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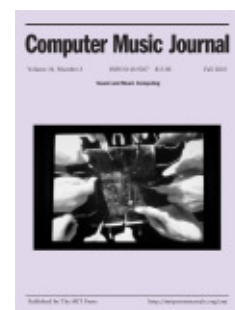
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## **An Interview with Paul DeMarinis**

Gascia Ouzounian

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## Gascia Ouzounian

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Since the early 1970s, the American electronic media artist Paul DeMarinis (b. 1948, Cleveland, Ohio, USA) has created works that re-imagine modes of communication and reinvent the technologies that enable communication. His works (see Table 1) have taken shape as recordings, performances, electronic inventions, and site-specific and interactive installations; many are considered landmarks in the histories of electronic music and media art. Paul DeMarinis pioneered live performance with computers, collaborated on landmark works with artists like David Tudor and Robert Ashley, undertook several tours with the Merce Cunningham Dance Company, and brought to life obscure technologies such as the flame loudspeaker (featured in his 2004 sculpture *Firebirds*). His interactive installation *The Music Room* (1982), commissioned by Frank Oppenheimer for the Exploratorium in San Francisco, was the first automatic music work to reach a significant audience. His album *Music As A Second Language* (1991) marks one of the most extensive explorations of the synthesized voice and speech melodies to date. Installations like *The Edison Effect* (1989–1993), in which lasers scan ancient recordings to produce music, and *The Messenger* (1998/2005), in which electronic mail messages are displayed on alphabetic telegraph receivers, illustrate a creative process that Douglas Kahn (1994) has called “reinventing invention.”

Paul DeMarinis has performed internationally for several decades, and his works have been exhibited at museums including the InterCommunication Center (ICC) in Toyko, the Kiasma Museum of Contemporary Art in Helsinki, and the San Francisco Museum of Modern Art (SFMOMA). His work is the subject of a recent book, *Paul DeMarinis: Buried in Noise* (Beirer, Himmelsbach, and Seiffarth 2010). He is Associate Professor at Stanford University, where he holds appointments in both the Department of Art and Art History and the Department of

# An Interview with Paul DeMarinis

Music. During 2009–2010, he undertook a residency in Berlin as part of a Deutscher Akademischer Austausch Dienst (DAAD) Berlin Artist Fellowship. This interview took place in his Berlin residence on 3 August 2009 and was supplemented with subsequent electronic mail communications.

## Early Work and Education

**Ouzounian:** I wanted to start with some general questions about your studies. I read that you had studied film and music as an undergraduate.

**DeMarinis:** Yes. I came to music from classical music, which I studied as a teenager. In college, I became very interested in media: film and tape, making pieces with electronics. I went to a small liberal arts college in Ohio called Antioch College. Paul Sharits was there; he was a really inspiring filmmaker. I then went to Mills College for graduate school.

**Ouzounian:** Is that where you met David Tudor?

**DeMarinis:** I met David when I was in school at Mills. Bob Ashley was co-director of the CCM [Center for Contemporary Music] at the time, and he invited various artists for projects; David Tudor was one of those. Also David Behrman, Gordon Mumma, Alvin Lucier—they all came and did projects, so I met all of them during that period. I worked with David Tudor from 1976–1978 on the electronics for *Rainforest IV*.

**Ouzounian:** What was it like to work on what would become such an iconic piece?

**DeMarinis:** It was really remarkable. If you look at it in hindsight, the idea of David taking on unknown, inexperienced young artists in a project that was, for him, a pretty high-profile piece—in 1976, for instance, we presented it at the Festival d'Automne in Paris and the Espace Pierre Cardin in Paris—it was pretty amazing to manage to do this piece. That he would pick up this band of people. David Tudor

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**Table 1. List of Works by Paul DeMarinis****Sound Installations/Works with Sound**

*Dust* (2009)  
*Early Media Goes to the Movies* (2008)  
*Hypnica* (2007)  
*One Bird* (2007)  
*From Rome to Tripoli* (2006)  
*Bridge Re-Titled* (2006)  
*A Light Rain* (2004, in collaboration with Rebecca Cummins)  
*Firebirds* (2004)  
*Tongues of Fire* (2004)  
*Rebus* (2003)  
*Wavescape* (2003)  
*According to Scripture* (2002)  
*Moon dust Memories* (2001)  
*Walls in the Air* (2001)  
*Four Foxhole Radios* (2000)  
*The Lecture of Comrade Stalin* (1999–2002)  
*RainDance/Musica Aquatic* (1998)  
*Grind Snake Blind Apes*  
(*A Study for Pomeroy's Tomb*) (1997)  
*Living with Electricity* (1997)  
*Sound Waves and Scan-O-Vision* (1996)  
*Gray Matter* (1995)  
*Chaotic Jumpropes* (1994)  
*An Unsettling Matter* (1991)  
*The Edison Effect* (1989–1993)  
*Fireflies Alight on the Abacus of Al-Farabi* (1989/1998)  
*Alien Voices* (1988)  
*Voice Creatures* (1986)  
*Music Room/Faultless Jamming* (1982)  
*Sound Fountain* (1982, in collaboration with David Behrman)  
*Sounds and the Shadows of Sounds* (1979)  
*The Pygmy Gamelan* (1973)

