

# THE POSSIBILITIES OF A LINE: MARKING THE GLISSANDO IN WESTERN ART MUSIC

Cat Hope

Western Australian Academy of Performing Arts  
c.hope@ecu.edu.au

Michael Terren

Western Australian Academy of Performing Arts  
m.terren@ecu.edu.au

## ABSTRACT

The glissando as it is deployed in Western art music notation carries with it a number of challenges to the hegemony of traditional harmony, rhythm, and notation. The glissando embodies the smooth line, unlike the striated pitch-time space of traditional Western music, which aligns the glissando to many philosophical concepts, as well as mathematical, scientific, and architectural disciplines. Select works by Iannis Xenakis, James Tenney and Giacinto Scelsi are discussed for their development of glissandi as integral formal components, especially around the glissando's tendency to encourage stasis. Compositional attempts to combine the nature of glissandi with drone in the author's own work are described, providing an examination of examples of the way glissandi and related concepts can be notated formally, rather than decoratively, in musical works.

## 1. INTRODUCTION

The glissando is unusual in music notation. Unlike almost every other sign for a sound and its relationship to time, the glissando seems to indicate a unique interpretation. It can be thought of as the ultimate analogue musical symbol, as opposed to the digital symbols used to represent music in most traditional notation. It visually describes a trajectory, a direction, a path - whereas a musical note represents the moment of attack, followed by 'implied' time. The glissando looks very much like it sounds, notwithstanding complications arising from instrument design, such as the difficulty for some woodwind instruments and the piano to slide smoothly between chromatic notes. Traditional music notes, tied together, don't represent time as clearly.

This idea of the line, and its relationship to time, has been contemplated by numerous philosophical movements over many years. Kant and Husserl held a "Newtonian view of time as linear succession ... [as] unified, uninterrupted unfolding" [1, p. 81]. Derrida's concept of the trace conceives of lines as being inferred from a "series of arrests," instants in time, which demarcates and defines space and time in a linear way [2]. Deleuze, in his *Difference and Repetition*, writes that all repetitions are necessarily ordered in a "pure form [of time], or straight

line," despite repetitions threatening to destabilise this linearity [3, p. 294]. Deleuze and Guattari bring their understanding of the line closer to music in their analysis of Pierre Boulez, in which they describe "smooth space" as embodying "continuous variation, continuous development of form... the pure act of the drawing of a diagonal across the vertical and the horizontal." [4, p. 480]

In music, it was the Greek composer Iannis Xenakis that really began a committed interrogation of lines and their relationship to music. For Xenakis, the line was something that united music, architecture and mathematics. He compared the straight line or curve of mathematics to a wave in physics, to a glissando or sine tone in music [2]. He often spoke of sonic shapes when discussing architecture, and his design of the iconic Philips Pavilion at the 1958 Brussels World Fair was also the initial composition plan for his work *Metastasis* (1955). "Composing music amounts to lay a series of points on a line," he suggested when discussing the relationship of his composition practice to that of his architectural one [5]. Yet for all his discussion of line and shape, and the existence of many drawings and plans for his musical compositions, Xenakis never embraced graphic notation as a system of communication to the performers; finding it imprecise, and giving away too much of his compositional responsibility to the performer [6, p 2]. Xenakis instead meticulously notated the contents of his long, overreaching glissandi using traditional notations. He often drew a line describing his glissandi above the staff, calling this a "Cartesian notation - graphical representations of sounds in a pitch-time space" [6, p 3]. In this way, he was indicating the intention in a way traditional notation could not.

The glissando can be thought of as a type of graphic notation that often appeared within traditional notations, making it a development of that notation rather than a separate movement altogether. A glissando extends what conventional musical notation is capable of depicting. Originating as an ornament attached to traditional notation, it developed into a more significant component of music fabric in the music of the postwar avant-garde. Electronic music, with its ability to make endless sound, and the use of sine tones to represent them, provided an interesting area for experimentation. The use of sirens in Varèse's *Hyperprism* (1922-23) provides an important early example of extended glissandi. The texturalist composers such as Krzysztof Penderecki and György Ligeti used the massed, plural glissandi as a way to emphasise attention on timbre. Others, such as George Crumb, who pioneered the now often despised 'seagull'

effects in his work *Vox Balanae* (1971), extended the use of the glissando beyond a colouring technique. Composers such as Beat Furrer and Gloria Coates use glissandi to connect different pitches together over different tempi.

