

Analysis in Electroacoustic Music:

Fábrica - a Structural Analysis

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The analysis of electroacoustic music poses certain problems unknown in instrumental music. In general, scores as we know them from instrumental music do not exist, and plans of realization, even if available, would not help, because there is no common language of notation. Every composer has his or her own way of producing a piece in the studio. We are left to find compositional contents and structural relationships simply by listening to the music. But analytical listening is further complicated by another problem: the immense variability of sound, one of the most important aspects of electroacoustic music. Structural and thematic coherence are easier to recognize in instrumental music because we generally have more experience with conventional music genres. While listening to a piece, we can immediately begin to search for structural relationships and musical contents without being distracted by new sound characteristics. Even the instrumentation itself can easily be recognized as an aspect of compositional structure.

The liberation of sound and in a sense of structural constraints in electroacoustic music have the disadvantage of making it more difficult to identify otherwise obvious musical and formal aspects. Since it is possible to reach an extraordinary degree of virtuosity in composing electroacoustic music, to invent new *orchestras* in every new piece, as well as to develop new harmonic sound spectra very different from traditional ones, the perceptibility of musical structure becomes more and more speculative. One danger seems evident: a compositionally brilliant piece may hardly be understood by the public – even by specialists – because they are not accustomed to the sounds. This leads to listening *along* the music without discovering general formal aspects; we follow the piece from one musical event to the next, and any kind of discussion often stagnates in superficial descriptions. We are required to handle a huge amount of musical information and we do not have access to a general language that would enable us to specify the characteristics of an electroacoustic piece more exactly. The composer's responsibility regarding the perceptibility of his piece by an audience seems to be greater in electroacoustic music than in instrumental music. The composer must be aware that this new “orchestra” is familiar to him and perhaps to some specialists, but probably not at all familiar to the public.

Despite this difficulty, I still have the impression that it is possible to recognize good electroacoustic music. I think that the paths leading to analysis are often more traditional than usually assumed. In no other kind of music is the discrepancy between the technical aspect and the musical content so large. In a way this is comparable to twelve-tone composition, where a brilliantly structured musical phrase does not necessarily provide an extraordinary musical experience. The same applies to electroacoustic music: the use of a fantastic sound or a special computer music program may support the compositional process, but it cannot automatically provide a composition of high quality. It could be that being dependent on our ears while trying to analyze an electroacoustic piece is an advantage in that we must use our general music experience, intuition, and sensitivity in discovering the structure of the piece. It is commonly known that formal analysis can only describe the surface but hardly the emotional contents of a piece of music.

An analysis of my composition *Fábrica* provides an example of this situation. I can describe the systematic context regarding sound and structure, the development of sound and motive, the inclusion of space and timbre to a main concept. This provides a sensible arrangement of the material and hopefully continuity of musical expression. However, I cannot describe or explain the emotional contents, all the intuitive decisions I made during the realization, or all the associations which arise when we hear sounds that are strange to the musical world.

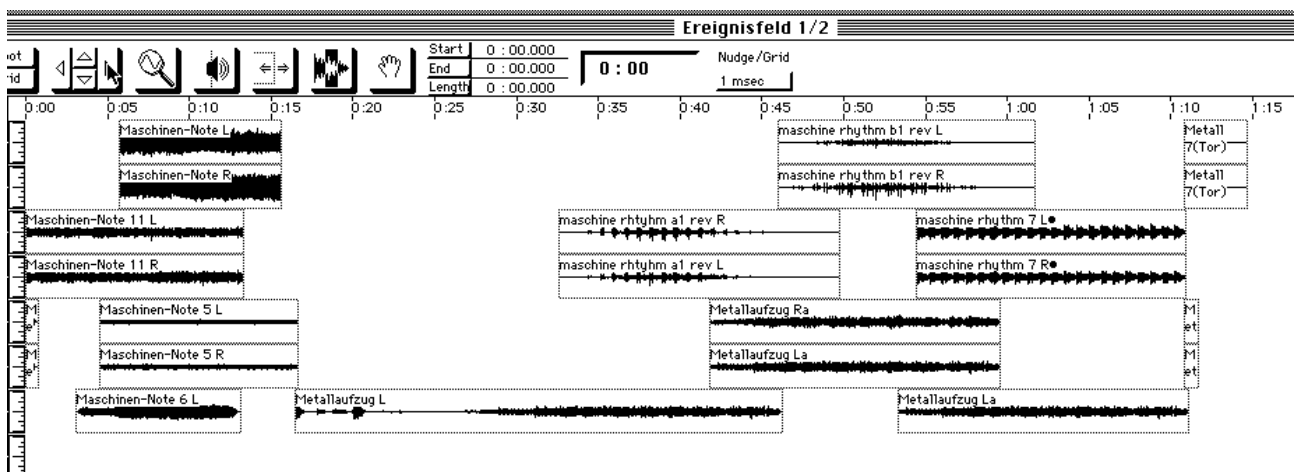
Fábrica is a composition using machine sounds and sound atmospheres from industrial plants, which I found and selected in a studio for *Hörspiele* (radio plays) in a radio station. My goal was to find musical and structural connections between this sound material and its transformations. I used only cutting and collage techniques to discover new sound structures based on bits of the originals. This provided fresh thematic material without sacrificing its basic sound character.

