A MULTI-PLATFORM, PROCEDURAL APPROACH TO GRAPHICAL COMPOSITION

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A thesis submitted to the University of Huddersfield in partial fulfillment of the requirements for the degree of Master of Arts by Research in Composition

The University of Huddersfield

August 2011

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ABSTRACT

The world of multi-platform (cross-platform) entertainment presents programs available to consumers on a number of different production media, such as TV, online streaming, radio, and podcast download; essentially a bridging between television and 'new media'.[1] A multi-platform approach to composition, therefore, is derived from this idea, together with the array of software that contemporary composers have come to employ, particularly in the designing of graphic notation.

In order to fully explore the effectiveness of this approach, I present an analytical breakdown of my own procedural compositional methodology in the context of related works, examining the platforms and processes used, and their significance. This is preceded by discussion on the concept of composing using multiple platforms and the hardware and software involved, then a comparative study into the application of design in the creation of graphical notation. Parallels are drawn between areas of music notation, graphic design, and applied geometry, typography, photography, and topography, whilst reflecting upon their importance in the visual and sonic results of my music. Then the value of this approach is empirically illustrated through the musical and notational outcomes of my work in the accompanying portfolio. Essentially a fluctuating yet coherent balance between the visual and the sonic, my approach to composition blends myriad influences in the procedural abstraction of an original concept, through multiple working platforms, to create a graphical notation that employs fundamental principles of design with a view to ultimately creating sound.

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1 BBC Press Office (2007) *BBC Vision launches new multiplatform strategy,* online at
   [http://www.bbc.co.uk/pressoffice/pressreleases/stories/2007/09_september/27/multiplatform.shtml]

1. MULTI-PLATFORM

1.1 PLATFORMS

In an effort to critically discuss my approach to notation from a variety of influential perspectives, I adopt an array of terminology from related fields of study, to use in combination with established musical language. Beginning, in this chapter, with an introduction to some of the technical issues that play an important role, I explain and evaluate my own working method in context of other composers who produce similar works, or who approach composition with similar, or related ideas.

The practice of composing for me has become a tautological process *because* of the platforms upon which I work. The term platform need not necessarily refer to software alone, but to any plane, surface, or framework upon which music or notation can be created. In the same way that a racing car may be constructed through a series of designing, metalwork, engineering, furnishing, and painting platforms, such a structured approach to composing music will be shown to have many practical and artistic advantages. That is not to say that in such a structured approach, every platform is used for identical compositional purposes, nor does it mean that my work is composed through rigid processual means. There apply musically artistic and intuitive decisions at every point, but a procedural, platformed style caters for these decisions, and encourages innovative blending of the visual and the sonic. While it would have been possible to discuss a large number of related and resulting aspects of this approach to composition, I strive to remain focused on the direct implications and possibilities of composing in this manner. Where appropriate I allude to personal intentions and issues of indeterminacy, openness of the score, or relationship with the performer, for example. However, I largely try to concentrate on ideas and principles integral to my own composing method.
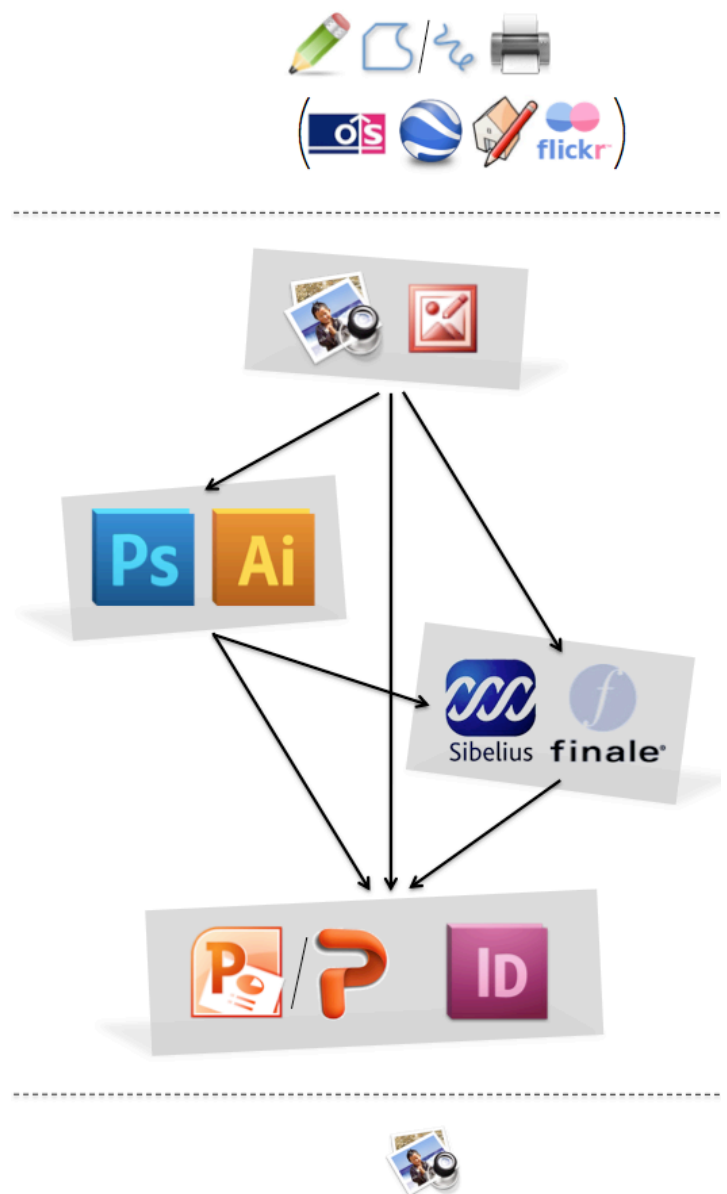

Fig. 2: an infographic outlining the software used in the multi-platform approach to a number of my own pieces.

Composers who create graphical work make use of a wide range of platforms: from sketching and scanning ink drawings, to use of graphics tablets and audio-graphical synthesis; from 'native' functions in musical notation software, to advanced imaging features in graphics programs. Combinations of graphic platforms such as these allow the modern, computer-literate composer to create the exact notation he desires, in the exact manner he wishes to create it. However such a platformed approach not only allows for a personally unique notational style, it can also play a fundamental role in the act of composing itself. A procedural abstraction of non-musical, visual source material is just as important as the musical information that it will inevitably serve to convey. This stems from a personal interest in line and contour: musically, this relates to the development of frequency through time and the sonic qualities of how acoustic instruments differently interpret pitch contour; visually, how line and shape (and to an extent, texture and space) can be abstracted and/or derived from natural phenomena, and conversely, how primitive geometry can be applied and used as a representation of natural phenomena. I strive to approach all stages of the composing process with these ideas in mind. Thus the concept of line and contour, in both visual and sonic forms, is a fundamental personal concern in my music. However, before examining my own work in more detail, I first lay down some context for a multi-platform approach.

1.2 PROTOCOL / THE AGE OF THE PDF

Publishers and performers at all levels often expect scores to be submitted digitally, usually in a universally transferable PDF format, with all the necessary notational and graphical elements in a state of completion. Not only at stages of production, but throughout collaborative correspondence between composer and performer, it is beneficial for many composers to have a format of notation that is easily transferable, compact enough to email, and agile enough to regularly edit and export. This can apply to even the most straightforward of traditional scores, where the notation can be produced in a single software, but it becomes even more crucial when the composing and editing process involves multiple kinds of software. Therefore my answer has always been to determine a digital platform in which to organise and finalise the notation. In working with the awareness that all parts of the notation will eventually be collated and produced together, one is free to harness tools and procedures from an infinite number of specialist programs and composing methods. This system immediately gives the composer complete control over the final presentation of their work, which is critical when graphics or experimental notations are involved.[1]

This platformed approach is noticeably effective in my own method of composing.[2] Ideas that begin on paper, through sketching, mapping or tracing, can be imported easily into image managing software (such as Microsoft Office Picture Manager or Mac OS X Preview). These could then be transported into multiple different types of graphics software for specific editing functions (such as Adobe Photoshop or Illustrator). They could alternatively, or subsequently, be imported as graphics files into musical notation software (such as Finale, Sibelius or Score), where traditional symbols or specific musical characters could be added, or used as annotation. Finally, everything can then be assembled in an open, presentation-based layout and organisation platform (such as Microsoft PowerPoint or Adobe InDesign). Here, prepared graphics and scanned materials can be imported and even edited further, and text can be applied. Pages can be structured;

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1 Complete editing and arranging control, compared to the native layout and formatting options of notation software, which often have to be worked around, in order to incorporate graphics of any form.
2 See appendix p. 40-41 for annotated, step-by-step illustrations of the exact software used in my own work.

elements within each page can be arranged, and additional features can be created and edited, such as title pages, program notes, or illustrated and annotated performance instructions. The argument could be made that exporting all components of a score from different programs can prove to be cumbersome. However, in working with graphical notation where much of a score consists of image files and where text, notational symbology or more graphics may also be required around these images, it is imperative to collate and arrange these components in a practical, flexible layout platform. Also, it need not be every aspect of the notation that is created elsewhere, exported, then imported into an ultimate production environment, only the elements that need to be created in separate, specialist software. Traditional clefs and notes on a staff may be acquired from musical notation software as suggested before, edited graphics or airbrushed scans of sketches may be exported from graphics software, but applying all text and additional labels, lines and markers in a final production platform allows for presentational continuity, through design elements such as fonts, proportions, colour, layout formatting, and page space.

It is of course possible to add foreign features in notation software, through finding alternative ways of inserting and arranging text boxes or importing precisely designed graphics. However the editing of all elements of a score can become incredibly awkward and time consuming when a number of outside graphic files are used. Canadian composer-engraver Dennis Báthory-Kitsz writes extensively about his encounters and conflicts with music notation software. He composes a wide variety of graphically influenced scores, some of which are credible examples of applied photography in notation.[3] He also blogs, somewhat cynically, about his thoughts on engraving and arranging in notation programs.[4] Describing pure notation programs such as Finale or Sibelius as 'nineteenth-century notation programs', he talks about a 'measure-based, horizontal, graphics-free, note-bound workflow lifted right from the engraver's plates'. Then, after a critical anatomisation of Finale, surveying its 'native' features and means of creating post-1900 notational features, he concludes the post with a thought on multiple platforms,

> From simple text, through advanced, multi-dimensional presentation, office tools present few barriers to imaginative visual communication. Though they may not encourage imagination, they do not prohibit it in the very nature of their toolset. Computer notation programs erect enormous barriers...[5]

His idea is that music notation can be created in any form of advanced graphics program, which is true to an extent. However he proceeds to criticise notation software whilst finding ways around its inherent graphical limitations, whereas I use notation programs only for what is necessary, using other relevant platforms to create what notation platforms struggle to produce.

Regardless of how attitudes towards composing digitally have changed throughout the last few decades, there will always exist individuals resistant to such use of multiple platforms in the graphical composing process, as well as in the layout and production processes of finalising a score. Some dislike the idea of complicating their compositional style by editing every minute aspect of the notation, down to the pixel. Others may not require any digitalisation of their work; delicate sketches or experimental graphite markings, for example, often create the appropriate notational style through their

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3 Báthory-Kitsz, D. (2007) *Lunar Cascade in Serial Time*, - see appendix p. 42-43 for excerpts.
4 Báthory-Kitsz, D. (2006) *We Are All Mozart*, online blog post at [http://maltedmedia.com/people/bathory/waam-20061007.html] – see also appendix p. 44-45 for the chart and comments.
5 Ibid.

very nature. When it comes to digitally organising layout and presentation of a score (for reasons mentioned previously, such as collaborative email or PDF printing), those unprepared to confront different software must make compromises, either by relying on the helpfulness and tolerance of publishers and performers, or by paying for engravers or designers. For centuries there has existed the need for extra personnel in producing traditional scores; from general transcription by an arranger/engraver, to the collating and cataloguing of Mozart's music by Ludwig van Köchel, as well as the requirement for typesetters, and in our current generation, graphics editors. Although many of these crafts still remain in the production of contemporary music, the role of a contemporary composer usually entails many, if not all of these responsibilities. This is especially significant in the work of composers using graphics in notation, where such extra-compositional roles become fundamental to the composing process itself.

It is, therefore, the adoption of multiple platforms and the learning of necessary specialist software that enables modern composers to develop new ways of approaching graphical notation. In today's generation of computer-literate, digitally aware young composers, using software in composing music almost becomes second nature. With such a vibrant perspective, these composers are able to use natural computing expertise, alongside a historically informed, open-minded perspective to music and its notation, to expand new ideas with new software and fresh ways of composing. Furthermore, the standardisation of the Portable Document Format (PDF) as the protocol for publishing and sharing scores online, means even the most enterprising of composers are now unrestricted by platforms, devices, and operating systems.[6]

1.3 GRAPHICAL-MUSICAL PLATFORMS

Whether the interest of a composer lies exclusively in visually representing a sonic world of frequency and amplitude, or a performative world of creating symbologies and semiotic frameworks from which a performer reads, graphical notation can be approached from a vast array of perspectives. As an introduction to some noteworthy software (which is not discussed exclusively in relation to my work in a later chapter), there are an ever-increasing number of applications that seek to fuse worlds of music and graphics, through notation. Some of these programs have been significant vital research platforms in my experimentation with graphic notation across the past few years, and although they may not feature in the actual composing process of my work, the historical context has been important. Beginning with Iannis Xenakis's exploration into digitally mapping drawn sketches to waveform sounds, the UPIC

Fig. 3: a one-minute excerpt of *Mycènes Alpha* by Iannis Xenakis, showing the hand-drawn graphics used to create the waveform contours.

sound system (completed in 1977) was a pioneer in European graphic-music software. Essentially an enhanced graphics tablet, the device allowed the user to draw lines with an electric pen that are then translated into sound. Assigning pitch, texture and timbre to various qualities of the drawn line; envelope, waveform type, and duration parameters can also be
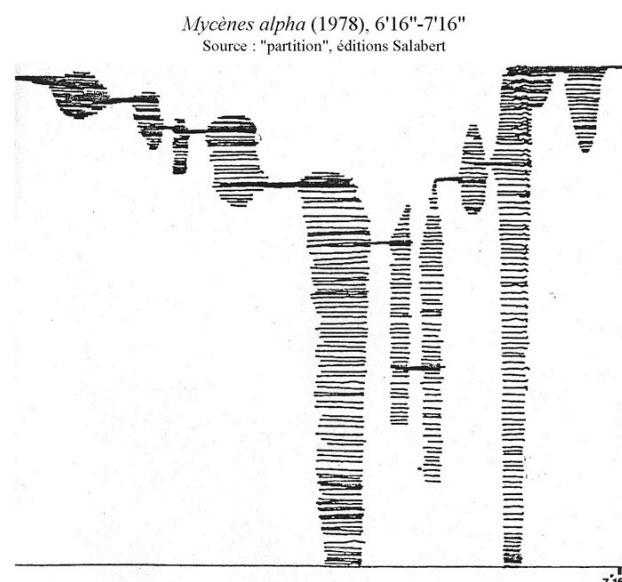
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6   Adobe Portable Document Format (PDF) *"Cross platform from desktop to mobile device"* [http://www.adobe.com/pdf]

'drawn'.[7] *Mycènes Alpha* (1978) was a one of the first groundbreaking Xenakis works to result from UPIC.[8] As a beta by-product of UPIC, the application HighC is one of the most effective, all-inclusive music and graphics programs available online. Through interweaving graphical drawing, shape and colour tools, with its ability as a synthesizer, sequencer and mixer, "its goal is to make music composition as simple and direct as sketching".[9] Although HighC merely produces basic forms of graphical audio synthesis, I find the manner in which it is delivered, and the software interface, to be incredibly accessible. The same applies to the many similar audio synthesis programs which incorporate graphics: the slightly more complex MetaSynth, the freeware application Coagula, and another research-based successor to UPIC, IanniX. From being useful learning tools for the most novice of sound explorers, they also have great potential as simple and effective platforms in the compositional approach of any sound designer. However it is this last point on which I dwell for a moment, with the thought that sound is not simply a trajectory of pitch in time. Due to the huge number of absent factors when working with only waveforms and digitally produced sound, I would find it very difficult to compose using these programs alone, hence my need for a software-diverse multi-platform approach.

In order to continue this discussion in the realms of graphical audio interfaces, but to move closer to physically performed sounds, it is necessary to briefly juxtapose my ideas against digital installation type works such as *Graph Theory* by American composer Jason Freeman, where a graphically designed interface encourages a user to navigate their way through pre-recorded samples determined by the composer.[10] Here we have an example of attractive graphic design being implemented in the performance score of a piece, rather than in the notation. Although the musical initiative behind the piece is substantially different from my own work, *Graph Theory* compares well as another example of how to effectively combine musical composition with graphic design, incorporating its many communicative, artistic and aesthetic principles.

1.4 PROBLEMS / MY APPROACH I

In comparison to the graphical-audio programs discussed previously, my approach to creating sound from visual information is considerably different, more elongated, and generally more laborious. My compositional technique is essentially concerned with the manipulation as well as the preservation of original source material. Beginning with the conceit of making a piece from a coastline, a river, or a cityscape, for example, my music is composed through preserving fundamental elements of this original source throughout the platformed notation-making process. The implementation of multiple types of software in composing undoubtedly encourages the integration of an array of personal compositional interests. This enables me to apply ideas of line and contour, inspired by the original source material, to the graphic design of the score as well as the musical information it conveys. In the translation process, from the research and mapping of initial source material, through image-editing and musical notation programs, to eventual production in a layout software, the constant juggling of visual elements with intuitively musical ideas would be significantly more difficult with a rigid approach to

7   Haswell, R. & Florian Hecker (Frieze Magazine, April 2006) *Seen and Heard* [www.frieze.com/issue/article/seen_and_heard]
8   Timmermans, P. (n.d.) *The UPIC System* [http://membres.multimania.fr/musicand/INSTRUMENT/DIGITAL/UPIC/UPIC.htm] – see also: appendix p. 46 for illustrations of the Xenakis work *Mycènes Alpha*.
9   Baudel, T. (2008) *HighC* [http://highc.org] & *History* [http://highc.org/history.html]
10 Freeman, J. (2005) *Graph Theory* [http://www.turbulence.org/Works/graphtheory] or *Piano Etudes* [http://turbulence.org/spotlight/pianoetudes/net.jasonfreeman.pianoetudes.PianoEtudes/wordpress]

creative platforms. As Alan Fletcher quotes the modernist designer George Nelson, 'what the creative act means … is the sudden realization that one has taken a lot of disconnected pieces and found, not done, a way of putting them together'.[11]

One key problem, however, arises from the ability to easily edit and export work in a multi-platform environment. Essentially, it should be considered an advantage that creating notations digitally means that they can be refined with ease, after being workshopped, performed or discussed. With the ability to open a project, move elements around, resize and rearrange by the pixel, the problem often encountered is to decide at what point a piece is finished. This issue of refining a work after every assessment raises many problems for composers and music publishers alike, notably the concern that multiple versions of the same piece make it out into the world.[12] There still exists the artistic predicament of knowing which version of a piece is a final version. Obviously this is a difficulty throughout all of the arts, when to stop adding detail to an oil paint portrait, for example[13], but as with so many other elements of my compositional approach, I find the answer somewhere in the overlapping worlds of sound and image. Viewing my work as a piece of music as well as a piece of functional graphic design, I reach a stage at which a notation is a faithful representation of both the graphical material used through the composing process, and also the musical idea intended to be communicated. This is aided greatly by the opportunity to collaborate and discuss a piece with the intended performer, as it is being composed. Where the opportunity arose, during the creative development of projects, multiple versions of a score were sent to the performer, with minute differences, and often with a personal preference already decided upon. Feedback from the intended performer allowed me to rework various features of the score, and decide on the amount of written information necessary to accompany the notation. As with many other pieces, once the musical and sonic intentions are established, the revision and modification often applies to the presentational and smaller notational details of a work. This has proved to be much more efficient in a platformed approach, as minor changes can be made at any point in the composing process, then rearranging and exporting can be done with minimal difficulty.

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11 Fletcher, A. (2001) *The Art of Looking Sideways*, Phiadon Press, p. 31.
12 Holter, C. (2011) *To Do or Not to Do: Publishing Scores Online* [http://www.newmusicbox.org/chatter/chatter.nmbx?id=6916]
13 Martin, A. (1997) *Agnes Martin Interview* (online video) c. 10'40" [http://vimeo.com/7127385] *"when they go out the door, I don't take any further responsibility..."*

2. GRAPHICAL

My reasons for adopting a multi-platform compositional approach are not all merely practical. As with many examples of graphic notation composed today, composers have many reasons for creating a personally unique, or an unconventional system of scoring. Many composers who utilise a similar software-diverse, procedural approach, compose pieces that are intended for an array of different audiences, sonic results, and performative outcomes and scenarios. Whilst always striving to create a visual notation to be interpreted as an acoustic result, I try to maintain a balance between the personal importance of both image and sound during the composition process. Working with graphics, my music is composed as much through the mind's ear as it is through the eye. Although this visual and sonic balance may fluctuate throughout the process, both are inherent within my approach to composition.

2.1 APPLIED GEOMETRY / APPLIED GRAPHIC DESIGN

When Nam June Paik famously asked John Cage in 1958 "When you compose, do you think notation first, or sound first? May I ask?", Cage replied, "Yes, you may ask... Both constitute an inseparable entity... I cannot separate them".[1] The idea of a substantial bond between the visual quality of notation and the sonic quality of its performance is decisive in my work. Through the application of rudimentary design principles[2], my notation maintains the visual-musical translation ideas of the graphical composing process, whilst remaining an effective conveyer of information to a performer. This is where the integration of graphic design and music notation is most effective.

To adopt a range of terminology similar to the technical terms used when discussing platforms, I apply various rudimentary design and geometrical terms to the creating of a notation. With the knowledge that the scores I produce will inevitably be printed onto paper, to be read by a performer, I am able to define a page space, with a set x- and y-axis (usually represented by y=pitch/frequency, x=time/duration), within which any symbol, figure, or geometric point, line, or line segment,
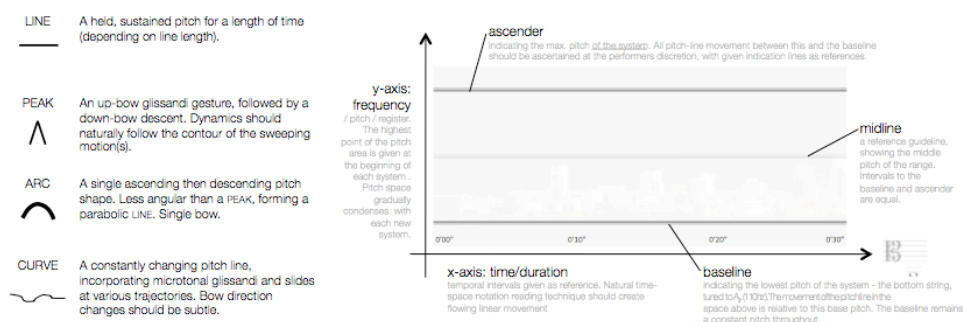

Fig. 4: a section from the performance notes of *Seattle*. The four geometrically derived line forms (left) represent sonic forms when applied within a pitch-space (right) with determined pitch boundaries.

1   Cage, J. & Alison Knowles (1969) *Notations*, Something Else Press (New York), p. 38.
2   Rams, D. (n.d.) Ten principles for good design, online at [http://www.vitsoe.com/en/gb/about/dieterrams/gooddesign]

can be deciphered acoustically. This idea is nothing new. Traditional five-line staff notation uses the same concept, only with a distinct symbolic and numerical system. The graphical-audio synthesis programs mentioned in the previous chapter also apply a similar idea to the representation of waveforms through time, perhaps with colour or shape variation representing dynamics or timbre. However, my notation does not rely on this idea. Instead I apply methods and techniques derived from graphic design and geometry, to the process of creating musical notation from naturally found visual sources.

2.1a FUNDAMENTAL PRINCIPLES

Referring to 'fundamental design principles', I take a holistic approach to notation, in the sense that, once preliminary musical decisions have been made and the process of bringing together intended sound and desired visual aesthetic is underway, matters of page space, visual perception and many other graphical elements each play their own part (either in the process or the eventual representation), but together form a complete notation that conveys multiple levels of information to the performer. However, holistic design philosophy is turned upside down in *A*

Fig. 5: four line forms and one point form create the typographically inspired pitch 'figures' in *A Series of Twenty-Six Typographic Figures*.

Series of Twenty-Six Typographic Figures, where the music is composed through notation and typography being broken down to its primary elements. The balance between artistic and functional design is an idea that applies considerably to musical scores. A prominent saying throughout the design world is that 'if the user can't use it, it doesn't work'[3], which puts more importance on the functional side of this balance. After all, in composing music, the aim is to produce acoustic results in performance scenarios; therefore my notation must be primarily functional. Just as traditional graphic design is most importantly functional (in advertising or selling a product), traditional notation is purely functional; it defines the correct representation of a sonic or performative product, whether aesthetically pleasing or not.[4] However, graphical notation expands on the artistic side of this balance. A large part of the resulting aesthetic of my scores, as well as the platformed composing process, is graphically biased. As Noël Llinos states in Cage's 1969 publication *Notations*,

> Notation of sound in time and space must give its information as clearly, as precisely and as beautifully as possible. While it is primarily a chart for ears, it must play provocatively and irresistibly on the eye. A painting appeals to the inner senses through the eye. A score of sound must reach these senses through the ear through the eye.[5]

The proportional balance of artistic and functional qualities in my notation is unavoidable yet crucial. John L. Walters writes 'the craft involved in preparing scores requires a link between the ear, the eye, and hand'.[6] In comparison, if I were to compose the same pieces in a purely functional manner, they would comprise rigid, temporally bound, tied glissandi, inundated with text explanations, set on a strictly linear, black and white page. If I were to compose the same pieces in a

3   Dray, S. (2010) [http://www.dray.com]
4   Wignet, M. (2005) *Nelson Goodman's Languages of Art, Notation, and Artistic Representation: An Analysis of,* p. 3 – online at [http://www.unc.edu/~winget/research/Winget_Notation.pdf]
5   Cage, J. & Alison Knowles (1969) *Notations*, Something Else Press (New York), p. 119-120.
6   Walters, J.L. (2001) *Graphic scores liberate music from the five-line grid: Sound, code, image*, an article for the online journal Eye Magazine – online at [http://www.eyemagazine.com/feature.php?id=23&fid=168]

purely artistic fashion, thinking only of visual aesthetic, they would be more similar to open fluxus works, or pieces intended for improvisation with an infinite number of possible realisations. The balance of artistic and functional qualities in my notation here concerns my own musical intentions on determinacy. Being itself a balance between determined values, such as pitch range, dynamic, or timbral qualities, and indeterminate values, such as register, harmony, and (occasionally) articulation, the music I intend to produce should not only be musically represented in, but also encapsulate aesthetic qualities of its notation.

The 'search for simplicity' in design, and applied to musical notation, is an issue which I strive to employ where necessary. However this sometimes proves to be difficult when the amount and density of musical variance in a passage of notation exceeds what looks to be simple. Here is another example of where intuitive musical decisions take precedence over effective design; the layout and organisation of a score must cater for these personal musical decisions. Shapes, points, and lines, within a two-dimensional score 'are interpreted by an active eye that seeks the simplest satisfactory explanation for what it sees'.[7] In the context of a musical interpretation of these figures, it becomes crucial that efficient layout design, and simplicity where possible, is put into practice to yield better results in a performance scenario. Another well known graphic design idea is that 'design can't rise above its content'.[8] And with its primary function as a communicator of instruction, information and aesthetic from composer to performer, the artistic relevance of notation should not rise above its purpose. I seek to employ design standards of layout and arrangement in a notation only to better convey the musical ideas expressed.

Layout is another instance in which, although the eventual organisation of elements of a score lies subordinate to its musical and communicative content, contemporary design principles can influence the visual aesthetic of notation. 'Like skating or walking the tight-rope, the art of lay-out is an art of balance. It cannot however be expressed merely as a mathematical calculation', Julian Rothenstein recalls a 1932 publication by A. Tolmer entitled *Mise en Page*, in which early, but very significant thoughts on layout were discussed.[9]

2.1b FORWARD LOOKING IDEAS

Many other enterprising ideas from the world of graphic design apply (or have been applied) to the notation of music. Californian designer Frank Chimero writes on a variety of subjects areas, viewed through the lens of design. He opens his post on *Rules of engagement* by stating,

> We used to have audiences, but the information age has transformed them into users who are no longer satisfied with the passive consumption of content. They desire interactions and opportunities to connect and contribute.[10]

How far one believes that this is also true in terms of contemporary music, is up for debate, however it is certainly evident from my perspective that our current, enthusiastic musical generation of composers, performers, and audiences/users alike, is constantly searching for new ways to blur traditional boundaries between these roles. This has led me to consider

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7 Arnston, A. E. (2007) *Graphic Design Basics* (Cengage Learning), p. 46.
8 Chimero, F. (2010) *A little bit about enthusiasm and hype*, online at [http://blog.frankchimero.com/post/1619412982]
9 Rothenstein, J. (2006) *A2Z And More Signs*, Thames & Hudson (London), p. 25-30.
10 Chimero, F. (2010) *Rules of Engagement*, online at [http://blog.frankchimero.com/post/469475806/rules-of-engagement]

combining various other areas of the visual arts, sonic arts, and traditional subjects, when approaching new works. Not only in the development of my graphic notation, but also at earlier stages of identifying source material and inspiration that will form the basis of the score itself.

Interface designers *ideasandpixels.com* use an inspiring one-line introduction to their business: 'We have a dream. A dream that one day, websites will be built with design principles, and the end-user in mind. That color schemes and structure will go hand-in-hand with content'.[11] I also share this dream, but rather than the building of websites, I strive to apply the idea to the composing of graphical notation. Naturally, many forms and styles of graphical notation are faultless in their current state, and many contemporary composers willingly explore new approaches and software in order to refine the digital and physical outcomes of their work. However a vast number of composers and engravers still fail to employ even the most basic principles of layout and design, the result being that potentially stimulating musical ideas are poorly represented, or not represented at all, and the crucial communication between composer and performer is uncoordinated. Both the artistic and functional properties of graphical notation essentially serve one comprehensive purpose: to communicate information to the performer(s). Even more so when using graphical notation; the score must sound like it looks. George Crumb describes his approach to notating as

> … getting the music on the page to look like it sound[ed] ... trying to find an evocative notation that would convey something to the performers, to jump off the page and become sound.[12]

Therefore by combining relevant graphic design ideas with my method of composing music, I feel that the musical information as well as the visual aesthetics of original inspirations are conveyed effectively to a performer.

2.1c IMAGE AND SOUND

Schemes of applying design concepts to musical notation may be pertinent when presenting a performer with a personally unique notation that s/he cannot, unlike Western traditional notation, immediately sight-read. The use of these concepts, such as the ones mentioned in the previous two chapters, are effective when used to better communicate information in an engaging, aesthetic manner. However, instead of the end product alone, I have conceived a method of composing sound that employs graphical procedures alongside musical intentions, therefore intertwining image and sound throughout the entire composition process.