## 2. XENAKIS AND THE LINE

It could be argued that Xenakis uses glissandi to imply motion in his music, replacing the harmonic impetus provided in music dependent on traditional tonal systems. This can take the form of a direct trajectory between one note and the other, as exemplified in works such as *Metastasis*, or ‘wandering’ as found in the solo violin work *Mikka* (1971), where the music meanders between quarter tones and darts across large leaps. In these works, the glissandi provide a mechanism to make time audible in a way traditional notations cannot – they do not provide steps to make out time or rhythms. They are images that are heard – made up of time, rather than existing in it. They take the idea of drone, and put it into motion in a different pitch-time space than other kinds of notation.

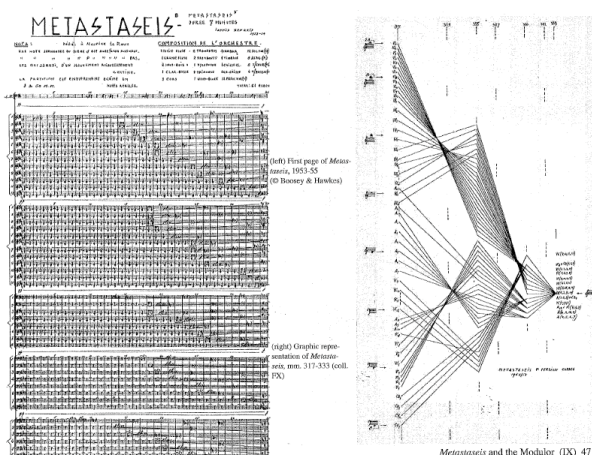


Figure 1: Iannis Xenakis, *Metastaseis* (1955) score and early sketch.

Despite the prevalence of the term "line" in musicology to suggest a trajectory or contour of a melody, these do not embody the line in the Euclidean sense of the word, due to the striated, stepwise nature of pitches in the chromatic scale in traditional harmonic music [7]. Glissandi have been described as having a more direct association with movement and motion than the traditional, striated notes of the European art-music scale [8]. As such, the relationship between the glissando and arguably more empirical fields such as physics, mathematics and architecture, becomes clearer in Xenakis' work.

In his electroacoustic work, glissandi have been used for decidedly less arithmetic means. In his work *La Légende d'Eer* (1977–78), glissandi take on a mimetic role, in its evocation of unhuman life-forms and environments. Allen S. Weiss also interprets the dense and unnerving glissandi of this work as stylising “those very same war sounds earlier valorized and sublimated by Filippo Marinetti and Luigi Russolo, most notably the Doppler effect of enharmonically changing pitch as shells pass overhead.” [9]

Glissandi, when employed in this way, takes on a more diffuse role, more informed by metaphors of ancient Greek mythology than the non-ambiguity of Cartesian pitch-time space. They establish what Francis Bayer called a “relation of incertitude at the heart of sonorous matter, opposed to the somewhat artificial precision of articulated systems: one can even claim that in the *glissando* we are no longer dealing with precise tones, but with a sonorous ensemble movement where, on the spatial plane, only the general direction is really determinable” [10]. Isabella van Elferen writes that because the glissando marks a “continual transgression of harmonic, melodic, and often rhythmic boundaries,” all of which constitute an understanding of time as linear, the glissando “destroys linear temporality and therefore necessitates the consideration of the impossible possibility of Being-outside-time” [11], a concept pertinent to *La Légende d'Eer*.



Figure 2: An excerpt from Iannis Xenakis' *Mikka*, showing 'wandering glissandi'.

## 3. GLISSANDI AND STASIS

The impact of electronic music on the employment of glissandi in music cannot be overstated. American composer James Tenney's *Postal Pieces* (1965-71) study three important musical elements; intonation, ‘the swell’ and perceptual states, with the swell being thought of as a series of interconnected glissandi. Tenney points out, “what we take to be the substance or content of some sound – say, a string quartet – is really the result of forms - formal shapes and structures at a microscopic, or ‘microphonic level’” [12].

