

Form and Poetic Expression in Three Electroacoustic Works

Gerald Bennett

May, 2008

Musical form, in electroacoustic music as well as in instrumental and vocal music, is our perception of the movement of sound through time. In older music, especially during the Classical period, this perception was often complemented by an appreciation of how a particular movement or piece varied an expected scheme (sonata-allegro, a-b-a, etc.). In the music of the 20th and 21st centuries, there are virtually no expected schemes, and the perception of form is, to paraphrase Wittgenstein, the perception of everything that is the case in a composition.

But musical form, even when the composer has done her or his best to exclude individual decision-making from the compositional process, is almost never completely arbitrary or accidental. Almost always, the way a music unfolds in time, the way a composition reveals itself to the listener, is the object of great attention by the composer. In compositions which hold our attention sufficiently to cause us to return to them time and again, understanding the form better will lead to a deeper understanding of the piece's meaning.

There are factors which make understanding musical form difficult. For one thing, wherever classical form schemes are avoided, we have few analytical tools with which to characterize and interpret 'everything that is the case'. Secondly, even where phenomena can be unequivocally characterized (e.g repetition, differences in register or speed), there is no consensus about the phenomena's meaning (does a repetition augment or diminish tension, how are great contrasts in register to be evaluated compared to small differences). Thirdly, until recently there has been very little analytical literature that would help us develop an methodology of form analysis.

In this paper, I will talk about three pieces of electroacoustic music, *L'Insieme di Cantor* (The Cantor Set) by Agostino Di Scipio (1998), *Una Carta* (A Letter) by Eduardo Kusnir (1996) and *Hälsningar från Syrenbersån* (Best Wishes from the Lilac Grove) by Lars-Gunnar Bodin (1994). The three pieces have similar lengths and were composed within four years of each other. All three have been published in collections by Institut de Musique Électroacoustique de Bourges (Di Scipio: *Chrysopée Électronique, vol. 24, paysages historiques*, LCD 2781130; Kusnir: *Chrysopée Électronique, vol. 9, Lily*, LDC 2781107; Bodin:

Cultures Électroniques 9, LDC 278060/61). However, the formal articulation of each piece is very different from that of the other two. Careful study of the shape of each piece will help us to understand how the composition of form contributes to their poetic meaning.

In *L'Insieme di Cantor* by Agostino Di Scipio we can expect to find a relatively attenuated formal articulation. The composer writes that the piece is a sort of remix of an ambient piece by Michael Rösenberg, *Roma Modulare*, which was made of sounds of Rome. Di Scipio found the sounds 'touristy', as he writes, and modified them using time-stretching and granulation under strong algorithmic control. Di Scipio's piece appears to be a kind of reduced palimpsest (Rösenberg's piece is almost exactly twice as long) set over the original, even though the original never appears in a recognizable way.

Listening to the piece, one realizes that the granulation has made for a very noisy texture, as though the air were full of tiny particles of sand or dust. There are no harmonic sounds in this music. The piece comes from silence and returns to silence at the end, not just by becoming soft again: it is as though the music becomes perforated at the end. After a long pause about a minute from the end, the music's flow is broken, until it becomes silent. These discontinuities near the end are one of the most striking formal features of the piece. The music is always at a certain distance from the listener, nowhere is there a gesture the least reminiscent of the human body, even the long, soft glissando after the first third seems to be set in motion by some mysterious rule. There are two principal types of sound, long broadband noise, often in the background and always presented with a crescendo-decrescendo envelope, and much quicker, louder, more aggressive sounds, rather like noisy lightning bolts. All of the sounds, despite their noisiness, are exquisitely constructed and beautifully combined.

I needed a second listening to hear the symmetry of the piece; perhaps the distant character of the sounds and the crescendo-decrescendo model of the long, noisy sounds prepared me for it. There are two groups of lightning-bolt sounds, separated by a break, at the beginning of the piece, the first surprising and disturbing, the second somewhat more fused with the broadband noise and ending with a long glissando leading to a new phrase of rather dark broadband noise. Then follow two long sections of noise, separated by a very short reminiscence of the lightning about in the middle of the piece. Finally there is a recapitulation of the two groups of lightning sounds from the beginning, but I can't be sure if the second group re-appears first or not. The last group is characterized by a thinning out of texture and appearance for the first time of holes in the continuity of sound. –And so I had a first approximation of the piece: music situated far from the composer, but also far from its origin (the piece by Rösenberg), no compromise made for easy attractiveness, nonetheless the sounds made and placed with the greatest care, the formal symmetry of the piece emphasizing the stasis of the theme, as though human beings were far away, or perhaps had not evolved yet.