The idea of preserving elements of the source material is important for me, when creating a graphical notation. As my interest lies in musically representing found contours or naturally formed shapes and lines, my entire process of composing deals with transforming natural phenomena, derived from the aforementioned array of visual sources, into a type of musical code from which performers can decipher information to create sound. However, as visual image may express different ideas to different individuals, the sonic result very much stems from the musical information that I apply to this abstraction of natural phenomena. My musical intentions for a piece are to musically represent not only the shapes and lines found in the original source, but the idea or the environmental aesthetic simultaneously. I arrive at this point through striking

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11 *www.ideasandpixels.com/about* (previously viewed, cached copy online at
[http://webcache.googleusercontent.com/search?q=cache:iInvRAWCKCUJ:ideasandpixels.com/about])
12 Oteri, F. (2002) *George Crumb: Jumping Off The Page to Become Sound*, an eight-part interview with George Crumb, for newmusicbox.org – online at [http://www.newmusicbox.org/articles/george-crumb-jumping-off-the-page-to-become-sound/1]

a balance between intuitive compositional decisions (to employ a particular sound or instrumental technique, for example) and visually influenced decisions (to apply this particular sound or technique every time a certain feature occurs periodically along a (visual) temporal line). Therefore both the process of composition and the sonic result is effectively a balance between applying personal decisions and removing myself from others. This raises many implications with regards to performer relationships and performance indeterminacy, which could be discussed in significant detail in another work, however these issues are not the sole reason for my graphical approach to composition. The translation process from visual source material to musical notation essentially results in my requirement of a graphic score. Although this process of translation most often takes the form of manipulating and abstracting source material through multiple working platforms, it also includes the preservation of particular elements, which then go on to form the non-personal decisions in the notation. Therefore because my music relies just as much on values derived from visual source material, the most effective representation of these values incorporates the visual material (or a manipulation of) within the notation, and this suggests a graphical notation.

2.2 NOTATIONS

Although the application of contemporary design ideas to graphical composition is still in its early stages, the concept of a multi-platform approach to composing music with graphics is not a brand new idea, as we have discovered with the evolution of audio-graphical tools throughout the 1970s. To talk about the placement of a platformed approach to composition in the context of related works and composers, some of the best examples can be discovered from the forty-year comparative window provided by the publication of John Cage's *Notations* (1969) and Theresa Sauer's *Notations 21* (2009)[13]. Many seminal works on graphic notation were published around the 1970 mark, signifying the growing enthusiasm for an alternative from the traditional Western notation system, as well as the converging of different ways of thinking and creating art. Since then, graphic notation has continued to evolve, albeit at a steady pace. *Notations 21* is an ongoing project[14] that seeks to rejuvenate (and has succeeded in rejuvenating) the interest in graphic notation throughout all areas of music, art and design. It has also personally been enlightening to research reviews of *Notations 21* from a graphic design perspective. A number of well known design magazines (as well as music journals) published critiques of Sauer's collection, some of which look at the notations from very different viewpoints.[15] Attitudes conveyed in reviews such as these have raised questions as well as answers concerning my application of graphic design ideas to composition.

In the same way that I felt the need to respectfully bypass traditional (purely functional) notations, I shall similarly move past notations at the other, artistically biased end of the spectrum, which rely heavily on performer interpretation rather than the composer's musical intentions. For example, scores which focus solely on graphics being incentives for aleatoric improvisation can be very intriguing to the eye, and to the imagination, but what they possess in well designed visuals is often balanced out with an absence of sonic and musical intent – leaving the resulting product in the hands of the performer or to natural forces. I bracket such notations that focus on poetic interpretation, alongside the mass of conceptual and

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13 Sauer, T. (2009) *Notations 21*, Mark Batty Publisher (New York)

14 The *Notations 21* project (a follow-up from the publication) includes a continually updated blog, as well as various art gallery productions which Theresa Sauer curates herself, that showcase performances and artworks featured in the book.

15 Crowley, D. (2009) *The Art of Noise*, Creative Review Magazine (June 2009), p. 46-49.
  Retzel, F. (2010) *Theresa Sauer: Notations 21,* New Music Connoisseur, Vol. 18, Issue 1 (Spring 2010), p. 26-27 – see appendix p. 48-49.

fluxus works from the 1960-1970s. Although the same conceptual ideas are continually developing today, I struggle to compare my own music and my own approach to composition with pieces that have no indication of resulting sound, if any sound actually results at all. Whereas the artistic 'pictographic' endeavours and site-specific intentions of Mark Applebaum's *The Metaphysics of Notation*[16] are aesthetically sublime, and the technical computer-graphic workings of composers such as Herbert Brün[17] are intricately fascinating, what I aim to create is exclusively notation, composed for a chosen instrument or specific sonic product, to convey musical information to the performer on how to reach this sonic product. Indeed all of these works draw upon skilful graphical expertise and engaging conceptual ideas, but generally offer very little musical content, if any. Works with introductions along the lines of 'the viewer is invited to hear the music they [the graphics] portray, with or without the mediation of actual musical instruments'[18] rarely have any direct influence on my compositional approach. The same can be said for works which straddle artistic boundaries such as Marco Fusinato's *Mass Black Implosion*[19], for example; an interesting work in which original notation is used as a canvas upon which lines are drawn, and the result is both displayed in art galleries and used as notation for improvised performance. I find considerable aesthetic interest in graphics that are solely intended to act as springboards for improvisation, however I aim to approach notation with a functional, performative purpose in mind, as well as a need for aesthetic visual appeal. Needless to say, the notational innovations of Cornelius Cardew, Earle Brown, Anthony Braxton, and various works by Morton Feldman and John Cage founded a solid seed-bed upon which today's contemporary graphical composers can grow new ideas and adapt new approaches to notation, cross-pollinating between an infinite number of design, illustration, typographic, and computing platforms.

The subject of indeterminacy does, however, play an important role in my music. Having distanced my own work from those that are purely springboards for improvisation, my ideas have more in common with works where the acoustic result is composed as well as effective notation. Raymond Murray Schafer, after founding the fields of Soundscape Composition and Acoustic Ecology, alongside Barry Truax and Hildegard Westerkamp during years together with the World
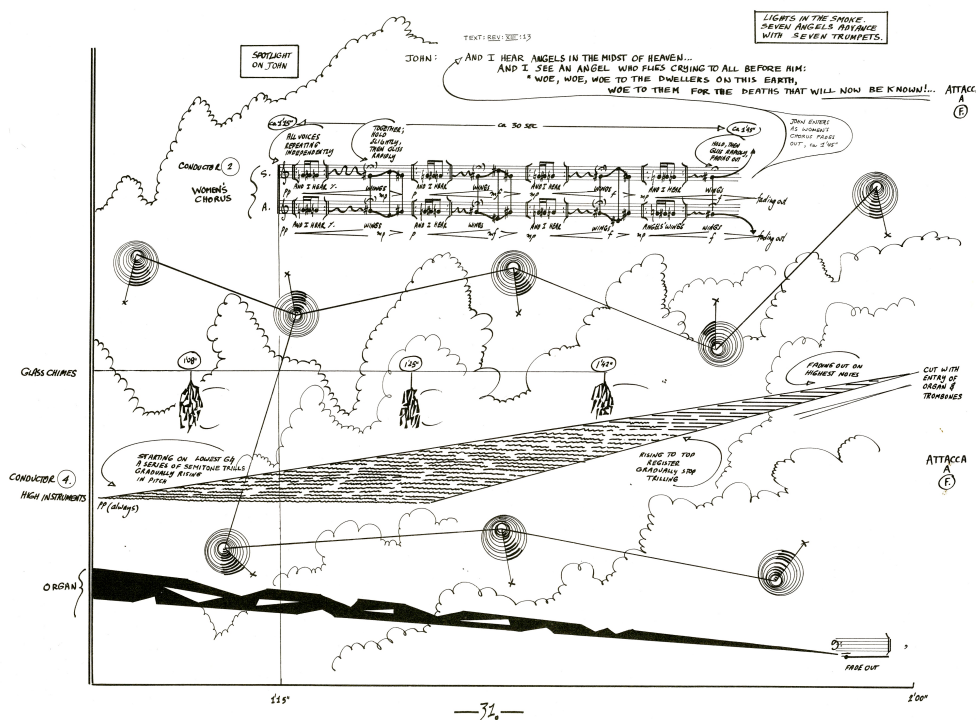
Fig. 6: an excerpt from *Apocalypsis* (R.M. Schafer) showing the composer's juxtaposition between traditionally notated passages alongside graphical devices.

16 Applebaum, M. (2009) *The Metaphysics of Notation*, score available online at
   [http://museum.stanford.edu/participate/documents/TheMetaphysicsOfNotation2.pdf] – see also: Robert Arnold's short film
   about the work, online at [http://www.youtube.com/watch?v=sxsssRAB8bc]
17 A selection of Brün's graphics and compositions are available to view online at
   [http://www.herbertbrun.org/Gallery01/Gallery01FrameSet.html]
18 McQueen, C. (2004) *Score For Moths,* writing in *Notations 21* (2009), p. 149.
19 Fusinato, M. (2007-2009) *Mass Black Implosion*, online at [www.marcofusinato.com/projects/mass_black_implosion.html]

Soundscape Project, composed many instrumental works that make significant use of graphical notation. Many of his larger pieces for chorus and/or orchestra, such as *Cortège*, *Psalm*, and *Apocalypsis*, are beautifully illustrated with wave-like sketches representing tape parts, alongside hand-drawn cloud patterns and sweeping curves which give a chorus of vocalists indications of pitch-movement through time and relationships to other parts. But while the graphics in these pieces are artistically illuminating, they remain more representations of desired sound effects, rather than instructions for specific sounds. This is evident in *Apocalypsis*, through the way that Schafer notates occasional passages using traditional clefs, staves and noteheads, but then illustrates other sound-shapes (such as screams, percussive textures, and glass chime attacks) graphically, with only vague indication of pitch, dynamic, timbre and articulation. For a large work, I believe Schafer has the perfect notational balance between visually aesthetic (artistic) and notationally informative (functional) qualities. The score as a whole is successful in its role as a notation; a true instruction to performers, as well as a discernible representation of the sonic result. However it is in some of Schafer's smaller-scale instrumental works that I have discovered valuable comparative examples to my personal approach to notation. Writing in *Notations 21*, about his 1981 piece for women's choir *Snowforms*[20], Schafer discusses how voices in the piece 'glide' between designated pitches, following the graphical curves that were inspired by foldings of snow from the view of his Canadian farmhouse window. With occasional pitch markings given, and dynamics represented by the subtle changing in thickness of the lines, my concern with musical contour is a perfect parallel to that of Schafer. Parallel, but not directly alike. Although on the surface, instances within my notation may seemingly correspond to those in *Snowforms*, differences become notably apparent in the acoustic result. Whereas I try to authentically apply line and contour from existing natural sources to notation for an equally linear sonic representation, Schafer consciously controls harmonic content by applying diatonic pitches to sections of pitch contour, therefore intuitively composing the basic tonal nature of the piece. Similar to the larger works mentioned previously, durational indications in *Snowforms* are 'suggested', but he encourages a certain amount of freedom when referring to these. Maintaining informative and aesthetic clarity, he advises performers of the difference between 'abrupt curves' and 'more continuous curve[s]'. I seek to combine similar stylistic ideas to Schafer's scores, as well as a similar interest in representing natural phenomena in graphical notation, with contemporary design principles, and a personal taste for annotating contours with extended performance techniques (both musically and graphically).
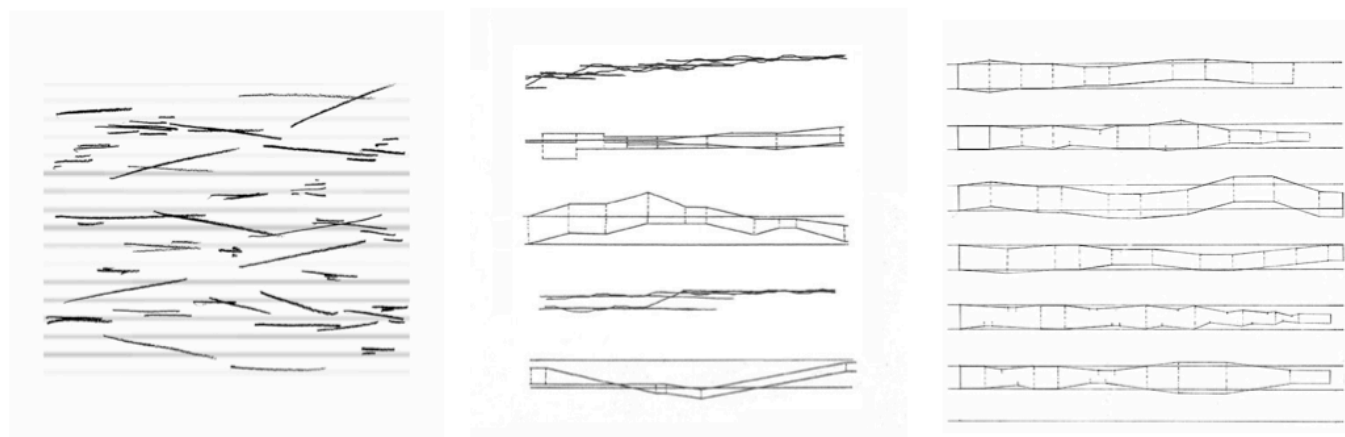
Fig. 7: examples the sketched work of Chiyoko Szlavnics. From left to right: *Untitled* (2008), *Cilia Tremble* (2006), *Forms* (2009).

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20 Schafer, R.M. writing in Sauer, Theresa, *Notations 21* (2009), p. 211.

There are many other notable individuals whose approaches to graphical notation compare well with my own. The sketchings of composers such as David Cope, Chiyoko Szlavnics and the founding father of many sub-strands of music-graphics, Iannis Xenakis, for example, also make effective use of musical contour. For both the first two composers, where once they sketched rough drawings of pitch curves and sonic movements to be transcribed onto a staff as traditional notation, they now limit themselves to using the raw hand-drawn diagrams to be the notation itself, in graphical form. Alan Hilario, on the other hand, mounts specific sketches and lines on millimetre graph paper in order to notate every conceivable microtone. Just as Xenakis creates curves in pitch contour through sequences of intersecting straight lines (glissandi) at different degrees[21], Hilario maps straight lines, which comprise every microtone possible along a pitch path. Although the grid paper measurements are given precise musical value and meter is indicated across all parts, he maintains that the notational style is 'not a strait-jacket for the diverse geometrical figures'.[22]

Electroacoustic composer, poet, painter and academic Kyong Mee Choi compiles enlightening assessments of her approach to music in *Notations 21* as well as in an interview with Theresa Sauer for the IAWM Journal[23]; many parts of both which seem to reflect my thinking exceptionally well. As a composer who seeks to incorporate influences from a wide variety of subject areas in her notation, she explains how 'creating notation is a natural progression' in composing her music.

Since graphic notation naturally evolved from my personal interest and background, it has become essential for my compositional process, going beyond its original purpose as instructions to performers.[24]

She goes on to state 'as long as the score clearly communicates the intent', which for Choi often means juxtaposing her own invented graphical symbologies (usually to do with electroacoustic parts) with traditional notation.

The area of electroacoustic graphics is another category of notation parallel to my own interest, however its job as a notation is inherently different to my work. It is purely representational; listening scores and graphical aides inform a listener of what sounds exist in a piece, whereas my notation, and many of those discussed previously, communicates to performers information of how to create these sounds and in which ways. Slavek Kwi and David Berezan present some eye-catching examples in *Notations 21*; the former being a more conceptual artistic representation of environmental 'sound paintings', with the latter being a more informative mapping of sounds and their vague frequencies through time. Ge-Suk Yeo formulates onomatopoeic visual examples of sounds she uses, drawing reference from consonant and syllable ideas of linguistics.[25] The idea of a listening score, for a previously composed electronic or electroacoustic piece, is one with huge graphical potential. One of the most famous adaptations is
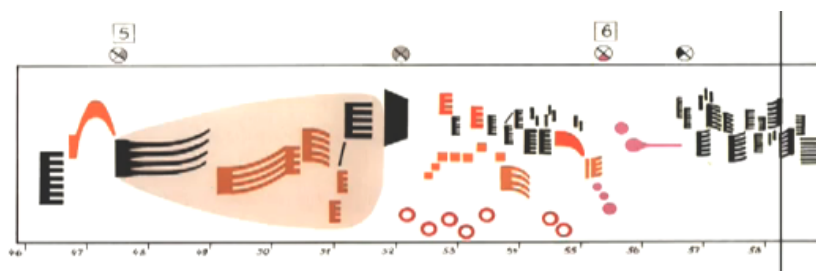
Fig. 8: the graphics used in Rainer Wehinger's listening score for *Artikulation* represent the electronic sounds to a passive listener. They do not instruct a performer/interpreter how to produce the sounds.

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21 Xenakis, I. (1954) *Metastasis*
22 Hilario, A. (1998) *Überentwicklung–Unterentwicklung,* featured in Sauer, Theresa, *Notations 21* (2009), p. 106
23 Sauer, T. (2007) *Kyong Mee Choi*, interview available online at [http://notations21.wordpress.com/kyong-mee-choi]
24 Choi, K.M. (2009) writing in Sauer, Theresa, *Notations 21*, p. 52-53
25 Yeo, G-S. (2005) *Ilgob Sorigori, - A cycle of seven sound poems* – more information online at
     [http://art.cappuccinonet.com/www/index.php?locale=en&page=project-ilgob-sorigori]

Rainer Wehinger's visual listening score that accompanies *Artikulation*, by Gyorgy Ligeti.[26] Many electroacoustic composers successfully approach notation with a very similar cross-platform style to myself; another example of the progressive integration between many fields of music and technology throughout the last few decades. This has therefore lead me to believe that, after drawing links to instrumental notation with informative or interpretative use of graphics, then to electronic and electroacoustic notation with representational or figurative use of graphics, my approach is positioned relatively uniquely between a variety of connecting fields of notation.

2.3 MY APPROACH II

'The notation of music, which is of course much more than simply a means to an end, offers a reservoir of possibilities. For the creative artist, searching them out will become an inescapable necessity the moment he realises that they exist'[27], a statement made by Erhard Karkoschka in the opening to his groundbreaking 1972 publication which catalogues a broad range of non-traditional notations. This statement, although true for many art forms and their respective notation or documentation, becomes even more pertinent when fusing different worlds of creativity. The inevitable impact of primitive geometry and graphic design principles in my work has allowed me to enhance and refine all stages of my compositional approach, and notational outcomes. The following, final chapter will clarify in more detail how these related strands of graphical arts and philosophies have had direct influences on my notation. My work, then, serves to prove that in combining the composition of music with the composition of graphic design, through use of multiple creative platforms, one can develop a comprehensive, personally unique approach to notation.

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26 Ligeti, G. (1958) *Artikulation*, ed. Wehinger, R. score photo available online at
http://www.flickr.com/photos/davido/227036970/, and video score available online at
http://www.youtube.com/watch?v=71hNl_skTZQ
27 Karkoschka, E. (1972) *Notation in New Musik,* London/New York, p. 6.

3. PROCEDURAL

As an empirical study of how a multi-platform approach can be an effective one for the contemporary graphical composer, this chapter will discuss in more depth the compositional procedures in the making of my works included in the project. I outline the methodology used in each piece chronologically, while also drawing upon any relevant influences, inspirations, extra-curricular projects and research. After explaining briefly how my personal interest grew in the areas of graphics in composition, and the circumstances from which I began this project, I explain the process behind my recent work, as well as plans and ideas that proved to be lessons learned rather than successful pieces.

With the intention of continuing to involve my fascination with geography in the creation of music, I sought to further develop my skills in graphic design and notation producing software. The point of departure prior to this study was a solo for bass clarinet *Coastline* (2009)[1], the first piece in which I employed basic techniques of a multi-platform approach to composition. Through dissecting a coastline, whilst recording measurements of cliff height and annotating textural qualities of the shore, I created (through various editing, imaging and translation processes that will be discussed) an experimental style of graphical notation. Within this notation, a constantly sliding pitch line (measured along a y-axis) traces naturally found contours of a coastline along a duration (x-axis), incorporating timbral variation and extended instrumental techniques that represent changing qualities of the coast. The use of graphical notation was a result of the preservation and abstraction required in the composing and translating process mentioned previously. However the compositional methodology exercised in this early piece was to become the roots of a development that changed my creative outlook and approach to composition entirely. Through the acoustic outcome of the piece, alongside the vast amount of listening research I was undertaking at the time, I fully recognised for the first time, the sound-worlds for which I was aiming in my own work. Therefore I embarked on this project with the intention of continuing to gain inspiration from both the visual and the sonic. The initial aim was to develop a compositional approach that combines these two fundamental areas whilst still beginning with geographical or non-musical stimuli.

3.1 VOICES THAT WILL NOT BE DROWNED

The first compositional opportunity of the project was to write a piece for four members of the EXAUDI vocal ensemble. This not only had vast musical and performative potential, it also sparked personal connections as I had seen the complete ensemble perform numerous times prior, in my home county of Suffolk. I was aware of how much the ensemble maintained local geographical links; therefore it prompted the idea of composing a piece with connections to my hometown

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1   Coastline (2009) – compositional workings and the score of this earlier work are available online at

and the natural features of East coast. With an enthusiasm to proceed in developing the idea of geographical concepts being translated to graphical notation for musical representation, and having already attempted a coastline-based work, the River Alde seemed the perfect stimulus.[2] *Voices That Will Not Be Drowned* would soon become another valuable learning experience in the development of my multi-platform composition technique.[3]

Initially the idea was to use similar procedures as had been established with *Coastline*, but catering for a small ensemble rather than a solo performer. Thus links were quickly determined between geographical (visual) features of the river and intuitive acoustic ideas; a reconciliation between
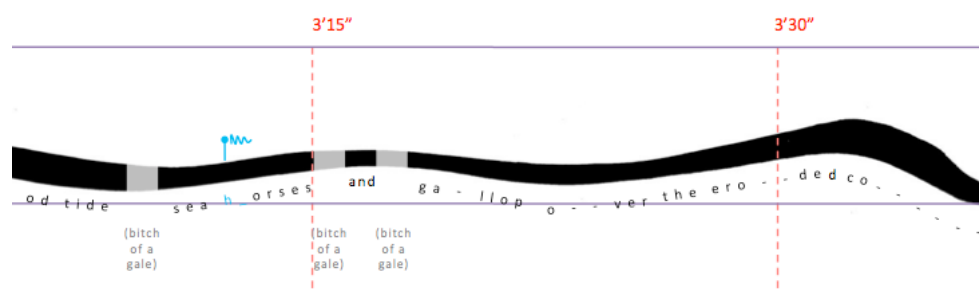
Fig. 9: an excerpt of one vocal part from *Voices*. The black pitch-line was created through hand-traced, inked, and digitally edited procedures, preserving the natural contours found in the original source.

environmental elements and timbral and technical musical qualities evolved soon after. Here is the first solid evidence of my use of a multi-platform composing process. The procedural aspect my composing method is also noticeable here, through the step-by-step manipulation of original source material.[4] Initial manual procedures included tracing the river's journey from OS Maps and online image prints, then dissecting this line and inking it, in preparation for scanning and graphic work. This indicates a second platform in the process: basic digital imaging, after scanning necessary graphics. In a picture-managing software, the eight sections of the river were edited, using functions such as adjusting brightness and contrast of the image files to create monochromatic graphics, then various smoothing-off and filling-in amendments with simple brush and magic-wand tools in Adobe Photoshop. Once satisfied with the graphical editing of what will soon become the pitch-line, the application of musical, interpretative notational features could begin.

For practical reasons, and because a seven to eight minute duration gave rise to the desired speed, the eight equal-length sections of the river graphic used in editing were retained, and each allocated a duration of one minute. Other musical decisions made at this point included giving musical relevance to specific elements of the original source, for example, marsh land (being itself a mixture of water and earth) represented by a whispered or breathy tone quality. Also similar to Coastline, by mounting all musical information on a continuous temporal scale, rather than a traditional metered scale, I avoid all overt aspects of rhythm, within and between parts. Needless to say, rhythm still exists; only relying on naturally derived measurements rather than personally formulated ones. At this point in the composing process, the river-line had been moved (conceptually, sometimes physically) from the OS map source, through tracing paper and a scanner into digital form, then refined through graphical editing software, and eventually into a production platform, in this case, Microsoft PowerPoint. Here the necessary instructional annotations such as duration guides and pitch-area markings were added. Performative indeterminacy, as discussed in the previous chapter, is an important element at this stage of composing. As with the crucial balance of aesthetically artistic and informatively functional graphics, musical instruction concerning

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2   The Alde and Ore Association, *Protecting Aldeburgh's River*, online at [http://www.aldeburgh-uk.com/aldenore.htm]
3   The piece discussed here, composed for the EXAUDI workshop, still remains part of a larger planned 'wind and voice extended study' entitled *'WAVES'*; part 1 (2010) being *Voices that will not be drowned*.
4   See appendix p. 54-61 for annotated illustrations of the compositional workings behind *Voices that will not be drowned*.

determinacy must also embrace a similar stability. Clear intentions were laid out for pitch contour and its movement, as well as the pitch relationships between each performer. A decision to stagger each of the four parts to produce separate 'waves' was intended to create the allusion to four different currents flowing upstream, encountering the same obstacles and direction changes in the same order, but at slightly varying time intervals. To achieve this in the notation, three different variations of the original river-line were constructed through image altering functions such as cropping, resize and rotation tools (whilst the original remained as the fourth). This was another procedure, carried out in a different platform; this time in Adobe Illustrator, as monochromatic vector graphics are easily edited here. On the converse side of the balance of determinacy, however, I was interested to leave exact pitch-class values (and performer genders) open to interpretation. Through applying only pitch (frequency) boundaries to the vertical extremes of a designated page space, performers are free to determine their own ranges. The pitch-line is then interpreted using sliding vocal sounds, incorporating the technical details and timbral changes that annotate the line.

Finally, the text consists of excerpts from the libretto of the 1945 Benjamin Britten opera *Peter Grimes*[5], which itself
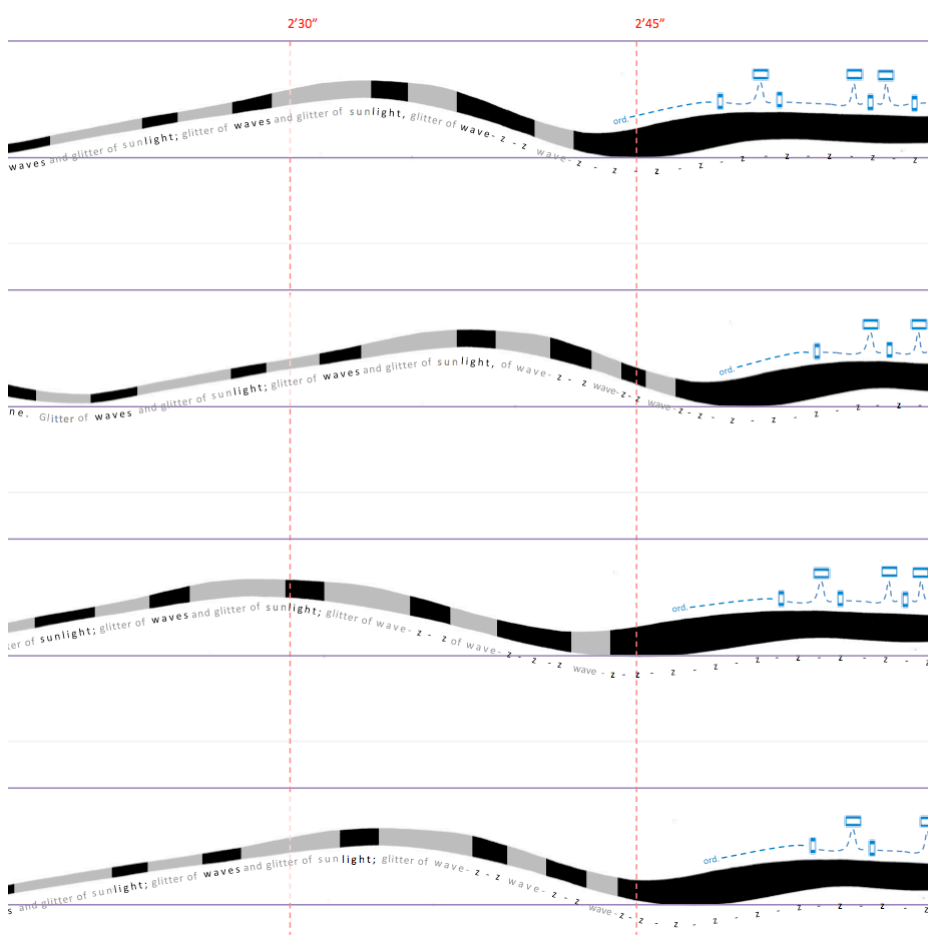
Fig. 10: a cross-section of the four parts from *Voices*, showing the staggered temporal relationships between parts, as well as extra musical techniques.

is adapted from a poem by George Orwell entitled *The Borough* (1999) said to be inspired by the town of Aldeburgh. After sifting through the libretto text, I settled on a number of specific lines or words and allocated them to specific parts of the river, often with linguistic meaning or onomatopoeic quality of the text relating in some way to the assigned part of the river. A number of extra intuitively musical events were then composed into the piece: repetition of the words 'light' and 'waves' in an on/off sequence at the point in the river where the imposing Orford lighthouse can be seen, followed by the sustaining of the 'z' sounding phoneme at the point in the river where an eerie electrical-humming sound is generated from overhead masts and wires[6] (see fig. 10).

Although the piece compares with other graphical notations based on rivers, such as Philip Corner's *Mississippi River South of Memphis*[7], I was more concerned with incorporating a variety of musical influences such as, the geographical

5   Britten, B. (1945) *Peter Grimes*. Aforementioned libretto by Montagu Slater.
6   See also: appendix p. 60-61 for photographs and diagrams behind ideas discussed here.

concept of Annea Lockwood's *A Sound Map of The Hudson River*[8], and an artistically representative style such as the timbral and textural methods with which Smetana musically represented stretches of the river Vlatava running through his homeland in passages of his symphonic poem of the same name.[9] In terms of sonic inspiration, the sweeping vocal-scape of Tod Dockstader's *Wave* was a significant acoustic influence, as I imagined the graphical possibilities of notating my own, similar smooth-moving contours. Although some discrete notational problems were encountered in the performance workshop, these would only go to better inform a subsequent piece in a similar style. Thus I considered successful the way in which the completed notation encapsulated an array of musical influences, as well as combining my own compositional methods of applied graphic design and cross-platform composition.

3.2 A62

  It seemed logical, after composing a solo piece developing a personally new compositional approach, then expanding the texture to a four-part ensemble, to complete the sequence by composing a piece for a larger number of performers. This objective was combined with a personal fascination with the online collaborative video project, *In Bb*[10], in which a number of performers submitted short videos of sounds, the spoken voice, or pitches of the B flat scale. A tribute to Terry Riley's *In C*, the software interface of the project allows a user to play the videos (hosted on Youtube) separately or simultaneously, and volumes to be adjusted with individual volume sliders. This was the ideal video-installation scenario with which I wanted to develop a piece through my own graphic notational approach.

  By now I had become comfortably familiar with this particular manner of composing with graphics. A geographical stimulus was conceived (in this case, the ring road around Huddersfield town centre), and plans were constructed to dissect, edit, reconstruct, annotate, and produce a notation.[11] In a similar fashion to my previous piece, a map was dissected, although rather than physically tracing and scanning lines, here I worked digitally, cropping images and reconstructing the road as a continuous contour. This line was split equally into what would eventually become four systems, then imported into a graphics software and polished. This piece was also a personal experiment in performative variation. Although the technical instructions that precede the two-minute score are detailed for each instrument, many primary decisions are left to the performer; pitch register must be performer-determined (although the range of an octave is specified) and durational markings are intentionally sparse to allow for temporal discretion. At the two instances where the pitch line exceeds the octave range, the higher pitch can be any multiphonic above the performed pitch, and a similar idea applies to the 'split pitches'. My musical intentions here were to juxtapose the idiosyncrasies of different instruments whilst the same contour pitch-shape is interpreted by all parts. Obviously some sound-producers create polyphony in different ways than others; for some it is routine and for some it is more complex. However cohesion should only be apparent in the developing pitch contours and the temporal relationships between instruments.

