

CHAPTER 1: INTENT AND SCOPE OF THIS STUDY

Interactive electroacoustic works, i.e. compositions combining live instrumental performance with flexible, performer-controlled electronic sound generation and processing systems, are often out of reach for performers because of their elaborate technological requirements. This barrier to performance is made more acute when specialized electronic hardware or software is required to perform a given piece, especially when the specified hardware or software is no longer available due to technological obsolescence. As Joel Chadabe has recently pointed out:

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. ... 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 ... such approaches can be artistically viable if the performer understands the composer's intentions.¹

This study is an attempt to implement Chadabe's prescription for preserving electroacoustic works by analyzing and describing the sounds and functions of the electronics from a performance-practice perspective. Since standard musical notation is clearly inadequate for describing non-standardized musical uses of electronic technology, my goal is to thoroughly document the electronic sound generation and processing algorithms, control functions, and required performer-computer interactions that define

¹ Joel Chadabe, "Preserving Performances of Electronic Music." *Journal of New Music Research*, 30, no. 4 (2001): 303.

the electroacoustic components of four separate works. My technical analysis is intended as a blueprint for future performance implementations of the required interactive electroacoustic systems using whatever technology is available to the performer.

For each work considered in this project, I will provide a brief historical overview of the piece in terms of the circumstances of its commission and premiere performance, the original technology employed, and issues of diffusion and continued performance as related to availability of technological resources for performance.

Secondly, I will briefly describe the musical role played by electroacoustic technology in each work. This musical overview will concentrate on the composer's motivation for combining live clarinet with interactive electroacoustic resources and the performance relationship between the live player and the electronic technology. This study is primarily concerned with the performance practice of interactive electroacoustic music rather than with the compositional techniques used in its creation. Therefore I will not attempt a general musical analysis, and I will focus instead on the practical issues performers face when attempting concert realizations of these works in the absence of the original technology used by the composer.

Thirdly, I will present a thorough analysis of the interactive electroacoustic music systems employed in each of the four works. Each system's internal components and functions are described in general terms independent of any particular device or computer program. My intention is to present all the necessary synthesis, processing, and control algorithms, and to guide the interested performer or system engineer in realizing these works for performance in the absence of the composer's original equipment.

Although each work is significantly different from the others in its use of electronics, there are some important commonalities. I have made every effort to standardize my analysis format in order to facilitate comparison between these works. I am hopeful that continuation of this type of research on a broader scale might some day lead to a general definition for a “common practice” in interactive electroacoustic composition and performance. Preliminary findings from the limited study presented here are encouraging in this regard.

Finally, I will present a brief overview and documentation of the software and equipment used in concert realizations of the two works presented at my lecture-recital. This will include a description of the electronic hardware and setup configuration used on stage as well as an explanation of the main components of new software implementations of the interactive systems required for performance of Musgrave’s *Narcissus* and Pennycook’s *Praescio IV*.