A GUIDE TO ELECTRO-ACOUSTIC PERFORMANCE FOR THE ACOUSTIC
OBOIST

by

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ABSTRACT

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This dissertation examines the role of the oboe in electro-acoustic music. It begins with a look at the history of electro-acoustic music. Three types of electro-acoustic compositions for oboe are explored: fixed media, interactive computer, and live effects processing. Each genre of composition is looked at in detail from a performer's perspective. Major compositions are discussed for each of the three types. Equipment which the oboist will need is detailed, along with setup arrangements. Each category of composition is broken down into the learning phase and the performance phase to help the oboist with the problems they will encounter that are not found in repertoire from standard instrumentation. Chapter six deals extensively with microphones, as this will be necessary in all three types of compositions. The appendices include interviews with composers of electro-acoustic compositions and oboists who perform the music. The document concludes with two lists of all the works known involving electronics and solo oboe. The first is listed alphabetically. The second listing is by instrumentation for ease of consulting when programming a performance.

It is the goal of the author to remove trepidation from oboists who wish to delve into electro-acoustic music, and aspires to facilitate more interest in its performance.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1

ELECTRO-ACOUSTIC MUSIC FOR OBOE

The oboe has always been considered an instrument worthy of numerous solo compositions due to its unique timbre. Music has been composed for the oboe since the instrument's creation in the seventeenth century. Through the centuries composers have pushed the boundaries of the abilities of both the performer and the instrument. As composers wrote increasingly challenging pieces, oboe makers strove to bring mechanical instrument advances to the performers. The mechanism improved to allow for more seamless technique in fast passages. The body of the oboe has been constructed from many different types of wood to alter the tone, strengthen the bore, and become more eco-friendly. In the twentieth century composers began exploring the use of the oboe in new and unconventional ways. They incorporated extended techniques into compositions that called for such things as finger clicks, flutter tonguing, multiphonics, playing without a reed, rolling tones, and percussive sounds among others. Many oboists have responded enthusiastically to the new technical challenges. In the 1960s, composers began extending the use of the oboe into the new world of electronic music. It is possible that the oboe has been employed in electronic music because of its ability to cut through other sounds. The oboe has the capability of being heard over an orchestra, as well as over oscillators and recorded sounds.   This use of the oboe in electro-acoustic music is a natural step in the evolution of the instrument and the music written for it.

In this research I hope to help oboists understand the basic concepts and technical knowledge required in order to approach playing works that incorporate electronics. I endeavor to take the mystery out of using the equipment they will need to work with in order to play these new compositions.

Impact Of Electro-Acoustic Music

Electro-acoustic music has been a growing subgenre of instrumental music since the late 1950s. Performers of other instruments are beginning to incorporate some of the pieces work in the body of standard modern repertoire. However, oboists are not as aware of electro-acoustic pieces for their instrument as possible. This ignorance of electro-acoustic works for the oboe is largely due to the lack of performance of these works in the concert setting. If performers were more comfortable programming these works on concerts, they would be more recognized in the oboe community. This recognition would spawn the birth of more electro-acoustic oboe compositions, since composers will write more for a combination they know will be performed. This study seeks to give the performing oboist a basic knowledge of the electronics, performance practice, and considerations necessary to allow them to feel comfortable programming electro-acoustic works on recitals. This will also encourage oboists to commission electro-acoustic works themselves.

Electro-acoustic oboe works can be divided into three main types: fixed media, interactive computer, and live effects processing. By breaking this study into the three divisions each type can be addressed individually, as each has its own unique equipment, challenges, and practice techniques. Currently there are

no sources for oboists interested in learning about electro-acoustic oboe music longer than a few pages. This work will fill in this gap in oboe scholarship.

I was first exposed to the merging of the oboe with electronics as a young oboist when I stumbled across the CD, *Organic Oboe* by Joseph Celli, which first came out in 1977 on vinyl. The third track on *Organic Oboe* is Elliot Schwartz's *Extended Oboe,* a ten-minute piece for oboe and electronic tape, written in 1973. One of the interesting things to note about *Organic Oboe* is his disclaimer on the back of the album which reads "All the music was recorded in one take, no overdubbing, no splicing, and no editing."[1] I find this important because as a performer, I believe the ability to perform the music is mandatory. Editing, post-production processing, and multiple individually recorded tracks played simultaneously, will be enjoyable to the listener of a recording, but they will be impossible to duplicate during a live performance. The liner notes on *Organic Oboe* also tell us the album was recorded live, with an audience under Celli, who performed on a platform above their heads, in the dark, creating a new, odd, and original sensory experience.[2]

It is the unique merging of unconventional performance possibilities coupled with a love for both the oboe and the electronic music of Depeche Mode that has brought me to this dissertation topic. My research has taken me in a number of different directions. The first goal has been to amass a listing of all known works written for the instrumentation of either the oboe, English horn, oboe d'amore or baroque oboe with electronics. This list is a constantly growing

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[1] Joseph Celli, *Organic Oboe*. Recorded 1978. OODiscs No.1, 1995. CD.

[2] Ibid.

resource with its current incarnation spanning forty eight years, including over

110 entries from over 100 different composers. After creating this exhaustive list

of oboe and electronic music, I contacted all the living composers from my list, as

well as oboists who are known to perform with electronics. I have interviewed

both oboists and composers associated with the combination. My questions

concerned their introduction to electronic music, equipment they prefer, the

amount of collaboration they wish to have in the composition and performance

process, problems in notation and equipment standardization, technological

advances, and where they see the genre heading. The response, especially

among composers, has been amazingly good. It seems there is a real interest in

having music in this niche area programmed more frequently.   I hope my

dissertation will serve as a primer to facilitate growth, in the area of the oboe and

electronics.

Definition Of Electro-Acoustic Music

The definition of electro-acoustic can be different depending on the work

cited. The definition I am using for the basis of the research is compositions

involving the use of an acoustic instrument with electronic elements. This means

any work which is combining an acoustic musical instrument with electronics of

some form. The term "electronics" is defined in detail in the section called "Early

Oboe Electro-Acoustic Compositions" in chapter two.

CHAPTER 2

A BRIEF HISTORICAL BACKGROUND OF ELECTRONIC MUSIC

Origins

The first significant electronic instrument was the Telharmonium made by Thaddeus Cahill in 1897. It measured sixty feet long, weighed 200 tons, and looked like a power station generator. The Mark II (as it was named), cost $200,000 and was assembled in the Broadway building in 1903, directly across from the Metropolitan Opera House in New York, setting the stage for the future merging of classical and electronic instruments.   The enormous Mark II took two people to play and utilized seven octaves. The keyboard offered polyphonic, velocity sensitive keys, and made sounds by generating electric signals via moving tone-wheels. Each key had its own tone-wheel, and there were additional tone-wheels for harmonic variations.[1]

The Mark II was made before the invention of electric amplification. It used acoustic horns to amplify sound and was connected to homes, restaurants, and hotels via the phone line by subscription. This happened a full seven years before the first public radio broadcast of a live Metropolitan Opera House performance in 1910. Until this point, someone had to buy tickets and go to a concert hall to hear music. It also predated the mass introduction of the phonograph to the US market in the late 1920s.

The Telharmonium was not used as an instrument by composers. Apparently, there was not any original music written for the instrument. The

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[1] Simon Crab. "120 years of electronic music : electronic musical instrument 1870-1990," http://120years.net/wordpress/ (February 23, 2014), 18-19.

players would perform popular marches, pieces by Bach, and other well-known works.   It can easily be considered the birth of "muzak." Unfortunately before its final dismantling in 1965 for scrap metal, a recording was never made of this first electronic instrument.

Edgard Varèse, born in France 1883, is known as the father of electronic music. Varèse was a visionary composer, whose mission was the liberation of sound from tradition. He was fascinated by the intersection between noise and sound. He sought a clean break with the past by developing entirely new ways of writing music. In the world according to Varèse, sound was the organizing principle. He said, "I dream of instruments obedient to my thought and which with their contribution to a whole new world of unsuspected sounds, will lend themselves to the exigencies of my inner rhythm."[2] This fit perfectly with his experimentations with electronics. Varèse went on to say, "Our new liberating medium – the electronic – is not meant to replace the old musical instruments which composers, including myself, will continue to use. Electronics is an additive, not a destructive factor in the art and science of music."[3] His *Ecuatorial* in 1932 is considered the first piece which attempted the fusion of pre-existing acoustic instruments and electronic sounds. The piece was originally composed for four trumpets, four trombones, percussion, organ, piano, two Theremin cellos, and bass voice. The electronic sounds involved come from the two Theremin

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[2] Edgard Varèse, "Liberation of Sound," in D.J. Kostelanetz, ed., *Classic Essays on Twentieth Century Music: A Continuing Symposium* (Belmont: Wadsworth Publishing Co Inc., 1996), 110.

[3] John Wayne Freeman, "Current Trends in Electroacoustic Music for Wind Ensemble" (DMA diss., University of Memphis, 2010), 2.

cellos, an instrument patented in 1928 by Russian physicist, Leon Theremin. The original theremin instrument is composed of a box with two metal antennas which are used to modify the sound created by an internal oscillator via the performer's proximity to these antennas. The theremin cello was an adaptation of the instrument into the physical approximation of a cello. It is played with the left hand touching the fingerboard to produce the pitch. The right hand operates a lever to specify phrasing and volume. The piece was later revised for ondes-martenot in 1961, a keyboard instrument developed in 1928 by Maurice Martenot, with a similar sound to the theremin.

Early Oboe Electro-Acoustic Compositions

The definition of "electronics" for the purpose of my research encompasses any electric powered device which provides musical elements to the music. I have chosen to keep this parameter expansive for three reasons. The first reason is the sheer number of electronic technical advances, in the past five decades. The oldest oboe electro-acoustic composition that I have encountered currently is Andrzej Dobrowolski's *Music for Magnetic Tape and Oboe Solo*, written in 1965. This was written thirty-three years after Edgard Varèse first started experimenting with adding electronic sounds to his compositions in *Ecuatorial.* The most recent piece on my list is *In Memorium*, composed in 2013 by Scott Hines.   The complete list may be found in "Appendix D" and "Appendix E."

The second reason for my broad definition of "electronics" is the general lack of knowledge about this music by oboists. Until my research, there was not

a resource available for oboists to acquire a list of pieces for this instrumentation. This music has been considerably under-performed, partially due to the lack of knowledge of the existence of most of the repertoire. In choosing this dissertation topic, I wanted to provide a list of all the compositions that have been written. For this reason I have purposely left the definition of "electronic" broad to cover anything and everything an oboist could possibly be interested in performing.

The third reason for keeping the electronic parameters broad is the large variety of electronics which have been paired with members of the oboe family. Quite a few of these combinations are found only once or twice on my list.

Some of these unique combinations include Heinz Holliger's *Cardiophony* for Oboe and Live Heart Monitor. This piece calls for the oboist to have a special microphone attached to his chest. The oboist's heart-rate is incorporated into the music and becomes part of it. The signal is amplified to a volume where it serves as both accompaniment and tempo for the oboist to perform with. As the oboist progresses through the music the heart rate naturally rises. The oboist must speed up the tempo to match the heart-rate, fighting against the tempo and in the end losing. Joseph Sverker writes this about Holliger's *Cardiophony* in "Art is Life: Rookmaaker, Theology and Art - a Critical Consideration."

> On the one hand, the heart is coworking with the oboe as an instrument: it is metaphorically regarded as the centre of emotions and thus expresses emotions, just as music expresses emotions. On the other hand the heart is expressing more than the music alone, it is bridging the gap between art and reality, art and life. The heart is not simply the centre of emotions and life metaphorically, but also an actual centre of life. Interestingly these two aspects,

the metaphorical and the real, are interwoven in this piece to create music penetrating barriers between art and lifeses.[4]

This piece is being listed in the interactive music section because of its use of computer software when performing it today.

Another unique combination is Luciano Berio's *Sequenza VII*, written in 1969 for oboe and drone. *Sequenza VII* is the seventh in a series of fourteen sequenzas. The oboist is asked to play five different fingerings for B in the piece, over a B drone. The concert B drone is commonly played with a standard tuner, using the onboard sound feature, or a drone of prerecorded oboe sound. Berio does leave it up to the oboist to decide by what method to produce this drone.[5] Some oboists have utilized singers, other oboists, or even other instruments. But the most effective way of maintaining a steady in tune B over the course of the entire piece is the incorporation of an oscillator-driven B. A recording of oneselve playing the B might be an interesting idea in incorporating fixed media.

One particularly strange reoccurring combination is cassette recorder and oboe. Unlike the combination of tape player and oboe, the recording aspect is actually utilized during the performance. One example of this combination is David Bird's *Squeem* for Oboe and Two Tape Players, composed in 2011. David Bird describes *Squeem* on his website like this.

> Squeem is performed with an oboist and electronics performer. The oboe is amplified and positioned at center stage. The electronics performer is slightly off-center. Both performers are standing. Behind them is a single speaker where electronic signals flow. The

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[4] Joseph Sverker, *Art is Life: Rookmaaker, Theology and Art - a Critical Consideration*, (2003), 19.

[5] Emily K. Madsen, "Selected Music for Oboe and Electronically Produced Sounds" (DMA diss., University of Maryland, 2010), 2.

electronics performer is assigned two cassette decks. The performance consists of playing, stopping, rewinding and fast-forwarding prescribed segments of the tapes. At points in the piece the electronics performer is instructed to record and overdub fragments of the oboist's live performance onto the tapes. As a result, the audio on each tape is constantly changing.[6]

The tape portion is completely composed by the oboist during the performance instead of the composer providing the audio track ahead of time. No two performances of *Squeem* can ever be the same using this method.

The accompaniment of the vast majority of the works on this list, fall into three main categories. These are fixed media, interactive computer, and live effects processing. In the following chapters I will discuss each category, its equipment, the learning process, the performance process, and trouble shoot possible pitfalls.

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[6] David Bird, 2012. "Squeem 2011 Oboe and Tape Player," http://davidbird.tv/squeem-2011-Oboe-and-Tape-Player (March 10, 2014).

CHAPTER 3

FIXED MEDIA

Definition Of Fixed Media

Fixed media is becoming a blanket term which covers any prerecorded sounds or melodies the musician performs with, that do not have any interactive capabilities. The performance is not based on the musical actions of the performer. With this definition, fixed media encompasses all the audio playback mediums that have evolved through the last five decades through technological advances including tape, CD, and MP3. Most of the early music for oboe and electronics falls into this category and is still widely composed for today.

When an audience goes to a live concert, there is an expectation of spontaneity, that every performance will not be the same. If they were always the same, why would the audience go at all? Why not listen at home? This issue has been brought up when discussing fixed media music. This question is answered by pianist Shiau-uen Ding. According to her, "Many people overlook the rich variety of musicality inherent in interactive works for live acoustic instruments and tape. With acoustic instruments as a 'live element', music for instrumental performance and tape may off the same degree of interaction between players and audience, contributing to the excitement of it performance."[1]

Relationship Between Electronics And Oboist

These pieces have an unchanging pre-recorded accompaniment, recorded by the composer to be exactly the way it will be performed. The sounds

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[1] Shiau-uen Ding, "Sitting at the Piano, Cradled by Speakers: Developing a Rhythmic Performance Practice in Music for Piano and Tape" (DMA diss., University of Cincinnati, 2007), 256.

could be sounds found in nature as in Phillip Bimstein's *Half Moon at Checkerboard Mesa.*[2] They could be recorded acoustic sounds from other instruments, similar to those found in Joan LaBarbara's *L'albero Dale Foglie Azure.*[3] It is possible they could be recorded voices as found in Dr. Scott Hines's *In Memoriam.*[4] They could even be synthesized sounds produced by oscillators accompanying voice as found in Jacob Ter Veldhuis's *Garden of Love.* When an oboist purchases one of the pieces, it comes with a "performance track" and also a "practice track," which will provide a way of preparing the piece for performance. The practice track will have the oboe part also recorded into the track for the oboist to play with. The score for a fixed media composition will often give a notated copy of the recorded track, as well as timing markings, specifying the exact minute and second an entrance should occur.

There are quite a few positive aspects to performing with fixed media. The first advantage is the consistency of the accompaniment. The additional music will always be performed with the correct notes, pitch, and rhythm. Many composers find fixed media very appealing because of the high level of control they have over a large portion of the final product. Not as much is left in musician's hands, as the composer is, in a sense, the other collaborative performer. The oboist will have the welcome opportunity to practice with the full instrumentation at any time of day or night, twenty-four hours a day. The oboist

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[2] Phillip Bimstien, *Half Moon at a Checkerboard Mesa for oboe and tape* (Franklin Stark Music, 1997).

[3] Joan LaBarbara, *L'albero dale foglie azure* for oboe and tape (ms.score, 1989).

[4] Scott Hines, e-mail message to author, March 21, 2013.

will have the freedom to schedule performances without possible conflicts. This is something you will never get with human collaborators.   There will be no interpersonal issues or the possibility of someone canceling. All oboists who perform frequently have been in the unfortunate situation of being paired with people who causes more stress than confidence. This can be completely avoided, by performing with fixed media. Sarah Louise Bassingthwaighte, a flute player and composer who wrote a doctoral dissertation involving electro-acoustic flute music says, "The sub-genre of flute and tape pieces has the ability to combine the limitless capabilities of the computer with the energy and interest of a live performer – it is precisely what sets it apart from both acoustic music and from purely computer-generated sounds."[5] This statement can apply to electro-acoustic music between electronics and oboe as well.

Fixed Media Troubleshooting

There are some downsides to performing music for oboe and fixed media. The playback equipment can be outdated and challenging to obtain. Some of the pieces for tape from the 1960s actually require a reel to reel tape machine, which is difficult to acquire today. Other pieces may require cassette players, which can be located easily second hand. However, over time tape quality for both medias degenerates, warping the sound and possibly breaking the tape. The same issues apply on a currently smaller scale to the CD storage medium. With the mediums of playback constantly changing, the oboist must do his research ahead of time to make sure the composition is still performable.

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[5] Sarah Louise Bassingthwaighte, "Electroacoustic Music for Flute." (DMA diss., University of Washington. 2002), 10.

This issue of antiquated technology required for performance, and possible degeneration of backing recordings, if using a storage medium involving tape, is only exacerbated if the composer is deceased, since the composer will no longer be available to provide missing tracks, or transfer them to new mediums. If the track is not notated in the score, it could be lost forever. I have found a few pieces already in my research that fit into this category, completely hindering future performance possibilities. In cases like this, it is extremely important for the oboe community to share any remaining recordings, so the composition is not permanently lost. The combination of oboe with electronics is relatively new, and unlike the cantatas of Bach, this repertoire will require the frequent technological upgrade for survival.

If the composer is still living, however you may be able to contact him to see if he is willing to revive his composition by transferring it to another medium. In my email interviews with composer, I have a found a number that are enthusiastic about this possibility. Among these composers are Charles N. Mason, Russell Pinkston, Janice Misurell-Mitchell, Faye-Ellen Silverman, Robert Carl, Jorge Garcia del Valle Mendez, David Bird, Christopher Fox, Scott Hines, Mark Phillips, Phillip Bimstein, Todd Winkler, Brooke Joyce, and Jacob Ter Veldhuis. Johannes Kretz responded, "If I am asked by a musician/oboist for support for an old piece, I usually take this as an opportunity to check, if everything is still working. If not, I provide an updated version of the electronics."[6] Nicolas Verin states, "I do update them once in a while, generally

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[6] Johannes Kretz, e-mail message to author, April 2, 2013.

14

on the occasion of new performances. I would do it for an oboist of course, it

there is an upcoming performance."[7] Other composers have been less than

enthusiastic. Greg Dixon tells me, "I try to when it's absolutely necessary. It's

kind of a bummer fixing up an old piece when I really should be writing new ones.

I would absolutely do it for a performer that was performing my piece with the

right intentions."[8] David Jaffe says, "I have done so on occasion, but it's difficult

and I tend to prefer to put my finite energy into making new pieces."[9] Some

composers will just tell you no, flat out. Christos Hatzis is one of these

composers. "No. I am constantly too busy writing commissioned works and that

is a better use of my creativity that to reconfigure existing pieces."[10] Linda

Swope told me, "I have not had to do it yet, but I don't think I would. I would just

write another work using the newer technology, and leave the older works to

history."[11] If you do not see the composer listed above, it is always best to

contact the composer and see if he will move the fixed aspect of his composition

to a current useable medium. It may be worthwhile to encourage a composer to

update his technologically outdated works: as you could be the oboist

responsible for bringing an outmoded work back to life.

An additional detraction to performing with fixed media is the "fixed"

aspect of the performance. If the tempo of the backing track was recorded at

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[7] Nicolas Verin, e-mail message to author, March 29, 2013.

[8] Greg Dixon, e-mail message to author, April 7, 2013.

[9] David Jaffe, e-mail message to author, March 28, 2013.

[10] Christos Hatzis, e-mail message to author, April, 8 2013.

[11] Linda Swope, e-mail message to author, April 30, 2013.

quarter note equals 90 beats per minute, every performance will be quarter note equals 90 beats per minute. There will be no variation, even if the tempo causes difficulty. This also means if a mistake is made by the oboist in pacing, it is completely his responsibility to rectify the issue by quickly finding and syncing to the recording.   Elizabeth McNutt, a flutist who performs fixed media music, says fixed music is "the worst human accompanist imaginable: inconsiderate, inflexible unresponsive and utterly deaf."[12] Fixed media has been given the reputation of hindering musicality, due to this unsympathetic, non-wavering aspect.

Some oboists, however, find it a welcome challenge to see how much musical nuance they can include and still be synced with the backing track. Michelle Fiala, who frequently performs music for oboe and fixed media stated, "It is the same as under a conductor. We almost always have prescribed boundaries when we are performing, and we still have to conceive of the music as imaginatively as possible."[13] Linda Swope indicated that the most important thing to finding your own musicality in fixed media is "understanding what is happening in the music, and add the solo part to emphasize and color what is happening."[14] Syncing with the backing track can especially be difficult when the track is ethereal and does not contain identifiable aural cues before oboe entrances.

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[12] Elizabeth McNutt, "Performing Electroacoustic Music: A Wider View of Interactivity," *Organised Sound* 8, no. 3 (2003): 299.

[13] Michelle Fiala, e-mail message to author, March 31, 2013.

[14] Linda Swope, e-mail message to author, April 30, 2013.

When an oboist is confronted with such a piece, the best way to rectify this situation is to employ a stopwatch. The oboist should notate the specific minute and second of each entrance on the oboe part and have a stopwatch on the music stand in order to be able to follow the time cues. The stopwatch should be synced with the start of the backing track. This will prevent the possibility of getting hopelessly lost without the chance of re-syncing. McNutt provides the suggestion of using headphones that provide an audible click track in order to prevent the performer from straying from the tempo as an alternative to using the stop watch.[15] This suggestion may only work for learning purposes, as playing with headphones poses its own set of issues. Most composers tell me that they see the fixed track and oboe functioning as a duo, not as oboe and accompaniment. They feel that the best pieces are those that have utilized the electronics for original sounds, and not reproductions of acoustic instruments.

Fixed media should always be performed with a monitor, to allow the oboist to clearly hear the part. It is important to work with fixed media in a variety of acoustics, because the cues you are listening for may not be clearly heard in a different performance space. The tempo you are working with may not feel the same in a hall with vastly different acoustics from your practice environment. There should be a significant physical distance between the audience, and both the speakers and oboist, in order to obtain a combined acoustical impression for the listener.

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[15] McNutt, "Performing Electroacoustic Music: A Wider View of Interactivity," 300.

Major Compositions

As stated earlier, the newest piece for oboe and electronics on my repertoire list is *In Memoriam* for Oboe and Fixed Media, by Dr. Scott Hines. I approached Dr. Hines last year, and offered to perform a new composition if he might have any interest in writing a piece for oboe and electronics. December 14th, 2012, I received a message from Dr. Hines that he had found his inspiration, but it wasn't going to be a cheerful piece. Dr. Hines has written the following regarding his inspiration for the piece.

> A lot of my music is about people who have been wronged, or are the underdog. I've composed pieces honoring Dr. King, Geronimo, the victims of the Holocaust, and the veterans of the Vietnam War — those who came home and those who didn't. I have been called a political composer, and that has never been my intent, though I understand the label. These statements I'm making are only my personal feelings and very heartfelt at that. In Memoriam was born the day of the Newtown tragedy. It is not a call for any solution, as I don't know what solution there is. I hope we find a way to stop these senseless killings, but I'm afraid my hope is not high. We human beings do have propensity for killing one another. We seem even to enjoy it. In our ongoing national debate, I just want us to remember all of the victims not just from Newtown. I don't want the victims to get lost in the screaming arguments that control the discourse in our society these days. This piece is also my questioning, of why these things happen. As singer-songwriter Gordon Lightfoot once so eloquently asked, ""where does the love of God go, when the waves turn the minutes to hours?"" Where was God when these young men were killing? Why would God allow innocent children to die? What did they do to deserve this? I've asked these same questions in a previous composition, ""What do you want?"" I'm still looking and listening for these answers. Heaven, so far, is not offering comment, despite repeated attempts by this reporter to contact someone.[16]

The oboe in plays a slow lament as a foundation while samples from news broadcasts, the voice of President Obama, and a reading of the names of murder

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[16] Scott Hines, e-mail message to author, March 21, 2013.

victims are heard. In utilizing samples and voices, fixed media can communicate a more concrete grasp on programmatic music, than other oboe solo works.