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DeMarinis, P. 2004. "Firebirds." Available on-line at [www.stanford.edu/~demarini/Firebirds.htm](http://www.stanford.edu/~demarini/Firebirds.htm).  
DeMarinis, P. 1999. "An Archaeology of Sound: An Anthropology of Communication." In C. Harris, ed. *Art and Innovation—the Xerox PARC Artist-in-Residence Program*. Cambridge, Massachusetts: MIT Press, pp. 164–185.  
DeMarinis, P. 1998. "The Lecture of Comrade Stalin." Available on-line at [www.stanford.edu/~demarini/stalin.html](http://www.stanford.edu/~demarini/stalin.html).  
DeMarinis, P. 1998. "The Messenger." Available on-line at [www.stanford.edu/~demarini/messenger.html](http://www.stanford.edu/~demarini/messenger.html).

**Table 1. Continued**

DeMarinis, P. 1993. "Essay in Lieu of a Sonata (The Edison Effect)." Available on-line at [www.stanford.edu/~demarini/edison.html](http://www.stanford.edu/~demarini/edison.html).  
DeMarinis, P. 1985. "Gray Matter." Available on-line at [www.stanford.edu/~demarini/graymatter.html](http://www.stanford.edu/~demarini/graymatter.html).  
DeMarinis, P. 1979. "Drifting Harmonies." In R. Ashley, ed. *Music with Roots in the Aether: Interviews with and Essays about Seven American Composers*. Köln: Edition MusikTexte.

**Discography**

Ashley, R., and P. DeMarinis. 2003. *In Sara, Mencken, Christ and Beethoven There Were Men and Women*. Audio compact disc. New York: Lovely Music CD4291.  
DeMarinis, P. 2000. "Vocal Variety." Recorded on *Volume: Bed of Sound*. Audio compact disc. New York: PS1 Contemporary Art Center.  
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DeMarinis, P. 1995. *The Edison Effect: A Listener's Companion*. Audio compact disc. Eindhoven: Het Apollohuis/Apollo Records ACD039514.  
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DeMarinis, P. 1994. *Wireless Telephony*. Recorded on *Ääni Kalenteri: A Sound Calendar*. Audio compact disc. Helsinki: Kruunuradio/MUU Helsinki.  
DeMarinis, P. 1993. *The Dream Advisor*. Recorded on *Pieces pour standards et repondeurs telephoniques*. Audio compact disc. Dijon, France: Nouvelles Scenes NS-01.  
DeMarinis, P. 1991. *Music as a Second Language*. Audio compact disc. New York: Lovely Music 3011.  
DeMarinis, P. 1989. *Mind Power*. Audio cassette. New York: Tellus Cassette #22.  
DeMarinis, P. 1988. *I Want You* and *Kokole*. Audio compact disc. Kensington, California: Music and Arts Programs of America CD176.  
DeMarinis, P. 1985. *Eenie Meenie Chillie Beenie* and *Yellow Yankee*. Audio cassette. New York: Tellus Cassette #9.  
DeMarinis, P. 1981. *She's-a-Wild*. New York and San Francisco: Record Records RR101.

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**Table 1. Continued**

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- DeMarinis, P. 1980. *If God Were Alive (e He Is) You Could Reach Him By Telephone and Forest Booties*. Recorded on *Lovely Little Records*. LP record. New York: Vital Records VR106.
- DeMarinis, P. 1979. *Great Masters of Melody*. Recorded on Blue Gene Tyranny's *Just for the Record*. LP record. Remastered on audio compact disc. New York: Lovely Music Records LCD1062.
- Various Artists. 2007. *The League of Automatic Music Composers*. Audio compact disc. New York: New World Anthology of Recorded American Music CD80671-2 DIDX# 126527.
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was such a generous person. That whole generation of people—John Cage and David Tudor, Bob Ashley, and David Behrman—they were all so immensely generous in a way that was really unusual.

