

Interview with Gottfried Michael Koenig (I)

Ángel Arranz: For me this is a very meaningful interview. In my research your music represents a kind of pivot quite important, probably not well enhanced in historical research. For many reasons: one of them is that I find in your work a quite interesting connection between the serial practice and the new expectations, just in the fifties, about working music in such quite different way. Somehow I found in your approach the most cohesive thought. Probably the studio practice was quite fascinated by a lot of composers that try to use it and probably in the less wise way, by using the studio as a sort of 'extended instrument'. But your way of thinking was quite different...

Gottfried Michael Koenig: It was a matter of time, of course. Most composers came as visitors, perhaps a few weeks or a couple of months, sometimes a little more, maybe a year. There was not an standard duration. They could not really get completely acquainted with the equipment and its possibilities, so this was the advantage I had, of course. But on the other hand everyone had his own approach and my approach has been set: you have to find it out by yourself.

AA: I would like to know what are you working now in.

GMK: Oh, nothing special! I have a lot of early written music, but also computer programs. Together with a German colleague, at this moment I am busy reestablishing one of my programs for another platform, another software, namely the SuperCollider program. So this colleague wants to integrate my program into the SuperCollider, so that not only my program can be used in the normal way (the way it is made for), but on the other hand also for translating the structure immediately into sound. The sound library belonging to the program, but on the other hand SuperCollider offers the possibility to program your own sounds and to write them into a given structure composed by the program. So, this is one of the main things I am busy with. My first composing program was called *Project 1* and that is something that is nearly finished in this cooperation. And the second one, *Project 2*, is still in preparation. This is one thing what I am doing right now.

On the other hand, I sometimes compose a piece of music, but not continuously. Last thing I did was *Book for Piano* (Klavierbuch) with a couple of pieces in it.

In the third place I am frequently reading old letters, as to see what I have written over the years and decades even, going back to 1945 or something. I always kept my letters, all the contents of them, and copies of them or whatever. There are also the letters what I have received... So, I can go back quite accurately into many details. That is interesting, but also the relationship with other people, of course: all the composers, colleagues, students, and friends, relatives even... I am reading through all letters and make some extracts sometimes, to have them ready for their inspection. And further on, I am just enjoying life! [Laughs].

AA: Basically I would like to go into this automatic approach in your music. And also, as a sub-point of interest, this inner movement of sounds: how to compose the inner structure of sounds. I would like to develop this calmly along this interview, so there is not a rush here. I was quite astonished myself while reading the Summary Observations on Compositional Theory, about the definition you observed as the composition process, that is: condition - instruction - execution. I was quite inspired as well, in order to really think about the music composition as an issue that is not just written notes, or finding a pre-compositional strategy and then writing down everything, but rather using another tools, for instance, computers or analog studios.

GMK: It was a pre-computer time actually when I wrote this article. This had nothing to do with computers at all, but with the electronic music. But on the other hand, my interest was to see what are the conditions under which you conceive of musical structure and what are the preparations before sitting down and writing things up in the form of a score or in whatever form. Even, when I was a child, I was interested in the way music was made along playing the piano, and of course there were some pieces of Bach, for instance. I wanted to know what could be if all this notes were exchanged. You had a certain amount of eights, quarter notes or sixteenth notes in a certain sequence. Could you make, with the same material, another piece? I had to study both hands separately and play them, only the one or the other hand. My teacher was very accurate in this respect, so maybe that was one of the reasons I was going to ask myself this kind of question: not only taking the piece for granted, but asking myself in what way what was it conceived, in what way was it composed, and why and so on and so forth.

Later, when I started composing myself, I could not take up music before having some idea of what I was going to be busy with: Why to compose music if there was enough music around? There always comes up to this respect the question of self-expression: you compose, you write the poem or the story, or you paint the

picture, because you have something to say about yourself. I did not find anything in myself what I have to say: I was interested in music. Music it was for me an object and I was interested in this object, not in myself. This objective approach was very important vehicle for my approach to electronic music. I did not do music because it says something about me. I was saying something about the sound generator: what we could do with it. In which way you could find a connection to the existing music: the music scene, the music history and the music life. And there is the public, there is an audience; you have people to listen to music. I do not know what they want of music, what they hear when they listen to music. I have not idea. But I see all the people around sitting and listening to the music, so they are getting something from it. Even I do not know what it is, but it is musical. So, this is a way of contacting other people, like the baker: he makes bread for them. He does not eat himself: that is for them. So, the music I do not make for me, but for them... [Interjecting himself] Actually this is not even true, because I do not know what people expect of me! I only know myself (as a listener) that no one is expecting of myself. So, in this way (and I think that is very common to other composers as well), what you are composing is the first line what you would like to hear. But other composers are not prepared yet, so you would have to do it for itself. So, I am composing the music nobody else is doing for me.