Fábrica has six parts and an introduction containing a little *theme* which becomes important for the piece in the main structure:

| | | | |
|--------------|---------------|-------|--|
| Introduction | 0'00"-0'17" | 0'17" | <i>Theme</i> (four pitches from atmospheres) |
| Part I | 0'17"-1'11" | 0'54" | <i>dramatic element</i> , industrial elevator |
| Part II | 1'11"-3'27" | 2'16" | <i>virtual machines - background</i> |
| Part III | 3'27"-7'49" | 4'22" | original atmosphere – <i>theme</i> and variations – original atmosphere |
| Part IV | 7'49"-10'38" | 2'49" | atmosphere/attacks – <i>machine counterpoint</i> – atmosphere/attacks |
| Part V | 10:38-14'37" | 3'59" | varied <i>theme</i> – <i>virtual machines</i> – atmosphere |
| Part VI | 14'37"-16'45" | 2'08" | <i>dramatic break</i> – varied <i>theme</i> – <i>virtual machines</i> – atmosphere |

Pitch transformations, variations in time (*time stretching*), artificial reverberation and room simulations are not used. The four *notes* of the *theme* at the beginning (*Maschinen-Note*) originate from sounds from four different machine halls with different main frequencies. These notes are the only defined pitches used later for the basis of motive variation.

Part I has a dramatic task: It introduces us to the world of machine sounds while using an industrial elevator (*Metallaufzug*) which passes through three machine halls (all the machines in the halls have the same tempo) and a large metal gate (*Metalltor*) at the end. This trick clearly illustrates the origin of the sound material, suggests the beginning of a musical journey, and heightens the expectations for what follows:

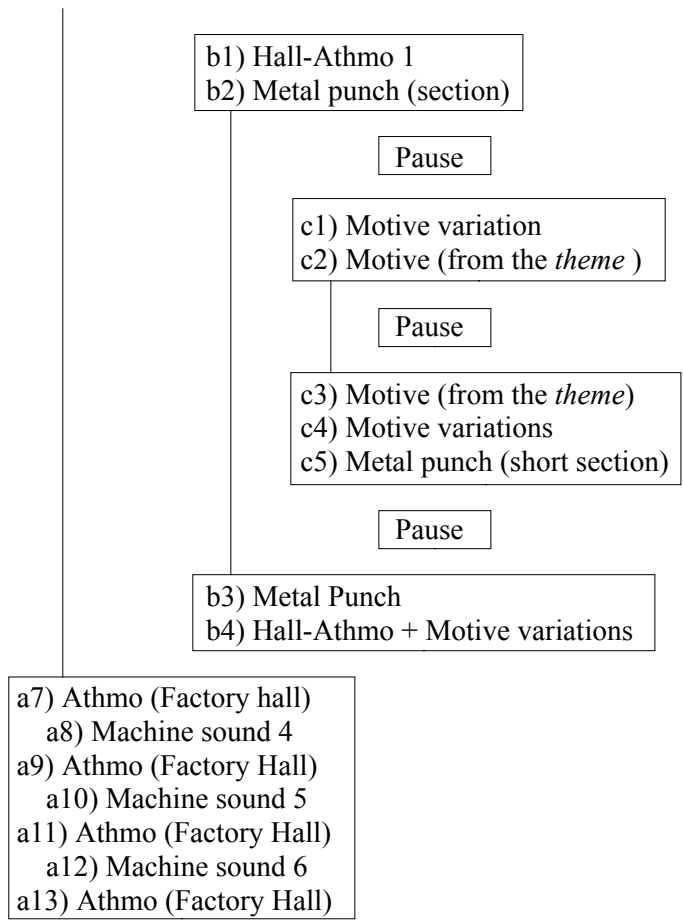


The structure of the following parts is cyclic. All parts except Part II have three sections, which form a musical unit regarding sound material and duration, and which are generally arranged symmetrically. These are the larger scale musical connections:

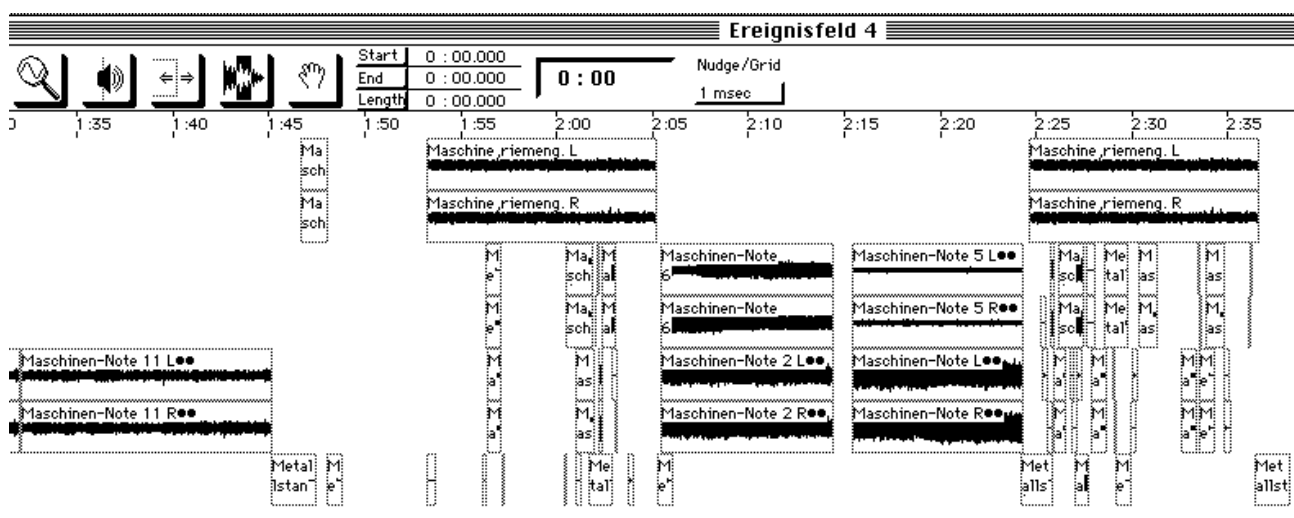
- Part II contrasts complex rhythmical motives (*virtual machines*) with a static background sound. This musical situation is also used in Part V and Part VI. A cyclic development with the climax in the center supports the symmetry in respect to time. These motives are understood as a formal connection between Part II and Part IV.
- The cyclic evolution in Part III contains variations of the *theme* (Introduction):

Fábrica Part III

- | |
|---|
| <ul style="list-style-type: none"> a1) Athmo (glass blower) a2) Machine sound 1 a3) Athmo (glass blower) a4) Machine sound 2 a5) Athmo (glass blower) a6) Machine sound 3 |
|---|



- The pause in the middle is the axis of symmetry of the composition: the arrangement of the elements is mirror-like in respect to time and sound material. Small variations are caused by the musical context.
- Part IV is also a variation of Part III: An evolution is surrounded by two original sound atmospheres and a polyphony of sound is implemented. A huge machine with metal sound and a random rhythmic structure leads to an aggressive climax at the end (*Maschinen-Note 11 + Metalstan.*) of the first section. Then, after a pause, another structural symmetry follows: the *theme* from the introduction is set (with a short pause in the middle) is surrounded by a polyphony of rolling, ostinato-like machine sounds in the background and short motifs in the foreground:



Many structural rules like this exist in the piece, and an analysis of all of them is too ambitious for this article. Of main importance is the contrast between a certain liberty in the selection and combination of the sounds and structures, and a *classical* main format of the entire piece and its parts:

- Variations
- Motivic development
- Polyphony

Musical development is supported by:

- Dynamics
- Increasing/decreasing complexity in musical structures
- Density
- Contrasts
- General change of sound

Then:

- Ostinato (Part IV and V)
- Pedal point (Part II, V and VI)
- Motivic original sounds (ex.: metal punch in Part III and V)
- Musical gestures (built like *melodies*, but not with pitches)

Original atmospheres of industrial halls and workshops can be found throughout the piece, beginning with the symbolic introduction in the first part of *Fábrica*, where the opening and the closing of the metal gate enclose the elevator. They interrupt the context like *windows* not as a contrast, but rather to support the musical environment. The change between original and transformed elements enables the two to merge and become unified.

For me it is very significant that the use of original sounds for musical structures provides a change of meaning. Already the *theme* with its four pitches is understood as a musical motive and not simply as a quote of four sound atmospheres, where they come from. The same situation can be seen in all the collage-based gesture motives: starting with the extracted bits of the original sounds, I could compose fascinating rhythmic passages as in instrumental music. I could also use musical principles of composition without being afraid to leave the sound world of the piece, and the relationship between original sound and artificial structure remains intact. Sometimes the reverse situation takes place: the *windows* described above contain sound structures which can be heard in combination with the surrounding music as being *composed* and no longer as *random* sounds. The resulting music draws its fascination from the constant change between real existing sound and an artificial sound world.