

MUSIC TECHNOLOGY IN THE MARCHING ARTS:

A Study in the Evolution of Electronics in Marching Ensembles

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SUBMITTED TO THE GRADUATE FACULTY

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Production Track

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ABSTRACT

The objective of this thesis was to study and compare the degree to which music technology is used in marching arts ensembles. Considerable research was done to determine a wide perspective of use at many levels of performance ensemble, from scholastic to independent organizations. Additionally, this thesis outlines the evolution of electronics and technology in the marching arts, and how different organizations are creatively utilizing these tools in design and performance at present, and how some are seeking to use them to inspire and continue use into the future.

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CHAPTER 1: INTRODUCTION

Nirvana, The Beatles, Prince, Madonna, and Usher, while encompassing many different styles and genres of music, have one common thread: they have all defined the image of a popular musician, each working to re-define the pop music genre (Woody 2007). The remarkable style, artistry and accomplishments of these performers have captured the attention of musicians the world over. Many performers have attempted to emulate their prowess on their instrument and replicate their music.

As popular music steadily evolved, so did the interests of those who chose to study music. Many educators began to use popular music as a method of engaging students in music education and bridging the gap between the popular music with which students were acquainted, and the more traditional music used in education. These methods provided moderate success in increasing the understanding of traditional styles, but didn't provide the opportunity for students to appreciate popular music or embrace it at its core. It also did not provide a means to reproduce the music in a traditional school environment (Woody 2007).

Enter the marching band, a traditional style of performance music that has allowed many musical youth the possibility to take the music they know and love and perform on an instrument they have been taught from a young age. A simple Google search of marching bands with popular music brings up hundreds of results from sources such as Rolling Stone magazine, which provides examples of ensembles performing the music of pop artists such as Kanye West, Daft Punk, Beyonce or No Doubt (Gentile 2013). A far distance from its traditional Sousa

marches and militaristic style, the marching band demonstrates the ability to adapt pop music for its use, and engages students in the music they love.

A (Brief) History of the Marching Arts

Marching arts organizations grew out of military bands and programs in the earlier part of the 20th century. These ensembles, which once paraded through the streets, began to perform shows combining the parade style marching with more traditional military drill on football fields for the enjoyment of the masses. Over the years, more sophisticated performance evolved, and organizations were founded with the sole purpose of performing music for the marching idiom. These programs have grown to encompass the globe, and are now a traditional part of most educational institution's music outlets.

Marching arts organizations fall into two primary categories, which are "scholastic" and "independent" organizations. Scholastic organizations are created with some relationship to an educational institution, such as a school or university. Typically, these organizations only allow participation from the educational program's student body. Marching bands are the primary "scholastic" organizations. The second category, independent, is an organization without ties to an educational program, and are self-operating organizations. Drum corps are the primary "independent" marching organizations.

Both marching band (scholastic) and drum corps (independent), encompass all wind and percussion instrument families, including brass, woodwinds, and percussion. Additionally, performance elements are incorporated via "non-musical" performers (colorguard). All performers, excluding stationary percussion (front ensemble) are required to move and play

their instruments on a football field. These performers are required to complete military-style drill and choreography, all while maintaining the proper technique to perform on their instruments or colorguard performance materials (flags, rifles, sabres, etc.).

There are three remaining iterations of the marching arts, which take place indoors in the winter months upon the completion of the marching band and drum corps seasons (indoor), and are encompassed in both scholastic and independent bodies. The first, indoor percussion, creates a similar style show to that of the outdoor organizations, save the brass and woodwind instruments. Indoor percussion ensembles create elaborate performances inside gymnasiums, performing their shows on basketball courts. These performances utilize the same marching percussion instruments (battery) and stationary front ensemble instruments that were used in marching band, with a much heavier reliance on the sonic capabilities of the front ensemble instruments for melodic content. Furthermore, some indoor percussion organizations utilize non-musical members of the ensemble to assist with movement, acting as a purely visual facet.

The second indoor organization, indoor colorguard, acts as an outlet for the continuation of the colorguard and performance perspective of the marching arts. This performing ensemble consists of only non-musical performing members, creating a purely visual performance set to pre-recorded music. The third and final indoor organization is indoor winds. An ensemble type in its infancy, indoor winds has only been recognized in competition for one full season. As this performance type is still establishing its identity, very little is known or accepted as standard for its performance. Given the limited information regarding indoor winds programs, and the non-musical nature of indoor colorguard, neither will be addressed in this study.