A third listening showed me that musical ideas in the piece often presented themselves as a pair with a short pause between the two. I wondered if this pattern – present in both the form and the local elaboration – might be an important motif for the piece, and I couldn't help wondering if self-similarity was at work here. I also decided that it was time I admitted to not knowing what a Cantor Set was, and set about finding out. I was fascinated to learn that Georg Cantor had set himself the task of defining a set of numbers between one and zero which was both infinitely sparse and contained uncountably many members. The geometric representation of the derivation of the Cantor Set was more help: A line whose middle third was missing, and the middle thirds of the remaining two lines was also missing, etc. Here are the first five iterations of the process:

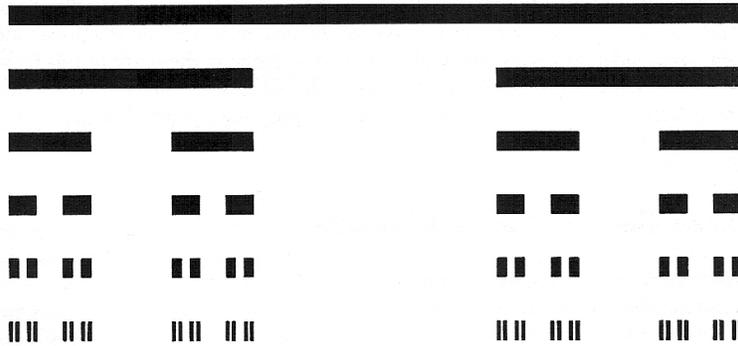


Figure 1. A representation of the Cantor Set after the fifth iteration. The example is taken from Manfred Schroeder's wonderful book *Fractals, Chaos, Power Laws. Minutes from an Infinite Paradise*. W.H. Freeman and Co. New York. 1991, p. 16.

Figure 2 shows another representation after the fifth iteration.

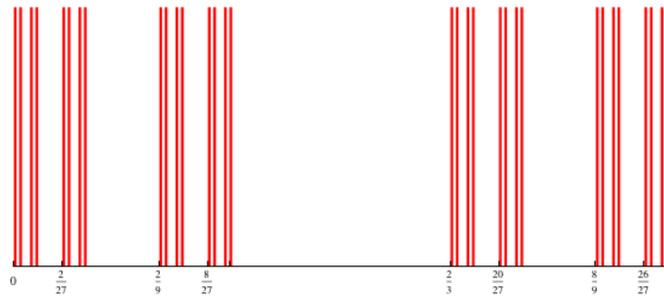


Figure 2. A representation of the Cantor Set after the fifth iteration. The example is taken from the *Wolfram Demonstrations Project*. (<http://demonstrations.wolfram.com/>)

I made a sonogram of the piece. It resembled the derivation of the Cantor Set shown above, except that it shows the characteristics of the Set in much finer detail than the fifth iteration. I looked more closely at the spectrum (see Figures 3 and 4 at the end of the article).

I found evidence of the formal influence of the Cantor Set at many temporal levels of the piece: the large-scale form (the second iteration), the articulation of the first and last large sections (third and fourth iterations with suggestions of a fifth iteration, although the Fourier transform is not precise enough to be absolutely certain), and of course the nearly ubiquitous presence of ‘Cantor Dust’ (‘Cantor Dust’ describes the condition of the Cantor Set after a large number of iterations). My analytical tools did not allow me to demonstrate a derivation of the ‘dust’ – technically the result of granulation – related to the Cantor Set, but I see no reason to doubt that this most characteristic aspect of the composition is not somehow related to the Set. The Set’s influence can be seen in many non-formal aspects of the piece as well, like the two resonances between about 7.5 and 9.5 kHz which are present through much of the piece, or the placement of formants in the lower frequencies of the noisy sound during much of the piece.

The Cantor Set presents one formal difficulty: the long ‘empty’ space in the middle. Di Scipio divides the space into two nearly equal parts by recalling the first ‘lightning sounds’ of the piece. The first ca. 25 seconds of ‘dust’ at the beginning of the work seem not to be part of the Cantor Set form at all but rather an introduction to the piece’s sound-world, and the final section seems to introduce a formal asymmetry by being somewhat shorter than the first, although the empty space at 390 seconds may in fact be an ‘erasure’ of originally planned music: in this case, first and last sections would correspond to each other. The ‘perforation’ of the final section, beginning with the silence at 390 seconds, adds an asymmetry to the piece which I find surprising. At the same time, it is, so to speak, the only ‘personal’ moment of the piece, a disturbing development, as though the machine were running down. (In fact, I think the perforation begins exactly at the middle of the piece, where the left and right channels seem to have different temporal patterns, even though the sound material is the same. I have not carefully checked this impression.)

Listening to *L’Insieme di Cantor* without recognizing the Set itself is certainly very satisfying: the sounds are so exquisitely worked out and the distant, non-corporeal tone of the music transports the listener in a very special world. But if one follows the lead given by the work’s title (the title of an earlier version of the piece was *Paesaggio scalare* (Scalar landscape) which refers to the scalability of fractal entities like the Cantor Set), one comes to understand in a much more complex fashion the role of the form in this composition. The sounds in their distant abstraction are simply the bearers of the work’s structure; the meaning of the piece articulates itself in the music’s form. *L’Insieme di Cantor* does not describe the Cantor Set; the music *is* the Cantor Set.

