

Conversations With Post World War II Pioneers of Electronic Music

By Norma Beecroft





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NOTES ON READING THIS BOOK

Track numbers appear in the margin to assist any reader who has purchased an audio disc that accompanies the interview.

Interviews that were originally conducted in French are included and transcribed in French with an English translation. The French and English versions appear together.

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Preface

In June of 1970, an international conference was organized by UNESCO in Stockholm, Sweden, with the collaboration of the Fylkingen Society for Contemporary Music. The subject of the conference: the relationship between the arts and technology, and of all the arts, music seems to have been the most particularly involved. The questions raised: has anything of lasting value been achieved during the last 20 years in musical composition by the use of the new technology offered to composers? Does such music have a future?

These questions of course were not answered by the delegates to the conference, many of whom were avid practitioners of the new resources for music, but the discussion was lively, and continued for years to follow. As a composer and dedicated user of this new technology, and being heavily involved in the world of new music as a broadcaster at CBC, and cofounder and administrator of New Music Concerts in Toronto, it was

inevitable that I would be questioning the present and future value of technology to music, this interesting interaction between the fields of science and the humanities.

Thus began my investigations in the late 1970s, exploring music's relationship to technology through the voices of some of the world's foremost creative musical minds. I traveled to the centres where the action took place: in Paris, France, when Pierre Schaeffer startled the world with his *musique concrète*, and Iannis Xenakis began his work with computers; to the United States, where John Cage was becoming a legend with his unique approach to what was 'music', and the early experiments with magnetic tape conducted by Vladimir Ussachevsky and Otto Luening at Columbia University; and to Cologne, Germany, at the Westdeutsche Rundfunk where Karlheinz Stockhausen composed his first opus with sine tones; and the advent of electronic music studios in Canada at universities in Toronto, Kingston and Montreal, mentored by our most famous researcher, Hugh Le Caine, who contributed immensely to Canada's incredible creativity.

I am indebted to my colleague William Van Ree who transferred my old cassette recordings to digital, from which we commenced our endless editing of both audio and text. And thanks must go to Ananda Suddath for her expert translation of the French interviews with Pierre Schaeffer and Francois Bayle: and to the Canada Council for the Arts for supporting this project, understanding its significance in the development of new musical resources for composers: and to the Canadian Music Centre who is making this important documentation available, and especially Matthew Fava, Ontario Region Director of the CMC, for his dedication in assembling all the elements for this ebook, assisted by Jennifer Chan whose expertise in layout and design was invaluable.

The period immediately following the Second World War was a fascinating time, an explosion of creativity, and a completely new and unique area was added to the long history of music. We hope you will enjoy hearing from these many voices, and that my "Conversations with Post World War II Pioneers of Electronic Music" will be illuminating in its discussion of a significant era in the world's history.

Norma Beecroft

BARRY TRUAX

b. 1947 Chatham, Ontario

Following his education in mathematics and physics at Queen's University, Barry Truax pursued his primary interest in music at the University of British Columbia. Between 1971-73, he studied at the Institute of Sonology in Utrecht, Holland, where he began to develop his PODX computer music system based on the principles of frequency modulation. His work in FM eventually progressed to realizing a computer composition called Riverrun (1986), the first composer to use granular synthesis in real time.

Returning to Canada in 1973 to teach in the Communications Department at Simon Fraser University in B.C., he became a research assistant with the World Soundscape Project initiated by Murray Schafer. In 1975, he became Research Director of the World Soundscape Project, and has edited its Handbook for Acoustic Technology, and written a book dealing with all aspects of sound and technology titled Acoustic Communication.

Barry Truax is a founding member of the Canadian Electroacoustic Community and the World Forum for Acoustic Ecology. He has been recognized by Simon Fraser U. as a recipient of the 1999 Awards for Teaching Excellence, among others. His background in music, technology and the acoustic environment places him in a quite unique position in the annals of Canadian contemporary music.