**Ouzounian:** Were you studying electronic music at Mills College?

**DeMarinis:** Yes, it was an MFA in electronic music and recording media: film, video, and electronic music. I started with film, and I got the bug of building circuits very quickly. I think it was when David Behrman visited and showed us how to use Signetics 566 chips to make oscillators. I got a few circuits and a few parts and started building things; I became really interested in hardware construction. But unlike the other contemporary practitioners (David Tudor and the Sonic Arts Union people excluded), I wasn't interested in building synthesizers. I was much more interested in building pieces. It got me to the place where, very early on, in 1973, I no longer even considered synthesizers. My pieces were in fact even more contained.

**Ouzounian:** Was that around the time you made *The Pygmy Gamelan*?

**DeMarinis:** Yes. That was a piece in which that *is* the score—that is, the instrument, that is *that* object that does *that* thing. I was somewhat of a zealot about that idea, of not wanting to make instruments, not wanting to make general-purpose instruments. I thought of myself as thinking much more in the

culture of art, making objects that were pieces, sometimes requiring performances, sometimes not, sometimes standing alone.

**Ouzounian:** Would those pieces have a unique musical or sonic identity?

**DeMarinis:** Yes, they would have a unique sound. *The Pygmy Gamelan* was one of a whole lot of different things. There was another one that used induction pick-up coils on appliances with swept filters that could be controlled by touch-sensitive plates. It was a piece for earphones. Each piece—whether it was a piece to be experienced alone, or a piece to be performed for someone, or a piece to be in a gallery—I thought of them as pieces.

**Ouzounian:** Were you inspired by other practitioners who were making circuit-based works at the time?

**DeMarinis:** The way David Tudor built circuits was to start out with something he found in *Radio-Electronics* magazine, and then to start playing with it somewhat randomly. A lot of his circuits had interchangeable inputs and outputs, which makes sense. You could look at them as very highly spiced impedance elements in a network. He would have a capacitor that would break down at a certain voltage and go “thump” and then recover. They would make these sounds that were unique. There was no way that the schematic, a SPICE [Simulation Program with Integrated Circuit Emphasis] model, would convey what that circuit did. That was inspirational to me—more than it was that I actually used any of his circuits.

**Ouzounian:** Did you ever study electrical engineering?

**DeMarinis:** I learned a little bit of real electronics with Don Buchla. After grad school I needed a job, so I took a job at his synthesizer company. Buchla was an amazing engineer, a remarkable analog designer. He's the only real engineer I worked with.

**Ouzounian:** What did you do for Buchla's company?

**DeMarinis:** I wired circuits and made printed circuit diagrams, printed circuit layouts, and did various odd jobs. I learned how to use operational amplifiers

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from Buchla; he was one of those people who really understood how those things work. Learning these things is something for which I'm grateful, because it's been very useful.

## Computer Music

**Ouzounian:** What sparked your interest in computer music?

**DeMarinis:** People who had been the inspirational generation for us—those people I mentioned—were mostly against the idea of computers, in any form, being involved in music. They had been through that in the 1960s, and seen nerdy guys with pocket protectors from IBM and Bell Labs talk about how computers were going to revolutionize music. Jim Horton, a very unsung person, had a lot of influence in generating interest in computer music, particularly in the Bay Area. He was a self-taught philosopher, programmer, mathematician—a person very much at odds with the world. To wit, he was the originating force behind what became the League of Automatic Music Composers. This was 1976. They had a network band—Horton, Rich Gold, John Bischoff, and David Behrman—and later, Tim Perkis became involved. But it was Horton's idea to put a lot of computers together that were doing diverse things with different meanings to the programmers. It wasn't a lot of computers all doing the same thing, in the sense that we think of networks as linear arrays. This was an instance where inputs and outputs were individually determined by the nodes, and all that was required was that they not have the same meaning. Horton was the person who really encouraged us to get into this, and to use microprocessors to achieve this. He was the one who turned everybody on to the KIM-1. He had his finger on the pulse of the industry and was aware of what was coming around. When the 6502 chip came out, he was on top of that. He was right there with Atari.

**Ouzounian:** In order to be part of this kind of community, you would have to be experimenting with very new technologies.

**DeMarinis:** Yes. I was interested in the computer, but I wasn't interested in the network, or the social

idea, that didn't fit my way of working. I would go to some of the early meetings of the League of Automatic Music Composers—I played with them once—but I didn't get heavily involved with them. David Behrman was initially against the idea of computers, having been involved in the 1960s encounter between computers and the arts, but then a few months later (in 1976) he got into it as well.

**Ouzounian:** Was there a clash between computer music and experimental music at the time?

**DeMarinis:** There was. Computer music was very much seen as institutional, academic music. The people at Mills and Cal Arts and other places that overlapped with the art world were not very interested in computer music; it was seen as another world entirely. But I don't think the feeling was reciprocal. Now that I know Max Mathews and John Chowning (my colleagues at Stanford), I know they were very much open to experimental music. I don't know if it was an insider/outsider thing, or if it was a cultural issue. In those times, the politics of being in an institution like Bell Labs (which had military contracts) may have been read differently by different people. Getting a computer was something that was charged with several different meanings.

