An Interview With Donald Buchla

By: John K. Diliberto

"I think that electronic technology offers us the possibility of divorcing ourselves from the necessity of virtuosity, without divorcing ourselves from the possibility of intense and meaningful interaction with our instruments."

Donald Buchla is a classic American loner -- a living realization of the all-too-mythical individualist who follows his particular vision despite all the obstacles, hardships, derision, and easy exits that are available to him. Like Lewis and Clark, Buckminster Fuller, and Harry Partch he flies against the winds of convention and sometimes, by his very effort, changes those conventions.

Donald Buchla makes electronic music instruments. And though those instruments resemble what we know as synthesizers, and work in much the same way, Buchla insists that they are not synthesizers. He sees each of his devices as part of the larger electronic music instrument family. "Electronic instruments are a family of instruments", he claims, "just like the wind family, the brass family, or members of the string family."

Buchla began designing instruments for the electronic family when he was at the San Francisco Tape Music Center in 1962. His name and instruments are not as widely known as those of Moog, Arp, or Prophet, but among those who know electronic instruments, the name Buchla is one to reckon with. He's generally credited with arriving at the voltage control modular synthesizer at the same time as Robert Moog. But from that point on their parallel paths diverge. Moog geared his instruments towards a burgeoning popular market that he in fact had created. His instruments were tailored to the expressed needs of musicians like Wendy Carlos, Keith Emerson, Tomita, and Jan Hammer. Buchla, on the other hand, was himself a practicing musician and composer. He's a self-proclaimed avant-gardist and experimentalist, and his instruments reflect those concerns. He is opposed to the concept of imitative synthesis to the point that he doesn't even like having keyboards on his instruments: his concession is a metal touch-plate system. So, it's not surprising to him or anyone else that his instruments have been embraced by artists on the sonic frontiers, such as Morton Subotnick, rather than the popular mainstream.

Determined individualism can become self-righteous smugness with some artists, and Buchla has been almost willfully obscure in pursuit of his musical purity. More than one musician has told me stories about trying to buy a Buchla instrument and actually being turned down because Buchla didn't think their music was serious enough.

Despite being an innovator of electronic music design, Buchla claims to know little about the actual technology in his creations. "I don't care about circuitry", he asserts. "I design my instruments from the outside in". He speaks of music in terms of language, gesture orientation, and interactiveness. He doesn't seek the touch-sensitivity of so many keyboard synthesists, but rather an almost cybernetic interface between the body, mind, and instrument. His own concert performances entail audience interaction with his computers. He relates how at one concert he gave flashlights to audience members, who then aimed them at a screen which triggered the instruments. With Buchla conducting and playing his instrument, it created a true feedback loop between artist and audience.

Buchla is now involved with digital technology. His newest instruments, the 400 Series, de-

part from his modular designs and contain everything, including a touch-plate keyboard and real-time score editor, in a unit the size of a medium suitcase. (The 406 Model has a more traditional weighted clavier keyboard.) You can create any waveshape imaginable with this instrument. During a demonstration he gave me, one waveshape looked like a coastal map of Norway and sounded equally jagged and complex.

After more than 20 years in the vanguard, Buchla has evolved an enigmatic personality that tends to undercut his obvious enthusiasm for his music and instruments. His Sahara-dry humor cuts through many of his often cryptic answers, at once daring and provoking further inquiries. But he was also happy to talk about his creations and verbalize the concepts that are embodied in a Buchla electronic instrument. As he said, "I'm used to sitting in my ivory tower and passing schematics out under the door. I don't get to talk about them that much". Here, Donald Buchla talks.

John Diliberto: When did you start putting together electronic components and synthesizers?
Donald Buchla: Electronic musical instruments in about 1961-62.
JD: What were you working with then?
DB: Instruments of my own invention. They were an outgrowth of my own personal need and acoustic instruments.
JD: So you came to it as a musician.
DB: Yes, as opposed to a technician.
JD: What were the instruments that you were working with at the time?
DB: Well, the studio of the early 60s, the traditional studio, was equipped with an array of electronic instruments, none of which were designed to make music. The concept of designing electronic instruments was new at the time. My first instrument was a device that read the shape of the hand and interpreted it as a waveshape. It embodied the philosophy that the instrument had to be highly interactive with the human being who was playing it. It was a way of transcending the limitations of the instruments that I was acquainted with, which tended to be Hewlett-Packard oscillators, Ampex test equipment, borrowed World War II gunsights and such