AA: *At a certain point, there is a special moment in your developed career: you started to think on numbers, instead of notes.*

GMK: I am not that so sure of that numbers are very easy way of indicating notes. I do not think that numbers is such an important thing. When I told you about my experience when I was a child at the piano, numbers were not a state; I do not think so. Music was a very complex phenomenon, which I had to travel to dissect to find out what is made of. The complexity was the first impression and the fascinating thing, but on the other hand the problem you have to sort out (otherwise you could not compose it if you do not know what are you doing), it was the pass of the complex as an objective experience. Numbers that came into my mind became important (I think not before electronic music studio), where you could not say: "Give the note F, E or B", but give me the frequency (because that is a concern of the generator). You really found out easily the relationship between the numbers and the notes; that is not difficult. It is very simple to handle numbers, instead of notes. Notes come up. Just, when you use numbers, the notes come out.

AA: *I mention this because I have read something in Kees Tazelaar's book, On the Threshold of Beauty, where he mentions something about it. Probably while you were working in the Project 1, something changed in the way of looking at composition.*

GMK: Do you mean my look at the composition? Or other way around! Because of my special look at composition, I decided to make *Project 1* (because *Project 1* actually came not out of music). It was not a musical problem that I thought could better solved by computers, because in those days computers were not available at all. So I studied computer technology... [Interjecting himself] It is not correct what just I said, because during the work together with Karlheinz Stockhausen at the Cologne studio, there was a moment when I thought that the Stockhausen studio could be better with some mechanical means (the computer, for instance). But on the other hand, I did not know exactly what a computer was. It was called in those days 'electronic brain' (*elektronische Gehirn*). It had something to do with thinking processes.

I had a neighbor who was a professor at Bonn University. I showed to him a score for electronic music from my piece *Essay* and said: "I am sure you have composed it with the aim of the computer!" Because there was a kind of regularity, structured things that I had written with that idea. I have just composed it: pencil and paper. "Or that you have printed your score with the computer!", because it was neatly printed. I said: "No, I did just use my typewriter for the whole score, nothing else". He said: "It was looked like the one of someone who may be interested in computer music." I said: "I am interested". And he said: "I will give you this one". And he gave me a little lift-off about the computer language Fortran (Fortran was in those days); just to give me some examples, some insight into what I could expect to be written with the computer. I found written something like: $i = i + 1$, a very normal computer instruction. This is a kind of equation, but nonsense: i can never be $i + 1$, it is not the same thing. This is not my work; I would never find my way in this equation or kind of mathematics. Until I understood what it meant. That is 'not equals to', but 'becomes'. I became interested a little more. Then I had a friend at Bonn University and there were a course on computer technology, which was for professors and students. So I started to study this stuff, just to find out what is a computer: what you can do with it, what would it be useful for music. Because there was not a base between music and the computer; they had nothing to do with each other. In those days, you had never heard such as a computer before. Of course there was a possibility to write your own program, test it at the computer and ask the professor if you could use some examples and some programs for music. And he said: "They are written in the books". And you said: "Oh, yes, very nice!" So I wrote little programs for music.

At the end of this process, I thought it could be interesting to find out how sets of rules work out if you get them into the computer. Because in those days, or in the days before even (I am not talking about the year 1963 – 64, but ten days before), in the Darmstadt course there was only this question of making rows (only integer rows, like twelve-tone rows) and permutations to compose with them, as other composers like

Stockhausen, Boulez, Pousseur... All those composers talked about serial music: Berio, Maderna... That is very nice to have a certain given rule to compose the music. But it would be nicer to test the rule before it is played. I used the computer actually as a testing tool for musical conceptions: rows, permutations... things that I applied to different parameters. That was actually my idea: a testing station.

AA: Yes, I get the point.

GMK: The composers at Darmstadt at least were taking about this direct point. I remember Pousseur editing theory on sets of permutations. It is a nice strategy, but sometimes if it went wrong, then you had to do a retraction according to the set you tried. And I thought: "OK, it would be interesting to know what happen without this correction". To know what kind of rule according to which to compose: what will be in its natural state, so to speak. And not only twelve-tone music was concerned, but the same was for all kind of music. [Exclaiming] Because you cannot write a note before knowing what are you doing! You must set some kind of planning, some kind of idea: some kind of objective. And what is it? What does it make you writing the second note after the first one? There must be some connection; you must have thought of that. There must be some objective: what is allowed, what is not allowed; what is true and what is false; what is good, what is bad.

There is a conception behind it, a kind of rule setting. So, I did something where to work too. I called this rule, according to which you are acting: rule, objective, wish... some bigger item, entity, set of conditions or whatever it is. And I thought that all that thinking, all these possible combinations and conditions, are very difficult to do. So, it would be nice to have some mechanical machine that could do it for you, like calculating. I did not think of making music with it. I just wanted to test conditions for it.

AA: But it was very nice to find this intermediate space for composing, even in those cases you have not availability for computers. If I am right, it is not until 1971, Institute of Sonology in Utrecht you have not this PDP-15 computer.

GMK: No, we had other ones at the computer center in Utrecht.

AA: The *Electrologica X1*?

GMK: Yes, the *Electrologica X1* and *Electrologica X8*. Before that, I had a computer in Bonn University, so I was in touch with computers since the autumn September 1963, when I went to Bonn.

