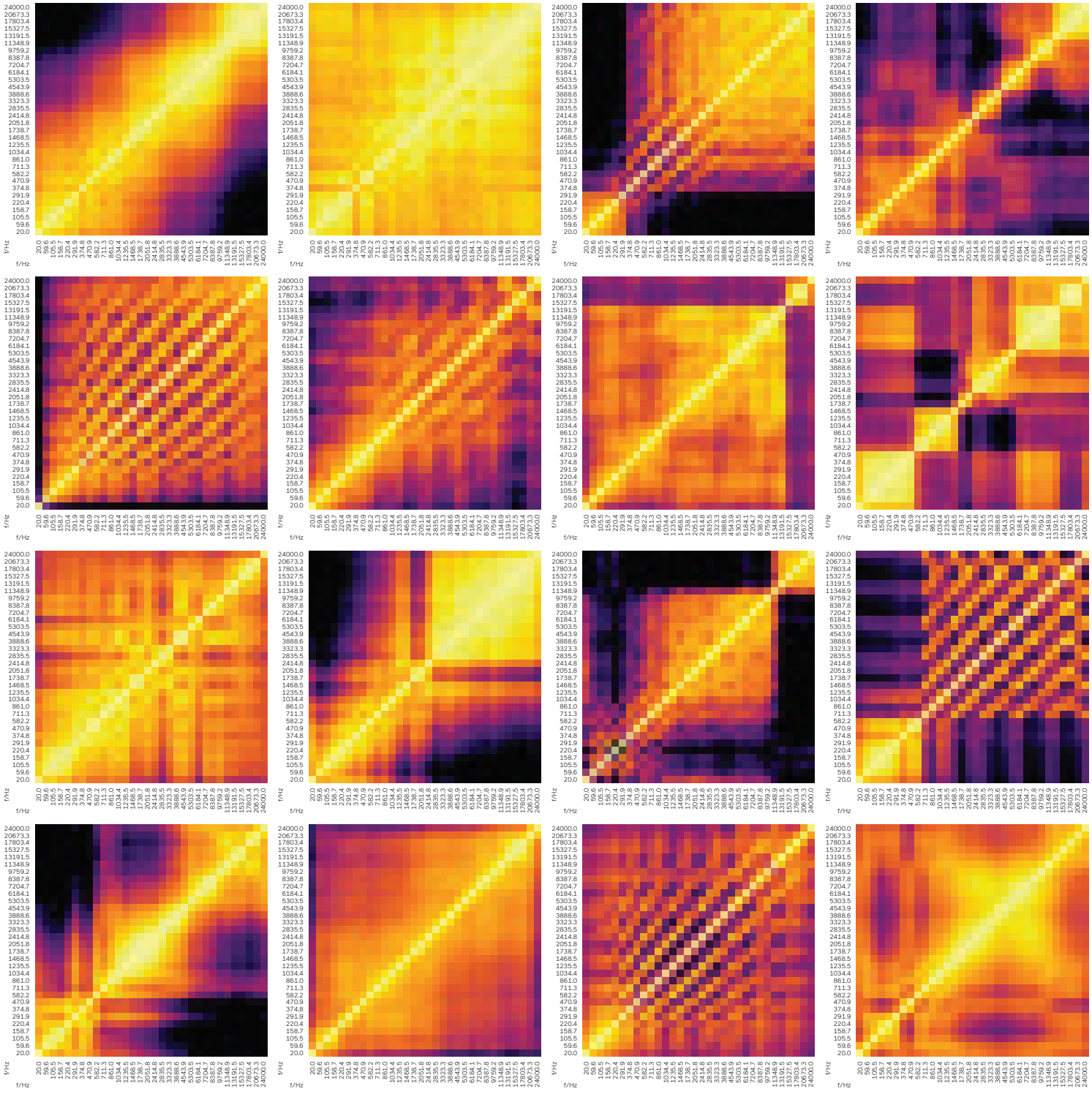
FLORIAN HECKER
SYNOPSIS TRAMWAY
26 MAY – 30 JULY 2017



The Technical Sound—On Florian Hecker's *Synopsis* and the apparatus of Electronic Music.