For Tenney, musical form and the nature of sound are the same thing, and this is demonstrated in his notations. In *Postal Pieces* no. 9 ‘*Cellogram*’ (1971), the movement of a sound wave is employed in a similar way to Xenakis' use of glissandi, but described very differently. He draws the sine tone into the staff, as glissandi. The choice of bass instruments ensures a clearly articulated and smooth, lengthy period movement of the sound wave, leaving the slow undulations to enable enough space to delicately weave between small differences in frequency.

Despite the ability of the glissando to depict movement, it also retains a close relationship to stasis, as it holds the possibility to indicate long form, slow change over time. An examination of drone music, where long musical forms hold small and gradual changes, provides useful tools to describe glissandi. Joanne Demers suggests drone and noise music create an immanent, rather than transcendent relationship with time [13, p. 93]. Building on contributions from electronic music composers and the texturalists, Demers suggests that long form drone music

appears to defy transcendence by avoiding the development and arrival of conventional harmonic and melodic goals expected in most Western music [13, p. 193]. Rather than illustrating a passage through time, it obscures its passing – which is no more than a perceived effect, since all sound is constantly in motion by its very physical makeup. Drone music provides what Kramer calls ‘vertical time’ [14], where small events become very significant and the idea of a work ‘becoming’ is annulled. A very slow moving glissando, or very microscopic glissando-like movements are likely to feature as some of the detail that features in a piece of drone music.

V.11.1.U

## CELLOGRAM for Joel Krosnick

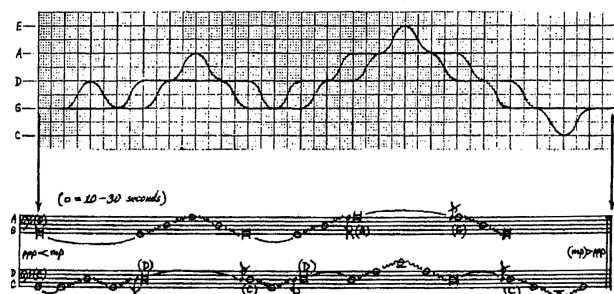


Figure 3: James Tenney, *Cellogram*, 1971.

A composer working with microscopic glissandi to create harmonic stasis is Giacinto Scelsi, whose later string works often feature a single tone replicated over octaves in different instruments and enveloped only by vibrato, pulsations, glissandi and microtones [15]. In *String Trio* (1958), a perception of stasis replaces any sense of harmonic or formal development. Yet there are small details that elaborate this stasis - the very opening note of the first movement is a small upward glissando, and from thereon in, any change to the initial pitches are not iterated by pulse or harmony, but rather by inflection – varying speeds of vibrato, quarter tone movements, dynamic variation and the occasional pizzicato. The single movement *String Quartet no. 5* written between 1974 and 1985 takes the idea further; the whole work is based on a single F - which is slid to and from, attacked and sustained in different timbre, shapes and dynamics. These later works of Scelsi employ glissandi as a way to sustain interest a kind of harmonic stasis, colouring it and shaping it using the very nature of the sound itself, as Tenney did in *Cellogram*. Scelsi used an early synthesiser, the Ondiola, to create these works - using the small glissandi knobs on the machine to create these sounds which were then notated for acoustic instruments [16].

## 4. GLISSANDO AS STRUCTURE

To meld this idea of drone with that of glissandi in music notation became a focus of the authors own work. The first of these experiments was *In The Cut* (2009), a small ensemble work which examined the idea of ‘descent’. This did not rely on a long, slippery glissando alone, but also used small descending steps and bends against sliding tones. A trio of acoustic instruments slowly descend in pitch until they reach their lowest note, when they are asked to detune even further as to distort the timbre and

make pitch identification difficult, as happens with very low sounds. They are accompanied by bass guitar providing a long descending tone, semi-articulated and effected with heavy delay and reverb, as well as a vinyl record that plays a descending sine tone coloured only by the vinyl noise from playback. In this way, a range of inflections colour the singular, long glissando the instruments play, and which is the basis for the form of the work. This descending glissando is made up of interlocking parts, and culminates in the absolute lowest sound possible on each instrument - detuned on the bass, cello and viola, extended using pipe on the bass clarinet, and even the sine tone which goes beyond the frequency capacity of the bass amplifier that sounds it. *In The Cut* employs a glissando as singular form, as well as trajectory. Unlike the seemingly static works of Scelsi or Tenney, it has a movement, a place to go.