Disclaimer

The following will serve as a disclaimer for the rest of this dissertation. The equipment I discuss in my research is by no way the only equipment that will work for these compositions. In some cases it may not even be the best equipment or method to achieve the desired results. However the equipment I include has worked for me or another performer I have spoken to while researching this performance genre. It is up to date with current technology to the best of my knowledge at the time of writing the dissertation. I have been in contact with no companies to market their equipment, nor am I in any way promoting specific brands over others. Contained in the following writing are my own findings and the findings of those around me, which may help get you started down your own path to discovering even better methods and equipment to utilize in the performance of these works.

Equipment

The first piece of required equipment is a playback device for the audio portion of the music the composer provides. If given a CD, you will need a CD player, or computer. If given MP3's you will need a computer or MP3 player. You may always convert the audio files from whatever medium the composer gives you to best suit your equipment setup. Do not feel chained to a bulky CD player forever if you feel that you could run the sound much more efficiently through your iPhone.

The performer will need a good pair of studio monitors, which are compatible with his playback device. I am currently using Alesis M1Active 520 USB Nearfield Studio Monitors with USB Audio Interface. These are studio monitors, which mean they give a flat frequency playback of your sound file. Other speakers which are not flat response studio monitor speakers may enhance the bass or other frequencies, in the name of making your music sound better. However the performer needs to hear the frequency levels exactly as the composer advised, because the sounds you are hearing are not only your fellow performer, they are also the your roadmap during the performance. You will use these sounds for references throughout your performance for syncing. I like the USB aspect of the Alesis MI Active 520 USB Nearfield Studio Monitors because it allows for plug and play action without having to include a M-Box or other similar digital user-interfaces in connection with your computer. However the monitor speakers can still incorporate the one-quarter-inch connectors if wanted, which allow for multiple ways of equipment setup.

These are the only pieces of equipment which are mandatory to work with fixed media. However, I will discuss other pieces of equipment you may want to invest in as we proceed through the learning phase of the process. I will leave it up to the reader to decide on the amount of equipment they want to invest.

Learning Phase

Initially you will need to obtain the composition from the composer. This should come with a backing track of some sort for the performance of the piece, known as the "performance track." Most of the times it will also come with a

"practice track," which is different from the performance track. The practice track

is specifically available to help the musician best get prepared for playing with the

performance track. It could be slower in tempo then required from the

performance tempo. The practice track could contain multiple small tracks cut

from sections of the performance track, so the oboist can practice small harder

technical sections repetitively without having to replay the entire track. The audio

files will usually also include a "reference track" which will include the oboe

recorded on the track as well as the backing music. This reference track is

helpful to hear how the oboe fits with the recorded music. It is helpful for the

performer to play along with this track insuring you are aware of the correct

placement in the mix before attempting to sync with the performance track. The

oboe sound on this audio track acts as a safety net for the performer.

I try to use a computer for playback of fixed media compositions during

this learning phase, because of the versatility the computer provides that a CD

played cannot. The computer is more user friendly at skipping to specific

sections of the composition. It can be helpful to also burn CDs of the tracks,

providing the ability to listen to the recordings in different environments. Different

environments will allow you to hear the recorded sounds in new ways. This

technique is employed by studio engineers when mixing prerecorded tracks. The

performer needs to know even the smallest sounds present on the recorded

track, as these could be used as reference points guiding his synchronization

with the recorded track.

The placement of the oboe in the music is the next issue the performer

must address. When using the currently discussed fixed media setup, the

performer is performing with a recording. This is something experienced

normally by students when using music published by the company Music Minus

One. With Music Minus One pieces students are exposed to standard repertoire

playable in a complete state without a human accompanist, as the

accompaniment is provided on the furnished CD. This seems to be what most

oboists initially think of when given a description of fixed media. However, I am

making a clear distinction between Music Minus One and fixed media

compositions. Although Music Minus One employs the technology used in fixed

media compositions, the two are not the equal. Music Minus One is a learning

tool to facilitate student learning of standard repertoire when a pianist is

unavailable or to make the practice time with a pianist minimal.[17] Music Minus

One is employing the fixed aspect associated with fixed media compositions as a

learning tool. This is where the similarities between the two stop.

The Music Minus One recordings are not compositions originally created

for this genre of oboe and fixed media. Fixed media music is intended originally

for this instrumentation of oboe and prerecorded track. It specifically employs the

fixed, prerecorded track to provide sounds in the composition normally otherwise

unavailable. Sounds such as the frogs found croaking in Phillip Bimstein's *Half

Moon at Checkerboard Mesa* for oboe and tape, could otherwise not be made

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[17] Music Minus One website, https://musicminusone.com/ , March 6, 2014.

22

from other instruments on stage.[18] The fixed media aspect gives composers this opportunity to incorporate new aural innovations in the soundscapes of their compositions. Composers of fixed media view the fixed track not merely as a recording of a musical instrument, but a musical instrument itself. The difference only being that this musical instrument has a prerecorded existence, prior to the actual stage performance.

The two instruments, the oboe and the fixed prerecorded track are of equal importance. Since the composer is writing for two instruments, not one instrument plus a recording, the current equipment practice setup should be modified for the actual performance of most fixed media compositions. Normally, when an oboist is performing with another instrument, they are either both placed on microphones or neither instrument is amplified. This is because the aural sonority or both instruments should be experienced by the audience in the same way, either both acoustically pure of amplification or both equally amplified. If only one instrument is amplified in a duet, the sounds never merge with each other combining to form the cohesiveness that the concert audience desires. The sounds of the instruments will sound like two separate entities occurring simultaneously, but not as unified music.

When a fixed media composition is heard using with the practice setup, the listener hears the performance track, with all its variety of preprogrammed sounds, through the monitor speakers. The listener hears the oboe in its normal acoustic fashion. This separates the two instruments from ever merging into one unified aural experience for the listener. In order to have the ability to merge the

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[18] Phillip Bimstein, e-mail message to author, April 7, 2013.

oboe sound into a duet with the performance track, the oboe must be amplified via a microphone. Different types of microphones are discussed in depth in chapter six. It is highly recommended that the reader decide on a microphone before proceeding with this chapter.

After choosing a microphone, unless choosing a contact microphone, the performer will need to purchase a boom microphone stand with swivel capabilities, making it easier to achieve the correct microphone position which best captures the oboe's sound. Unless using a wireless microphone, the oboist will need to purchase an XLR cord to connect the microphone to the amplification system. Choosing a fairly long cord of at least ten feet is preferable because the shorter the XLR cord, the closer the microphone will be to the amplifier. If the amplifier is close enough to the microphone that the signal from the amplifier can be picked up by the microphone a feedback loop can occur. A feedback loop presents itself as a distinctive squealing sound which increases in volume the longer it lasts. Once started, a feedback loop takes drastic measures to stop, so it is best prevented.

My amplification system, when not performing for an audience, is the Fender Champion 25 R guitar amplifier. Since this is made specifically for guitars and not necessarily for instruments requiring microphones, the addition of an impedance matching transformer adapter is necessary. The impedance matching transformer adapter will make the low impedance signal coming from the microphone high enough for the amplifier to register the signal. This is something easily overlooked in an equipment setup, but without it no sound will

come from the amplifier regardless of the amplifiers volume setting. I use a

CP8201 Microphone Impedance Matching Transformer made by Audio Technica.

This will raise the signal level high enough for the amplifier to be able to register

the presence of a signal to amplify.

This should provide everything needed to get the performer through the

learning phase.   Set the levels of the practice track and the amplifier to a

position everything on the practice track can be heard clearly. The performer

may want to practice without the amplification of the oboe initially until a good

grasp is had on the practice track sounds.

With setup issues taken out of the equation, focus can be placed on other

issues related to learning a fixed media composition. The biggest issue

encountered when learning a fixed media composition is the properly

synchronizing of the oboe with the backing track. If a listening track that includes

a recording of the oboe part is available, it is easiest to listen to this track

numerous times until the piece is committed to memory.

After understanding the fixed track and its relationship to the oboe part,

the performer should start from the front of the composition and work out

sections consecutively. While playing, the performer should listen for the cues

on the electronic track to reassure proper synchronization is occurring. When

learning a fixed media composition it is important to first learn the recorded part

and then fit the oboe line to the recorded track. With new compositions this can

be complicated if the track is not yet available from the composer, but it is

important because the recorded track will change the interpretation of the oboe's phrases.[19] Linda Swope, oboist and composer told me,

> I make the complete score first, so the soloist can practice with the solo on the CD, and then I eliminate the solo part and make the accompaniment so when the soloist feels ready, he/she can perform it using the track that only has the electronic accompaniment.[20]

It is possible that a piece will not have any such audible clues available in the recorded track. If this is the case there are other options. Xenia Pestova, a pianist who wrote a dissertation on piano and electronics, takes this approach:

> Splitting pre-recorded material into smaller sections is one possible way to introduce an element of interaction into a fixed media piece. In case of a work with silences between sections with attacks that are coordinated with instruments and the electronics (as opposed to continuous resonance in the electronic part), the attack sections can be "triggered" by the performer with the use of an external device such as a MIDI pedal, simplifying coordination.[21]

She changes the fixed media composition into an interactive computer composition, allowing the musician the capability of causing the backing track to wait before play certain sections until triggered remotely by the musician. If the performer feels confident with your electronics this could be a resourceful option. The triggers which would be necessary to activate the recorded track in this situation are discussed in detail in chapter four.

Another option to help facilitate a smooth synchronization of the oboe line to a sparse backing track can involve stopwatch timing. Scott Hines' "In

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[19] Elizabeth McNutt, "Performing Electroacoustic Music: A Wider View of Interactivity," *Organised Sound* 8, no. 3 (2003): 300.

[20] Linda Swope, e-mail message to author, April 30, 2013.

[21] Xenia Pestova, "Models of Interaction in Works for Piano and Live Electronics" (DMA diss,, McGill University, 2008), 13.

Memoriam," the most recent composition in the appendices of electro-acoustic works, is a fixed media composition which does not furnish the oboist with a score to visualize the exact alignment of the oboe's lines to the vocal samples on the recorded track. The recorded track starts first with a sample of a child singing "Jesus loves me this I know, for the Bible tells me so, so, so, so." It is on the last "so" that oboe enters with its first phrase. This line sung by the little girl is the only part of the soundtrack notated on the oboist's music. The phrases are not set in strict time and should natural and mournful. Hines has stated that he does not want a concrete placement of oboe line, but for it to be more fluid with the oboe line completing its final phrase just before the final line of the electronic part. This way the vocal sample on the recorded track ends alone and because of the nature of the words being said, causes a greater impact on the audience.

I have discovered syncing the oboe, with the recorded track, to best be achieved in *In Memoriam*, using a metronome set on quarter note equals 66 beats per minute, but set in the silent, blinking only position. This facilitates the correct combination of sounds, since there are no notated cues in the oboe part. The metronome can easily be set on the stand with the oboist's music for the performance. I would recommend not overlooking this tool during the actual performance as adrenaline can easily cause a misjudgment by the performer of the quarter note equals 66 beats per minute tempo, possibly causing the oboist to finish considerably before the recorded track.

Performance Phase

A few things must be addressed about performing a fixed media composition from a performance perspective that are not necessarily needed when performing other genres. The dress rehearsal is the first change. As with all performances, a dress rehearsal is a necessary addition to the oboist's schedule in order to feel the best about an upcoming performance. The dress rehearsal is the time to get in the hall and see any possible issues arising that were not present in the rehearsal space. When working with more equipment than just the oboe, this possibility is multiplied considerably. With the addition of acoustic works also on the program, it may be preferable to do both a dress rehearsal and a solely electronics dress rehearsal. At the very least, make sure to schedule the acoustic only part of the dress rehearsal before the electronically involved pieces. The oboist will want to allow any other musicians a quick rehearsal of their pieces and to not be held up by any potential issues involving the electronics for the fixed media composition.

The dress rehearsal is the time to coordinate all the factors of the performance. In an acoustic only concert this means getting the musicians on and off the stage. The coordination of bows and encores occur during this time, along with stand and chair setup coordination. The dress rehearsal is the time to test the acoustics of the hall. However, with an electronically involved concert other factors must also be considered.

First is the question of which equipment the performer is providing, and which is the performer relying on the concert venue to provide. Having a fixed

media composition means a need for specific types of equipment. It is between

the performer and the concert venue to decide what equipment will be the

responsibility of each party. Linda Swope stated, "I usually bring my own items,

as I can't be sure that they will have what I need. Everyone's amp produces a

different sound, also. If I use the venue's amp, I want to try it ahead of time."[22]

The last thing a performer wants to encounter is getting to a venue a significant

distance away only to find out the venues speaker system is not functioning. At

that point it would be impossible to transport your own equipment. The performer

should make sure his contract with the venue states the equipment the venue will

be providing. Contacting the venue's sound engineer or building manager to find

out the equipment availability for the concert date can prevent these issues.

Access to all of the equipment used during the learning phase will be

necessary. This equipment presumably consisted primarily of a playback device

and possibly oboe amplification. This setup was fine while learning the music,

but more is necessary to make the experience pleasurable for your audience.

The combination of the sound of the amplified oboe with the performance track

into the same auditorium speakers heard by the audience is needed. In the

learning phase setup this step was not taken. The oboe was amplified, but the

tone was not combined with the backing track and coming mutually through the

same location. This step is now needed to allow the sounds to combine

completely. This requires some additional equipment which the venue may be

able to provide. The biggest piece of additional equipment is a mixing board

where the sounds come in individually, but leave together through the same

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[22] Linda Swope, e-mail message to author, April 30, 2013.

stereo left and right track. The complete performance setup is shown in Figure

3.1.
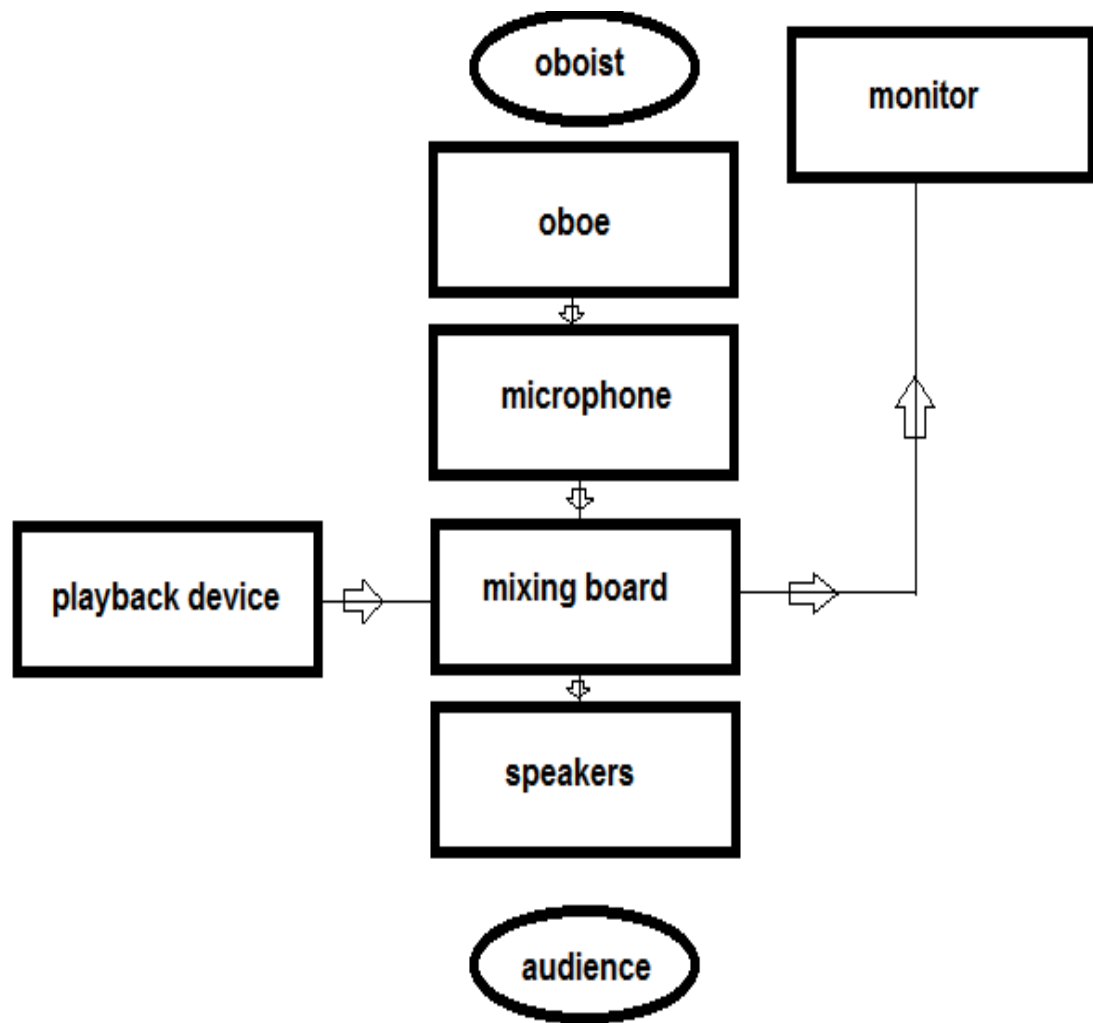
Figure 3.1 Fixed Media Performance Setup

The microphone acts as an extension of the oboe as the manner in which it picks up the audio signal from the oboe becomes the core of the sound that the audience will hear. Because of this, the oboist will always want to use his own microphone in performances. Something so important to the actual tone of the oboe should not be left in to the venue to provide. Think of the microphone as one would think of his English horn bocal, a piece of mandatory equipment specifically picked out personally for his English horn to help achieve the best tone possible.

CHAPTER 4

INTERACTIVE COMPUTER

Definition Of Interactive Computer

The second type of electronics frequently paired with the oboe is

interactive computer. The definition of interactive computer music for the sake of

this research is music for oboe and computer, where the behavior of the

computer is controlled by the oboist's production of musical input or trigger.

Relationship Between Electronics And Oboist

Guy Garnett writes, "Interaction has two aspects: either the performer's

actions affect the computer's output, or the computer's actions affect the

performer's output."[1] I do not agree with this definition. If the performer can also

be taking cues from the computer, this is no different from the relationship which

we established between musician and computer when performing a composition

for fixed media. Only the interaction of the computer reacting to the musician will

be considered in this definition of interactive computer music. The musician will

of course have the normal musical reactions experienced when playing with any

music of any sort, but this is not something at all unique to interactive music and

does not need to be discussed. This reaction of the computer to the musician's

trigger, whatever the trigger may be, can be equated to the computer being an

active participant in the music in some ways similar to an actual musician. This

reaction will be a real-time occurrence, based on the actions of the musician and

depending on the programming may not always be exactly the same. Rachel

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[1] Guy E Garnett, "The Aesthics of Interactive Computer Music," *Computer Music Journal* 25 (Spring 2001): 30.

Yoder in *Performance Practice of Interactive Music for Clarinet and Computer with an Examination of Five Works by American Composers* says "The philosophical territory explored by interactive composition is a fundamental them of life in the twenty-first century: the question of the nature of our relationship to machines, computers, and artificial intelligence systems." This view brings the relationship of oboe and electronics into a new light.

Equipment

Pestova tells us,

Interactive performance systems offer several advantages to the performer despite having problems of their own. They grant the musician the ability to be flexible with tempo, and reduce problems with synchronization of prominent events by providing control over timing.[2]

The computer will use a program with interactive capabilities, to trigger musical output which was preprogrammed by the composer. A trigger is anything that happens which the computer has been programmed to look for in order to facilitate a musical response.

One option currently in the experimental stage involves the musician's movements triggering the computer. It could use involve sensors which are hooked to different parts of the musician's body that are able to tell what movements the musician is making. It could also use the technology utilized in the theremin in which a certain portion of the stage is monitored by the computer. Depending on where the space monitored is disrupted, the computer reacts accordingly.

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[2] Xenia Pestova, "Models of Interaction in Works for Piano and Live Electronics" (DMA diss., McGill University, 2008), 10-11.

Another trigger option is score following. According to Pestova this was "introduced simultaneously but independently by Barry Vercoe and Roger Dannenburg in 1984, involves entering a score into the computer and comparing it to the musician's playing of the same score on a note-by-note basis. The computer can "listen" to the live input through microphones and track the musician's tempo, frequency (pitch tracking) or dynamics (amplitude following) in order to determine the location in the score. This technique allows events or processing to be triggered automatically at precise moments, greatly simplifying synchronization problems that are prevalent in works for instruments and fixed media." This could be thought to be terribly rigid in theory. It may be assumed that if absolutely anything the musician does varies from what the score has which has been inputted into the computer, then the computer would wait until that next note is replayed exactly before going further in the score. However according to Pestova's research, she found that Robert Rowe in "Interactive Music Systems: Machine Listening and Composing" says, "Barry Vercoe's score-following program uses tempo estimation and "remembers" the performer's interpretation from rehearsal, decreasing the chances of error in performance even if the performer deviates from the score."[3]

Another programming possibility is score orientation.   Instead of inputting the entire score into the computer and have the computer constantly following the music in order to listen for the point of its entrance, the computer is selectively programmed to only listen for specific things which instigate the response. The computer could wait for specific frequencies or dynamics. In

[3] Pestova. "Models of Interaction in Works for Piano and Live Electronics," 18.

either of the possibilities, the hardware setup would involve a microphone for input of the information causing the trigger.

As seen on Figure 4.1, the oboe player plays into a microphone, which plugs into a signal converter box via XLR cable. The signal converter changes the audio signal into binary numbers, which are then sent through another cable into the computer via USB port, or firewire. The computer produces sounds which are sent to the mixing board. The mixing board sends the audio signal to the monitor for the oboist to hear and the speakers for the audience to hear.
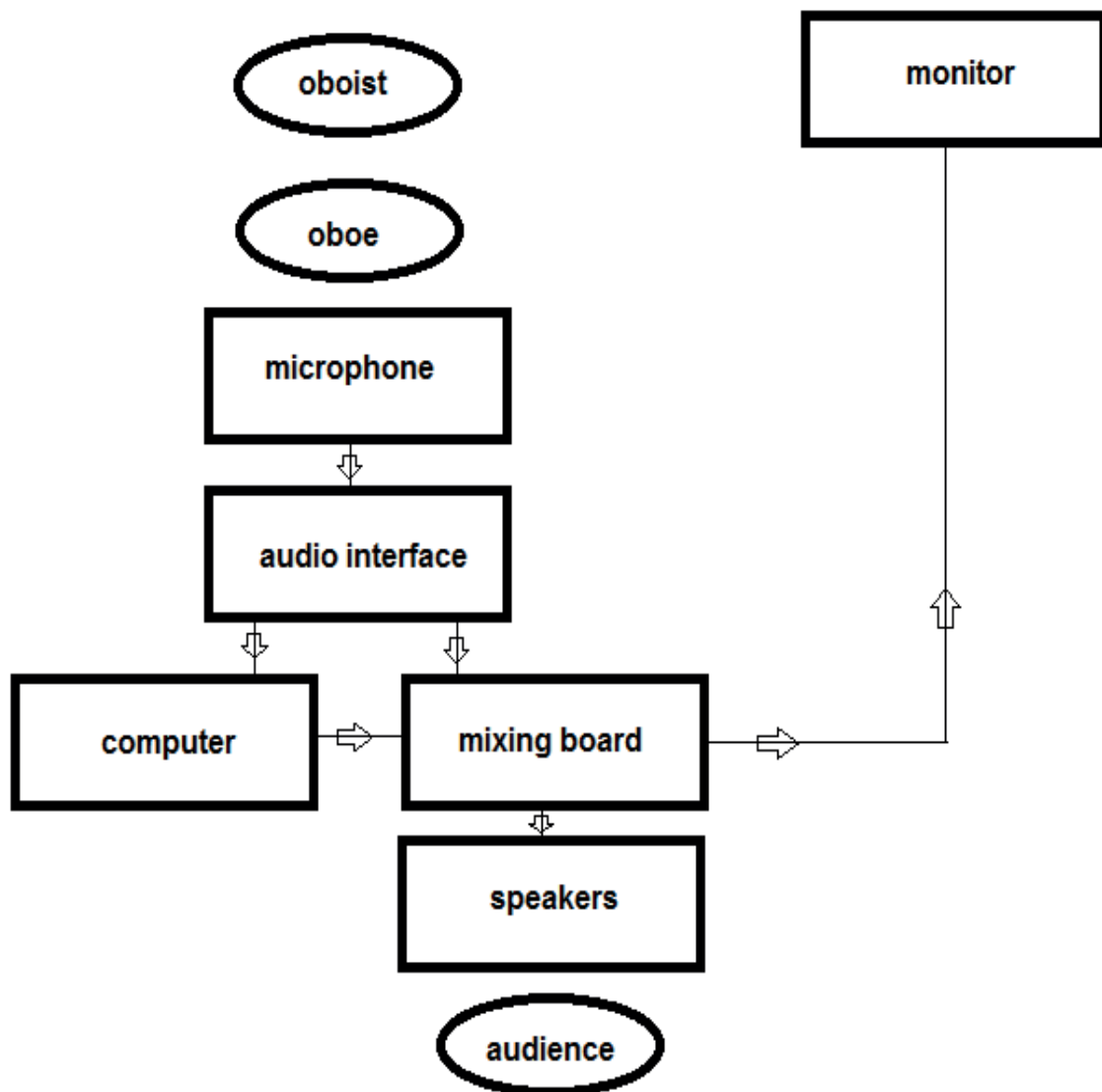
Figure 4.1 Interactive Computer Performance Setup

Currently, the most used triggering device is a foot pedal that the oboist will press to trigger the computer to provide a musical response. This trigger works through MIDI (Musical Instrument Digital Interface) or more frequently today through OSC (Open Sound Control).   This can present its own issues. If the performer wants to not spoil the surprise of a computer entrance this may not be the correct trigger to use, since you could also be visually cueing your audience to the upcoming computer response. A pedal can be tricky to maneuver while performing, since it adds an additional physical requirement into the oboist's already full road map. It will take some practice to master this seamlessly. Certain footswitches can make a clicking sound when pressed. Testing any foot switch first before purchase to make sure it will be silent on stage when used is recommended.