By Luke Fowler.

We are driving out to the suburb of Ehrenfeld in Cologne to meet Volker Müller, sound engineer from the WDR Electronic Music Studio since 1970. The studio is no longer in daily use for composition but acts as an archive, preserving the historical sound-producing devices and recording apparatus maintained since its foundation in 1951. In its day the WDR Studio was commonly considered the bastion of 'pure' or 'abstract' electronic music and the antithesis of Pierre Schaeffer's parallel development in Paris of a *musique concrète*, that is to say—a music comprised primarily from recordings of acoustic sounds.

The WDR studio is currently maintained by Volker Müller as an unofficial museum. Housing three major iterations of the studio's technical apparatus and the master tapes for all the compositions created there. Müller plays back some of the late multi-channel compositions created in the studio and then instructively demonstrates some of the more rudimentary techniques of early electronic composition. An instant early Stockhausen-esque 'study' is materialised by combining several passes of single tones from a sine wave generator onto tape. Müller skilfully manipulates the mixer's fader with one hand and the frequency of the sine-wave generator with the other.

The pale green test equipment sits on top of a jarring turquoise Formica unit bearing names like; Random Noise Generator, Beat Frequency Generator, Heterodyne Analyser, Universalzähler und Zeitmesser. It was with this basic test equipment that complex scores were materialised in the late 50s and early 60s. Most of these devices were not originally conceived to be used for musical purposes but, when re-purposed, created the complex sonorities and movements which software synthesisers and apps have never fully achieved[1]. Although the WDR studio incorporated two (at that time, state of the art) electronic keyboards; the Melochord and Trautonium, Stockhausen rejected them both in preference to the exact timings, pitches and amplitudes afforded by the test equipment.

Discussing the different scales of interpretation Hecker's pieces afford, Christopher Haworth notes that "To other listeners, the materials may denote 'computer music' or the German 'elektronische Musik' of the WDR studio. Since these categories mark a more fine-grained set of boundaries, the expectations they set in motion may be shaped through a distinction from musique concrète or electroacoustic music; they may take the form of 'the work will not make use of any recorded sources', and so on[2]."

Such an analogy could be down to some of Hecker's compositional strategies—which owe a great deal to non-musical apparatus and concepts. For example his *Chimera* pieces, which feature means of analysis and re-synthesis stemming from audiology and psychoacoustics[3], or his ongoing application of software environments for technical computing, such as MATLAB and Octave, and general-purpose programming languages as Python: software designed as professional-grade signal processors, primarily used in scientific and engineering applications. This software could be considered the digital equivalent to the analogue test equipment beloved by the "classic" electronic music studios.

I've touched on his relationship to the WDR studios and Hecker's "non-musical" approach to electronics but I'd like to devote the rest of this essay to discussing some themes that Hecker's work evokes for me in the context of music technology *proper*. I'd like to posit that music technology—in the service of electronic music making—has in many ways come full circle. The promise that portable computers offered musicians in the early days of Computational Arts has become so standardised and commercialised that artistic approaches have split into—as I see it—two avant gardes[4]. The first repudiates the use of computers in favour of a return to analogue instruments, field recordings, sound objects (l'objet sonore) and *the studio as an instrument* approach. The other camp, to which I'm proposing Hecker belongs, continues to use computers in the spirit of the first generation of computer music pioneers such as James Tenney, Jean-Claude Risset, The League of Automatic Composers, David Behrman, Martin Bartlett, Laurie Spiegel, Larry Polanski, David Rosenboom, Trevor Wishart, Iannis Xenakis, Herbert Brün and Curtis Roads. I would like to discuss how we came to this point and the experience that being with Hecker's *Synopsis* can bring us—if we care to listen.

