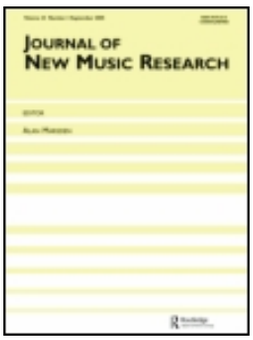

Journal of New Music Research

ISSN: 0929-8215 (Print) 1744-5027 (Online) Journal homepage: http://www.tandfonline.com/loi/nnmr20

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To cite this article: Joel Chadabe (2001) Preserving Performances of Electronic Music, Journal of New Music Research, 30:4, 303-305

To link to this article: http://dx.doi.org/10.1076/jnmr.30.4.303.7485

Journal of New Music Research
2001, Vol. 30, No. 4, pp. 303–305

0929-8215/01/3004-303$16.00

Preserving Performances of Electronic Music

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Abstract

Traditional instrumental music can be preserved through notation, first because traditional compositions are defined by elements which can be notated, and, second, because traditional instruments are played in standard ways. Since electronic instruments are not played in standard ways, and further, since rapid changes in technology lead to a steady turnover of electronic instruments, notation can not serve as a way of preserving performances of electronic sounds. This author believes that electronic performance can be preserved by describing the sounds themselves so that they can be performed on any appropriate instrument, by using current technology, or by updating the composition itself, and that such approaches can be artistically viable if the performer understands the composer's intentions.

1 The role of notation

What is the substance of a musical work? And how can it be preserved? The substance of the music of the western classical tradition is pitches and rhythms. The notation of those pitches and rhythms preserves that music. The sounds of the music may vary, but so long as the pitches and rhythms endure, the music remains the same.

How do the sounds vary? For one thing, the sounds vary through history as instruments change and transform. Hearing a Mozart sonata played on a late-18th-century fortepiano, for example, or hearing a Chopin prelude played on a two-string-per-note wooden-frame 19th-century piano, is a historical experience very different from hearing the same compositions played on a modern piano, or, as we might imagine, from hearing them played on an electronic piano of the future. The sounds also vary with each performer and performance. It is not only that Vladimir Horowitz and Arturo Rubenstein perform Chopin differently, it is that the pianos they play and the halls they play in will produce a different sound and create a different ambience. The performer of a traditional score is an interpreter who contributes a layer of new information to the music while preserving the essence of the work being performed, at the same time reacting to the instrument being played and the nature of the hall in which the performance takes place. But so long as the performer plays the pitches and rhythms so that they are recognizable, we recognize the composition. We recognize La Traviata, for example, even when the performer is playing a street organ.

The preservation role of notation in traditional music applies also when the music is defined by something other than pitches and rhythms. In 4′33″, for example, John Cage notated the structure while leaving the sounds (or lack of them) to be completely determined by the performer; thereby defining the composition as an illustration of the concept that structure is like an empty glass into which any sound can be poured. [Cage, 1960] Pauline Oliveros' Sonic Meditations are verbal instructions for activities, as in "Find your place in a darkened indoor space or a deserted out-of-doors area. Mentally form a sound image . . ." [Oliveros, 1971]

In summary: Whether notated as the pitches and rhythms of western classical music, or as structural charts, or as verbal procedures, music can be preserved through its notation when the elements of the music that are notated define the music.

2 Notation in electronic music

Electronic music, by which I mean music composed specifically to be realized as electronically generated sounds, encompasses many different approaches; but in general, electronic music is different from traditional instrumental music in that an electronic composition is defined by its sounds or by the nature of its performance process. The sounds of many non-performed electronic compositions, as in tape music, are preserved in the recording media for which they were composed. But for electronic music compositions that are com-

Accepted: 26 November, 2001

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posed to be performed, the reproducibility of sounds and performance processes can present serious problems.

Traditional notation has served us well as a tablature to be interpreted by a performer as a sequence of specific actions to be executed in a specific rhythm. But the success of a tablature depends upon two conditions: first, that the mechanism of performance remains that same for all specific examples of the intended instrument, and second, that a predictable sound will result from a specific action. In other words, the success of a score for piano depends upon every piano being playable via a keyboard and producing a piano sound. Since these conditions cannot be met by electronic instruments that move quickly from generation to generation with radical changes in sound-generating mechanisms, tablature approaches can not work with electronic instruments; and new answers to the quesion of preserving the possibility of future performance need to be formulated.