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7 Corner, P. (1960-75) *Mississippi River South of Memphis,* featured in *Notations* (1969) (Cage, Knowles) pp. 72, featured on *Between Sound and Vision* (2001) (various artists) [http://www.discogs.com/Various-Between-Sound-And-Vision/release/797152]

8 Lockwood, A. (1989) *A Sound Map of The Hudson River* (Lovely Music) online at [http://www.lovely.com/titles/cd2081.html]

9 Smetana, B. (1874) *Vlatava*, information and quote online at [http://water.thinkaboutit.eu/think5/post/the_vltava]

10 Solomon, D. (2009) *In Bb*, online at [inbflat.net]

11 See appendix p. 62-66 for annotated illustrations of the compositional workings behind *A62*.

Despite the absence of recordings and performances of these two works, I am content with the outcome of this trilogy of geographically inspired graphical pieces. I also found that by the completion of *A62*, I had become comfortable with the development of my platformed approach to composing. Not only through becoming increasingly confident with the array of software being employed, but also with the finished outcomes of the scores. One result of an integrated design approach to notation is the inevitable immediacy of a score. Clearly organised and simply produced, performers generally take pleasure in approaching my notation, whereas occasional graphical notations strike fear in the eyes of a performer. Immediacy is also reiterated in the performative results and recordings of the work; a listener is generally able to understand the sound-world, and become immersed in the development of the sonic contours and their musical gradients and technical annotations. Successful performances of the following works prove to demonstrate that the convergence of musical composition and graphic design is clearly effective when creating a notation.

3.3 REEF / A CHANGE OF DIRECTION

Confident with the gradual development of my approach, I maintained the idea of applying line and contour found in natural environments to musical line through various smaller composition projects. In each scenario, I would assign myself an instrument to compose for, then pair this hypothetical commission with a geographical concept, and develop a piece through bringing together graphic notational intentions, and musical or sonic objectives. Though some of these seedling ideas grew to evolve into more complete, successful pieces, most were abandoned due to an unbalanced compositional

Fig. 11: photos of the designated coastline of Cornwall alongside John Keys' sketchings for the installation project *Tidal* (Graham Fitkin).

approach. This balance, as discussed before in graphical terms of artistic versus functional design, is crucial in my music. One example of these early experiments is the graphical workings of *Reef* [12], a hypothetical piece for solo marimba. Here,

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12 See appendix p. 88-89 for the early graphical workings behind *Reef*.

the composite area of 'geometric topography' was my applied personal interest; continuing to implement ideas of geographical shape and contour, but applying geometrical value to forms and figures. Key areas of influence included the abundance of aerial photographs at Earth Snapshot[13], and 'approximate fractals in nature'[14], as well as the concept and graphical work behind Graham Fitkin's audio-visual installation work, *Tidal*[15]. After exploratory endeavours to create a notation from source material derived from Google Earth images, the composition process was cut short to allow for a non-hypothetical commission. However the time-consuming procedural workings of this project made me aware that I needed to expand my source material further than the realms of geography and Google Earth (maps). The application of other personal interests such as geometry, architecture, and typography, in a platformed, procedural method of composing, appeared to be a suitable tangent. Therefore I set out to find different angles from which to combine these relating areas with my graphical, contour-based style of music.

3.4 CHI·CA·GO

Presented with a commission from vocalist Peyee Chen to compose an electroacoustic piece for live voice and electronics, and with the prospect of a collaborative working partnership for more than six months prior to the performance date, I opted to venture into more unfamiliar areas of inspiration. Namely, a different graphical approach to original source material; undertaking studies into architecture-inspired music and graphics, rather than a geographical stimulus, as well as personally audacious score formats and performative possibilities. The architectural approach to contemporary music and graphics has always been a popular one, however the aim was to integrate this already established compositional incentive with my own platformed approach to composing. After settling on the idea of buildings and structures from the city of Chicago, Illinois, the initial working stages of the composing process were relatively routine, as they had been with previous pieces.[16] Although the graphical platforms upon which photos and textures were edited, incorporated various specialist software that had to be learned and explored as part of the graphical compositional process. As well as photography being manipulated through the customary imaging processes (contrast, exposure, sharpness, brush, magic-wand, and layering techniques), the Google software SketchUp was also employed. Here I made use of software predominantly used by architects and 3D developers to design, digitally fabricate, and render 'anything from coffee pots to skyscrapers'[17]. However, I approached the program's functions in reverse: instead of building and rendering 3D models, I took-apart previously made models of existing buildings, in order to create a collection of textures and diagrams from which to extract shapes, lines, sequences and patterns. This produced some intriguing graphics that could quite easily have been used in design work alone. However, in returning to the collaborative musical plans, and with an official performance date looming, the performative decisions and musical values in these graphics proved to become a problematic area.

In context of the determined concept and structure of the piece, each speaker within an eight-channel surround-sound setup would essentially represent a building. The first compositional task was to assemble a 'pool' of graphic cells

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13 (various contributors) *Earth Snapshot: A daily view if the planet*, online at [http://www.eosnap.com]

14 Davenport, C. (n.d.) *Approximate fractals in nature,* online at [http://everyoneforever.com/#/mathematics/EF23568737]

15 Fitkin, G. (2009) and John Keys, *Tidal*, information available online at [http://www.fitkin.com/past/tidal] and the artist's sketches at [http://www.johnkeys.com/opzet/drawings/drawings.htm]

16 See appendix p. 67-77 for annotated illustrations of the compositional workings behind *CHI·CA·GO*.

17 McCall & Associates, Google SketchUp homepage, online at http://sketchup.google.com/intl/en/index.html

and notational ideas for each of the eight buildings (which were decided upon collaboratively). The score would then take the form of an eight-part reference guide, with the performance instructions to navigate one's way through these notational cells, interpreting them however one sees suitable. A decision was also made to include original photography within the notation, a technique discovered in the works of various contemporary graphical composers[18], and also popular design logic in that 'photography gives concrete form to the subtlest thoughts'[19]. The inclusion of photographic cells as well as notational ones was an attempt to give each pool (building) a strong sense of theme, graphically, and later, sonically. At this point, the broad compositional process had clearly moved from a graphical editing platform, to one of layout and organisation functions, with the intention here to produce a score to be performed from. However, in collating the necessary elements of graphical and musical notation, compositional problems began to appear. Whereas in previous works the subject of indeterminacy has been one that I employ and work effectively alongside, in this piece I felt more and more uneasy with the extent of undefined graphical parts and lack of musical information. As a work which began with the intention of testing the boundaries of my compositional comfort zone, I continued to allow many graphic elements of the score be widely open to interpretation, however I made use of small traditionally notated annotations to accompany the open graphical suggestions.

Due to the practical collaborative possibilities and surround-sound studio availability, performative representations of the featured graphics could be rehearsed at the same time as through-composing the electronic part. The 'tape' part was a simple, sonically metaphorical concept. Like an explorer walking through a cityscape, with a total of eight determined buildings to view, when one's focus is on studying the most delicate visual details of a single structure, that is largely all that occupies their thoughts. Although vague shapes and imposing figures of larger buildings may be sensed in their peripheral vision, concentration remains on details of
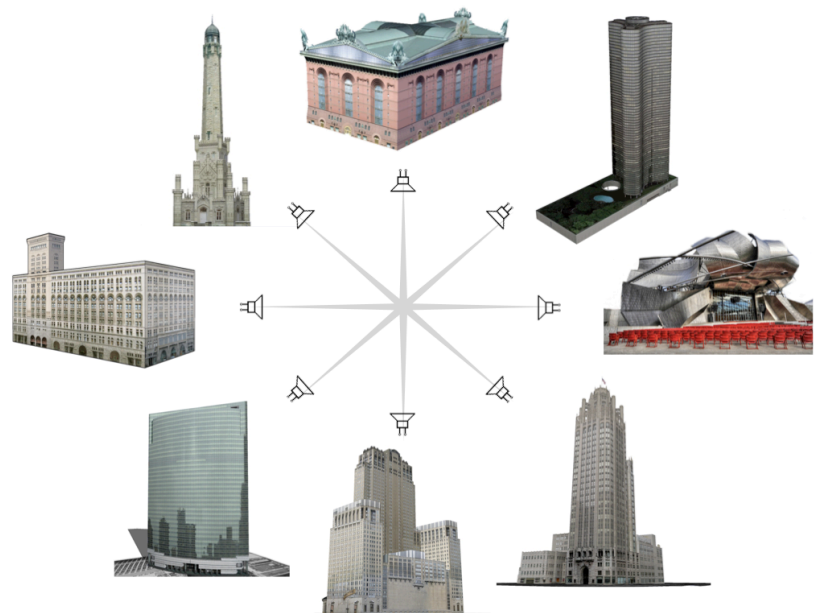
Fig. 12: the conceptual idea behind the surround-sound piece *Chi·ca·go*. Graphic material was derived from each building, then represented sonically or electronically diffused across the 8-channel speaker setup.

a single building. Then, when one shifts their line of sight to another building, the visual details of the previous one are no longer the focal point. Although some details still remain in memory or peripheral vision, new visual details are now being studied, perhaps with a different style or a contrasting aesthetic. This is the concept I wished to reproduce within a concert hall performance, with sound instead of sight. Hence, the eight different parts in the score (the eight buildings' graphical qualities) embrace their own thematic styles and features; some are measure-bound, repetitive and strictly linear, some are curvaceous, chaotic and irregular. These styles and architectural aesthetics of each building were represented in the pools of graphic cells, which were then left to the performer's discretion as to how best to represent these contrasting graphical

18 Examples such as Dennis Báthory-Kitsz – *Lunar Cascade in Serial Time* (2007) – see appendix p. 42-43 for excerpts.
19 Tolmer, A. (1932) *Mise en Page: The Theory and Practice of Lay-out*, The Studio Magazine (London) ed. Rothenstein, J. (2006) *A2Z And More Signs*, Thames & Hudson (London), p. 30.

styles as sound. Fragments of traditionally scored notation were used as annotation to some graphic cells, however the thematic ideas conveyed from the graphics were swiftly realised during rehearsals.

As with all other works, intuitive and educated design decisions were made regarding format and layout of the eventual score. In an attempt to dissuade a performer from settling on a single narrative, or route through the score, the pools of notational cells are arranged in a non-linear, irregular grid fashion. Here I applied previous research undertaken into graphic design and clarity of balance: mise-en-page, a graphical term for the arrangement of content and blank space on a page. The alignment and spacing of content in the eight parts of *Chi·ca·go* conveys a directional freedom; an absence of narrative. Therefore a performer is able to move from cell to cell instinctively, and not be tied to making specific sounds at specific timings. There is however a performance path, for practical reasons of performing with a pre-composed electronic part, which the performer approximately follows by walking from speaker to speaker, around the audience, shifting between themes in the score. This is intended to create a performative surround-sound experience as well as an electroacoustic one, for the audience. Relating back, in the same way that one cannot avoid imposing shadows or towering skyscrapers in a downtown cityscape, a listener's ear cannot completely avoid the sound of an acoustic voice even when other distorted and manipulated sounds from speakers are surrounding them. In retrospect, such an ambitiously experimental notation perhaps was not ideal for a piece that required a meticulous coordination between the concept, the performer's part, and the electronic part. By remaining objective to a wider range of musical possibilities, however, I feel the thematic, graphical qualities of the notation were successful.
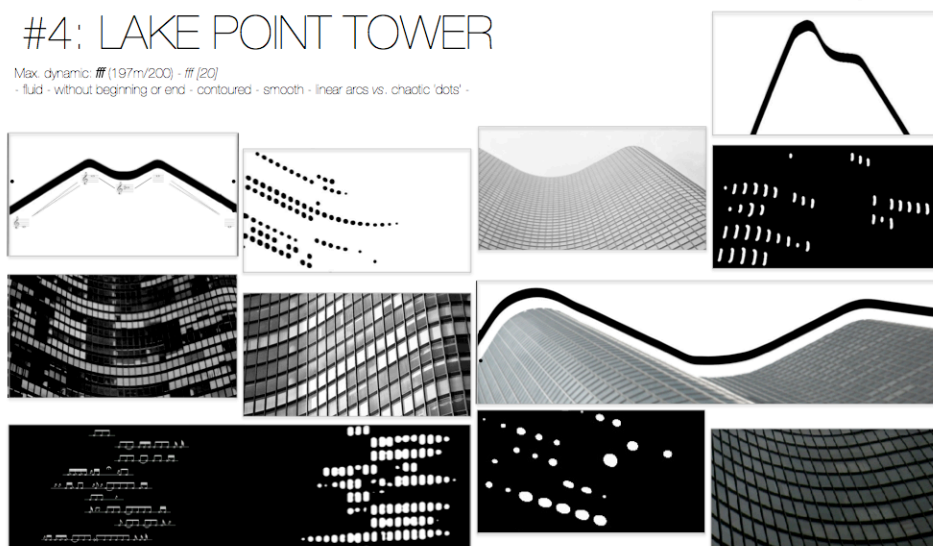
Fig. 13: a pool of graphic notation, from within the performer's score to *Chi·ca·go*. The offset alignment of cells and the mixture of graphics, musical notation, and photography, allow for extensive interpretation, but also convey a strong thematic differentiation between pools.

3.5 SEATTLE

After the highly encouraging graphical outcomes from the *Chi·ca·go* project, I sought extra research in studies of geometry. A number of composer-performer conversations during the development of the piece generated interesting ideas, particularly the fundamental graphic-to-sound representation of the simplest of curves. Known in primitive geometry as a Béizer curve, an asymmetrical curve has identifiably different possibilities of sonic realisation than a parabola (for example), yet these irregular and regular curves, along with points, straight lines and line segments, form the basis of many musical notations. Such ideas of primitive geometry also relate to the very basic foundations of graphic notation; from the graphic representative features of Xenakis's UPIC system, discussed in a previous chapter, to contemporary audio-visual synthesis

software, and even to computer sequencer's visual representations of sound such as piano-roll interfaces. To employ selected geometrical terminology – where a 2D plane exists, and where values y=pitch (frequency) and x=duration – any point, line, line segment, curve, or any other mark, is given sonic value. Therefore, with the intent to employ primitive geometrical ideas in the subsequent composition, I began to develop a more approachable set of graphics.

The following opportunity was to compose a piece for viola d'amore and live electronics, for Carter Williams. Another personal inspiration to base a piece on the city of Seattle reasserted itself here, and to integrate the geometrical notation approach, a skyline-based piece was appropriate. After several graphically thought-provoking versions of what could form the basis of a notation, the decision was made to fully employ the geometrical ideas from prior research.[20] The idea, after printing and physically cutting-out and tracing around images of the city skyline (screen captures from Google Earth), was to divide the piece into an initial left to right pan of the horizon, mapping the relatively simple geometric patterns found. This would then followed by a 'closer view' in which textures and more detailed contours could be discerned, as the skyline contour was to be represented as pitch through time, architectural textures would become timbral or technical qualities of this sound. Rather than an original plan to compare the 'zooming-in' concept to ideas of fractals and mathematical self-similarity (where a quasi-self-similar skyline would create constantly varying contours and textures), I opted to use only two iterations of the complete skyline. This is apparent when viewing the score, but intentionally less apparent if only listening to a performance.

Fundamental ideas of primitive geometry were inherent in contours of the skyline silhouette; the geometric topology of horizons lends itself fittingly to graphic notation. However as a means of creating an accessible performative vocabulary through which to represent the skyline as a notation, I identified four key geometrical figures that made up all pitch movement within the piece. To be read from a simple y=pitch/x=duration 'pitch plane', the notation left little open to interpretation, apart from approximate details such as the pitch-area within set boundaries to be determined at the
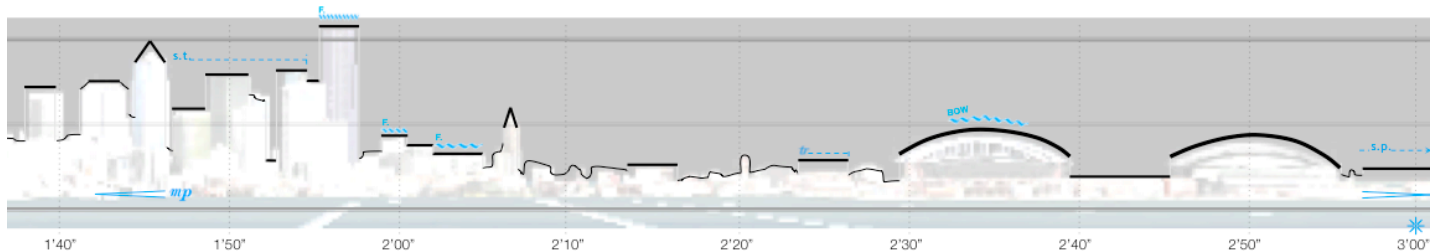
Fig. 14: primitive geometrical forms (see fig. 4) applied to a graphically edited silhouette of Seattle skyline, then annotated with instrumental technique and articulation. Creative procedures executed in multiple platforms to produce the desired notation.

performer's discretion. After arranging the geometrical figures that formed the skyline, in a layout and production platform (through adjusting and organising my chosen figures using crop, resize, draw, rotate, and transparent-background functions for files that were not .png format), I could then return to image-viewing platforms such as Google Earth and online photography sources, to study textures of the skyline, to annotate the geometric contour with various extra-graphical instruction and information. The construction of a patch to generate a live electronic part was merely a record, store and reverse-playback idea that was intended to distort and confuse a listener's perception of each iteration enough, but not to overwhelm the intricate sounds produced from the live part. This worked well in a four-channel diffusion scenario, and after

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20 See appendix p. 78-82 for annotated illustrations of the compositional workings behind *Seattle*.

some beneficial hours of rehearsal and discussion, therefore I concluded that (with or without the electronic part) a somewhat rigid, symbolic graphical notation could be arrived at, through a multi-platform approach, by applying geometry to notation – when the non-musical stimulus calls for more rigid contour, and less smooth. By outlining a select number of geometric forms, the eventual graphical notation remains committed to the intentional sonic outcome; as Xenakis states,

> Graphical writing, be it symbolic, as in traditional notation, geometric, or numerical, should be no more than an image that is as faithful as possible to all the instructions the composer gives to the orchestra/machine.[21]

3.6 A SERIES OF TWENTY-SIX TYPOGRAPHIC FIGURES

Approaching my final composition of the academic year, I pursued research into applied geometry in graphical notation, reigniting a personal interest in typography. These strands of study fell perfectly alongside each other, and so needed to be exploited in a composition. This final commission took the form of a Microscore[22], for solo violin; a project initiated by the intended performer, Johnny Chang. The unique element of this compositional brief was the maximum piece duration of thirty seconds. Consequently, schemes were designed in which to incorporate a typographic stimulus, through applied geometry, into a graphical notation. I eventually settled on an idea that studied the geometric qualities of typographic anatomy, applying designated elements of type to selected musical parameters.[23] Making use of the twenty-six characters that make up the Latin-derived English alphabet, and the popular sans-serif typeface of Helvetica, a series of figures were created, which derived from capital character ascent contact points (where the top, ascender or apex of a

capital letter meets the typographic ascender or cap-height line). Then, aware of the extremely condensed durational space in which this piece will be realised, this compression was replicated in the pitch (frequency) parameter, too. Mounting my series of figures on a traditional treble clef staff (although signifying a downward transposition, to be played on the G string), my Microscore was the sonic representation of twenty-six figures, evenly positioned and faintly separated through a duration of twenty-six to thirty seconds.
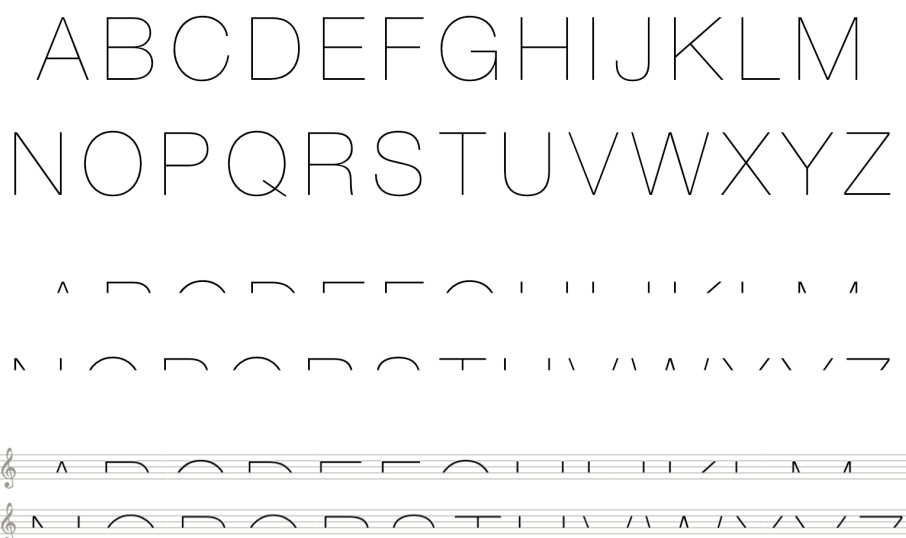
Fig. 15: the typographic concept behind *A Series of Twenty-Six Typographic Figures*. Using character ascent points to derive a selection of geometric forms, to then be represented musically.

Much work was also done to determine the timbre, attack and articulation from figure to figure. In a study of the phonetic qualities of the twenty-six

21 Xenakis, I. (1992) *Formalized Music: thought and mathematics in music*, Pendragon (New York).
22 Information on the Microscore Project is available on the performer's website:
  [http://johnnychchang.blogspot.com/2007/10/microcsore-project.html]
23 See appendix p. 83-87 for annotated illustrations of the compositional workings behind *A Series of Twenty-Six Typographic Figures*.

characters, specific phonetic characteristics were represented by specific performative techniques (considering sharp, soft, plosive attacks; short or sustained durations; pitch to noise ratios) resulting in a series of figures that each had their own unique sonic value, corresponding to the phonetic alphabet. In performance, a listener need not be able to remember or relate to specific figures, or even realise that each figure is unique. Instead, my intention was to put forward (for the performer as well as the listener) a set of similar sounding, similar looking figures that could potentially be learned.[24] Similar to Seattle, the multi-platform approach to this piece was slightly inverted and adjusted, in that I did not begin with photographic or image-based stimuli, and therefore did not require the routine specialist graphics software. Alternatively, much of the early work began in a word-processor, and was then (after exporting typeface characters as transparent image files) assembled and mounted in the usual production platform. The benefit of a platformed approach, to this piece, was the ease with which delicate alterations could be promptly made. Precise aspects of the notation could be re-edited, saved and sent to the performer with minimal hassle. When such a collaborative composition scenario is possible, the reliability and professionalism of a (in this case, purely digital) multi-platform approach, is a truly swift and efficient way of working.

3.8 CONCLUSION:

Through studying a significant number of approaches to graphical notation, undertaking comparative analysis from both musical and design perspectives, I have been able to refine my own personally unique way of composing, and an aesthetically distinct style of notation. This methodology still allows for a wide variety of inspirations and source materials, which have come to form the foundations upon which my work is composed. New developments are still underway in more recent compositions, all of which involve either different software used as a compositional platform, or different concepts applied to the procedural style of composing. These include the use of a computer mouse-tracking tool to create graphics which feature different weight points and lines;[25] this, given musical instruction and annotation, could become either a representational score for electronic sounds, or a notation to be interpreted electronically. Another recent work-in-progress (a piece following on from A series of twenty-six typographic figures) makes use of the thirteen London Underground lines[26] using graphical editing techniques featured in the workings of A62 to create a series of simple pitch-lines with musical details. These examples are further evidence that an approach to composition that incorporates a variety of platforms, and caters for an array of relating areas of interest, has huge potential to expand and evolve. Whether this expansion takes the form of different personal fascinations adapted to become notations, or creative collaborations with individuals in different areas of the arts (or elsewhere), it will certainly keep pace with the ever-advancing world of technology in music.

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24 In email correspondence with the performer Johnny Chang, he discusses how he approached the piece by "alphabet training", and how, after a few rounds, he grew familiar with the notation and its shapes and sounds. See appendix, p. 87.
25 See appendix p. 92-93 for illustrations of the *IOGraph project*.
26 See appendix p. 90-91 for annotated illustrations of *A Series of Thirteen Underground Lines*.

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APPENDIX

This scrapbook-appendix is the culmination of illustrations, examples, diagrams and extra resources included in the research behind my MA Thesis. It also contains all background work, sources (maps, photos, etc.) and additional information for the compositions within my MA Research Project. Pagination continues from the bibliography of the MA Thesis document, as important references are included in footnotes of the written work. Annotations within this scrapbook-appendix do not add to the word-count of the MA Thesis, but merely provide written information and explanation of the illustrations and other sources featured. The elements within this appendix are divided into:

p. 39-52. References from the MA Thesis

p. 53-93. Workings, sources, illustrations, graphics and diagrams from the portfolio of compositions (and other work).

Inspiration, source material, or spontaneously found visual stimulus can stem from an infinite array of places. Whether found online, printed, hand-drawn, or derived from another origin entirely, a visual concept for the beginning of composition can be scanned, photographed, screen-captured, or downloaded, to assume digital form for a procedural composition process.
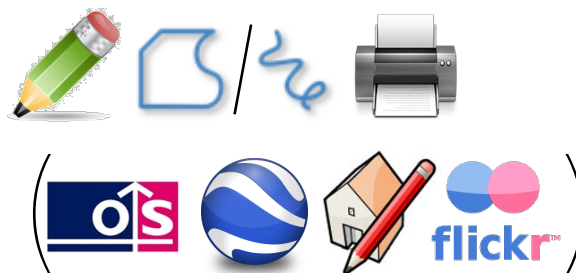
An initial image-managing platform is necessary to assemble scanned, uploaded and saved images. Here files can also be graphically edited through simple functions such as resizing, cropping, or adjusting contrast, exposure, saturation and more.

Specialist graphics software may also be required, for creating or adjusting specific lines, shapes, gradients, and graphical annotations.
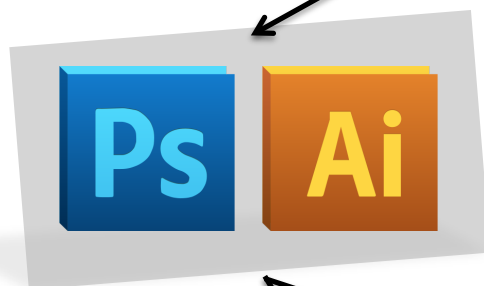
Musical notation software can also be employed – either as another platform (through importing graphics) or merely as a source of traditional notation images (symbols, clefs and staves exported as graphics).
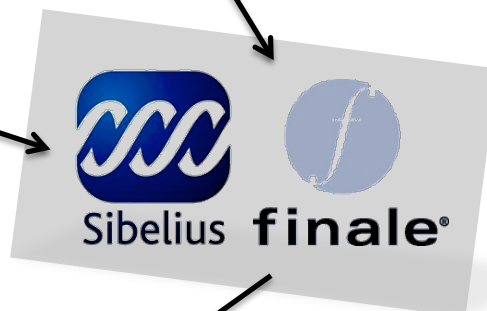
Finally, a production platform is a simple, effective environment in which to bring together all parts of a notations. Here elements can be arranged freely, layout and formatting options modified, and text can be added. Additional pages can also be created and edited, including title pages, performance instructions and program notes.

The score can then be exported as a PDF, ready for print or email.

Fig. 16 (opposite): An infographic showing the breakdown of the
software I used in the multi-platform approach to some pieces.

Software icons:

Preview: basic image viewer for
Mac computers.

Microsoft Office Picture Manager: as
above, but for Windows computers.

Adobe Photoshop

Adobe Illustrator

Adobe InDesign

Programs
within the
Adobe
Creative
Suite

Sibelius: music notation software

Finale: music notation software

Microsoft PowerPoint
(Windows and Mac icons)

Ordnance Survey maps.

Google Earth: satellite imagery,
photography, and elevation terrain.

Google SketchUp: A 3D design
and rendering software.

www.flickr.com: a photo managing
and online sharing application.

for Seth Gordon

Lunar Cascade in Serial Time
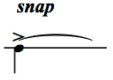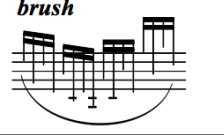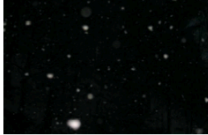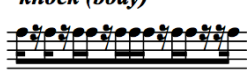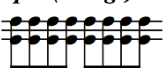
Northfield Falls,
Vermont
June 15, 2007

June

Dennis Báthory-Kitsz

Start playing at the inside or outside ring. The performance moves from ring to ring, but should not skip them. Length of notes is a combination of their values and their importance within the photograph. Areas without pitches can be silence or improvisation, depending on the context of the performance and the photograph.
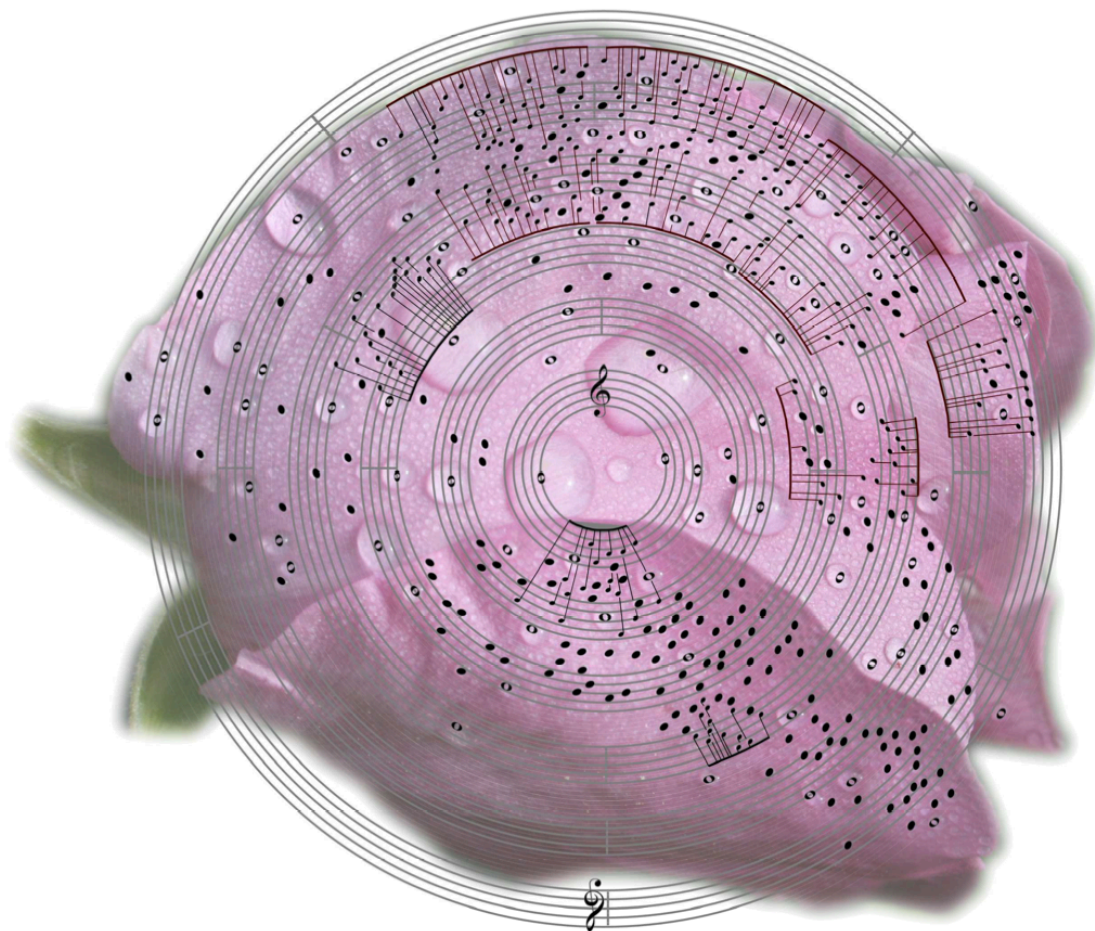
The full moon of mid-year brings new blooms and deep intensity of tactile experience. This should be reflected in a dynamic that is always quiet, fully expressive within the microscopic nature of the dynamic, and often dropping to the point of sub-ambient silence.