> *[...] so here we are in the wonderful world of electronics and everyone's rushing to buy and sell synthesisers and there's this instant obsolescence about everything so that all the time the talk is of the new ZQ943 that's coming out in a few months and that I'll have to sell my poor old TG76 for a quarter of what I paid for it to buy this*

wonderful new thing that's going to open the doors to a whole new creative career. You can't help but feel that that is rather odd (laughter).

Martin Bartlett
Soundworks magazine, 1993

This is an excerpt from a talk given by the Canadian composer, Martin Bartlett [5], in July 1990 at the Western Front. Martin began using electronics in the late 60's influenced by his mentors, Pauline Oliveros and David Tudor. Both Oliveros and Tudor are exemplary in the manner in which they used analogue electronics and are worthwhile considering in the context of Hecker's digital equivalence. Tudor reverse engineered both his own circuits and commercially available electronics to highlight their internal sonic character within a feedback matrix, whilst Oliveros explored layers of echo to the point of masking any underlying tonal content. She created these studies at various American electronic music studios (usually set up under the auspice of academia) using valve oscillators, tape relays and the first Buchla voltage controlled synthesizers. It was from this background that Bartlett began exploring the possibilities of computer controlled analogue synthesis before going on to work extensively with the Buchla 400 computer controlled digital synth [6]. Despite living in a different country, Martin had a close relationship with the instruments' designer, Don Buchla, and would sail his boat over to San Francisco to visit him—he was perhaps the only person to write his own software (Mabel) for the instrument. They performed concerts together on two Buchla 400's and apparently enjoyed a fruitful relationship exchanging ideas on instrument design.

As analogue synthesisers began to root themselves firmly within musical culture, some composers and musicians became dissatisfied with, or critical of, the new instruments. Tony Conrad, who played amplified violin with La Monte Young, Angus MacLise and John Cale in the Theatre of Eternal Music, in an interview discussing his invented instruments recollects trying Buchla synthesisers out at the time [7]. He was, however, not inclined to use them because their sound odour "stank" too strongly of the composers who had carved out a niche for themselves working with the "Buchla boxes [8]".

Other experimental composers, for example, members of the Sonic Arts Union, favoured hand-built electronics, tape machines or test equipment, as opposed to embracing commercial synthesisers. For example Alvin Lucier largely employed sine wave generators and tape feedback techniques to explore acoustic phenomena, whilst Gordon Mumma developed the idea of *Cybersonics*—a school of electronics that was influenced by scientific developments.

In these examples, I've tried to allude to the long and productive histories of artists who have rejected the restrictions imposed by standardized electronic instruments in favour of DIY instruments or re-purposed devices outside the field of music. I want to continue this narrative by referring to a major paradigm shift in the electronic music industry: the implementation of the MIDI (Musical Instrument Digital Interface) standard in the 1980s [9]:

The standardization of MIDI (mid-1980s onward) involved a change of focus more toward the use of the computer as a labour saving and a cost-cutting device for music production, and resulted in an unprecedented degree of standardization of creative technique and conceptualization of musical materials. In terms of software, this was characterized by the dominance of fixed application programs, entirely predefined, unchangeable by the user, and usually modelled on pre-existing musical techniques and models (conventional notation, multitrack tape recording, pre-defined orchestrations simulating traditional acoustic instruments, etc.). Music software began to be written by professional programmers, often having only minimal musical experience, for use by non-programming musicians. This was a major departure from the previous path of computer music, whose evolution had been driven during its earlier decades by the desires and visions of individual composers who learned to be their own programmers in order to explore untried musical methods, sounds, processes, and structures which had never been possible prior to computers.

Laurie Spiegel
(1991 / revised 1994, unpublished ms.)