BT: First of all, music is being used in the environment in a way that doesn't have any aesthetic implications either, in the sense that it is not for aesthetic beautification, it's to control people, and entertain people, and to get them out of the store quickly and to buy their purchases in the right kind of way, and to keep them happy when they have to wait, and to mask the background noise. It has functional purposes, and we may find that aesthetically distasteful, but aesthetic criteria are not being used in the acoustic environment, and even music which is regarded as beautiful can lose all aesthetic meaning when it is used indiscriminately.

NB: Isn't that astonishing how that functional use of music, or commercial use of music actually works on the human race.

BT: Yes, it's surprising.

NB: It's really quite phenomenal.

BT: That's right, largely because it works on us at a very involuntary level, in other words, it works on us whether we have aesthetic judgments about it or not, and so you can feel offended by it but you'll still be affected by it. I'm not sure that this is very often brought into the question of music and technology is that everyone has a relationship, in my opinion, to technology and is affected by it. Even if we just take the musical questions and leave out the rest of the social implications of technology, but everyone's perception of music and relationship to music is very much influenced by technology already. You almost have to start from this point of view. The majority of music that people hear, first of all, is electroacoustically reproduced. That alone changes your whole relationship to music.

And secondly, besides its being everywhere, it is now also a commodity. It's bought, sold, engineered, and consumed, in a way that we have never experienced before, and these two central facts that must be obvious to anyone who simply experiences one day of their life and listens to how much music they consume or listen to, or are exposed to.

It conditions first of all our perceptions, it conditions our environment, it conditions our attitude towards music and music making and music as entertainment, which is a multi million dollar industry, in fact a billion dollar industry if you take the whole pop market into account, and a composer nowadays can hardly ignore these very serious implications.

NB: It's amazing how many composers do.

BT: Yes, but that's also the way they are taught. One of the sorriest examples of that, to me, is that a significant number of high school teachers that are teaching music are having to retire early now because of hearing loss. The people that we are training to train our children to be more sensitive to sound are having exactly the opposite effect. They are becoming less sensitive to sound, in fact there is actually physical hearing danger.

NB: Those are the negative aspects of the technological age, and hopefully they will change in due course. What is your feeling?

BT: Well, I emphasize the negative aspects, not because I want to be a doomsayer, but because I feel that, first of all, it's obvious I am very, very involved with technology, and sound and music. I'm pointing out these aspects of the music business and of the acoustic environment because I feel we have to understand those implications, and we have to take some responsibility for them. Then, once I've done that, I hope it's just not to soothe my conscience although obviously that's part of it, then I feel that somehow my relationship to the technology is already clarified, and that I know what it can do on the negative side, and for every negative implication, I feel there is also a positive implication, and once you start seeing negative ones, you also then start looking for the positive ones. I would rather emphasize all the positive ones, but unfortunately there seems to be such a lack of awareness of the implications of technology in society, from the point of view of sound and music, particularly for musicians and among musicians, that somehow I feel that I have to keep saying and pointing out some of these other aspects.

NB: I find it difficult to understand how in days where our pop music culture is highly dependent on technology, that the young people would not be aware of it and that you would have to continue to point it out because it is the young people who are making these high decibel tunes, etc.

BT: I'm not saying they're unaware of it. I think they're unaware of the implications of it, but they're certainly unaware of it in the same way we're unaware of the air we breathe. They take music and technology for granted. I find they're very receptive to it in the courses that I teach and they also recognize very quickly they are already very involved with music and technology.

Track 2 NB: Let's go back a little bit, to Utrecht, and following your experience in Stockholm, which led you to your pursue your work in the field of computer music. I know that you have written some computer programs which were in operation there, presumably still are, and which are in operation at Simon Fraser. Can you explain in another way what these programs are intending?