Una Carta by Eduardo Kusnir presents us with a very different situation. The very first sounds awaken immediate associations: they seem to be calling someone (perhaps in vain? – there seems to be no answer). All the sounds in the composition are exquisitely worked and chosen. They speak eloquently of the care and love invested in their making. The tone of the piece is intimate and personal. The movement of the music is almost always slow, the envelopes of the sounds, with a few exceptions, gentle and without aggressiveness. The sounds are all quasi-harmonic, with clear partials and very little noise. Most of the music is high in range, giving the piece a feminine quality. (*Una Carta* is part of the cycle *Lily*; the letter is – presumably – written by Lily.) The first low sounds are placed directly in the middle of the piece. A few short, quasi-instrumental sounds punctuate the second half, and only towards the end of the piece do two loud, rather noisy, low and disturbing sounds significantly darken the gentle melancholy which characterizes the composition. The composer’s voice at the end, reading what seems to be a coda to the letter, is both surprising and moving:

Te escribo esta cartita
para decirte que estoy bien,
y para contarte
lo que te conté.
Non te dije que viajo mucho...
y que te adoro.

I write you this letter
to let you know that I am well,
and to tell you
what I told you.
I didn’t say that I travel a lot...
and that I adore you.

This is a stunning text, where the contrast between the rather distracted, casual, almost foolish tone of *y para contarte / lo que te conté. / Non te dije que viajo mucho...* and the enormously focussed confession of what follows takes one’s breath away. The change of apparent speaker and of vantage point, and the gently ironic quasi-instrumental music at the very end leave one much less certain about the sense of the piece than one expected to be.

Those are first impressions. More specifically now, how does the music’s form contribute to an understanding of the its meaning? Let us look for a moment at the sonogram of the entire piece. (See Figure 5 at the end of this article.)

The sonogram looks much sparser than the music sounds because the sonogram has full frequency resolution to show the importance of high frequencies in making the sounds. One can see clearly the episodic character of the music, usually with one or two repetitions

of the last texture after a new one begins. The movement of the music is relaxed and informal, one episode leading to another with no obvious logical or emotional reason, often repeating an element or elements from earlier. The repetitions are not of structural importance and do not extend over the entire duration of the piece (so, for instance, there is no recapitulation). They seem to enter irregularly and give the music a conversational quality: ‘Oh, and I forgot to say before . . .’ One can also see clearly the entrance of the first low sound in the piece, a low *C*, at 4 minutes 4 seconds, exactly halfway between the beginning of the piece and the entrance of the speaking voice at the end. The low-*C* episode lasts 70 seconds. One can see clearly the three appearances (from 6 minutes 18 seconds) of a short, disquieting organ-like sound. Then there are two other low sounds and the two worrisome sounds shortly before 7 minutes 50 seconds. These sounds, which differ greatly from most of the other sound material in the work in harmonic structure, range and envelope, are responsible for the darkening of the music’s mood after the middle of the piece.

It will clarify these details to look at the sonogram in larger scale (see Figures 6a-6c at the end of this article; the upper octave of the spectrum is missing in order to have more detail in the lower frequencies). Figure 6a illustrates the succession and overlapping of episodes, as well as the repetitive nature of each episode. The opening motif is repeated several times after other episodes have begun (and ended), the last time at about 3 minutes 14 seconds. Figure 6b shows the low-*C* episode; greater magnification shows the harmonic structure of the low *C*, and one hears the *C* alternating with the fifth *A-E* so that a-minor is also present. One also sees that the low *C* provokes considerable non-harmonic middle and high-frequency activity. Figure 6c shows in greater detail the three organ-like sounds with their quasi-harmonic structure. One also sees after 6 minutes 30 seconds three more low sounds (magnification shows harmonic structure with perturbation of some partials); all have the pitch *A*, a minor third lower than the low *C* of earlier. One sees the two disturbing sounds with their half harmonic, half inharmonic structure, the speech and then the final ironic sounds. In particular, the fall of a minor third from *C* to *A* contributes strongly to the sombre tone the music increasingly takes on towards the end of the piece.

The spectrum gives us much information about *Una Carta*, but to understand the form better, we should look at the piece’s harmonic structure. The use of so many pitched sounds allows us to do so easily. Figure 7 show the first ca. three minutes of the piece with the principal pitches written in. At the beginning, the harmonies are related to *a*; the long passage from about 1 minute 5 seconds to 2 minutes 5 seconds emphasize *a* as tonic. From about 1 minute 30 seconds the *g-sharp* changes enharmonically to *a-flat*, and an f-minor harmony is built up. Figures 8 shows again the entire piece with important pitches written in. Around minutes 5 seconds a *b-flat* comes to the *f*, and while *f* remains the predominant pitch, it is ornamented by *e* and *f-sharp* in a higher register. Then, exactly in the middle of the piece, begins the episode with the beautiful low *c*’s. In the middle, an a-minor harmony emerges, but the episode concludes with the low *c*. An episode of

nearly 50 seconds' duration brings a glissando-like sweep from *g-sharp* to *f-sharp* (*g-sharp* is the leading note to *a*). The organ-like sound mentioned above (the minor sixth *g* and *b-natural*) interrupts and leads to the final low *a*, whose gentle cadence is interrupted by the two disquieting sounds spoken of before. After the reading of the text, the silly, ironic coda, whose function it is to lead away from the strong emotion of *y que te adoro*, in fact leads away from the tonic to finish in b-flat or g-minor with the notes: *b-flat*, *b natural*, *b-flat*, *f*, *d*, *b-flat*, *g*, thus concluding with a minor third ('yoo-hoo'), just as the piece began. The formally decisive passages (the low-c episode and the final low *a*'s) would certainly not have the weight they have were they not placed in such a strong harmonic context. The low *a*'s seem so final because they represent a fall from the low *c*'s, but even more because *a* is so clearly the main tone of reference in the piece.