Since the introduction of the MIDI standard that Spiegel describes in 1991, music technology has accelerated exponentially and the MIDI protocol, once requiring its own port, has now largely been integrated into the generic USB connection. Not only have computers become ubiquitous tools within the recording studio, even the lowly domestic computers by far exceeds the capabilities of analogue 24 track tape machines. The introduction of faster and more powerful microprocessors has facilitated a democratisation of music technologies, allowing complete tracks to be made "in-the-box" with simplified Digital Audio Workstation

(DAW) software like Reason (Propellerheads, 2000) or Garage Band (pre-installed with new Apple Macs since 2011). While early experimental software languages like HMSL or CDP were invented by artists / composers and were specifically designed to be open-ended and non-prescriptive as to how they could be used within a sonic setting. Software like Reason and Garage Band were largely designed to re-hash existing musical genres, providing the user with preset grooves, sample libraries and soft-synths, designed to emulate canonised analogue synths and drum machines like the famous Roland TR-series [10].

> *Technologies are socially shaped along with their meanings, functions, domains and use. They cannot come into existence to fill an existing role, since their function is co-created with and by its makers and users. More importantly, their role is not static but changes over time for different groups of people.*
>
> Jonathan Sterne (2003)
> from Bourdieu, Technique and Technology, 2003

DAW software may seem unduly restrictive and commercially-orientated on the surface. Yet as Sterne points out, technologies are only "socially sedimented" by their context. It is when they are applied to different contexts with different imaginaries that the limitations can be transcended. For example the Belgian step sequencing DAW Fruity Loops (Image Line Software, 1997) has become increasingly popular with groups of Dance music producers in the South African township of Durban, allowing them to develop their own deeply personal and idiosyncratic style of House music known as GQOM.

When the act of creating electronic music then largely becomes one of painting by numbers, the consideration of creative relationships with technologies and their designers becomes far removed from our consciousness. Along with it we may also, over time, come to jettison intent, social relations, communities, politics, desire and beliefs. Instead, electronic musicians have a tendency to become trapped, as Bartlett points out, in an insidious web of materialism. Within this, the social relations between musician and instrument designer become replaced with a false consciousness that our musical problems will be solved by new and improved off-the-shelf products. As I see it, there are two ways of overcoming this artist-consumer stalemate. One methodology is the subversion and re-purposing of existing (often obsolete or undervalued) technology, as I have described above with the appropriation of Fruity Loops. This software is largely dismissed in Europe and North America, due to the market dominance of more sophisticated and ubiquitous DAWS like the Berlin based Ableton Live (Ableton, 2001). Yet this technique of technological re-appropriation plays a critical role in the history of musical counter-cultures. We could take, for, example the hacking of the cheap Yamaha FB01 synthesiser by a community of experimental composers (including Bartlett) in the 80s, in order to exploit its plain FM sounds for microtonal music. Or the use of the mass produced mixer and guitar pedals in the early 2000s to create the school of "No-Input Mixing" (thanks to the inspiration of David Tudor and its re-application by Toshimaru Nakamura). These are just a few examples of the ingenuity of musicians to creatively overcome the cycle of obsolescence, driven by commercially astute manufacturers.

Another way is to start from a digital ground zero: to program our own codes, to create our own (acoustic and electronic) instruments, to take inspiration from fields beyond the remit of music—including psychoacoustics, psychophysics, linguistics, audiology or acoustics—to work in collaboration with engineers and programmers in the design of our own algorithms or to re-purpose forgotten or marginalised ones. This is the path that Hecker has chosen and is exemplified in Synopsis, a display of his most recent spatial compositions at Tramway. Building upon a previous work—Formulation (2015)—Hecker subjects this source to a series of digital transformations; using analysis, abstraction and re-synthesis. Some of the pieces we hear feature a texture synthesis algorithm designed by Axel Röbel and members of the Analysis Synthesis Team at IRCAM, Paris. In a discussion (with Matthew Fuller) at Tramway, Hecker describes subjecting his source material to a high number of recursive processes, each step gradationally sculpting the audible results into distinct iterations.

