Interrogating The Machine

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Abstract: The author discusses three of his own compositions in terms of his approach to technology. Four related principles are defined and exemplified: **interrogation**, the exposure and exploitation of a machine's basic functions and assumptions; **subversion**, the use of tools in ways not originally intended (by the manufacturer); **differentiation**, the use of musical applications that are necessarily unique to the equipment employed, and **catalysis**, the use of machinery in the service of a live event that is unique to the moment. Also discussed are ways in which electronic hardware can enhance the creation of musical processes that can be clearly discerned by the listener. Finally it is suggested that subversion, interrogation, et. al. can help empower those who are overwhelmed by technology.

機械への尋問

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テクノロジーへのアプローチについて3つの自作品を通して論じる。ここで4つの関連した法則を定義し、例証する。まず第一に「尋問」、機械の基本的機能と仮定の露出と搾取。2つ目に「破壊」、本来(製造者が)意図した使い方ではない道具の利用。3つ目に「識別」、機材を使用するのに必然的に独創的である音楽アプリケーションの利用。4つ目に「触媒作用」、その瞬間、独創的なライブ・イベントの有用における機械類の利用。また、聴取者によってはっきりと聴き分けられる音楽プロセスの創造を高めることのできる電子工学的ハードウェアにおけるいくつかの手法についても論じる。最後に、「破壊」、「尋問」などがテクノロジーに圧倒されている者に権限を与えるのを手助けすることを提案する。

I work in a variety of formats, but always use form some of modern technology. In this article I will outline and exemplify four related aspects of my approach to the machines, as well as how electronic hardware has enhanced my efforts to create musical processes that can be clearly discerned by the listener. I will discuss three of my own concert pieces in terms of these concepts.

First, much of my work springs from an attempt to expose and exploit the most basic functional structures and assumptions of existing equipment, as the Jamaican "dub" producers of the 1970s did, for instance, in using the multi-channel mixer to create drastically altered versions of reggae recordings. This approach could be called interrogation; what is being

interrogated in this case is the paradigm of multi-track with its long rows of meters and volume controls; just how this is accomplished electronically, whether by tubes or transistors (or running mice) is irrelevant. John Cage and Lejaren Hiller acted similarly in the LP version of *HPSCHD* (1967-1969, released on Nonesuch), by recording separate components of the piece on the left and right channels and asking the home stereo listener to realize the piece by adjustment of the left/right balance and volume controls. Here they interrogate the two-channel separation of stereo at the conceptual level—just how this is implemented electronically is again of no consequence.

Second, I aim to use tools in ways not originally intended (by the manufacturer), as the early "scratch" disc-jockeys did by manipulating phonograph players by hand, and Cage did in *Cartridge Music* (1960) by suggesting that feathers and toothpicks be inserted into a phono cartridge instead of the needle. This approach could be called subversion. In this context, all acts of interrogation are a subset of all acts of subversion, that is, all interrogation is subversion but not all subversion is interrogation; smashing a TV subverts (and destroys) but does not illuminate and thus (by my definition) does not interrogate. One very popular technological subversion might be the intentional pointing of a microphone or electric guitar into its amp to create feedback. This is now such a standard practice that one could argue that yet another act of subversion has been "co-opted" or assimilated into the mainstream.

Third, I search for musical applications that are unique to the equipment employed (the exact opposite of the stated goal of many synthesizer manufacturers), as Wendy Carlos and many others sometimes did in using the Moog (or Buchla, etc.) synthesizer to sound as only a Moog can, without reference to other sounds or instruments. Call this differentiation. Interrogation is most potent when it differentiates—using a tape recorder as a drumstick does illuminate certain traits about the tape recorder, but these are traits it shares with many other things.

Fourth, I endeavor to put machinery in the service of a live event that is unique to the moment, as Cage (again!) did in a number of pieces that use live radio. Arguably the piano serves the same function in *4'33"*—Cage's very famous work in which the pianist makes no intentional sounds whatever. I call this catalysis, that is, the effect of a catalyst, a substance which fosters a reaction among other substances, itself coming out of the process unchanged. Thus the radio is a catalyst because it calls vivid attention to the moment, while remaining essentially inert. I use live radio and other indeterminate elements quite a bit. Unlike Cage, though, I aim for a rather more conventional musicality and theatricality. I believe that sometimes a chance decision is simply the best, most musical one—if the context is creatively and intelligently controlled.