**Ouzounian:** People don't necessarily have such a strong political sense about using new technologies anymore.

**DeMarinis:** No, they don't. And I think that's partly because of Silicon Valley. Silicon Valley was born outside the military-industrial complex. The military uses Linux—go figure. They have to buy their chips from Intel—chips that have been developed for personal computers. At the time I was becoming involved with electronics, that was just starting. Chips like the 555 timer and the 8008 microprocessor were developing with no military contract. They were developed for consumer purposes. I remember seeing that as a real opening, a real freeing-up of this technology. In 1975–1976, we bought these microprocessors for US\$ 250. A year before that, the only way to have access to a computer was to get a mini-computer like the PDP-11 for US\$ 60,000. That happened in one year. In 1974–1975, the system

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I was working on (the system that Buchla was developing for his hybrid synthesizer) was only using a computer—no sound generation, just endpoints of envelopes, controlling, making voltages for oscillators: complete superstructure control.

**Ouzounian:** At the time, there was a lot of excitement about the merging of art, science, and technology in ways that were fueled by a political sensibility—engaging in alternative lifestyles, experimenting with psychedelics, working outside mainstream cultures. This seemed to be especially important to students. Now that these politics aren't necessarily at work in the academy, but students are taking courses in computer music, how do you see this affecting their sensibility?

**DeMarinis:** For me, you can do anything with anything. I'm sure somebody could do a really nerdy drug experience, and someone could do something really out of control on a computer—those things are always possible. I think for everybody, it's where you find your flow.

**Ouzounian:** With regard to technologically based artwork that was taking place in the 1960s and 1970s, I have a sense that there was much more engagement with the larger questions of "why" and "how." When I studied music technologies in the late 1990s, there seemed to be more of a sense of "engineering for engineering's sake" and not necessarily an engagement with larger cultural issues.

**DeMarinis:** There are always those attitudes in anything, as much in an individual life as within the culture at large, although I imagine that there are people who are habitually one way or another. I remember a concert that Gordon Mumma did in San Francisco in the mid 1960s. Some saucer-eyed hippie came up and asked him if he didn't think the whole universe was a wave, and Gordon Mumma snapped back, "Certainly. It's a square wave." [laughter] I think this idea of flow (Czikszenmihalyi 1990) is important. As much as there are generations over the dam who got flow from techno with its incessant, measured beat (while taking Ecstasy), other people got it from analog circuits. I think digital sampling definitely brought sound into a

granular place . . . something that had always been music and had always been flowing and unfolding. Always. It's one of the characteristics of musical and much sonic experience. Sampling brought it into a textural level.

## Interdisciplinarity

**Ouzounian:** Your work operates within so many different fields: the history of media and technologies, electronics, phonography, circuitry, Victorian science, fluid dynamics, computer programming, telegraphy, laser and wave technologies, television, wireless technologies—the list goes on—the Internet, speech and language, physiology. . . . What is your process of researching or studying?

**DeMarinis:** Well, I've been at it a long time, first of all, let me say that. I've been at it long enough to have had several different understandings of the same things, like the phonograph (which I was very much interested in as a child) and the radio. I've come at things at different stages of my life. As far as what I can say I do today, I read books; I go and get the books that nobody's checked out of the library for a hundred years and read them. Usually I start with a kernel of an idea, an image of a piece I'm doing (or think I'm doing). Along the way, I might find things that stick to it, and I find things that don't stick to it but that are also interesting. These pieces sometimes have a very long incubation period.

**Ouzounian:** It seems you never felt conflicted about working between disciplines, which is something a lot of artists and students struggle with.

**DeMarinis:** I was very lucky in finding these remarkable people who could act as teachers or mentors or just fellow travelers, and who could let things be. I was always interested in the things I was interested in, and where they would fit, I wouldn't necessarily know. As much as I found David Tudor, I also found Frank Oppenheimer, the founder and director of the Exploratorium in San Francisco. It was absolutely an inspiration finding these people. And they are everywhere—people who are interested in how things "really" are, because

Figure 1. The Music Room (1982), a multi-player interactive music system consisting of five touch-sensitive guitars connected to a computer

that allows people with no previous musical training to engage in a lively musical dialog. (Photo courtesy Paul DeMarinis 2007.)



disciplines' divisions that exist in the university are constructs, things that belong in a museum.

**Ouzounian:** Can you describe the work you created for the Exploratorium?

**DeMarinis:** I created two pieces for the Exploratorium. One was *The Music Room*, which was made with these touch-sensitive instruments that anybody could play (see Figure 1). It was written in Forth in 48k of RAM on an Apple II. It probably wasn't the first automatic music piece, but it was maybe the first one that anybody saw that had a public—thousands and thousands of people a week.