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JD: A lot of people feel that the recent generation of synthesizers is still very non-interactive.
DB: I'd say that's generally true.
JD: What then makes yours interactive?
DB: I'm concerned with language and input structure every bit as much as I'm concerned with generative structure.
JD: How does that translate into your electronic designs?
DB: It influences the man-machine interface, the way one communicates with the instrument. It takes place at the tactile level and the language level.
JD: It seems that one of the benefits of synthesizers is that they have made music more a function of the mind and less a function of tactile dexterity, something that has been the tradition of music for hundreds of years.
DB: Well you chose the word dexterity, I didn't. I think that electronic technology offers us the possibility of divorcing ourselves from the necessity of virtuosity, without divorcing ourselves from the possibility of intense and meaningful interaction with our instruments.

"I wouldn't call anything that I've built a synthesizer."

JD: When did you first start designing what you might call a synthesizer?
DB: I wouldn't call anything that I've built a synthesizer. I first started designing members of the electronic family of instruments in 1962.
JD: What differentiates what you design from a synthesizer?
DB: A synthesizer, according to popular usage, is a keyboard instrument with the expectation that when you strike a particular key that you will get a particular pitch. I would even extend the expectation to having a certain type of oscillator followed by a filter and a gate, keyed by an envelope with an expected rise time, fall time, sustain, and so on. I would expect a certain imitative aspect to a synthesizer -- imitative to the extent of copying what we expect from percussive sounds of the world to which we are accustomed.

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JD: Why did you feel a need to go outside these expectations?
DB: Because I didn't feel a need to go inside them. I have always been outside and I've chosen to remain there. I've been an experimentalist since my early childhood. I've been interested in avant-garde and experimental music far more than I've been interested in, as a composer, more traditional form and structure. My instruments have reflected that need.

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"...there are hundreds of thousands of people interested in alternative modes of expression."

JD: Who were some of the people that you were listening to in your early days?
DB: I grew up surprisingly ignorant of what was going on in other people's music. I was amazed to find, in the early sixties, people in San Francisco that were composing and experimenting along lines that did not adhere to the status quo. Since then I've learned that there are hundreds of thousands of people interested in alternative modes of expression.
JD: Outside technology is still having an effect on electronic instrument design.

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DB: The advent of the microcomputer has really made it possible to make the electronic medium a very viable performance medium. Before the microcomputer, we were very limited as performers. But now we have a flexibility that should be admired by a player of an instrument.

JD: The touch-plates are something that is very much associated with your instruments. Why did you go to them instead of some other triggering device?

DB: Well, it's a cop-out, a compromise between the expectations and demands -- the psychological demands, at least -- of the black and white keyboard versus the generality of the sky-blue input structure. It's easy to adapt to the expectations that many of us have, and easy to transcend those same expectations with a keyboard oriented in slightly known traditional ways.

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JD: Your basic philosophy seems to be derived from a concept of breaking away from any traditions that preceeded you.

DB: I would guess so, yeah. My own interests are in that direction. We're tradition bound. We have concepts of what music is, and what is and what is not music. We have virtuosity, that is performance technique, developed after years of study and centuries of tradition. We have instruments that have been refined and refined, generation after generation. So music as we know it is rooted in a great deal of tradition, and is resistant to change on many levels: the instrumental, the performance, and the listening levels. I'm not well-rooted in any of the traditions and I'd like to investigate the sonic experience in a very general way.

JD: Do you think that electronics are a better way of delving into sound?

DB: I'm not that involved with the intricacies of sound as some. I pursue the investigations of timbre, but I'm more concerned with the investigation of musical structure. I think that's where more music lies, than with what we might call the static timbres.

JD: You and Robert Moog began developing electronic instruments at about the same time.

DB: Yes, we both had our starts about the same time. We both used modular designs also. The idea of voltage control was significant in that it allowed us the possibility of discreetness in realms that were otherwise limited to continuums. Everybody's favorite oscillator in 1961 was the Hewlett-Packard because it was very stable and predictable, and very well calibrated. The big limitation was accepted as something that could never be transcended, namely it had a knob on it so that if you wanted to go from 440 Hz to 770 Hz you had to go through every frequency inbetween. Consequently, to make a jump in frequency you had to splice a tape and put the pieces together. As simple as that may seem, it was a very fundamental limitation of the classical studio. Voltage control allowed us to generate and conceive discreet changes in pitch, as opposed to continuous changes. We can then extend that the voltage control of other parameters.

