The Fly in the Ointment -- Proto-Web Music by The Hub

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It is so obvious as to be barely worthy of mention: certain technical innovations have had a profound effect on the development of musical style. The introduction of the valve to brass instruments concluded the chromaticization of the orchestra; the piano's rise to cultural dominance was fueled by improved iron casting techniques. But our century has seen a proliferation of technological innovations whose implications dwarf the contributions of earlier eras. Electronic technology has radically changed the composition, performance, distribution, and consumption of music on a global scale. Whereas for the first three-quarters of our century the principle forces of musical change were recording and broadcasting, since 1975 the computer -- occupying as it does an ambiguous position between compositional aid, performance instrument, and an embedded controller for appliances -- has become the dominant engine of radicalization.

One can link the flowering of "live computer music" to the introduction of one specific piece of hardware: the Kim 1 microcomputer. Introduced in 1975 by the Commodore Business Machine Corporation primarily as an evaluation device for the new 6502 microprocessor chip, the Kim was a far cry from any previous notion of a computer: an A4-sized circuit board with a small keypad and display, it looked, according to composer Paul DeMarinis, much more like an autoharp than like the popular image of a computer, with its cupboards full of twisting tape reels and panels of blinking lights. Years before the Apple II swept the hobbyist market, the Kim established that computers could be affordable, personal, portable, configurable, musical. A community of musical hacking sprang up quickly in 1976, initially centered around the Center for Contemporary Music at Mills College in Oakland, and very much inspired by the proselytizing of Jim Horton, a Berkeley-based composer. The MFA program at Mills College, under the direction of composers Robert Ashley, David Behrman and Terry Riley, already had a strong reputation for fostering live electronic music and composer-designed "home-made" electronic musical instruments. The Kim was a circuit board you could hold it in your lap, not so different from those soldered up in the composers' homes, and it made the step to computer music a natural one. Although the bulk of the composing was done in software, the Kim

reinforced the tactile, instrumental character of the technology, and gave the resulting music a fundamentally different character from mainframe-based academic computer music, in which composers worked almost completely isolated from hardware considerations.

This coupling of compositional and instrumental characteristics became the dominant trait of Bay Area computer music (and spread East as microcomputers were adopted by other composers). At the forefront of technological aesthetics, Horton proposed an ensemble dedicated to pushing this idea to its natural conclusion: the decentralization of the compositional and instrumental elements. "The League of Automatic Music Composers" was formed in 1977 by Horton, Rich Gold and John Bischoff. Their three Kims were networked: a common data bus allowed the machines to exchange information. Each composer wrote programs that responded not only to his playing of the computer's keypad, but also to the more unpredictable data that any other computer might place on the network bus at any time. All sounds were generated directly by the computers, via D/A converters, serial output ports, or programmable timer/oscillators. The three machines effectively became a single six-handed performance instrument, with the three composers' "scores" factorially expanded by data sharing and computer decision-making.

The League gave several ground-breaking performances, but did not travel widely outside the Bay Area. Problematically, the role of networking -- the essential mechanism of their music -- was often impossible for an audience to perceive. As with Christian Wolff's "co-ordination" pieces of the early 1960s, the rules that governed the performances could only be made obvious by limiting the compositions to a very pedagogical form, thus sacrificing the kind musical richness unique to the entwined machines. And, as with Wolff, the composers opted for musicality over pedagogy, and their compositions have a similarly edgey complexity.

In the mid-1980s, after a period of dormancy, the group reformed as a sextet: Bischoff was joined by Chris Brown, Scot Gresham-Lancaster, Tim Perkis, Phil Stone, and Mark Trayle. By now the personal computer industry was in full swing, and there was no longer a single standard computer for the group. In order to network the Macintoshes, Amigas and IBM PCs that had replaced the Kim, a simple microcomputer was dedicated as a server, and a more sophisticated protocol was established for the exchange of data; the group took its name -- The Hub -- from this new configuration. By now the proliferation of MIDI permitted an expansion of sound resources and input devices: no longer did the group

have to depend exclusively on the direct digital sound output of the Kim, and they were able to supplement numeric keypads with piano-style keyboards, alternate controllers and pitch-to-midi converters. The group lost some of the extremism -- both sonic and conceptual -- that came with the constraints of the earlier working environment, but the more open structure of the network increased the breadth of musical possibilities, and the server protocol made the writing of programs vastly easier.