Finally, technology can be an invaluable facilitator of what critic Kyle Gann has called transparency, referring to musical processes which are clear or transparent to the listener. This notion is eloquently explained by Steve Reich in his essay "Music As A Gradual Process" (though transparency does not require gradualness; the effect of talking into a helium balloon, for example, is transparent and instantaneous). His early works *Pendulum Music* and the seminal phasing tape loop pieces *It's Gonna Rain* and *Come Out* are excellent examples. "Transparent" doesn't necessarily mean "better"; it is really a matter of context and style. Most (all?) composers consciously or unconsciously rely on one or more compositional rubrics to limit the infinitude of options; transparency is one such of mine. Gann has identified transparency (as defined above) as a defining attribute of minimalism, but the concept is much older; Ravel's Bolero represents transparency; pure serialism for that matter eschews it explicitly.

A musical process might be purely theoretical, as in canon (Reichian phasing being a special case of canonical writing!) and thus independent of any particular technology. Alternatively, a process might have a strong connection to the physical world, as when a sound is passed through a reverberant space or through an electronic device, many of which are designed to imitate the effects of just such a physical event. Both alternatives (and the gradations in between) can be represented schematically by an input, a processor and an output. I will use this terminology in offering further examples of how technology can enhance the transparency of both kinds of processes.

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Travelogue (1991-1993)

Travelogue relies on what I call headphone-driven performance. The piece is composed for two synchronized audio tape tracks and one live vocalist. TAPE ONE, the musical accompaniment, (actually two-channel stereo) was created in a MIDI studio and is heard only by the audience. TAPE TWO, which contains various vocal sounds, is heard (via headphones) only by the performer. The performer has never heard these sounds before, and yet the performer is asked to imitate exactly what she or he hears on the headphones—with every word and expression intact, and with *no lag time whatever*. This last requirement makes the task quite impossible and the output resembles a bizarre unknown language—even though the input is, for the most part, plain spoken English. Because of the necessary element of surprise, the piece itself cannot be used for either audition or rehearsal; a person can perform *Travelogue* only once. A "mock-up" tape containing material similar to that of TAPE TWO (the headphone track) is used as a test for potential performers.

Travelogue is characterized by highly organized interplay between performer and accompaniment. The work is structured in episodes, which range in flavor from highly emotive, to minimalist to humorously absurd. The title refers to feelings of dislocation, alienation, exhilaration and despair often experienced by travelers—and everyone else, for that matter, at one time or another. In the course of the piece, the performer experiences and portrays an extremely wide range of emotions, from giddiness to bewilderment to terror. The performer is constantly on edge; the imperative to "don't look back" provides a degree of tension. Occasionally an isolated intelligible word or phrase emerges. At its best headphone-driven performance puts performer and audience into a heightened performance mode.

Travelogue subverts and interrogates the tools of the recording studio, and differentiates the multitrack recorder and cover-the-ear headphones from other tools. The piece could hardly be done any other way. It does not differentiate with respect to the instruments of the taped accompaniment (unlike my *Headset Sextet*, discussed below), hence in this case (unlike the work of Wendy Carlos, etc.) whether the underlying tape employs Moog or Steinway is irrelevant.