Finally we must think about the role of the spoken text for the form of the piece. The best way to do this is to imagine the piece without the text. Without the text, we would hear a beautifully worked out lyrical work which moved slowly from the bright *f-sharp*, *d-sharp* (*nota bene* minor, not major third) to the sombre low *a*'s and the disquieting sounds of the end. We would not know the contents of the letter, nor the reason for the darkening of mood. The spoken text is a coda, spoken after the letter was written. After the coda, we still don't know the contents of the letter (*y para contarte / lo que te conté*), nor do we know why the music's mood has changed so strongly. We do not know under what conditions the text can be spoken to the person to whom the letter was written (or is the writer speaking to herself?). We learn of the adoration of the writer for the addressee. But the mysteries have multiplied, rather than diminished. The spoken coda raises the stakes, so to speak, but leaves the listener less sure than before about the meaning of the piece. The extreme emotional focus given by the text doesn't help us to understand anything in an every-day sense, but it does make us understand everything in a poetic sense. The coda, as sometimes with Beethoven, brings us essential new information about the music we have just heard. Without it, the piece would be lovely but rather distant. With it, the work is still lovely, but it becomes personal, mysterious and heart-rending, even if one cannot explain why.

Hälsningar från Syrenbersån (Best Wishes from the Lilac Grove) by Lars-Gunnar Bodin is the longest of the three pieces considered here. Bodin writes about the work:

In Swedish [syrenberså] means a rather tiny grove, more like an outdoor room (without a roof) where the lilac shrubbery form[s] the walls. ... My grandparents used to have one when I was a kid. For me it is a kind of metaphor for summer ... and a non-problematical life-style. ... My hope is that this piece will radiate something of the same relaxed feeling and contemplation you may experience when visiting such a room.

In fact, the piece is contemplative in nature, although it seems to me far less relaxed and non-problematic than the composer suggests here.

The work is composed of many single phrases played one after another. In their succession, the phrases are mostly unrelated and isolated from one another. However, although nothing is ever exactly repeated, there are families of similar sounds. There is often silence between two phrases, and there is no clear development in the piece, no strong increase in tension, no revelation at the end, as with *Una Carta*. The sounds are very clear and precise, and although they are exquisitely crafted by the composer, they have a cartoon-like quality to them which despite their beauty and interest keeps them at a certain distance from the listener. The piece begins with four regular ‘beats’ and ends with six regular ‘beats’. Otherwise, a first listening suggests little that could help describe the work’s form.

Further listening let one distinguish families of sounds that re-appear sufficiently often to be considered motifs: the (usually) four regular beats of the beginning, a mechanical tremolo-like music, musical phrases that seem to speak, long held soft chords forming a background contrasting with the often energetic or tense foreground (this background, rather like the noise of the universe left over from the Big Bang, is present for over half the duration of the piece). Almost all phrases begin in their highest states of energy and either continue mechanically in this state or die out. Almost nothing builds up. Many of the phrases immediately awaken associations with physical actions or, more frequently, with social situations (doubt, shyness, many people speaking together, etc.). Soon it seemed clear that the piece was bipartite: a similar bubbling up of hysterical voices ended part one (at about 5 minutes 10 seconds) and part two (at 10 minutes 20).

The formal ordering of the music is rather more elaborate. Figure 9 show a sonogram of the entire piece. The numbers in circles refer to six different motivic elements and show their placement in time in the piece. The sonogram shows that after the middle of the piece elements 1 and 2 signal the beginning of the second part. Then the motivic elements are presented in reverse order until the end of the piece, when element 6 is presented much more flamboyantly than at the piece’s middle. Finally, the very first motif of regular beats closes the piece, in groups of two plus two plus two. At the beginning of the work, the final beat of the first group was lengthened by reverberation (a frequent motif). At the end, the final beat is almost immediately damped, as though willfully cut off. The resulting formal shape is mirror symmetry, a symbol of stasis and stability.

The individual phrases are very different one from another in their expressive and associative intent, and in general the ‘temperature’, the general tension, of the music remains much the same throughout the piece. Even so, there is a slight tendency to development in the course of the piece: The number of ‘beats’ in the motif 1 increases from four at the beginning, the final appearance of motif 6 is more extensive than the other time, the coloring of the sounds in the second half of the piece is possibly rather more sombre than in the first part, but these are only slight nuances, offering at most a gentle counterpoint to the stasis of the formal symmetry.

Hälsningar från Syrenbersån has a complex formal shape. A large number of individual musical phrases succeed each other, sometimes with silence between them, sometimes against a distant background of soft chords. Although the order of the phrases seems informal, like fragments of memory that come unbidden to the surface, in fact they have been fit into a firm mirror symmetry so attenuated that we need to look for it to notice it. At the same time, factors suggesting a more dynamic kind of formal organization, they too very attenuated, lighten the heaviness of the symmetry.

