Article

NAVIGATION – GRAPHIC DIRECTIONS IN SOUND

Nathan Thompson

The description of sound has always been elusive. Its complex ephemeral nature has often defied the boundaries of traditional musical notation. The 1950s and '60s saw an increased desire on the part of some composers to integrate everyday sounds and elements of chance into musical composition. This expanded range of sounds dictated an increased range of graphic tools available for the exploration of sound. A chance encounter with graphic scores by John Cage stimulated research into the relationship between graphic scores and sound. Using navigation as a theme, this writing explores these connections across continents and communities and looks at how graphic scores operate as technologies.

PART 1 – THE MAPPING OF SOUND

"I am the play within the structure"[1]
Morton Feldman

The graphic score is a technology of paper and pencil. A manual tool consisting of a series of related marks designed to describe and articulate sound, in doing this a graphic score organises and orders frameworks of experience. Unlike traditional musical notation, graphic scores form a relationship with sound which can evolve and adapt through use. The tools and signs used for one score may not be adequate for the next. Drawn on two-dimensional surfaces, graphic scores are like maps for the generation of time-based events. This essay explores this relationship and my fascination with these machines made of pencil and paper, viewing them as a kind of poetic nanotechnology that encompass some of the ideas that interest me most in music.

The twentieth century saw an increase in the use of the graphic score by composers. In America, Morton Feldman and John Cage were devising new notation that varied from piece to piece. Feldman's *Projection* (1951) and John Cage's *Fontana Mix* (1960) are both examples of a notation and sound evolving in parallel to produce music. In Feldman's piece, he uses a graphic score to describe tones, lengths of sound and clusters of notes. Cage, on the other hand, develops graphic systems that incorporate everyday sounds into music. Both composers sought to include sound excluded by traditional musical notation.

To many, these new sounds lay outside the bounds of music and were regarded as noise. Writer David Novak defines noise as "the opposite of shared public consensus," and in relation to music this is particularly true. Music is essentially spread through consensus. In his book *Noise: The Political Economy of Music*, philosopher Jacques Attali argues that "the entire history of tonal music, like that of the political economy, amounts to an attempt to make people believe in a consensual representation of the world."[2] Tonal music supports this consensus by using a series of notes of specific pitch combined with a written format that allows only for the expression of these pitches. The mapping of sound on paper evolved into a formal language that has been rendered invisible by its ubiquity. The rules and structures of traditional music notation were invented long before recorded sound and distinguished music and composition from environmental sound. Ironically, the eight-tone scale originally proposed by Pythagoras around 500 BC was derived from the ringing of blacksmiths' anvils and was used to provide the beginnings of a rational framework for writing and reproducing music. This formatting of music was done at a fairly heavy cost. As Attali

details, from here successive rationalisations within music progressively sought to exclude the polyphonic rumble that accompanied human activity. This "leftover" was to be considered noise and, as such, outside of the bounds of music. The exclusion of noise from definitions of music represents not only a dramatic reduction in the sonic materials available to the composer, but a drastic reframing of sound for the listener. Noise was effectively turned to silence as the tools of music were used to impose a kind of cultural deafness.

There are many alternate ways to visually map sound. Traditional musical notation may have excluded a great deal from music, but other methods of writing sound have at times drawn attention to sound as a basic building block in the formation of music. In 1787, physicist and musician Ernst Chladni placed sand on a plate of glass. When he bowed the edge of the glass the sand formed into regular patterns and in so doing demonstrated visual traces of pitch, incorporating physical process into the representation of sound.[3]

Representing sound visually is a form of mapping, and the mapping of experience onto paper can take many different forms, all creating their own retelling of the experience, adding or omitting information consistent with their style or format. Ten years before Chladni, Captain James Cook was commissioned by the British Royal Society to search for an undiscovered continent that many speculated was located in the southern ocean. Charged with the responsibility of finding and mapping this mythical continent, *Terra Australis*, Cook translated his experience into a series of marks, patterns and diaries that form a detailed mapping of the contours of each land he encountered. Viewed as a whole, the marks and entries join together to generate an impression of a location. Like the graphic score, these markings become like a paper machine that takes experience and regenerates it in an alternate form. Cook's journeys were exploratory by nature; he used the skills and instruments at hand to translate his experiences in uncharted waters. Similarly, the graphic scores of Feldman and Cage form a graphic language in relation to the changing fields of uncharted sound that were opening up before them, forming maps to be read, interpreted and used to generate new music.

