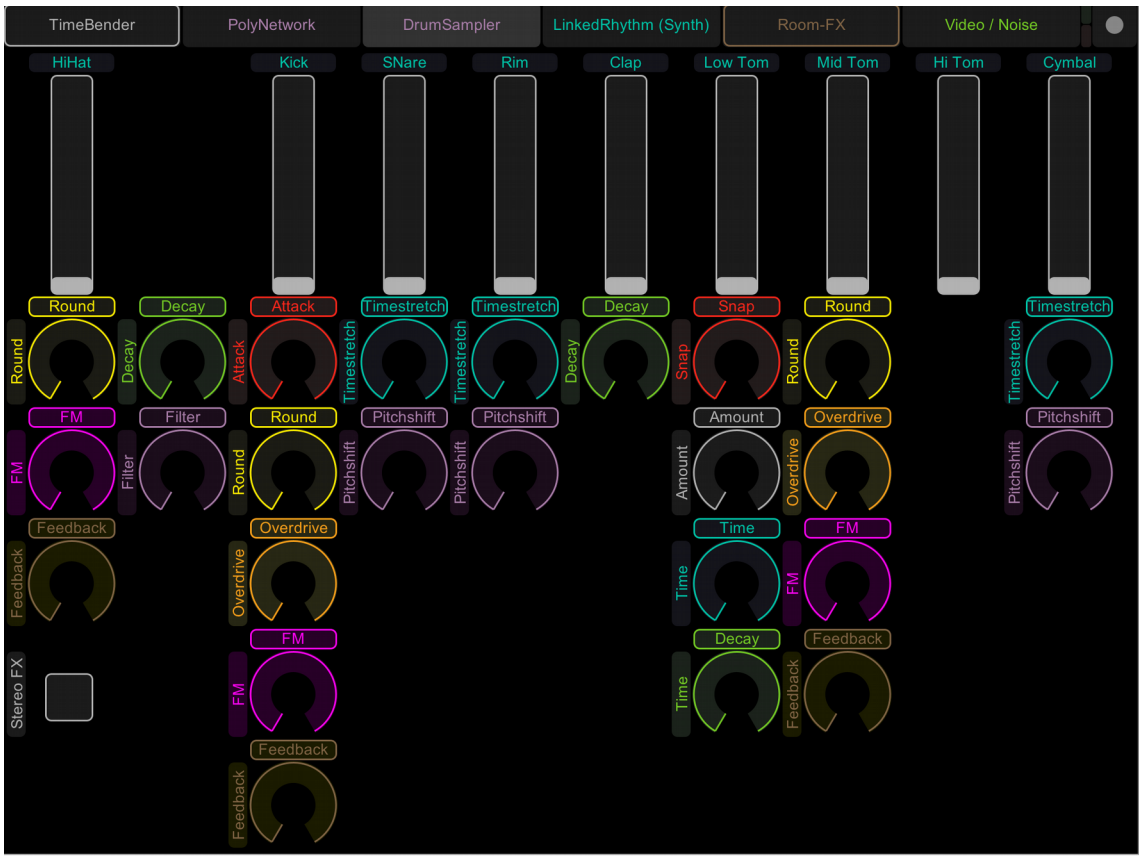

Illustration 27: rhythmsynthesizer ; drumsynthesizer

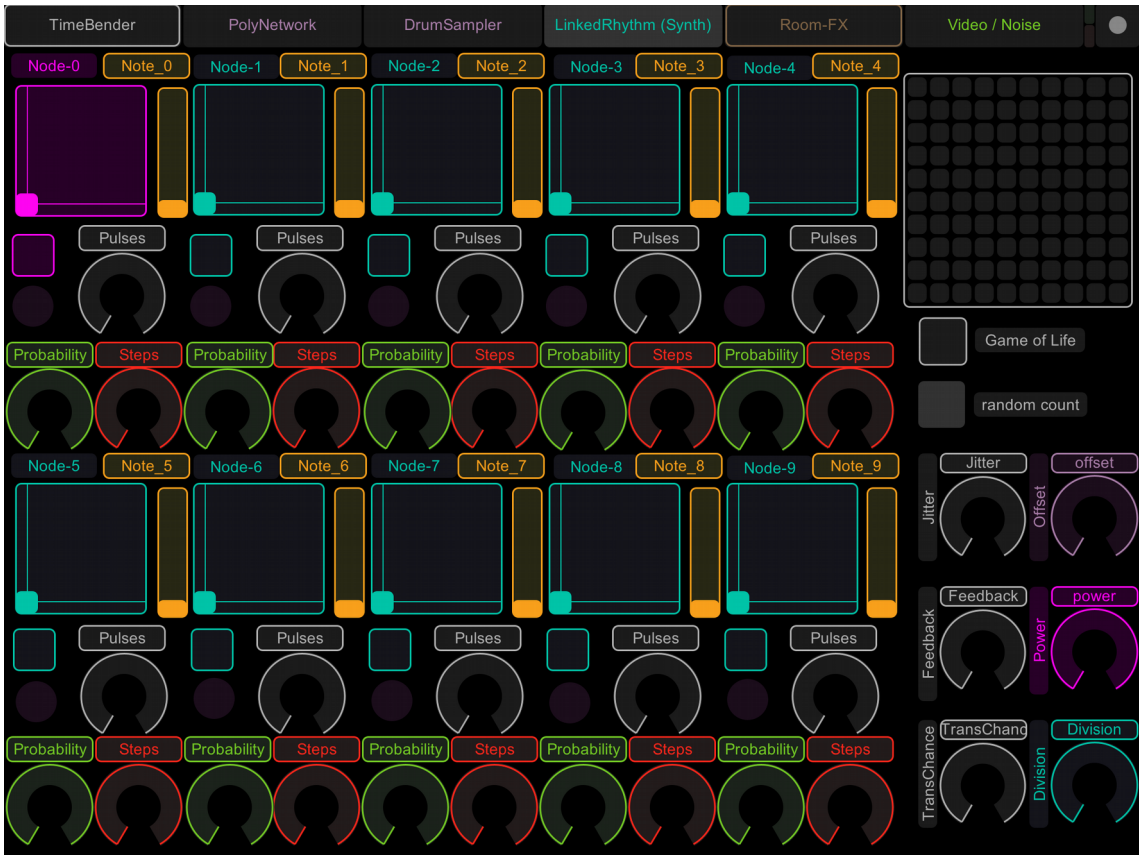

Illustration 28: FM-Synthesizer and -Sequencer