I then made another piece, *Alien Voices*, in the late 1980s, which used signal processing. It was more esoteric in a sense, accessible to anybody, but less gregarious, a little more spooky. You would go into two old-fashioned telephone booths and you could talk on the telephone with somebody else who you couldn't see but only hear on the telephone. It used real-time LPC [linear-predictive coding] analysis and re-synthesis of the voice to pick out the prosodic elements of speech and emphasize or change them. It had an unnerving effect. LPC was a way of quickly sorting out things like pitch from resonance and all of those features of segmentation of speech; it could do all of that stuff in a hurry, if not in a very complete way. It was the only way available then. For example, if a father and a child find themselves in the museum and one goes into the booth and it detects a low voice and a high voice, it can reverse those things and give the child a really husky voice

and the father a really whiny voice with a plaintive, descending glissando through speech segmentation. The CD *Music as a Second Language* comes from a lot of those things I did with that piece at that time.

## Voice and Speech Synthesis

**Ouzounian:** When I heard the pieces you wrote for Tellus in 1982, *Eenie Meenie Chillie Beenie* and *Yellow Yankee*, I had the impression I was listening to cyborg music, in the sense that it's music that cyborgs might listen to or music that cyborgs might make . . .

**DeMarinis:** . . . what people thought cyborgs would listen to in 1982.

**Ouzounian:** When you were writing those pieces, were you interested in cyborg cultures or sub-cultures?

**DeMarinis:** I suppose so. I was interested in how synthetic speech couldn't get away from "the little man in the box." Eventually, I concluded that it was because synthetic speech didn't use any zeroes. It was all poles—they're all-pole filters—so it couldn't have these anti-resonances. And synthetic speech didn't use sound sources, especially the mouth. I was very interested in that "little man in the box" who could say things like the ventriloquist dummy—things that couldn't be said, things that were idiotic and transgressive.

**Ouzounian:** There is a quality to the synthesized voice, like on *Music as a Second Language*, that's aurally captivating in the sense that you feel that you have to listen to it.

**DeMarinis:** And it's just a little man in a box. That's the thing I loved about LPC. I got into LPC via the Speak & Spell. In 1978, Texas Instruments marketed the Speak & Spell. Nobody outside the military industrial world had access to digital synthetic speech, but it was built inside this toy. Someone in Australia published an article on how to hack the Speak & Spell, and then I got some information about how to crack into the bus of the Speak & Spell. I managed to download a bunch of the [Microsoft] Word files and laboriously figure out how to



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reverse-engineer what those different bits in these fields meant. I spent some time getting into that, made some pieces like *Et Tu, Klaatu* in 1978–1979 with the Speak & Spell, and then played with various other kinds of hardware speech-synthesis devices as they came out. I then had an intuition about how to play with LPC data (because it's so condensed), so that when I was able to write for a TMS-320 in 1984, I wrote an LPC analysis–synthesis program. I was able to make pieces with it that approached the feeling of the “little man inside the box,” but more fluidly, like the pieces on *Music as a Second Language*. It was all done in integer, fixed-point DSP; it was in assembly language. It was kind of crazy . . .

**Ouzounian:** Where did your interest in the voice stem from?

**DeMarinis:** The interest in voice goes back really early for me. My mother spoke many languages—was very interested in languages. I was aware of speech-sounds very early on. Working with Bob Ashley was also very influential. Bob had an amazing sense of voice. That piece that I worked with him on, *In Sarah, Mencken, Christ, and Beethoven There Were Men and Women*, where he cut all the pauses out of all those verses—it really is like a machine. It just goes for 45 minutes. There's this voice that just doesn't stop.

**Ouzounian:** Was your contribution to that piece the electronic accompaniment?

**DeMarinis:** Yes, the electronic accompaniment, which was played but also derived sonically from Bob's voice. It used banks and tuned filters to pick up formants, resonances of his voice; it was done mostly with a Moog synthesizer.

**Ouzounian:** The accompaniment reminds me of very early electronic sound circuits, like the ones on the *Forbidden Planet* soundtrack.

**DeMarinis:** Well, Moog had some “spacy” qualities. Also there were these Ling filters that I used a lot. Ling was a company that made these filter banks for military shake tables, and I think Mills got them from a military surplus sell-off. They would shake a piece of equipment (like a piece of a fighter jet),

and with transducers they would vibrate it, sweep the frequency, and look for resonances. They had banks and banks of very high-Q filters that could pick up resonances that were developing in the thing at a certain frequency. This was a way of testing things to make sure they wouldn't fly apart. That's the *Pygmy Gamelan* type of sound in there: pulses from the Moog sequencers going into ringing those filters. The Moog was a nice synthesizer, because it interchanged signals with controls. They were interchangeable, unlike the Serge or the Buchla, which kept the score separate from the sound synthesis. That's one of the things I liked about the Moog. It's really just circuits, and you can plug them together the wrong way, or any way you wanted.