PART TWO – GRAPHIC TECHNOLOGIES

"More essential than composing by means of chance operations, it seems to me now, is composing in such a way that what one does is indeterminate of its performance. In such a case one can work directly, for nothing one does gives rise to anything that is preconceived."[6]

A map, like a graphic score, is a technology in that it both mediates and orders experience. Graphic scores navigate paths through sound and image, excluding or including information in accordance with their structure. John Cage sought to expand the field of music by creating scores that drew attention to the sounds that surrounded the listener, maximising aspects of indeterminacy into his works in an attempt to lessen the importance of the composer. His composition *4'33"* (1952) presents four minutes and 33 seconds of silence and is a clear example of Cage's intention to create a piece in which the audience formed music from what he called "an attention to the activity of sound." The original performance of this piece consisted of pianist David Tudor sitting at a piano. Divided into three sections of varying length, each section is marked by the opening and closing of the piano lid, with the only sound provided by the surrounding environment. In *4'33"* Cage uses silence and time to draw music from noise by providing a listening space of specific duration. The piece is notated in words and numerals rather than notes and bars. Music is returned to its analogue continuity, taken back from the discrete data of notes on paper.

Differences between conventional musical notations and many of Cage's scores could be seen in terms of the difference between following a map and plotting navigation. Cage's scores often differ from other graphic scores in that rather than creating a visual map of sound they set up a series of instructions, which in turn lead to the production of music. Cage initially sought to incorporate chance elements and sounds into his performances, before reworking this idea slightly in order to lessen the importance of the composer. He did this by using graphics and language to loosen the link between the score and its execution and introduce new sound into his music. For example, in *Fontana Mix* (1960) he includes the following instructions:

Fontana Mix is an example of a graphic score that contains a set of instructions for plotting an approach to sound production. The score contains various sheets of paper on which squiggly lines are drawn. Also supplied is a section of a finely gridded graph printed onto mylar. Handwritten instructions specify the placement of the gridded mylar over the piece of paper. The number of squares taken to cross the line twice is used to plot a length of time in which a musical action will occur, to be performed by an unspecified instrument. While providing little in the way of a concrete end point or a tangible link to specific tones or pitches, these simple graphic tools are used to organise sound. Unlike conventional music, they do not provide a recipe that if followed will produce a specific result. The score instead provides a way to proceed in order to produce music, rather than the execution of a set of chronologically ordered notes.

Like Cook's navigational maps, Cage's graphic scores navigate the gulf between graphic material and lived experience and, as with Cook's antipodean explorations, Cage's *Fontana Mix* operates with a map only partially complete. For Cage, this incompletion is an essential part of the map, allowing space not only for the interpretation of the performer but creating a fissure in which unintended sound can be integrated into a performance. In one sense, Cage's graphic tools provide provisions for a journey rather than a map. The score acts more like a thermometer, regulating activity over time by providing sets of limits rather than prescribing specific outcomes.

Cook's second voyage to the Pacific was motivated by a search for an undiscovered continent that, it was speculated, lay somewhere in the lower southern hemisphere. With an incomplete map, Cook proceeded to turn what appears to be a very improvised existence on the open seas into systemised graphic material. One of the fascinating things about Cook's diaries is his description of uncharted territories. These descriptions form diaries that are made as a direct response to the natural phenomena he encountered, chronologically presented as a result of the carefully plotted ship's movement.