The hardware setup using the foot switch would look like the following illustration.   As seen on Figure 4.2, the oboe player presses a foot switch which sends signal to the converter box. The signal is then sent through another cable into the computer via USB port, or fire wire. The computer produces sounds which are sent to the mixing board. The mixing board sends the audio signal to the monitor for the oboist to hear and the speakers for the audience to hear.
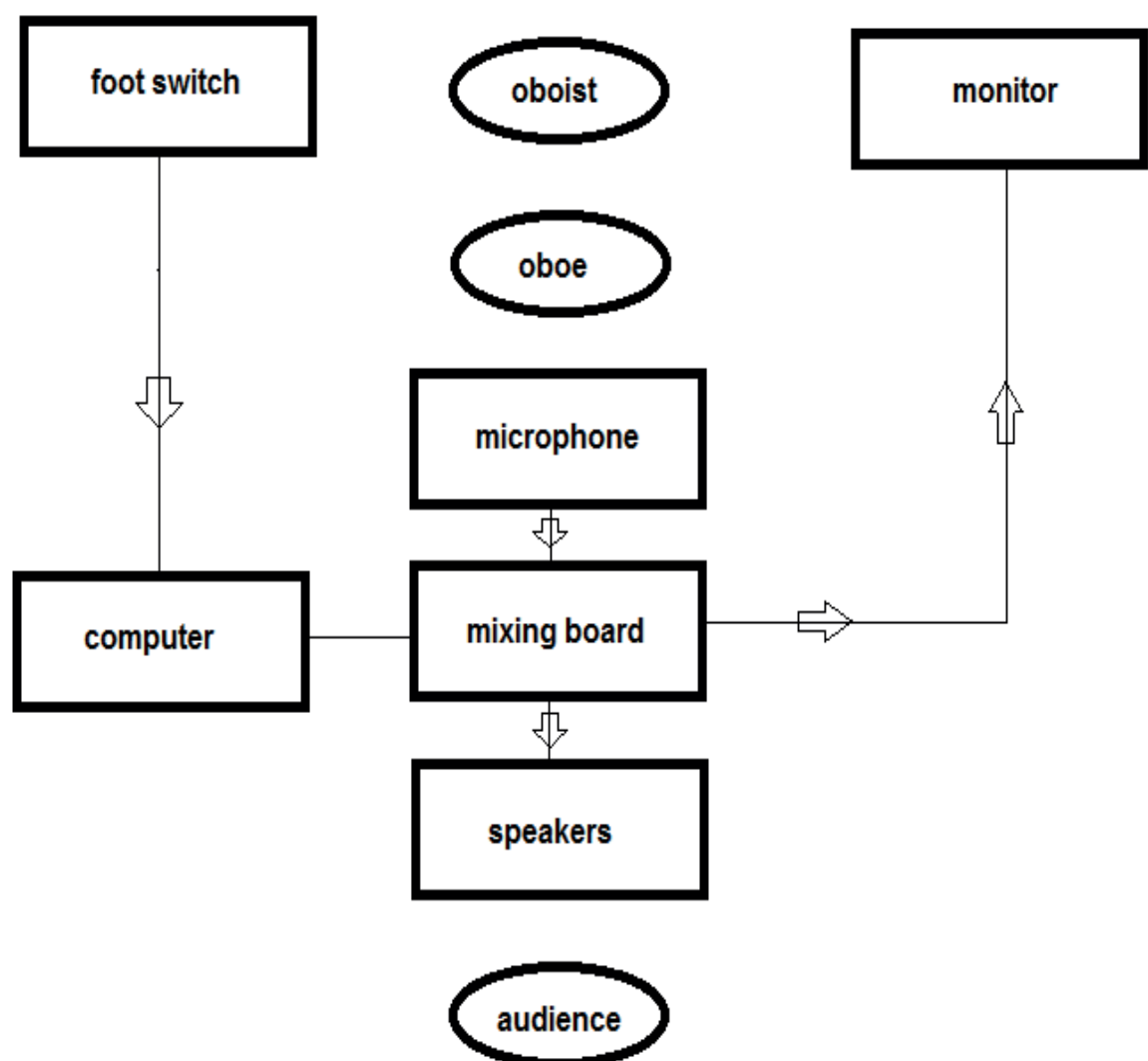
Figure 4.2 Foot Switch Performance Setup

The biggest issue with compositions written for interactive computer is the

technology itself. The composer codes the interactive part of the composition, in

his chosen program. Examples of these software programs include Kyma,

Max/MSP, Abelton Live, Cypher, Voyager, and Pure Data. In order for the oboist

to perform these compositions, he must have access to the specific program that

the composer used. In the case of Karl Scaletti's Kyma, this will be an expensive

investment, and will run only on a MAC platform. Max/MSP (Max Signal

Processing) which was developed in 1997, offers a free "RunTime" version of its

program, which will allow playing of pre-coded information, but no user

alterations. Pure Data (Pd) is a free open source program invented by the same

programmer that invented Max, Miller Puckette, but is not as user friendly as

Max/MSP.[4] Some composers feel that by using an open-source program, they

are extending the life of their compositions, because the program will be

continuously updated, preventing obsolescence.   Abelton Live will run on either

operating system, and is relatively affordable.   As computers change,

composers must reinvent their works using new programs. This is the biggest

challenge for older compositions to have a sustainable future. The majority of

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[4] Rachel M. Yoder, "Performance Practice of Interactive Music for Clarinet and Computer with an Examination of Five Works by American Composer" (DMA diss., University of North Texas, 2010), 7.

composers I spoke with are open to updating their compositions, if requested.

See chapter three "Fixed Media" for a comprehensive list of composers who are

open to updating their compositions if contacted.

Major Compositions

Interactive music compositions are currently not as abundant as the fixed

media compositions. Fixed media has been available since the 1960s with the

birth of analog tape which could capture sound for playback. However the

software necessary to produce and perform an interactive music composition has

only existed in the last twenty years and has only really been become available

to the average oboist recently because of price. Major compositions include Paul

Archbold's *A Little Night Music* for oboe and interactive computer, written in

2004; Bryan Jacobs's *A Gentle Ruin* for oboe and live electronics, written in

2007; and Michael Young's *Argrophylax* for oboe and interactive computer,

written in 2006.

Learning Phase

Setup has already been discussed in detail. It is recommended that the

performer place the computer within reaching distance during the learning phase

so that it is easy to see what is going on and notice any issues quickly. Place the

setup within easy access to the control pedal if one is being utilized. It is

important to determine what point in the depression of the control pedal triggers

the response of the computers output to help facilitate seamless synchronization of the performer's oboe playing with the pressing of the control pedal.

One of the questions that I asked all of the composers I have interviewed is, "What level of electronics knowledge do you expect oboists to already have when they approach your compositions?" I wanted to find out if the trepidations that many oboists seem to have about approaching interactive music were warranted. All of the composers I spoke with told me they did not expect the oboist to come into their compositions with any prior knowledge of the software that was involved in their compositions, only to have access to the software. Although Max/MSP is a very sparse and confusing looking piece of software by itself, a piece of music which utilizes Max/MSP will not appear the same to the oboist. Most of the time, composers take special measures when programming to ensure that the visual impact for the oboist is user-friendly when the program is opened. Composers are aware that if the program is not user-friendly an oboist will not proceed further.

Performance Phase

The most important thing in the dress rehearsal for a piece involving interactive computer is the test run of setting up all the equipment properly. The performer will need the addition of a mixing board, just as in the performance phase of fixed media compositions. The mixing board will be where the computer's output and microphone output are both fed before being sent out to the audience.

The typical placement of the monitor is directly in front of the oboist, approximately one foot from the edge of the stage facing the oboist. This will allow the oboist to hear what is coming through the monitor clearly without the possibility of causing feedback.

Interactive Computer Troubleshooting

Programs involving score reading or score orientation which are listening for specific notes to be played by the oboist in order the trigger the computers response can be faulty.   Things such as coughing, trills, instrumental harmonic overtones, wrong notes, and loud noises are among the things that could cause the computer to either trigger early or not at all. McNutt equates this to an accompanist who stops playing because the oboist hit a wrong note.[5]   This could possibly be more prevalent with pieces involving double reeds than other instruments, due to the changes in tone, timbre, and articulation which occur between different reeds. It is hoped that the composer will realize this and program for these slight alterations in the oboes sound by setting the triggers for small ranges, instead of single concrete parameter.

Although I prefer to keep electro-acoustic music for the oboe as much of a solo affair as possible, it may be beneficial to have someone operating the computer to counteract any unwanted actions by the computer, or provoke a missed cue. If this is something the performer wishes to have, altering the computer placement and using much longer cords connecting to and from the

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[5] Elizabeth McNutt, "Performing Electroacoustic Music: A Wider View of Interactivity," *Organised Sound* 8, no. 3 (2003): 300.

computer to allow the computer to be offstage where your engineer can have access to it at all times is essential.

One alternative to bringing an additional person into the setup is to have the computer programmed in order to allow a footswitch to always be able to initiate the next trigger, in case of a situation when the computer does not react properly to an audio trigger. This is something that would most likely need to be discussed with the composer, unless the oboist has significant programming capabilities with the software the composer has used to program the interactivity. As seen in Figure 4.3, the oboe player plays into a microphone, which plugs into a signal converter box via XLR cable. The oboist also has the option of pressing the foot switch which sends the signal to the converter box. The signal converter changes the audio signal from the microphone into binary numbers, and then sends both signals through another cable into the computer via USB port, or firewire. The computer produces sounds which are sent to the mixing board. The mixing board sends the audio signal to the monitor for the oboist to hear and the speakers for the audience to hear.
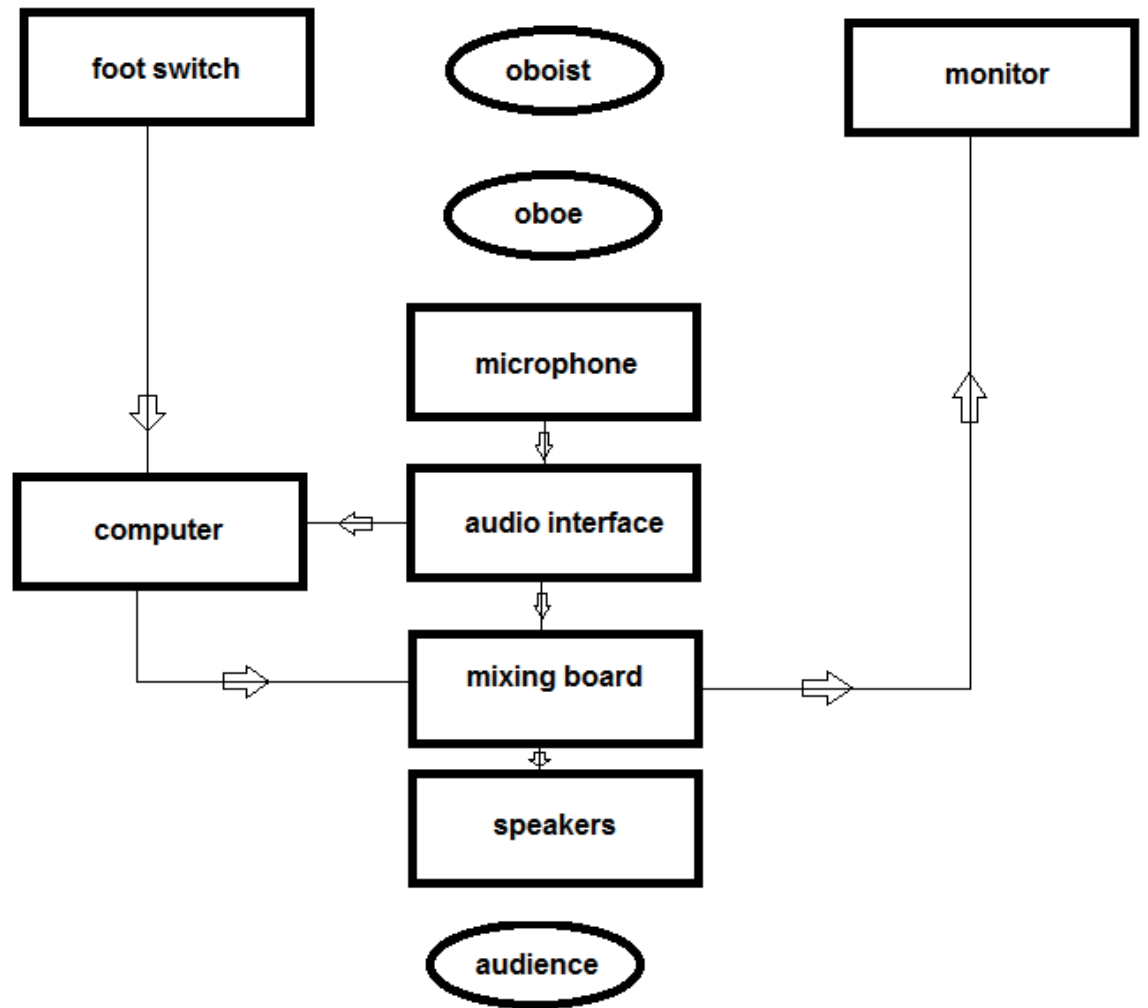
Figure 4.3 Combination Performance Setup

CHAPTER 5

LIVE EFFECTS PROCESSING

Definition Of Live Effects Processing

The last major type of electronics paired with the oboe is live effects processing. Live effects processing is the real-time manipulation of the oboe sound through electronic means, e.g., by computer program, rack-mount units, guitar pedals or other devices.

The combination of acoustic instrument paired with live effects processing, began with patents from around 1912, which show telephone transmitters placed inside the bodies of banjos and violins to amplify the sound. This extended into the 1930s, with the electric guitar. The 1960s, began the modification of the amplified sound, through the development of effects pedals, which alter the sound before it reaches the amplifier, speaker, or monitor. The oldest composition for oboe and live effects processing on my list of works is David Rosenbloom's *And Come Up Dripping* for oboe and live electronic processing, which dates back to 1968. When the date of the first piece for this combination is looked at within the context of this timeline, one sees the oboe was used experimentally, from the beginning of signal processing.

Although pieces date back to 1968, actual performance practice is hard to find. Until now, it has mostly been left up to the oboist, to find a path, through the many different electronic options available. Even today, performance practice for live processing is difficult to navigate. Composers are wisely choosing not to write for specific hardware, instead choosing to describe the desired effect. This

is great because the music can outlast the hardware, which will no doubt become

obsolete rather quickly.

Relationship Between Electronics And Oboist

> While the performer is traditionally held responsible for the final result,
> working on recent repertoire with live electronic can often require
> explanations, assistance or collaboration from the composer in addition to
> technical support from an experienced technician who will oversee
> processing and control sound projection in real time during the
> performance.[1]

In my research, I have tried to stick with pieces that can be accomplished solely

by the oboist. However in the appendices I have listed all available works I have

found for the instrumentation. It will be up to you as the performer to decide if

there is a way you can perform the composition alone or if help is necessary.

Pestova says in *Models of Interaction in Works for Piano and Live*

Electronics,

> It is important to note that live electronics differ from fixed media by giving
> the composer and the performer an opportunity to escape the potential
> rigidity of strict synchronization and to have the electronic as well as
> instrumental parts of the piece sound different in every performance.[2]

This is a welcome change from fixed media, as the entirety of the electronic

sounds is now in the hands of the oboist. While having the freedom to develop

your own electronic sounds can be enticing, it can be intimidating if you don't

have some basic knowledge of the capabilities and requirements of your

electronics.

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[1] Xenia Pestova, "Models of Interaction in Works for Piano and Live Electronics" (DMA diss., McGill University, 2008), 4.

[2] Ibid., 2.

Oboes are more complicated to use with live effects processing than other instruments, because they are more difficult to isolate from the total sound. String and brass players have good results when using clip-on microphones. However, the oboe has sound coming from different areas of the instrument, depending on the note played. A clip-on microphone would not uniformly pick up these sounds. If the oboe sound is not isolated, it will create a feedback loop. One idea to help alleviate feedback is to add a noise-gate to the daisy chain of effects, to cut the background sound, while still obtaining a pure oboe tone. This is discussed further in chapter six, "Microphones," in the section "Microphone Trouble Shooting."

Major Compositions

Oboemobo for solo oboe and effects pedals was composed by Sean Friar in 2010. I use two different units; the Boss ME-70 guitar multiple effects processor and a DigiDelay guitar digital delay pedal, made by Digitech. The different effects in the piece were initially notated specifically for an Eventide, digital delay box. This was due to Friar writing this piece for a specific person who had an Eventide unit available to them. However, after talking to Friar, he gave me general effect descriptions, which I could translate into my available technology.

Friar breaks the effect requirements of *Oboemobo* into six different presets. The following is a quick summation of Friar's effect requests. These are not as detailed as he has given me, but they will give the reader a good idea of the requests a composer can give the oboist for effect needs. The first preset

49

calls for use of two simultaneous delays that should give the effect of a "shimmering afterglow" with a ten-second suspension of sound until silence. Preset two calls for a short phasing delay combined with a tape echo delay. Preset three is a sped up version of preset two. Preset four is similar to the first preset but with the addition of isolating particle partials. Preset five is a heavy version of preset three with possible addition of reverb. The last preset should only be a one-second delay. The last line of the piece is completely without effects. I settled on using different combinations of hall reverb, octave modulation, an effect volume pedal, and two separate delays of different amounts, rate, and sustain to achieve these instructions.

According to Sean, the oboe works especially well with delay pedals, because it has the most incisive attack of any woodwind. He realizes some notes on the oboe have very prominent overtones that can be easily exploited in an electro-acoustic setting. In *Oboemobo*, the listener will hear this occurring specifically on low B and B-flat. Despite the problems involved in live processing, I find it enjoyable to experiment with the expanded sound palette, which usually is not associated with the oboe.

Equipment

Live effects processing will require a similar microphone setup to the previous setups for fixed media and interactive computer. The difference occurs in where the signal is sent from the microphone before it reaches the amplifier or speakers. It is at this point in the process that the effects processing is put on the oboe signal as you see in the figure below. Processing can involve any

number of effects; such as delay, echo, looping, reverb, fuzz, equalization, compression, distortion, and overdrive. Processing the oboe's sound can create a completely different soundscape, expanding the oboe's capabilities. Figure 5.1 shows my live effects processing setup.

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        ┌─────────┐
       (   oboe    )
        └─────────┘
             │
     ┌───────────────┐
     │   microphone   │
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     │   impedence    │
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     │   digidelay    │
     └───────────────┘
             ⇩
     ┌───────────────┐
     │   boss me-70   │
     └───────────────┘
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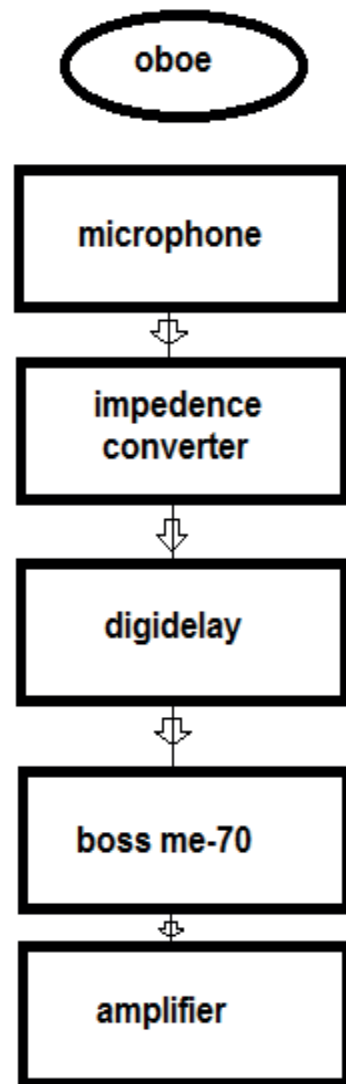
Figure 5.1 Live Effects Processing Practice Setup

Guitar Pedals And Effects

The following is a quick description of possible effects a composer could require and what they can do. The amount of wetness of each effect versus the original sound of most of these effects can be altered using an onboard expression pedal if the oboist is utilizing pedals and processors normally used by guitarists. Wetness refers to the amount of a given effect in comparison to the amount of the original sound that is present. One popular effect is delay. This produces an echo-like effect by postponing the sound. The delay time may be altered to change the length of time before the attack of the reproduced note happens. It may be altered by lengthening the sound once it is produced. The delay on some units can play the sound backwards. There are usually at least three different alteration parameters on a delay box: time, feedback, and equalizer level. Some units will incorporate a looping option. The loop will allow the oboist to record up to approximately thirty-eight seconds of sound which will then be repeated back to the oboist repetitively when activated. This is a technique which has been used by composer Ingram Marshall.[3]

Another possible effect is the compressor. A compressor can suppress peaks in the amplitude of the oboe's sound and reduces the dynamic range. It can also be used sustain the pure sound or alter the signal using certain preset patches. These presets, such as "wah wah," defretting, hum, slow gear, and solo, are specifically made with the guitar in mind but can have interesting impacts on the oboe's sound. A normal unit will have three level variables that

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[3] *Boss ME-70 Guitar Multiple Effects Owner's Manual* (Hamamatsu: Boss Corporation, 2008).

the oboist can play with: sustain, attack, and peak. Experimentation is the only way to find out if compression is something that can benefit your sound.[4]

Overdrive will add distortion and sustain to your sound. There are many different preset options on most distortion pedals: everything from metal to fuzz, blues, boost, and core. Each one will emphasize certain frequencies to achieve the desired impact. Common variables on these units are drive, tone, and level. Drive sets the intensity. Tone sets the brightness of the sound. Level sets the volume of the effect.[5]

Modulation will alter the pitch of the sound. There are quite a few possible modulation settings. Flanger sweeps the frequency range producing addition or subtraction to the overall sonic character. Chorus adds a tiny wave in the sound which causes the tone to appear fatter. Tremolo has a slower wider wave in sound. Harmonizer adds other pitches to the sound at a predetermined interval defined by the user. Octave will add sound an octave lower than the performed pitch. Common variables for these units include rate/key, depth/harmony, and resonance level.[6]

Reverb is the most requested effect. It can replicate the sonic character of a room of any size or material. The hall setting is usually the wettest, meaning it saturates the original sound the most. The preamp can be used to magnify the

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[4] Ibid.

[5] Ibid.

[6] Ibid.

original signal before sending it to an effect and can also act as an equalizer capable of altering the signal.

Learning Phase

The first thing that should happen before beginning to think about the electronic components involved in the piece being programmed is learning the notes. A lot of tweaking and experimenting will need to occur with the electronics, especially if the performer is new to them, and having the notes already under control will give the freedom required.

After the notes are under control and necessary equipment has been acquired, move to a practice space big enough to avoid feedback. Live effect processing compositions are the type of pieces where feedback will occur most frequently. This is due to the oboist wanting to hear a saturation of the effect in comparison to the unamplified tone heard coming directly from the oboe. Without having the signals high enough to hear the effects clearly, it is hard to tell if they are correctly meeting the specifications given by the composer. When working on *Oboemobo*, I used a normal-size classroom for rehearsal space and frequently encountered feedback. One way of alleviating this is to set the equipment up at different angles and to play at one end of the room diagonally across from the other end. This allows the sound waves to bounce other directions before finding the microphone. Another option is to place carpet or another type of padding across the wall directly across from the sound to absorb the waves.   Carpeted flooring will also help rectify this dilemma.

Work with each effect separately. If multiple effects are combined in the beginning, it is difficult to understand which variable is responsible for which sound. For example if you are working with delay, work only with the attack first. After the attack has been placed in the desired location, then focus on the sustain of the sound. After the sustain of the sound is correct, then manipulate the decay of the sound. When the delay is at a desirable level, then move to the next effect. Continue this process through the first electronic rehearsal and find possibilities for all the effects. Before teardown, make sure to have a record of the position of everything accomplished. The most efficient way to accomplish this is by taking close-up pictures of the placement of all the knobs and dials on the units. At the setup for the rehearsal, the performer can consult these pictures and continue from the last stopping point.

If the actual physical setup of the electronics is confusing, it may be necessary to label all the components as well. Linda Swope applies colored tape on the ends of all her cords, with the same colored tape at the points on the equipment where the plugs are connected.[7] Just as in the oboe, muscle memory will play a role in the live manipulations of the effects via the performer's feet. Make sure to always place the pedals in the same order and location each rehearsal. I find rehearsing barefoot helps to get better acclimated with operating the pedals without having to look at down at them, although oboists may want to practice with the shoes he will be using them in the performance.