**Ouzounian:** Do you ever work with old electronic instruments now?

**DeMarinis:** No, I don't. I have a Serge and a Buchla from that era. I sometimes use the Serge for a sweep oscillator for something else. They're pretty limited, and I think that people who didn't grow up with them would probably have a better idea of what to do with them than people who did.

**Ouzounian:** When I studied music technologies at McGill, to study electronic music composition you took two introductory courses—one made use of all pre-digital technologies, like a Moog and a reel-to-reel.

**DeMarinis:** I think it's really useful for understanding the relationship between technical language, sensation, and music. It's harder to do on a computer—much harder. I think of synthesizers like the Moog as kinds of philosophical toys: They are demonstration devices for conveying a certain understanding of things that is really beyond what they can accomplish. In a sense, they're laboratory reductions that give you an insight into things much bigger than either the artistic medium or the physical principles.

## Performance Work

**Ouzounian:** You've performed across the United States and Europe, and in Canada, Mexico, Japan,

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and Australia, in festivals like Ars Electronica, Audio Art, and Open Systems. Can you describe some of these performance activities?

**DeMarinis:** My performance work always played with my installation work in terms of ideas, materials, objects, and so forth. For instance, the early Speak & Spell pieces used not just the touch-sensitive guitar, but actual mechanical drums à la Joe Jones—percussion instruments that I played so as to accompany the “little man in the box” with something that had a physical quality to it. Over the last decade, I was doing a lot of work in the pit with Merce Cunningham, where you can’t do that—you’re pretty much tied to sound sources and signals.

**Ouzounian:** Can you talk a bit about that collaboration?

**DeMarinis:** I did different tours with Merce. A lot of what I did were the “Events,” which were very free-form, and I did some repertory works. We did a revival of *Rainforest I* by Tudor, for example; all the musicians did some of those. For the “Events,” I used laptops and other electronic devices and circuits. Merce has the idea of there being no underlying connection between music and dance. And yet—and I think this is the reason that Merce almost always had live music—there is a real entrainment between the musicians in the pit and the live dancers on the stage. Even if you’re not trying, there’s an energy shared back and forth. Even if you’re avoiding it, it’s unavoidable. I think Merce very much knew this, and very much understood the value of everything happening live.

**Ouzounian:** I suppose it’s also important that everything happens in the same place, versus things happening at different times and later being mixed. It has a very different quality.

**DeMarinis:** It happens in the same place at the same time. It’s right there; the stage is vibrating. I think this is why you can play 45 minutes of electronic noise and audiences would cheer. It’s not that they were cheering for the dance and somehow failed to notice the music. It’s the synergy of “live-ness.”

## Interactivity

**Ouzounian:** Some of your very early works, like *Sound Fountain* with David Behrman, *Music Room*, and *Voice Creatures* allow users to create music (and move images in the case of *Sound Fountain*) through interaction with touch-sensitive sticks or guitars and voices. What led you to start working with interactive technologies in a musical or sonic context?

**DeMarinis:** The interface devices themselves grew quite naturally out of the live performance-with-electronics situation. Having a touch-sensitive controller got us away from twiddling knobs and staring at the alphanumeric displays and keypads. Remember, laptop music started way before laptops; just take a look at me in the images of *A Byte at the Opera* (1976) trancedly leaning over my Kim-1 display as I floated over an audience of a couple hundred people (see Figure 2). We should have seen it coming. But what was a surprise back then was how much automation could be subsumed by software. This is what led me, at least, toward my early “interactive” pieces like *The Music Room* and *Sound Fountain*.

The way I arrived at it was thus: I had developed the capacitive touch-sensitive guitar-like instrument in 1980 to use in some performance pieces. During a rehearsal, I left the system on as I attended to matters in the other room, and I heard my (then 5-year-old) son playing my piece just about as well as I could. I realized that I had automated the piece to the extent that anyone could play something that sounded like music. A few weeks later, Frank Oppenheimer heard a performance and invited me to be an artist-in-residence at the Exploratorium, so it seemed like a good situation to run with this automatic-music idea. I developed the touch-sensitive instrument more into a guitar form to crystallize musical fantasies, and I developed some software ideas to let people have a meaningful experience of music without being didactic. That is, I avoided what musicians know about music (scales, chords, rhythm) and made a playground filled with little “Maxwell-demons” that run around to keep everything sounding good. The piece was very

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Figure 2. A Byte at the Opera; Jim Pomeroy with Paul DeMarinis (1976). (Photo courtesy Paul DeMarinis.)



popular, and as a result of extensive exposure at the Exploratorium during the 1980s, I think it had a lot of influence on ideas of automatic music performance in popular arenas like video games and digital musical toys. It was, in 1981, probably the first new paradigm for automatic music since the chord-rhythm organ of the 1950s.