A more complete analysis would devote much time to discussing the sounds themselves and to illustrating their many layers of meaning. The most puzzling aspect is the cartoon-like quality of the sounds, but I understand this as keeping us at a certain distance from the sensuous directness of the sounds, as well as giving the work as a whole a lightness and apparent cheerfulness. The silences between the sounds suggest loneliness, and the distant backgrounds of chords may stand for lost activity and lost life, present only in memory. The four (three, five, six) beats of the principal motif seem to belong to some ritual act, perhaps that of remembering, and the freezing or dying out of most sounds seem to suggest that the sounds are not representative of life themselves, but only come to life for a moment through being called into consciousness. Such interpretations seem subjective, of course, but only by such speculation can we approach the meaning of this mysterious music, which manages to convey simultaneously such melancholy and such gaiety.

But our task here is to reflect on the piece's form. I would suggest that the form of this music is absolutely essential to the meaning, giving the work great stability while allowing for a breath of dynamic development. Bodin manages to attenuate the strong and complex formal plan to such a degree that one only becomes aware of the work's shape by paying special attention to it. The strong, stable form of the composition keeps the melancholy which pervades almost all the sounds from becoming overwhelming. As the dynamic formal elements contribute a counterpoint to the stasis of the symmetry, so the work's emotional meaning too remains in balance, sombre and yet bright, nostalgic and yet gay, melancholy but yet cheerful and without regret. That the final six 'beats', this motif which has taken on such meaning in the course of the work, leave us pensive and yet content, is a feat of the work's formal articulation. Despite the gentleness of the conclusion, the damping of the final cymbal reminds us that we are in the present, not the past, and that the beauty we have just experienced is in our imagination, not our reality.

Illustrations

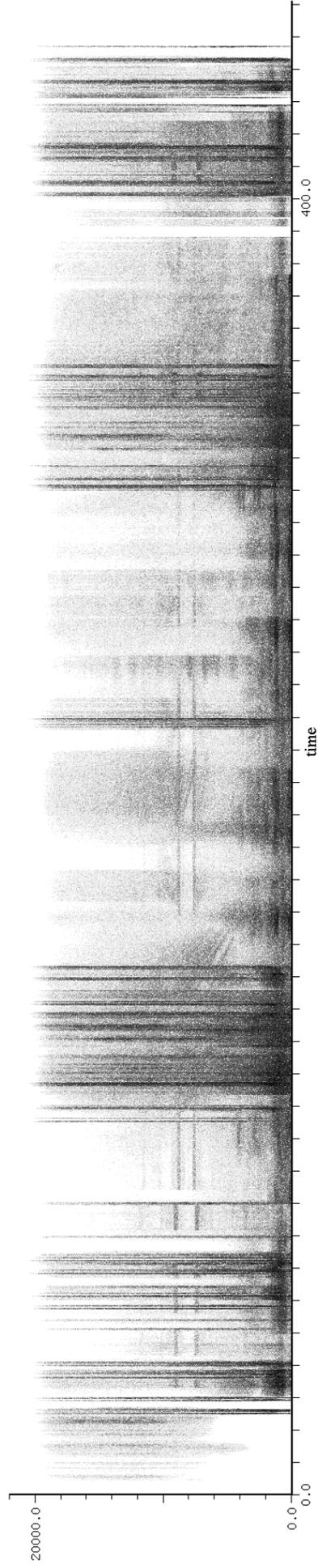


Figure 3. A sonogram of the entire composition L'Insieme di Cantor by Agostino Di Scipio. The vertical axis represents frequency (0 – 22,000 Hz) and the horizontal axis represents time in seconds.