Fig. 17: *June*, a movement from *Lunar Cascade in Serial Time,* Dennis Báthory-Kitsz, 2007.

Fig. 18: *January*, a movement from *Lunar Cascade in Serial Time,*
Dennis Báthory-Kitsz, 2007.

Last night's premiere of *Eventide* wasn't bad. But before a concert report (I'll leave that until tomorrow, after tonight's second performance), there will be commentary about notation. Again, yes, but it's really to make at least one descriptive term clear: "Nineteenth century notation."

Yesterday on the Finale notation list, a musician wagged a virtual Rumsfeldian finger, writing, "Written musical notation is continuously and seamlessly evolving, and its current form can be characterized as '19th century' only as a deliberately inaccurate pejorative. You need to stop that."

Hah. Aside from being delusional, this guy's wrong, if only because the topic was music notation *software*. He can be forgiven for a reading deficiency, but at least it gets out in the open a simmering resentment between composers and publishers for the better part of a century. Music publishers are businesses, and their interest in art is switched on only so long as it coincides with their ability to make the payroll. But that's a given in a corporatized environment, even with little arts companies. The social commitment to artistic creation is dead.

Profit comes into play because coincident with the hyper-capitalistic trends came the fastest and deepest development in notational practice in the history of written music. This is the fortieth anniversary of the publication of Erhard Karkoschka's *Das Schriftbild der Neuen Musik*, published in the U.S. six years later as *Notation in New Music*. Though notation has continued to evolve in these forty years, the most explosive development took place between 1920 and 1970, a good part of which Karkoschka has captured. (I bought the book on its U.S. release for $29. The used price is now $530.) However, an examination of *SoundVisions* (Torsten Möller, Kunsu Shim, Gerhard Stäbler), published last year, shows that development has continued, albeit at a slower pace.

The examples from Karkoschka's book are largely hand-written manuscripts or hand-inked fair copies, as one would expect during an era when music typography was an expensive process, and music engravers were still engraving on metal plates. However, *SoundVisions* shows, aside from traditional notation, no change from the hand-inked circumstance -- despite more nearly twenty years of available computer music engraving.

What has happened? Nothing. Absolutely nothing. The software adopted the notational symbology and techniques straight out of the Nineteenth century -- measure-based, horizontal, graphics-free, note-bound workflow lifted right from the engraver's metal plates. Advances made as early as 1900 do not appear in software more than a century later.

The fundamental distinction between a contemporary notation program and an engraving program needs to be made. If a notation program is considered to be exclusively a graphical program, then almost anything is possible. However, the efficiencies in software are gained by what the software handles *natively*, not what can be forced into place. In such circumstances, one can just as easily (or with just as much difficulty) create a contemporary score in an advanced graphics program. But the true advantage of notation programs comes from the fluidity of the interface, that musical information can be entered in musical ways, and that proofing, playback and studio features are available. Without these musical concepts, the software is little smarter than me humming along with my Osmiroid music-writing pen.

Though I have tried Sibelius, Igor, Graphire and Score, I work with Finale. For the interests of a notationally wide-ranging present-day composer, it seems to me to be -- despite its history as an unmanageable and unlearnable morass -- the most flexible program with the greatest number of actions that can be assigned by musical activity and can be assigned musical purposes. But it still, at heart, is based on Nineteenth century models of notation, and it represents its internal data in that fashion. (Consider the presentation of visual content on the web if it were limited to Nineteenth century models of publication.)

But without examples, these grand statements are meaningless. So let's have at it with the following brief chart of notational features in use after 1900. (My example is Finale, but those with experience in other programs are welcome to send me a list to fill out the options. Also, corrections are invited, but my definition of "natively supported" is strict -- no workarounds and juggling of bits & pieces.)

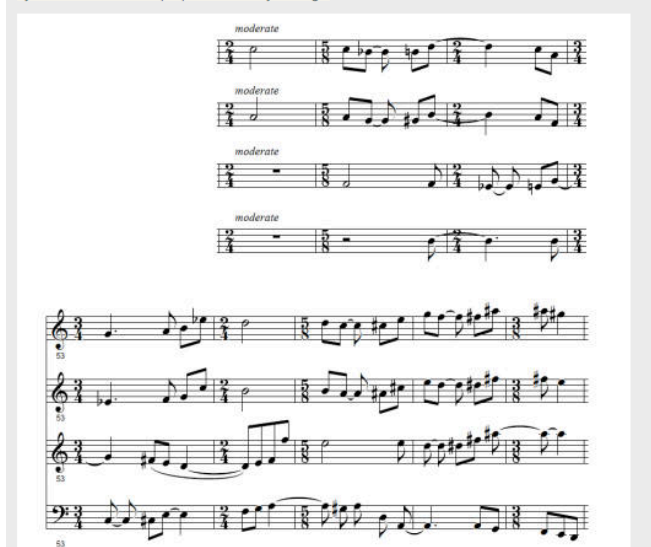| Notational Item	Natively supported?	Workaround or technique?	Playback supported?
✓ = Yes, ○ = Partly, ✗ = No			
Percussion symbology.	✓	Special font	✓
Contemporary articulation symbols.	✓	Special font	✓
Empty or alternate noteheads.	○	Special tools or staff styles	✓
Stemless notes.	○	Special tools or graphical kluge if stemless with beams	✓
Staff lines other than five.	○	Graphical kluge for ledger lines	✓
Beam over barlines.	○	Third-party plugin or graphical kluge	○
Feathered beams.	○	Special tools	✗
Boxes and circles.	○	Graphical kluge, and no layering available	✗
No barlines.	○	Staff styles, individual removal, and notation adjustments	✓
Staggered barlines.	✗	Graphical kluge	○
Broken (through) beams.	✗	Graphical kluge	✓
Beamed flags.	✗	Graphical kluge	✓
Tone clusters.	✗	Move notes or special font	✗
Quarter-tones.	✓	Change key signature	✗
Other microtones.	✗	Special font	✗
Circular accidentals.	✓	Special font	✓
Fractional tuplets.	✗	Graphical kluge	✗
Interwoven tuplets.	✗	Graphical kluge	✗
Angled stems.	✗	Graphical kluge	✓
Rotatable symbols.	✗	Graphical kluge	✓
Stretchable graphic elements.	✗	Graphical kluge	✗
Drawing graphics (curves, writing, etc.) on-page.	✗	Graphics tool	✓
Linear (time-based) notation.	✗	Graphical kluge	✗
Curved, bent or circular staves.	✗	✗	✗
Two-dimensional (grid) staves.	✗	Graphical kluge	✗
Vertical or angled staves.	✗	Graphical kluge	✗
Arbitrary (wavy, square, diminishing) 'continue' lines.	✗	Graphical kluge	✗
Curved arrows.	✗	Graphical kluge	✗
Broken (through) arrows.	✗	Graphical kluge	✗
Half-slurs or half-ties.	✗	✗	✗
Equitone or Klavarscribo.	✗	✗	✗
Score elements in color.	✗	✗	✗

There is a staggering number of no's and kludges. Why does this exercise me so much? They are possible aren't they? Sure -- with a pen.

Even among creative people such as composers, and particularly when the creative activity is secondary (music engraving), artists are limited by their tools. Their imagination may stretch well past the tools, but in practice, one has to produce materials for performance. Among those in a forward-looking musical community, among musical friends, or where a reputation is established so that performers are willing to (or paid to) spend time and energy creating a piece from hand-drawn materials, the tools -- pen and ink -- are not a barrier. But materials move out of the circle of acquaintances. Publishers, even small publishers, take them on. Some publishers reprint composers' manuscripts, as with Gunther Schuller and John Cage. The latter's *Music of Changes* is in my library, and I see it inked in what looks to be the composer's hand. In the recent past, calligraphers and engineering drawing experts were hired, and more recently, specialists working in a combination of programs (such as Score, Finale, and Illustrator) to create fine graphical renderings.

The economics of self-publishers and small publishers militate against hiring graphic artists. Some large publishers now even *expect* materials from "less profitable" composers to be submitted in digital format, camera-ready. One of my engraving clients is a well-known composer whose publisher expects him to provide ready-to-print pages, and he is not prepared to learn software as well as be a composer, so his compromise is to pay for the engraving, knowing that ultimately he may have a few performances -- but, as with a beginning composer and not one of his stature, the joy of performance will be his only profit.

I will use myself as an example, when I was new to Finale (and when Finale was the only option for a scoring program with playback, which was used to create demo versions). The 1970 *Quartet for Winds*, in its fourth movement, contained a section of independent time signatures with staggered barlines. When I engraved it using Finale 2.2 in 1993, the program would not allow separate time signatures for each staff with overlapping barlines like these, so in order to publish it -- this was before I determined how to kluge it graphically -- this is what happened:

Wind Quartet (1970) fourth movement, in my hand-inked version, showing staggered barlines with vertical synchronization -- a simple piece from 36 years ago.

Wind Quartet (1970) fourth movement, engraved in Finale 2.2 in 1993, showing staggered barlines eliminated and the rhythms rewritten -- and the sense of the individual parts *gone*.

There is the reason why I call notation programs embedded in the Nineteenth century. I was a 21-year-old composer using largely traditional methods of composition *which to this day defy software to work with them natively*. I'm hardly alone. Tens of thousands of us work in notation normal for compositional life, and the software -- which supports only Nineteenth century notation -- chokes its dry old digital throat.

Postscript: My conclusion was omitted: As composers come up through composition using these computer notational tools, just as writers come up with computer text editing tools, they will find themselves limited by their enormous inconvenience of working outside of Nineteenth century conventions. From simple text through advanced, multi-dimensional presentation, office tools present few barriers to imaginative visual communication. Though they may not encourage imagination, they do not prohibit it in the very nature of their toolset. Computer notation programs erect enormous barriers to imagination.

Fig. 19: Chart and blog post by Dennis Báthory-Kitsz, surveying the native features of contemporary music notation programs.

Báthory-Kitsz, D. (2006) *We Are All Mozart*, available online at [http://maltedmedia.com/people/bathory/waam-20061007.html]

Fig. 20: Image reproduced from *Iannis Xenakis: UPIC sketch for 'Voyage absolu des Unari vers Andromède'*, 1989. Perspectives of New Music, 28(2), p. 119. ed. Clarke, P. *Xenakis' UPIC System*, online source at [http://thecomposerandtechnology.wordpress.com/2011/04/11/xenakis-upic-system]
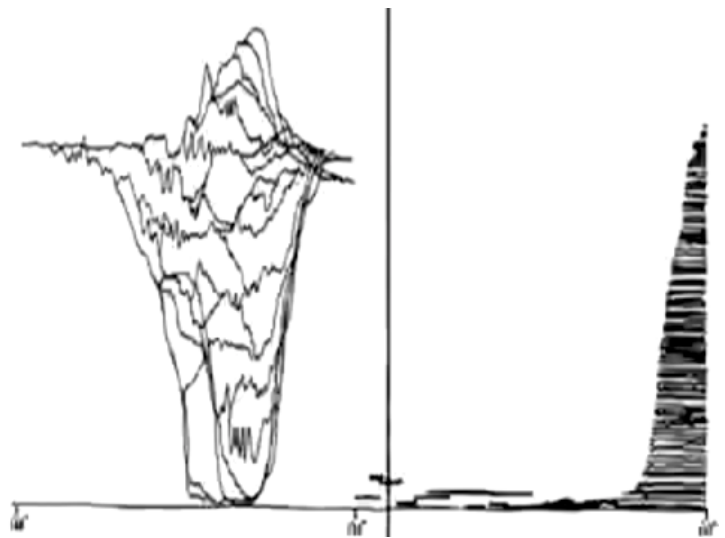
Fig. 21: a caption of Xenakis' UPIC drawings for *Mycènes Alpha* (1978), taken from an audio-visually synchronised video, online at [http://www.youtube.com/watch?v=yztoaNakKok]

Fig. 22: Score excerpt and performance notes from *Panorama, for Trombone and Piano*, Alvin Lucier (1993).

ALVIN LUCIER

Panorama
for
Trombone and Piano

Dedicated to
Hildegard Kleeb and Roland Dahinden

Trombone

During the course of the work, the trombonist slides continuously, outlining the shapes drawn by the diagonal lines. He may stop sounding his instrument at any time before he runs out of breath but continues moving the slide silently, following the score as if his instrument were sounding. He may start playing again when he has regained his breath but is under no obligation to hurry or fill in the silences.

Numbers above the trombone tones indicate timings in minutes and seconds; those beneath, microtonal tunings. Fractions indicate tunings within a semitone, higher or lower than the notated pitches, as shown by the arrows. Single numbers indicate cycles per second above and below the notated pitches. The player is not expected to be able to hear these finer tunings, but may perceive them as beats per second against the piano tones.

Piano

The pianist plays single tones and intervals, following the timings given in the score. Sounds should be allowed to decay to zero. She should synchronize them with the trombone's pitches in order to create the audible beats caused by the descrepancies between the piano's fixed tunings and the microtunigs of the trombone, but may occasionally shift her sounds forward and backward, to vary the beating speeds accordingly.

Note

The shape of this work, as traced by the sliding trombone part, was copied from **Wildspitzpanorama**, a photograph of the East Central and Berner Alps, taken near Zug, Switzerland, by Doctor Hermann Voegeli.

BOOKreviews

THERESA SAUER:
NOTATIONS 21
Published by Mark Batty Publisher, New York 2008

by Frank Retzel
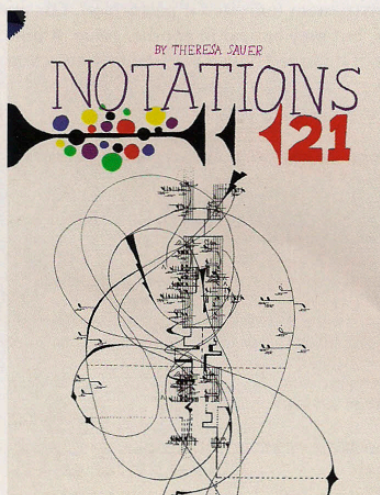
"We live in an incredible time in music history – here is only a small sampling of the evidence." With these words from the Preface, Theresa Sauer launches her 40-year revisiting of John Cage's unique book *Notations*. As Cage sampled the notational evidence at mid-20th Century, *Notations 21* is timely with its view of score practice early in the 21st century. Like Cage's book, numerous composers are represented (here over 100), placed not according to the type of music but alphabetically.

Composers were asked to contribute a small section of one or more compositions and were asked to write a statement or description about their work. Several of those commissioned treated the book as a forum and submitted essays on topics such as notation, contemporary music, graphic notation and the creative process. I totally agree with Sauer – "all are completely fascinating and unique." At 320 pages, 8 1/2 x 11 inches format and color used throughout, this is a gorgeous book, as visually striking as it is provocative.

Comparison with Cage's book is unavoidable, and here we see some glaring differences in subject approach. The 1968 *Notations* uses a cross sampling of graphic and indeterminate scores and those in conventional (or nearly so) notation. One noticeable difference is that virtually all examples are in the composer's hand. Several contributions are of composer sketches. There also seems to be a democracy of musical styles with conservative and radical artists existing in a peaceful kingdom. The accompanying text was typical Cage: one to sixty-four words (often cryptic) chosen with I-Ching chance operations and applied to the two hundred and sixty-nine composers. *Notations* is for a specialized reader, one who understands mid-20th Century notation and the many styles in existence. There is a wealth of personalities revealed in the examples chosen and in the composers' manuscript. Creative processes and work methods are often reflected in the writer's pen. Here is Aaron Copland's thought on the matter: "Examining a music manuscript, inevitably I sense the man behind the notes. The fascination of a composer's notation is the fascination of human personality."

Beyond the examples of contemporary manuscript, Cage provided a few examples of music where score beauty is on an equal par with the distinctive quality of the music (eg. Roman Haubenstock-Ramati's *Mobile for Shakespeare*). Graphic or indeterminate notation often could approach the level of conceptual art where the visual beauty of the score was equal to the sound upon realization. It is with this type of score that *Notations 21* really hits its mark. From one page to the next we are presented with a bevy of pages suitable for framed display. Is the visual beauty, though, the only criterion for inclusion?

Theresa Sauer takes a cue from composer Earle Brown. After quoting the innovative composer on 'open' or 'available' form she writes "In other words, the identity of notation comes from its purpose for the creation of music, a phenomenon that can allow for spectacular variations in musical scores (Foreword p. 10)." She writes that she has "examined this phenomenon and the impact it has had on performance as well as our collective consciousness as consumers of art and music." The result is *Notations 21*.

From one piece (and composer) to another we see the "spectacular variation" spoken of in the Foreword. There is the occasional work in traditional pitch/rhythmic notation. These all are of an evolved modernist aesthetic. Then, there are a great variety of graphic scores and scores that equally impact the visual and aural. A wonderful feature of *Notations 21* is the composer's note following many of the score pages. These help to explain the notational symbols and the visual component and/or provide a program note of meaning. There are some wonderful essays that examine the concept of notation in today's world or more directly in the particular writer's world. Here's a small sample. After presenting composer Robert Fleisher's *Mandala 3: Trigon* for soprano saxophone in score, a concise set of notes explains how to read the music. Following this, Fleisher's essay 'Being of Sound (and Visual) Mind' explores the topic of notation via Cage's book, Schoenberg's concept, the visual/aural sense of Klee and Kandinsky, through Crumb and Haubenstock-Ramati. Four very unique graphic works are presented by composer William Hellermann. Following this is an extended letter written to composer Philip Corner to discuss "Score Art."

Theresa Sauer, the composer who put the whole volume together, is represented by her work *Parthenogenesis,* written for da'uli da'uli (a kind of xylophone) and an unspecified number of female voices. In the note, she states that "the mother Komodo dragon and her genetic code are the source of all the lines and other designs within the score (p. 207)." A further program note discusses the meaning of 'parthenogenesis.' I'd love to see the rest of the score. That holds true for so many examples in *Notations 21*. Considering that a certain number of these are a type of intermedia (e.g., the visual is a notational trigger for the audio), I am curious how the style and design of notation might dictate the style of the individual composer, and might dictate the style of the realized composition. I have thought for a while about this very thing in my own music and am intrigued to see a volume exploring the same concepts.

My only criticism is that music of a more conservative nature (in sonic design and notational directive) is not included. So many countries and cultures, so many traditions of music are represented that anything possible would seem to be covered. Yet, going from the earlier compendium of Cage's book with its myriad styles to the 21st Century graphic art of this new volume, one could easily be misled into thinking it reflects the mainstream. What about John Adams, Philip Glass, Arvo Part, film music? Theresa Sauer, in her Foreword, mentions the close deadline facing her after in order to meet the 40th anniversary of *Notations*. She seems to hope that further editions will come out which can include examples not in this volume. That would be welcome: it truly would allow for the continued Forum on new music, notation, art and music, creative process, etc. already launched.

What we have in *Notations* 21 is a beautifully rendered volume on notation. Beyond the composers, students and scholars of 20th/21st Century music, one can easily imagine this book in the hands of artists and art historians, and anyone who appreciates a book with stunning visuals. Bravo! ‖

Fig. 23: *Theresa Sauer: Notations 21* – a book review by Frank Oteri, in the New Music Connoisseur journal, Vol. 18, Issue 1 (Spring 2010), p. 26-27.

The pieces in **Mass Black Implosion** transform scores for academic avant-garde music into suggestions for 'free noise', although the relationship between use-value and the aesthetic they present is complex. Perversely, Fusinato's investment of his objects with a clear functionality operates largely through a return to and celebration of the exact moment in the history of musical notation, the development of 'graphic notation', when, alongside and partner to avant-gardist sonic experiments, the purpose of scoring is being questioned: even without Fusinato's additions, how exactly is a score like Anestis Logothetis' Agglomeration to be performed, and is any 'performance' of it really an unrelated improvisation (a question that opens up the possibility of different modes of musical authorship)? Fusinato's Osamu Tezuka inspired linear intervention into these scores transforms them into material for new connections and brings out their complexity, but also annihilates their meaning in a humorously representational gesture opposed to the abstract-symbolic operations of musical scoring: they look, fittingly enough, like explosions or implosions, masses of lines either bursting forth from a central point or being irresistibly drawn into it.

 To attempt to perform these scores, where any sense of linear movement or internal logic has been destroyed by Fusinato's army of lines and every note drawn into an arbitrary centre, is to re-imagine them in terms where there is no longer any gap separating the parallel histories of academic musical experimentalism and the sub-cultures of noise, improvisation and lo-fi. These graphic works parallel Fusinato's own practice of noise-based improvisation using guitars and electronics, in which the expectation frustrating dynamics of the academic avant-garde meet the energy and volume of rock.

Fusinato discovers a principle of anti-linearity in his diverse sources. Tezuka pictured dynamism through a build up of individually drawn lines, just as Xenakis created monolithic clouds of sound from thousands of disparate events spread throughout the orchestra or tape, just as Masayuki Takayanagi's Mass Projection transformed the expressive individualism of free jazz into an ego-less storm of noise (or, against the cult of a Coltrane, Taylor or Ayler, emphasised what had always been there: the trio, quartet, quintet, Unit). While sharing in its anti-linearity and sonic materialism, this is not the monolithic unity of La Monte Young's drone, whose similar resistance to linear movement is easily grasped, but rather the principle of the mass; a field of disparate voices that defy linear movement not through their perfect unity (as in drone) but rather through an exaggerated splitting apart (Ligeti's micropolyphony). **Mass Black Implosion** is the improvisational (or 'mass projectional') mass that not only cannot move forwards linearly, but also dramatically obstructs any attempt to do so. With analogous effects to Sol Le Witt's 'machine that makes the art' or On Kawara, **Mass Black Implosion** is the physical materiality of sound that destroys attempted abstract impositions of the composer's will.

Fusinato's title for this project mimics the language of Black Metal, where we find a logic that meets his other sources in its privileging of the total effect over progression and the individual expressive voice. 'Into Night Moor', 'Nocturnal Emissions', 'Woods To Eternity', 'Black Fire Serenity': Black Metal song titles disregard syntax (the linear progressiveness of language) in favour of a total effect, a build-up and conglomeration of meaning and phonetics much like the accumulative effect of the massed individual voices in Xenakis or Glenn Branca/Rhys Chatham's guitar symphonies (or Fusinato's own Mono-). **Mass Black Implosion** is a gesture that maps an anarcho-materialist tendency across diverse cultural expressions.

Francis Plagne
Melbourne, 2008

Fig. 24-32: excerpts from works within *Mass Black Implosion*, Marco Fusinato, 2007-2009.
Images from [http://www.marcofusinato.com/projects/mass_black_implosion.html]
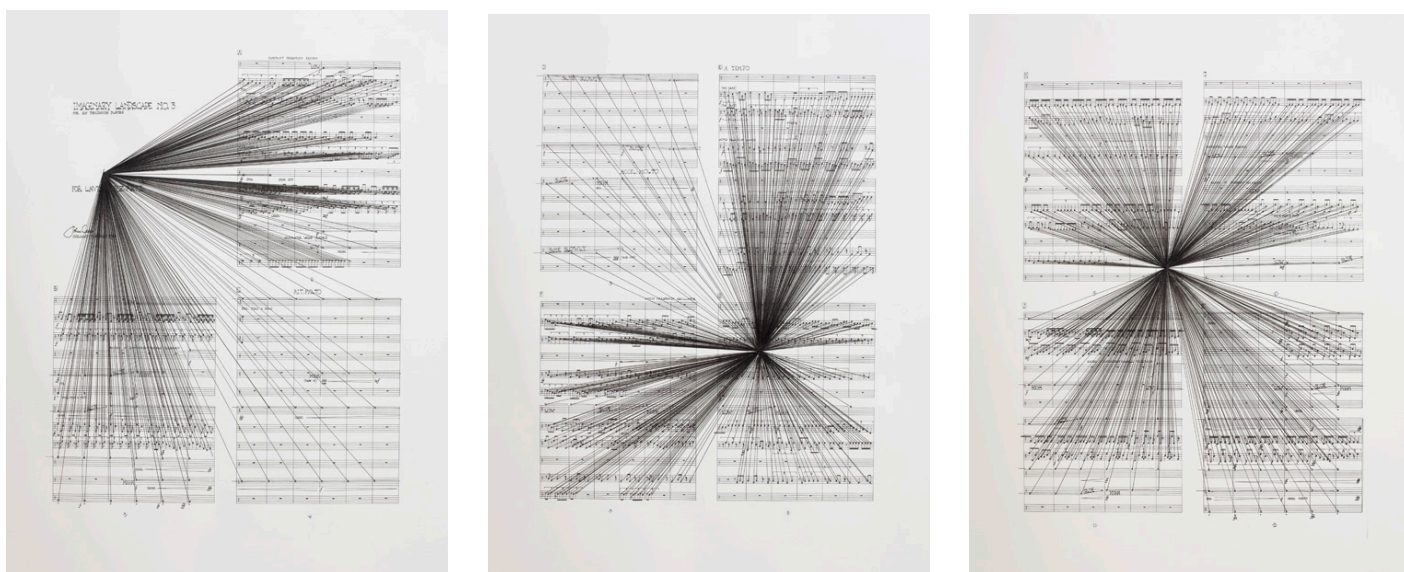
Marco Fusinato - Mass Black Implosion (Imaginary Landscapes No. 3, John Cage), 2009.
Ink on archival facsimile of score
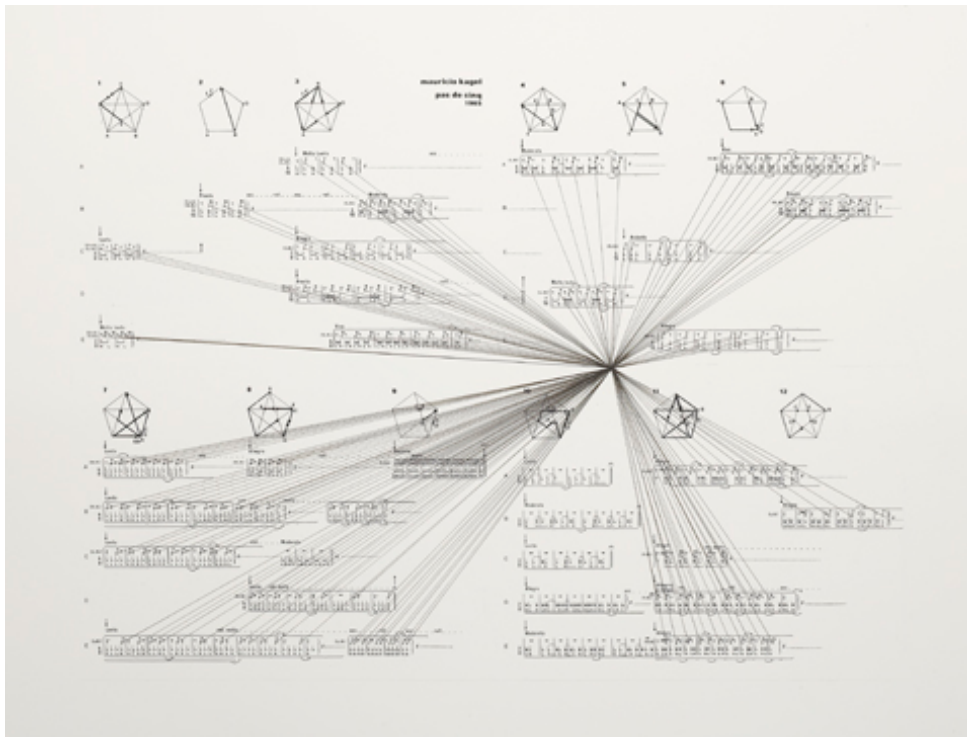
Marco Fusinato - Mass Black Implosion
(Pas de cinq, Mauricio Kagel), 2007.
Ink on archival facsimile of score, 2
parts, 42.5 x 58 cm each (64 x 78 cm
framed)
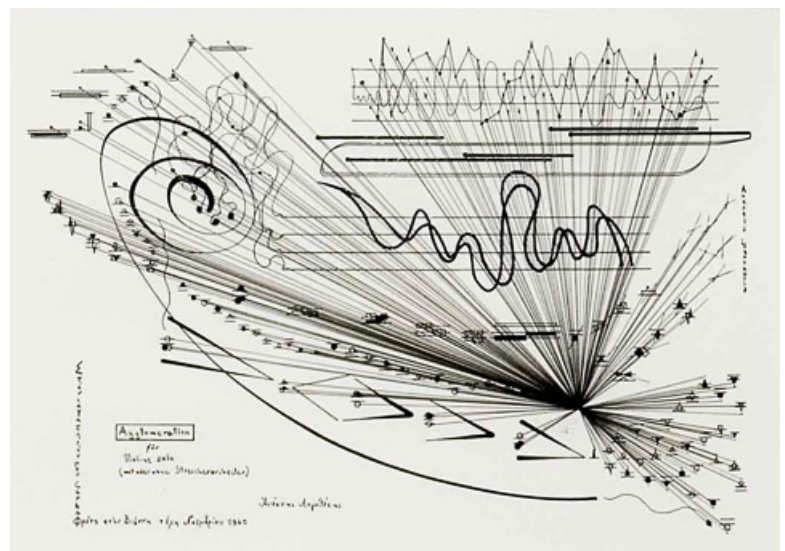
Marco Fusinato - Mass Black
Implosion (Liaisons, Roman
Haubenstock-Ramati), 2007
Ink on archival facsimile of score,
41 x 28 cm (65 x 87cm framed)
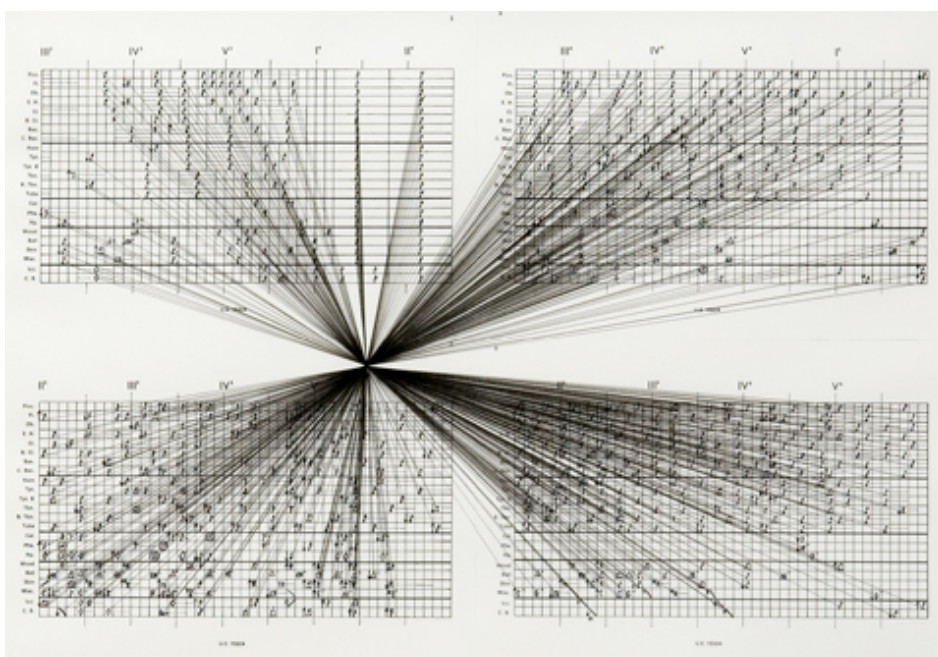
Marco Fusinato - Mass Black Implosion
(In search of an orchestration, Morton
Feldman), 2007.
Ink on archival facsimile of score, 4 parts.
42 x 60 cm each (63.5 x 80 cm framed)