Modern Music Evolving

Pop music has evolved over the years. The previous examples, the Beatles and Usher, provides a clear picture of this evolution; one group needed two guitars, bass and drums, while the other makes music purely in a digital realm. As music became easier to produce in this fashion, artists had new possibilities at their disposal, the likes of which were previously either too expensive or too difficult to generate. Where an orchestra was needed to capture a symphonic feel, digital instruments and controllers allowed for quicker and cheaper alternatives. Even the general capture of sound became a simpler process. The traditional studio recording process created masterful sounds with production quality that steadily developed over the years to perfection. These same capabilities come free with programs like Garageband, which can record and edit sound on levels approaching that of professional studios (Morris 2014).

This paradigm shift from the traditional acoustic role of musicians to a digital front is perhaps best exemplified by the award winning film composer Hans Zimmer, who has scored such films as *The Dark Knight*, *Inception*, and *Gladiator*. Zimmer has been quoted as suggesting that he is not a musician, rather a programmer, and that "...I've always felt the computer was my instrument." (Berkman 2013). He demonstrates that the tools that are readily available to any musician with a computer can be seen on the biggest screens and stages.

Digital Impact on Live Performances

Synthesizers and other digital instruments have not only allowed creators to work more easily in the studio, but also when performing live. Instrumentalists are no longer needed to perform in a

live settings when digital sampling can accurately take their place (Pogue 2014). While this may take away some of the performance elements of live music, it puts the programmer entirely in control of all elements of the performance, including dynamics, articulation, phrasing, and other elements you would expect from high caliber musicians. Many instrumental purists may find themselves upset, but nevertheless, the technology exists to replace many live musicians with digital counterparts.

While the modern performers find themselves at a crossroads within a debate of live vs. digital, their musical art forms find themselves in a position of adopting technology without compromising the original art form. For example, an opera company may effectively turn to sampled instruments to replace the accompanying orchestra (Pogue 2014). In this case, the simple push of a button launches a performance containing all the nuanced phrases and musical elements of the traditional orchestra and serving as an effective accompaniment for the opera's vocalists.

But what if the expectation of sampled music and other recorded material was not to replace part of the traditional musical experience, but rather to work with it to enhance a performance. In fact, what if rules existed that mandated that all sounds must adhere to a particular set of guidelines so as to not interact or assist with a musician or group's performance ability? In the realm of most performance music, this seems all too farfetched; however, in the marching arts, this is the accepted norm and expectation of each performing ensemble.

Defining the Need

To date, no study has been undertaken which examines the use of music technology in the marching arts. In fact, little has been written regarding the topic. The nearest topic discussed is the use of electronic amplification specific to the outdoor marching activity, in particular the performance ensembles participating in Drum Corps International (“DCI”) (Maher 2011). This study addresses the time table of amplification and the history that defines its controversy. Consequently, the study briefly references the inclusion of electronic instruments in DCI, and describes in detail the rules for using electronic instruments in performance.

While the study’s information regarding amplification is tremendously effective, it is very specific to only poll one particular facet within the marching arts. Furthermore, the focus on amplification pinholes one particular segment of music technology. Since the completion of this study, ensembles in the marching arts have grown and adapted to radically change the amount of amplification, as well as the methodology used in its approach. A study of this type not only updates Maher’s study of amplification in drum corps, but also presents details regarding other portions of marching arts ensemble’s signal chain, and in a multitude of environments and calibers.

Purpose Statement

This study attempted to identify and compare the varying degrees to which multiple marching arts organizations are utilizing music technology, and to determine the impact these tools have on the overall performances. This study examines both the indoor and outdoor aspects of the

marching activity, as well as how each ensemble approaches the use of technology from the standpoints of design, production, and performance. Additionally, this study seeks to determine what tools may not have yet been utilized, and how these elements may alter the future of the performing arts activities. **With this in mind, this thesis seeks to document the use of music technology in marching ensembles and explore the redefinitions of marching activities which are now possible.**