3 Solutions for electronic music performance

Some indefatigable composers have sought to devise a tablature notation with a combination of pitch-and-rhythm symbols, images, verbal descriptions, block diagrams, flow charts, and other types of how-to-do-it instructions, but such approaches tend more to document the equipment of the time rather than provide any insight into future performance problems. Given the volatility of technology development and the impossibility of finding component parts to keep old instruments in operation indefinitely, the sensible solutions to the problem of preserving electronic performance are likely to emerge in three categories: (1) notation as a description of the sound itself rather than tablature instructions; (2) the recasting of a performance with current technology; and (3) an update to the basic material of the composition. It should be self-evident that, above and beyond an understanding of the technical issues involved, the success of any specific solution will depend upon the performer's clear understanding of a composer's intentions.

3.1 Notation as a description of sound

Alvise Vidolin, for example, understood Luigi Nono's intentions. Vidolin told me: "I began to collaborate with Nono at the end of the 1970s. Our work together in the 1980s, with live electronics, was a collaborative friendship. We worked together to get certain results. Nono always looked for collaborators rather than performers." [Chadabe, 1994]

Several years later, Vidolin used the MARS workstation, a DSP system developed at IRIS in Italy in the early 1990s, to recreate music originally composed by Nono with analog technology. In Vidolin's words [Chadabe, 1994]: "In the 1980s, Nono worked in live electronics at the Experimentalstudio der Heinrich Strobel Stiftung des Sudwestfunks e.V. Freiburg. There was a hybrid system at that studio at the time, with analog sound processors and various digital connection and sound-distribution devices and delays. There were a lot of specialized machines. With the development of the MARS system, I thought of transcribing to the MARS the many things that Nono had done at Freiburg . . . The problem is to perform with the machines of today the music that was conceived for the machines of yesterday, and so there's a problem of transcription, for example from analog machines to digital machines . . . For example, in Nono's score for Post-prae Ludium Donau, there are specifications for delays, spatialization, reverberation time, and filtering, and pitch transpositions for harmonizer effects, and since the score specifies all that, we could realize it all on the MARS . . ." [Nono, 1987]

3.2 Recasting a performance with current technology

In September 1999, as another example, I conceived a new way to present John Cage's Bird Cage. Having assisted Cage in composing Bird Cage in 1972, I knew and understood his intentions. As we had finished it at the time, there were twelve tapes of randomly sequenced and processed recordings of birds singing in aviaries, Cage singing his own Mureau, and street sounds. As we performed it in the following years, Cage and I took turns standing at a matrix mixer in the middle of the performance space, randomly turning knobs and pushing buttons, thereby directing any of the tapes in any combination to any of the loudspeakers around the hall. My idea in 1999 was to convert the tapes to computer sound files and program their random distribution to loudspeakers placed around the hall. Holland Hopson did the programming. And the result not only made performances possible, it was more musically convincing than standing at a matrix mixer. It short, by recasting the performance process in contemporary technology, we had given Bird Cage new life. [Cage, 1972]

In Vidolin's work with Nono's music and my work with Cage's music, the original functions of early analog hardware were emulated in up-to-date software. Both of us knew and had worked with the composers; and our goals were narrowly defined as the recasting of a performance in current technology while preserving the spirit and character of the original work.

3.3 Updating the material of a composition

But it may also be artistically desirable, and within the range of the composer's original intentions, to update and indeed to change a composition to take advantage of new technologies. Updates, in fact, can reflect a growth of creative ideas that may better achieve the artistic goals of a particular composition. In conjunction with the International Computer Music Conference in Berlin in August 2000, for example, Ronald Kuivila directed several workshop attendees in using SuperCollider, a well-known software synthesis program, to generate the basic sound material for a new version of David

Tudor's Rainforest, originally conceived in 1958. [ICMA, 2000]

I am currently engaged, for another example, in updating my own composition Solo. The software, first finished in 1978, was written for the Synclavier, one of the first digital synthesis systems. Following many years of performing Solo through the early 1980s, a lack of spare parts, the size and weight of the instrument, and general impracticality conspired to keep me from carrying my Synclavier to concerts. At the same time, the lack of availability of a similarly powerful and portable non-MIDI system kept me from rewriting the software. The Kyma system, a current DSP system developed by Symbolic Sound Corporation, now offers an opportunity to rethink the work and recast it in a more powerful mold. [Chadabe, 1980]

There are many reasons to update a composition, among them practicality in performance, the creation of a better realization of a composer's intention, the enhancement of sounds that may have faded in old media, and the revitalization of a work in a new artistic or social context. The performance of music, in short, is a living process. And the re-creation of performances is a wonderful thing. It keeps the music alive.

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