Marco Fusinato - Mass Black Implosion (Free music No 1, Percy Grainger), 2009. Ink on archival facsimile of score, 23 x 32 cm (59 x 79 cm framed)
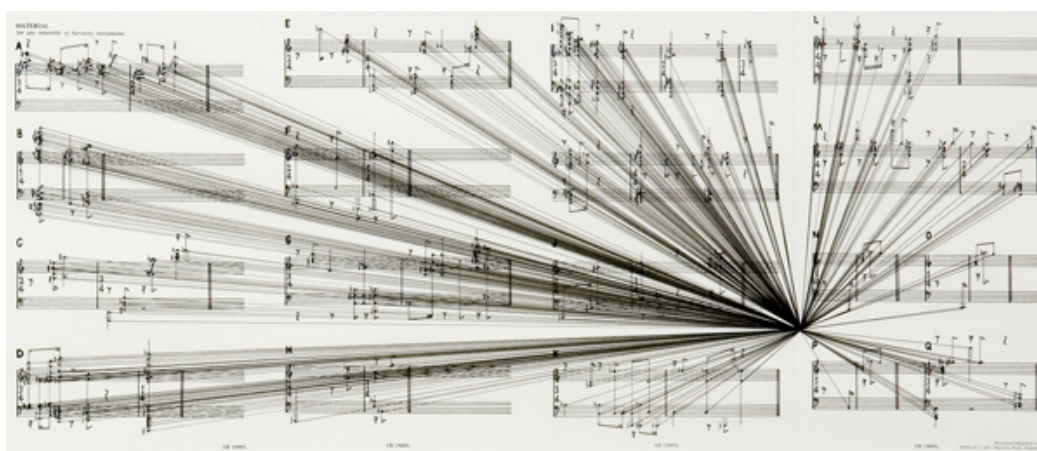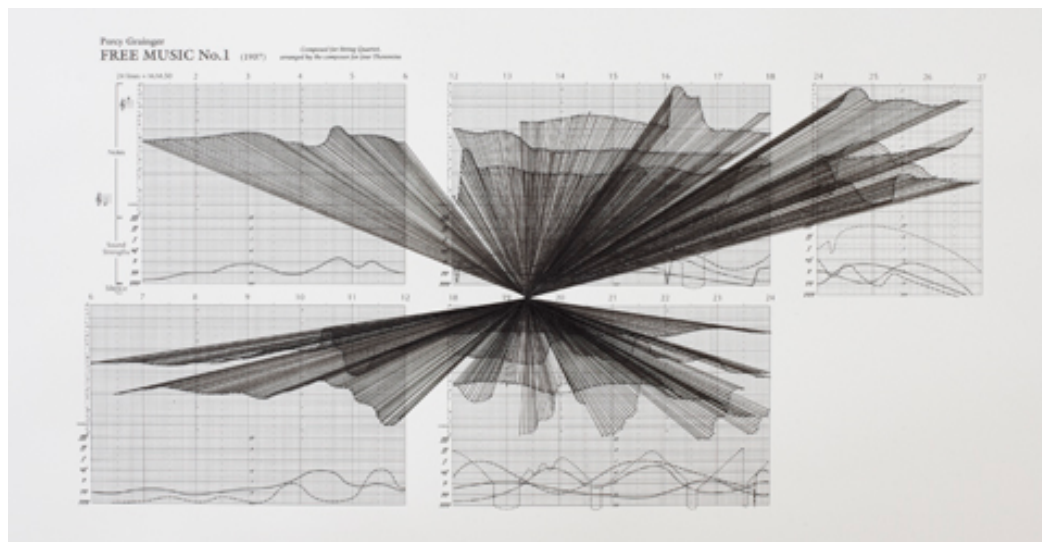
Marco Fusinato - Mass Black Implosion (Material, Cornelius Cardew), 2007. Ink on archival facsimile of score, 30 x 69 cm (59 x 92.5 cm framed)

Marco Fusinato - Mass Black Implosion (Tautologos III version 4, Luc Ferrari), 2007. Ink on archival facsimile of score, 35.5 x 77 cm (64.5 x 100 cm)
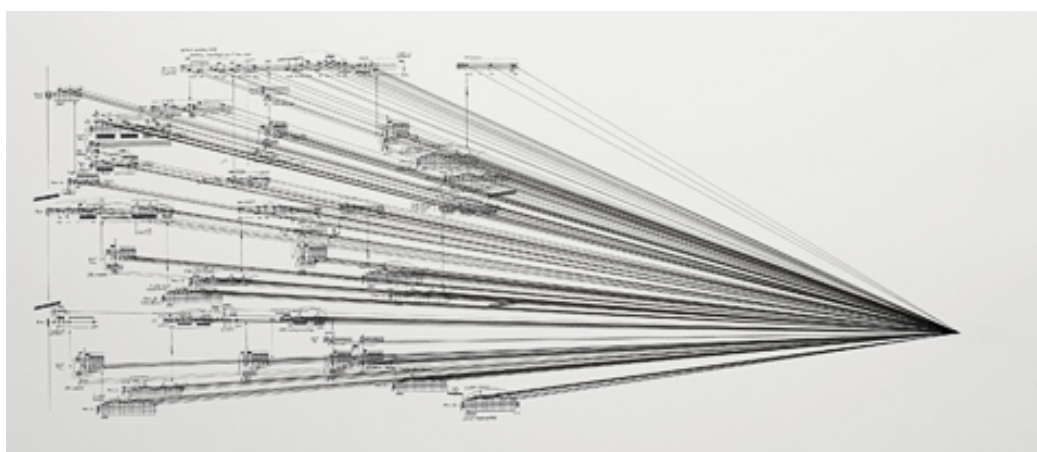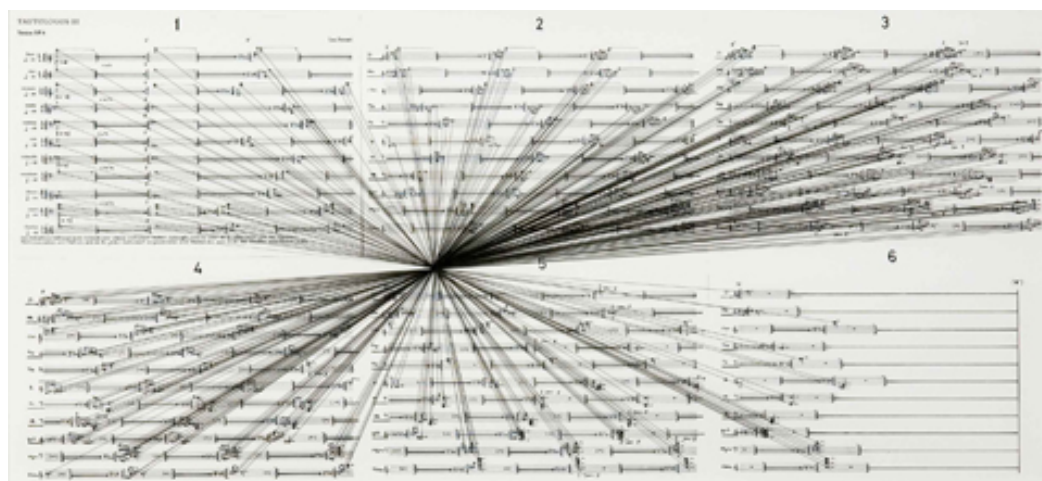
Marco Fusinato - Mass Black Implosion (Songs, drones and refrains of death, George Crumb), 2008. Ink on archival facsimile of score, 9 parts 60 x 84cm each (framed)

COMPOSITION APPENDIX

Extra illustrations, graphics and diagrams of current or mentioned works:

VOICES THAT WILL NOT BE DROWNED (2010)

For any four vocal ranges. Workshopped by EXAUDI vocal ensemble, March 2010.

Fig. 33: original visual source material in its OS Map form. Four pages, arranged to show the river's entire course.

Fig. 34-35: other images were cropped and arranged to create ideas of a continuous-linear river.
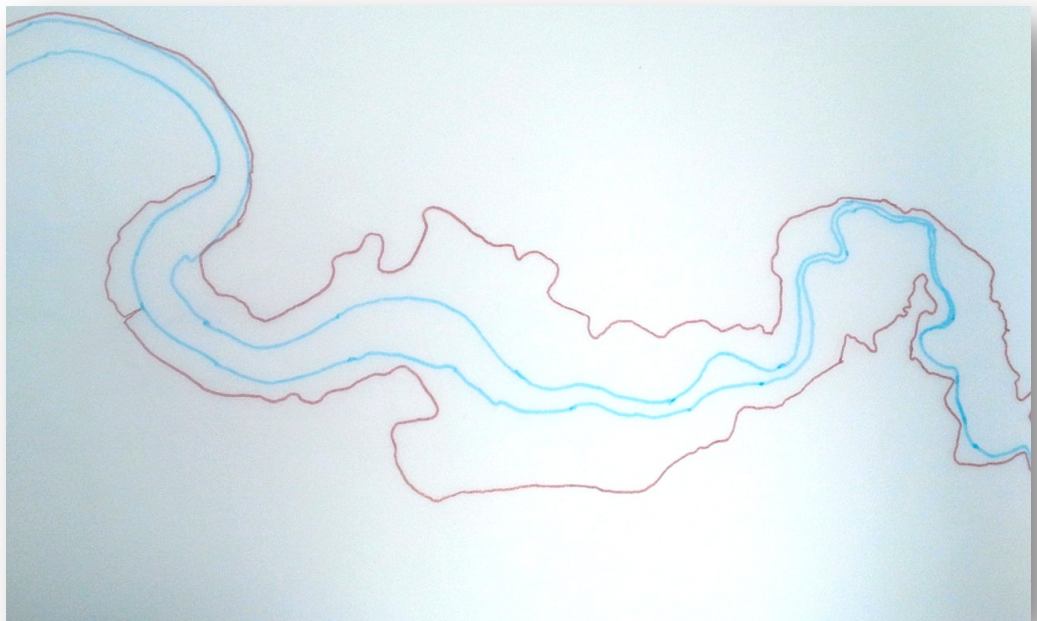
Fig. 36: the OS Map course was then traced and re-traced.

Fig. 37: the traces were then inked over in preparation for scanning. (See the feint pencil lines remaining - these were edited/airbrushed out in a later platform: Adobe Photoshop.)

Fig. 38: graphics were then manipulated and exported three times, creating four similar but slightly varying river/pitch lines.
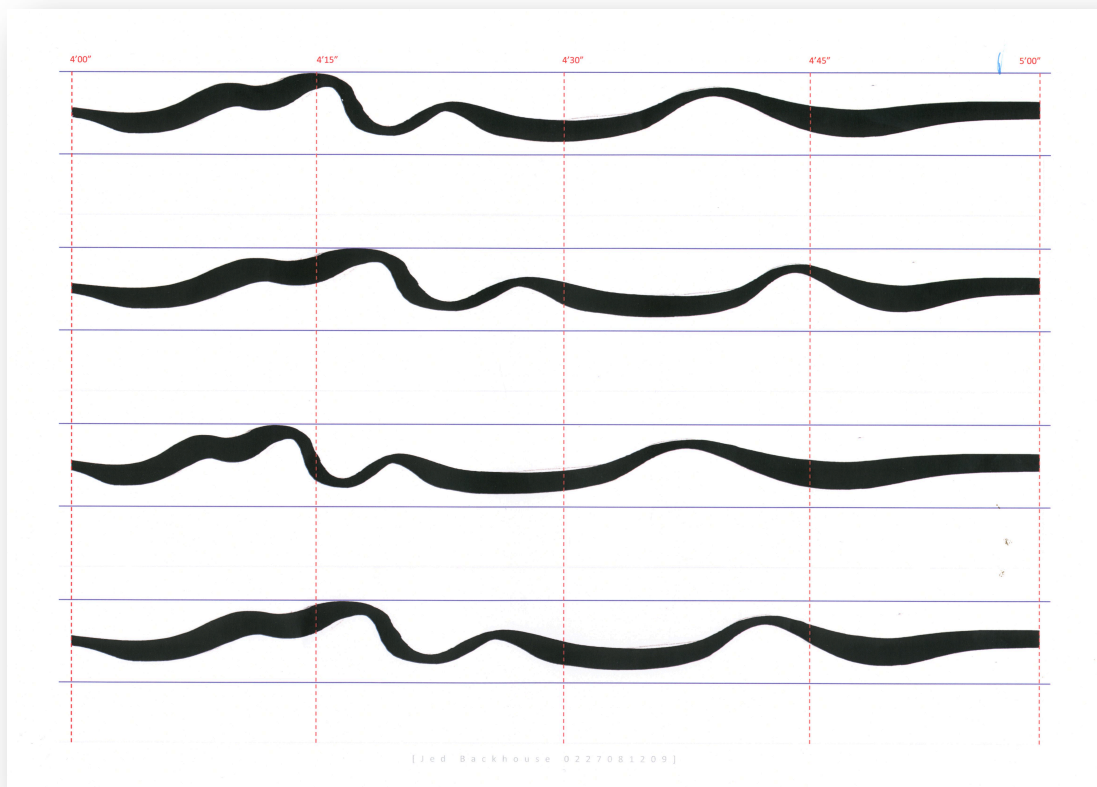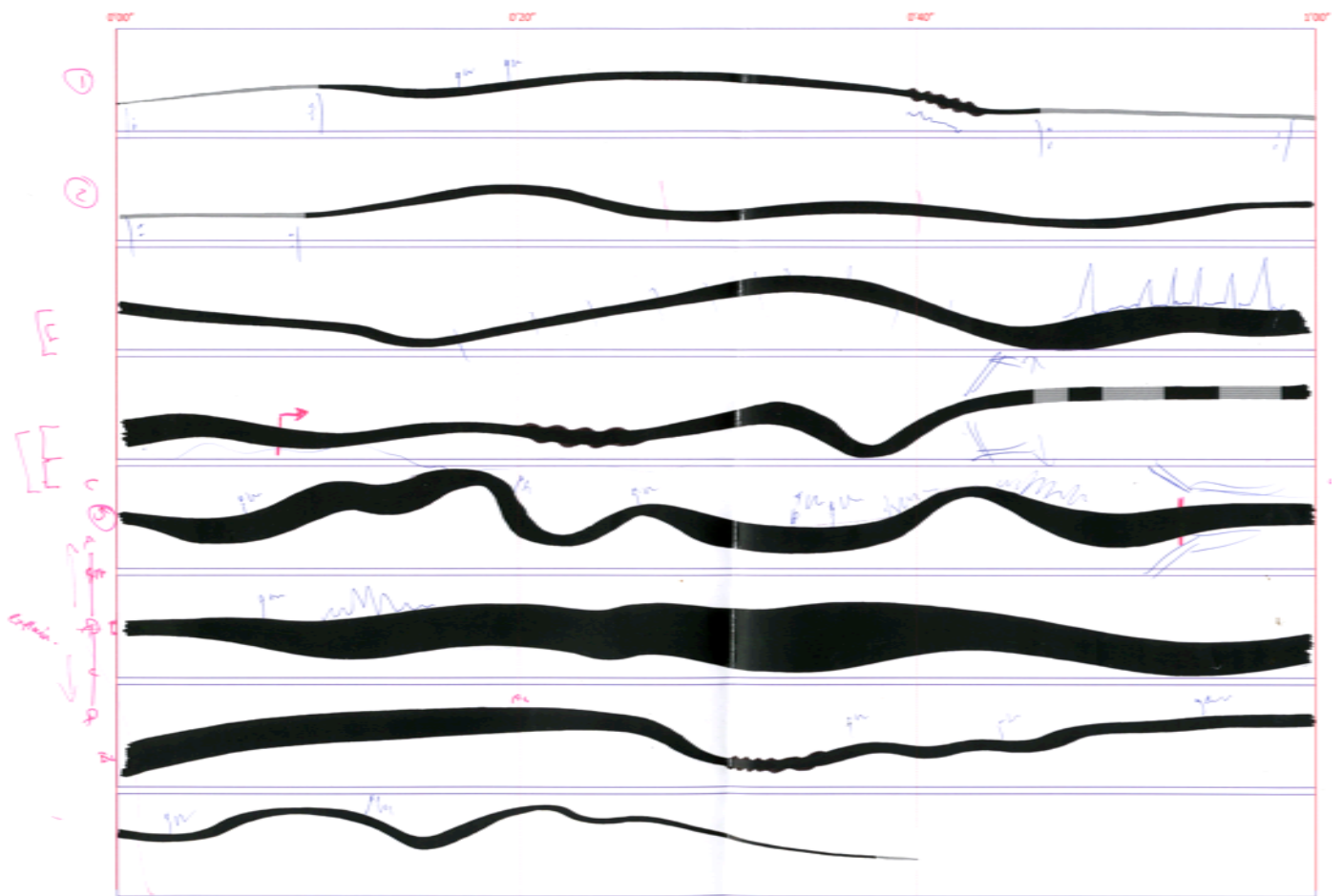
Fig. 39: technical instrumental annotations were mapped onto the graphic, whilst referring to the original OS Map for their position along the river.

Fig. 40: as well as reconciling designated geographical features with vocal techniques, the excerpts of the Britten text were also mapped along the river.
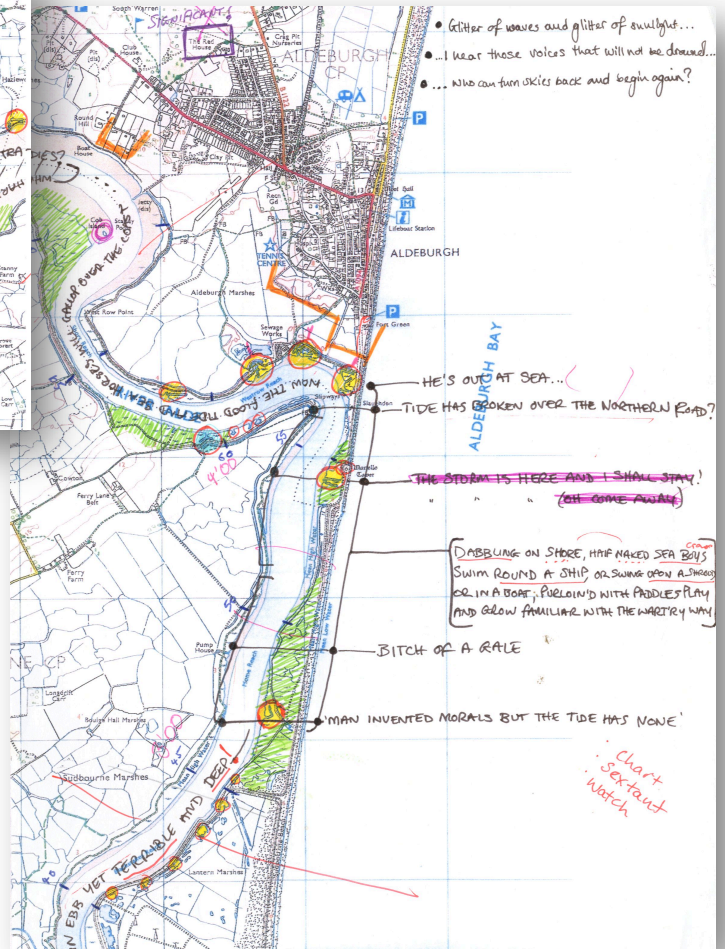
Fig. 41: manually, at first, then applied digitally to the pitch line. The decision to have the text follow the pitch contour was an aesthetically informative one, to convey the idea of a meandering verse.
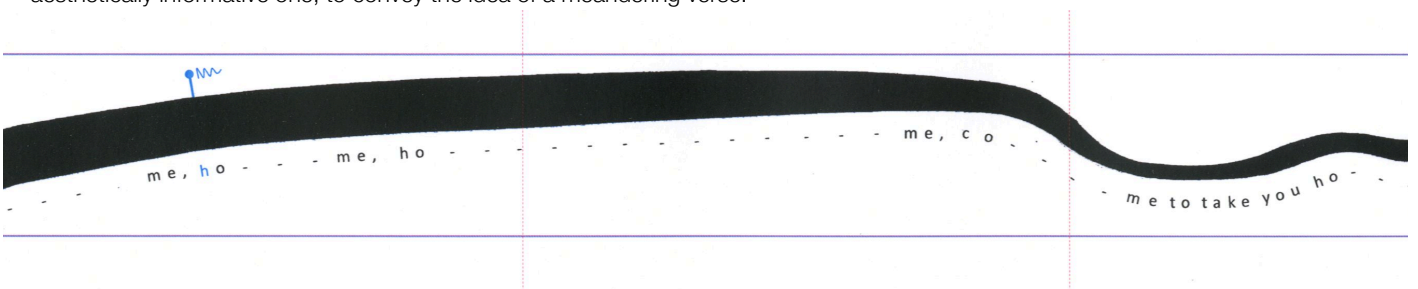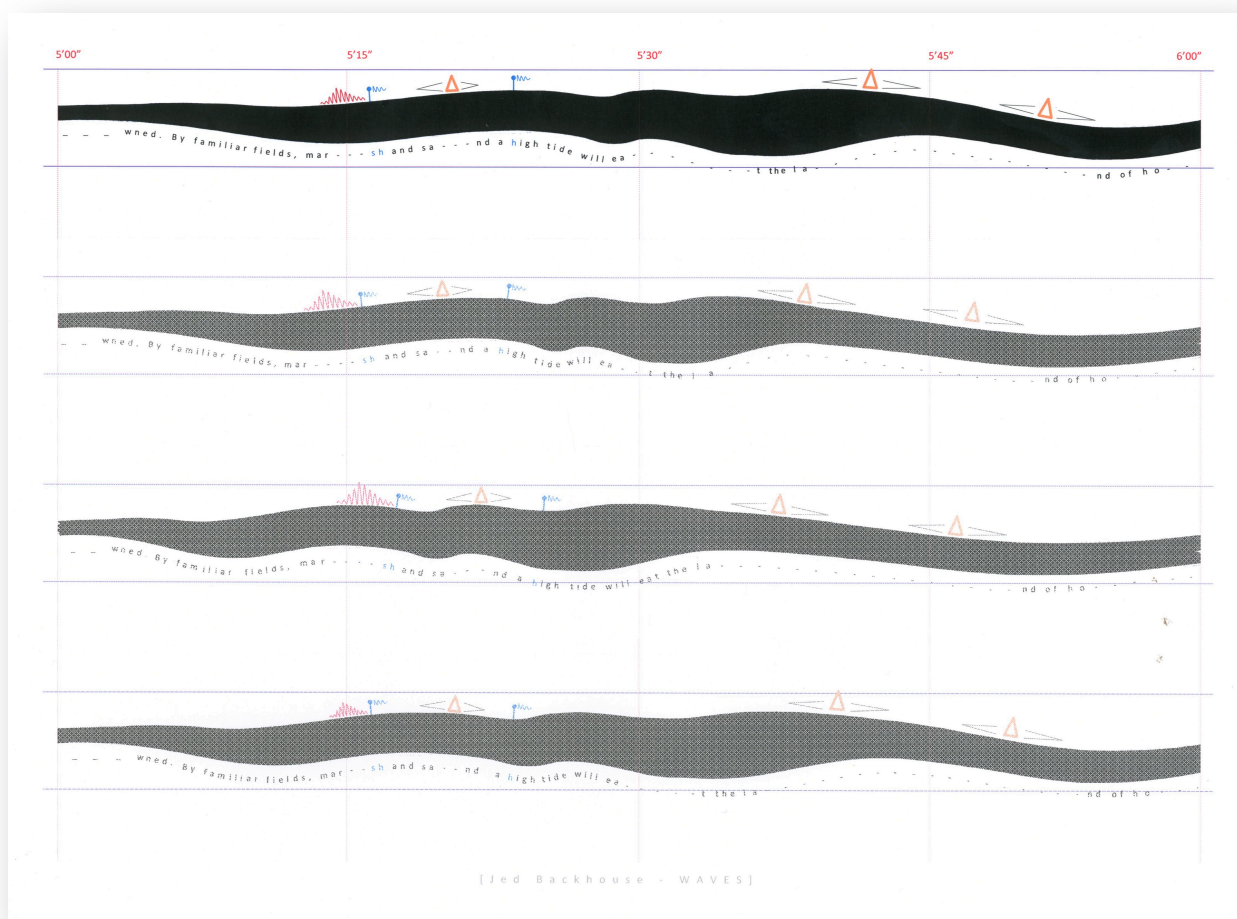
Fig. 42: the (four) separate vocal parts each contained the other scores, but covered with a semi-transparent sheet. This enabled the individual performers to remain in synchronisation of the other parts, and aware of their variations.
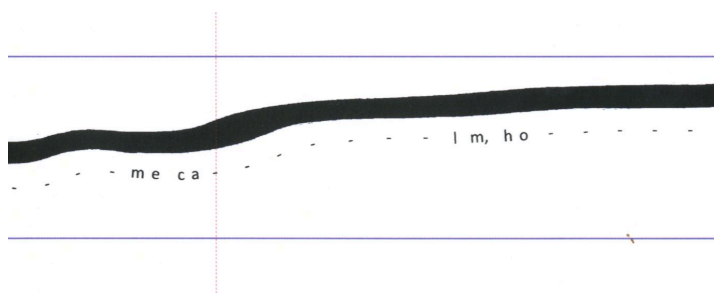
Fig. 43 (opposite): various geographical features or landmarks are represented
sonically, either by specific vocal techniques or by thematic musical ideas.

Fig. 45: the recognizable lighthouse at Orford Ness.

A62 (2010)

A video piece, for 16 ~~glissing~~/sliding instruments.

Fig. 46: a screenshot of the interactive interface of *In B flat .com*

Fig. 47-48: aerial views of the designated visual source material - images from Google Earth and Google Maps, respectively.
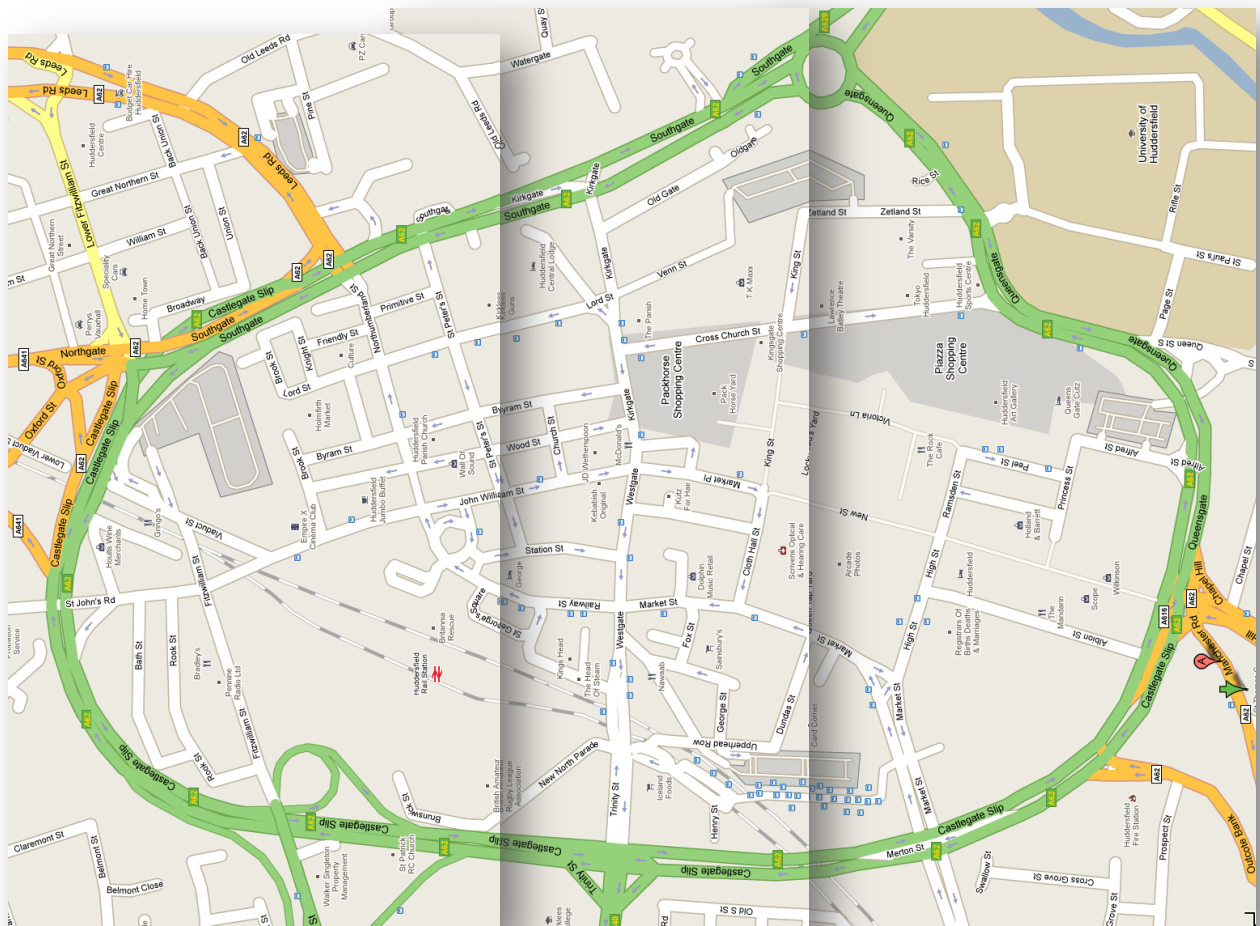
Fig. 49: the cropping of sections of graphic material and reassembling into a continuous line, whilst preserving significant elements of the original source.

Fig. 50: traced and inked versions of the four sections of the original graphic.

1) Manchester Rd. → Queensgate/Uni.

2) Queensgate/Uni. → Leeds Rd.
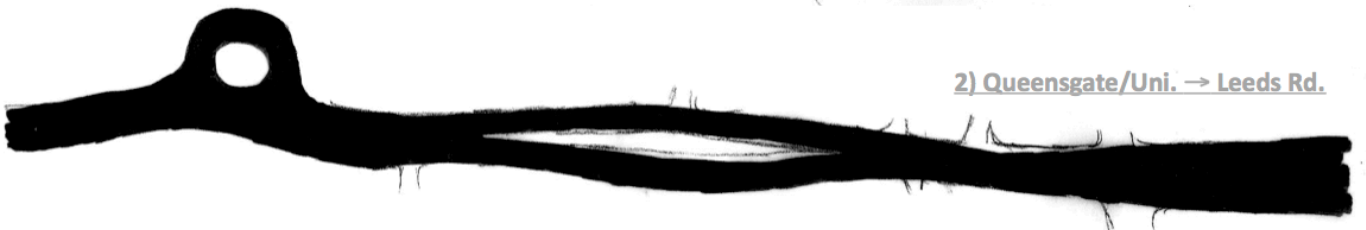
3) Leeds Rd. → Halifax Rd.

4) Halifax Rd. → Manchester Rd.

0'00" 0'10" 0'20" 0'30"

Breaking the 4-system piece into 12 sections, each worth 10" would also be easier so the performer can see/hear what's immediately ahead.

The basic gliss. passages have interesting contrasts, from minimal pitch change...

...to extreme slides over 5-10".

This time I've taken extra care to ensure the line finishes one (staff) at the exact height and width thats it begins on the next.

