CHAPTER 12:
FUTURE DIRECTIONS FOR THIS RESEARCH

This project grew out of a personal search for interesting and performable works for clarinet and interactive electronics. However, the analysis and preservation of older electroacoustic works has become an issue of concern for many musicians interested in the long-term viability of such pieces in the face of rapid technological change. With the recent advancements in interactive music programming environments running on general-purpose computers, we may be fast approaching the day in which a standard methodology for specifying electroacoustic instruments and compositional or performance techniques is indeed possible. In the meantime, I offer my approach as one possible model for such a standard. The test of its viability will come from its usefulness in the hands of other researchers.

12.1 REAL-WORLD TESTING

I would be very interested to see the results of a third party realization of one of the works I have described in this paper. To date, I know of one performance that has already taken place using my analysis and reconstruction of the digital delay for Musgrave's *Narcissus*.[95] An even better test might be for a performer/engineer to create a new realization from scratch using only this paper and the score as a guide.

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[95] Todd Welborne, professor of piano and music technology at the University of Wisconsin, Madison in May 2004 used a prototype version of my software for *Narcissus* for a performance by one of his students.

One further practical application for this analysis is the possibility of preparing critical editions of the works analyzed. Such an edition would include a version of the analysis in the form of technical notes to accompany the score. A working software realization (or even several alternate versions) of the required interactive system could be distributed with the score as well (either on fixed media or via Internet). In this case, most performers would ideally have to be concerned only with the software. They would, however, be armed with a detailed analysis in case they reach a situation in which the software needs modification, is no longer supported, or will not run on available machines.

12.2 LIMITATIONS OF THIS MODEL

I have developed my analysis according to the immediate requirements of the four pieces under consideration. If this model for analysis is extended to cover a wider range of works, there will be instances in which new descriptive techniques will have to be employed and possibly invented.

Two situations spring to mind that might stretch the ability of mere text to cope with the demands of adequately describing the electronic resources called for by a composer. The first awkward situation for abstract analysis of electronic systems is encountered in when the original instrument is itself the exact and irreproducible embodiment of the composer's intentions. A case in point is given in Stockhausen's remarks regarding a new realization of *Mikrophonie I:*

> There was the problem that we could no longer rebuild the old filters. They were so-called *Hörspiel-Verzerrer W 49* [W 49 Radio-play distorters], built in-house at the WDR in Cologne: filters with carbon strips. It is really interesting how very old-fashioned that sounds (after all, violins with catgut are used today). Such materials are glorious, aren't they? The two metal levers of the filters scrape along the carbon strips, and spray must now and then be used. Today if you try to substitute computerized filter simulations, the characteristic sound goes to hell. The scraping and the skips between the filter levels is lost; but they actually belong to such a sound, when it is brightened up from below to above, or vice-versa.[96]

In such cases, computer simulation may be the only option, but we are aware that something important is missing. Here the performance-practice problem of authenticity and original instruments has crept into the repertoire of the very recent past. Perhaps complete schematics for reconstructing the original instrument would be necessary to achieve a fully authentic realization of the composer's intentions. We therefore have a situation not unlike that faced by a clarinetist preparing a performance of Mozart's *Concerto in A Major, K. 622,* for which an "authentic" realization requires a reproduction of an instrument that was unique to Vienna in 1791.

A second difficult situation arises when a piece of music requires recorded sounds that cannot be recreated according to a set of instructions. While any clarinetist using the provided excerpts can recreate the pre-recorded sounds required in the works by Kramer and Lippe discussed in this paper, some pieces require *concrète* sound samples that are unique and irreproducible. A case in point is my own *Memories of You… (for clarinet and recorded voice)*, written in 1992 and revised in 1994 for interactive computer electronics. The recorded voice referred to in the title is that of my maternal grandfather,

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[96] Karlheinz Stockhausen, "Electroacoustic Performance Practice," *Perspectives of New Music* , 97

Alan J. Davidson (1899 – 1996). Excerpts from his spoken memoirs, stored as digital audio files that are triggered in response to footswitch signals from the stage, are used as a counterpoint to the solo clarinet line. Supposing another clarinetist wanted to perform this work twenty years from now, could this piece be preserved? Since the samples are spoken-word recordings they can be easily transcribed as text. However, this leaves out the inflection, vocal quality, and historical authenticity that give these sounds their essence. The sound files are stored in a standard audio file format. Can we be certain they will be playable in 20 years? On what media should they be stored? One extreme strategy for avoiding the eventual obsolescence of digital media formats is to store the streams of audio sample data as text on paper. This would create very large appendices indeed, since each second of stereo sound is represented by 88, 200 sample values. Existing analysis/re-synthesis and audio compression techniques might aid in reducing the necessary data somewhat, but any strategy of that type would also require thorough accompanying documentation describing the decoding process. I imagine the Rosetta stone of the future to be a multi-lingual digital file format specification, chiseled in some durable, non-magnetic medium. The best strategy for short-term preservation at the present time seems to be to store the necessary recorded sounds in as many formats on as many types of standard media as possible, update when possible, and otherwise hope for the best. Long-term viability of recorded sound is a major issue that requires a concerted effort on the part of the digital media community at large.

12.3 NEXT STEPS

I now have a small repertoire of four works for clarinet and interactive electronics fully analyzed and ready either for performance or for a new realization. My immediate plans for this work include a realization and performance of Jonathan Kramer's *Renascence* at the next opportunity. Furthermore, there are a number of other works for clarinet and interactive electronics that I considered for this project but was unable to accommodate for various reasons. These include Richard Boulanger's *From Temporal Silence* (1989), Todd Winkler's *Snake Charmer* (1992), and Morton Subotnick's *Passages of the Beast* (1978). Each of these works would be excellent candidates for the same type of analysis I have presented in this paper, though some of the particular challenges would be different.

Naturally, as a clarinetist, I am primarily concerned with the repertoire for my own instrument. However, there is nothing inherent in my analysis model that would limit its application to only clarinet pieces. Therefore, I would welcome the efforts of performers and engineers from diverse backgrounds to expand this project. Eventually, this type of analysis could encompass a general approach to building a viable repertoire of works for interactive electronics and acoustic instruments of all types.