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[7] Linda Swope, e-mail message to author, April 30, 2013.

Performance Phase

The dress rehearsal is of considerable importance when performing pieces that involve live effects processing. It is more than likely that until this point, the performer has not been practicing in the performance location. The size of the performance space is probably different than the rehearsal space, and the sound will be run differently if you are using the venues equipment. This will cause major differences in the sound, even when setting signal effect levels exactly as shown in the pictures taken during practice sessions.   The addition of the auditorium's mixer and speakers into the setup will mean there will have to be setup adjustments made.

After the signal is processed, it is sent to a monitor, speakers or amplifier. The oboist will need to decide the level of processed vs. original sound desired. For this reason, the oboist should make an effort, to perform a significant distance from the audience, in order to obtain a proper combination of the sound. See Figure 5.2 for a visual of this setup.
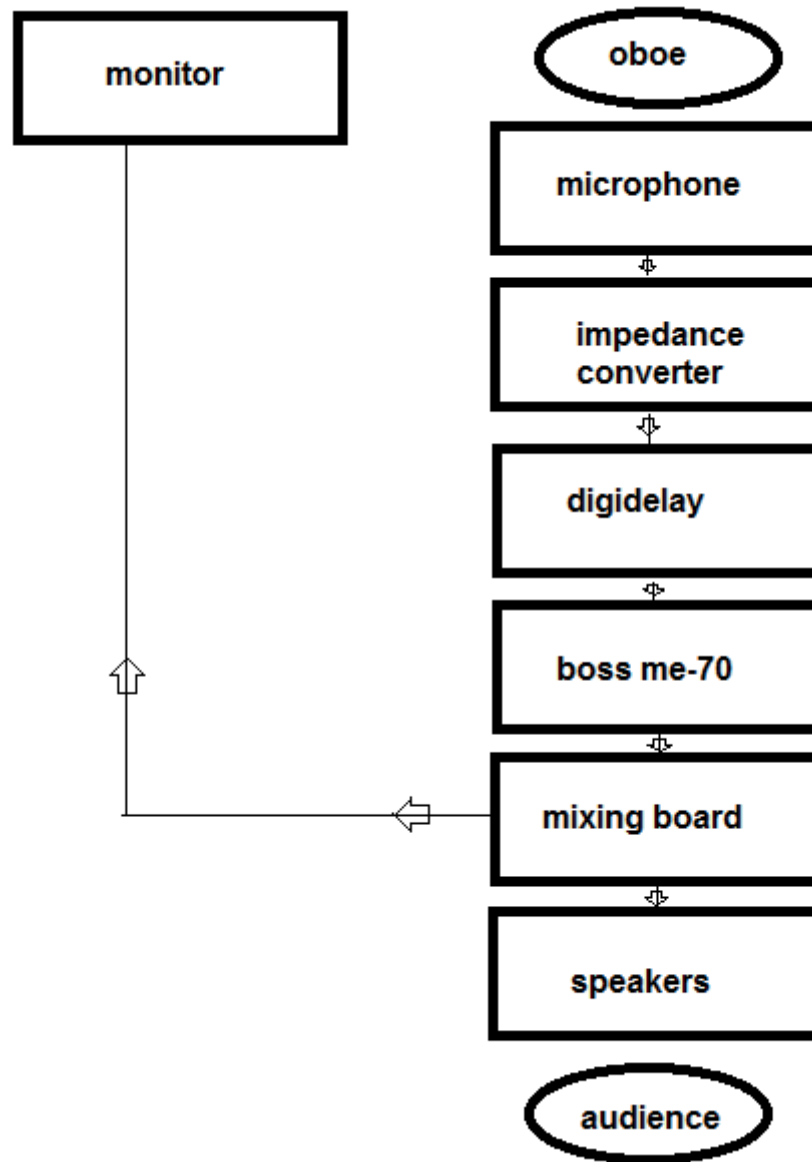
Figure 5.2 Live Effects Processing Performance Setup

Having a person in the audience is necessary to perceive the effect

saturation from the audience perspective, which is impossible from the stage.

The effect levels will be altered on the effects themselves, but the overall volume

of the processed oboe tone will be altered using the track fader of the track with

which the signal line from the oboe sound is running.   The correct placement of

this should be tested by playing the loudest portion of the program which involves

the amplification to insure feedback does not occur.

Once the correct levels are found for all of the effects and mixing board,

again take pictures of all the units since changes have not likely been made.

Even if the setup is able to be kept intact before the performance, there is always

the likelihood that someone will touch something that could horribly alter the

sound. A quick glance at all the levels with the pictures before the concert will do

a lot to soothe nerves.

Live Effects Processing Troubleshooting

Pestova says this about live electronic piano music,

Due to the rapid ageing of technology, much of the classic and even
relatively recent live electronic repertoire is virtually unplayable today.
This issue is especially prevalent in works that require external hardware,
whether commercial or custom-made. In many cases it is possible to
reproduce external hardware and analogue or early digital effects units in
a computer patch.[8]

This applies to oboe music as well. Even as I write this, live effects processing is

evolving as new models come out on the marketplace and others are discarded.

The Troubleshooting section of Chapter three on Fixed Media further discusses

this option. Just as composers can upgrade the medium the composition uses,

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[8] Pestova, "Models of Interaction in Works for Piano and Live Electronics" 3-4.

they can also find alternate new technology to emulate the original sound they were looking for if contacted. In the process of doing so, they could perhaps find that they were initially limited in the options and now find an effect that more completely emulates their original concept of the sound. Manufacturers of these live effects units know that although the public wants to hear their new innovations in sound, they still want the access to ability to achieve the sounds from the previous releases. Because of this, the sounds will still be achievable; they just may not be coming from the same unit. Composers have become careful to start notating their effect choices in more generic terms to help the musician become less caught up in needing a certain accessory and more concerned with achieving the certain effect in a specific way.

There is a high learning curve when working with effects processing. In the beginning, it feels like you are attempting to play more than one instrument simultaneously. It is important that the oboist is familiar enough with the equipment to be able to diagnose and fix any electronic issue quickly. Pat Morehead shared with me "When the equipment breaks down for the performance I have been known to tell stories and jokes while the tech difficulties get sorted out."[9] Oboists will run into issues of feedback, choosing the correct effect and amount, hardware fallibility, expensive and cumbersome equipment, coordination of on-the-fly changes, and music that gives little to no, concrete direction. Working with live effects processing requires oboists to have flexibility. The oboist needs to learn to listen to the finished processed sound, and not to what is coming out of the bell as normal. However, I really want to stress,

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[9] Pat Morehead, e-mail message to author, April 1, 2013.

despite this huge list of issues, it's a lot of fun. I asked everyone interviewed,

where they felt the combination would go, in the future. Overwhelmingly, they all

said the sky was the limit.

CHAPTER 6

MICROPHONE BASICS

Equipment

It is very important to find a good microphone for the oboe. For the majority of electroacoustic music the performer is be required to amplify the oboe sound to meet the other sounds, creating a surround-sound audio experience for the listener. According to Rumsey, "A microphone is a transducer that converts acoustical sound energy into electrical energy."[1] This energy can then be altered via live effects processing tools such as delay and reverb boxes among other things. After the electrical signal is finished with the processing phase, it is converted back to acoustical sound energy through the amplifier, monitor, or speakers. The first, and possibly the most important, step in this process is finding a good microphone. An oboist only has as good a signal to work with as has been initially captured from the microphone. If the microphone is not the right one for the situation, it will not capture the most pure signal possible. This will only diminish at each stop in the signal's path. Oboists want to make sure to have the correct microphone for capturing the oboe sound. Microphones come in many sizes and shapes for many situations. The microphones capable of capturing the sound of a baseball game for the radio may not be the perfect choice for the single warm tone of the oboe. While there is not one specific microphone for recording the oboe, a better understanding of microphones will help facilitate an adequate microphone choice.

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[1] Francis Rumsey and Tim McCormick, *Sound and Recording* (Oxford: Focal Press, 2009), 48.

Polar Patterns

Every microphone on the market today has a polar pattern. The polar pattern is a specific directional response pattern which shows the microphone's capacity to pick of sound from a specific area around the microphone. This pattern is graphed on a two-dimensional contour map.[2] There many different polar patterns available in microphones. The polar pattern is the visible representation of what the microphone will pick up. There are many different possible polar patterns for microphones.   An omnidirectional microphone will pick up signal from all directions, including the audience, making this a bad choice for the oboist wishing the only mike themselves. This microphone would be used from picking up the entire environment during an event. There are figure-eight polar patterns, which pick up the same amount of sound from directly in front of the microphone as directly behind it. This is also not the ideal microphone as the sound of the oboe would come from only one direction. The microphone would be used for possibly an interview of two people simultaneously talking using the same microphone while facing each other.   The hyper-cardioid polar pattern will pick up predominantly in the front of the microphone, plus a small section directly behind the microphone as well. The hyper-cardioid microphone might be a good microphone for recording in an empty large cathedral, because it would also record some of the reverb coming from the environment. But this would not be good for a clear signal from only the oboe as you would want in an electro-acoustical oboe concert. A cardioid microphone has a polar pattern which resembles a heart shape. The bottom of

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[2] Ibid., 53.

the pattern is not inside the heart shaped pattern. Sound from this area will not

be picked up by the microphone. This is a better choice for an oboist who wants

only to amplify the oboe. This is especially important when performing utilizing

live effects processing. In this situation any unwanted sound can be amplified to

the point of inducing feedback. See Figure 6.1 for a visual representation of

these polar patterns.[3]

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[3] Ted Carfrae."TCM Mastering." https://tcmmastering.wordpress.com /tag/microphone-technique/page/2/ ,May 7, 2014.
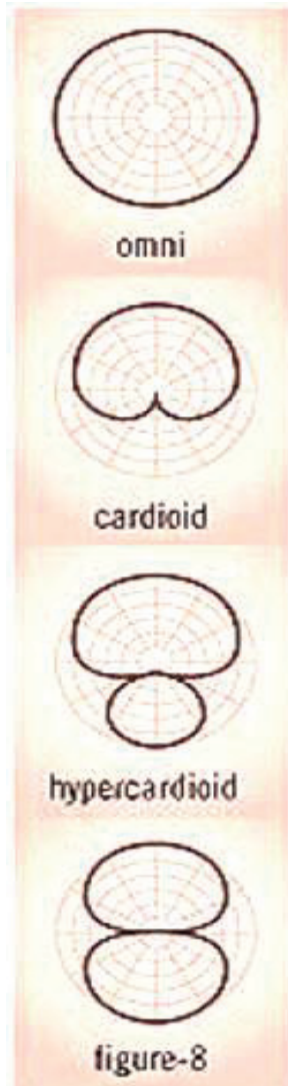
Figure 6.1 Microphone Polar Patterns

Once a polar pattern has been chosen, the next step is finding the correct type of microphone employing that specific polar pattern. There are three main types of microphones. They are the ribbon microphone, dynamic microphone, and condenser microphone.

Ribbon Microphones

Ribbon microphones can have a very warm sound. Rumsey says, "The ribbon microphone consists of a long thin strip of conductive metal foil, pleated to give it rigidity and 'spring', lightly tensioned between two end clamps. The opposing magnetic poles create a magnetic field across the ribbon such that when it is excited by sound waves a current is induced into it."[4] This vibration is great for the low register; however there is a roll-off above 14hz, which may interfere with the highest harmonics of the oboe.[5] This means that above 14hz the microphone will not pick up as much of the signal. They are very delicate microphones, which are for the most part bi-directional. This may not be the polar pattern oboists are looking for in a microphone to amplify an oboe. Ribbon microphones can also be expensive, moving easily from the $1000 - $5000 price range. These reasons have steered me away from ribbon microphones.

Dynamic Microphones

According to Rumsey,

Dynamic microphones consist of a rigid diaphragm, which is suspended in front of a magnet. A cylindrical former is attached to the diaphragm on to which is wound a coil of fine-gauge wire. This sits in the gap of a strong

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[4] Francis Rumsey and Tim McCormick. *Sound and Recording.* Oxford: Focal Press. 2009: 49.

[5] Ibid., 52.

permanent magnet. When the diaphragm is made to vibrate by sound waves the coil in turn moves to and fro in the magnet's gap, and an alternating current flows in the coil, producing the electrical output.[6]

They are durable, reliable, relatively inexpensive, and good for close work. I started out using a Shure SM-58, which is a dynamic, cardioid patterned microphone. When interviewed Matt Sullivan, a New York oboist who can frequently be found playing his own electro-acoustic oboe compositions, he stated that he plays Shure SM-57 or 58 microphones exclusively.[7] The Shure SM-58 is a typical microphone used for vocalists. It is actually just a Shure SM-57 with a pop filter added. The pop filter is the bulb seen on the end of microphones which filter out the hard sounds which make consonances louder than the rest of words. These microphones carry a much more manageable price tag of around $100.00. However this microphone does not work well for me, because I find the signal output to be low. This means that there is not enough signal coming from the microphone. Because of the low signal output, it needs to be boosted considerably using a preamp. The process caused me to have feedback frequently, which is always to be avoided.

If you look at the frequency response chart for the Shure SM-58, you see a huge bass and treble roll-off, and a boost in the mid-range frequencies. This prevents a warm oboe tone and accentuates tinny frequencies.   If an oboist is playing a composition requiring live effects processing of any kind, I am recommending investment in a condenser microphone.

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[6] Ibid., 49.

[7] Matt Sullivan, e-mail message to author, March 27, 2013.

Condenser Microphones

After experimenting with the SM-58, I moved to a Sterling Audio SP-30 pencil, cardioid, and condenser microphone. Condenser microphones have an excellent response, more sensitive, and are for the most part more expensive than their dynamic microphone counterparts. They start at the price of a decent dynamic microphone and increase from there.

This microphone has a flat, even frequency response, through the entire range of frequencies, audible to the human ear. Another difference between dynamic and condenser microphones is the need of condenser microphones to have an external power source. This power source is called "phantom power" and can be found on most mixing boards. If not using a mixing board, the performer should purchase a phantom power box in which to run the microphone's XLR cable, in order for the microphone to obtain necessary electricity. After the phantom power, an XLR cable runs through an impedance matching transformer, which is needed to raise the electrical signal from the microphone high enough to work with the effects pedals.

Contact Microphone

Contact microphones are microphones that can physically attach to the oboe. The most logical place to attach a contact microphone is to the end of the oboe, pointed right inside the bell. Many musicians use contact microphones. They can be convenient to use because the performer does not have to worry about microphone placement or constant proximity to the microphone. Contact microphones are also frequently wireless, eliminating on an extra cord on stage.

This is nice for both the aesthetic look of the stage as well as peace of mind when performing since there is one less piece of equipment to possibly tripup the performer.

Contact microphones can have downsides as well. Linda Swope informed me she "has been using a tiny drum mic velcroed inside the bell of the oboe, but it is a bit heavy and cumbersome with the wire hanging."[8] If wireless, they will require batteries. The necessity of batteries puts another factor into the setup equation that could possibly fail during performance. Batteries are finicky little devices that hide their current shelf life. When used with devices which are known to consume large amounts of power, batteries quickly run out of life. Another consideration is the added weight a contact microphone will add to the instrument. Depending on the size of the microphone and the placement, it could possibly cause an uneven distribution of the balance of the oboe, causing technical passages to be more difficult. If using a contact microphone the oboist will not have access to the phrasing capabilities available when using a stand-alone microphone. These capabilities are further discussed in the "Microphone Uses in Phrasing" section in this chapter.

Sky Macklay, a New York oboist and composer is planning on her next microphone purchase to be the Applied Microphone Technology WS Oboe Microphone. She writes,

> This is a combination of two cardioid microphones with a gooseneck that mounts on the oboe which will pick up sound coming from both the keys and the bell. I think it is an awesome mic because it is important to pick up the sound from both of these places on the oboe. Until I get that mic, I prefer to point the mic towards the right hand keys because that is, on

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    [8] Linda Swope, e-mail message to author, April 30, 2013.

average, where the most sound comes out through. Of course it varies depending on the register.[9]

The AMT WS Oboe Microphone comes in both a regular and wireless version which running on a 9-volt battery. It employs a belt pack to allow the user to control the volume.

This seems to be a popular choice, as an older version of the same microphone is used by Kyle Bruckmann, the electronic oboist of EKG. He was given the microphone years ago by teacher Harry Sargous and is still using the microphone despite its current state of disrepair.[10] If choosing to use a contact microphone such as the AMT WS, be aware that the musical microphone nuances that stand alone microphones can offer to your musical interpretation will not be available.

Microphone Placement

If using a contact microphone, placement will be self-explanatory. More than likely the microphone will be attached to the inside bell, unless using the AMT WS. Kyle Bruckmann shared a story with me about having a hole drilled just below the reed well, years ago in a mediocre oboe. A small microphone was inserted into the hole, in a similar fashion as is done to some jazz saxophones. It did not produce the beautiful sound most people expect or desire from the oboe. But it was the raw, raucous tone he was looking for in his experimentation. I do not advise this measure unless using a throwaway oboe.[11] Other ideas in the

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[9] Sky Macklay, e-mail message to author, March 28, 2013.

[10] Kyle Bruckmann, e-mail message to author, March 2, 2013.

[11] Ibid.

future could be to possibly have a microphone inserted into the side of an English horn bocal or thick metal oboe staple.

If using a stand-alone microphone the placement of the microphone is a little trickier. The idea is to get the best clean signal from all the notes played on the oboe, but without picking up extraneous noises such as key sounds or breathing. Depending on which notes are being played, the sound will come from a different place on the oboe. Specifically, it will come out through the first open hole on the instrument. For example if playing A440, the sound will come from the third large hole, sometimes called the A hole. If playing a low B-flat, the sound of the B-flat will come out through the lowest hole on the oboe, the bell.

It is advised that the programmed music be analyzed to see if it is predominantly in the upper or lower register. If in the lower register most frequently, place the signal receiving end of the microphone about eight to ten inches away from the oboe's bell pointed toward up toward the bell, taking into account the polar pattern of the microphone. This will provide easy signal pickup of the low notes. In order to have the most even dynamic range through the entire oboe using this placement, it may be necessary to play the notes in the upper register slightly louder to compensate for the further proximity from the microphone. If playing predominantly in the mid – to upper register, place the signal receiving end of microphone eight to ten inches from the middle joint of the oboe pointed toward the middle joint, again taking into account the polar pattern of the microphone. In this case it may be necessary to slightly emphasize dynamically the oboe's low notes to maintain dynamic equalization through all

the registers. Of course it is normal and likely that the composition will be using the full range of the oboe. The normal placement of the microphone is to place the signal receiving end of the microphone around one foot away from the oboe pointed at a downward angle approximately ribcage height.

I have already discussed Sean Friar's *Oboemobo* for oboe and live effects processing in chapter five on Live Effects Processing. As previously stated, *Oboemobo* was composed around the reoccurring low notes B and B-flat which have very prominent overtones that can be easily exploited in an electro-acoustic setting. I exploited these low tones by placing the microphone low in the position previously discussed for low register playing. This gave me the ability to engulf the microphone with the bell of my oboe when hitting low Bs and B-flats. Since the piece was about emotional impact and not about pure pretty tones, this was effective in making these notes sound raucous, raw, and overpowering.

Microphone Uses in Phrasing

Having a stand-alone microphone which is not attached to the oboe gives the ability to move the source away from the microphone. The microphone, when used to its fullest abilities, can be a powerful tool in a performer's musical toolbox. While an oboist naturally has a certain decibel range available to him to perform a dimmenuendo based on the speed of his air, and condition of his oboe and reed, the microphone multiplies this capacity considerably. The way this is achieved is by moving from a position which points the sound directly at the microphone in its most conducive polar pattern, to a position away from the

microphone, preventing the microphone from picking up and amplifying as much, if any, of the original signal.

This technique can be utilized in a multitude of musical ideas, besides the obvious crescendo. With accents, the oboist can use the microphone primarily on only the accented part of the musical line by not having the oboe's sound point directly at the microphone during the rest of the line. If the oboist plays into the microphone only on the accent itself, then only that note will receive the full amplification of the microphone, thus giving it an accent which is not based on airflow. This technique could also be utilized on antecedent and consequent phrases, where one phrase acts like an answer to the initial phrase's question. If the oboist pulls back from the microphone on the question phrase, he is free to pull towards it on the following answer phrase. This will create that feeling of the consequence phrase being a bigger commitment in dynamics than the antecedent phrase.

Moving towards and away from the microphone can have an effect not only dynamically on the oboe's sound. If an effect is added to the oboe's tone via live effects processing, this processing occurs in the daisy chain right after the signal has been captured by the microphone and turned in electrical signal. This means that the only part of the oboe's tone that is affected is the part picked up by the microphone. The oboist may move away from the microphone in order to have less of the signal processed by the effects processors, but still keeping the wetness of the effect. This will cause the effect of producing less overall signal but still keeping the same amount of effect on the amplified signal. However the

audience will be able to better hear the unprocessed, unamplified oboe sound since there will be less amplification of signal.

Microphone Troubleshooting

I have discussed the basics of microphones types, uses, and placement. The oboist will find that issues will arise while using a microphone that will need rectifying. Here are a couple possible problems and solutions. These are in no way all the issues that are encounter able, but they are some of the most frequent.

Feedback is the biggest issue all the performers I spoke with encounter. It is the biggest issue that I have personally had to deal with. Feedback can come from a multitude of different places depending on the size of the daisy chain in the setup. But in every setup where feedback could be an issue, the setup always begins with the signal coming into the chain via a microphone. Feedback is caused by a signal being infinitely multiplied and the result continuously being outputted. The longer the feedback continues, the more it multiplies and the louder it gets. The input device where this signal is being fed from is the microphone. Therefore it should be the microphone we check first to make sure it is not the cause of a feedback loop.

Microphone placement in regards to the monitor is very important. The performer needs to make sure the XLR cable is long enough to keep the monitor far away for the polar pattern pickup of the microphone. Point the monitor diagonally away from the microphone so that the signal does not have a direct path to the microphone. Never have the signal receiving end of the microphone

pointing in the same direction as the monitor. If the oboist hears feedback begin,

the first thing to do is to turn down the microphone. Turn down the signal before

turning off the monitor. Turning off the monitor first can cause a loud popping

noise which can damage the equipment. Simply moving the microphone to end

the feedback will not work, because it is already multiplying quickly onto itself.

Drastically bring down the signal input level, and then make the necessary

changes is the best solution. Because of the evasive measures that must be

taken to get rid of feedback, it is preferable that feedback never begin. This is

something that should be closely checked during the dress rehearsal to ensure

that even when playing as loud as possible, feedback will not occur. I went over

more specific ideas about dress rehearsal checking in the "Performance Phase"

section of chapter five on live effects processing.

Line noise can have a possible impact on the microphone signal. It will

manifest itself as a low hum, rumble, static, or crackling sound. Fixing the source

of the noise is preferable to masking the symptom of the problem. Some

microphone cables are not insulated well enough to prevent an electrical signal

from being picked up through the cable itself. This can happen if the microphone

cable is running next to an electric cable, computer, or electric outlet. The easy

fix for this noise is to always keep all audio cables running separately from the

electric cables. Cheaper USB microphones are also know to sometimes have

these line noise issues as well.

If moving the cables or changing microphones from a USB microphone

doesn't fix the problem, the symptom can be alleviated by installing a gate into

the daisy chain of hardware after the signal has picked up by the microphone but before it is altered by any effects processing. It is important to achieve a clean pure tone with the gate, before sending the signal for alteration. A basic frequency band gate works by letting the user set a specific perimeter of frequencies to prevent from passing through the unit. It acts as a gate to allow only the other frequencies to pass. Experimentation with the frequency perimeters on the gate is necessary to find the exact frequencies containing the noise needing elimination. Make sure to only eliminate the frequency bands associated with the noise and not alter any of the overtones or harmonics of your oboe sound.

CHAPTER 7

FUTURE PREDICTIONS

Of course it is impossible to predict the future when it comes to electronics. Moore's Law states that technology doubles amount of transistors every eighteen months. Although this seems to now be slowing down, things are still changing at a rapid pace. There is really no way of knowing what technological advances will happen with electronics, or how composers will choose to utilize these electronic advances in the future compositions.   Included in my interview questions of oboists and composers involved in the electro-acoustic oboe music was a question concerning the future. The answers were almost always optimistic and hopeful, although most also people interviewed admit to having not the remotest idea.

One positive prediction I see happening shortly was voiced by both Greg Dixon and Jacob Ter Veldhuis.   It is the incorporation of multi-media visual aspects of the performance which would be triggered the same way music is already activated via computer in interactive music compositions. Jacob Ter Veldhuis, the composer of *Garden of Love* for oboe and tape sees, "combi with videos, stage design, lighting, music performance can become a total experience…the danger is that the music becomes just a part of it, and that visuals distract from the music…"[1] Greg Dixon, the composer of "Train of Thought (Derailed)" for amplified oboe and English horn, says,

> I see the future of the genre becoming more integrated with electronic visual displays, computer networks, and sensor technologies. I also see the computer utilized for the performance of this music moving from

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[1] Jacob Ter Veldhuis, e-mail message to author, March 29, 2013.

laptops to mobile personal computing devices. I would like to see it go in a direction where there will be a greater focus upon interaction with the audience in musical performance, which will help to make electroacoustic music more attractive to a broader audience.[2]

[2] Greg Dixon, e-mail message to author, April 7, 2013.