Multiphonics may venture above the designated pitch area.

0'30" 0'40" 0'50" 1'00"

A new idea: for the performer to follow THE GREY LINE as pitch, and use the thickness of the black surrounding area as varying dynamics...?

Multiphonics could be specified for each instrument (different in each score) - OR could be performer-chosen, with the instruction "higher pitched multiphonic" ?
- Whilst maintaining the original (lower-pitched) line.

Possibly remove this line, to have a single up + down multiphonic?

1'00" 1'10" 1'20" 1'30"

...sometimes between extremes in 5-10" diminuendi.

Constantly varying dynamics...

1'30" 1'40" 1'50" 2'00"

Gaps, or where the line splits in two, should be represented my that exact motion in sound... So, the single pitch line should become two pitch lines, one higher and one lower than previously (but both a lot softer in dynamic). Continue the progression of the two lines, then reconverge to a single pitch
- at a louder dynamic.

Fig. 51: after graphical refining and the addition of a 'pitch-center', duration markings were added and musical ideas were annotated.

66

CHI·CA·GO (2011)

For live voice and 8-channel surround sound electronics.

Fig. 52: initial visual ideas of finding lines and shapes within the city that could be represented musically.

Fig. 53: a selection of buildings from the city. These images are white-background exports from the 3D models downloaded from Google SketchUp Warehouse - available online at http://sketchup.google.com/3dwarehouse
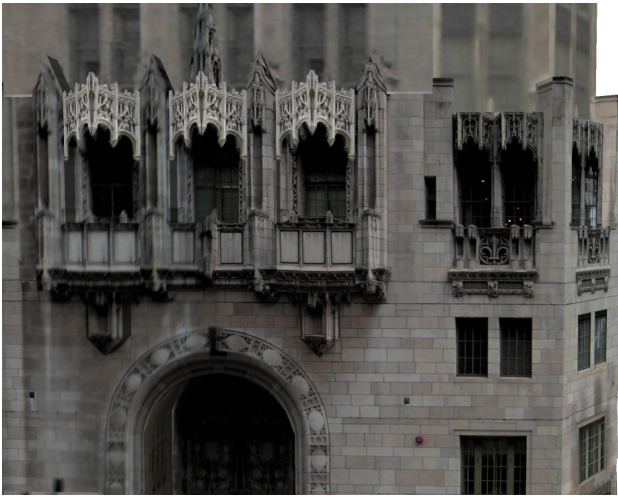
Fig. 54 (selection): analysing the architectural qualities of the 3D models in SketchUp was an initial procedure. This lead to the amalgamation of saved images which could then be graphically edited with musical or sonic representations in mind.
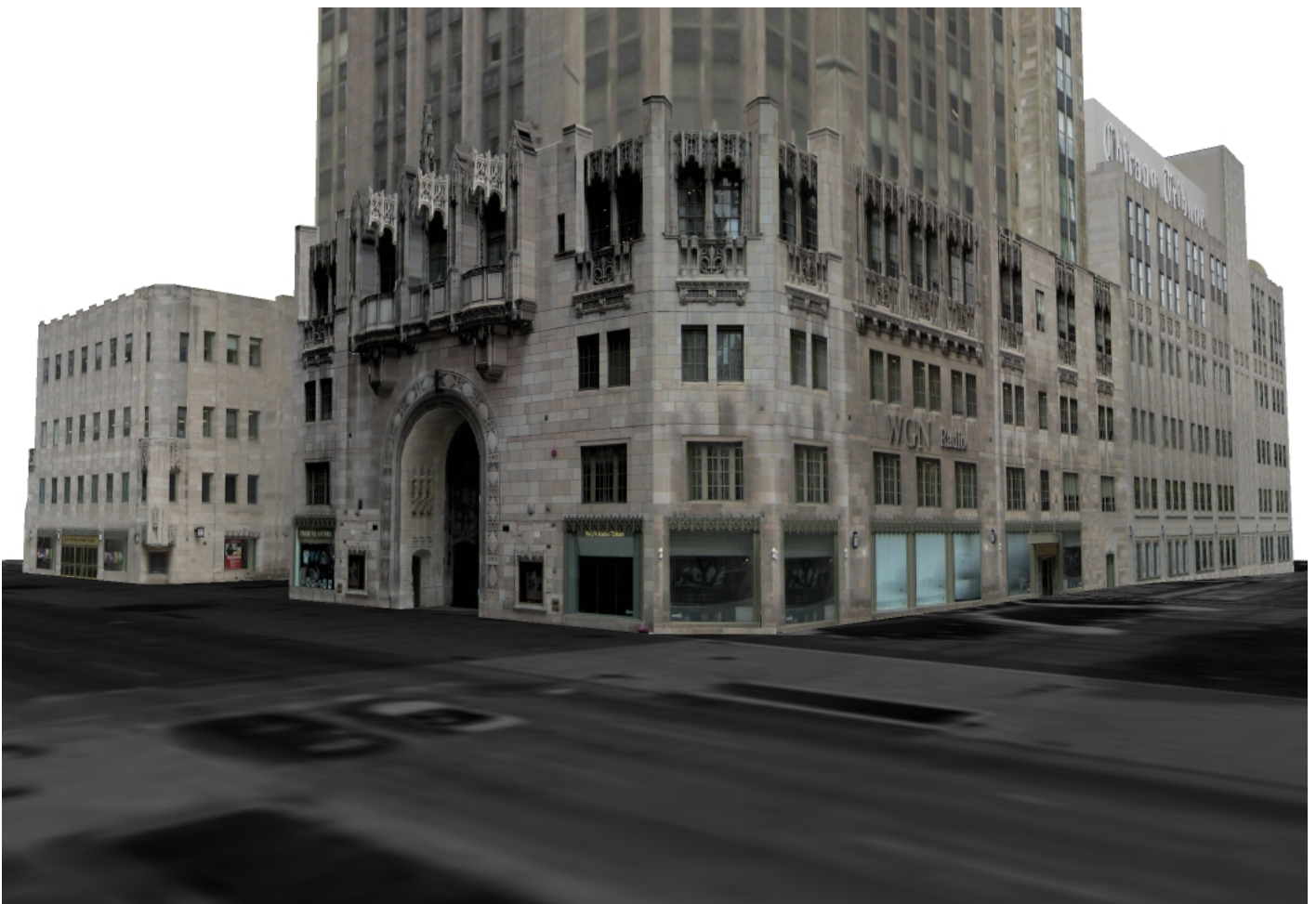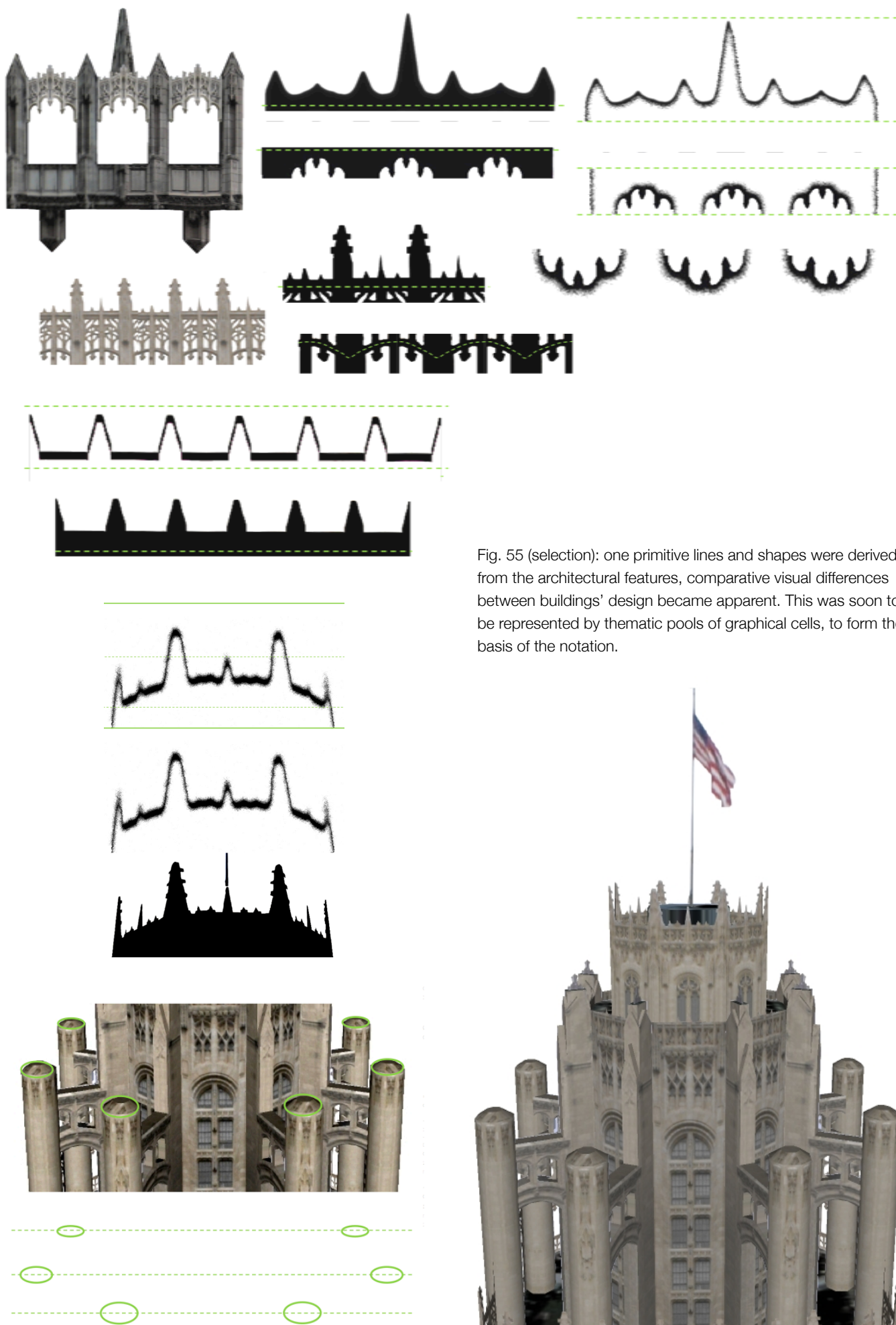
Fig. 55 (selection): one primitive lines and shapes were derived from the architectural features, comparative visual differences between buildings' design became apparent. This was soon to be represented by thematic pools of graphical cells, to form the basis of the notation.

Frank Gehry on the architecture of the pavilion:

http://www.youtube.com/watch?v=zZoR6SpmgSQ&feature=fvsr
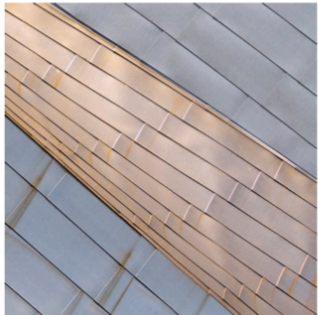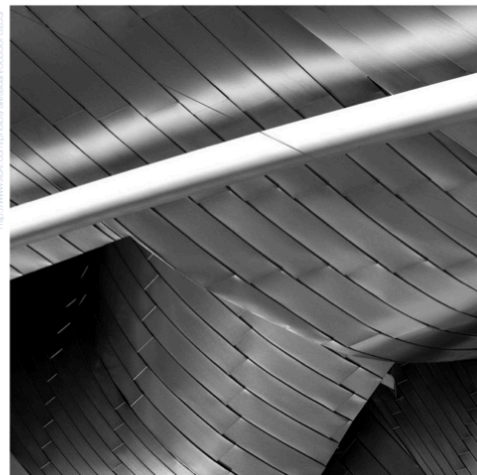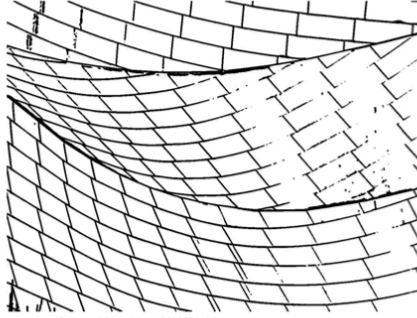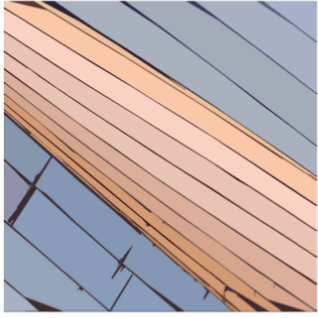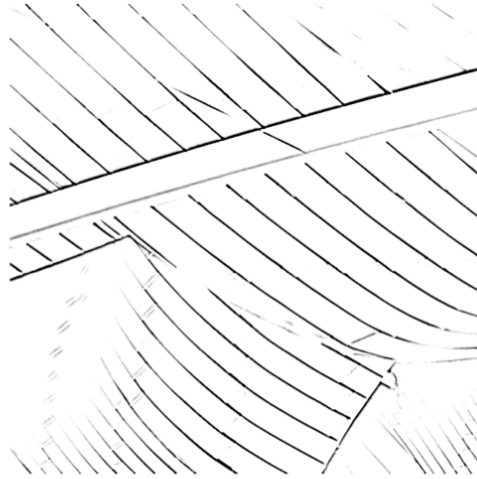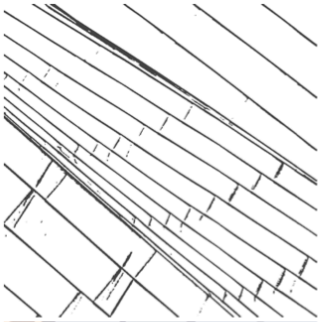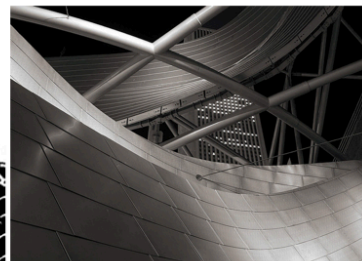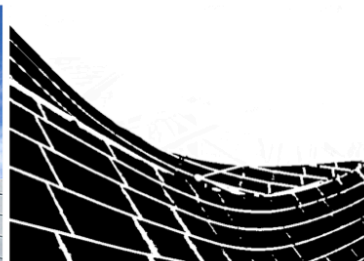
Exporting 2D graphics from SketchUp.
Microsoft Picture Manager to crop, make B&W
(set brightness/contrast to extremes). Microsoft
PPT and Adobe IS to overlay lines and trajectories,
and to make the originals transparent. Other frames:
Adobe PS Filter Gallery effects to bring out lines,
patterns and themes (Stamp, Photocopy, Graphic Pen,
Cutout, and various distortions and blurs). Microsoft PPT
to collate, align, compare/contrast the graphics with
manipulated edits.
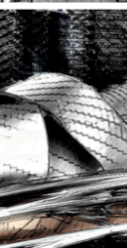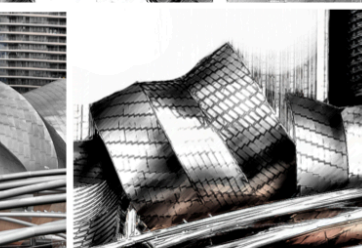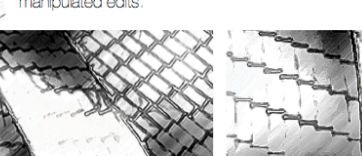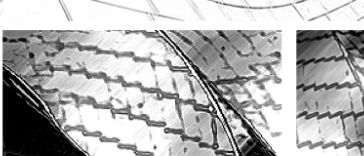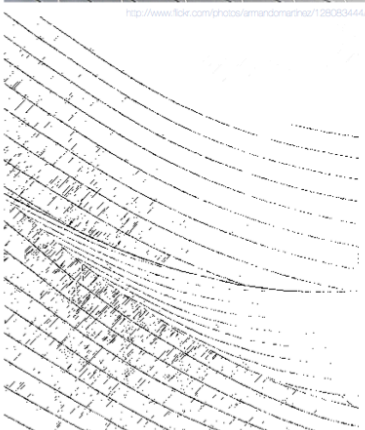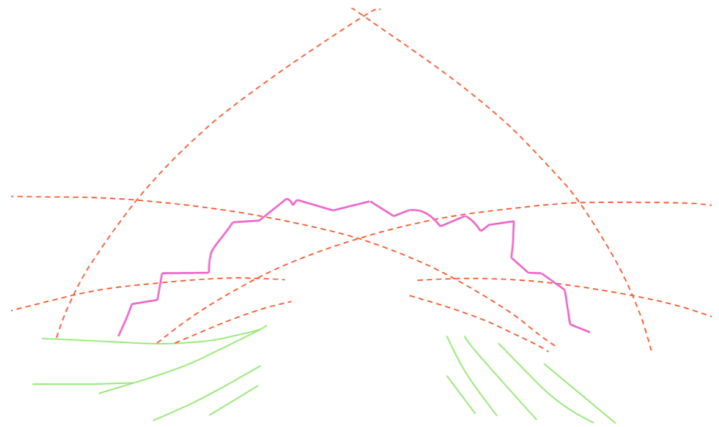
Fig. 56 (selection): procedural graphical analyses of the shapes and lines apparent in each structure were carried out for each of the eight buildings. Sources included the 3D models previously mentioned, as well as Flickr photography and architectural infographics. Figure 56 (across both sides) shows the graphical workings of building #2:' Pritzker Pavilion'.
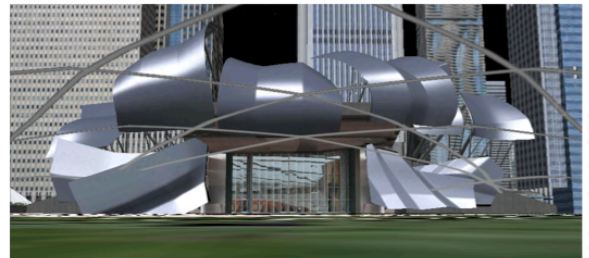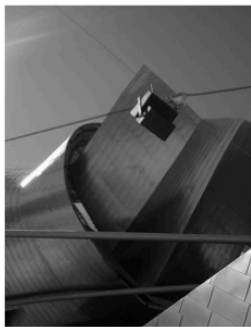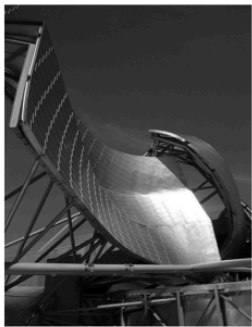
Pritzker Deconstructed, 2008
Artists: (art)n, Ellen Sandor, Chris Kemp, Thomas Meeker, Chris Day and Mike Seigel
Details: 40"x30" Digital PHSCologram, Duratrans, Kodalith, and Plexiglas
http://www.youtube.com/watch?v=YH-2OuInRCYc

http://www.flickr.com/photos/runningforasthma/

http://www.flickr.com/photos/swisscan/3833070255/in/set-72157600298074508/

http://www.flickr.com/photos/swisscan/3304272768/
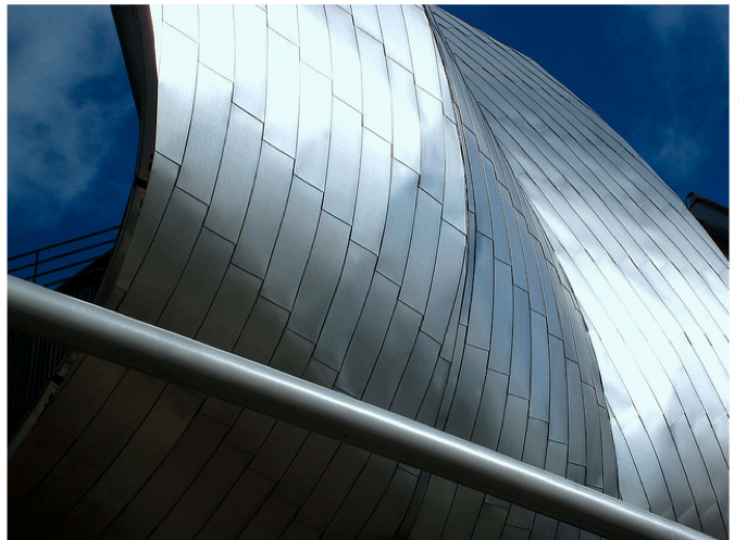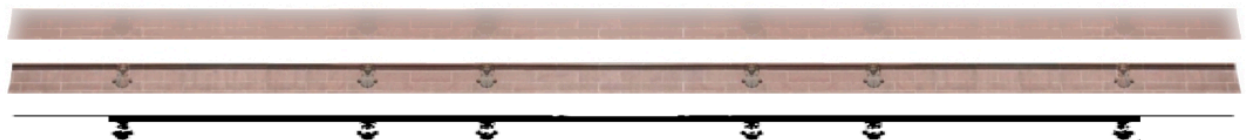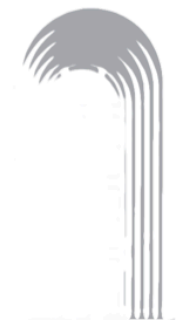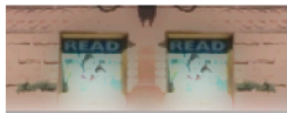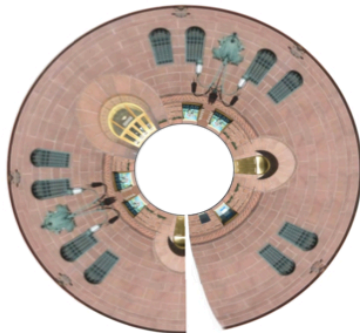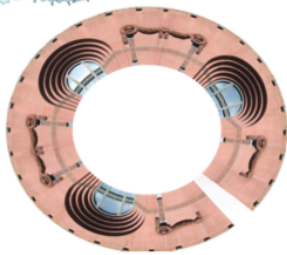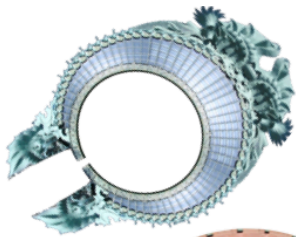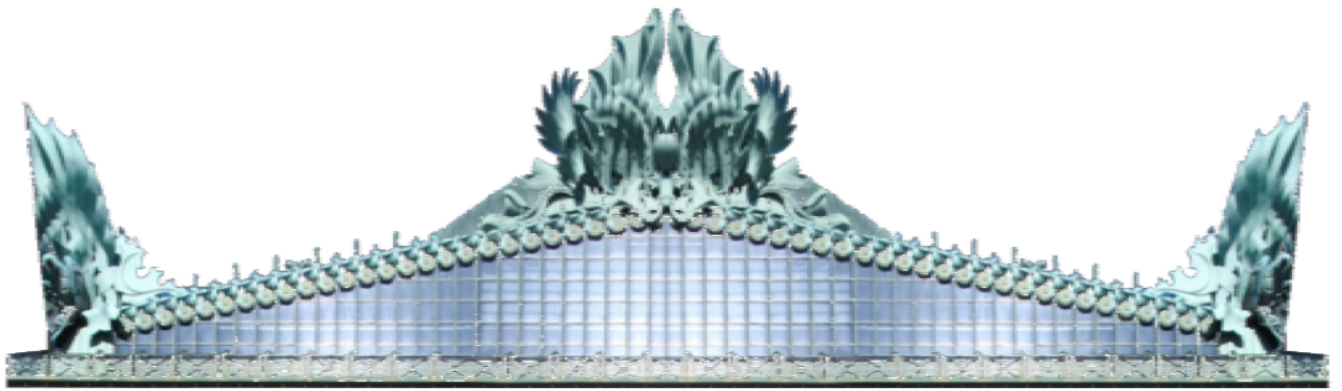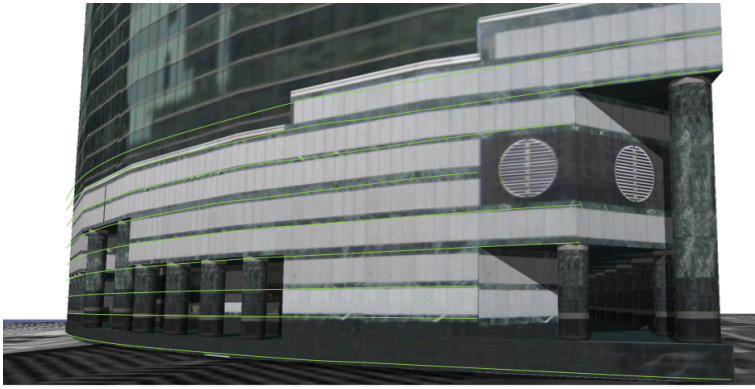
Fig. 57 (opposite): 'Chicago Public Library'
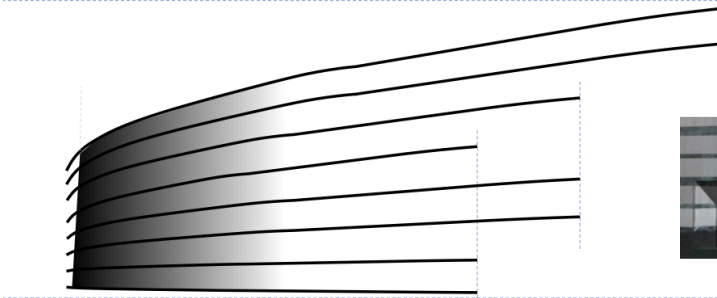
Fig. 58: '333 Wacker Drive'

Fig. 59: graphical themes became apparent when we came to applying sonic qualities to the visual images.

Fig. 60: the 'performance path' was mapped and rehearsed within the 8-channel studios. The electronic part was through-composed with this performance path and these durations in mind, to suggest the sonic concept discussed in the Thesis..
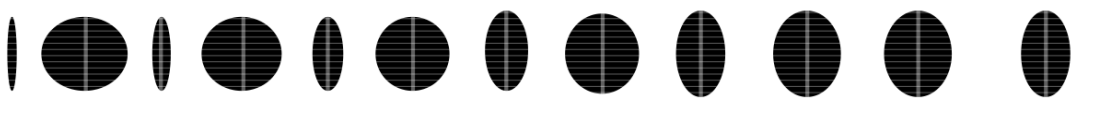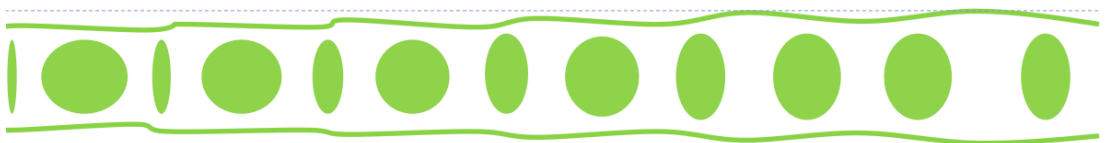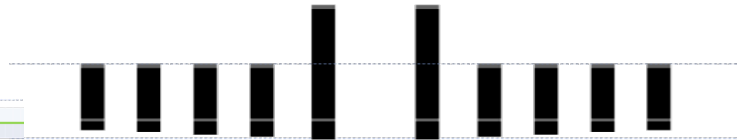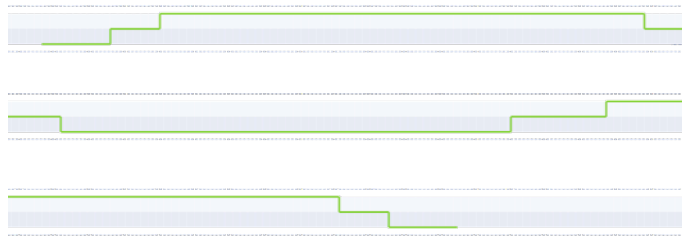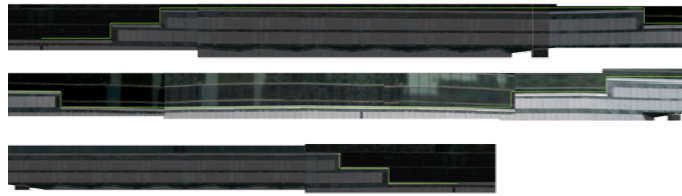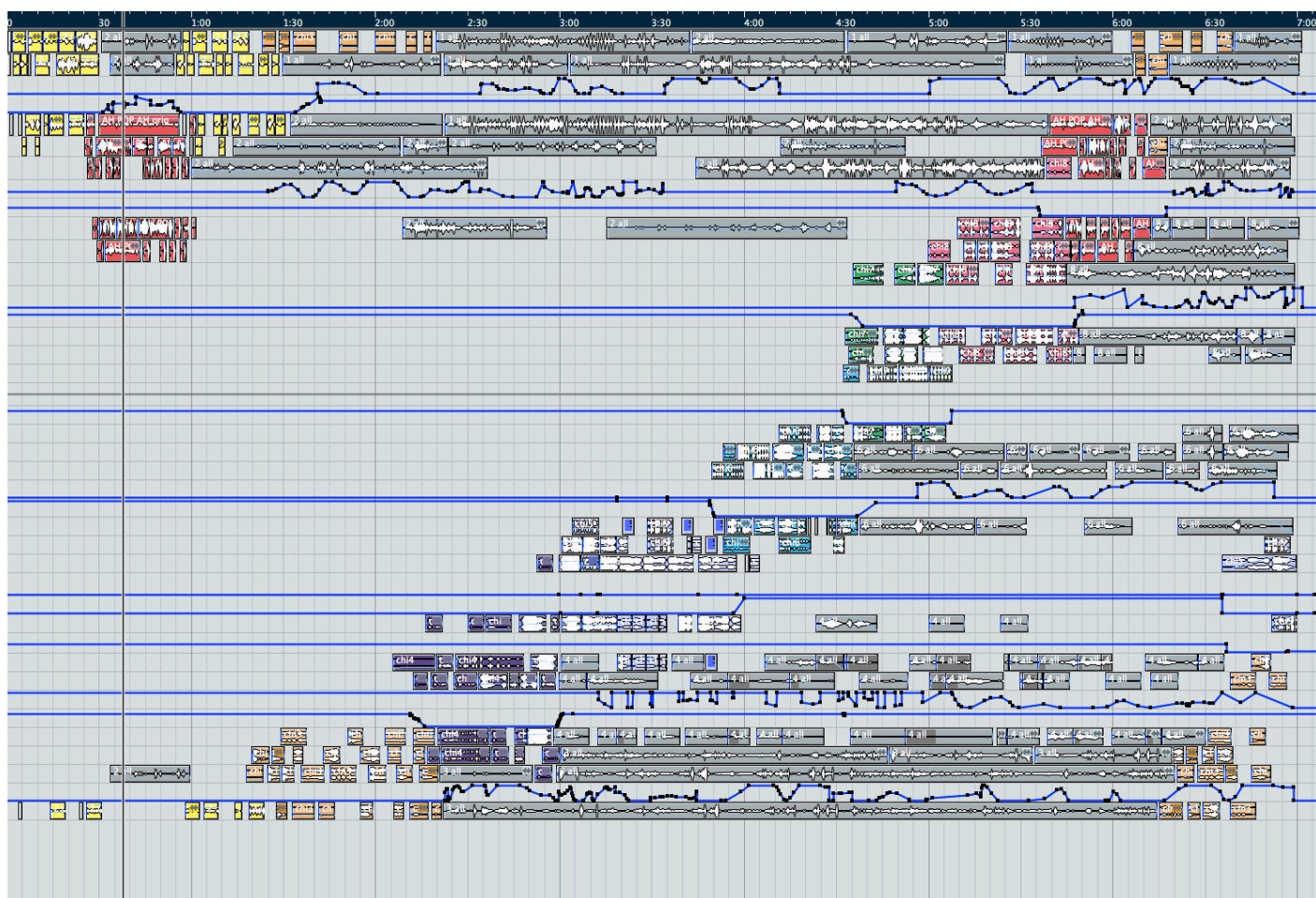
Fig. 61: a screenshot of the Nuendo project in which the electronic part was produced. This shows clearly the following of the live performance path around the 8-channel circle, and the manipulation of original recorded material. (The coloured events are from original recordings, the grey events are distorted or have applied sonic effects.)