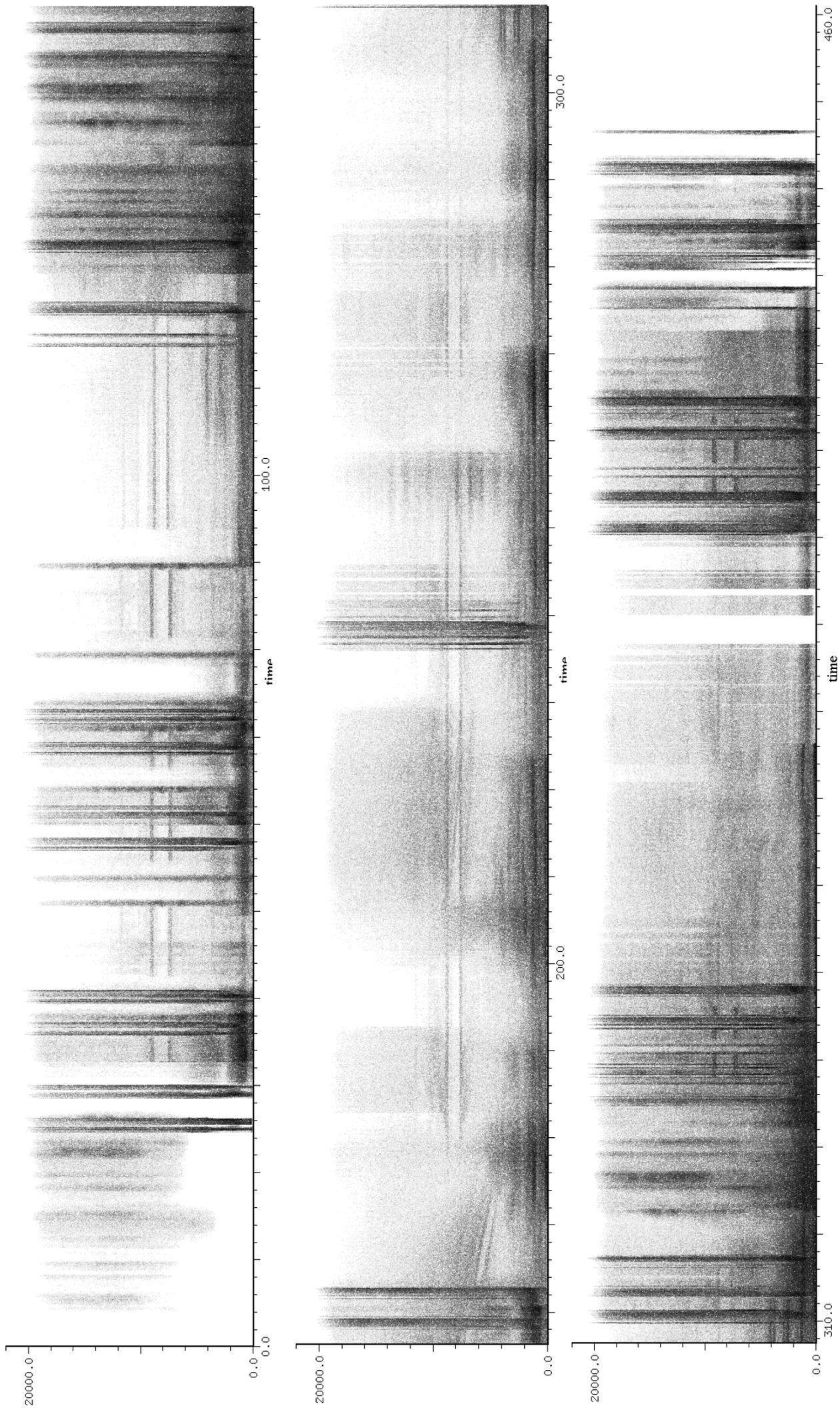


Figure 4. The sonogram of L'Insieme di Cantor in larger resolution. The axes have the same values as in Figure 3.