BIBLIOGRAPHY

Applied Microphone Technology. "AMT WS." Accessed February 13, 2014.
http://www.appliedmicrophone.com/portfolio/amt-ws-2/.

Bassingthwaighte, Sarah Louise. "Electroacoustic Music for Flute." DMA diss.,
University of Washington, 2002.

Bimstien, Phillip. *Half Moon at a Checkerboard Mesa for oboe and tape.* Franklin
Stark Music,1997.

Bird, David. "Squeem 2011 Oboe and Tape Player." Accessed March 10,
2014. http://davidbird.tv/squeem-2011-Oboe-and-Tape-Player

Boss ME-70 Guitar Multiple Effects Owner's Manual. Hamamatsu*:* Boss
Corporation, 2008.

Carfrae, Ted. "TCM Mastering." Accessed May 7, 2014.
https://tcmmastering.wordpress.com/tag/microphone-technique/page/2/

Celli, Joseph. *Organic Oboe.* Recorded 1978. OODiscs No.1, 1995. CD.

Crab, Simon. "120 years of electronic music : electronic musical instrument 1870-
1990." London, 1990: 18-19. Accessed February 23, 2014.
http://120years.net/wordpress/

Ding, Shiau-uen. "Sitting at the Piano, Cradled by Speakers: Developing a
Rhythmic Performance Practice in Music for Piano and "Tape." DMA
diss., University of Cincinnati, 2007.

Friar, Sean. *Oboemobo for oboe and effects pedals.* Score, 2010.

Freeman, John Wayne. "Current Trends in Electroacoustic Music for Wind
Ensemble." DMA diss., University of Memphis, 2010.

Garnett, Guy E. "The Aesthics of Interactive Computer Music." *Computer Music
Journal* 25 (Spring 2001): 21-33.

LaBarbara, Joan. *L'albero dale foglie azure for oboe and tape*. Score, 1989.

Madsen, Emily K. "Selected Music for Oboe and Electronically Produced
Sounds." DMA diss., University of Maryland, 2010.

McNutt, Elizabeth. "Performing Electroacoustic Music: A Wider View of
Interactivity." Organised Sound 8, no. 3 (12, 2003): 297-304.

Music Minus One. "Music Minus One." Accessed March 6, 2014.
    https://musicminusone.com/

Pestova, Xenia. "Models of Interaction in Works for Piano and Live Electronics."
    DMA diss., McGill University, 2008.

Rumsey, Francis and Tim McCormick. *Sound and Recording.* Oxford: Focal
    Press. 2009.

Sverker, Joseph. *Art is Life: Rookmaaker, Theology and Art - a Critical
    Consideration.* 2003. 19.

Varèse, Edgard. "In Liberation of Sound," In *Classic Essays on Twentieth
    Century Music: A Continuing Symposium*, edited by D.J. Kostelanetz, 110.
    Belmont: Wadsworth Publishing Co Inc., 1996.

Wetzel, David Brooke. "A Model for the Conservation of Interactive
    Electroacoustic Repertoire: Analysis, Reconstruction, and Performance in
    the Face of Technological Obsolescence." Organised Sound 11, no. 3 (12,
    2006), 273-84.

Wetzel, David Brooke. "Analysis, Reconstruction, and Performance of Interactive
    Electroacoustic Music for Clarinet and Obsolete Technology: Selected
    Compositions by Musgrave, Pennycook, Kramer, and Lippe." D.M.A.
    diss., University of Arizona, 2004.

Yoder, Rachel M. "Performance Practice of Interactive Music for Clarinet and
    Computer with an Examination of Five Works by American Composer."
    D.M.A. diss., University of North Texas, 2010.

APPENDIX A

DEFINITIONS OF KEY TERMS

Abelton Live: program which allows coding of interactive composition part for any computer platform

Acoustic Sound: sound produced without electronics

Amplifier: device which raises electrical signal volume and converts back to acoustical energy

Amplitude: volume of sound

Attack Rate: rate the sound begins and increases in volume

Boom Microphone Stand: microphone stand containing an extra extension allowing the microphone a wide range of placement options

Cardioid Polar Pattern: shape of the sensitivity vs. direction plot for a particular style of directional microphone which rejects sound arriving from the rear

Chorus: effect which adds a tiny wave in the sound causing the sound to appear fatter

Compressor: effect which suppresses or alters specific peaks of amplitude of a sound.

Condenser Microphone: type of microphone that uses a capacitor as the sound pickup element and requires phantom power

Contact Microphone: microphone which has the ability to attach itself to an instrument

Cypher: program which allows coding of interactive composition part

Daisy Chain: describes serial electrical connection between devices or modules

Decay: reduction in a signal from its original level to a sustained level

Delay: echo-like effect produced postponing the attack of the sound

Distortion: undesired change in an audio waveform that creates unpleasant sounds

Dynamic Microphone: type of microphone that works on the electric generator principle, where a diaphragm moves a coil of wire within a magnetic field

Echo: type of delay which adds repetition of sound

Effects Processor: hardware component which employs a variety of methods to alter sound

Effect Wetness: amount of processed sound versus original sound

Electro-Acoustic: compositions involving the use of an acoustic instrument with electronic elements

Electronic Processing: modifying an audio signal with various devices, such as equalizers, compressors, and limiters

Equalization: process of adjusting the tonal quality of a sound: graphic equalizer provides adjustment for a wide range of frequency bands, and is normally inserted in the signal path after the mixing desk, before the amplifier

Expression Pedal: variable pedal control which activates effects

Feedback: occurs when the sound coming out of the speakers goes back into the microphones, then back out the speakers continuously

Figure Eight Polar Pattern: microphone pickup pattern picking up best from the front and back of the diaphragm and not picking up from the side of the diaphragm

Fixed Media: a previously recorded track of music, which is unable to change or react during performance

Flanger: modulated delay effect using feedback to create a dramatic, sweeping sound

Frequency: indication of how many cycles of a repetitive waveform occur in one second

Frequency Band Gate: electronic device designed to mute low level signals from a specific range of frequencies so as to reduce noise

Frequency Response: measurement of the frequency range that can be handled by a specific piece of electrical equipment

Guitar Amplifier: amplifier specifically designed for amplifying signals from an electric guitar

Guitar Pedal: unit that will add effects to a direct guitar signal, including a imulated instrument amplifier sound and (often) delay and reverb effects

Hall Reverb: usually the wettest, most saturated reverb

Harmonizer: effect which add other pitches to the sound at a predetermined interval defined by the user

Hyper-Cardioid Polar Pattern: microphone pick up sensitivity pattern where the least sensitive pick up point is more than 90 degrees but less than 150 degrees off axis (usually 120 degrees)

Impedance: term for the electrical resistance found in a/c circuits, which affects the ability of a cable to transmit low level (e.g. sound) signals over a long distance that is measured in Ohms

Interactive Computer: software on a computer which is able to produce sounds or effects based on an external source trigger

Kyma: program developed by Karl Scaletti for the MAC platform and allows coding of interactive composition part

Live Effects Processing: changes made in real-time to sound electronically

Max/MSP: (Max Signal Processing) program developed in 1997 by Miller Puckette and allows for coding of interactive composition part

Microphone: a transducer that converts acoustical sound energy into electrical energy

MIDI: (Musical Instrument Digital Interface) music industry's standard serial communication protocol for the interface and control of musical instruments

Mixing Board: device which can combine several signals into one or more composite signals, in any desired proportion

Modulation: effect which alters the pitch of the sound

Monitor: speaker placed in front of the performer which allows the electronic output to be easily heard by the performer

Octave Modulator: effect which will add sound an octave lower than the performed pitch

Omnidirectional Polar Pattern: meaning all, refers to a microphone that is equally sensitive in all directions

Original Sound: unaltered sound

OSC: (Open Sound Control) intended for sharing music performance data between musical instruments, computers, and other multimedia devices

Oscillator: circuit designed to generate a periodic electrical waveform

Overdrive: effect which adds distortion and sustain to a sound

Peak Rate: maximum positive or negative instantaneous value of a waveform

Performance Track: audio track given by the composer for the performance of a composition

Phantom Power: 48V DC supply for capacitor microphones, transmitted along the signal core of a balanced microphone cable

Phasing: timing difference between two electrical waveforms expressed in degrees where 360 degrees corresponds to a delay of exactly one cycle

Playback Device: an electronic device capable of playing rerecorded sounds

Polar Pattern: circular plot that indicates the directional response of a microphone at various frequencies

Pop Filter: material or screen placed between the singer and the microphone to reduce the popping sound created by plosives

Practice Track: audio track given by the composer to help the musician best prepare to play with the performance track, may contain segments, slower tempos, or prerecorded solo line

Preamp: used to magnify the original sound before sending it to an effect

Pure Data (Pd): free open source program invented by Miller Puckette and allows for coding of interactive composition part

Reference Track: audio track given by the composer containing the performance track and a prerecorded solo line

Reverb: effect which replicates the sonic characteristics of a room of any size or material, time it takes for a sound to decay

Ribbon Microphone: microphone where the sound capturing element is a thin metal ribbon suspended in a magnetic field, when sound causes the ribbon to vibrate, a small electrical current is generated within the ribbon

Signal: an alternating current (or voltage) between 20 Hz and 20,000 Hz

Signal Flow: path that a signal moves through an audio system such as a console

Studio Monitors: speakers with flat frequency response

Syncing: system for making two or more pieces of equipment run in synchronism with each other

Tremolo: effect which causes a slower wider wave form in the sound

Trigger: anything that happens which a computer is programmed to look for in order to facilitate a musical response

Voyager: program allows coding of interactive composition part

Wah Wah: effect where a bandpass filter is varied in frequency

Wireless Microphone: microphone with an FM radio transmitter inside of its case that transmits a signal to an FM receiver off of the stage area

XLR: connector commonly used to carry balanced audio signals including the feeds from microphones

APPENDIX B

INSTITUTIONAL REVIEW BOARD APPROVAL

The University of Memphis Institutional Review Board, FWA00006815,

has reviewed and approved your submission in accordance with all applicable

statuses and regulations as well as ethical principles.

PI NAME: Wendy Grew

CO-PI:

PROJECT TITLE: Interview with oboists and composers involved in electronic

music

FACULTY ADVISOR NAME (if applicable): Janet Page

IRB ID: #2683

APPROVAL DATE: 5/14/2013

EXPIRATION DATE: 5/13/2014

LEVEL OF REVIEW: Expedited

Greg Dixon – April 7, 2013 via e-mail

How did you first get involved in composing electronic music?

As a child I played around with tape recorders and electric guitars. This eventually evolved into playing and recording my own music on the computer in the late 90's. In 1998 I decided to pursue a degree in Music Engineering Technology from Ball State University where I first studied music composition and electronic music.

I am compiling a list of works in the genre for oboists. Please list the title of any solo works for the oboe family including electronics you have composed.

Train of Thought (Derailed) for amplified oboe and English horn.

Do you feel there are any differences in writing for oboe and electronics versus other instruments and electronics?

Yes, I feel that there are differences for writing for different instruments and electronics. Most of these differences relate directly to the orchestration and how it might affect how one wants to conceive of his relationship with the electronics.

Do you feel there are any misconceptions about this genre?

I feel electronic music and interactive electronic instruments pervade most urban people's lives today. Electronic music, if it wasn't already a kind of organic art form seems like it is becoming more organic with respect to the modern

86

human condition. I find that there is a great amount of interactivity and electronic sounds found in a common ATM machine, car, smartphone, etc. Video game sounds are becoming even more interactive as well, which means that a great deal of younger people are exposed to increasingly more complex and elegant forms of interactive music whether they know it or not. I think some folks are unaware of how much exposure they actually have to electronic music and interactive music systems in their day-to-day experiences. I feel because of the massive prevalence of these things in our lives as tools we can tend to forget their special nature.   We often use electronic interactive (musical) systems, but we don't have to think very hard about how we are interacting with them rendering their interactive qualities allusive.

What level of electronics knowledge do you expect oboists to already have when they approach your compositions?

It really depends on the performer I am composing for. If they are a type of performer that really wants to have control of their own audio hardware and setup I may write specifically for their setup. Other performers are less comfortable with running all of the electronics. I prefer to work directly with the musicians as their sound technician. I don't look at this as a bad thing, because there is a rich history of composers/ audio technicians collaborating with performers presenting mixed electronic works. Sometimes, however you can't work directly with the performer so technical details of a piece might take more time to work out.

How much of the responsibility lies with the composer to make a composition feel technologically accessible to the performer?

I think it's very important and often one of the hardest parts about writing mixed electronic works. Ideally the technology doesn't infringe on the performer's musical expression as well.

Have you had much collaboration with oboists in the performance of your pieces? What was this experience like?

Yes. I collaborated directly with an oboist, Victoria Eastman, at the University of North Texas who had asked me to work on a piece for her. We started out by going into the music studio and recording strange effects that we could make with the oboe and English horn, often through extended techniques. Many of those sounds then became the sonic materials that I used to create the electronic part and score for the piece. We had a really fun time and after that collaboration I'll always think of this work as a fun and easy-going piece.

What would you like oboists to know about performing your electronic pieces?

Since I just have one piece for oboe and electronics, I will just refer to *Train of Thought (Derailed)*. I would encourage oboists to play the piece, and to try to make it their own. The piece is technically simple, but the difficulty lies in that it requires a performer that will bring out the choreographed and theatrical elements of the work. The work also feels kind of humorous at times, but should be played with sincerity. The electronic part is fixed and the oboe is supposed to be amplified with a PA or sound system.

How do you feel about the lack of standardization in electronic music notation?

I think the lack of standardization reflects the complex nature of electronic music compositions. Composers should still seek to create clear notation of electronic music parts when needed.

What method do you use for notating electronics in your compositions?

I prefer to not cling to specific methods so this could change for any given piece. I have used computer graphic illustrator software to illustrate notations for electronics. My last piece used Inkscape for these purposes. I import my illustrations directly into Finale once I have decided the spacing of my music score for the acoustic instrument. Inevitably, sometimes the music spacing ends up changing so I have to go back to the drawing board and export new graphic images from my older illustration files.

Do you specify specific electronics in your music or do you prefer to leave this up to the musician?

So far, I have always specified the electronics in my compositions for performers. However, when I work in the recording studio with musicians I often give them freedom to use their own electronic sound processing systems.

Are there specific types or models of electronic hardware you feel oboists should have access to in order to effectively perform your music?

If they are excited about playing interactive electroacoustic pieces I think it makes sense to look into having a basic understanding of the hardware that is utilized. If they have the extra money or resources, they can look into what kind

of microphones people are using to amplify oboes and experiment with those microphones. The microphone choice and acoustic space often play crucial roles in the satisfactory presentation of a mixed electroacoustic piece. Check out a computer audio interface and gain a basic understanding of how it works. Find sound engineers or venues with PA systems and collaborate with them through performances.

Are there specific types or models of electronic software you feel oboists should have access to in order to effectively perform your music?

For interactive music performances of my music I would suggest musicians download and install free software for interactive performance such as Pure Data and Max MSP Runtime.

Do you have a preferential size of space to have these pieces performed?

I don't often consider the size of the space when I compose for performers, unless I know ahead of time that the premiere will be in a specific space.   I think ideally I like a medium sized concert hall, or a very large concert hall where the acoustics are nice and controlled.   However, if I'm making interactive music for an installation my composition is very informed by the space where the work is installed.

Given the constant progression and obsolescence in electronics, how can an oboist access your older works which utilized now outdated hardware/software?

Thankfully I don't have this problem yet at this stage in my career, while I have always considered it. Writing interactive music using free open-source software is positive to the extent that it sort of naturally defies obsolescence.

Do you update your older works to keep them relevant with current technology? Would you do this for an oboist if approached?

I try to when it's absolutely necessary. It's kind of a bummer fixing up an old piece when I really should be writing new ones. I would absolutely do it for a performer that was performing my piece with the right intentions.

What do you see as the future of the genre? Where would you like to see it go?

I see the future of the genre becoming more integrated with electronic visual displays, computer networks, and sensor technologies. I also see the computers utilized for the performance of this music moving from laptops to mobile personal computing devices. I would like to see it go in a direction where there will be a greater focus upon interaction with the audience in musical performance, which will help to make electroacoustic music more attractive to a broader audience.

Dr. Scott Hines – March 21, 2013 via email

How did you first get involved in composing electronic music?

I think it was some kind of class project or something along those lines. Initially I wasn't impressed and what I'd heard from the 60s and 70s (bleep, blop, bloop) didn't impress me either. As I began to hear more contemporary works and sound designs in TV shows and theatrical films, my opinion changed.

Do you feel there are any differences in writing for oboe and electronics versus other instruments and electronics?

Not really, aside from the inherent difference between the oboe and other acoustic instruments. I look at it the same way I would if I were writing a standard sonata or concerto. You learn as much about the instrument as you can and then compose. Many of the things I learned I didn't use (extended technique) as what I chose to compose turned out to be different than when I started sketching.

Do you feel there are any misconceptions about this genre?

It's all going to sound like squeaks and squacks, it won't be musical, etc. In some cases that might be true. In others, not so. Is Boulez musical? Is Stockhausen? Who is to say? Not all pieces are "out there" but not all pieces are interesting either.

What level of electronics knowledge do you expect oboists to already have when they approach your compositions?

None expected, but any knowledge is helpful. Less explaining that way maybe.

How much of the responsibility lies with the composer to make a composition feel technologically accessible to the performer?

I see the questions are getting harder. The composer shouldn't scare off the performer. It should accessible/easy with which to work. The performer should feel as comfortable with the technology as they would with a duet partner or a pianist. The simpler the better, which means less can go wrong in the performance as well.

What would you like oboists to know about performing your electronic pieces?

That, for the most part it will be fun or easier than they think. Depends on the piece of course. I wouldn't call In Memoriam a fun piece. Hopefully, they'll find something in my music they like, that they want to perform, and hopefully thought provoking

How do you feel about the lack of standardization in electronic music notation?

Heavens yes. There isn't any standardization. How does one right woo-ga woo-ga woo-ga in a score to explain what the sound is you should hear at point "C" and is there a way to graphically show that where it makes any sense? Someday maybe we'll figure it out.

What method do you use for notating electronics in your compositions?

I don't. I've given up trying. I work closely with the performer to discuss cues if they are needed. Or as in my Sax and Electronics, written the "sound design" to be triggered by pedal when there is a change.

Do you specify specific electronics in your music or do you prefer to leave this up to the musician?

If it is a MaxMSP patch, they get a version in Max Runtime that takes care of everything. If they have a particular piece of equipment they use, then I work with them to figure out how to use it in the piece. or, I just give them a soundtrack and say "play along".

Are there specific types or models of electronic hardware you feel oboists should have access to in order to effectively perform your music?

Max runtime would be about it at this point.

Do you have a preferential size of space to have these pieces performed?

Not really. Lighting or less of it would be the thing I'd like. The performer would have to have a stand light or something, but I like the electronic music to played in darkness. Much like I used to listen to Pink Floyd, without only the lights of the stereo illuminating the room. I'd like to have you in a spotlight while all the rest is dark. At rehearsal, I'll show you what we can do. If it's just electronic and no performer — darkness!

Given the constant progression and obsolescence in electronics, how can an oboist access your older works which utilized now outdated hardware/software?

That is a big problem these days, more so for the composer as the equipment on which a piece was written or written for no longer exists. Some composers are having to re-compose their works on the newer equipment. I think that may really be up to the composer not the performer. Otherwise, there's

always e-bay, but I'm not sure that is always fiscally possible. If seen at least one article on that in the last year. Tis a hazard of the technology.

Do you update your older works to keep them relevant with current technology? Would you do this for an oboist if approached?

Yes of course, but at this point I don't have those issues. Items created in Max 4 work in Max 6 or Logic 3 work in Logic 9. I don't use a lot of hardware. What software I use, the samples and the midi are easily converted into the next kind of software — at least at this point. Ask me in 50 years.

What do you see as the future of the genre? Where would you like to see it go?

I really hope virtual reality or something of that nature enters the composing and performer world. (And anything wireless. Tired of fighting cables.) You think of a piece and it happens. You place a pair of glasses on the performer, they "see" the music and they play it just like a game. Technology will determine the future of the genre and I think it will be much different in 50 years than now. How, I don't know, but it's so much better than it was 10 years ago, so there are many exciting(?) changes ahead.

Johannes Kretz – April 2, 2013 via e-mail

How did you first get involved in composing electronic music?

Since childhood I have always been interested in both, music and electronics/mathematics. When I got my first computer (still as a teenager), I immediately started to create little pieces of software, among them also experiments with creating interesting sounds. When I studied composition, I learned about the possibilities of electronic music, and immediately it became clear for me that integrating electronics and instrumental writing would allow me to achieve a tight integration of harmony and timbre, which I have always been very interested in.

I am compiling a list of works in the genre for oboists. Please list the title of any solo works for the oboe family including electronics you have composed.

Urban Gypsies for oboe, electronics and silent movie (silent movie by Laszlo Moholy-Nagy). [20 min], commissioned by Klangforum Wien

Do you feel there are any differences in writing for oboe and electronics versus other instruments and electronics?

Every acoustic instrument has its particular spectral characteristics, acoustic behavior and playing technique. Usually I try to develop a certain approach of using electronics, which takes into account the behavior of the acoustic instrument. For example the low notes of the oboe sound rather hard and rough. I don't see this as weakness of the instrument but rather as opportunity for interesting work with timbres. Then I try to create electronic

sounds, which match this particularity. Also the fact, that the oboe offers a multitude of multiphonic sounds and can play micro tonal scales relatively easily and accurately is important for me. The electronic part of "urban gypsies" reflects the sound world of the oboe and emphasizes its characteristics.

Do you feel there are any misconceptions about this genre?

When writing for an instrument (or instruments) plus electronics, one has to be aware of composing for two planes. One could also say: for two media. Or: for two stages. It is similar to making a theater play including aspects of cinema at the same time. One has to deal with the fact, that the electronic sounds from loudspeakers (being "projections") have a different nature than sounds produced by a musician on stage. There are many creative approaches to deal with this issue. The role of the electronics could for example be: a background, an augmentation of the acoustical space, a way to create a "super-oboe", a kind of "memory" (by recording the oboe and using the recording later as a kind of deja-vu coming from a different plane etc.). The worst pieces for instruments and electronics, which I ever heard, were those ignoring the above. For example: it is not a good idea to use electronics as a cheap playback orchestra, trying to compensate the absence of a real orchestra being to expensive to provide.

What level of electronics knowledge do you expect oboists to already have when they approach your compositions?

Usually I see the electronics as a second part. Therefore a work for oboe and electronics is a duo piece, not a solo. The performance requires two artists, the oboist and the electronic performer. The oboist should master his/her

instrument and have a musical understanding of his/her own part and of course

of the musical relation between the oboe part and the electronics. But it is not

necessary for the oboist to have a technical understanding of the electronics.

Equally the electronic performer does not have to be able to play oboe. I don't

believe very much in works, where there isn't any dedicated performer for

controlling the electronic part involved.

How much of the responsibility lies with the composer to make a

composition feel technologically accessible to the performer?

It is the responsibility of the composer to provide a score to the oboist,

which is realistically playable. Usually the preparations of the world premiere can

be an opportunity to make last corrections and improvements. In the same way –

if the work is going to be performed in absence of the composer – the composer

is obliged to provide the performance material for the electronic performer,

(which should be an dedicated expert in that field, see answer to question 5).

This means, that the electronic performer has to receive the necessary media

(sound tracks, software, instructions etc.) that allow him/her to perform the piece

together with the oboist. Usually, when I cannot play the electronic part myself, I

create a version of the electronics, which hides the complex background of the

details and provides a relatively clear, simple surface to the electronic performer.

This surface (usually a patch for MaxMSP) has to be as reduced as possible, but

still leaving the necessary control for the performer, so that he/she can interpret

the electronics part within a certain well-defined range.

Have you had much collaboration with oboists in the performance of your pieces? What was this experience like?

For *Urban gypsies* I collaborated a lot with Markus Deuter, the oboist of Klangforum Wien, who later played the premiere and a few more performances, too. We discussed various aspects of the instrument, playing techniques, technical/acoustical constraints etc. Later I revised my first version of the piece together with him and implemented a few corrections suggested by him. It was a very fruitful and inspiring collaboration.

What is your ideal performer/composer collaboration?

I never write without a commission. From the very first moment I need the interaction with musicians in order to have clearness about the constraints of the work. I don't perceive this as limitation but rather as help, to reduce the number of possibilities and support me in front of the "horror of a white paper". I like to work in a team, therefore the interaction with a performer before starting to compose is very important for me. Also I appreciate, if different performers develop different interpretations of my work. (Or course within certain limits.) In general I like that fact, that my pieces can show different aspects of their nature through different interpretations.

What would you like oboists to know about performing your electronic pieces?

First of all: an electronic performer (being either myself or somebody with similar competence) is required in almost every case. The electronics have to be interpreted with the same accuracy, sensitivity and intensity as the oboe part.