CHAPTER 2: LITERATURE REVIEW

Proponents for electronics in the marching arts are not only quick to point out the newly available sonic capabilities, but also the other potential benefits of a more modernized ensemble. Chad Criswell suggests that electronic instruments such as synthesizers and guitars allow for more members of an ensemble that otherwise wouldn't be able to participate. This is a bonus for both scholastic and independent ensembles, as scholastic groups are able to increase the population of membership and allow for more students to participate. Independent groups are also able to increase in size, thus additionally provide a stable financial pool of resources. Criswell cites several examples of scholastic ensembles that have created successful programs utilizing music technology in the performance environment. A perfect example is Western Carolina University (WCU). A more traditional style marching group, WCU utilizes both a traditional front ensemble and a rhythm section featuring many different electronic instruments, including the aforementioned synthesizers and guitars, but also MalletKats (a digital percussion keyboard), vocoders, electronic drum sets, and sampler systems, in total reaching 29 pieces of electronic equipment for their 2015 performance season. (Criswell). This ensemble not only demonstrates that electronics can successfully be implemented in any style of marching ensemble, but the tremendous possibility it can have on personnel and instrumentation.

The use of electronics in the marching arts, particularly DCI, did not happen overnight. In fact, it took many years of discussion and arguments in marching's elite for it to become a reality. As referenced in her study, Erin Maher dictates that first use of music technology in DCI, the amplification of acoustic sound, was officially accepted in 2003 when the governing body voted

in favor of Cadets Drum and Bugle Corps Director George Hopkins' proposal (Maher 2011). Coincidentally, it was also Hopkins who later proposed the use of electronic instruments for the 2009 season. In the proposal, Hopkins defined the use of electronics as follows:

“Music from instruments such as electronic keyboards, synthesizers, electronic drum sets, and all other electronic instruments are allowed given that the instrument's performer(s) are present and performing live and in real time.” (Hopkins 2008).

Hopkins would later justify the use of these instruments by suggesting that the instruments provided ensemble design teams to utilize the instruments to generate a more elaborate and impactful production. He also included that many members of performing ensembles had already been introduced to the technology, and that its implementation would sustain an educational impact as well as enhancing the performance. (Hopkins 2008).

The final point Hopkins argued in his proposal was that drum corps was the last of the marching arts activities to recognize the impact and inclusion of electronic instruments and music technology, as both WGI and scholastic marching ensembles at all levels had been previously using the technology (Hopkins 2008).

Hopkin's sentiment regarding the literacy of most students to technology has been echoed by many others involved in the marching arts. Kevin Ford, the band director at Tarpon Springs High School (FL), suggests, “...we are teaching digital kids. Electronics are infused in every aspect of their lives. We see it as our responsibility to educate our students by providing quality examples

of how the use of technology can complement and enhance musical compositions and performances.” (Sun 2009).

As the visual and production facets of marching arts continued to evolve, so did their choice of repertoire. As mentioned previously, drum corps and marching bands traditionally played marches, classical repertoire, and popular songs, however, as the art form grew and expanded to include a larger visual performance requirement, the goal of using newer and more challenging music became apparent. This music would include film scores, electronic music, and other more contemporary works. Many corp directors and marching band designers believed contemporary and electronics work to better facilitate a sound scape as part of the overarching musical material. David Gibbs, executive director for the Blue Devils Drum and Bugle Corp, suggests “It’s just going to continue advancing the activity. It gives us a bigger paint bucket, a lot of color spectrum. It gives us a lot more options, so we can keep advancing the creative designs of the shows and the effects of the shows for the future.” (Carden 2009).

In 2015, the Blue Devils performed a program entitled “Ink,” in which they portrayed several fairy-tale like themes and ideas. Their performance featured music by Steven Sondheim, most notably songs from his musical works “Into the Woods” and “Sweeney Todd.” Additionally, the ensemble used a song titled “I Like You” by Korean artist J.Y. Park. (corpsreps.com - The Drum Corps Repertoire Database). It was this particular portion of the performance that provided a notable example of music technology’s usefulness within the activity. The Blue Devils’ synthesizer player performed edited samples of the vocals from the actual song, and performed them in time with the rest of the ensemble using a digital sampler. The sampler held the clips, and through using percussive triggered pads, was able to play it back in real-time, blending the

sound with the acoustic sounds of the brass and percussion members, as well as the amplified sound of the rest of the front ensemble. This particular example provides an accurate description of how many groups are utilizing the available technological resources at their disposal. (TheBlueDevils 2015)

While the Blue Devils provide an example of an ensemble using music technology to moderately enhance a traditional performance, other groups are choosing to rely more heavily on technology as a means to define their performance. The best example is the DCI ensemble the Bluecoats. The Bluecoats, based in Canton, OH, created a program in 2015 entitled “Kinetic Noise,” exploring sound and movement concurrently. However, the Bluecoats sought to redefine the extent to which a group could implement technology in performance. The Bluecoats used many different styles of music, but each piece focused on phasing and layered-textures. In doing so, the Bluecoats sought to find a way to combine digitized sound with the traditional acoustic sound of the ensemble. Bluecoats electronics designer Vince Oliver explained the electronics design as a “sonic playground,” in which speakers on the field would take amplified sound from both performing members and previously recorded material and blend them together as the sounds were produced. Additionally, brass arranger Doug Thrower describes a new timbral color capability provided by these amplified signals, as the music of the brass performer is digitally processed and also added into the mix, creating a sonic capability unlike anything that had been previously attempted. (Canton Bluecoats 2015).