AA: So, it probably took several weeks or months to implement *Project 1*.

GMK: That took some time, because I did not have immediate access. It was not on my table. I had to work at the Computer Center hanging in some sets of pitch class, and then wait for a week or so, therefore I could received some notes.

AA: So, it was this kind of craftsmanship!

GMK: Yes, yes...

AA: I find quite important other things you mention. There is a very important term you say, that is chance. It was arising all the reflections. When you talked about composition (algorithmic composition) or electronic synthesis (electronic music), chance is a capital concept in your conceptions. In those times you are describing, the Darmstadt years, chance was used probably as a quite systematic approach, by means of what to do with pitches, what to do with rhythm; what to do with the intermediate state of each other. But I do not find any figure in Darmstadt days that really says, 'Hey, let us stop and try to analyze this in a higher level'. I find this approach of you quite fruitful not for those days, but actually as an access to computer music.

GMK: Yes, I am asking myself at this moment when I had that idea of using chance. As I have said, I was looking for testing rules and the rules given are for twelve-tone rows written down. So as I was wondering there is not chance, I was just thinking them up. For whatever reason, the chance is out of question. Even if different twelve-tone rows, generally, are in contact with each other during a composition with the different parameters, it is not a question of chance: everything is out of necessity. When I took my first contact with the computer to learn the Fortran language, there was not a generator for chance operations. You had to build your own! There were some crazy numbers, like phi, e... but the chance generator was not present: it

was no part of the system. I had not idea that chance could play any role: I was looking for rules, not for chance. I think chance came for the very first time into my mind when I was working together with György Ligeti, because of his *Artikulation* piece.

AA: Did you assist to Ligeti?

GMK: Yes, we did it together. I was his assistant for making the piece when he came to Cologne. First, I was showing him around the pieces of equipment, apparatuses that we had and the way of to handle it, to communicate it. I was composing at that time my *Essay* piece. So, according to what I did in this piece, there is not chance operation. In *Essay*, absolutely not: everything is through the rule. And then, Ligeti started making his own notes preparations for one piece, for which Herbert Eimert had given him a commission. And then he came with a sheet of paper with very meticulously notated different frequencies, time values, loudness values and so on... Everything looked exactly like a preparation for a strictly serial piece of music. Then, we had to produce all these sounds he had notated, even the rests, just leave a take-up: this sound under certain tape so long, that so long... So, everything was like a serial composition with nicely ordered items. And all this was when I said: "Put just them in a shoebox and take it out randomly".

AA: Wow!

GMK: Yes, that was my key: experience, actually! It was my encounter with chance. It was an idea of Ligeti, actually. It was before Cage, of course!

AA: So, first Ligeti composed the score by specifying these intentional materials, this was generated and then finally randomly composed!

GMK: Maybe it was his intention to put everything in that box, I do not know... but it went about it. It looked like the preparation so as to Stockhausen could understand. I was very astonished when he said: "Put it in that shoebox, taking it out, putting them together and then we will see what comes out". After we had put them together and came along all the tape pieces for maybe ten seconds of music, he said: 'Now let us listen to it'. And when you have listened to it, you say: 'Oh, it looks like just some people that are talking to each other'.

AA: That was the idea!

GMK: I remember very neatly that from Ligeti. And after that, I started to use chance myself, because after *Essay* I composed my first string quartet in 1959, maybe inspired by Ligeti. That was before any work with the computer. I think that in such an inspiration (let us try out what can be done when, at a certain moments, you could make a decision for A, B or C: what is a difference, what is better... difficult to say), chance is a nice way of solving problems. If you do not see any quality differences between the different outcomes, let us try what happens (if you like to just let it happen).

AA: And it was a quite important approach.

GMK: Yes, that had me latter for computer programming, because you could not give for any decision rule beforehand. Then that was done by chance, instead of an inspiration: chance is inspiration.

AA: Yes, I have completely the point.

GMK: Did you see what I mean? Otherwise, you just ask another question.

AA: Actually you say a very interesting thing in Summary Observations on Compositional Theory. You say: to compose chance itself and simulate necessity. Probably that is the role of chance. I mean, at a certain point it seems more important to create the conditions.

GMK: That is what I said before. You have to have some kind of objective that leads you on, to do the necessary things to reach that goal. I cannot compose without knowing what I want to reach, which kind of goal. That is a condition, actually, on which the decisions are made. Always inside there is a set of conditions; outside you do not know what will be there. But inside you have given conditions and you could take your decisions. In that way, you have led on, let us say, that makes a kind of necessity, indeed. You have

to follow a certain path; otherwise you will never reach your goal. But on the other hand, I was aware of the fact that if you see the goal before, there are many ways leading to it: there is not only one.

I think later on, together with my *Segmente* compositions, I developed the idea of the landscape, watching let us say from the hill. You see all the possibilities as if you could walk to that landscape. And always you experience a hole: the hole of the landscape. You can go from left to right or right to left. You would pass the same items on their way. I was looking at the music score as one of the many possible ways you could walk from the beginning point to the end point.