This includes the way, how the sound is projected into the space/hall, how the balance between oboe and electronics is shaped, how much the oboe should be amplified in order to create some fusion of sound between the oboe and the electronics, how much reverberation is applied to the oboe and/or the electronic sounds etc. The oboist should have a certain sensitivity to sound, he/she should create a mental image of the electronic part during the rehearsals, allowing him/her to relate musically to the electronics while playing. It is pretty similar to playing chamber music, where each musician should also be familiar with the parts of the fellow musicians in that way, that the interaction between the musicians makes sense. But I don't expect much technical knowledge regarding electronics from the oboist.

How do you feel about the lack of standardization in electronic music notation?

This is a serious issue and a open question. I am personally working on it intensively in the frame of my research activities. Together with this document I am also sending you some paper about my software KLANGPILOT, which – among other things – tries to address this topic.

What method do you use for notating electronics in your compositions?

It depends on the piece. Often I only indicate such information, which is really essential for the performer(s), like cues, triggers, verbal description of specific sounds, the musician should recognize as cues, etc. Sometimes I create a graphical score, allowing the musician to follow the electronics accurately event after event.

Do you specify specific electronics in your music or do you prefer to leave this up to the musician?

I compose the electronics very precisely, either as "tape" (sometimes including a "click track" for synchronization) or as Patch for MaxMSP.

Are there specific types or models of electronic hardware you feel oboists should have access to in order to effectively perform your music?

For rehearsal purposes a CD player (or in our days a laptop with internet connection and software for playing back mp3 files) is often sufficient. Besides a computer/laptop also makes sense in order to use it for sending/receiving PDFs, mp3-tracks and for Skype sessions (rehearsals e.g.).

Are there specific types or models of electronic software you feel oboists should have access to in order to effectively perform your music?

It would not harm, if the oboist interested in electronic music would have some basic knowledge of MaxMSP software. (www.cycling74.com). But so far I am not expecting oboists to be able to operate live electronic software themselves.

Do you have a preferential size of space to have these pieces performed?

A skilled electronic performer can always adapt the sound projection to the size of space. Really small spaces could be a problem, because there should be a certain physical distance between the loudspeakers and the audience in order to obtain a decent acoustical "image" for the listener.

Given the constant progression and obsolescence in electronics, how can an oboist access your older works which utilized now outdated hardware/software?

Using MaxMSP and avoiding external (third-party) objects is a reasonable and relatively sustainable method, since the software developers of cycling74 are trying to do their best to keep the function of the "canonic" objects untouched from update to update. In my experience specific hardware (effect boxes etc.) are getting outdated / unavailable much faster than software systems.

Do you update your older works to keep them relevant with current technology? Would you do this for an oboist if approached?

If I am asked by a musician/oboist for support for an old piece, I usually take this as an opportunity to check, if everything is still working. If not, I provide an updated version of the electronics.

What do you see as the future of the genre? Where would you like to see it go?

I am sure, that works for instrument(s) and electronics will become something very normal, both for interpreters and concert organizers.

Phillip Bimstein – April, 7 2013 via e-mail

How did you first get involved in composing electronic music?

I experimented with tape-recorded sounds and an early, primitive form of "sampling" of 45 rpm records in the 60s, but I became more involved through digital samplers in 1990 when I wrote *Garland Hirschi's Cows*, based on the sounds of the cows next to my home in southern Utah. I also used an interview with their owner, and that got me started down the path of exploring the voice as a storytelling instrument, where I also incorporate sounds of the speaker's environment in my electronic score. I usually also write a score for acoustic musicians to synchronize with my electronic score, because I love the live interplay between the performer and the sounds.

I am compiling a list of works in the genre for oboists. Please list the title of any solo works for the oboe family including electronics you have composed.

Half Moon at Checkerboard Mesa (oboe and electronics)

Cats in the Kitchen (oboe, flute and electronics)

Dark Winds Rising (wind quintet and electronics)

The Bushy Wushy Rag (wind quintet and electronics)

Do you feel there are any differences in writing for oboe and electronics versus other instruments and electronics?

The oboe has such a unique sound and personality, and a particularly emotive range, that can both blend and stand out within an electronic landscape.

It adds an especially human quality and speaks in a way that distinguishes it from technological sounds.

Do you feel there are any misconceptions about this genre?

There are many possible conceptions; some may be better conceived than others.

What level of electronics knowledge do you expect oboists to already have when they approach your compositions?

My compositions do not call for specialized electronics knowledge—all the performer needs to do is study the score and rehearse with the sync track. But there are certain places where the timing needs special attention to be tight.

How much of the responsibility lies with the composer to make a composition feel technologically accessible to the performer?

I feel that the composer must take responsibility for the accessibility of the composition in all ways: technical, interpretive, technological, etc. While it's the performer who brings the music to life in that moment, the composer must provide the performer with all that he or she needs to birth it. That includes an accessible score, a good story, and easily usable technical materials.

Have you had much collaboration with oboists in the performance of your pieces? What was this experience like?

Yes, with several. I've been fortunate to work with Stephen Caplan on several pieces, and Michele Fiala commissioned another. Both were a great help and joy to collaborate with. Also, my partner, Charlotte Bell, is an oboist and we perform together in a chamber folk music ensemble, Red Rock Rondo. She has

a great ear which enables her to create her own parts, and she also is a wonderful improviser.

What is your ideal performer/composer collaboration?

My ideal performer/composer collaboration in one where we both take initiative to be creative and contribute, offer constructive ideas, listen and respond, and make the project blossom.

What would you like oboists to know about performing your electronic pieces?

They are fun and adventurous! You get to interact with frogs, coyotes and cats, or with baseballs and catchers' mitts, or with American Indians meditating on the sanctity of their native land. And I like it when I hear your personality coming through, giving each performance a unique dimension.

How do you feel about the lack of standardization in electronic music notation?

I must confess I'm in my own little electronic world and have not thought about how others notate their works.

What method do you use for notating electronics in your compositions?

I provide a written score which only indicates a small number of the electronic events—only what the performer needs to know to execute it well. Sometimes I describe the events in words; sometimes I indicate notes or rhythms. When there is a voice involved, I indicate the spoken words in the score.

Do you specify specific electronics in your music or do you prefer to leave this up to the musician?

I provide a CD or a digital file (which can be burned to CD) with the entire sequence of all the sounds recorded. All the performer needs to do is press the play button.

Are there specific types or models of electronic hardware you feel oboists should have access to in order to effectively perform your music?

No—you only need a CD player or iPod (or similar) and a good PA system (a monitor is sometimes good to have). And I highly recommend a good sound engineer and a GOOD sound check, to make sure the balance (between you and the electronics) is right and that you can comfortably hear everything on stage.

Are there specific types or models of electronic software you feel oboists should have access to in order to effectively perform your music?

Not necessary for my music so far, but who knows in the future?

Do you have a preferential size of space to have these pieces performed?

My pieces have been performed in small intimate rooms, large concert halls and outdoors to 100,000. They all can work, but these days I prefer closeness and intimacy. Of course, it's always good to draw a crowd!

Given the constant progression and obsolescence in electronics, how can an oboist access your older works which utilized now outdated hardware/software?

That's the beauty of my sound scores being recorded: I used to provide them on DAT tape, then on CD and now mostly on digital files, and can keep moving with the times and the technology.

What do you see as the future of the genre? Where would you like to see it go?

I don't know what the future holds, but I hope that music in whatever manifestation will always be natural, organic, expressive, interpretive, and speak volumes about us, our societies, our relationships, our planet and our universe. I believe that we all compose our communities, collaboratively, and that we are all coyotes, or "songdogs," singing our world into existence. We all have that creative ability.

Sean Friar – March 3, 2013 via email

How did you first get involved in composing electronic music?

I wouldn't say I compose electronic music, but I first got involved writing electro-acoustic music by writing for amplified ensembles like Ensemble Klang, NOW Ensemble, and Newspeak. From there, it was a natural step to write a piece like *Oboemobo* for oboe and effects pedals.

I am compiling a list of works in the genre for oboists. Please list the title of any solo works for the oboe family including electronics you have composed.

Oboemobo for oboe and effects pedals.

Do you feel there are any differences in writing for oboe and electronics versus other instruments and electronics?

Each instrument has its own idiosyncrasies, but I don't believe the oboe is special beyond that. Some notes on the oboe have some very prominent overtones, which can easily be exploited in an electro-acoustic setting. Creating complex patters with a delay would work especially well on oboe because it has the most incisive attack of any of the woodwinds.

Do you feel there are any misconceptions about this genre?

I do not think there are enough pieces for oboe and electronics for people to think of it as its own genre with its own distinct properties. There is a general conception that pieces for any solo instrument plus electronics are often not as well-composed as wholly acoustic pieces are. I think this is primarily because there is no standard repertoire for these sorts of electro-acoustic pieces.

What level of electronics knowledge do you expect oboists to already have when they approach your compositions?

I would not expect an oboist to have much knowledge of electronics. Access to a laptop with some standard music software or an effects pedal, along with a willingness to experiment with them for a bit, is enough.

How much of the responsibility lies with the composer to make a composition feel technologically accessible to the performer?

Most of it. If the composer leaves too much up to the performer, it seems to me the composer does not have a clear idea of what he or she is trying to achieve. This is especially problematic with pieces that involve technology because it can place an inordinate burden on the performer to try to get the technology to do what the composer asks for when the composer himself might not have even taken the time to make sure it is possible.

Have you had much collaboration with oboists in the performance of your pieces? What was this experience like?

Yes, but most of my oboe pieces do not involve electronics. For the one with electronics, I would say it requires flexibility on the part of the oboist because they need to learn to not listen to themselves as they normally would, but to consider instead what the final product of their sound plus the electronic elements sounds like. This, quite understandably, does not come naturally to performers who do not regularly perform electro-acoustic music.

What is your ideal performer/composer collaboration?

Writing the piece by myself while having constant access to a performer to ask questions and test out ideas I have not tried before.

What would you like oboists to know about performing your electronic pieces?

Take the verbal descriptions of the effects seriously and realize them as accurately as possible. Just because the piece involves a delay pedal does not mean that any kind of delay setting will do.   I think performers who have never worked with a delay pedal can run the risk of not being careful with the nuances of the settings.

How do you feel about the lack of standardization in electronic music notation?

This is an issue in all contemporary music, not just electronic music. The only thing that matters is making sure the directions are clear. In most cases, using new symbols that a performer has never seen before is not a good idea; the whole point of a symbol is that it is shorthand for a concept we all understand, and if the performer doesn't understand it, asking them to memorize it is likely to lead to mistakes. I think redundancy is best for new techniques. Create a key in the front of the score which describes each new technique, and also briefly describe them the first time they are encountered in the piece (as well as after long periods in the piece in which the technique does not occur).

What method do you use for notating electronics in your compositions?

See above. I avoid creating new symbols unless they are extremely intuitive, as otherwise it just gives the performer one more thing to memorize when a short written description would work more effectively.

Do you specify specific electronics in your music or do you prefer to leave this up to the musician?

I indicate which electronics I used in the creation of the piece (if applicable), but I always include ample written description of the effects so that performers can recreate them on other equipment. I would never write a piece that could only be performed on a specific piece of hardware, as that would almost guarantee the piece would become obsolete when that piece of hardware does, which it inevitably will.

Are there specific types or models of electronic hardware you feel oboists should have access to in order to effectively perform your music?

No.

Are there specific types or models of electronic software you feel oboists should have access to in order to effectively perform your music?

Any performer who plays much electronic music should have access to Logic, Cubase, or Pro Tools. But, in this day, any performer at all should have access to that software so they can edit their own recordings.

Do you have a preferential size of space to have these pieces performed?

Larger is better; large spaces allow for the acoustic and electronic sounds to blend more convincingly. If the audience is too close to the performer, the acoustic sound of the oboe will be too easy to separate from the electronic

sounds. For this reason, I also like the amplifiers to be in front of the oboist, and for the oboist to be further back on the stage than they would normally be for an acoustic performance.

Given the constant progression and obsolescence in electronics, how can an oboist access your older works which utilized now outdated hardware/software?

I keep my use of electronics flexible and general so the pieces can be reproduced on a wide variety of hardware/software.

What do you see as the future of the genre? Where would you like to see it go?

It would benefit from more pieces in a wider variety of styles.

David Jaffe – April 17, 2013 via e-mail

How did you first get involved in composing electronic music?

I was intrigued by electronics since I was in 1st grade. I was a ham operator as a teenager until music (and girls) eclipsed that interest. It was only natural that I would be drawn to combine my technical and musical interests. I also played electric guitar as a teenager (in addition to violin, mandolin, banjo, guitar, oboe*, cello and bass) and was interested in the kind of sound processing that was being pioneered by Jimi Hendrix and others and experimented with tape loops and such. When I went to college (after taking 2 years off to tour with a bluegrass band), I made some initial experiments with electronics at Ithaca College School of Music. Then, at Bennington College, I became more serious about electronic music, studying with Joel Chadabe, creating pieces with magnetic tape and the Moog synthesizer, as well as programming the Synclavier I that had just been acquired by the State University of New York at Albany. But I felt that I needed finer control over the sound and was thus drawn to the pioneering work in computer music that was being done at the Stanford University Artificial Intelligence Laboratory. This led me to go to graduate school at Stanford, which eventually became CCRMA (Center for Computer Research in Music and Acoustics.)

I never progressed very far with the oboe. The reeds drove me crazy!

I am compiling a list of works in the genre for oboists. Please list the title of any solo works for the oboe family including electronics you have composed.

Impossible Animals, for oboe and synthetic voices (4 channels) (1990) – 10' (written for oboist Libby Van Cleve)

http://davidjaffesite.squarespace.com/music/impossible-animals.html

Do you feel there are any differences in writing for oboe and electronics versus other instruments and electronics?

In *Impossible Animals*, I took advantage of the singing quality of the oboe, which blended well with the synthetic voices. Also, oboe players have fine control over subtle timbral variation, which is very much like the kind of detail that computer music composers (or at least some of them) deal with.

Do you feel there are any misconceptions about this genre?

There is an assumption that a loudspeaker will automatically blend with an acoustic instrument. This is not true even when what is coming from the loudspeaker is a recording of an acoustic instrument. Care must be taken with direction of projection, distance from loudspeaker, reverberation, etc.

Another misconception is that electronic music or computer music is a "style". Rather, it is a medium. If the composer has a strong personality, it will transcend the medium.

What level of electronics knowledge do you expect oboists to already have when they approach your compositions?

I only expect them to approach the electronics with the same sensitivity that they would approach any ensemble situation.

How much of the responsibility lies with the composer to make a composition feel technologically accessible to the performer?

The composer is responsible for making the piece playable and everything that entails. In a technological piece, that includes making it comprehensible technically. The biggest impediment to performance tends to be that the equipment goes out of date or is one-of-a-kind.

Have you had much collaboration with oboists in the performance of your pieces? What was this experience like?

I've always enjoyed working with musicians. I endeavor to write idiomatically so that the effort that musicians expend is rewarded with musically effective results.

What is your ideal performer/composer collaboration?

I work on commission whenever possible. I like to familiarize myself with the performer(s), where their strengths lie, etc. I also like to know as much as possible about the hall, the circumstances of the premiere, etc. Then, after writing the piece, I like to rehearse with the performers and help them to find the essence of what I am attempting to express, but at the same time allow them to express themselves in the context of the music.

With some electronic pieces, particularly those for "new controllers" (such as the "radio drum"), I tend to leave the player space to explore. That is, rather than dictating the precise notes that the player is to play, I program a domain in which he or she can improvise/explore, constraining that domain so that whatever (s)he discovers will fit in the context of the piece. My work with the "radio drum" is along these lines (see the many references to radio drum on my web site.)

What would you like oboists to know about performing your electronic pieces?

As I have only one work for oboe and electronics, the main thing to keep in mind is that it is to be approached like a Bach cantata or any other work from the repertoire; that is, it is not just a matter of playing the right notes at the right time, but requires expression and interpretation. To facilitate this, I have endeavored to notate in a way that is not overly-picky, as I trust the player to bring musicality to the work.

How do you feel about the lack of standardization in electronic music notation?

Notation for a player is not a description but a proscription. That is, it tells you what to play but it doesn't describe how it will sound. With electronics, there is confusion about what exactly the notation is supposed to mean. The approach I take is to notate only as much as is required for proper ensemble synchronization and for the player to understand how his/her part fits in. I don't

attempt to notate the entire electronic part; the electronic sound itself describes itself.

What method do you use for notating electronics in your compositions?

I use musical notation as much as possible. Where that is not adequate, I resort to graphic symbols. In the case of "new controllers", there is no alternative but to use a collection of arrows, symbols, etc., combined with extensive prose directions.

Do you specify specific electronics in your music or do you prefer to leave this up to the musician?

The electronics are part of the composition. For example, in *Racing Against Time*, I programmed physical models of car engines and airplanes, among other sounds, performed by the radio drum.

Are there specific types or models of electronic hardware you feel oboists should have access to in order to effectively perform your music?

A computer with a high-quality audio interface and a microphone is adequate. For some pieces (though not for the oboe piece), I've added foot-switches and such.

Are there specific types or models of electronic software you feel oboists should have access to in order to effectively perform your music?

I tend to write my own software. I have used MAX extensively (MAX is a graphical language).

Do you have a preferential size of space to have these pieces performed?

Impossible Animals requires four speakers at the corners of the room. The oboist can be in the front or in the middle of the room. The space needs to be large enough to allow some distance between the speakers and the audience so they avoid getting "blasted" with a speaker (though I don't play it at high volume.) I have also had the opportunity to present the piece in situations with many small speakers, such as at the Max Mathews 80th birthday celebration at CCRMA, Stanford.

Given the constant progression and obsolescence in electronics, how can an oboist access your older works which utilized now outdated hardware/software?

This is a big problem. I have a basement full of equipment that I keep only so that I can perform certain pieces. Even then, there's no guarantee that a 20-year-old computer will even boot. For this reason, I feel it is particularly important to make high-quality audio (and if possible video) recordings of electronic works.

Do you update your older works to keep them relevant with current technology? Would you do this for an oboist if approached?

I have done so on occasion, but it's difficult and I tend to prefer to put my finite energy into making new pieces.

What do you see as the future of the genre? Where would you like to see it go?

Again, I don't see it as a genre per se, but one of the many ways that a composer can express him/herself. I see oboists as contributing to the expansion and development of the sonic vocabulary available to composers, by developing new ways of playing (e.g. quarter tones).

APPENDIX D

INTERVIEWS WITH PERFORMERS

Kyle Bruckmann – March 2, 2013 via e-mail

Please describe how you first became involved in performing with

electronics, and what role it currently plays in your work as an oboist.

I've been interested in more 'popular' forms of electronic music since I was

in high school, and began playing synthesizers and drum machines in a very

teenage industrial band in 1988. This evolved into more radically experimental

contexts through college, but was still always a strain of activity entirely separate

from my conservatory oboe work, and primarily in the context of the post-punk

rock underground. I got deeply into the discipline of improvisation (and

associated genres including free jazz and Creative Music) while completing my

Masters work in Ann Arbor. Even then, I had plenty to do just focusing on the

oboe itself and never had much of a chance to benefit directly from the work my

teacher Harry Sargous was then doing with amplification and Max/MSP (he even

took off to IRCAM for one of the 4 semesters I was there!) – rather feels like a

missed opportunity in retrospect.

I moved to Chicago after graduating in 1996, and it was only there, fully

immersed in the free improv, noise rock, and sound art community, that I finally

started delving into analog synthesis and live processing of my oboe and English

horn. Much of this work was technologically really quite primitive and rather

anachronistic (lots of contact mics, guitar pedals, and 60 cycle hum), but willfully

so. I was essentially in the front row during the development of the then nascent

'eai' (electro-acoustic improvisation) scene, and from that vantage point valued

rawness, fragility, and complex/unstable systems far more than the fussiness and

high-gloss precision I then saw more academic, digitally-generated electronic

music as representing.

Now, 10 years after moving to the SF Bay Area, I'm performing much

more with various New Music ensembles, doing a lot of contemporary concert

music (as it's more commonly understood) that involves electronics in really

varied, intricate and satisfying ways (recent standouts would have to include

James Dillon's New York Triptych, Phill Niblock's Disseminate, and Tristan

Murail's L'Esprit des dunes). But there's typically somebody else running the

cables and twisting the knobs, much less writing the code. I've performed far less

'oboe and live electronics' or 'oboe and tape' literature than you might expect,

and still do the bulk of my electronic work in the context of improvisation and/or

my own solo or collaborative compositions. It's probably splitting hairs, but I

suppose what I'm trying to say is that I currently think of it less in terms of

factoring into my work "as an oboist" than as a composer/performer.

Do you feel there are any misconceptions about this genre?

Well, the genre's impossibly broad by now, so any misconceptions

(including my own) would have to stem from insufficient exposure to too small a

slice of what folks have done and are now doing. I was recently observing a

panel discussion at the Chamber Music America conference, and it really made

me cringe hearing people bad-mouth performing with electronics as being "too

rigid" and leaving no room for expressivity or interpretation. Well, sure, if the only

piece you've ever played (or even heard) involves a relentless & quantized backing track badly amplified over the wrong system in a venue completely under-equipped for that sort of aesthetic…

What was the first piece you performed and describe the setup and experience?

Bearing in mind all the disclaimers from Question 1…the best example of the sort of piece I assume you've got in mind would be *Shore* for Oboe and Electronics by Hans Tutschku – I apparently played the US premiere at Stanford University's CCRMA in 2007. The composer was present & took care of all the setup – if I recall correctly, I was miked, triggering Max, and had to step on a pedal when indicated in the score. It was somehow simultaneously both more and less mysterious than I'd imagined; I suspect my familiarity with that idiom would be greater if I'd ever played the sort of piece where the Max patch came with the score and I had to configure everything myself.

What do you find most enjoyable about performing with electronics?

More than anything, it's the hyper-extended timbral palette. I have enough misgivings of my own regarding the oboe's compressed expressive possibilities (limited range of pitch and dynamics, endurance shortcomings) – why would I expect anyone else to want to listen to just the sound of the oboe for any extended length of time? The few pieces with tape/CD I have added to my repertoire permit me to travel light, enabling me to play a sonically varied and more aesthetically satisfying solo recital program. In more improvisatory contexts, I love the way it explodes the boundaries of what an oboe is supposed

to do, or permitted to do: contextualized by electronics, the oboe's ancillary noises can be recast as texture, pitch can be reconceived as frequency, and tone production that isn't conventionally beautiful can be more readily perceived as providing a greater range of color options, rather than as evidence of failure.

Has this genre changed your concept of your oboe sound? Have you made any specific changes to your sound as a result?

Not consciously or specifically – it's more a matter of opening the barn door to a greater range of options as I already hinted at above. This may be a slight tangent, but it does bring to mind a subtle shift in consciousness I've become aware of through the feedback loop of improvising electronically and acoustically…I feel I might as well try to explain it here because it's become so central to my creative practice, even if it may not figure so prominently in my 'interpreter/performer' role as an oboist:

When I really started intensively pursuing free improvisation on my electronics (an ever-changing rig involving some intricately interconnected subset of analog synth modules, effects pedals, contact mics, and a vintage Minimoog), I gradually began to realize that what I was essentially doing was creating an inherently unstable and complex system, approaching (at least in a metaphorical sense) chaos (as scientifically understood), that I could influence but not truly predict, control, or fully understand. Intuitively at first, and later quite deliberately, I was configuring a monstrous meta-instrument that I could, at best, sort of steer, but was by no means driving. I compare the experience of playing in such a mode to canoeing down whitewater rapids. 'The music' is way bigger and other

than me, and not entirely mine, but not at all in the sort of genuflecting Platonic way we usually conceive of within Western classical paradigms. This struck me as pretty heavy, and well worth meditating on.

Little by little, this electronically-inspired mindset started more consciously infiltrating my oboe playing – which was extremely liberating, and not a moment too soon, given how damn hard the oboe is to control (perhaps you've noticed), how much browbeating I'd internalized and inflicted upon myself throughout the course of my training, and how my perfectionistic tendencies had driven me perilously close to burnout and paralysis. At this stage, my acoustic 'improvising vocabulary' prominently features an array of 'extended techniques' (I've got issues with that term, but that's another dissertation…) that I've gravitated towards precisely because of their instability and inherent complexity. I've practiced them – a lot – but I can never truly know exactly how they're going to behave at any given moment. And that's the point. I love riding that knife-edge at the brink of control and comprehension; I find it not just titillating but…(at the risk of getting a little NorCal woo-woo here)…spiritually honest. Heck, I'll play anything by anybody if I find it sufficiently interesting and/or the paycheck's good, but I'm most specifically drawn to music where that energy, in whatever manifestation, is as close as possible to the foreground.

Have you had an electronic piece written for you? If so, please describe your level of input in the composition, and the process of preparing the work with the composer.

I've written pieces for myself, and for myself to play with others. And everything EKG (to give one particularly salient example in my work history) has ever done is, in a sense, a collaborative composition.

But the best example of what you're getting at would have to be *The Mutiny of Rivers* by Christopher Burns (currently a professor at UWMilwaukee). He's a good friend, a close colleague, and a deeply eccentric composer; it was a dream collaboration, messily entangled at every step of the way.