BT: Let me describe a few characteristics of the programs in a non technical way, because in fact you don't have to know very much about technology to use them. First of all, they use the technology that we have to create a rather unique learning situation, in fact a very powerful learning situation. The technical term is interactive, but that simply means there is a two way communication going. In other words, you may type something in but the typewriter types something back at you as well, or, you get the sound back which is another kind of information exchange or feedback. In other words, you have a situation where you learn by doing. Piaget describes that as to learn about an object is to act upon it, not to measure it – that is the traditional scientific approach – but to act on it, to get to know it by doing it, or working with it. I think there is fairly strong evidence that children learn a lot of things this way, and I think we see in educational terms how to change from merely rote learning, or memorization, or facts to how to do things, how to find information, how to solve problems, not dates, numbers, terms, and this sort of thing. Now, apply that to sound, and not only to

sound in the sense that electronic music does create the sound as well as the structure, but also to composition, and maybe yet what I think is still the strongest aspect of the computer music situation, it's not always exploited, by the way, but it has tremendous power of being a very powerful learning situation where you are very precisely controlling the sound material or the structure, you're getting the feedback of your ideas very quickly. In other words, it acts as a very intelligent assistant from which you learn.

NB: Was that your initial intention though?

BT: No, no. There are implications of this that you simply don't realize when you start. You start because of some vague feeling that maybe it will be interesting, you have a curiosity about it. There's any number of reasons why you get into it, but it has become in practice so powerful, it has changed my whole approach to music and to composition so strongly that, and that also being rather intellectually and academically inclined, I go back and say why, why does it do this, what is it about this process that I sort of stumbled onto or just evolved because it was obviously going in the right direction, it was producing good results, so I was following it and watching it develop, then I stand back and say, well why does it do it. This is one result, a good learning environment.

NB: You started to talk about the characteristics of your program, briefly.

BT: OK. I think that's definitely the first one. Another one that is more specialized and is probably more important to composers is the notion of using the computer to control architecture or structure. With the computer you are able to construct or work with structure, with form, with large scale development, all of these things can be implemented on the machine. It's a very powerful tool that I find more and more is for me very attractive. First of all, to some extent it's the sound, or the novelty of it that is attractive, in other words rather at a surface level. But after a while, you start thinking along these terms, you start thinking in a way that is more systematic, certainly I am thinking in a more systematic way, composing in a more systematic way and it's because the computer allows me to, control certain things so therefore I can start

composing in that way, and it's a direction that is not achievable in any other way. Afterwards, you look back and say, why does this happen, and one conclusion that I've come to is that the computer allows you to represent knowledge in a way that is very different from what we've ever had before. It represents a certain knowledge of how to do things, and that knowledge is externalized, and no longer is it just in my head, but now it's also in the machine. And as soon as you have a situation where part of the knowledge is in the user and part of the knowledge is in the machine, and those two are interacting, first of all, it's a very exciting process. It's like the difference between playing with an intelligent chess partner, and pulling an automat and getting a chocolate bar out, you don't have very much respect for that machine. That's why you kick it, you don't kick a chess partner, because they have some intelligence there, and so you learn what's a good strategy for learning how to play chess while playing against a good partner, because you learn by your mistakes. But you're learning with problems that you've set up yourself, and so ultimately you're learning about yourself. There is a very positive aspect of it, you also are encouraged to think and to create musical structures that could not have been created any other way, that are new ways of thinking. Really the only importance that the computer has is that it affected the process, the process of composing was now irrevocably changed.

Track 3 NB: Will that spin off into instrumental composition as well, eventually?

BT: Oh yes. For sure. For instance, Ligeti has been very vocal, very articulate about, first of all, in the '50s when he worked in the electronic music studio and then went back to instrumental composition, and he describes very clearly how his thinking was totally changed, and of course you can hear it in the music that came out after that. It is really only conceivable after the electronic music experience, and now that he is getting back involved with computers, I think it is for the same kind of way, that it's going to start affecting the process, and I think he senses that very strongly.

NB: Barry, do other composers that use the computer, share your feeling about changing the process of composition?

BT: I don't know whether they share it or not, I find that I get a lot of support and a lot of agreement just on a personal level from composers. They're very interested listeners and sense that somehow this is true. I don't want to say that somehow I am privy to some great truth or discovery or something like that. What I think the situation is is slightly different. I think that most composers who have gotten involved with technology have simply, like most technologists who have gotten involved with music, which of course is the other side of it, they simply are so concerned about technical problems that they've never stood back and really looked at it in a slightly more objective way. You're just so caught up in it, there are so many details, there is so much that involves you that it's only later if you have the moment to reflect on what's happened that then I think you'll start asking these questions. It's all very much after the fact reflection.