Travelogue asks, in a sense, "just because multitrack recording (and even plain old stereo) allows two things to be recorded in synch, must they then always be heard together? And can the two-way isolation afforded by the miracle of stereo headphones be used to musical and theatrical effect?" As writer and photographer Jeremy Wolff put it, *Travelogue* "precisely reverses the intended purpose of recording equipment...exposing these technologies by turning them inside out" (Wolff, 1989). Recording equipment is normally used to translate what is live and ephemeral into something static (for the purpose of mass production). Here this application is reversed, and the equipment becomes a catalyst in a "reaction" between source tape, performer and audience, enabling a one-time- only live event, exposing raw human qualities in the performer. The audience is told that the performer is hearing plain English, and this is confirmed by the few intelligible words that arise out of the mayhem; with this knowledge as proviso the basic process of *Travelogue* becomes transparent indeed (and far from gradual!). The processing unit is a human being. That the input is standard, recognizable English is crucial; to add extended techniques or baby talk, for instance, to the headphone tape would obscure the process. Non-English-speaking performers would require an appropriately translated source tape.

Headset Sextet (1995, to be revised 1997-8)

Headset Sextet expands headphone-driven vocalization from one performer to many. Each of six vocalists responds to a discrete headphone track, following the basic instructions of *Travelogue*. As in *Travelogue*, multitrack tape is used, with two tracks reserved for the musical accompaniment. In addition, minimal stage directions are incorporated into the

headphone tracks, electronic tones signaling the performers to switch between utterance and "do-as-told."

One duet, the "8/9 Canon," uses double two-part tempo canons in the matter of American composer Conlon Nancarrow: in both vocal and accompaniment one channel enters late by factor of one-ninth of the total duration and at nine-eighths the tempo of the first, such that all four end in emphatic unison. In addition, from entrance to the final unison, each accompaniment track decelerates drastically from 200 to 20 BPM. Each is based on arpeggiated 9th chords arranged in isorhythmic patterns.

As a headphone-driven performance piece, the *Sextet* subverts, interrogates, differentiates and catalyzes just as does *Travelogue*. The human processor remains. But the tempo canon brings in a new (and purely theoretical) process forcing new technical subversion and new concerns of transparency.

My goal was to create a canon not of parts but of the actual sounds of an entire piece, so that all durations, decays (including echo and reverb), vibratos and beating effects are affected. The input to the canon process is not a notation but a sound recording.

To compress the duration of such a long high-quality sound file was beyond my means at the time, so time-compression was accomplished by altering the recording speed and compensating with real-time pitch-shifting, using an old Yamaha SPX 900. But such a tape-speed shift alters the time-code (in this case SMPTE) accordingly, so three time-code tracks were required, one for each non-standard tape speed, and one at normal speed for overdubs and mixing. Thus whereas in Jamaican dub the subversion of technology feeds new theory (in my book, dub's subtractive process ranks with Reich's phasing, Glass's augmentation and Nancarrow's canon), here pure theory—and economy—feeds technological subversion. But this is "hidden" subversion; as a means to an end and otherwise opaque to the listener, it is not a good example of interrogation.

Nancarrow generally keeps his "input" parts quite dissonant, with the result that to offset and overlay them does not affect the harmonic tension. Here my simple and static source harmonies provide continually shifting tension and coloration as the canon proceeds. Nonetheless, my arpeggiated 9th chords, a workable-enough gambit for minimalism initially didn't yield quite the transparency to the canon that I sought. Octave shifts were added and embellishing figures overdubbed to serve as "landmarks", each such landmark occurring first in one channel and repeated later in the other. To be even more transparent the accompaniment tracks were panned hard left and right, thus one side answers the other across the stereo field. As above, abstract theory drives technological ploy. The accompaniment tracks actually "cross" in fact, continuing past the climactic unison for a moment, the faster tempo finally ahead.

A more complete analysis of the piece in terms of input-processor-output stages would include many more processes, even disregarding the headphone-driven aspect: source chord ==>arpeggiation ==>addition of passing tones to make 12-note pitch pattern ==>application of duration values for 11-note isorhythm ==>octave shifts ==>instrumental arrangement with accompanying percussion and embellishments ==>tempo deceleration ==>sound recording ==>tempo canon. In this case my concerns of transparency are most keenly focused on the headphone-driven and canon processes.

Shoe Music (1988-9)

Shoe Music is a suite composed for the MUSICAL SHOES, an instrument I invented in 1988 to fulfill a commission from La MaMa Experimental Theater in New York. The shoes were fabricated by myself and John Driscoll.