The installation itself is deceptively reductive—a series of large loden green, rectangular absorber panels, are suspended in the centre space—following the indented metal lines of its previous incarnation as a tram depot. These "units" appear to subdivide the space into different zones. In each of them, a constellation of three small black speakers are hung at face height. Texture synthesis extracts statistical features from one sound and can re-synthesize another sound using these descriptions, Hecker draws a metaphor to the complex timbre of natural phenomena like the crackling noises of fire, or gravel—some of the initial laboratory case

studies of this concept. The metaphor to the natural world, seems to me an apt comparison—when not evoking the Shepard tones of early computer music, Hecker's sound world shifts the morphology and lexicon of existing electronic music. Avoiding diluting his process by panning or mixing between different instances, each speaker then represents an individual voice; like frogs sitting at the edge of a pond or the breathing of aquatic animals and plants. When these objects are voiced together in different combinations, we perceive the stream of events like walking through a strange ecosystem. Hecker's synthetic composition enchants us with its shifting timbres, tones and noises—his polyphonies affecting us more intensely with each new auditory perspective [11].

1 I am basing this assertion on my comparison of the EMS VCS3 iPhone App and the ANS iPhone App with the real things—both of which perhaps give you a rough idea of the sound world but are otherwise incomparable. There are no Stockhausen / WDR virtual instruments that I know of.

2 Christopher Haworth 'Analysis / Synthesis: Cultural and Environmental Listening in Florian Hecker's Affordance' In: Robin Mackay (ed), Florian Hecker—Formulations, Walther Koenig Books, London, 2016

3 See Stefan Helmreich 'Chimeric Sensing' in Helmreich, Sounding the Limits of Life: Essays in the Anthropology of Biology and Beyond. Princeton: Princeton University Press, 2014

4 The basis for this appraisal comes from the research carried out for the exhibition Computers and Cooperative Music Making (Fell and Fowler, 2015): I am indebted to my collaborator, Mark Fell, as well as to Larry Polanski for their contribution to this debate

5 For more on Martin Bartlett—see my 45 minute portrait 'Electro Pythagorus' (Fowler, 2016)

6 For a detailed commentary of Hecker's project with a Buchla 200e synthesizer coupled with a Comdyna analogue computer see Robin Mackay, 'Climate of Bass Hunter', Acid in the Style of David Tudor, CD, Editions Mego, Vienna, 2009

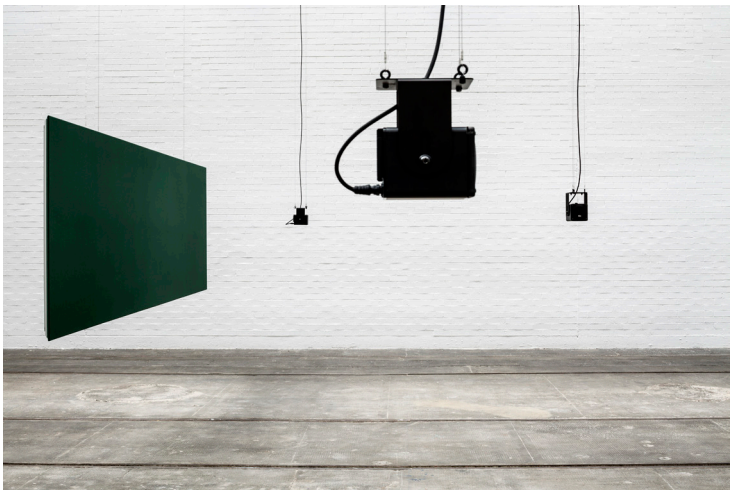
7 Tony Conrad: Invented Acoustical Tools-Instruments 1966–2012 (DVD courtesy of Bucholz Gallery, 2012)