**Ouzounian:** What were some of the challenges of creating interactive sound works in the 1980s? How have these challenges changed over time?

**DeMarinis:** Well, having to invent and build everything was a challenge, but one that I relished. Needless to say, computers of the sort I had access to at the time didn't have any sound output beyond a square wave driving a small loudspeaker. Audio-rate D/A conversion was something only found in laboratories. In 1981, there was no way even to connect available sound synthesizers to available computers; MIDI was still a few years away. For *The Music Room*, I hacked Casiotone MT-30 synthesizers to access their internal bus and built a dual-port RAM interface card for my Apple II so I could control them. A similar hack worked on the Roland rhythm

box. And if you wanted to make a real piece within a realistic budget, you had to be content with those sounds.

Everything has changed now. Any sound is available directly from a computer. Vast technical and aesthetic resources derived from decades of electroacoustic practice are easily available to morph, mix, and spatialize sounds. These techniques came out of research practices that had little inclination toward "interactivity." I must re-iterate that "interactivity" had something akin to an anti-elitist social agenda for artists who promoted it in the early 1980s, before Atari proved to the world its universal applicability to profit by consumers' desire for useless toil. But of course—and this is vastly more important a change—listening has changed enormously since then. What sounds are considered musical, what are the situations where people listen, what they do as they listen, who listens—all of this has changed. It is at least as great a change as what occurred between 1775 and 1800, probably much greater, and there is no way to consider interactivity, at least in music and art, without accepting this vastly altered social and aesthetic milieu.

Figure 3. *Gray Matter* (1995), consisting of interactive electrified objects that produce sound and sensation when stroked with the hand. (Photo courtesy Paul DeMarinis 2007.)



**Ouzounian:** Can you describe the modes of interaction that are present within your installations *A Light Rain* and *Gray Matter* (see Figure 3) and the technologies that enable these interactions to occur?

**DeMarinis:** *Interactivity* became a buzzword in the early 1990s, so much so that every artist for a time felt obliged to pay obeisance to it. I recall painters proclaiming that their works were interactive because people experienced the art by looking at it, by moving around it. Sure, why not? In the end, it just came to mean accessing files with a mouse over the Internet, that's all. By then, I understood something about the nature of "interactive art"

from my experiences in the early 1980s, mostly its limitations for artistic experience. Also, personal computers had gotten so big and sluggish by 1990 that latency was (and still is) a bigger part of the interactive experience than it had been in the jolly pre-operating-system days of the Kim-1 and Apple II.

So I guess I wanted to make works that still include the viewer but that fix them at a very particular point in a web of transmitted causes and received effects. *RainDance* (1998) and its collaborative successor *A Light Rain* (with Rebecca Cummins, 2004) do this in a lighthearted way. They are literally immersive works—you really get wet to listen to the music, because it is produced by precisely controlled water jets falling on your umbrella. But there is no question that the music is made without you. For that reason, though not exclusively, I use only really banal composed music like Mozart, Strauss, and popular tunes from before World War II—the common patrimony that everyone shares without thinking about it.

*Gray Matter* (1995), on the other hand, is a little more sinister, in that it requires you to insert your living flesh into a 400-Volt electrical circuit that can be painful, in order to eke out a major scale or a Bach Partita—musical content that is regarded as punitive for most people, like the stuff of music lessons—a *Gradus ad Parnassum* à la "In The Penal Colony." I wouldn't say that these works fully realize the capabilities of "interactivity" or even extend them in novel directions. Rather, they are stunted versions of the idea designed to position the viewer in a compromised position where the piece can emerge.

**Ouzounian:** Do you conceive of modes of interaction or engagement differently with regards to interactive versus non-interactive works?

**DeMarinis:** If your readers hadn't followed me until now, and just dropped in from outer space, I would have to point out just as an aside, that art has very little to do with medium, content, programming, public, or markets, or all those other smokescreens. It has everything to do with modes of attention, listening, looking, remembering. How we do it is what changes in art. The rest is just stuff. And that is why art can be so revolutionary, so compelling,

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and really change things. So of course modes of attention that depend on being physically part of the work differ from things that use focus and fixation as the primary modes of attention. Here, you get to a bogeyman of it all, as I see it: concert listening, one of the most peculiar and insular cultural practices to survive into our times. It appears to me to be so major an anachronism that I have no doubts that an anthropological study of its survival, even its vitality, would reveal much about our civilization, our economics, our theology. Most people never learned to do this kind of music listening.