"The Clowds near the horizon were of a perfect snow whiteness and were difficult to be distinguished from the ice hills whose lofty summits reached the clowds. The outer or northern edge of this immense ice field was composed of loose or broken ice so close packed together that nothing could enter it."[7]

In this description of a ship's journey into uncharted waters, names and places give way to pure description. Like Cook's mapping, Cage's scores can be seen in terms of methodical plottings and frameworks, forming new meaning in relation to the chaotic elements of noise. The documentation of the journey becomes a kind of dance between methodical recordings, plotted as coordinates on an evolving map, and his subjective descriptions of uncharted waters.

Unlike Cook, Cage's goal is not an attempt to order the known universe but to invent a graphic notation that allows for the inclusion not only of sound excluded by conventional musical notation, but sound not dictated by the composer. To put it into nautical terms, Cook maps a journey whereas Cage uses graphic tools to extend the ocean. What interested Cage most was sound and the experience of listening. Many of his works create a context in which the audience is invited to pay attention to the sounds that surround them. The idea is that this noise is turned into music through paying attention to it. In doing this, he actively acknowledges the audience's attention in the construction of the music. The point for Cage was that sounds were always to be found in relation to other sounds and to the environment around them. Where traditional notation isolated sounds by tying them to specific symbols within a fixed framework, Cage used the graphic score to reinsert noise back into music. One way to understand the impact of Cage's scores is to look at those of his peers.

Karlheinz Stockhausen, in works like *Study 2*, uses blocks of tone to make a graphic representation of sound. Bar lines are retained from conventional musical notation to represent the passing of time. Rectangles are blocked in with specific dimensions prescribing set durations, pitches and tonal values. Although not using conventional graphic notation, Stockhausen's work could be seen as similar to Cook's approach to mapping. His marks use tone and scale to map a direct visual translation of sound onto paper. Like Cage, Stockhausen seeks the integration of new sound into his work, and his works do integrate a certain amount of performer interpretation but, unlike Cage, his works do not present the possibility for the generation of sound independent of the score. Cage's scores often involve instructions which, ironically, he uses to generate indeterminacy within his works. In some ways, language is the ideal medium for Cage in that it has the ability to structure things while still retaining a great level of indeterminacy.

Philosopher Alfred Korzybski points out in his book *Science and Sanity* how indeterminate language can be. He observes that "A map is not the territory it represents."[8] He uses this phrase to point out that language is the structure that we use to rationalise the things that we perceive and it should never be confused with the objects that it represents. He saw the structure produced by this rationalisation as our link to the world of things. In *Science and Sanity* he states that: "If words are not things, or maps are not the actual territory, then, obviously, the only possible link between the objective world and the linguistic world is found in structure, and structure alone."[9] Korzybski saw the structure of language as having a fundamental impact on our perception of the world. In one of his lectures, he demonstrated this principle by offering his students some homemade biscuits before showing them the dog-biscuit bag they had come from. Until the bag was produced the general consensus was that the biscuits were very tasty; many of the students had an almost physical reaction to the sight of the bag, and so Korzybski demonstrated the power language has on our relationship to the world around us. Cage combines language with mark-making to reintroduce noise into music, producing an indeterminate meditation on the relationship between language and sound.

Cage's introduction of noise into music forces a re-examination of noise. In his 2006 Columbia University PhD thesis "Japan Noise: Global Media Circulation and Experimental Music," David Novak talks of the way Japanese Noise music (an underground electronic music genre popular in the 1990s) organises the movements of participants in a Noise culture in Tokyo. He demonstrates that no map is singular and that the movements of subcultures of people between venues constitutes a new mapping of spaces traversed by thousands of people every day following their own maps. Novak's ideas of mapping blur the lines between drawing and culture. Following a map dictates a series of experiences as much as a direction. Whereas Cook was an explorer, mapping by the stars from a moving ship, Novak shows multiple people individually remapping a city, following noise as it forms into music through use.