NB: Isn't that one of the pitfalls of working in the field of computer music?

BT: Yes, indeed. It's an incredible pitfall that a lot of people simply never get out of. And the technologists often don't make it any easier for them. Often they are making it more difficult for them, unwittingly perhaps, but still there are many unfortunate barriers facing the composer, partly it's the composers' training, they've not really been trained to take advantage of the technology to understand it, they're usually not trained in anything in terms of acoustics or psychoacoustics, which is really the only universal language that you can talk to technologists about or that computer programs can operate on them is, it really has to be an acoustic representation of music, and that has not been part of composers' training. They're not used to expressing their compositional ideas in terms of anything that a machine could use. And of course the same thing goes for technologists. They have no idea of what really is important musically, and yet they have been trained to think that their answers are the best answers. As soon as a computer programmer tells you this is the most efficient way to do it, and he has a god called efficiency, another god called elegance, another god called cost-effective demands, and no one is going to convince him that those may not be

the ultimate reasons for doing what he wants to do, and the composer often doesn't have enough self confidence to say, I don't believe you, or I think it should be done another way.

NB: But that gap will become less in time obviously.

BT: Yes, I think the composers frankly are hopefully making bigger strides than the technologists are. I see a lot of signs that composers, particularly younger ones now are really prepared to go to work and learn a lot of things that they normally haven't learned before. The technologists I don't feel are really becoming that sensitive yet to the arts. There's a few, lovely exceptions, and I'm very pleased to be working with some of those people, but somehow the scientific training is generally not going in that direction. Maybe one exception might be that there is a bit more consciousness among computer science teachers that there is a social responsibility in the use of their craft. What you see is that computer science people are very bright, but they get almost trapped by their own brilliance in a way, that the ego gets involved in it, that now they can do this, and they have this power to program these machines, and then once they graduate they get picked up by the best corporations that can pay the highest jobs, the highest wages, and very few of them ever stop to think about the implications. Again, the technology is controlled by forces that are not musical, I mean that's obvious it's economic forces.

Track 4

NB: Well, there's another factor too, don't you think, that the generation that runs the music business, and therefore is privy to the way in which to get subsidies to support their particular projects, are not particularly the people who are now in their late twenties or early thirties who are developing this field, that is another economic consideration which strikes me that it will take another couple of generations to change that attitude, when the young people suddenly get into their forties and fifties and start controlling the music business as it were.

BT: Well, I certainly wouldn't be overly optimistic. Yes, I think there is a gradual change. It happens. Whether it can offset the tremendous change in the technology and its availability, because also remember now the technology is also affecting the whole market as well as the

professional market. There is so much money involved that a young person that is being trained in this field, often gets the illusion, just as the home computer buyer gets the illusion, that suddenly has the control over something, and I'm afraid that it is somewhat of an illusion because it is not really that much more control than a viewer of television has while switching channels. It's going to be quite a while before there's really any fundamental change.

One hope is that more people will become familiar with technology and not be bamboozled by it, and I hope that composers are going to be in that category. I spend more time trying to work with composers and get their ideas back and interact with composers because a lot of composers can use the kind of programs that I've developed. I feel it's more important that they understand the situation and get access to the machines easily, and get the kind of information and have some kind of overview, just practical experience, and I would spend much more time in that direction, because then at least once you have a composer that basically knows what he or she wants and knows what the situation is, well then, perhaps that person can use the technology in hopefully a freer way more creatively.

I've been very lucky and in fact I've got from technology what I want, that's one way of saying it, or you can say that I can't consider composition apart from technology now. So perhaps that means that I feel maybe a greater responsibility for somehow reflecting on the situation, writing about it and talking about it.

NB: What I'm perceiving from you is the most significant contribution of technology to music right now is the fact that it changed the process of composition, and no matter what ever happens to it, that in itself is probably important even if there was no more technology, no further development.