But not everyone likes the addition of electronics in marching bands and drum corps. In fact, many ‘old-school’ members and fans are wholeheartedly against the decision to modernize the marching arts. For instance, Philip Ginn, writing as a part of his blog, begins an entry with the

following: “I hate electronic instruments in drum corps.” (Ginn 2009). Ginn continues to outline arguments held by many, that the art form should consist of purely traditional acoustic instruments. As outlined by Maher in her study, many believed that even amplification of instruments in the marching arts was an atrocity (Maher 2011). Another DCI fan described the use of music technology as being in the same vain as a rock concert. “Guitars, amplifiers, etc. clogged my inner ear membranes so that the main ingredient of the evening — drum corps — could not be seen, heard and enjoyed.” (Ferlazzo). These individuals represent a minority of the patronage of drum corps and other events, as both WGI has experienced tremendous growth in participation (Ness 2012), and DCI set a new record for ticket sales in 2015. (Weber 2015).

Music technology has brought forth seemingly limitless potential for marching ensembles, however, it is not without its share of risks. A traditional marching group (brass/woodwinds, percussion, and colorguard) was able to practice in any condition. However, ensembles using amplification and/or electronics for a production are inherently dependent on weather conditions, including rain and snow, as well as high heat levels which may cause equipment to malfunction. However, many groups have back-up plans in place for situations such as these, and have utilized different strategies to protect equipment during performance and/or rehearsal (Eisenman 2010). Even with optimal conditions, many groups have issues with performances due to faulty set-up or something as simple as a wire coming loose. This can result in a performance being sub-par, and thus for competitive organizations, a lower score and overall placement. The most recent, and perhaps greatest, example occurred in April of 2016, in which RCC, a competitive ensemble competing in the WGI Independent World Semi-Finals in Dayton, OH, experienced an electronics malfunction. Knowing that their program would be grossly unsuccessful without their electronics, RCC decided to solve the issue before performing,

resulting in a massive penalty. Considered by many as a championship contender and even favorite, RCC entered the Finals round of competition just barely skating into competition in 14th place out of 15 ensembles. In other words, RCC nearly ended their season on a bad run due to an electronics failure, proving that such a heavy reliance upon music technology can be as dangerous as it is effective (Scores/PIW/Semifinals).

The point could also be made that less emphasis should be placed on electronics so it would not have such a direct impact on the performance. Also in 2016, Ayala High School (CA) presented their performance titled "Igor's Riot, which was a nod to Igor Stravinsky's work *The Rite of Spring*. The performance used many different electronic components, most notably electronic samples and several television displays that coincided with the material presented in the production on the floor. However, in their World Championship Finals performance, the material displayed on the televisions cut out, revealing a blue computer screen. Though the performance was hindered in the process, the student performers continued to execute their show successfully. The group was successful in their pursuit of a gold medal, scoring nearly half a point higher than their next competitor (Scores/World/Class/Finals). Ayala High School demonstrates a group that knowingly takes risks with technology, but creates a performance that can also be successful when things inadvertently go wrong.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

Defining Research

The goal of this thesis is to examine the integral use of music technology in the marching arts, and to determine the extent which music technology impacts the overall program.

Information regarding the application of electronic instruments and equipment in scholastic and independent marching ensembles was collected using qualitative research. Qualitative research may be defined as a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem (Creswell 2009). In other words, qualitative research allows for human perspective to play a much greater role in the collection and interpretation of data received. Qualitative research prescribes open-ended responses, addressing issues or opinions head-on rather than through determination via data collection. Additionally, qualitative research allows for varying degrees of responses amongst those questioned.

Qualitative research was initially collected through the observance of video archives from various scholastic and independent marching programs. Each of these video archives demonstrates the varying degree to which each program utilizes elements of music technology, including sound design, recording and amplification, and digital instrumentation. Each video provided a preliminary observance of the materials utilized by each independent organization that would later be interviewed directly. Additionally, the archives provided an example of previous instances of music technology utilized, providing a perspective of what needs have evolved in a new season's performance.