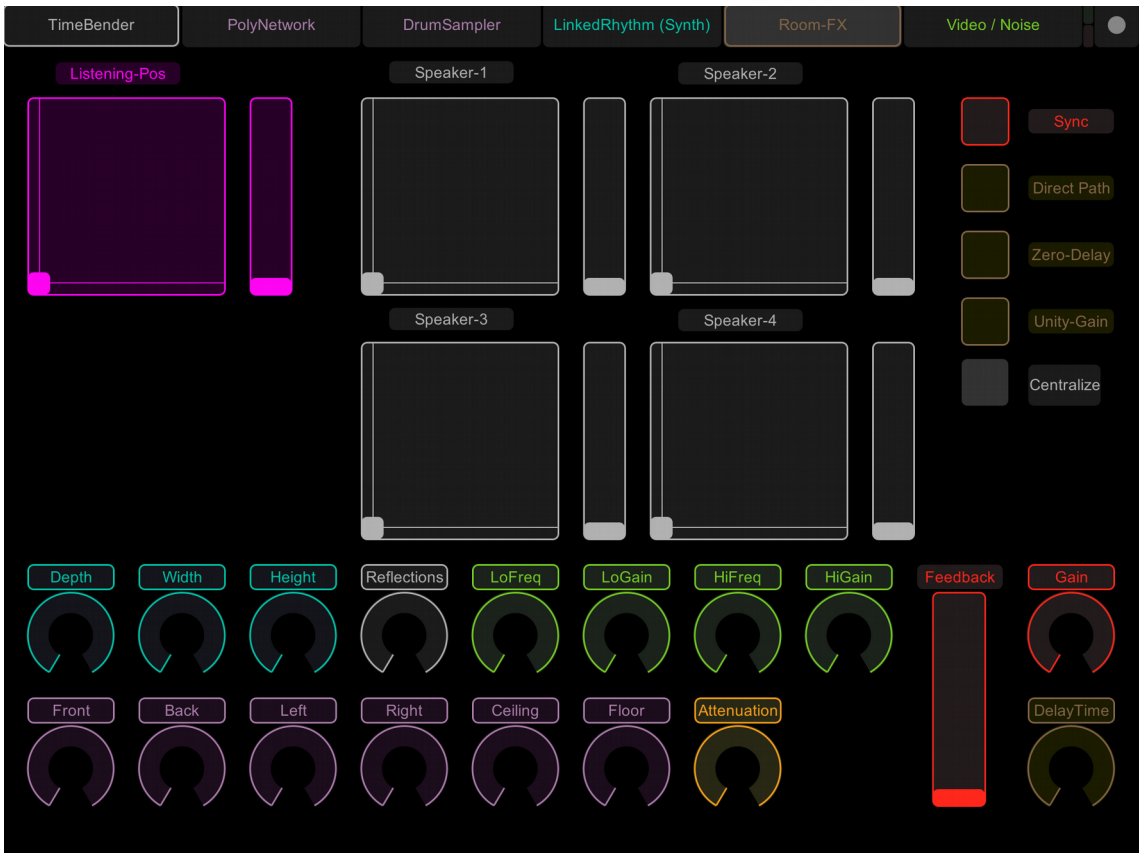

Illustration 29: IEM-Ambisonic 'Room'-FX

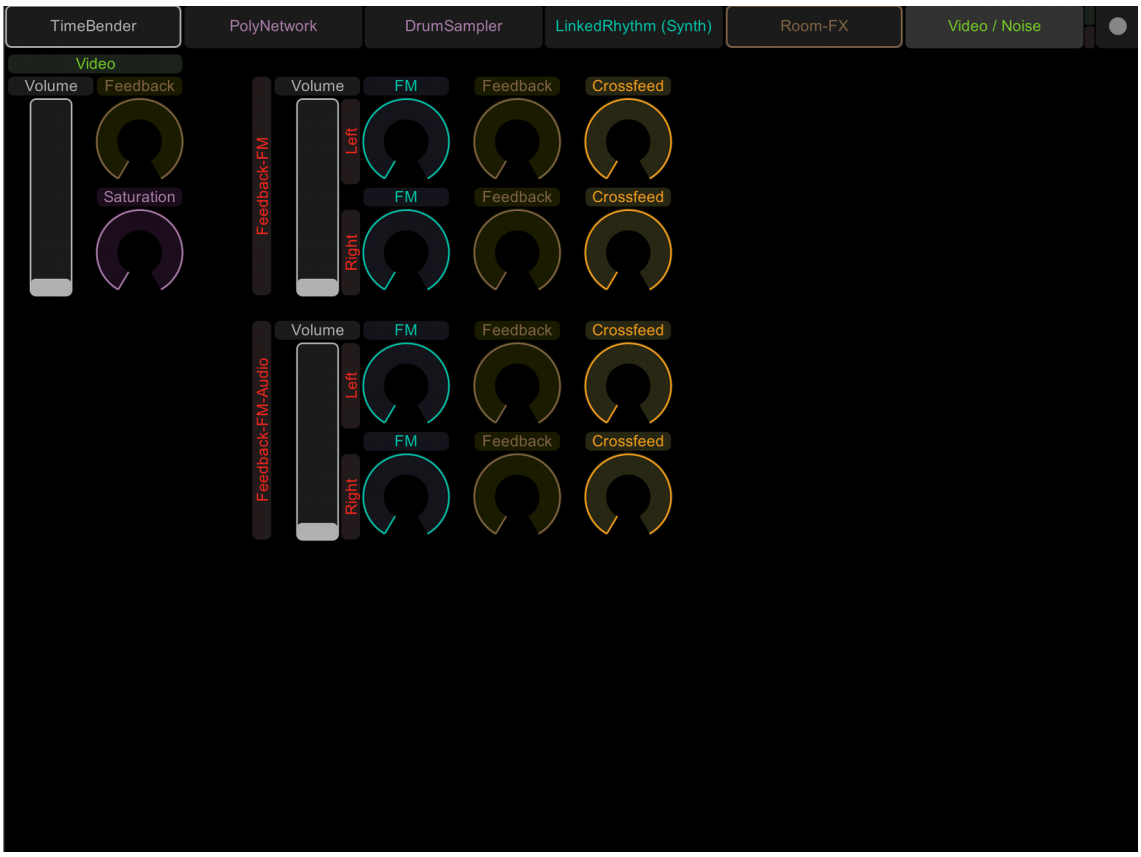

Illustration 30: Feedback-FM-Synthesis (internally, using the waveforms generated by the 'TimeBender', and externally, based on input material received from the analog-mixer)

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