The concept of the modular design was the original concept of the synthesizer, that is to synthesize the whole out of the sum of the parts. And the modules were the parts. If we needed a lot of generators we would obtain a lot of modules that had generative functions. If we wanted to do a lot of analysis, we would obtain modules that did envelope detection and perhaps filtering. If we wanted rhythmic elements, we would string together a lot of sequencers. So the modules allowed us to engross ourselves in different kinds of biases, depending on what we were interested in. If we wanted we could emphasize the structure, or the density or processing capabilities versus the generative capabilities. It allowed us interconnection at a very important level, that is the structural level as opposed to systems that came along shortly thereafter that made all kinds of assumptions like the sawtooth should precede the filter, should precede the envelope generator or whatever. I don't even know how the typical synthesizer has come together.

JD: How would you compare your work to Moog's?

DB: It's like comparing apples to oranges. Both of us are making viable additions to the musical instrument family. I suppose his instruments have been more oriented to traditional concepts of musical structure and mine towards non-traditional concepts. At one time we were considered to be West coast versus East coast and in some sense there is truth to that concept. Certainly ten or twenty years ago more experimentation took place on the West coast than the East coast.

JD: Electronic instruments have changed since the first Moog and Buchlas with their big patchboards attached to a keyboard. What ideas have gone into those changes?

DB: A lot of learning has gone down in twenty years. We've found that certain kinds of structural interactions can be assumed. Certain others can be taken over by the computer that controls the innards of our instruments, and can be specified in a way that can make changes in patches instantaneous instead of tedious. The computer has made a lot of changes but it's only a small part of it. The language is the major part of it. The operative language behind our instrument has taken over a lot of the role of establishing

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the relationship between input gesture and instrumental responses.

JD: What do you mean when you speak of language?

DB: I like to regard an instrument as consisting of three major parts: an input structure that we contact physically, an output structure that generates the sound, and a connection between the two. The electronic family of instruments offers us the limitation, if we approach it traditionally, and the freedom if we approach it in a new way, of total independence between input and output. And in fact the necessity of some way of generating a connection between the two. Language becomes an important aspect in the electronic family of instruments, where it had played no part with all traditional acoustic instruments. The relationship between input and output is fixed with traditional instruments; it's to-

tally flexible with electronic instruments. It was established by the setting of knobs and routing of the patch cords in the electronic instrument of the 60s. But in the electronic instruments of the 80s it is established by human intelligence working through sophisticated electronics. Therein lies the exciting possibilities of electronic instruments: the instantaneous remapping of the relationship between input gesture and output response. We've only begun to investigate this because of our own ignorance and our dedication to tradition, in that we continue to build electronic instruments with linear additive input structures, assumptive connective structures and imitative output structures.

JD: You talk about gesture orientation and interaction with the instrument, yet touch-plates hardly seem to give musicians the touch-sensitivity that a lot of them want.

DB: Those same musicians are the ones who go into the stores and say "I'm the keyboard player from such and such group and I'd like to see what you have in the way of 'synthesizers'." And the rock and roll synthesizer expert shows all the black and white keyboards and sure enough, they're all spring-loaded keyboards with switches on the other end. They're all organ keyboards and they're all adaptations of something that was developed to throw hammers at strings. It's a really crude problem and not too graceful an answer. That's what these guys have demanded, that's what the marketers have picked up on, and that's all we've got down there in synthesizer-land. These same guys that are complaining that their $6,000 instrument doesn't make every sound that they want, that it won't imitate anything, finally start to realize that it really will make any sound. But it won't imitate the musical structure of the thing that they had in their minds that it would do. The reason that it won't do that is that it only has a finite number of pitches and they're all designated as pitches. There's no interaction between them. It's all a very simple linear-additive system that doesn't lend itself to alternative musical structures. Did I evade your question?

JD: Yes you did.

DB: I didn't claim to solve the problem. I'm just here to elucidate it.

JD: Is it a problem that you want to solve?

DB: No. What I try to do is persuade as many people as possible that are in a position of influencing our musical heritage and instrument design, to look on the possibilities of the electronic family as a legitimate family of musical instruments and not as an imitation or a bastard or a space wars. We should have the same variety of approaches in the electronic family as any other family. We should stop competing with each other and saying that, say, the Prophet is better than the Oberheim. That's a bunch of crap. Let's stop aiming towards the same pie-in-the-sky, and start developing a variety of instrumental approaches and musical techniques and performances. Let's get something that reflects the true possibilities of the technology at hand, as well as the music and creativity behind them.

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