Several years ago, Ernst Karel and I (as EKG) began considering whether and how we could meaningfully interpret existing or commissioned compositions by others. We began with an electroacoustic realization of Morton Feldman's *Oboe and Orchestra*, for which Ernst faithfully recreated the entire orchestral part using Doepfer analog modular synthesis and his trumpet. It's essentially a tape piece that would likely have made Feldman livid, but I love how it turned out and have performed it numerous times now both with and without Ernst at the controls.

Our next move was to think of composers who have an authentic engagement with electronics and also understand and respect improvisation, collaboration and blurry authorship…basically, people who would rise to the occasion of writing for an extremely idiosyncratic ensemble with a highly specific skill set and clearly established aesthetic stance. Chris did so, in spades – in

large part by respecting our methods by evading them, requiring us to go places we would never otherwise go on our own. I'd essentially dared him to consider Luigi Nono's *la lontananza nostalgica utopica futura* as a model – too bad Nono didn't write that for English horn, huh?

He responded with a maximalist dogpile of sound that can never possibly have a definitive performance. There are 8 streams of pre-recorded sound (featuring loads of material derived from us workshopping techniques in my living room, recorded via his laptop's built in mic) that Ernst must mix and navigate such that the total of the work's 'content' will never actually be heard in its entirety. Ernst is also free to do additional live processing of these tracks, which he tends to do through his modular rig. My part is a modular deck of pages, alternating complex notation with cryptic textual goads to improvisation, for which I have to determine a cogent order that can be changed for each performance. I'm also encouraged to judiciously employ live processing of my own.

It's the sort of piece that, in theory, other duos could perform – and I think it well worthy – but it's so performer-specific in its conception that it's somewhat hard to imagine anyone would.

I am compiling a list of works in this genre for oboists. Please give the title and composer of any solo works you have performed that fit in this genre. You may also list any pieces you have not performed that you feel deserve to be recognized.

Mary Jane Leach – *Xantippe's Rebuke*

Interactive Music

What would you consider to be the biggest challenges in preparing and performing with interactive music? How have you dealt with the challenges?

(this section is all kind of N/A for me – I've tremendously enjoyed improvising together with plenty of folks running me through Max/MSP, Audiomulch, or Kyma (and a system called Maxine that a guy here at UC Berkeley named Ritwik Banerji is currently developing) – and I'm extremely excited to be playing an updated version of George Lewis' seminal Voyager coming up at the end of April – but never with anything involving notation, and I've never had to be responsible for the setup.)

CD/Tape

What would you consider to be the biggest challenges in preparing and performing with CD/Tape? How have you dealt with these challenges?

The difficulty of completely internalizing clock time – it's humbling how heavily that still, after a couple decades of performing, gets distorted while on stage. I don't know what best solutions could be, but I tried to address this (in part by problematizing it yet further!) as one of the premises for a piece of mine for oboe, clarinet and CD entitled *Cell Structure*. The piece consists of a series of…well, cells, most of which are populated with improvising materials that are abruptly cut off at fairly unpredictable intervals by extremely jarring audio cues in the recorded part. The psychological effect is, by design, quite unnerving for both audience and performers.

Live Processing

Do you have a typical hardware setup when using live processing (microphone, pedals, computer programs, VST, monitor, amp, etc.)?

Live processing: good point. I suppose I was thinking in terms of "I don't have any repertoire composed for oboe and live electronics." Though I do occasionally go that route in the context of electroacoustic improvisation & such (not so much these days, but definitely within the history of EKG in particular). When I do, it's much less about "augmented oboe" than it is about completely transformed/dislocated/(if not destroyed) oboe – kinda treating it like just another oscillator in my synthesizer array. Once upon a time, there was a fair amount of ridiculous wankery with a Digitech Whammy-Wah pedal, EQ, and Big Muff...now, those have all long since broken & the pared-down effects rig consists of:

Zvex Fuzz Probe

MoogerFooger ring modulator/LFO & CP251 Control Processor

spring reverb

sometimes running it through the Minimoog's filters and modulators

What is your microphone preference and placement? Why?

This is a problem I've never fully researched or effectively solved, and I would really appreciate seeing what else your survey reveals!

In the early days of my longest-lived noiserock band, I actually installed a Barcus Berry mic in my high school beater oboe – it required having a socket drilled into the top joint, just under the reed well (the first repair technician I called to ask about getting this done actually hung up on me, mortally offended!) This

sounded disgusting, but that's exactly what the context demanded – and it had the advantage of not continuously squealing feedback in a very loud environment.

I inherited a hand-me-down Applied Microphone Technology double mic system (which no longer appears to be a current model) from Harry Sargous; it's been fine for raw electroacoustic processing, but I've never been satisfying with the 'naturalness' of its sound, and it's unfortunately falling apart in its old age.

Michelle Fiala – March 31, 2013 via email

Please describe how you first became involved in performing with electronics, and what role it currently plays in your work as an oboist.

I first performed Phillip Bimstein's *Half Moon at Checkerboard Mesa*, found it wildly successful with audiences, and started looking into more electroacoustic music. I commissioned Bimstein's *Cats in the Kitchen* and Michael Kallstrom's *Ozymandias* and recorded both *Cats in the Kitchen* and Mark Phillips' *Elegy and Honk.*

How did you first get interested in playing with electronics?

Hearing Steve Caplan's CD with Bimstein's "Half Moon" on it.

What was the first piece you performed and describe the setup and experience?

Bimstein's "Half Moon" – I don't remember the setup. Probably two speakers. I think that was when I realized that you really need a monitor. Maybe I even realized that before the performance.

What do you find most enjoyable about performing with electronics?

Cool sounds the oboe can't make!

What do you find the most difficult about the genre?

Balancing the oboe with the track. Being able to hear the track clearly while the audience can still hear you clearly.

Do you have an ideal performance environment?

One with a good monitor speaker. At some point I might also consider amplifying the oboe.

130

How much hardware do you depend on the venue to furnish? What do you prefer to supply yourself?

I depend on the venue to furnish the CD player and speakers whenever I am travelling. I might bring speakers if I'm in the town where I live.

Have you had an electronic piece written for you? If so, please describe your level of input in the composition, and the process of preparing the work with the composer.

Phillip Bimstein's *Cats in the Kitchen* – he allowed me a lot of input, sending me snippets and drafts all along the way. One of my cats is even in the background track! He creates the entire soundtrack first and then composes the instrumental parts.

Michael Kallstrom's *Ozymandia* – on this we gave Michael the idea and he presented us with a piece. I did not see the process in between. He was open to feedback and where we began our performances with a vocal line he had prerecorded with the other sounds on the CD, he was open to feedback and we later performed it with a live vocalist and the rest of the sounds in the CD, which created a much better effect (was easier to understand the haunting text). We also experimented with the level of reverb in the track to get something that was pleasing in the halls.

What is your ideal performer/composer collaboration?

I am open to composer's who want more or less feedback during the writing. The most important thing for me is that they are conscientious and meet a deadline so that we as performers have time to learn the piece.

CD/Tape

What issues have you encountered in the notation of music with CD/Tape? Do you have any ideas to fix these issues?

The aforementioned issues of needing a monitor. I've used in-ear monitors while recording the pieces but never in live performance. It might be a good option.

What would you consider to be the biggest challenges in preparing and performing with CD/Tape? How have you dealt with these challenges?

The CD does not adjust to you and you must adjust to it. I write in a lot of cues. I also practice with the CD frequently in different sound environments because when you get into a new hall with different speakers, you may hear different parts emphasized and some things you used as cues before might be more difficult to hear.

How do you find your own musicality and interpretation within the confines of the fixed accompaniment?

The same way you do in an orchestra under a conductor. We nearly always have some prescribed boundaries when we are performing and we still have to conceive of the music as imaginatively as possible.

What do you see as the future of the genre? Where would you like to see it go?

I think that it will continue to be popular. Many composers have found it to be a great way to fuse popular music with classical music and I think this trend is likely to continue.

Linda Swope – April 4, 2013 via e-mail (performer and composer)

Please describe how you first became involved in performing with electronics, and what role it currently plays in your work as an oboist.

As an older classical oboist in a rural area, with very little work, I wanted to finally do some exciting and different on my oboe - a little "extreme" work. Around the same time, I was taking a composition class, and had reason to write a piece of music.

How did you first get interested in playing with electronics?

As I watched the bluegrass and rock musicians working in a group, and changing sounds using foot pedals, I began to wonder what it would sound like to do that on oboe. I decided to pursue the idea and find out what I could about using microphones and foot pedals. I wrote my first piece, called *Rapid Transit* for Solo Amplified Oboe for a composition recital.

Do you feel there are any misconceptions about this genre?

No - I think most people find it interesting.

What was the first piece you performed and describe the setup and experience?

My first piece was *Rapid Transit* for Solo Amplified Oboe. I had to plan ahead for set-up in order not to take up too much time setting up. I carried the equipment I needed in a carry bag, and I put colored tape bits at each end of each wire and connection so I could connect everything quickly.

What do you find most enjoyable about performing with electronics?

Most enjoyable is the fact that I am offering something unusual, interesting, and educational for my audience, and they are actually interested.

What do you find the most difficult about the genre?

This is very easy to answer....the most difficult thing about electronic music is having to carry around all the equipment and make sure it works properly. I am not very technologically savvy, so I find it difficult to remember all the steps for hookup and use.

Do you have an ideal performance environment?

Smaller rooms, recital situation, where I might speak to the audience about what I am doing.

Has performing with electronics caused a change in your oboe equipment setup or reeds?

No change in reeds or oboe equipment, just the addition of extra equipment which can be used for oboe and/or other instruments as well...I also play recorder.

Has this genre changed your concept of your oboe sound? Have you made any specific changes to your sound as a result?

No - I still approach tone and embouchure, reeds, etc. the same.

How much hardware do you depend on the venue to furnish? What do you prefer to supply yourself?

I usually bring my own items, as I can't be sure that they will have what I need. Everyone's amp produces a different sound, also. If I use a venue's amp, I want to try it ahead of time.

Have you had an electronic piece written for you? If so, please describe your level of input in the composition, and the process of preparing the work with the composer.

No. I have written my own, or else I played one that was already written for someone else.

What is your ideal performer/composer collaboration?

When I am the composer, I want my performer to understand what inspired me, and what the reason was for my piece, so that they can perform it with the same feeling that i would. I would want the performer to look for certain construction in the work and play it so that emphasis is placed where it belongs in phrasing. I would want a composer to expect that of me too.

I am compiling a list of works in this genre for oboists. Please give the title and composer of any solo works you have performed that fit in this genre. You may also list any pieces you have not performed that you feel deserve to be recognized.

My own pieces - *Rapid Transit* for Solo Amplifed Oboe, *and Serial Synth Sonata* have both been performed by me and received well. I also performed Anna Rubin's Stolen Gold and it was received well. I recommend that one also.

CD/Tape

What issues have you encountered in the notation of music with CD/Tape? Do you have any ideas to fix these issues?

Maybe I do it differently, but I make my electronic part with Finale music writing program's sounds and I add the solo part, creating a score, and then make a CD of the piece. I make the complete score first, so the soloist can practice with the solo on the CD, and then I eliminate the solo part and make the accompaniment so when the soloist feels ready, he/she can perform it using the track that only has the electronic accompaniment.

What would you consider to be the biggest challenges in preparing and performing with CD/Tape? How have you dealt with these challenges?

Timing it and staying with the accompaniment.

How do you find your own musicality and interpretation within the confines of the fixed accompaniment?

Understanding what is happening in the music, and add the solo part to emphasize and color what is happening.

What do you see as the future of the genre? Where would you like to see it go?

I am not sure. This genre was getting popular, and I really do like it, as I don't have to rely on an accompanist, but technology is moving along so fast that I am sure composers will be on to something else really soon, and our current machinery and equipment will be obsolete, so possibly electro-acoustic music with CD might go that direction as well.

Live Processing

What issues have you encountered in the notation of music involving live processing? Do you have any ideas to fix these issues?

By live processing, do you mean live performance? No problem I can think of.

What would you consider to be the biggest challenges in preparing and performing with live processing? How have you dealt with these challenges?

Equipment issues - time consuming and bulky

Do you have a typical hardware setup when using live processing (microphone, pedals, computer programs, VST, monitor, amp, etc.)?

Yes, since I use wires and jacks, I have to keep the amp way out in front, and so use the longest wire there, but the other items need to connect, foot pedal being accessible with my right foot, since the pedal is on that side, and I have to make sure the wires are not in the way as I go from the mic to the processor, to the pedal, and then to the amp. The equipment is expensive so i can't keep changing, but now we can go wireless, and also use an ipod to act as a looper and make changes in sounds that can go through the amp. I can't keep up with what is available out there!

What is your microphone preference and placement?

As an oboist, i have been using a tiny drum mic velcroed inside the bell of the oboe, but it is a bit heavy and cumbersome with the wire hanging...if I had the money, I would get a wireless setup.

Have you tested other hardware options? What were the problems you encountered?

Not really. I just tried a number of mic systems at a large music store and found the one that reacted best with the instrument and the amp.

What amount of pure oboe sound do you want the audience to hear versus processed sound?

That is the part I really like...true electro-acoustic. I want to set it up so they hear both. I want the true oboe sound, and the pedal then distorts it and amplifies it.

What do you see as the future of the genre? Where would you like to see it go?

I see very much experimentation of sounds for the future. However, I would like to see electronic and electro-acoustic music always remain true to the art of music. After we finish experimenting with sound, we need to keep in mind, as composers, that we are to compose something worthwhile, something with meaning, that has a reason to exist as music.

How did you first get involved in composing electronic music?

I wanted to write something different for the oboe, and saw the possibility when i watched the bluegrass players using their equipment.

Do you feel there are any differences in writing for oboe and electronics versus other instruments and electronics?

Not at all. We just need to know what each instrument can do on its own before adding the electronic enhancements.

Do you feel there are any misconceptions about this genre?

No, those out to hear electronic music in a concert are there because they want to hear it, and they have an idea what they are listening to.

What level of electronics knowledge do you expect oboists to already have when they approach your compositions?

Since I am a teacher at heart, I added instructions to my pieces, so that a person like myself, technologically challenged, can still play it.

How much of the responsibility lies with the composer to make a composition feel technologically accessible to the performer?

A composer wants his/her pieces to be heard...so it is important to make them accessible to the performer as much as possible for the best chance at getting the work performed.

What is your ideal performer/composer collaboration?

Working by myself...I feel I can play what I write and understand myself...haha....

What would you like oboists to know about performing your electronic pieces?

What equipment to use in order to get the same results.

How do you feel about the lack of standardization in electronic music notation?

As long as there is a good set of instructions the performer can follow, it is okay not to be standardized, as each electronic piece of equipment is different.

What method do you use for notating electronics in your compositions?

Finale notations, and symbols that I explain somewhere in the piece or in a list at the end of the piece.

Do you specify specific electronics in your music or do you prefer to leave this up to the musician?

Both. I tell what equipment I have used, but I tell the performer to use whatever he has on hand to achieve certain sounds.

Are there specific types or models of electronic hardware you feel oboists should have access to in order to effectively perform your music?

For my music, a good processor pedal, mic, and amp and a computer with speakers to play back the CD.

Are there specific types or models of electronic software you feel oboists should have access to in order to effectively perform your music?

I have to admit, I don't know how to use any other software other than Finale.

Do you have a preferred size of space to have these pieces performed?

I have not had enough experience to say one way or the other. I have usually performed in smaller spaces - smaller concert halls, library room, church stage.

Given the constant progression and obsolescence in electronics, how can an oboist access your older works which utilized now outdated hardware/software?

That is going to be a big ongoing problem, however, as long as the CD stays in vogue, I think my pieces will be accessible.

Do you update your older works to keep them relevant with current technology? Would you do this for an oboist if approached?

I have not had to do it yet, but I don't think I would. I would just write another work using the newer technology, and leave the older works to history.

What do you see as the future of the genre? Where would you like to see it go?

I think the future is heading toward more electronic computerized music (like laptop ensembles, etc.) but I still like electro-acoustic myself. I like the live sound of a real acoustic instrument, so I would like to see more sophistication in electro-acoustic work - music that is performable with much meaning and good phrasing, etc. with enhancement by electronics, but still reliant on the integrity of a good performer.

Sky Macklay – March 28, 2013 via e-mail (performer and composer)

Please describe how you first became involved in performing with electronics, and what role it currently plays in your work as an oboist.

I became involved in performing with electronics in my senior year at Luther College. I was in an electroacoustic music class and for my final project I wrote and performed an oboe and "tape" piece. Since then, I have learned a lot more about electronic music and I am especially influenced by my boyfriend, Sam Pluta, who is an electronic musician and laptop improviser. Performing with electronics is very important to my current work as an oboist and I mindfully seek out pieces for oboe and electronics. Currently, I am playing a piece by David Bird, *Squeem* for oboe + fuzz pedal and cassette players. In the near future, I hope to do move improvisations with oboe and electronics with Sam.

Do you feel there are any misconceptions about this genre?

I feel like the oboe and electronics genre is so small and little-known right now that there aren't really any "conceptions" about it among "mainstream" (aka, non "new-music" oboists).

What was the first piece you performed and describe the setup and experience?

The first piece I performed was *Scurvy Pete*, a piece that I wrote for oboe and fixed electronics. My assistant hit play and controlled the levels on the mixer and I played along from my pretty-traditional score. It was a good experience and it was an easy piece to put together.

What do you find most enjoyable about performing with electronics?

I could incorporate musique concrete sounds into my performance, giving me narrative possibilities that are impossible with instruments alone.

What do you find the most difficult about the genre?

I am not very technologically inclined, so sometimes setting up a piece is beyond my current skill set. Also, owning and/or having access to all the necessary hardware and software is difficult. I have therefore usually asked for assistance or advice from music technology buffs when working on pieces like this.

Do you have an ideal performance environment?

Somewhere with nice house-speakers and a mixer so that I don't have to bring those things.

Has this genre changed your concept of your oboe sound? Have you made any specific changes to your sound as a result?

It depends on the individual piece, but in general I think playing oboe + electronics pieces has expanded my concept of the sound possibilities of my oboe. For example, sending my oboe through a fuzz pedal still sounds oboe-y but it's like a super aggressive mega-oboe.

How much hardware do you depend on the venue to furnish? What do you prefer to supply yourself?

Right now I have nothing of my own except my computer, so at this time I depend on the venue or another person to provide everything else. The next thing I am going to get is a sweet double-headed attachable oboe mic though.

What is your ideal performer/composer collaboration?

Lots of collaboration is great! For example, I would like a composer to ask questions, ask the oboist to try things, and show the oboist ideas-in-process.

I am compiling a list of works in this genre for oboists. Please give the title and composer of any solo works you have performed that fit in this genre. You may also list any pieces you have not performed that you feel deserve to be recognized.

Scurvy Pete by Sky Macklay

Gobo by Russell Pinkston

Squeem by David Bird.

Interactive Music

What would you consider to be the biggest challenges in preparing and performing with interactive music? How have you dealt with the challenges?

The only piece that I've played that's "interactive" rather than a "play-along" oboe + tape piece is *Squeem*. In that piece, the auxiliary electronics performer plays two cassette players by rhythmically pressing play, rewind, record, and flipping the tapes. The tapes' sounds do not need to be played at exact moments in the piece; it is a little aleatoric in that way. I did not have any challenges or difficulties preparing this interaction because the composer's set-up and the flexibility inherent in the piece made it super easy. I have also performed oboe and electronic improvisations with Sam Pluta and with his

software it is just like playing with any other instrumentalist, so interaction was also not a problem.

What is your microphone preference and placement? Why?

I want to get an AMT WS oboe microphone which is a combination of 2 cardioid microphones with goosenecks that mount on the oboe and pick up sound coming from both the keys and the bell. I think this is an awesome mic because it's important to pick up the sound from both of those places on the oboe. Until I get that mic, I prefer to point the mic towards the right hand keys because that is, on average, where the most sound comes out though of course it varies depending on the register.

Have you tested other options? What were the problems you encountered?

I've tried pointing the mic at the bell but that doesn't pick up the high notes at well.

Do you have a preference of programs?

As a composer I will probably use Max/MSP in the future because it is a visual language which seems more accessible to me personally than a text-based coding language. When I improvise with Sam he uses his own software which he coded in SuperCollider. That works well for him because he is a great computer programmer.

Is there something you feel is a needed addition to these programs?

I think composers also need to experiment with analog electronic technologies (sometimes in combination with digital) like radios, mixers, feedback, speakers, and cassette players.

What issues have you encountered in the notation of interactive music? Do you have any ideas to fix these issues?

It is very unstandardized. I think the solution to this is for the composer to be creative and make up a notation system that is most appropriate for the particular piece. Standardization isn't necessary. Then, the oboist needs to enter and accept the notational language of the piece

How much of the computer's part do you like to see in the score?

Just as much as is necessary to play with it.

What type of computer notation do you prefer to see in the score (musical notes, graphic notation, descriptions, etc.)?

I prefer either notes or graphic notation. If it is a rhythmically strict piece, notes are helpful, and if I am just looking to follow the sonic events, gestures, and contours then graphic notation is the most helpful.

What is your preferred method for preparing interactive music?

Practicing the oboe part alone first until it's really solid and then combining it with the interactive part.

Describe the interpretive decisions you typically make as a performer of interactive music. How is this different from other genres?

I usually make interpretive decisions about tempi, dynamics, articulation, phrasing, performance practice, and tone. Usually these things are all still a part of interpreting interactive music though in some methods of interaction I suppose tempo might be constrained within a particular range that the program can follow along with.

How much of the performance do you prefer to control yourself from the stage? Do you employ an assistant?

Again, it depends on the piece.

How important do you feel it is for the oboist to understand the actions taken by the computer?

It's important so that they can hopefully fix it if something goes wrong.

What do you see as the future of the genre? Where would you like to see it go?

I think composers will keep writing oboe + interactive technology pieces and I would like to see some really stellar pieces get wide recognition.

CD/Tape

What issues have you encountered in the notation of music with CD/Tape? Do you have any ideas to fix these issues?

In *Gobo* I experienced notation that didn't really look like the sounds on the tape part, so sometimes that was a little confusing. For example, the score

147

showed pitches that weren't audible in the tape part. I think the composer could have written a more exact notational representation of the sounds.

What would you consider to be the biggest challenges in preparing and performing with CD/Tape?

Well, my biggest challenge has been staying coordinated with a very metrically exact tape part.

How do you find your own musicality and interpretation within the confines of the fixed accompaniment?

Just do as much as you can within the confines.

What do you see as the future of the genre? Where would you like to see it go?

I guess I see more people writing interactive pieces than tape pieces now. I think if the composer has an idea that is well-suited for the tape format, then he/she should still make the piece that way because it's generally easier logistically on the performer than an interactive piece.

Live Processing

What would you consider to be the biggest challenges in preparing and performing with live processing? How have you dealt with these challenges?

I think the biggest challenge is knowing how to do it (I know that is vague!) and setting everything up so that it works. I personally have not dealt with these challenges yet because I've always had someone who knows what they are doing help me.

Do you have a typical hardware setup when using live processing (microphone, pedals, computer programs, VST, monitor, amp, etc.)?

Well, when I improvise with Sam it's typically a microphone, computer running his software, his controllers (a manta and an ipad), a mixer, and speaker/s.

What amount of pure oboe sound do you want the audience to hear versus processed sound?

None usually but it depends on the piece.

What do you see as the future of the genre? Where would you like to see it go?

I think more oboists are doing it and I'd like to see this trend continue.

Do you feel there are any differences in writing for oboe and electronics versus other instruments and electronics?

Yes, but every instrument requires specific considerations of the sound production and just amplifying the strengths and character of the instrument.

Do you feel there are any misconceptions about this genre?

No, I feel like people don't know much about it.

What level of electronics knowledge do you expect oboists to already have when they approach your compositions?

Very little.

How much of the responsibility lies with the composer to make a composition feel technologically accessible to the performer?

I think it is generally the composers responsibility.

149

Have you had much collaboration with oboists in the performance of your pieces? What was this experience like?

Only I have performed my oboe + tape piece so far.

What is your ideal performer/composer collaboration?

Lots of interaction and testing things out together from the conception of the piece to the performance.

How do you feel about the lack of standardization in electronic music notation?

I am fine with it; the notational language should fit the individual piece.

What method do you use for notating electronics in your compositions?

I have used a shorthand using a combination of musical notes and textual cues. In the future I might use graphic notation.

Do you specify specific electronics in your music or do you prefer to leave this up to the musician?

Specify

Are there specific types or models of electronic hardware you feel oboists should have access to in order to effectively perform your music?

No, there are lots of different models and types of mic/speakers/mixers/amps etc that will work.

Are there specific types or models of electronic software you feel oboists should have access to in order to effectively perform your music?

For my current oeuvre, no.

Do you have a preferred size of space to have these pieces performed?

No, it's flexible.

Do you update your older works to keep them relevant with current technology? Would you do this for an oboist if approached?

I would do that if needed.

What do you see as the future of the genre? Where would you like to see it go?

I think there are lots of oboists who are hungry for it so composers will fill the demand and more awesome pieces will emerge!

APPENDIX E

ALPHABETICAL LIST OF ELECTRO-ACOUSTIC OBOE WORKS

Archbold, Paul – *A Little Night Music* for oboe and interactive computer. 2004.

Arcuri, Serge – *La Porte des Sables* for oboe or English horn, midi percussion and tape. 1989.