Upon reflection of several of the videos, it was determined that the vast majority of marching arts ensembles fall into one of three categories describing the use of music technology in performance:

1. Utilization of technology in a minimal setting, where technology was used sparingly in design and performance.
2. Utilization of technology in a moderate setting, where technology was used frequently in design and performance
3. Utilization of technology in a paramount setting, where technology was used heavily in design and performance.

Additionally, research was collected via individual interviews with both the same program designers and staff members in the video archives, and others in reputable programs. These staff members have designed and implemented electronics set-ups that include amplification systems, mixing equipment, synthesizers, and other electronic music equipment. These individuals are the best sources to define the extent performing organizations in the marching arts are utilizing music technology in their performances.

Each electronics designer creates a soundscape that works within the scope of the particular ensemble's performance requirements. The designers will define the extent to which their related ensemble have utilized elements of music and general media technology, and how it shaped their performance.

Methods and Explanation

With this information in mind, the following specific questions were developed and posed to the individuals on staff within these organizations:

1. How is your ensemble using music technology in its performance?
2. How has your audio set-up evolved over the last five years? How has the demand for electronics changed over the last five years?
3. How much of your overall performance is predicated on material developed outside of the performance realm (i.e. samples, recorded material, etc.)?
4. In what ways have electronics created new possibilities for your performance (i.e. amplification, sampling, synthetic instruments, etc.)?
5. Do you feel there is a backlash to the use of electronics in the marching arts?
6. How do you feel electronics may be used in the marching arts in the future?

These questions seek to shed light on exactly how ensembles are using music technology to enhance their performance and how each designer seeks to utilize technology in the process. The first question seeks to determine exactly how ensembles will be utilizing music technology in their current performance. This provides a snapshot of the current trends being utilized. The second question primarily functions to determine a scope of how these same electronic demands have grown and changed within a five year period. The follow-up question, regarding how their particular ensemble's performance has required the shift in electronics, seeks to develop a sense of the evolution of a marching arts performance with relation to electronic demand.

The third question focuses on the physical demand on the player in the live performance (synthesizer, digital percussion, etc.) vs. material generated for performance (sampling, recorded voice, etc.). This question in particular is of great importance, as a focus on material generated outside of the performance realm creates a sense that the performer has a minimized responsibility. Fourth, the opinion on the newly generated possibilities will highlight how groups have utilized technology to their advantage in the performance realm.

The remaining two questions hope to shed light on a situation which has driven a number fans away from the activity through its evolution. Unfortunately, as referenced in Maher's paper, many marching arts fans have been turned away by the increased use of electronics, particularly in drum corps (Maher 2011). Traditionalists would prefer to see the art form resort back to a more "old-school" time, when amplification wasn't allowed and all audible material was generated on the field by corps members. While this opinion isn't researched in depth in this study, the opinions of the fans of marching arts are necessary for its survival, and should be strongly considered in the future.

CHAPTER 4: RESULTS

The survey was distributed to 40 different individuals around the United States, each representing a different facet of the marching arts idiom (special thanks to the Marching Arts Audio Discussion group - facebook.com). This included indoor and outdoor only organizations, and both scholastic and independent units. The following individuals were selected from the pool in order to accurately depict a varying degree of electronics usage.

Geoff Schoeffel - The Cadets Drum and Bugle Corps (DCI)

Cristian Good - The Cavaliers Drum and Bugle Corps (DCI)

Erik Kosman - Bluecoats Drum and Bugle Corps (DCI)

Matt Jordan - Music City Mystique (WGI-WORLD)

Evan Brown - Matrix Percussion (WGI-WORLD)

Brian Christoffersen - Motor City Percussion (WGI-OPEN)

Dan Gelber - Nimitz High School (TX)

Ryan Bischoff - East Central High School (IN)

Aaron Tucker - Green Hope High School (NC)

Grant Butters - South County High School (PA)

Question 1

How is your ensemble using music technology in its performance?