CHI·CA·GO

ABOUT: JED BACKHOUSE
BORN IN IPSWICH, JUNE 1987
LIVED ON THE SUFFOLK COAST FOR EIGHTEEN YEARS
GRADUATED FROM UNIVERSITY OF HUDDERSFIELD IN 2009
STUDYING COMPOSITION: CREATIVE MUSIC TECHNOLOGY
CURRENTLY IN THE FINAL YEAR OF POSTGRADUATE STUDY
STUDYING COMPOSITION: NOTATION & GRAPHIC DESIGN
WORKS AS A BAR/RESTAURANT PIANIST
ENJOYS COFFEE, STATIONERY SHOPS, GOOGLE EARTH,
BLOGGING, SWIMMING AND OWL CITY
AS WELL AS THE LABORIOUS MUSICAL AND GRAPHICAL
PROCESSES DURING WHICH HIS WORK TAKES SHAPE.
DOESN'T ALWAYS WRITE IN LISTS

EIGHT BUILDINGS
TAKEN FROM ONE CITY
DISSECTED IN 3D SKETCHING SOFTWARE
DISCUSSED IN COFFEE SHOPS
PROCESSED IN GRAPHICS EDITORS
COLLAGED IN LAYOUT AND DESIGN PROGRAMMES
PRINTED IN THE EARLY HOURS OF THE MORNING
REHEARSED IN PRACTICE ROOMS
RECORDED IN HOME MUSIC ROOMS
DISTORTED AND FILTERED IN AUDIO SEQUENCERS
SONICALLY ANIMATED IN SURROUND SOUND STUDIOS
PRESENTED IN BLOGGING RUSH-HOUR
CONTEMPLATED IN THE SHOWER
ASSEMBLED AND PRACTISED IN REAL-TIME
FINISHED IN EARLY FEBRUARY
TO BE PERFORMED IN GEM DAYS 2011

Fig. 62: program notes and a brief composer-bio for the February 2011 performance (featured on the audio CD).
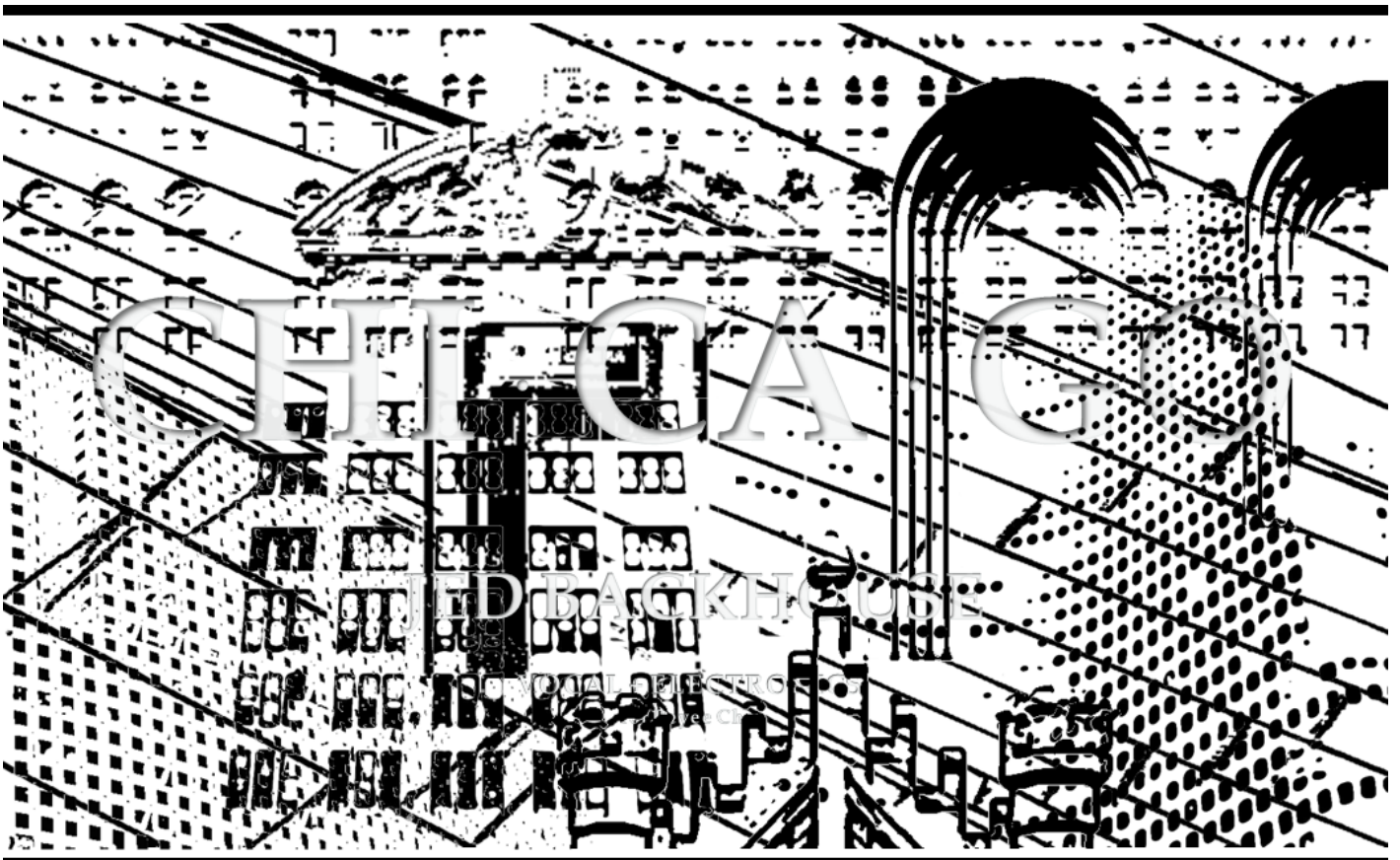
Fig. 63 (and 64-65 opposite): various solely graphical works to stem from the project.
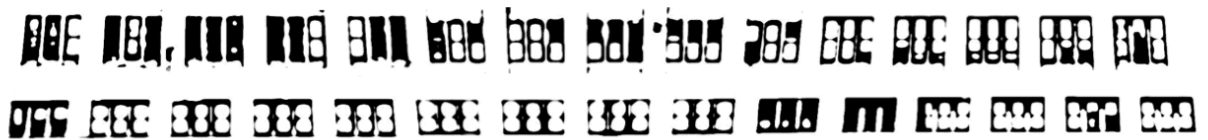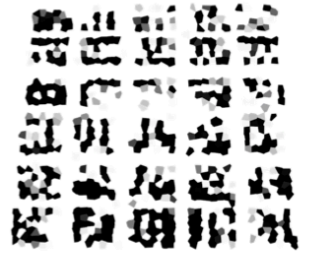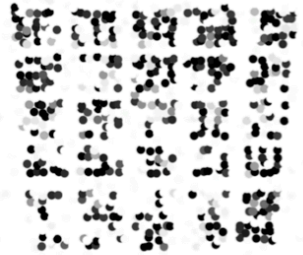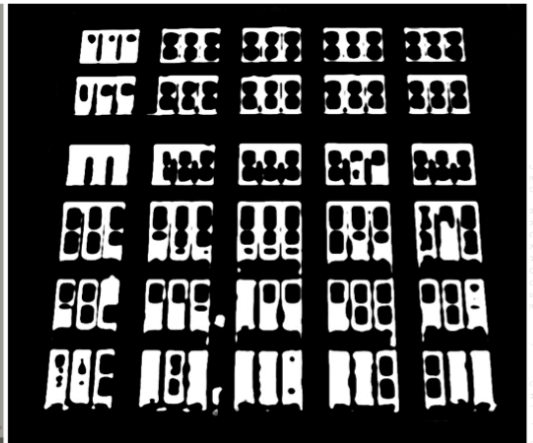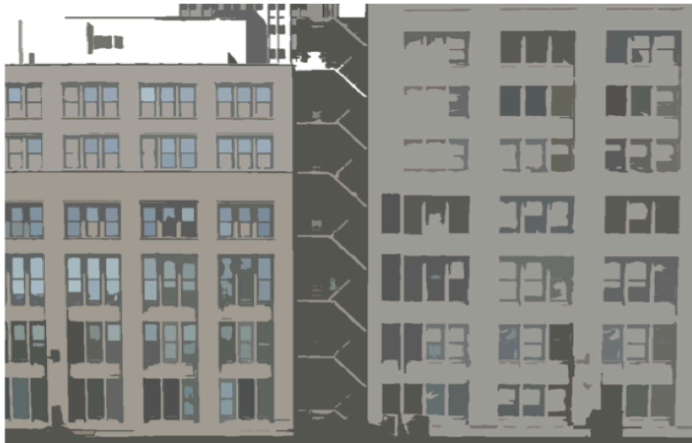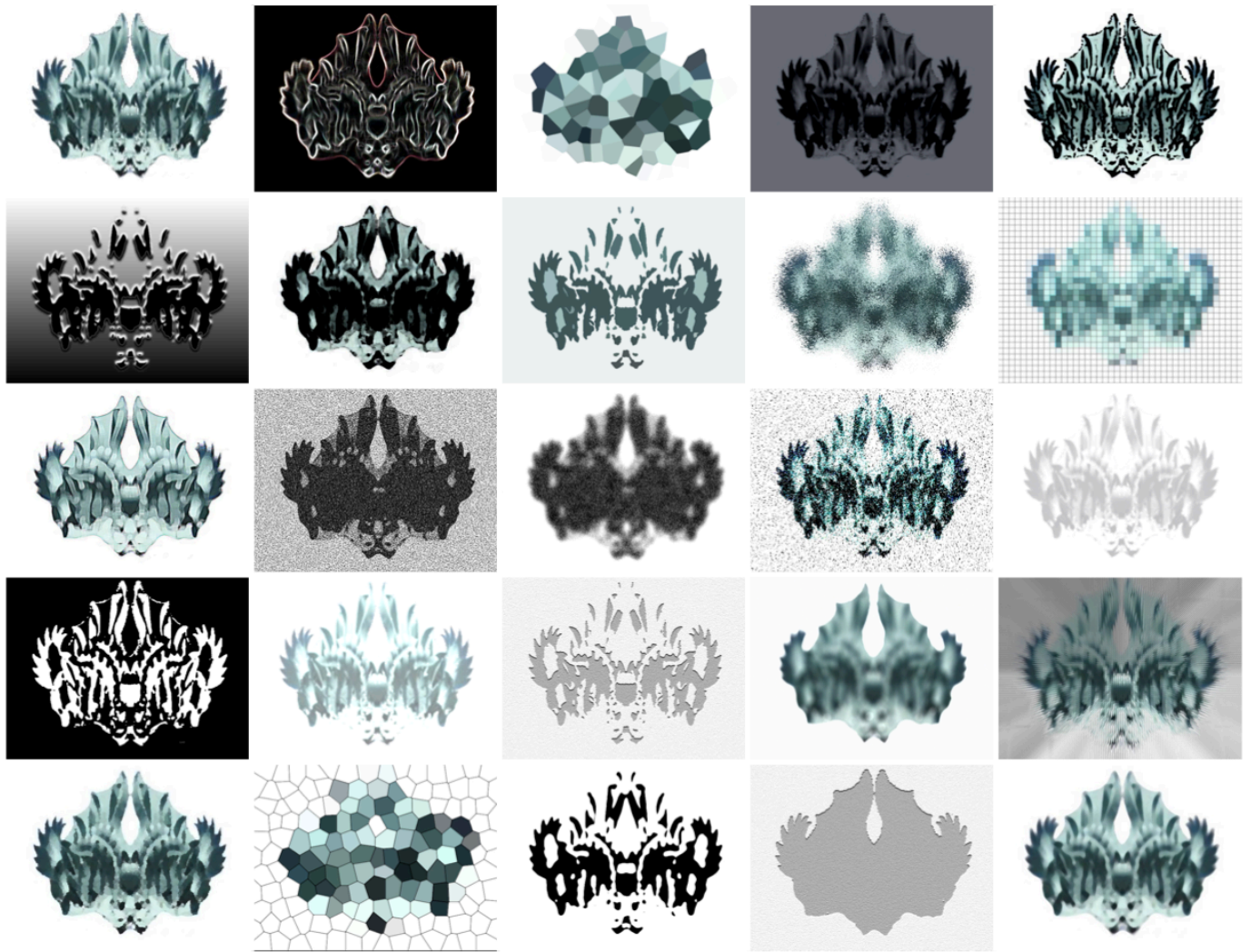
SEATTLE (2011)

For viola d'amore and 4-channel surround-sound live electronics.
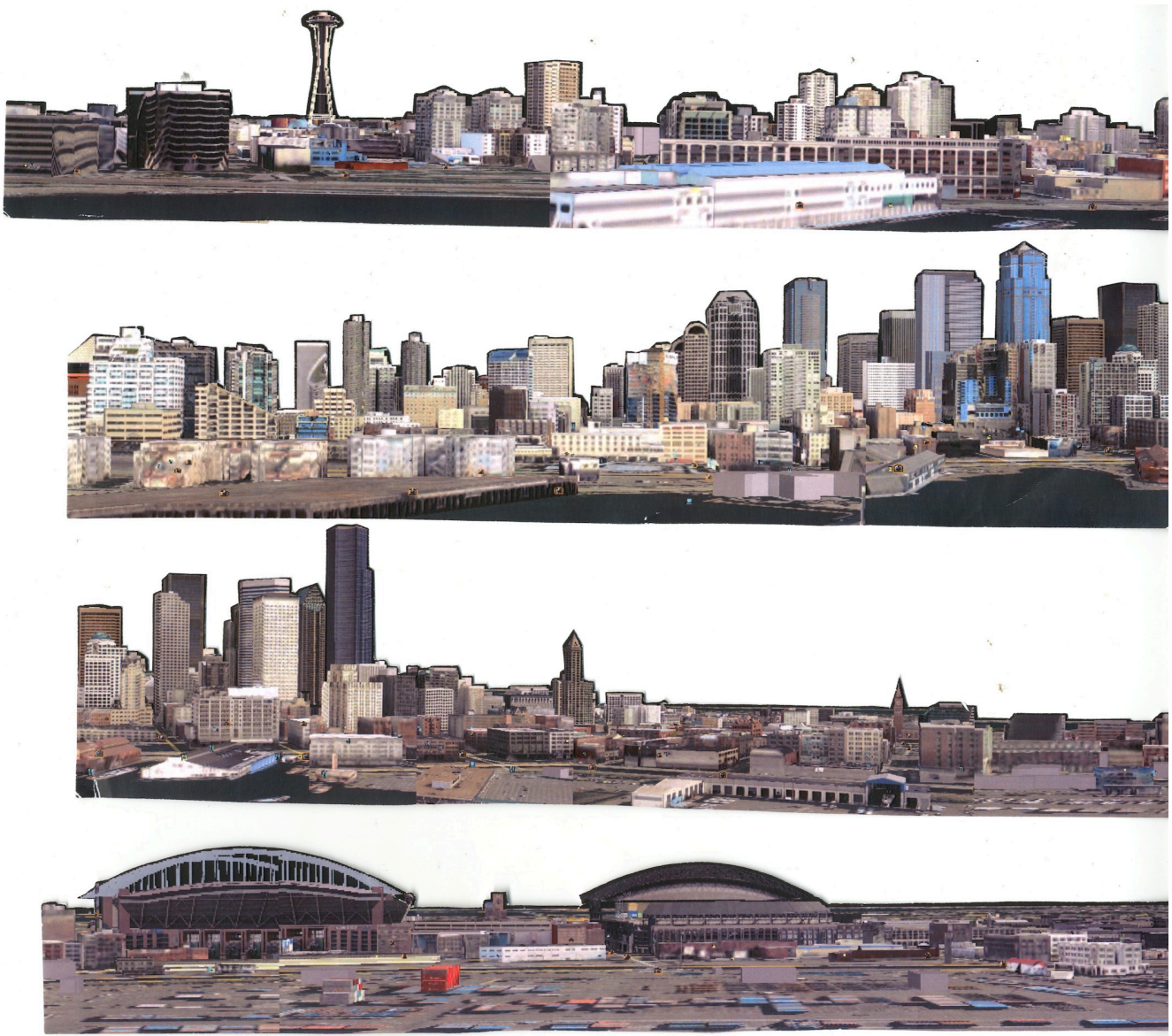
Fig. 66: large print-outs of the city skyline were cut out and graphically traced in an effort to recreate the horizon contour with basic geometrical shapes.

Fig. 67-68: various differing traces were minimized to a series of geometric shapes.
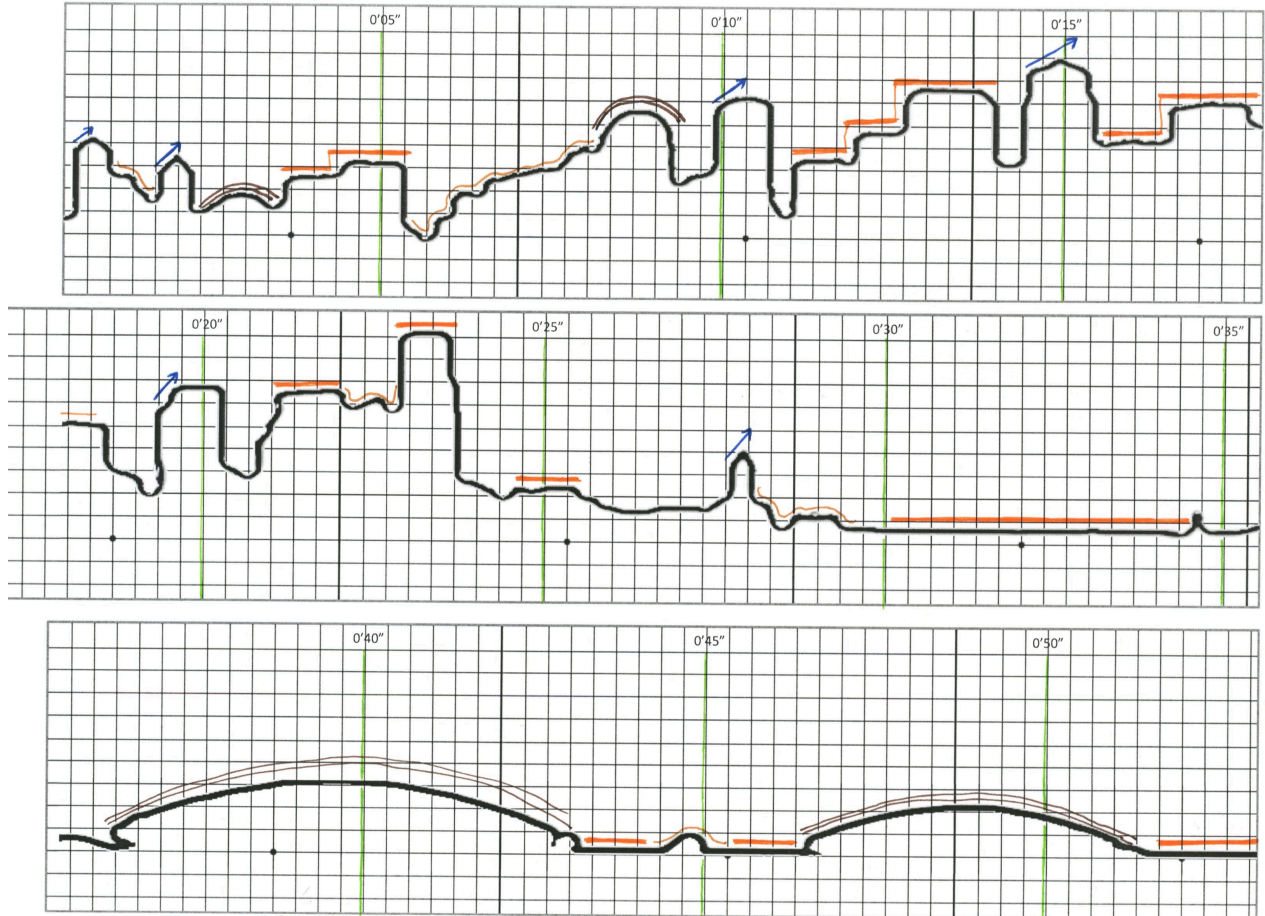

Fig. 69: the complete city skyline including 3D rendered models (built in SketchUp), as viewed from a half-lateral angle in the Google Earth software. Various lateral angle views were used as the basis of graphical material.
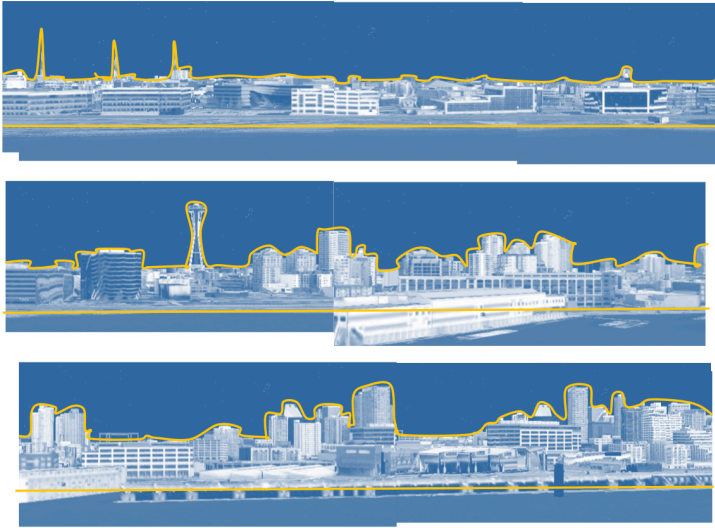
Fig. 70 (selection): an initial attempt to derive a smooth contour from the skyline, before the decision was made to work with geometrical shapes.
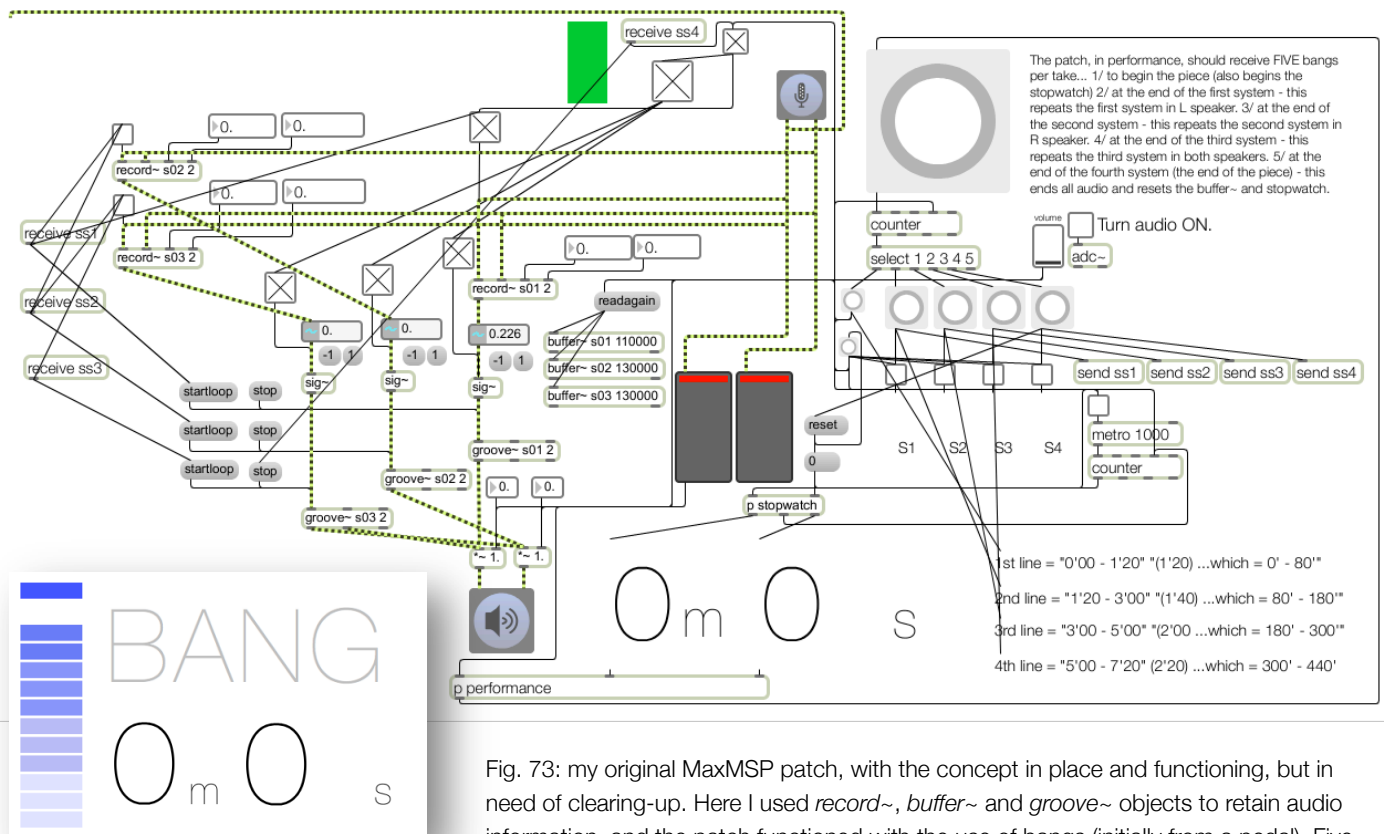
CURVE   PEAK   ARC   LINE
/APEX

Fig. 71: the four primitive geometric lines that are used to recreate the skyline contour. These each have unique performative qualities and gestures, outlined in the performance notes of the score.

Fig. 72: once the lines and shapes were in place, issues were then raised about how to best convey extra-musical information graphically. Small but significant details such as continuity in line thickness, or placement of articulations above/through the pitch lines, were among the features edited with aesthetic graphic design principles and fundamental musical notation standards in mind.

The patch, in performance, should receive FIVE bangs per take... 1/ to begin the piece (also begins the stopwatch) 2/ at the end of the first system - this repeats the first system in L speaker. 3/ at the end of the second system - this repeats the second system in R speaker. 4/ at the end of the third system - this repeats the third system in both speakers. 5/ at the end of the fourth system (the end of the piece) - this ends all audio and resets the buffer~ and stopwatch.

counter
select 1 2 3 4 5

Turn audio ON.
volume
adc~

record~ s02 2

receive ss1

record~ s03 2

receive ss2

receive ss3

startloop stop
startloop stop
startloop stop

record~ s01 2

readagain

buffer~ s01 110000
buffer~ s02 130000
buffer~ s03 130000

0. 0.
-1 1   -1 1   -1 1
sig~   sig~   sig~

groove~ s01 2
groove~ s02 2
groove~ s03 2

0. 0.

*~ 1. *~ 1.

reset
0

S1   S2   S3   S4

send ss1 send ss2 send ss3 send ss4

metro 1000

counter

p stopwatch

O m O   S

1st line = "0'00 - 1'20" "(1'20) ...which = 0' - 80'"

2nd line = "1'20 - 3'00" "(1'40) ...which = 80' - 180'"

3rd line = "3'00 - 5'00" "(2'00 ...which = 180' - 300'"

4th line = "5'00 - 7'20" (2'20) ...which = 300' - 440'

p performance

BANG
O m O   s

Fig. 73: my original MaxMSP patch, with the concept in place and functioning, but in need of clearing-up. Here I used *record~*, *buffer~* and *groove~* objects to retain audio information, and the patch functioned with the use of bangs (initially from a pedal). Five bangs, as outlined above, one to begin, and four for the end of each system in the score.

adc~ 1 2   r 1rec_start   r 1env   r 2rec_start   r 3rec_start   r 3env
                            r 2env
                            adsr~ 100. 0. 1. 400   adsr~ 100. 0. 1. 400   adsr~ 100. 0. 1. 400

record~ sec1 2   buffer~ sec1 80000   record~ sec2 2   buffer~ sec2 100000   record~ sec3 2   buffer~ sec3 120000

0.   0.

r 1play   r 2play   r 3play
line~   line~   line~
play~ sec1 2   play~ sec2 2   play~ sec3 2

r 1play_pan   r 2play_pan
loadmess 0.25   r 3play_pan

r master_gain
loadmess 127   cw.stereo~   cw.stereo~   cw.stereo~   cw.stereo~

dac~ 1 2

Steuerung

DSP
On/Off

Clock
Start/Stop

event selection
0

coll

p control
p midipitch
p ring_calc

Fig. 74: the eventual MaxMSP patch, edited by the performer. Here a similar *record~* and *play~* (instead of *groove~*) sequence is used for each system in the score, but with a few added patchers – as well as *loadmess* presets for performance, and *adsr~* envelope functions for smooth transitions between *buffer~* playbacks.

A SERIES OF TWENTY-SIX TYPOGRAPHIC FIGURES (2011)

For viola d'amore and 4-channel surround-sound live electronics.