AA: *That was quite interesting.*

GMK: Then that was another idea. There was always the complex of experiences. It is not simple, actually. There was also Lejaren Hiller in the States (I suppose most of them who had a point were in Darmstadt in those days). Before he went to the States, I began to work together with Hiller and he told me he was experimenting with the music writer, a manual typewriter in which you could print music. I ordered such a thing for myself. That made scores, which is apparatus. Before that, Hiller told me he was experimented. He wanted to use it electrified coming to a motor, so that punch tape, write... It could read the tape and print the notes at the same time. And that gave the possibility the computer could compose a piece of music (so as Hiller himself had done: his *String Quartet*). The computer could print the score and make the parts (extract and print the parts).

After having heard that, I thought the computer could also send off varying performances for each performance of the same piece and things like that, varied performances. The computer could calculate for each performance of the same piece a different score, a kind of variant: composed, printed, extract the parts and presented to the musicians. I have not done that, of course, but that was an idea actually inspired by Hiller's experiments on the music writer. There is one of my compositions in which I have tested at least giving the chance to the musicians to make all decision during the performance. This is not just that easy to make a completely mechanized score and parts production.

Later, I have written my own notating program, printing out scores like this. So I know what it is and also the parts extraction and things like that. Nowadays, I am using a professional program. That is better idea: you do not have to do everything yourself. So, about the point we are just talking about, chance, you see that there is different resources for it.

AA: *There is another rather interesting quotation in your Summary Observations that says something like: "The more opportunities chance is afforded of determining (within given limits), the smaller is the extent to which it has a determining influence in detail". So, somehow chance is good for, let us say, overall design. At a certain range of detail it is not fail, but necessity starts to work in the process.*

GMK: Actually what do you mean actually is the position chance takes in the whole compositional process?

AA: *Yes! If I understood well, chance is able to generate the overall form, even the smallest details. It is possible by chance going to the whole design, the meso-level and even micro-level: that is quite possible. But finally...*

GMK: This is noise [*laughing*]!

AA: *... it is a human agent who is writing the score and evaluating certain probably aesthetic concerns.*

GMK: I am not sure this is about the different ranges of the form: the innermost kernel and the 'something-in-between'. This is an idea I think very important when we are talking about chance, because chance needs alternatives. If I want to compose a piece, there is not alternative, unless I am asking myself: do I compose a symphony or a sonata? But I would not give it to chance. So, there is not condition for it. Well, this is a certain point for conditions coming up. You could make decisions about the *croches* or you could leave it to chance, because it does not matter so much. Whatever way is taken, there will be a ruled, guided follow-up: everything will follow to places, so to speak.

Then I thought that there are certain layouts in this form construction, where necessarily it is important to make conscious decisions. Otherwise, it could be very easily going wrong and losing control completely. You must really look out for what to take the chance decision and why you make the conscious decision. For instance, I talked about the innermost kernel, where in very short time there is many notes appeared at the same time and nobody can listen to the single notes, which just gives you a complex impression. They could use chance easily, because you would never notice the difference. This is not actually the reason for composing. For composing you need the outer shells as the most important goals to reach.

I started using chance operations in the studio during the production of *Gesang der Jünglinge*. After having put together thousands and thousands of little pieces of tape, Stockhausen said: “No, that costs too much time. I do not have to much time, so let us do it according to a curve, and then we follow that curve with the fader or other instrument”.

AA: Even though, it was a very long term working. As far as I know, it was like one year...

GMK: It was not even finished! We just broke the work at a certain moment, because the moment of the performance came up, so there was no time anymore. But on the other hand, we could see those curves we followed in the real way. That was meticulously composed, like any other stuff. Only that, if you have only very short time (two or three seconds), you have to make hundreds of little points, instead of putting together tape pieces of one to ten centimeters and so on. You just follow the curve with the knob, with the fader or with any other apparatus, that you did get the same result. And also it is a little bother: you have to see all over the stuff. You did not do the same way. You got some kind of shape and try to follow the shape with its voice. But the shapes were controlled, absolutely!

AA: Within the sound was not used control structure whatsoever to automatically generate different stuff, not really, was it? Or all these sounds that were generated, were they pasted into the tape?

GMK: Stockhausen made his preparation at home. Then he came in the morning into the studio with a piece of paper with all the numbers on it.

AA: This number for the waveform generator, this number for the voltage control amplitude generator... something like that?

GMK: Yes. For the frequencies to use, the dB values for the partials... Of course, the days before you would have made some experiments to find out how to do it. Then, in the composition everything came in its proper place in the serial way (permutations, transposition or whatever you did). It resulted of that neatly rows of numbers, so you could take the paper and give it to the technician to realize it. I was his technician in this sense. We did it together sometimes. When he had to leave early or to make a journey, or the weekend or so, then he left me his papers so I could just work them on until making the realization. It was just a one-to-one relationship: “400 hertz, put it in this generator and record it on tape. Then you would take 15.7 centimeters out of it. Separate it.” Stockhausen actually showed me how to put musical thought into mechanical operations.

AA: That is what I mean.