This particular question yielded a multitude of results. Every response had a few things in common. First and foremost, every group was utilizing technology in order to amplify the acoustic sound of instruments in the front ensemble, including the marimbas and vibraphones. Several groups even went as far as to include micing wind instruments (marching band/drum corps) in order to achieve a higher intensity in the overall soundscape of performance. Geoff Schoeffel, audio engineer for The Cadets Drum and Bugle Corps, describes his set up as including "...2 Shure wireless mics, one for a trumpet soloist, and one for an electric violin...some spot mics, 6 french horn mics, 5 timpani mics." (Schoeffel). This particular design includes several microphones, both of traditional wired and wireless designs, based on their application within the context of the performance. For instance, the french horn and timpani microphones remain in a stationary position at the front of the performance field. This allows them to be plugged in directly into a mixing surface. However, the trumpet and electric violin soloist mics are placed in the center of the field, well into the mix of the performance space, creating a necessity of wireless function (Lawson 2016).

In addition to amplifying acoustic sound, all groups included some form of synthesizer, though each group used it in a different manner. Cristian Good, sound engineer for The Cavaliers Drum and Bugle Corps, as well as numerous high school programs, suggests that the goal in using synthesizers or other synthetic instruments is to "create and manipulate sounds that we might not be able to with acoustic instruments alone." (Good). While many groups use traditional synthesizers to generate digital sounds, many are turning to MIDI controllers powered by

laptops in order to gain a wider variety of material. These programs frequently use Apple's MacBook running the synthesizer program Mainstage, and several go a step further by including expanded sound libraries like Native Instruments Komplete or Spectrasonics Omnisphere. Aaron Tucker, sound designer for Green Hope High School, suggests that using sound libraries on a laptop allows for greater control and adjustment of volume and effects on these materials (Tucker).

Sound libraries and digital synthesizers are excellent examples of pitch-related material that can be performed using a keyboard in a traditional manner. However, many ensembles are also now turning to previously recorded and sampled material, including spoken word, sound effects, and other such materials. Brian Christoffersen, front ensemble instructor at Motor City Percussion, explains that his ensemble uses samples to "...further emphasize the design of our show..." (Christoffersen). Grant Butters, sound engineer for South County High School, utilizes samples on two different surfaces, both housed on a dedicated sample pad and running through a computer program (Butters). Each has its own merit, though both are still employed by different ensembles.

While an increase in electronics use seems to be standard, there are of course those who take it to extremes. Perhaps the greatest outlier in the use of electronics is the Bluecoats Drum and Bugle Corps, who have seemingly redefined the use of electronics consistently over the last few seasons. As mentioned in Chapter 1, the Bluecoats utilized technology to create a "sonic playground" in 2015 (Canton Bluecoats 2015). In 2016, they went even further. Erik Kosman, sound engineer for the Bluecoats, describes their audio set up as having 13 speakers throughout the field, as well as 11 subwoofers. Additionally, their ensemble utilizes 75 total

inputs ranging from microphones to synthesizers and samplers. Several of these inputs are wireless, and the capabilities of their performance allowing them to pan material to speakers so that the sound generated reacts and blends appropriately with the material being performed. Thus allowing for amplified sound generated in one point of the field to follow the player as he/she moves throughout the field. The ensemble also took amplification to a new level, including an overhead microphone on each keyboard instrument. Where most groups will simply mic the bottoms of the keyboards for a true sound to be amplified, the Bluecoats determine that an overhead mic would allow for ambient sound, as well as material played away from the keyboard, such as clapping, to be amplified. The mic also serves for each player's in-ear mix, a technology which until now has not been used within the activity. Each player in the front ensemble is given their own mix, which allows them to hear certain material in better relation than other, similar to a studio recording process (Kosman). The Bluecoats, ever expanding the boundaries of electronics within the activity, have once again turned a new page.

A particularly new trend within the marching arts, predominantly indoor percussion, is the use of video and/or lighting applications in performance, all of which must be performed in real-time by a player on the floor as if it were an instrument. One such ensemble, Music City Mystique, has utilized both in recent years. Matt Jordan, Mystique's front ensemble instructor, explains, "we added a video component to our show, which meant we had to add a third computer and additional player." (Jordan). Jordan later went on to explain the method by which ensembles are utilizing lighting elements in performance. "Most of the show was sequenced, and he just had 'trigger points' set up when the rhythms of section needed more control..." (Jordan). In other words, the video and lighting elements created a visual representation of the sonic performance that was already take place in the performance. Evan Brown, sound designer for Matrix

Percussion, describes the video set-up utilized in a previous season as using a MacBook Pro running a Keynote presentation (Powerpoint-type software) with embedded video. (Brown). This scenario, similar to Jordan's lighting description, would allow for video to be triggered in sync with the performance on the floor.