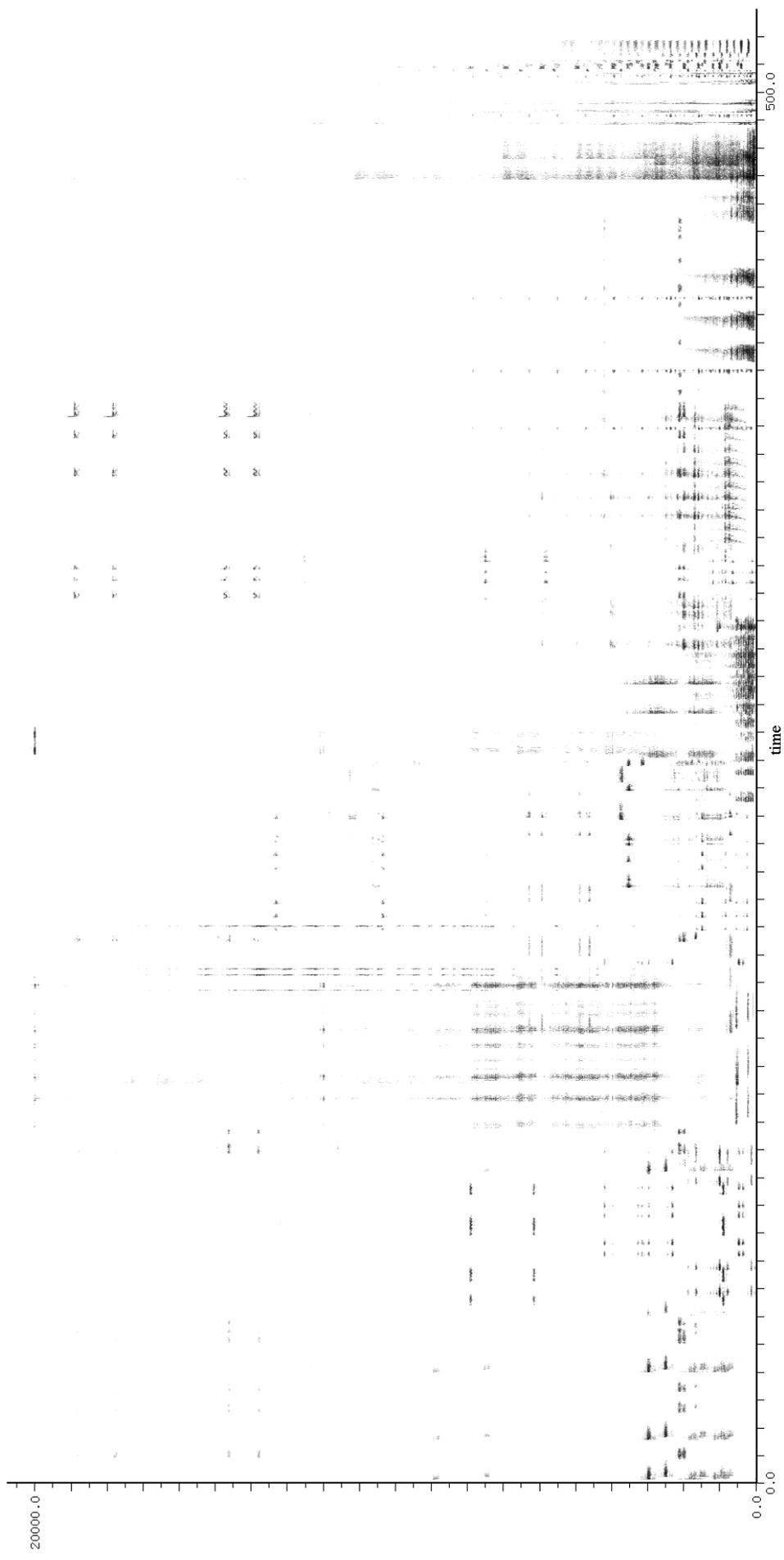


Figure 5. A sonogram of the entire composition of Una Carta by Eduardo Kusnir. The vertical axis represent frequency (0 – 22,000 Hz), and the horizontal axis represents time in seconds.

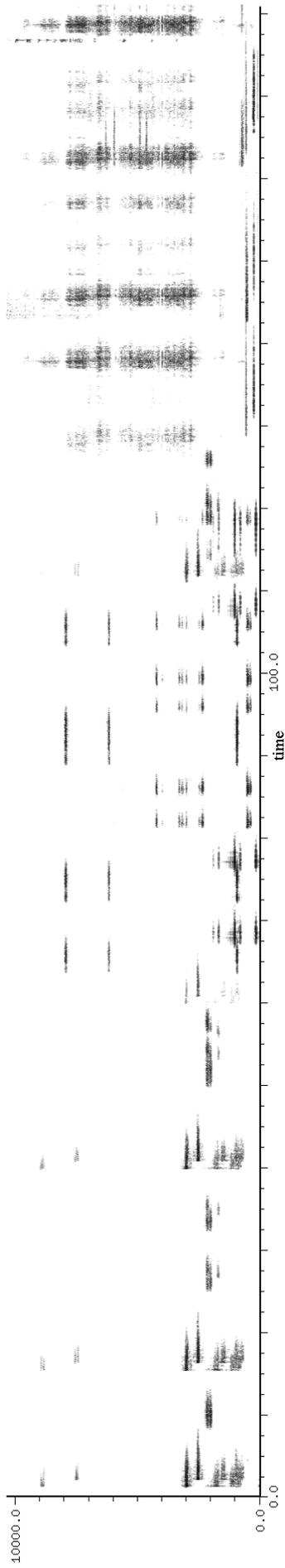


Figure 6a.

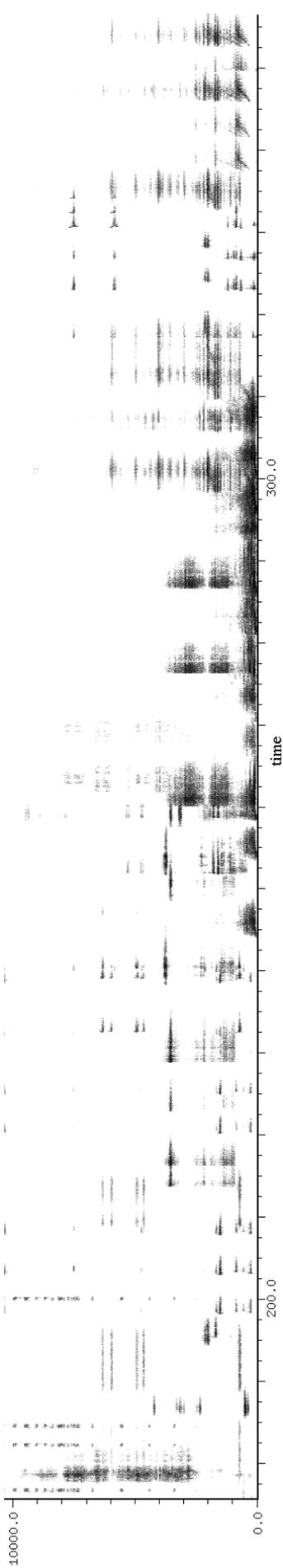


Figure 6b.