GMK: In electronic music it cannot be done any other way! Of course, you could start improvising, just turning knobs and listen to it: “I like this recording...” This is something else! But if you want a certain structure and realize pre-conceived ideas, then this is the only way to do it: like an architect.

AA: You were surrounded by machines, and machines do many other things. Machines are able to organize themselves, such an organism. I am very interested in your approach, in pieces as for example Terminus. I have the impression of this kind of conception of the analog studio as something else, in which each part of the studio really has its own function and this function is related with every device. So, that is interesting, because somehow is a small village. You have a group of people, each people have a role, a job: have a function in the society. In this way, I find it a much more exciting approach, in the way of there is some strategy going for a minimum structure. In the case of Terminus, I think it is five sinusoids, if I am correct...

GMK: Yes.

AA: ...and then there is an evolution, depending on the functionality. And this functionality is accorded by the combination of different layers of thinking, in order to produce the objective. For me, the important thing is just in the middle: how the process evolves within this complex structure.

GMK: I think I can answer this question quite straightforward. When you composed and people came into the studio during the first years, nobody actually knew what was electronic music. There were all invited by Herbert Eimert to come to the studio and he said: “What do you want to do?” I think there was a kind of sound you would try to have. You try to describe that sound in hertz and then you had to find out in what

way can you do that. Actually, the technician must be the composer, because the translation from the idea to something that means to be played on the piano, the violin or the flute, is a job of the composer. This is an idea that everyone would say: "But you can write it down and play it!" A composer can do that. Those composers did not do that; they talked about the sounds, but they not know how to do it. So, the technician had to make the translation. I did not like it very much.

I asked myself how did I come to a composition like *Terminus* or the other pieces I made, and then I thought out about myself actually having ideas about sound: I did not think in sound. Because I have a sound generator, I know what I could do with it. I have a tape recorder, I know what I can do with it. All I can do is using the instruments and whatever I do with them, they sound. Actually, I did not invent sounds or music: I invented ways of handling the equipment. So, I designed working methods, ways of working the equipment: what can I do to avoid all this disposing of tape, for instance. I disposed of billions of pieces of tape, I suppose until I was set up with that. So, I thought: "I am here with the whole clock of machinery. I want to make this machine should do the work, not me!"

AA: I found at the library of the Royal Conservatory in The Hague this book, Voltage Control: Diagrams and Circuitry. I think this is what are you mentioning now. They are the minimum description in order to "put yourself in position what are going to read". And somehow, you have this: the minimum strategy in order to construct some clear material.

GMK: That was actually done for students to show what the apparatuses can do. It does not take the musical motive with it, of course. Though, it was a useful idea to start with the way you can use equipment. The music would come later.

AA: So, that was important to establish a kind of code for the new people, I guess.

GMK: I found many pleasure and fun making this book. I never had made all this little pictures until writing the text with them. I liked it very much. But in Cologne, we did not have to do something like that, voltage control and this stuff... We had to do it in Utrecht. This equipment, is still in working order in The Hague?

AA: Yes, everything was rather the same, probably a different number of oscillators and actually some extra-added equipment, in order to have for instance a very nice reverberation... The sequence machine, the VOSIM is still there... I mean, the whole core thing is there. You could implement all this there now.

GMK: That was the interest then in being able to control every little detail, knowing musical instruments, knobs and the exact control over things. It is up to the composer to make whatever he/she wants and being able to translate his/her ideas in their exact physical or acoustical turbulence.

AA: This leads to another very interesting question I always wanted to know. You produce basically tape music within the studio. And within the studio you have an acoustical, even aesthetical pre-set approach. You are working surrounded by a space and you are working surrounded by the own instruments. I imagine, for instance, a church organ player playing within the machinery. When I was a child, I visited the machinery of an organ and I said: "This is now the studio". So, it has necessarily a connection, an influence in the composer. Another thing, which especially the GRM guys are very aware of, is about this concept of restitution. They first compose the music and then they need to think about a space that could be modulated by hands onto a mixer, and so and so forth. That is another approach. But actually there is a complete break-up between the compositional fact (at least at the beginnings with Pierre Schaeffer in 1948) and the restitution, the realization into a performance situation. How was to working in the analog studio? How was to imagine certain sounds, certain structures, then record them into a tape and how was the next step, the planning for a performance?

GMK: How did it happen in Cologne, for instance?

AA: Yes, even in Utrecht also, because I think it was a big difference.

GMK: We started with mono tapes, so that was not much a problem. There was a loudspeaker in the Cologne studio and then it came with music.

AA: So was it?

GMK: And then it came stereo.

AA: Okay.

GMK: Stockhausen never made a stereo piece in the Cologne days. We started this one of them that was four-channel immediately. The first time were monaural pieces and we started for a reason for five, even. The first performance was five. But then it should be only four, because five was much more difficult and there were not technical equivalence for five. So, we use four: his idea about using five was completely out of any technical realization.