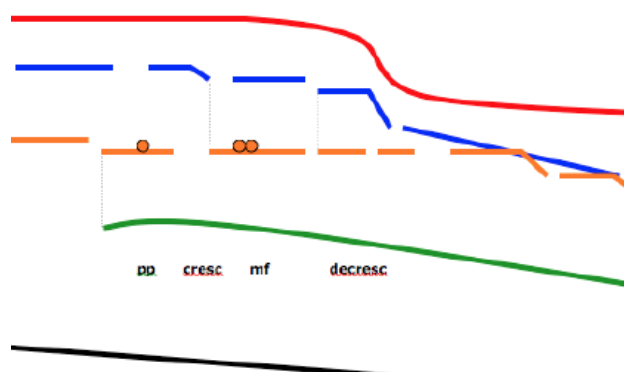


Figure 4: An excerpt of *In The Cut* (2009) by Cat Hope.

The score to this and the following works is presented as animated notation, to enable the reading of the long form lines in a smooth and coordinated way. The image passes from left to right, past a line that signifies the moment of performance. The rate of movement is smooth - without pulse, and obscuring any sense of tempo. It provides a perfect representation of the score that enables the players to focus on the point of performance, whilst predicting the direction of any change in pitch without steps or counting.

## 5. GLISSANDI INTERFERING WITH THE DRONE

*Longing* (2011) is a work that examines the glissando from a different perspective. It focuses around a single note for each of five performers, which is sounded at the start., and constantly referenced by way of a coloured ‘reference’ line that serves as a reminder of the original pitch as the instruments wander away from it. The note is not specified - the performers may choose any note to start, bearing in mind their capacity to smoothly journey away and back to it. They must also try to relate their activity to those of the other performers, creating peaks and troughs that are proportional in relation to other performers. The work is interrupted by upward moving staccato/pizzicato notes at the half way point, as axis to high-

light the lack of ‘forward’ motion before or after its appearance.

Unlike *In the Cut*, the form of the work is flat, it has no end point, no trajectory. Each instrument constantly refers to their original pitch, after wandering away from it by way of curved, almost circular glissandi, with the intention of creating a perception of time turning in on itself. Like Scelsi’s work, the drone is coloured by the glissandi, but in a more lugubrious way. These glissandi create structure to the work, rather than decoration to the line, due to their large pitch range and rapid trajectories.

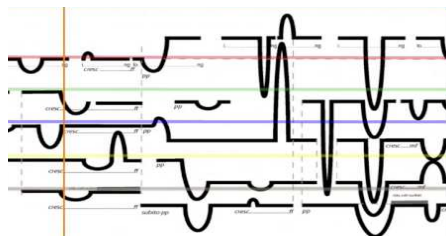


Figure 5: An excerpt of *Longing* (2011) by Cat Hope

## 6. MICROPHONIC POINTS ON A LINE

*Cruel and Usual* (2011) uses Tenney’s idea of microphonic points as Xenakis’s points on a line. In this work small points create a static electronic sound sampled from a very small point of the acoustic activity. The work is for string quartet, and uses similar concepts to *Longing* in its formal construction. The performers choose their own first pitch. A computer samples single microsecond moments in each instruments line notated on the score, using individual microphones. The computer then transcribes the samples down in pitch within a much less precise predicated range, and extends that pitch for ascribed durations, with timbral and dynamics variations indicated in the score. The electronics are reproduced through four bass amplifiers, one for each string instrument. The static acoustic lines are punctured by these bass interjections that initially seem quite foreign in timbre, but then melt into the line as they fade away, coalescing their difference into the ensemble, returning to the drone, and escaping in the glissandi..