BT: Well, even if music caught up with the capability of present day technology, which it's certainly it's far from doing, we certainly would be in a very, very different situation from the musical point of view. We're not using nearly the potential that technology has, because that

potential is blocked by a lot of economic and administrative blocks, and the technological barrier just of the machine itself and the fact that it is really designed for business and not for arts, and then the problem that composers have when approaching it. So what do we conclude from that, in terms of the future? Is it going to be a constantly catching up procedure?

NB: What is your own process from here on in?

BT: I'm really just understanding the process of what has happened just in the last year.

I find it very hard to lay a course for the future, and that may sound rather odd in a way, but because these things do change so rapidly, I find it's better not to, in fact, let's put it this way, I don't get disturbed if I don't have a very, very direct course. I'd rather understand what is happening, and what has happened, and on that basis be able to cope with, hopefully understand whatever changes are going to be around the corner. Crystal ball gazing in this day and age, particularly on this subject we are talking about, is very dangerous. I certainly see certain trends not all of which will affect me, but the home market is the biggest trend right now.

Track 5 NB: But the human brain still strikes me as being ultimately more complex, but will the human brain ever catch up with the machine?

BT: It's not really a matter of catching up. You see, part of the knowledge that we have is already implemented in the machine. In fact the part that we really don't need to be concerned with ourselves if it's done well, that is, there are certain fairly mechanical things and procedural things that it is just as well to have the machine do, so you don't have to be bothered with them. So, if we have these two sources of knowledge, and part of it is in the machine and part of it's in our head, then it becomes very clear as to which one's which. That may sound trivial, but with many composers I don't think they do realize what they share with other people and what is objective about the craft, and what is supposedly individual, and I think basically society, because they glorify the individual in our society, we tend to err on the side

of everything I do is unique and irreplaceable, and therefore we get notions that composition is unteachable, and composers are really very irrational, and probably are born geniuses if not eccentrics, and so on and so forth down the line. I would really like to see the end of that era, and bring music back into the humanities, bring it back into the social sciences, and bring it back into the realm of an art that is another form of complex human behaviour, that is understandable, that you can experiment with. Music theory could be a totally experimental science with the technology we have now. You can test musical behavior now. You can actually test musical behavior and find out what links the performer, the composer, the listener. There's a tremendous potential there of using the technology to elucidate the musical process, and also to further it, so I find that it's more a case of our understanding catching up than the machine brain sort of competing with each other. I find it's a very useful reflection of each other. Now that we know certain things are programmable, and are representable in machine form, then that makes it much clearer as to what is uniquely human or what is personal and individual, and what is shared. I feel much happier once that is clarified and not exploited into personality cult.

NB: Barry, I've asked you in our association many, many times about your own background, but here is the opportunity to say briefly to give us your background again because it is for a totally different purpose.

BT: I have both a background in music and in science. Like many high school students in the early '60s, and who were male and white and reasonably good in science and math, I was very excited by a career in science, and so when I went to Queen's University in 1965, I studied physics and mathematics, and actually managed to do that for four years and actually graduate. But by that time, I realized that my interests which were largely in the arts, were simply going to have to be given a little more consideration, because I had all this marvelous scientific training, and my music background which extends back as far as I can remember, I come from a musical family, but they'd always encouraged me to keep music as a nice hobby or avocation since it is not your surest bet for any living. That was good advice, but then by the end of my undergraduate training at Queen's I realized that I needed a sense of

creative kind of fulfillment, and that wasn't happening in science, and it was beginning to happen in a very exciting, primitive way with music, and with the piano which I have always played, and so I decided to devote a couple of years of my life anyway, to try it out and see what would happen. And after a while looking around I went to UBC, and became part of the Master of Music program there. Immediately went into the electronic music studio and you might say, never came out. There was a first love, and a very quick love, and I felt very much at home with the tape medium and with the electronic sounds, and from there on there was no looking back.

NB: You mentioned the period of the '60s, it was quite normal for young students to be interested in careers in mathematics.