I was very strange that Stockhausen's ideas sometimes came out outside the technical equipment, and then he tried to translate these ideas into the equipment. Sometimes I had to do it for him, because he was so much interested in recreating his eyes, I think. I would never have planned a piece for five sources; four, maybe eight a bit later. But five is not a musical number: you have a quintet, for instance. But in the electronic studio there is not equivalence based on number five. Ok, very strange!

Anyhow, then Stockhausen had the idea to move sounds surround, which is his famous turning table. It was very difficult to find a place to try that out, because the normal studio rooms in the radio station there was just one loudspeaker. Maybe you could put the second one, but not four! He had to hire one of the larger halls for the rehearsals. They could play four speakers, but then there was not machine for the playback. He had to make, using the whole building line, the connections with our central set room, to distribute four signals for the first floor or something like that, everything by telephone: "Please, start to tape it now in".

Actually, electronic music did not grow up in space. But early, the space here is the space of thought. The rest was imagination and waiting for the moment where you could have a real experience, maybe in the general rehearsal or something like that: not before. Our term was just distribution of sound on four channels, rather I suppose a connection of counterpoint: to distinguish parts, voices. To have an extra space, to separate things like listening to the fugue, to the theme, to the other parts, making them sing clear and transparent.

AA: I remember when you were in the Institute of Sonology during the master classes, in 2007 or 2008, I guess. Suddenly, one guy asked to you a question and that was: "Mr. Koenig, I have listened one of your string quartet and then I listened to Funktion Grün (or one of the 'function' pieces) and I found it quite similar. Why?" And you said: "Because it was the same composer" [laughs both]. I mean, this counterpoint business, it is quite clear in the deployment of certain sound structures. I am much more interested in this kind of (let us say not automatic, because there is a kind of strategy) sensation that you have there is an inner connection between the structure of sound and how the same sound behaves in correlation with the different parts. Probably this is called counterpoint in the classical way. Even (I would like to go a bit further away) that connects with the idea of inner components of sounds. The very same lucid, transparent strategy that you have by deploying this kind of automatic material it is detected in these inner structured sounds. I mean, somehow sound behaves quite lively and it seems that there is not purpose on it. You have not the feeling that there is a person behind fading up the controllers or distributing the tracks, or whatever, but you find something pretty organic inside. I was always very intriguing about this aesthetical approach, which could be observed for instance in Herbert Brün or Barry Truax as well... in many other composers who worked there. There was such intentionality on working these materials in a certain fruitful way.

GMK: When I am listening to music, I must try to orientate myself inside it, not with the piece I know, but with the new piece I have never heard before. I do not know why it is a kind of adventure. I do not know what would happen to me. So, I have to orientate myself. The philosopher Adorno said: "While listening to the piece, you must to compose it again, in order to hear and to understanding it". It is literally like that: to try to find out what the composers are saying to you that at very moment, until to get related different impressions to one another. And then you realize: "Aha! The composer tries to build something up..." Or perhaps he tries to show me the details, or two things in contrast to each other to see what happens between them. Or the composers are busy with themselves, getting no interest anymore in the listener. Or there was some problem to solve: "OK, let us to solve it". And then it will start beating again... so on and so forth! The listener always has this rather big problem to find him/herself some way of understanding what is happening there, because actually the music that is played by the orchestra or by the piano has nothing to do with him/her: it just has been composed it, then I have an offer on it, like a meal in a restaurant. I have paid my entry, so I am sitting and waiting for what will be presented to me. I am always talking about pieces I never heard before. Then we go to the *Ninth Symphony* by Beethoven, of course I know what we have. Is it known what I mean? As a composer, when performing a piece of music you just have composed, nobody in the whole world would ever have heard it before. It is you for everyone: this is the situation for the composer. The situation for listeners is the other way round. You are listening mostly to pieces, which they know already, because they like them. This is a big difference between the composer and the listener. I am the composer and at the same time the listener. How to bring things together?

I have a little story I could tell at this moment. Actually it refers to a student colleague when I studied music in Deltmold. This is something that has nothing to do with music. He was also contemplating the way you receive your environment to try to find your way. That is very early, but I think these things, which are saved with you, come back one way or the other. He said me a handful of things: matches for instance, peas or whatever. Let us just falling them down, so as would spread out in the chance way, without you knowing about it. Then, you came in to the door, you see another table and you had to try to find the system according to which this was been organized, whatever if you wanted it organized or not. If you want to give the impression that the structure of the items on the table was completely random, you have to work very hard. It came that, if you just make them random, it looks like structure. "If you want to have a random impression, you have to work very hard in construct randomness." These were his words. There is always something in it. If you turn to look around, you have to interpret to make your art what you see to find your orientation, what is the situation of this moment: that is awareness. That is a living thing; it cannot be anything else. And the same goes for the music. Even if you listen to one piece, which you have heard one hundred times, you will try to find something you have never heard before. I have this situation when I had to play always the same electronic pieces to many visitors of the studio. I thought *Gesang der Jünglinge* 50 thousand, 100 thousand, I do not know. I always tried to listen it as if it was for the first time, to be astonished, entertained, to hear something I never heard before, because to hear exactly the same what I heard before was not very interesting.