Bennett, Myron – *Dialogue for One* for oboe doubling English horn and two tape recorders. 1969.

Berio, Luciano – *Sequenza VII*. Universal Edition. 1969/2000.

Bimstein, Phillip – *Cats in the Kitchen* for oboe, flute and tape. 2007.

Bimstein, Phillip – *Half Moon at a Checkerboard Mesa* for oboe and tape. 1997.

Bird, David – *Squeem* for oboe and tape player. 2011.

Bloland, Per – Study for solo oboe and tape. 2002. (6 minutes)

Bruckmann, Kyle – *Cell Structure* for oboe, clarinet, and recorded analog electronics. 2009.

Brunner, George – *Teaching No Talking* for oboe and tape.

Cage, John – *Fontana Mix* for instrument or combination of instruments and magnetic tape. 1958. (11:13)

Carl, Robert – *Yearning* for oboe with digital delay, processing and tape. 1997.

Celli, Joseph – *Hands, Reeds and Video* for solo performer and four channels of video. 1985.

Celli, Joseph – *Star Island* for oboe, participants and stereo tape.

Chadabe, Joel – *Street Scene* for English horn, tape and projections. 1967.

Chini, Andre – *Två vackra moss* for oboe and tape. (13:45)

D'Alessio, Greg – *Reflections on a Poem by E.E. Cummins* for English horn and tape. 1994.

Dixon, Greg – *Train of Thought (Derailed)* for amplified oboe/English Horn and stereo fixed media. 2008. (5:30)

Dobrowolski, Andrzej – *Music* for magnetic tape and oboe solo. 1965. (9:04)

Drews, Michael – *Broken Symmetry* for oboe, piano and electroacoustic music. 2004. (7:20)

Duford, Brian – *31 Across*, Concerto for Oboe & Pre-Recorded Sound. 2001. (12 minutes)

Eisma, Will – *Adela I* for oboe and tape. 1977.

Eje, Niels – *Oboe in Orbit*.

Epstein, Marti – *Thalia* for oboe d'amore and digital delay. 1998. (11 minutes)

Erickson, Robert – *Nine and a Half for Henry (and Wilbur and Orville)* for instruments and 4 channel tape. 1970.

Fox, Christopher – *Broadway Boogie* for cor anglais prerecorded cor anglais.

Friar, Sean – *Oboemobo* for oboe and EPs. 2010. (7 minutes)

Freihofner, Philip – *It's Only the Wind* for oboe and prerecorded electronics.

Freihofner, Philip – *The Bell Field* for oboe and prerecorded electronics.

Freihofner, Philip – *Three Ways to Cook a Fish* for oboe and tape.

Gehlhaar, Rolf – *OM-c* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-d* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-h* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-m* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-n* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-p* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-r* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-s* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Globokar, Vinko – *Discours III* for oboe and 4 prerecorded oboes. 1969. (16 minutes)

Goldberg, Anne H. – *Explorazione Spettrale for Emily Di Angelo* for solo oboe and electronics. 2010.

Hambraeus, Bengt – *Mirrors* for oboe and tape. 1987.

Hannan, Peter – *RSRCH 2/84* for solo instrument and tape. 1984. (13:50)

Harvey, Jonathan – *Ricercare una melodia* for oboe and live electronics. (5:24)

Hatch, Peter – *Festina Lente* for three equal sustaining instruments and tape. 1990. (10 minutes)

Hatzis, Christos – *Byzantium* for oboe and tape. 1991. (24 minutes)

Hays, Sorrel – *Take Back a Country Road* for oboe, casio sax and DX-7. New York. 1992.

Hellerman, William – *One into Another (Ariel)* for English horn and tape*. 1972.

Heussenstamm, George – *Alchemy, Op. 60* for oboe and tape. 1976.

Holliger, – *Cardiophony* for oboe and MaxMSP live heart microphone. 1971.

Jacobs, Bryan – *A Gentle Ruin* for oboe and live electronics. 2007. (6:30')

Jaffe, David A – *Impossible Animals* for oboe and tape. 1990.

Johnston, Ben – *Casta* for any solo instrument with tape loop. 1970.

Joyce, Brooke – *Memory Jewels* for oboe, bassoon and cd. 2006. (10 minutes)

Joyce, Brooke – *Prairie Etudes* for English horn, live electronics and video. 2006. (6 minutes)

Justel, Elsa – *Feuillage de Silence* for flute, oboe and tape. 1994.

Karpen, Richard – *Life Study No. 2* for oboe and computer-realized sound. 1995.

Keane, David – *Tango* for oboe and tape (or piano). 1986. (10:18)

Krenek, Ernst – *Aulokithara Op. 213a* for oboe, harp and tape

Kretz, Johannes – *Urban Gypsies* for oboe, electronics, and silent movie (movie by Laszlo Moholy-Nagy). (20 minutes)

LaBarbara, Joan – *L'albero dale foglie azure* for oboe and tape. 1989.

Lake, Larry – *Psalm* for oboe and tape. 1985. (10 minutes)

Leach, Mary Jane – *Xantippe's Rebuke* for oboe and tape. 1993.

Lindroth, Scott – *Teerza Rima* for oboe and live electronics. 1995.

Lomon, Ruth – *Furies* for oboe and prerecorded oboe, oboe d'amore and English horn.

Louvier, Alain – *Qu'est devenu ce bel oeil? (What became of this beautiful eye?)* for flute or oboe and tape. 1977.

Lyon, Eric – *Fanfare for Gordon Mumma* for treble instrument(s) and tape.

Ingham, Steve – *Fast Breeder* for oboe and tape.

Marshall, Ingram – *Baghdad Blues* for oboe and electronics. 2006.

Marshall, Ingram – *Dark Waters* for English horn with live electronics and tape. 1995. (17:12)

Marshall, Ingram – *Holy Ghosts* for oboe d'amore and live digital delay processing. 2000. (9:16)

Mason, Charles Norman – *Amalgam I* for oboe and tape. 1988.

Maxwell, Melinda – *Pibroch* for oboe and drone.

Mefano, Paul – *Asahi* for oboe et dispositif électro-acoustique 1992. (6 minutes)

Melby, John – *Concerto* for English horn and computer. 1986. (15 minutes)

Mendez, Jorge Garcia Del Valle – *Blue Water, Dark Sky* for oboe and 2-channel tape. 2009. (21:30)

Misurell-Mitchell, Janice – *Deconstruction Blues* for English horn and DX-7. 1991. (11 minutes)

Mitterer, Wolfgang – *Charivan* for oboe and electronics. (6:30)

Moss, Lawrence – *Unseen Leaves* for soprano, oboe and tape. (16:32)

Musgrave, Thea – *Niobe* for oboe and tape. 1987.

Nazor, Craig – *Inverted Canons* for oboe and tape.

Pennycook, Bruce – *Fast Dance* for English horn and tape. (7 minutes)

Pinkston, Russell – *Gobo* for oboe and electronic sounds. 2007. (7:19)

Phillips, Mark – *Elegy and Honk* for English horn and tape.

Phillips, Mark – *Sonic Landscapes* for oboe and tape. 1989.

Procel, Gaytan – *Concerto No. 2* for oboe and electronics. 2008.

Ohara, Yoko – *Psychedelic Mirage* for oboe and CD backing.

Repar, Patricia Ann – Alex for oboe, viola and tape. 2014. (8 minutes)

Reynolds, Roger – *Islands from Archipelago: I. Summer Island* for oboe and computer-generated tape. 1984.

Rosenboom, David – *And Come Up Dripping* for oboe with live electronic processing. 1968.

Ross, Erik – *Succession* for oboe and tape.

Roxburgh, Edwin – *At the Still point of the turning World* for oboe and MaxMSP. (oboe with live delays and treatments)

Rubin, Anna – *Stolen Gold* for amplified baroque oboe, live electronics and digital audio. 1991/2001. (6:20)

Schwartz, Elliott – *Extended Oboe* for oboe and electronic tape. 1975.

Sekon, Joe – *The Fester Merchant*. 1973.

Silverman, Faye-Ellen – *Layered Lament* for English horn and electronic tape. 1983.

Sosa, Jorge - *Still Life (Naturaleza Muerta)* for amplified oboe and fixed electronic media. 2010. (10:30)

Stevens, Thomas – *Triangles IV* for English horn with three live or pre-recorded oboes. 1994.

Stockhausen, Karlheinz – *Kompositionen* for oboe

Stockhausen, Karlheinz – *Solo* for melody instrument with feedback. 1966.

Stockhausen, Karlheinz – *Spiral* for soloist with shortwave receiver. 1968.

Stockhausen, Karlheinz – *In Freundschaft* for oboe. (In Friendship)

Sullivan, Matt – *Oh Boy!* for oboe and live effects processing. (5:19).

Swope, Linda – *Rapid Transit* for solo amplified oboe. 2009.

Swope, Linda – *Serial Synth Sonata* for oboe and electronic synth sounding recording. 2009.

Szeghy, Iris – *In Between* for oboe and tape. 1993.

Takahashi, Yuji – *Operation Euler* for oboe and prerecorded oboes.

Ter Veldhuis, Jacob – *Garden of Love* for oboe and tape.

Theobald, Jim – *Above Ground* for treble instrument and tape.

Thome, Diane – *Estuaries of Enchantment* for oboe and computer-realized sound. 2002. (10:58)

Tittle, Steve – *Only, Other, Always* for oboe and tape. 1987.

Truax, Barry – *Song of Songs* for oboe d'amore or English horn, tape and slides. 1992.

Truax, Barry – *Tongues of Angels* for English horn, oboe d'amore and tape.

Ussachevsky, Vladimir – *Pentagram* for oboe and tape. 1980.

Veale – *Spieltechnik* for oboe and tape.

Vees, Jack – *Apocrypha* for oboe and tape. 1986.

Verin, Nicolas – *Miroirs Deformants* for oboe and tape. (12:07)

Veverka, Vilém – *Song for Eurydice* for oboe and electronics.

Wave, Julian J. – *Canon* for oboe and prerecorded tape.

Winkler, Todd – *Three Oboes* for oboe and interactive computer. 1989.

Young, Michael – *Argrophylax* for oboe and interactive computer. 2006.

Young, Michael – *Oboe Prosthesis* for oboe and interactive computer.

Zapf, Helmut – *Canto del Aria* for oboe and tape. 1995. (13 minutes)

APPENDIX F

LIST OF WORKS BY INSTRUMENTATION

Oboe and Fixed Media

Arcuri, Serge – *La Porte des Sables* for oboe or English horn, midi percussion
    and tape. 1989.

Bennett, Myron – *Dialogue for One* for oboe doubling English horn and two
    tape recorders. 1969.

Berio, Luciano – *Sequenza VII*. Universal Edition. 1969/2000.

Bimstein, Phillip – *Cats in the Kitchen* for oboe, flute and tape. 2007.

Bimstein, Phillip – *Half Moon at a Checkerboard Mesa* for oboe and tape. 1997.

Bird, David – *Squeem* for oboe and tape player. 2011.

Bloland, Per – Study for solo oboe and tape. 2002. (6 minutes)

Bruckmann, Kyle – *Cell Structure* for oboe, clarinet,
    and recorded analog electronics. 2009.

Brunner, George – *Teaching No Talking* for oboe and tape.

Cage, John – *Fontana Mix* for instrument or combination of instruments and
    Magnetic tape. 1958. (11:13)

Celli, Joseph – *Hands, Reeds and Video* for solo performer and four channels
    of video. 1985.

Celli, Joseph – *Star Island* for oboe, participants and stereo tape.

Chini, Andre – *Två vackra moss* for oboe and tape. (13:45)

Dixon, Greg – *Train of Thought (Derailed)* for amplified oboe/English
    Horn and stereo fixed media. 2008. (5:30)

Dobrowolski, Andrzej – *Music* for magnetic tape and oboe solo. 1965. (9:04)
Duford, Brian – *31 Across*, concerto for oboe and prerecorded sound. 2001. (12
    minutes)

Eisma, Will – *Adela I* for oboe and tape. 1977.

Freihofner, Philip – *It's Only the Wind* for oboe and prerecorded electronics.

Freihofner, Philip – *The Bell Field* for oboe and prerecorded electronics.

Freihofner, Philip – *Three Ways to Cook a Fish* for oboe and tape.

Gehlhaar, Rolf – *OM-c* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-d* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-h* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-m* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-n* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-p* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-r* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-s* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Globokar, Vinko – *Discours III* for oboe and 4 prerecorded oboes. 1969. (16 minutes)

Hambraeus, Bengt – *Mirrors* for oboe and tape. 1987.

Hannan, Peter – *RSRCH 2/84* for solo instrument and tape. 1984. (13:50)

Hatch, Peter – *Festina Lente* for three equal sustaining instruments and tape. 1990. (10 minutes)

Hatzis, Christos – *Byzantium* for oboe and tape. 1991. (24 minutes)

Heussenstamm, George – *Alchemy, Op. 60* for oboe and tape. 1976.

Ingham, Steve – *Fast Breeder* for oboe and tape.

Jaffe, David A – *Impossible Animals* for oboe and tape. 1990.

Johnston, Ben – *Casta* for any solo instrument with tape loop. 1970.

Joyce, Brooke – *Memory Jewels* for oboe, bassoon and cd. 2006. (10 minutes)

Justel, Elsa – *Feuillage de Silence* for flute, oboe and tape. 1994.

Karpen, Richard – *Life Study No.2* for oboe and computer-realized sound. 1995.

Keane, David – Tango for oboe and tape (or piano). 1986. (10:18)

Krenek, Ernst – *Aulokithara, Op. 213a* for oboe, harp and tape

LaBarbara, Joan – *L'albero dale foglie azure* for oboe and tape.
        Joan LaBarbara Music, 1989.

Lake, Larry – *Psalm* for oboe and tape. 1985. (10 minutes)

Leach, Mary Jane – *Xantippe's Rebuke* for oboe and tape. New York:
        `Ariadne Music, 1993.

Lomon, Ruth – *Furies* for oboe and prerecorded oboe, oboe d'amore and English
        horn.

Louvier, Alain – *Qu'est devenu ce bel oeil? (What became of this beautiful eye?)*
        for flute or oboe and tape. 1977.

Lyon, Eric – *Fanfare for Gordon Mumma* for treble instrument(s) and tape.

Mason, Charles Norman – *Amalgam I* for oboe and tape. 1988.

Maxwell, Melinda – *Pibroch* for oboe and drone. Trevco.

Moss, Lawrence – *Unseen Leaves* for soprano, oboe and tape. (16:32)

Musgrave, Thea – *Niobe* for oboe and tape. 1987.

Nazor, Craig – *Inverted Canons* for oboe and tape.

Ohara, Yoko – *Psychedelic Mirage* for oboe and CD backing.

Phillips, Mark – *Sonic Landscapes* for oboe and tape. 1989.

Pinkston, Russell – *Gobo* for oboe and electronic sounds. 2007. (7:19)

Repar, Patricia Ann – *Alex* for oboe, viola and tape. 2014. (8 minutes)

Reynolds, Roger – *Islands from Archipelago: I. Summer Island* for oboe and computer-generated tape. New York: C.F. Peters Corps. 1984.

Ross, Erik – Succession for oboe and tape.

Schwartz, Elliott – *Extended Oboe* for oboe and electronic tape. New York: American Composers Alliance, 1975.

Sosa, Jorge – *Still Life (Naturaleza Muerta)* for amplified oboe and fixed electronic media. 2010. (10:30)

Swope, Linda – *Serial Synth Sonata* for oboe and electronic synth sounding recording. 2009.

Szeghy, Iris – *In Between* for oboe and tape. Slovakia: Music Information Centre, 1993.

Takahashi, Yuji – *Operation Euler* for oboe and prerecorded oboes.

Ter Veldhuis, Jacob – *Garden of Love* for oboe and tape.

Theobald, Jim – *Above Ground* for treble instrument and tape.

Thome, Diane – *Estuaries of Enchantment* for oboe and computer-realized sound. 2002. (10:58)
Tittle, Steve – *Only, Other, Always* for oboe and tape. 1987.

Ussachevsky, Vladimir – *Pentagram* for oboe and tape. 1980.

Veale – *Spieltechnik* for oboe and tape. Trevco.

Vees, Jack – *Apocrypha* for oboe and tape. Los Angeles: Leisure Planet Music, 1986.

Verin, Nicolas – *Miroirs Deformants* for oboe and tape. (12:07)

Wave, Julian J. – *Canon* for oboe and prerecorded tape.

Zapf, Helmut – *Canto del Aria* for oboe and tape. 1995. (13 minutes)

Oboe and Interactive Computer

Archbold, Paul – *A Little Night Music* for oboe and interactive computer. 2004.

Holliger, – *Cardiophony* for oboe and MaxMSP live heart microphone. Mainz, Germany: Schott Musik International, 1971.

Jacobs, Bryan – *A Gentle Ruin* for oboe and live electronics. 2007. (6:30)

Karpen, Richard – *Life Study No. 2* for oboe and computer realized sound. 1995.

Roxburgh, Edwin – *At the Still point of the turning World* for oboe and MaxMSP. (oboe with live delays and treatments)

Winkler, Todd – *Three Oboes* for oboe and interactive computer. 1989.

Young, Michael – *Argrophylax* for oboe and interactive computer. 2006.

Young, Michael – *Oboe Prosthesis* for oboe and interactive computer.

Oboe and Live Effects Processing

Carl, Robert – *Yearning* for oboe with digital delay, processing and tape. 1997.

Friar, Sean – *Oboemobo* for oboe and EPs. 2010. (7 minutes)

Goldberg, Anne H. – *Explorazione Spettrale for Emily Di Angelo* for solo oboe and electronics. 2010.

Jacobs, Bryan – *A Gentle Ruin* for oboe and live electronics. 2007. (6:30)

Marshall, Ingram – *Baghdad Blues* for oboe and live effects processing. 2006.

Rosenboom, David – *And Come Up Dripping* for oboe with live electronic processing. 1968.

Roxburgh, Edwin – *At the Still point of the turning World* for oboe and MaxMSP.

Sullivan, Matt – Oh Boy! for oboe and live effects processing. (5:19).

Swope, Linda – *Rapid Transit* for solo amplified oboe. 2009.

Oboe and Other Electronics

Eje, Niels – *Oboe in Orbit*.

Harvey, Jonathan – *Ricercare una melodia* for oboe and live electronics. 2011. (5:24)

Hays, Sorrel – *Take Back a Country Road* for oboe, casio sax and DX-7. New York. 1992.

Joyce, Brooke – *Prairie Etudes* for English horn, live electronics and video. 2006. (6 minutes)

Kretz, Johannes – Urban Gypsies for oboe, electronics, and silent movie (movie by Laszlo Moholy-Nagy). (20 minutes)

Lindroth, Scott – *Teerza Rima* for oboe and live electronics. 1995.

Mefano, Paul – *Asahi* for oboe et dispositif électro-acoustique 1992. (6 minutes)

Mendez, Jorge Garcia Del Valle – *Blue Water, Dark Sky* for oboe and 2-channel tape. 2009. (21:30)

Mitterer, Wolfgang – *Charivan* for oboe and electronics. (6:30)

Procel, Gaytan – *Concerto No. 2* for oboe and electronics. 2008.

Sekon, Joe – *The Fester Merchant*. 1973.

Stockhausen, Karlheinz – *Kompositionen* for oboe

Stockhausen, Karlheinz – *In Freundschaft* for oboe.

Stockhausen, Karlheinz – *Solo* for melody instrument with feedback. 1966.

Stockhausen, Karlheinz – *Spiral* for soloist with shortwave receiver. 1968.

Veverka, Vilém – *Song for Eurydice* for oboe and electronics.

English Horn and Fixed Media

Arcuri, Serge – *La Porte des Sables* for oboe or English horn, midi percussion and tape. 1989.

Bennett, Myron – *Dialogue* for One for oboe doubling English horn and two tape recorders. 1969.

Chadabe, Joel – *Street Scene* for English horn, tape and projections. 1967.

D'Alessio, Greg – *Reflections on a Poem by E.E. Cummins* for English horn and tape. 1994.

Dixon, Greg – *Train of Thought (Derailed)* for amplified oboe/English Horn and stereo fixed media. 2008. (5:30)

Fox, Christopher – *Broadway Boogie* for English horn and prerecorded English horn.

Gehlhaar, Rolf – *OM-c* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-d* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-h* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-m* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-n* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-p* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-r* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-s* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Hannan, Peter – *RSRCH 2/84* for solo instrument and tape. 1984. (13:50)

Hellerman, William – *One into Another (Ariel)* for English horn and tape. 1972.

Johnston, Ben – *Casta* for any solo instrument with tape loop. 1970.

Lyon, Eric – *Fanfare for Gordon Mumma* for treble instrument(s) and tape.

Marshall, Ingram – *Dark Waters* for English horn with live electronics and tape. 1995. (17:12)

Pennycook, Bruce – *Fast Dance* for English horn and tape. (7 minutes)

Phillips, Mark – *Elegy and Honk* for English horn and tape.

Silverman, Faye-Ellen – *Layered Lament* for English horn and electronic tape. 1983.

Stevens, Thomas – *Triangles IV* for English horn with three live or prerecorded oboes. 1994.

Theobald, Jim – *Above Ground* for treble instrument and tape.

Truax, Barry – *Song of Songs* for oboe d'amore or English horn, tape and slides. 1992.

Truax, Barry – *Tongues of Angels* for English horn, oboe d'amore and tape.

English Horn and Interactive Computer

Melby, John – *Concerto* for English horn and computer. 1986. (15 minutes)

English Horn and Live Effects Processing

Marshall, Ingram – *Dark Waters* for English horn with live electronics and tape. 1995. (17:12)

English horn and Other Electronics

Misurell-Mitchell, Janice – *Deconstruction Blues* for English horn and DX-7. 1991. (11 minutes)

Oboe d'amore and Fixed Media

Gehlhaar, Rolf – *OM-c* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-d* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-h* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-m* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-n* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-p* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-r* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-s* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Hannan, Peter – *RSRCH 2/84* for solo instrument and tape. 1984. (13:50)

Johnston, Ben – *Casta* for any solo instrument with tape loop. 1970.

Lyon, Eric – *Fanfare for Gordon Mumma* for treble instrument(s) and tape.

Theobald, Jim – *Above Ground* for treble instrument and tape.

Truax, Barry – *Song of Songs* for oboe d'amore or English horn, tape and slides. 1992.

Truax, Barry – *Tongues of Angels* for English horn, oboe d'amore and tape.

Oboe d'amore and Live Effects Processing

Epstein, Marti – *Thalia* for oboe d'amore and digital delay. 1998. (11 minutes)

Marshall, Ingram – *Holy Ghosts* for oboe d'amore and live digital delay processing. 2000. (9:16)

Baroque Oboe and Fixed Media

Gehlhaar, Rolf – *OM-c* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-d* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-h* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-m* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-n* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-p* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-r* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-s* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Hannan, Peter – *RSRCH 2/84* for solo instrument and tape. 1984. (13:50)

Johnston, Ben – *Casta* for any solo instrument with tape loop. 1970.

Lyon, Eric – *Fanfare for Gordon Mumma* for treble instrument(s) and tape.

Theobald, Jim – *Above Ground* for treble instrument and tape.

Baroque Oboe and Live Effects Processing

Gehlhaar, Rolf – *OM-c* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-d* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-h* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-m* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-n* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-p* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-r* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Gehlhaar, Rolf – *OM-s* for stereo soundtrack and any solo voice or instrument. 2002. (13 minutes)

Rubin, Anna – *Stolen Gold* for amplified baroque oboe, live electronics and digital audio. 1991/2001. (6:20)

APPENDIX G

INTERNET RESOURCES FOR RESEARCH

American Composers Forum (ACF): http://www.composersforum.org
American Composers' Alliance: http://www.composers.com
American Music Center: http://www.amc.net
American Society of Composers, Authors, and Publishers: http://www.ascap.com
Australasian Computer Music Association: http://acma.asn.au/
Canadian Electroacoustic Community: http://cec.sonus.ca/
Canadian Music Center: http://www.musiccentre.ca/
Center of Experimental Music and Intermedia: http://cemi.music.unt.edu/
Center for Computer Research in Music and Acoustics:
https://ccrma.stanford.edu/
Center for New Music and Audio Technologies: http://cnmat.berkeley.edu/
Computer Music Journal: http://www.computermusicjournal.org/
Electronic Music Foundation: http://www.emf.org/
Electronic Music Midwest Festival: http://www.emmfestival.org/
German Society for Electro-Acoustic Music Association: http://www.degem.de/
Hellenic Electroacoustic Music Composers Association: http://www.essim.gr/
Institut de Recherche et Coordimation Acoustique Musique: http://www.ircam.fr/
International Association of Music Information Centres: http://www.iamic.net/
International Computer Music Association: http://www.computermusic.org/
International Double Reed Society: http://idrs.org
International Documentation of Electroacoustic Music:
http://www.emdoku.de/EMIntro-E.html
International Society for Contemporary Music: http://www.iscm.org
Lampo: http://www.lampo.org/
Music Works Magazine: http://www.musicworks.ca/
Norwegian Center for Technology in Music and the Arts:
http://www.notam02.no/web/
Society for Electro-Acoustic Music in the United States:
http://www.seamusonline.org/
Steim: http://steim.org/
Technology in Music and Related Arts: http://www.timara.oberlin.edu/