Question 2

How has your audio set-up evolved over the last five years? How has the demand for electronics changed over the last five years?

In a matter of five years, the possibilities of electronics in performance have introduced seemingly limitless possibilities for marching ensembles. While the equipment used by many groups is evolving, some are finding ways to maintain with what they have had for years. Ryan Bischoff, percussion instructor and sound engineer at East Central High School, explains that his ensemble has been utilizing the same set-up for several years without change, and has only recently taken steps to grow the electronic imprint on their programs (Bischoff). Some have purchased new equipment, but not changed the impact on their programs, like Dan Gelber, who suggests that though his group has purchased a digital mixing console and better speakers and microphones, not much has changed in a five year span (Gelber).

However, these individuals with minimal growth seem to be the outliers of those polled, as nearly all others described radical changes to their electronic equipment due to a higher demand for electronic-based material in their overall performance. Brian Christoffersen believes that the value of electronics toward the concept of the show has led his ensemble to increase their electronics usage and demand. His personal increase has been in the implementation and creation of sound effects and synthesizer patches, which he uses to match the tone and quality of the show's music and overall design (Christoffersen).

Many of those polled have made what could be considered a usual adaptation, switching their original hardware synthesizers for the previously mentioned computer-driven equipment. In fact, seven of the ten responses included elements such as synthesizers and/or samplers, that were driven by a MIDI peripheral connected to a laptop. As previously mentioned, the ability to edit and adjust these samples and synthetic instruments, as well as the vast wealth of available material that comes with a software synthesizer, have no doubt contributed to this grand sway in favor of a laptop system. Additionally, cost differential may also play a critical role, as Cristian Good points out that “it’s much easier to ask a school of boosters for a laptop that could be used later than a \$3000 synth that has a very limited and advanced purpose.” (Good)

As previously mentioned, several groups are exploring the use of surround sound type setups on the field. This change has led to many groups placing a higher emphasis on amplified material, and its placement relative to the performance environment. Many larger groups, such as The Cadets, The Cavaliers, and The Bluecoats, are using this idea to emphasize their performance, as well as address the idea of field coverage of sound. As such, more planning in regards to sound image panning as well as signal routing to speakers have become necessary.

Question 3

How much of your overall performance is predicated on material developed outside of the performance realm (i.e. samples, recorded material, etc.)?

This answer yielded a variety of responses. In general, most felt that sampled material should be used as an enhancement, not as a replacement. Ryan Bischoff suggests that his ensemble’s use of samples in the repertoire “uses samples as a kind of added bonus to make the (overall

ensemble's) sound nicer and (of) higher quality." Many samples could be removed "without harming the integrity of the show." (Bischoff). Others, like Cristian Good, suggest that sampling is heavily dependent on the show material, "obviously a Tron show is going to have a much heavier electronic presence than something called Little House on the Prairie." (Good). Some don't use sampled or recorded technology at all, like Dan Gelber, who only uses electronics to amplify acoustic sounds (Gelber). Matt Jordan explains that his ensembles "use the electronic element (samples/etc.) as a layer to the show that puts you in the environment for the show...never as a replacement for an acoustic part that can be played, but as a way to enhance the production value and audio/visual coordination that we can achieve in our shows." (Jordan). Overall, sampled material is used to varying degrees, depending upon show design and material necessary for performance.

Question 4

In what ways have electronics created new possibilities for your performance (i.e. amplification, sampling, synthetic instruments, etc.)?

Grant Butter's answer to this question perfectly sums up nearly all responses. "Electronics have made anything possible." (Butters). Aaron Tucker cites the ability to amplify instruments, allowing players to focus their energies on obtaining the best sound quality possible, no longer at the cost of volume (Tucker). Geoff Schoeffel believes that this electronic capability will also allow for better control as to how material is presented, that in addition to amplifying material, sound designers are able to adjust exactly how much of a particular signal is amplified to adjust the context of the sound (Schoeffel).

Cristian Good suggests that amplification has not only allowed for better control of acoustic sounds, but also of digital. “We are able to add narration, which when used effectively, can provide depth and understanding.” (Good). In other words, amplified spoken word is able to provide context for a performance, allowing the audience and judging community to more easily understand the ensemble’s interpretation of the material. Brian Christoffersen agrees, saying that “adding electronics just adds a completely new level of sophistication and complexity to what we present and even how it’s presented.” (Christoffersen).