So, I have made for myself this construction for the performance of a piece of music. You have three bodies, responsible threads: first the composer who thinks it up, second the musicians to play it and then listeners to listen to it: three different bodies in three different pieces. The composer has a completely different piece in mind than the listener to hear it. Even the musicians might have a completely different thought about it. The listener has something that composer has not any idea of. Actually I feel free to make whatever I want, because it goes to stations (it will go to the musicians, or the tape, the loudspeaker, whatever is the mediator) and then it would end up with the listener. I am free. Whatever I do, it would end up in a certain way shot up by all other instances we have in between. I have never felt the necessity to compose for the listener directly, because I will never reach him/her directly. I have to sit down and write a computer program, or to cut tape in two pieces, or to write a score or I have to instruct musicians and convince the musicians about what they are doing is what I want (which sometimes is not even easy), help them without playing what I do not want them to play, so on and so forth. This is my approaching on composing.

In order to be busy with myself, there is a certain baton, sounds of the stage pieces, the switches, the connections of the apparatuses... or possible instructions given to a pianist, or a violinist or a flautist... That is my material. I can handle it and do whatever I want. I would do what I like or get low the volume when I do not like it or when I cannot get the idea of that. I know what music is. I always like to listen to music. So, if I do something in the realm of music what I am used to like, I suppose how become not afraid that I would fail. It is a question of putting things together, which are at that moment at hand!

I put myself in the position that I wanted to make a piece of music, but without knowing what to do, how to do it, when to do it and using certain means for it. So that, have I to look for mechanical or other digital ways to reach my goal? No, I have sets of instructions, sets of materials, sets of things... I could play around with them and put it into all kinds of different relationships and that will be translated into acoustic medium, so that people could listen to it. I could do the same thing with visual things or things to come. I am not sure if I have answered your question. It is not at least specified.

AA: *It was quite explanatory.*

GMK: This is very general. Maybe you want to have a more specific answer, related to certain pieces of music.

AA: *Yes.*

GMK: I can easily explain that also. As I said before, I was a little upset with cutting tape into little pieces, tape it in together pieces and set it together again. I thought machines should do the work. Since we had an electronic music studio, I had to try start in thinking processes, which worked on musical structures, in such a way that the results of those workings was automatically related to one another. Because when I was composing on this pencil and paper, then I wrote down music, measures, bars... To go on, I have to take things over and write them repetitive or maybe copied, but with certain differences.

Writing a set of variations on a theme means to take over the base structure from the theme, but making little differences anytime. In that way, pieces of music are related to one another, like the sentence I am pronouncing is related to another with a kind of inner logic. It is the same in music. How can that be translated into all the machinery, which is not constructed for making music? Which is there to my attainment? What can I use? How do I do that? I made a list of possible transformations of a given sound structure, for instance transposition: in time-space, in only acoustical space, or only in time. I can make filtering, I can make chopping producing sound pulses, ring modulate it, put it in different loudspeakers, and so on. This is actually orchestrated in the studio, in the way I can work off a given piece of sound.

So as by composition comes in two parts: one part is composing the resulted structure, which is actually not related to the equipment. That can be very simple: this tape, this sound wave or filtered pulses... something that is not related to the apparatuses. I can give them the use of tape, microphones and take something on tape, so I have a base structure. And the second part of composing is how to use all the pieces of the equipment, which is transformative in such a way, that the relationship between the original and the copy is established and guaranteed. Sometimes I make a list to ask myself for instance what ring modulation will be older and what could I keep? For instance, all of this is spectrum, but it gives you a rhythm: I have two layers, which I ring modulated them; then you get a multiplication of those rhythms. If one voice is zero and the other voice is also zero, there is nothing to modulate. For filtering is the same: you hold the frequency range, but it gives you a rhythm. If I would do a kind of chopping process, I work on that rhythm and anytime I hear the rhythm. Split checking of a sound could create (depending on the moment) a certain pitch, a certain sound color, timbre or anything else. Then, I combine those descriptions in a way of a serial composer too.

Serialism has taught me to one thing in the first place, namely that you have to have a clear idea of the material you are working with. It is actually a kind of controlling system, which allows you to have a complete control. Every moment you know exactly where you are, where are you are coming from, where you are going to, what is in relation to and what happens at the same time, or what has coming just before, or what will happen a little moment later. It controls the structure that took on the shape of the series' notes from Arnold Schoenberg (although it is not be necessary; it could be anything else). Instead of rows, we could also have a variety for the same kind of control. In those days, they have been written rows: we have never found a role of the series so important. The kind of control you can have about the material and your thought and your thinking and the way your thought is developed, I think it was the most important thing about it: not looking for series, but the ways things are put into relationship, the way things follow each other.

About determinism I use a completely different situation, because when I have a source material and I make a transformation of it by filtering or whatever, then at the same time it is a little bit distorted until it makes deteriorated the copies of a little less quality than the original. If this process is repeated, then everything will end up in white noise. This process can be continued until a certain number of times, and then you have to stop it, because the things become the same. I developed for *Terminus* only a basic material in certain streams of transformations, which result you could transform again and that result you could again transform... The whole organization for that was based on serial thinking, not by using exactly the series or permutations, but this kind of control I have just talked about. After all these materials were produced, I asked myself whether all these materials could be used for the piece or not, concluding that no. At a certain moment for the presentation of the piece, the rest was left over. Then I tried to find out the way in which to present it. I wondered to show the production process not in the chronological way, but in a way that was more determined by the relationship of the sound results.