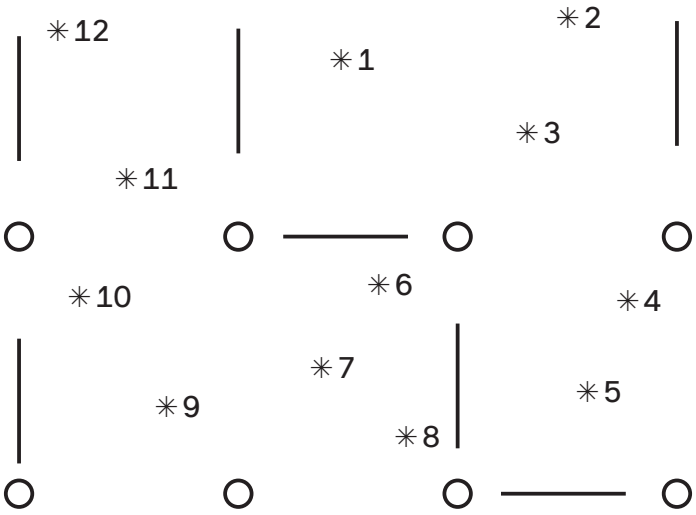
8 The Buchla Electric Music Box was commissioned by Ramon Sender and Morton Subotnick for the San Francisco tape-music center in 1963. It was widely considered to be the first voltage-controlled modular synthesizer and became quickly synonymous with Subotnick who used the instrument exclusively on his compositions Silver Apples Of The Moon, Wild Bull (1966) and many others throughout the era.

9 For example in hardware see: Handmade Electronic Music—The Art of Hardware Hacking (Collins, 2009) or in software / hybrid forms: The Music Machine (edited by Roads, 1989)

10 The ambivalent story of how presets carved a hugely important place for themselves both commercially and artistically within contemporary culture can be read about in PRESETS—Digital Shortcuts to Sound (Goldmann, 2015)

11 Thanks to Mark Fell and Florian Hecker for their comments and input on this essay.





Formulation As Texture [hcross] ■ ✳10 ✳11 ✳12
(2017)
- Pluriphonic computer-generated sound, software, loudspeaker system, acoustic panel system
- Produced on the occasion of the exhibition *Florian Hecker—Synopsis*, Tramway, Glasgow, Scotland, 26 May–31 July 2017

[24 min 20 sec]

Formulation Chim 111 [hcross] ■◧ ✳4 ✳5 ✳6
(2017)
- Pluriphonic computer-generated sound, software, loudspeaker system, acoustic panel system
- Produced on the occasion of the exhibition *Florian Hecker—Synopsis*, Tramway, Glasgow, Scotland, 26 May–31 July 2017

[24 min 20 sec]

Formulation DBM Self □ ✳7 ✳8 ✳9
(2015–2017)
- Pluriphonic computer-generated sound, software, loudspeaker system, acoustic panel system
- Produced on the occasion of the exhibition *Florian Hecker—Synopsis*, Tramway, Glasgow, Scotland, 26 May–31 July 2017

[24 min 07 sec]

Formulation ✳1 ✳2 ✳3
(2015)
- Pluriphonic computer-generated sound, software, loudspeaker system, acoustic panel system
- Produced on the occasion of the exhibition *Preis der Nationalgalerie 2015*, Hamburger Bahnhof, Berlin, 11 September 2015–17 January 2016

[24 min 07 sec]

All works written and produced by Florian Hecker, courtesy the artist, Sadie Coles HQ, London and Galerie Neu, Berlin

Sound synthesis software and sound spatialisation design, unless otherwise noted, by Alberto de Campo
■ Texture Synthesis Algorithm by Axel Röbel and members of the Analysis Synthesis Team, IRCAM, Paris
◧ Auditory Chimera Algorithm by Bertrand Delgutte with Jayaganesh Swaminathan
□ DBM Sparse Decomposition Algorithm by Bob Sturm

Graphic design NORM, Zurich

Visualisation of time-frequency statistics by Axel Röbel and members of the Analysis Synthesis Team, IRCAM, Paris

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