This reinforces Attali's claim that noise "constitutes the audible waveband of the vibrations and signs that make up society." Attali elaborates on the idea of music being a consensual representation of sound by implying that the size and connectedness of this consensus affects the speed at which sound will travel through populations.

In Attali and Novak, music shifts as a result of activity. With Cook and Cage, the activity that produces music or information is generated from a machine made of paper and ink and the way in which these paper machines generate activity. Cook and Cage's journeys into the unknown differ significantly in intention. Cook seeks to impose order on a world yet unknown; 150 years later a great deal of the unknown has been leached out of Cage's world, and yet, with the right tools, the chaos is still to be found. A map, like a history or a language, is in the end a machine for generating experience. Intersections between Cook and Cage occur in composition, a transition of materials through process. With Cage, sound moves through the score, forming a composition in relation to people. With Cook, the composition is drawn through the translation of natural phenomenon through graphic form, returning from the outer edges of the map to the centre of an expansionist monarchy. In the end, the real fascination and connection between the two is concerned with process and modes of transmission as much as it is with the final sound.

Nathan Thompson is an artist, videomaker and musician from Port Chalmers, New Zealand. He is a lecturer in communication design (drawing and illustration) at Otago Polytechnic. His work centers on the relationships between sound, noise, time and the visual image, and includes histories of modern music, experimental sound and film. His art employs a multidisciplinary approach incorporating sound, video, sculpture, drawing and painting. Key to all his work is the relationship between time, sound, noise and signal.

He has exhibited in numerous artist-run spaces and public galleries since 1993. He has had solo exhibitions in New Zealand and Australia, including *twilight* at The Physics Room, Christchurch, in 2004. His most recent solo exhibition was at the ATVP Gallery in Sydney. Thompson has had work selected for exhibition at the Exit International Film Festival (2004) in Auckland, and dLux media's *D>ART* exhibition at the Sydney Opera House (2005). He has also exhibited with Scott Donovan Gallery, Sydney (2004), Enjoy Public Art Gallery, Wellington (2008), and the Dunedin Public Art Gallery (2008).

Thompson is a founding member of several New Zealand-based sound improvising ensembles including The Sandoz Lab Technicians and Sleep and Eye. He currently also performs with PSN Electronic and performs solo under the name Expansion Bay. A program of his short films recently toured the Dunedin Public Art Gallery, Enjoy Gallery, Wellington, and The Physics Room, Christchurch. He has released recordings with Spanish Magic, Last Visible Dog, Kning disk, C.PSI.P, and Metonymic. He has played at many invited festivals and is a regular participant in New Zealand's premiere experimental music festival, Lines of Flight.

1   *Morton Feldman Says: Selected Interviews and Lectures 1964-1987*, ed. Chris Villars (London: Hyphen Press, 2006), 32.

2   Jacques Attali, *Noise: The Political Economy of Music*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1977).

3   Thomas Levin, "'Tones from out of Nowhere:' Rudolf Pfenninger and the Archaeology of Synthetic Sound," in *New Media, Old Media: A History and Theory Reader*, eds Wendy Hui Kyong Chun and Thomas Keenan (New York: Routledge, 2006), 45-81 at 49.

4   John Cage, *Silence: Lectures and Writings* (Middletown, CT: Wesleyan University Press, 1973), 69.

5   John Cage, *Fontana Mix* (New York: Henmar Press, 1960).

6   Ibid.

7   James Cook, *Hunt for the Southern Continent*, ed. Philip Edwards (London: Penguin, 2007), 15.

8   Alfred Korzybski, *Science and Sanity: An Introduction to Non-Aristotelian Systems and General Semantics*, 4th ed. (Lakeville, CT: International Non-Aristotelian Library Publishing Company, 1973/1933), 58.

9   Ibid., 61.