Decades ago, I lost my ability to sit still and listen to music in a concert hall. It wasn't the music that died; it was my ability to attend to sound in that way. I can still get completely into a piece of music from the common-practice period via a recording, or by playing it out on the piano. But of course, there is a host of other ways of being involved as a listener without specifying the orthodox version of interactivity, which, as I mentioned, imposes some severe artistic limits. Distracted listening, spatial listening, cocoon listening, touristic listening, visual listening . . . the list could go on and on: All these are attentional forms that involve the listener in different ways with the material. My own introduction to other ways of listening, as we discussed before, was David Tudor's *Rainforest IV*.

**Ouzounian:** Several of your installations, including *The Messenger*, employ networks as an interactive medium. What are some of the qualities you've found to be particular to interactions that take place over networks?

**DeMarinis:** During my years at Wesleyan (1979–1981), I spent zillions of hours in the libraries looking at old books on early electrical technology. Somewhere along the way, I ran across mention of Francisco Salva and his prescient proposals for the telegraph that would use electric shocks in a physical network of alphabets, wires, and servants. Vivid in their imagery, they seemed to point out a social dimension of imaging that seemed like it might be latent in all our electrical recording and communication systems. The interesting thing about *The Messenger* was that when I originally made it (1998), it was a very different

piece than what it became, not because it changed (it didn't) or because I revised my thinking about it (I didn't). It was because the network environment was still an unknown to most viewers in 1998—a fantasy world—and that situation evolved rapidly, changing the meaning of the piece in the process. So it became necessary to remake the piece in 2005, not so it would bring it back to the original meaning—that would be impossible—nor to make it mean something different than what I had originally meant—that would make it a different piece—but rather to make the same piece, but in 2005. This is an authorial possibility not available to Pierre Menard in his rewriting of Quixote.

In the course of these changes, the interactive (i.e., human-computer interaction) situation changed drastically. For example, in 1998, the chance of someone being in the gallery coming across an email they had sent (to the piece) was much likelier; email was much more peer-to-peer. By 2005, the chances of their reading an email they had received (e.g., an ad for Viagra) was far more likely. This collapsing of public and private was what the piece had envisioned in the medium of sparks and the bodies of the servants.

**Ouzounian:** Many of your works involve placing antiquated technologies in novel contexts, such that the technology becomes a subject of the work as well as its medium. Can you describe how this operates in one of your works?

**DeMarinis:** To my mind, this effect of technology becoming the subject of a work is happening all the time, and I only use “antiquated technologies” to achieve a distance, a discursive perspective so to speak, that would not be attainable otherwise. So, if in the case of *The Messenger*, for example, I had rather used the historical metaphor of the Internet to talk about the Internet and implement the piece on the Internet, it might be broad in theoretical scope, but very flat. The depth that historical media add seems to me not to be a pseudoscopic depth but a real one. That is my belief that the threads of our behavior and production, technological or not, connect across the centuries in a crisscrossing manner, their intersections being

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the products, practices, and peculiar behaviors that appear rooted in their time, but they have more extensive connections both backward and forward.

Maybe it isn't that we walk around outside while talking on mobile phones for privacy's sake, or because the reception is better, or even because it replaces a smoking habit, but we may use mobile phones because they give us a venue for this walking around outside behavior, and in that way it might link backward not with wired-telephone communication but with prayer, the way the priest paces back and forth in the garden while reading his prayer book.

The issue of communication is not overcoming distance, but distance itself. Erkki Huhtamo mused that Finns were early adopters of mobile telephony because they really don't like to face each other. Both the device and the social practice around that device may thus have historical cultural roots. So, in the case of Salva's telegraph, who would communicate with whom (and how) offers an insight as to why the distance is there in the first place . . . a kingdom and a colony, a master's house and the servants' quarters.

The history of recording suggests a host of similar questions that may be posed to our rampant media for recording everything, from my own unsearchable mass of family pictures to the National Security Administration's Carnivore software: why record everything? Ideas centered around dyads

like repeating or preserving, knowing or owning, come up right at the beginning of sound and image recording, and their context being a little different, they offer a perspective for thoughtful consideration.

On a personal note, though, beyond all the wonderful absurdity and occasional brilliant insight that emerges from the old technology, I get a real kick out of re-building an "impossible" technology from scratch, so to speak. These long-forgotten laboratory bench assemblages are not as easy to make work as one might assume from reading lab notebooks or patent specifications. There is nobody around who has any carnal knowledge of them. So some of the pleasure is not polemical or aesthetic; it is just enjoyment for me. And that, too, is part of my motivation.

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