Around this time I was the Curator for Performances and Sound Installations at PS1 and The Clocktower, two venues of the Institute For Art And Urban Resources in New York City. I wanted to invite the Hub for their first New York performance but -- working with a miniscule budget -- I could not afford the cost of six airfares from San Francisco. I proposed to Phill Niblock, a composer and long-time presenter of experimental music concerts, that we co-produce a project in which three members of the Hub perform at The Clocktower and three at Niblock's Experimental Intermedia Foundation, ten blocks away, linked by modem via telephone lines. Between our two institutions we could now afford four tickets, and I appealed to Mitchell Kapor, the visionary founder of Lotus Development Corporation and later of the Electronic Frontier Foundation, to contribute the $800 needed for the remaining two airfares.

The Hub members wrote two new compositions specifically for the remote linkage system. In these pieces the two trios performed without hearing each other -- the modems were used exclusively for the exchange of data between the two sites (each equipped with its own "sub-hub"), not for monitoring of the remote performance. In one composition data was shared as usual amongst the six computers, as if via a single hub; in the other the modems were used to send text prompts back and forth between computer monitors at the two sites ("play something loud now", "thin out the texture", " more noise", etc.), while the sub-hubs themselves were used only for local data sharing within each trio. The concert also included sextet compositions re-arranged for trio format, and solo works. The program was performed on two warm weekend evenings in the spring of 1987. One ticket gave admission to both spaces for both nights, and a leisurely intermission made it possible to stroll between the two venues at half-time. Niblock and I called it "wide stereo".

What did it sound like? Abrasive computer output reminiscent of the old League was mixed with smoother, more familiar timbres of MIDI synthesizers. Riffs would repeat, with small variations, for several minutes, then disappear or change radically in speed or register.

Occasionally a performer's gesture would seem to trigger an obvious change in the sound texture, but generally there was even less apparent causality than in performances in which the entirety of the Hub shared a single stage. The unpredictability of the "data from afar" seemed to surprise the performers at least as much as it did the audience, and contributed a not un-musical element of tension. Between the two sites the overall experience was not dissimilar to listening to a 12" remix record, where one hears multiple interpretations of the same basic tracks, each configured with a different emphasis (rhythm breaks, accapella sound bites, extended dance floor mix, short radio mix, etc.) -- minus the rhythmic drive inherent in dance music.

To the best of my knowledge this was the first concert of modem-linked music ever produced, and it confronted a fundamental conundrum of networking: while it was easy for an audience member to sit in one place and be a properly passive participant in the electronic network, the real pleasure came from the "sneaker net" -- moving one's body from site to site, getting the different views, mingling with different people, enjoying the balmy commute as much as either destination itself. The lack of cross-monitoring between the two sites heightened the differences between the parallel performances, and gave the event its defining character. With more phone lines the two trios could have heard and responded to each other as if in one room, but then the question would arise: "why bother?" Why fly performers across the continent (at a cost beyond our budget) if the same technology could be used to let them perform from home?

In the years since the Hub concert we have seen a number of other telecommunication-linked performances of music -- initially using direct phone connections for data, audio and video exchange, and later using the Internet -- that have raised, but failed to resolve, this question. And they have made us aware of a major flaw in concept of an "electronic community": people like to be near people. The postage stamp did not supplant the visiting card on the silver salver, the telephone did not replace the handshake, and the Web site has not killed the movie theater. As Andy Warhol once said, people don't go to the movies to see a movie, they go to the movies to stand on line. There are certain cultural artifacts too tightly entwined with social ritual to be entirely digitizeable: music begs warm bodies.

The essence of The Hub, and the League of Automatic Music Composers before it, lay in its recognition of the social, rather than informational, role of the computer. By splitting themselves in two for

their New York concert they made clear this schism: within each trio the computer's entwining of score and instrument extended a more or less traditional model of ensemble interaction, while down the phone lines data floated like the glass on a seance table -- sentient but disembodied, useful not as a substitute for direct human exchange but as an alternative, much the way a letter or phone call lets one express things that would never emerge in a face-to-face conversation. Networked performances will never be convincingly musical until they succeed in acquiring just that magical balance between the machine and man the social animal, between data and the date.