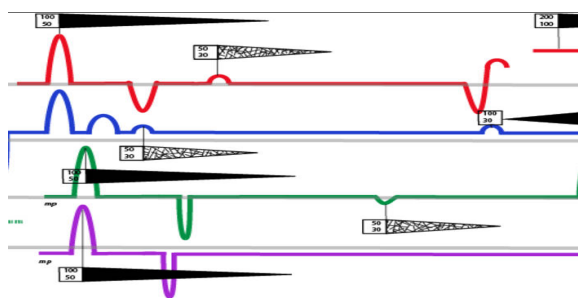


Figure 6: An excerpt of *Cruel and Usual* (2011) by Cat Hope.

## 7. CONCLUSION

These three works demonstrate how ideas of drone and glissandi in compositions can be used to inform formal

and structural cornerstones in notated works. Informed by key works of the twentieth century, these compositions attempt to challenge the idea of the glissando as decoration and reframe the potential of the technique to have formal and structural applications. Using simple but focused notations facilitated by animated notation, these works can be thought of as a step toward to more complex and asynchronous examples. Glissandi provide the potential to reconfigure the teleological conventions of musical structure and open up new ways of listening to music through time that is not driven by tempo or beat. A principal difficulty to engage glissandi in large forms has been the coordination of performance, as the line without rhythmic markings offers no points for performers to reference. This has largely been overcome through the innovations of digital scoring and animated notation facilities, opening the way for a richer ground of exploration.

## 8. REFERENCES

- [1] D. C. Hoy, *The Time of Our Lives: A Critical History of Temporality*. Cambridge, MA: MIT Press, 2009.
- [2] M. Iliescu, “Glissandi and Traces: A study of the relationship between musical and extra-musical fields,” presented at the International Symposium Iannis Xenakis, Athens, 2005.
- [3] G. Deleuze, *Difference and Repetition*. New York: Columbia University Press, 1994.
- [4] Deleuze, G., & Guattari, F. (1980). *A Thousand Plateaus*. (B. Massumi, Trans.). Minneapolis: University of Minnesota Press.
- [5] I. Xenakis. “Lettre de Iannis Xenakis à Jean Baudot (Centre de Calcul de l’Université de Montréal) du 1er novembre 1972,” *Centre Iannis Xenakis*, Accessed 24 November 2015. <http://www.centre-iannis-xenakis.org/items/show/780>
- [6] F. Delalande. Interview with Xenakis, Radio France, program broadcast on 14 December 1981.
- [7] I. Khannanov, “Line, Surface, Speed: Nomadic Features of Melody,” in *Sounding the Virtual: Gilles Deleuze and the Theory and Philosophy of Music*, B. Hulse and N. Nesbitt, Eds. Ashgate, 2010, pp. 249–267.
- [8] J. Shepherd and P. Wicke, *Music and Cultural Theory*. London: Polity, 1997. Pp. 159–160.
- [9] A. S. Weiss, *Varieties of Audio Mimesis: Musical Evocations of Landscape*. Berlin: Errant Bodies Press, 2008. P. 78
- [10] Francis Bayer, *De Schönberg à Cage*, cited in A. S. Weiss, *Varieties of Audio Mimesis*. Berlin: Errant Bodies Press, 2008. P. 74
- [11] I. van Elferen, “Music of other spheres: Diagonal time and metaphysics in *Lost*,” *Science Fiction Film & Television*, vol. 3, no. 2, pp. 253–270, Feb. 2010.
- [12] L. Polansky, *The Early Works of James Tenney*. Soundings NO. 13, Ed Peter Garland, p. 200.

- [13] J. T. Demers, *Listening Through the Noise: The Aesthetics of Experimental Electronic Music*. New York: Oxford University Press, 2010.
- [14] Kramer, J. D. (1988). *The Time of Music: New meanings, new temporalities, new listening strategies*. London: Collier MacMillan Publishers.
- [15] F.-M. Uitti, "Preserving the Scelsi Improvisations," *Tempo*, no. 194, Oct. 1995, pp. 12–14,