BT: Well science in general. This was two years after the launching of Sputnik, the first of really exciting space efforts. There was a tremendous push, because the United States felt it was behind in technology, and so there was a tremendous push which when combined with the baby boom, that produced an enormous amount of people going into these kinds of fields.

Track 6 NB: Would you say that that particular period was responsible for the fast proliferation of musical technological people?

BT: Well, of course it is a spin off of it. Perhaps I'm even typical of this or untypical use of technology in music is that there was such a push towards science that people acquired that kind of knowledge but didn't necessarily cut themselves off from other areas, because you do have to apply this knowledge in some way, and since technology was beginning to be applied very heavily towards music, then this possibility is there, and combined with a certain trend toward inter disciplinary thinking, it was beginning to gain some acceptance in the late '60s, well then, you do have this possibility of jumping from one field to the other. Whereas I think ten years before that, in the 50s, it would be on this continent rather odd.

NB: Can you describe your particular evolution once you got into that

electronic studio?

BT: Well, very briefly. First of all I was very fascinated by the tape medium and electronic sounds, but I made no connection with science or computers at that point, in fact I was running away from them and I had done a little bit of computer programming. One was expected to pick it up as a matter of course, but when I began in electronic music then I wasn't thinking of consciously making a bridge between the two, I really was making a very clear separation, and it was saying, OK, now I'm going to study music and before I was studying science. But as things have gone on, the more I've gotten away from science, the more I've gotten back into it, and have used it for these particular purposes.

Well, anyway, compositionally, there's only so far I feel that one can go in the voltage controlled electronic music studio, and that limit quickly became apparent to me when I went to Utrecht, the Institute of Sonology, a very sophisticated studio for electronic music. And at that time it had just acquired a computer, this was 1971, and they were starting to develop computer resources. So I was still composing exclusively with electronic sources, and live sound, but I also became interested in developing the computer resources because it was there. I was very skeptical about it. This is something that may be difficult for people who've not been trained in science to understand, but that kind of training often makes you more skeptical or circumspect about science, because in a way you might say you know too much about it, you know that it is not magic, that it doesn't have all the answers, there are certain limitations. It is a particular way of looking at the world, it's very powerful, but it is not everything. So, as a result I was very skeptical about what one could do with computers. I hadn't heard any computer music that was the slightest interest to me. One of the first indications that there really was something very powerful there was when I went to Stockholm to a very magnificent electronic music studio there and met Knut Wiggen. I spent an afternoon there with him, and he played me a composition of his done in the studio, and it was extremely beautiful first of all, it was musically very, very powerful and also very subtle, as most of his work is and he said to me that 'you need the kind of power and resource that the computer provides for the ideas that are being

developed in contemporary music'. And I was just completely stunned by it, because I saw, yes, in fact, you did and that instead of simply the computer being a device that you only got out of what you put into it, I saw that in fact it was an organizational tool, and that connected with what I was discovering in the electronic music studio was that, yes, you can produce a lot of sound, but when it comes to organization, in other words, when the composer starts to become concerned about structure, somehow controlling larger form, controlling processes, the most critical part of compositional thinking is controlling large scale relationships, and that's where the electronic studio for me breaks down and I think it does for many composers. There usually is a great influence that composers have when they're first exposed to the way of thinking that is necessary in electronics. This acoustical way of thinking is a systematic way of connecting one device to another, and describing wave forms, there's the physics of it and the logic of it, I think influences the composer tremendously because in terms of traditional music training, you've never been exposed, first of all, to acoustic notions or psychoacoustic notions, you've never been able to compose the sound, you've only been writing notes, so this has a tremendous impact on composers, this way of working with the medium.

But then, if you continue, OK, you might say there is a dividing point. You are probably tremendously influenced at the beginning, and then there will come some kind of fork in the road or whatever, where you have to make a choice whether, OK, you've had that influence and now you're going to go back to whatever field or instrumental writing, whatever you think is relevant, or are you going to go on being mainly centered in the electronic idiom. Well, if you do, well then you usually either go towards the performance oriented situation such as live electronics, or I think you tend to go towards the computer as a non real time way of organizing composition that's very powerful. That's essentially what I did.