The Musical Shoes consist of four upturned shoes mounted on stands. A piezo-electric pick-up is imbedded in each heel. Each pick-up is wired to a noise gate which releases a bit of any

ongoing source material at the instant the shoe is struck; the source can be anything—from a tape to a spontaneous sound collage. The gates (actually expanders) are sensitive to dynamics, and the release time of each is variable. They can be struck by the fingers but are usually played with drumsticks.

"Shoes, Loops, and FM Radio" uses two off-the-cuff tracks as source material: one made in front of the audience by grabbing a short loop off the radio, another which is an ongoing live commercial broadcast. The movement proceeds as an improvisation. Shoe Music also includes pieces for shoes and tape and a completely scored duet.

The "noise gate" is usually thought of as a means of carefully controlling musical content in a recording studio, and is normally used to shut out extraneous, "unwanted" instrumental sounds. Here the gate itself becomes the instrument and the means of determining which sounds are "wanted." So once again, technology is subverted, interrogated, and catalyzes a live event that is unique to a particular moment. No digital sampling is involved—yet metaphorically, Shoe Music turns the whole world into a real-time sampler. But the gate is not the "poor person's sampler"; rather, Shoe Music exploits what is unique to this device, differentiating it from other tools.

Again, *Shoe Music* (and earlier work with gates) springs from an urge to make a particular musical process transparent. The gate process takes information from two inputs: the "key" or controller input (from the shoe), and the audio input (radio, tape, etc.). The use of the shoe (rather than keyboard or chrome-plated drum pad) underscores the arbitrariness of the choice of controller. Indeed, it might have been more persuasive to use, say, a shoe, an iron, a book and a brick. *Shoe Music* doubles as a spoof on the electric gloves and infra-red beams of the alternative-controllers rage. In fact the trigger object can be any object at all, and so attention is naturally focused on the key processor, the gate. Thus here absurdity facilitates clarity. The familiarity of commercial radio does so as well (just as headphone-driven performance is clarified by the use of plain English as input).

In live sound processing, the performer-equipment connection is too often obscure—the computer or electronics a black box, leaving the audience in the dark. Shoe Music makes the connections clear (even if one has never heard of a noise gate).

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The works and the thoughts discussed above evolved from the late '70s through the present (some of the equipment dates from even earlier). During that time the digital revolution has changed our relationships to technology considerably. A computer by its nature has no "dedicated" functionality: a four-track mixer is a four-track mixer and headphones are headphones, but a computer can be a mixer of any number of tracks, as well as a synthesizer, a virtual paintbrush, palette and canvas, an internet terminal, bookkeeper, television, eavesdropping device, etc. Perhaps the computer cannot be interrogated in quite the same sense as can recording equipment or any of the equipment cited in this article. Yet I would argue that such a goal is as valuable or more so than ever; it will remain one of my primary motivations. With respect to MIDI, for instance, it's important to realize that the feature-laden commercial sequencing packages (now ubiquitous in academic and commercial facilities alike) are equally laden with aesthetic assumptions (try programming multiple concurrent tempos in Performer). Creativity can be stifled by what I call the spit-out-the sample-of-the- barking-dog-NOW paradigm of MIDI culture. It may be that in the future subversion, interrogation, differentiation and catalysis will be realized more with respect to software rather than hardware.

Admittedly, my concentration on "low-tech" (and perhaps "mid-tech") hardware has been determined by financial constraints as much as it has been by choice. But this focus fits neatly with the goal of showing by example the interrogation and subversion of technology that bears some relation to machines such as receivers and tape players that many people are familiar with. Everyone "gets" headphones just as they "get" a violin. One of the best things an electronic artist can do is to encourage people to take an active attitude towards technology that

in itself seems to encourage passivity, particularly in the case of those people who take an extreme view of the incipient digital age—as *deus* or *diabolus* ex machina. Those who would exalt or demonize technology will master and understand it only when they see it turned on its head—in art that communicates effectively, whatever its content. The artist offers survival techniques to the citizen facing the oncoming bulldozers of the information highway.

Acknowledgments

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