Grant Butters later added that the addition of sound banks for sampled material and synthesizers have allowed for a wider palate. “We have been using sample pads for samples like electronic drum sounds and unique world instrument sounds we don’t have.” (Butters). As might be the case with scholastic and smaller programs, access to certain larger or rarer instruments would be implausible to dedicate finances towards, however, many synthesizers and sound banks include digital copies of these instruments, allowing designers and thus ensembles to use them to enhance their performances. Matt Jordan agrees, stating “The ability to explore textures and timbres outside the normal ‘drums in a gym’ standard sounds are the single biggest benefit.” (Jordan).

Question 5

Do you feel there is a backlash to the use of electronics in the marching arts?

This particular question showed a divide in the responses. As previously mentioned, some of the more old-school fans of marching arts programs do not enjoy electronic components in performances. Dan Gelber suggests that after teaching for 33 years, he would rather invest the time to teach students how to play their instruments rather than use electronics. (Gelber). Grant

Butters, acknowledges this mindset, but plans his ensembles performance around a spectator or judging communities attitude towards electronics. Butters admits that his ensemble performs a different mix of the show diminishing electronics when they go to competition to appease these individuals. (Butters). Aaron Tucker believes that the backlash towards electronics has diminished, having been stronger when electronics were first allowed in marching's biggest activity, DCI. (Tucker). Cristian Good agrees, and suggests that "there will always be people who are against change as well as people that embrace it." Good even goes on to say that as it has become more accepted, those who embraced it early on have a definite advantage because they determine the best methods to utilize its implementation (Good).

Question 6

How do you feel electronics may be used in the marching arts in the future?

This question created a surprising conversation amongst those interviewed. Each person referenced that the newest trends in marching arts electronics are on display from the highest caliber ensembles, and that those groups establish the eventual expectation for others. Put simply, "every year some DCI corps does something new which trickles down to high schools." (Gelber).

Defining specifically what that might mean, Cristian Good cites that he believes that lights and TV's are "becoming more and more common in the activity." (Good). The use of these visual elements work to enhance the visual and general effectiveness of an ensemble's performance. Brian Christoffersen believes that we may even see holograms incorporated into performances in the future (Christoffersen).

This cinematic experience to the marching arts does not stop with element. Grant Butters believes that the future may also lie in surround-style speaker arrays, as many high caliber ensembles are utilizing already. Butters believes that the “multiple speaker setups and mics gave them lots of options to create depth within their electronic score...where sounds can come from a variety of places not just panned from left to right.” (Butters). Music City Mystique, The Bluecoats, The Cadets, and The Cavaliers already use surround sound audio setups. Matt Jordan, whose ensemble has also utilized video and lighting as performance elements, also believes that deeper computer setups will become necessary and expected as the demand for a greater audio and visual performance becomes standard. Jordan believes that ensembles will need redundant setups, or “two mirrored computers that prevents a computer crash from affecting the show.” (Jordan).

CHAPTER 5: CONCLUSION

I have been a fan of drum corps, marching bands, and indoor drumline since I was young enough to remember. I went to shows as young as five years old, and have watch the activity adapt and change over the last twenty-some years. In that time, I have witnessed amplification, synthetics, sound stage elements, and now vastly different visual elements like video and lighting, become the norm within the activity, and groups try to develop new concepts to consistently redefine that activity.

On the one hand, marching bands and drum corps have changed. They have grown and evolved over time to attract a new and younger audience. Electronics have been one of the major players in allowing this shift to take place. While young people, in any form of the activity, are able to learn the basic (and some advanced) tenants of musicianship, dedication, conditioning, and leadership, their ensembles are able to create elaborate and unforgettable performances that leave audiences sitting on the edge of their seats asking no other question but 'how?'.

The activity, and its patrons, have grown. Electronics have contributed greatly to this growth and evolution, and will no doubt continue to do so. Nearly every marching band, indoor drumline, or drum corps in existence is now using some form of electronics to enhance their performance. Of those included responses, all admitted to using electronics in performance, not only to stay relevant to the activity, but also for the incredible opportunities provide therein. The 'sonic playground', the amplification with use of better technique, the possibility of sample materials for conceptual enhancement, and the ability to provide a new visual element with video and lighting

are just some of the many ways that ensembles are utilizing technology in their performances today. As time goes on, no doubt the activity will continue to redefine itself, moving on to bigger and better tools that allow performances to be even more expansive. It seems that electronics in the marching arts are here to stay, and it seems that nearly all those affected, students, staff, designers, and audiences, are onboard.

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