AA: *So, it was a certain approach in which you split the whole instrument...*

GMK: Based on sounds what it looked like, in which sequence it would be able ever to present it.

AA: *...presenting sounds as clear as possible.*

GMK: Actually it was a catalogue of sounds and nothing else. It was about in which way could it be presented: how to say it to a child. As you see, there is a distance, because I was not thinking about the listener, of course! Because he/she was a receiver of the result of my work, that is true. But in the first place it turned into a question of how to talk to myself, to know myself and listening to pieces myself, so that I was satisfied with I was doing according to my own ideas and my own sadness. This is an aspect that has to do with motives and control. Otherwise I must be totally to a composer that is not satisfied! [*Laughing both*].

AA: *I have touched every concept I have planned beforehand.*

GMK: I do not remember what I have said in all those texts. When I have to say something about music, in most cases I am thinking it up and inventing something new. Maybe I said it before, maybe not. If you are quoting certain things, sometimes I remember them, indeed, but sometimes I do not. Then, it is difficult for me to react exactly to those quotations.

AA: *Even it is a very different focus, I mean: this is not a concern.*

GMK: Yes, yes...

AA: *Actually it is very nice to have this kind of disruptive thing. There is one thing I am probably curious focusing into the devices. You had in 1971 a PDP-15 computer. I am not sure if you had there was actually another computer, the DMX-1000...*

GMK: It came up some days ago when I was reading my own letters; I came again with this all things. I could not remember what it was.

AA: *When it was your last year in Utrecht?*

GMK: 1986.

AA: *It probably was that year.*

GMK: Jo Scherpenisse was our chief technician, especially concerned with our computers. In the end, he was the one who made all the decisions about it.

AA: *I did some general searching about the PDP-15 and DMX-1000¹ computers. It was kind of revolutionary thing. You go to other different fields of knowledge and you see that everyone made a lot of stuff... Especially in music, the PDP-15 represents something, because actually everyone could formalize a lot of things in such a moment. With the DMX-1000 occurred something like that, but it was not the same. It was a kind of external device with a digital to analog converter. It was possible to produce some sound, to produce some code and listen it directly.*

GMK: I have never use it; therefore I do not get acquainted with it. I used the PDP-15 for many years and also other computers and my own computers then. This was something that was around, but never used by me, so really I am not so sure really what it means. There is not connection with my work.

AA: *It was mentioned by Paul Berg, so that was in a very different time even. The use of PDP-15 was even socially quite interesting: all people sitting around that computer, sharing ideas...*

GMK: The EMS Stockholm had a PDP-15 also. The first PDP I have seen it was in London with Peter Zinovieff, do you know him?

AA: *The Russian composer?*

GMK: Yes. He had this studio in Putney, London in a garden shed on The Thames. His whole studio equipment was controlled with the PDP-8 (it was a smaller one). With the PDP-8 he was able to control all the analog apparatus. He did not compose music, but use existing music. I remember a little piece from Joseph Haydn, one of his piano sonatas, I think in E minor. I think he wrote on it, which fed it to the computer and the computer made variations of it. He called this piece *Lollypop For Papa*. I had a registration of it on tape that was used many times in lectures, just to amuse the people.

AA: *Probably that was similar to Press Button, Bertha, the experiment by Klein and Bolitho in 1956...*

GMK: I am going to looking at it at Google, if it is officially known. Zinovieff had such a first computer useful controller. When I reached him, it was before we got our PDP-15. It was actually very difficult in those days to buy a computer, because it was a quarter of million. We had to pay for it 250 thousand guilders and it even had not a hard disk with it. We had to buy another extra device, it was another 40 thousand: a quarter of a megabyte.

AA: *Incredible! It just was the beginnings...*

GMK: It is not imagined how little, small computation it had in it.

¹ The digital system DMX – 1000 was a device specially built, known as Transference Processor, which contains two small computers (PDP 11/24 and PDP 11/23), together with a collection of resources (SANI/BERNARDINI [1987]: 1986 International Computer Music Conference, Den Haag: Review in Two Parts. Perspectives of New Music, Vol. 25, N^o. ½, 25th Anniversary Issue (Winter – Summer), 1987, pp. 618 – 637).

AA: This kind of stuff (according with our current economical patterns) it should be nowadays at least one million of dollars or something like that...

GMK: I got myself a personal computer I paid eighteen thousand guilders. It came with two floppy disks (the big ones) without a hard disk.

AA: That is why everything should be real time...

GMK: ...included a printer and a monitor, of course. What about you appetite? Do you want something to eat?

*[The interview above was realized by Ángel Arranz the July 24th, 2014 at Koenig's studio in Culemborg (NL).
Source: www.angelarranz.com]*