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
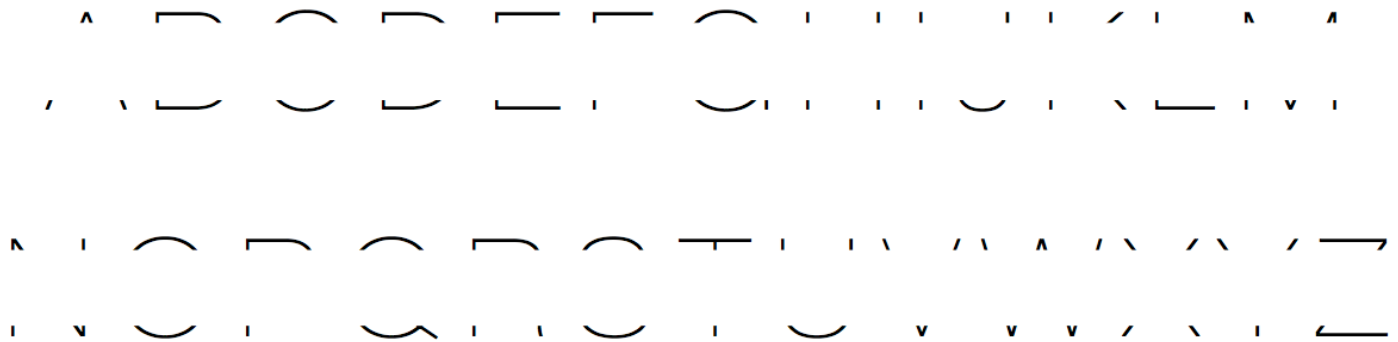
Fig. 75: the Helvetica Neue UltraLight typeface was the ideal sans-serif font to analyse for geometric shapes and lines.
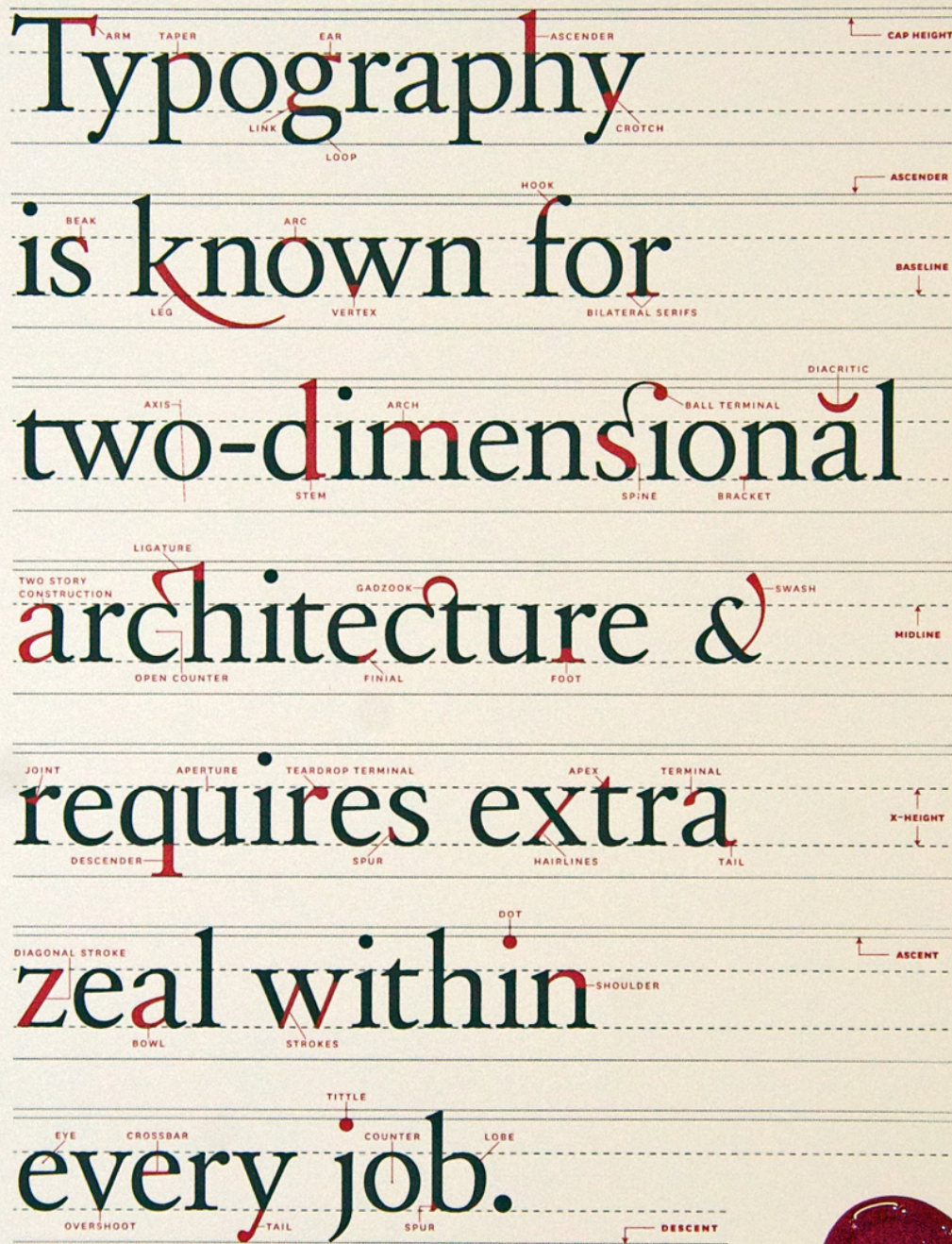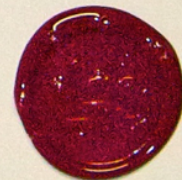
Fig. 76: 'A Typographic Anatomy Lesson' by Ligature, Loop and Stem (2010). Article with previews available online at http://fontfeed.com/archives/a-typographic-anatomy-lesson. Author's website online at http://www.ligatureloopandstem.com.

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z

Fig. 78: the series of twenty-six characters, when reduced to the cap-ascender
contact points/line, formed one of the six following geometrical primitives:

Point (1)	Points (2)		Points (3)	Line	Arc		Curve
A	H	K	W	E	C	G	B
I	M	N		F	O	Q	D
J	U	V		T		S	P
L	X	Y		Z			R
4 +	8		+ 1	+ 4	+ 5		+ 4

= 26

	Bilabial	Labio-dental	Dental	Alveolar	Post-alveolar	Palatal	Velar	Glottal
Nasal	m			n			ŋ	
Plosive	p b			t d			k **g**	
Affricate					tʃ dʒ			
Fricative		f v	θ ð	s z	ʃ ʒ		(x)	h
Approximant					ɹ	j	w	
Lateral				l				

Fig. 79 (selection): background research into phonetics of the characters being used. Each character's phonetic qualities (sonic and/or gestural) were represented by allocated instrumental techniques on the violin, as suggested below.

M, N - nasal, no mouth airflow, but sound still resonates behind the tongue/lips.

P, B, T, D, K, G, C - stopped consonants, no airflow at all. Although only air acts to form plosives.

F, V, S, Z, H - fricatives force the airflow through a very controlled space, shaping the sound precisely.

J, W, Y, Q, R - between fricatives and vowels, not as precisely forced airflow, more loosely controlled.

L - lateral airflow; air from the lungs escapes at one side or both sides of the tongue.
Smooth sound - *sul tasto*?

X ?

A — Arco. [clear] *(ord.)*

B — Pizz. [w/ finger] *(ord.)*

C — Pizz. [w/ finger] *(ord.)*

D — Pizz. [w/ finger] *(ord.)*

E — Arco. [clear] *(almost on~ bridge)*

F — Pizz. [w/ finger] *(ord.)*

G — Gete. [clear] *(ord.)*

H — Arco. [clear] *(ord.)*

I — Arco. [clear] *(towards~ bridge)*

J — Arco. [clear] *(ord.)*

K — Arco. [clear] *(ord.)*

L — Arco. [clear] *(ord.)*

M — Arco. [clear] *(ord.)*

N — Arco. [clear] *(ord.)*

O — Arco. [clear] *(on~ fingerboard.)*

P — Arco. [clear] *(ord.)*

Q — Arco. [clear] *(ord.)*

R — Arco. [clear] *(ord.)*

S — Arco. [clear] *(ord.)*

T — Arco. [clear] *(ord.)*

U — Arco. [clear] *(towards~ fingerboard.)*

V — Arco. [clear] *(ord.)*

W — Arco. [clear] *(ord.)*

X — Arco. [clear] *(ord.)*

Y — Arco. [clear] *(ord.)*

Z — Arco. [clear] *(ord.)*

Gmail by Google

Jed Backhouse <jedbackhouse@gmail.com>

topo

Johnny Chang <johnny.echo@gmail.com>   15 March 2011 09:50
To: Jed Backhouse <jedbackhouse@gmail.com>

Hi Jed,
Thank you for getting in touch. I have the score !

Some quick response.

It was clear after a while that the score you sent represents two possibilities of communicating your ideas to me. First through text explanations and the second graphic representations of the same ideas. To take on the analogy you provided of learning a new alphabet, each grouping of left/right hand motions can be said to form syllables and eventually words (I suppose). In fact I found that this was very helpful to me in terms of coming to grips with the actions/sounds you had in mind for the piece.

* One point to note before I share my learning experience. With the exception of "bowing *vertically/diagonally*" and possibly pizzicato using *nails/finger pad*, all other symbols are fairly standard notations, so I think you were covered in the first place.

I found that after a few rounds of "alphabet training" , I did not need the text version any longer. And in fact after further training, even the customary stave notation was almost not exactly necessary, since the pitch material revolved around the same D-B-D region. However this would not have been possible, in a way, if one did not start with full explanations of the symbols.

In closing, I have one question about your pizzicato instructions. Of the 5 pizz fragments , the final one is really only a "scrape" along the string, even though technically you treat it as "plucked". Do I understand this correctly?

That's all for now, hope this was helpful in some way.

Looking forward to meeting you next month.
Best,
Johnny

Fig. 80: in email correspondence with the performer, the two slightly different styles of notating the instrumental techniques were discussed. The score included is the version which was used for the performance also included; this version includes both types of notation (as they were both used by the performer in practicing).

REEF (2010)

A SERIES OF THIRTEEN UNDERGROUND LINES (2011)

Line: constant pitch

Line above

Line below

Circle above

Circle below

Circle through
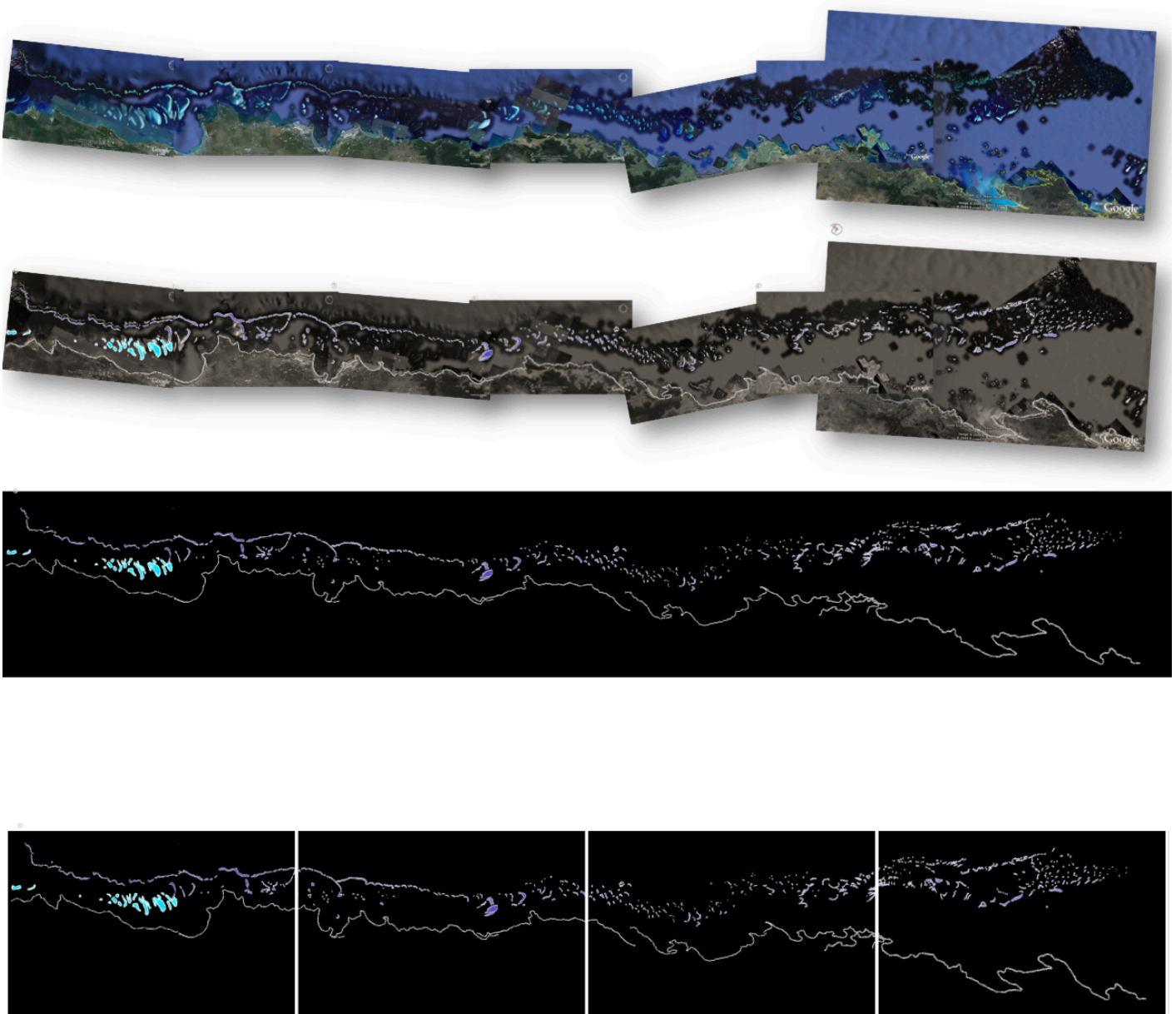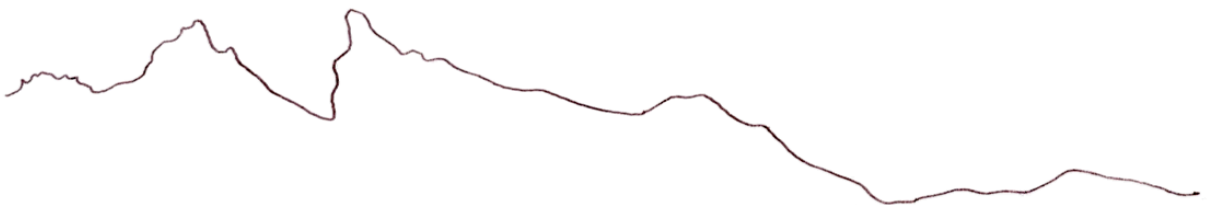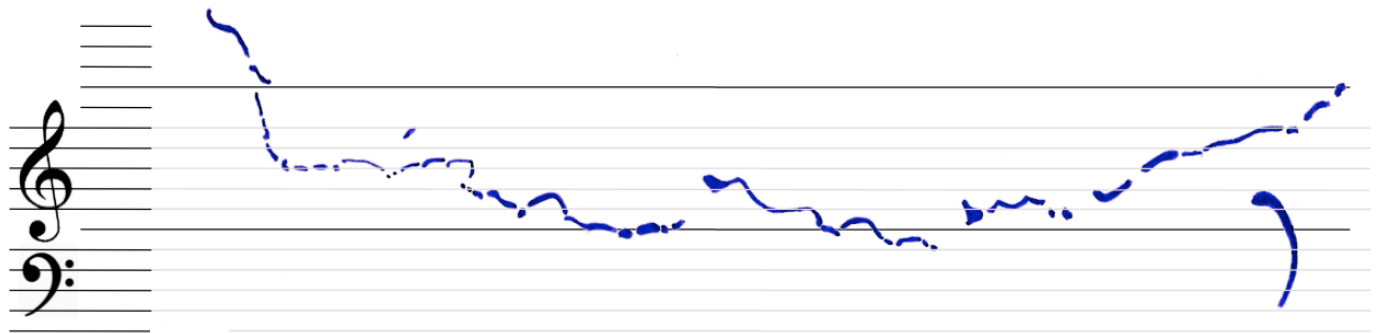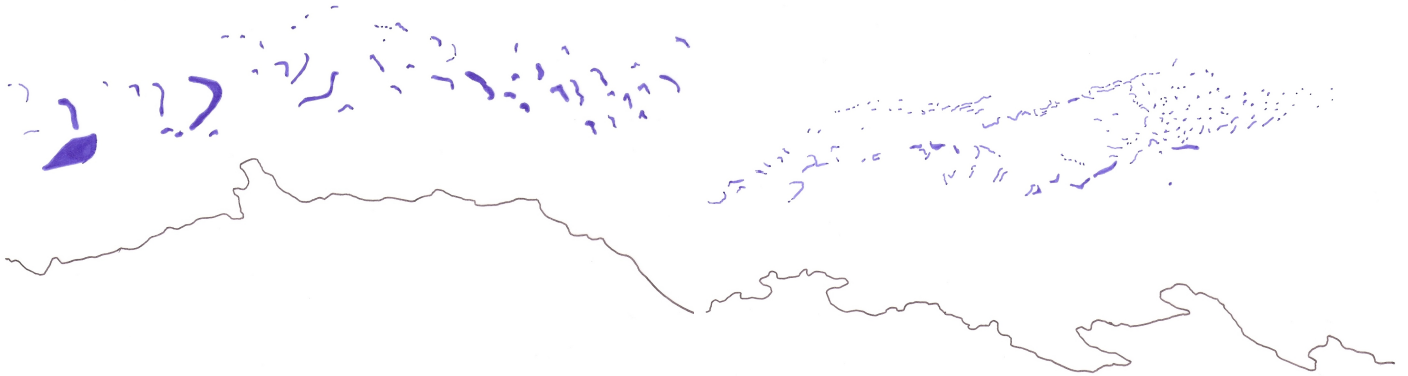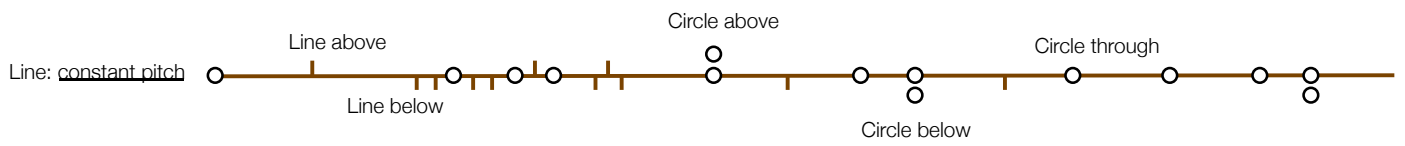
Each line will naturally be of different length.

The only variables along the constant line are the smaller-lines and circles suggested above.
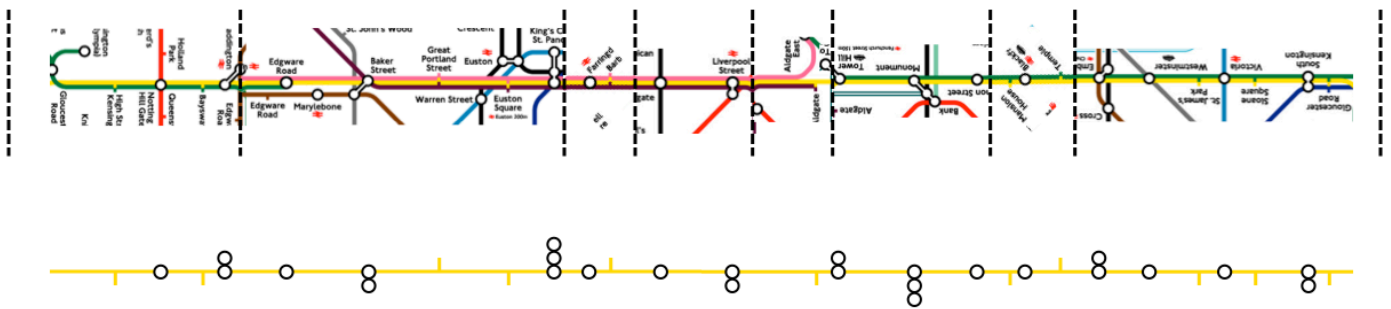
Bakerloo	Hammersmith & City	Victoria
Central	Jubilee	Waterloo & City
Circle	Metropolitan	DLR
District	Northern	Under construction
East London	Piccadilly	⇌ National Rail

IOGRAPH PROJECT (2011)
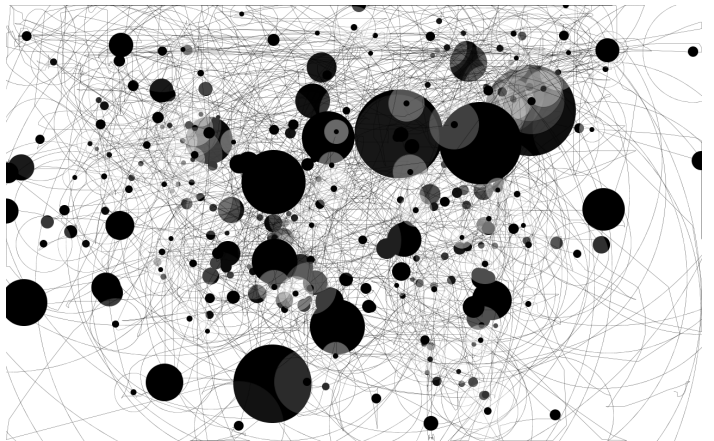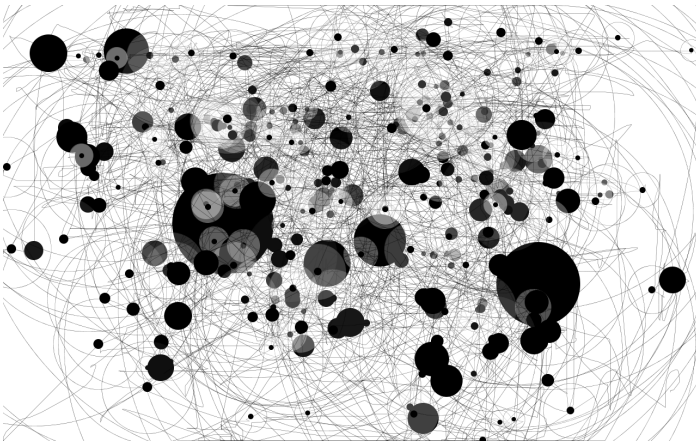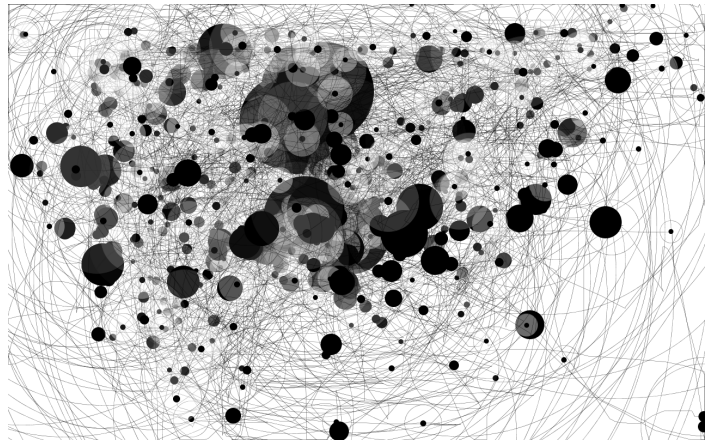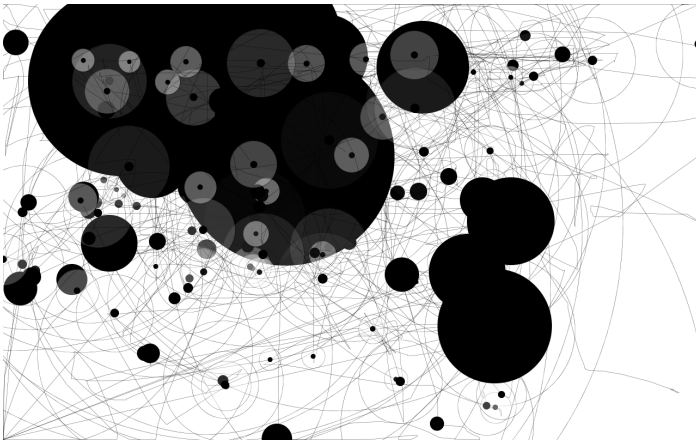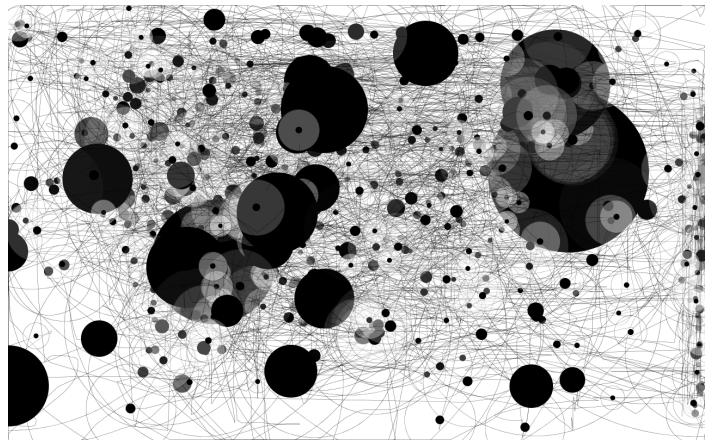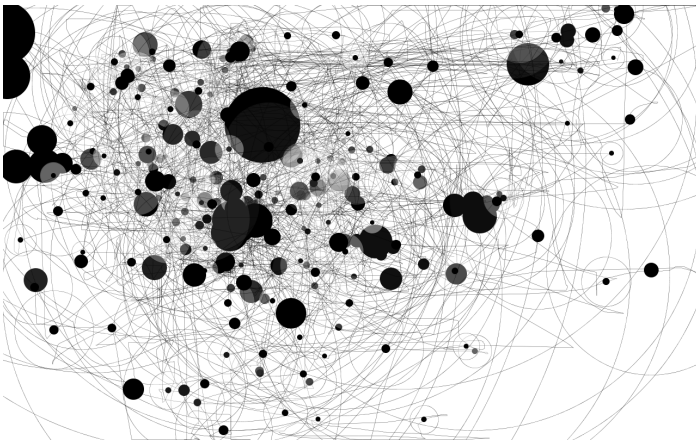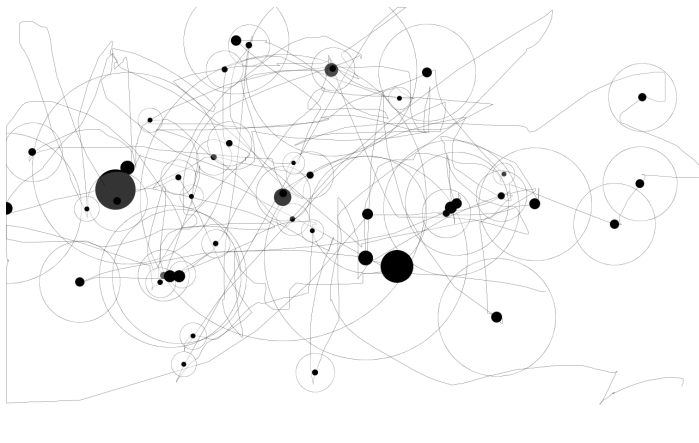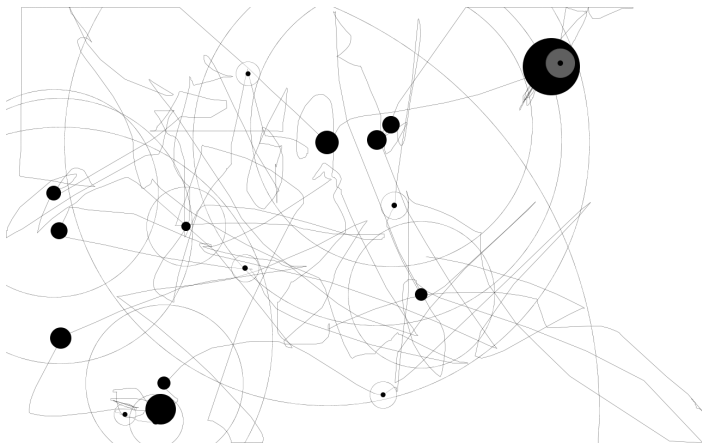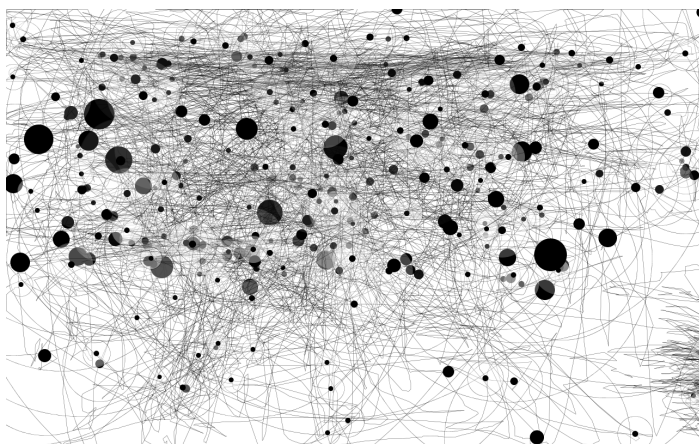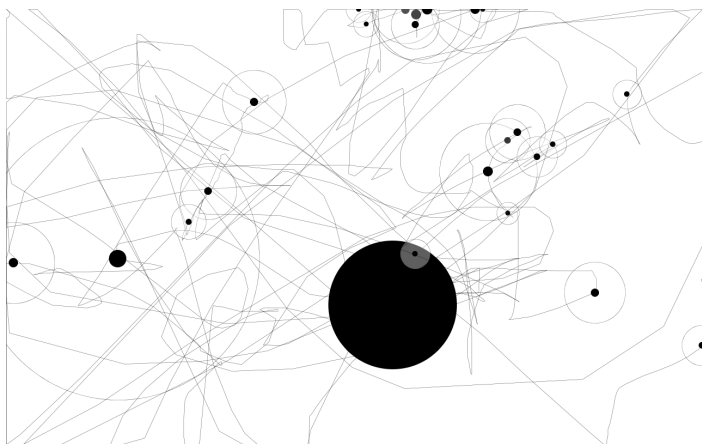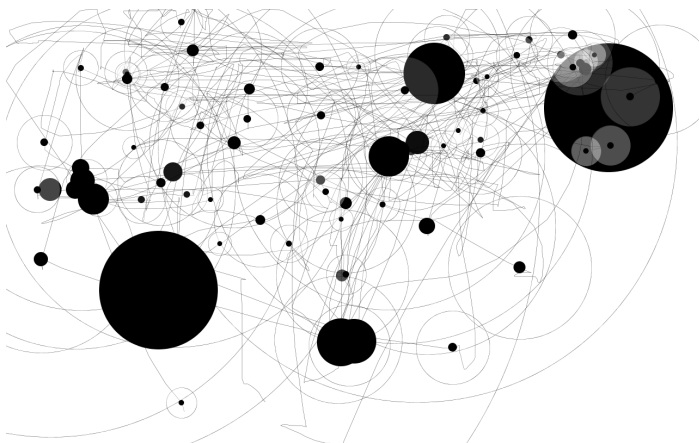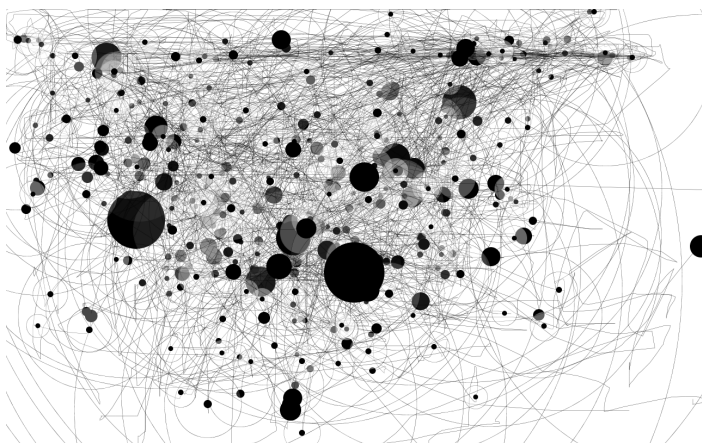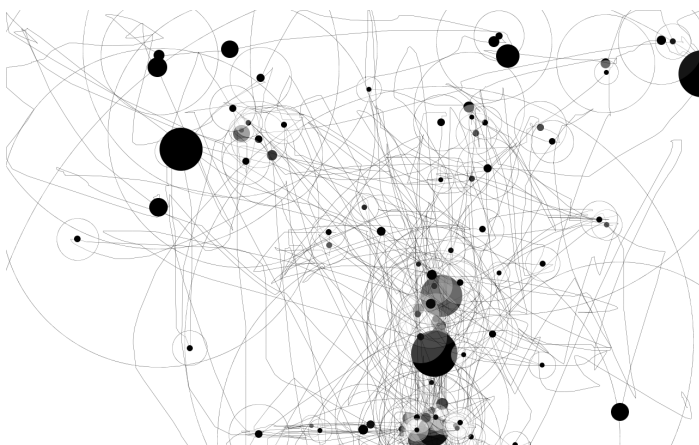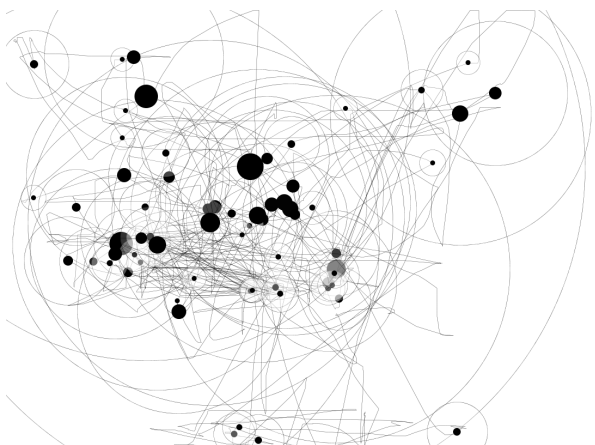
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