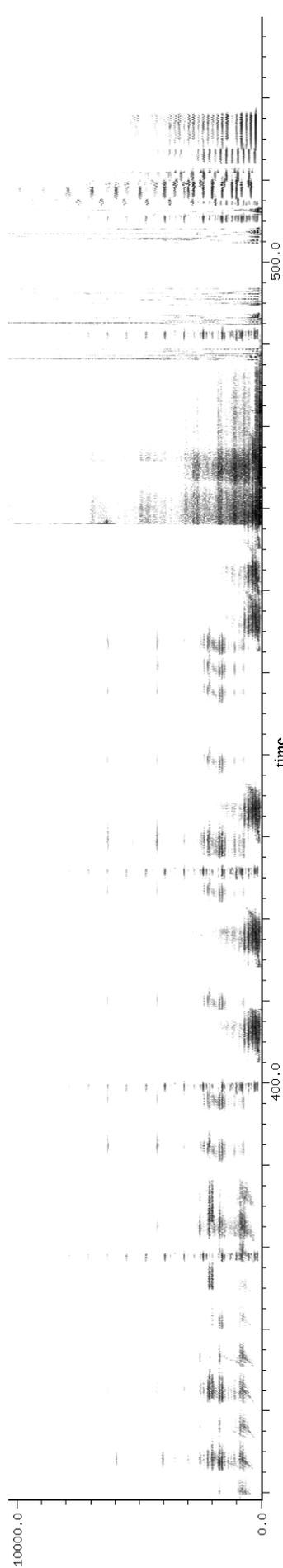


Figure 6c. Figures 6a-6c illustrate the spectrum of Una Carta at higher resolution. The frequency axis extends only to 10,000 Hz in order to give greater detail at lower frequencies.

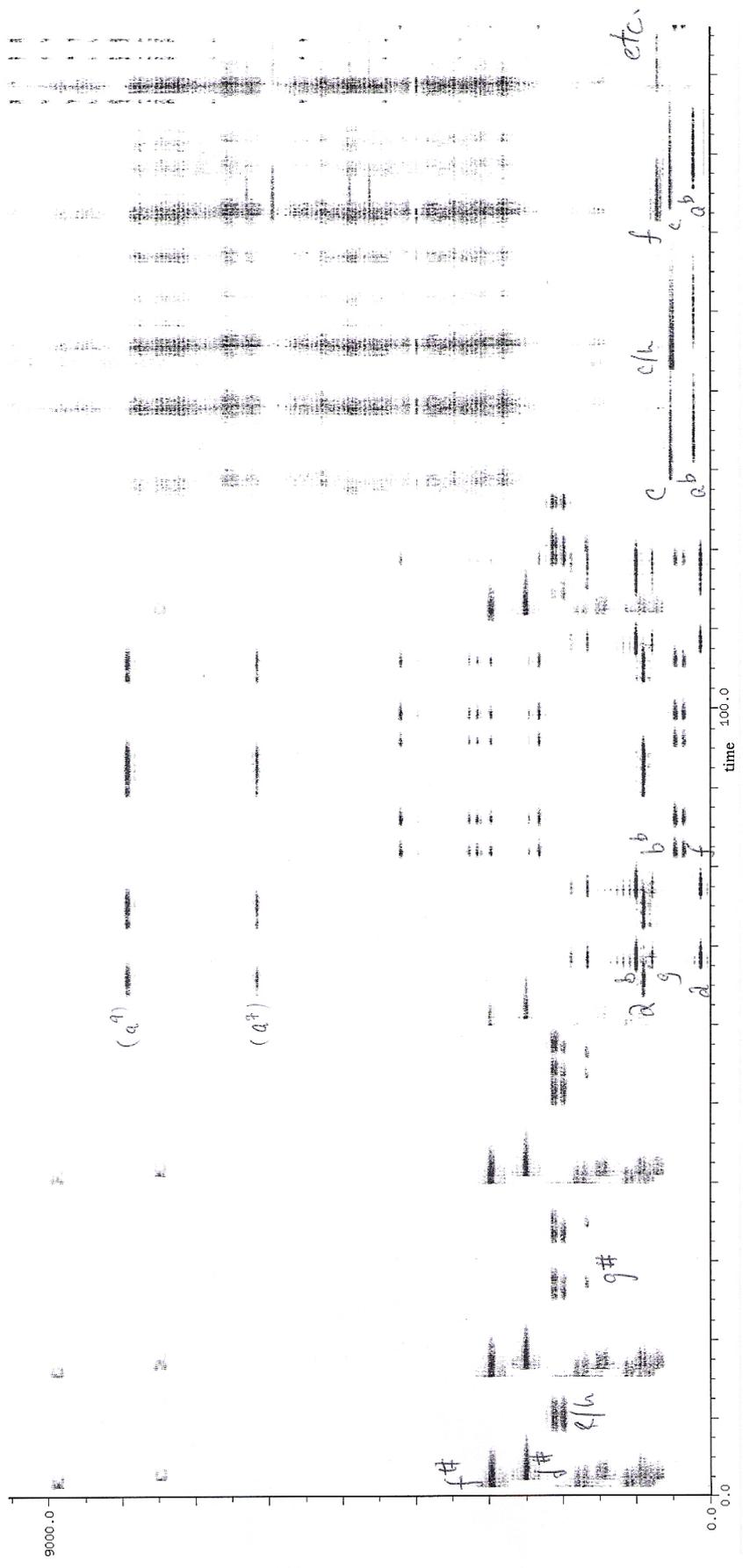


Figure 7. A sonogram of the first three minutes of Una Carta showing the main harmonies and pitches.

