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INTRODUCTION OF THE DUNCAN TECHNIQUE, A NEW EIGHT-MALLET TECHNIQUE
BASED ON THE STEVENS METHOD, THROUGH EXERCISES AND A NEW WORK FOR
MARIMBA

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This document is dedicated to my family. Thank you to my parents, Troy and Suzanne, my siblings, Aubrey, Bryson, and Hayden, and my extended family for supporting me through performances, lessons, rehearsals, and practice.

A special thanks to my wife Emily for helping me through one of the most challenging times in our lives. This document would be impossible without her steadfast encouragement.

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I am grateful for researchers, instructors, composers, and performers that engage with extended multiple mallet techniques. I am not alone in my fascination of these techniques or the belief that they hold a meaningful place in the keyboard percussion repertoire, much of which has yet to unfold. Our contemporary grows every year, and I am excited by the prospect that this document may play a role in these techniques' growth.

A special thanks to you, the reader. My hope is that you will find this document and technique a worthwhile contribution to the discipline, joining me in championing extended multiple mallet techniques.

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ABSTRACT

This document introduces a new Stevens-based eight-mallet technique for keyboard percussion, the Duncan technique. The limited body of eight-mallet literature reveals an equally limited pool of performers and composers, none of which utilize a Stevens-based technique. My new technique offers additional range, increased individual mallet independence, and a direct transfer of pre-existing coordination from the four-mallet Stevens technique in the form of mallet pairs. This is a distinctively effective feature in the transfer from four to eight mallets that is absent from traditional and Burton-based approaches. Exercises written for the development of this technique are included and organized by physical function, like the foundational text and exercises presented in Leigh Howard Stevens's *Method of Movement for Marimba*. A technical analysis of my new piece, *Stalactite, Stalagmite, Column*, demonstrates the efficacy of double-single independent strokes, double-double laterals, and dense eight-mallet rolls. These techniques, among others to be discussed in the document, are innovative applications of the technique's distinctive mallet pairs.

CHAPTER 1: INTRODUCTION

Introduction

When I learned the four-mallet Stevens method for front ensemble in the eighth grade, the new possibilities afforded to me seemed limitless. I evidently played more often than my classmates, as I eventually developed bloody callouses in between my middle and ring fingers. Fortunately, I learned to manage the weight and tension of the mallets more effectively with help from my teacher and no longer injured myself while playing, but recounting this memory demonstrates my immediate passion for keyboard percussion.

In undergraduate study, the notion that six-mallet performance was possible piqued my interest further, and I sought out the six-mallet equivalent of the Stevens method. My teacher knew of Kai Stensgaard's YouTube channel, and I learned by watching his videos.¹ The study of Keiko Abe's *Itsuki Fantasy for Six Mallets*² using this technique proved too taxing for me, and for the first time in my life, I had to set a piece aside after attempting to learn it. Despite the blow to morale, this was not the end.

In the second year of doctoral study, I returned to the piece and performed it in a solo recital with the same technique. This was a primarily physical triumph rather than a mental, note-learning one. I then wrote a comparative analysis of the traditional/Burton (crossed) and Stevens-based (non-crossed) six-mallet techniques in relation to the piece for a class taught by one of my committee members, Dr. Vivian Luong. The class, entitled *Theorizing Musical Bodies*, showed me how to think of all bodies involved in the music making process. This includes the composer,

¹ Kai Stensgaard, YouTube channel, accessed May 30, 2026, <https://www.youtube.com/channel/UCwbpy-J3QTJ88oLYpQHJJA>.

² Keiko Abe, *Itsuki Fantasy for Six Mallets*, (Xebec, 1993).

performer, and audience, but also the composition, the instruments, the implements, and others. The mindset shift towards physicality and performance practice as inherently meaningful expanded my horizons. The conclusion of my paper was conflicted by the independence and interval spread Stevens-based multiple mallet techniques offer, and the ease of power production and lack of fatigue over time Burton and traditional-based techniques offer. I concluded that marimbists seeking to perform the widest variety of repertoire ought to be versed in both a crossed and non-crossed six-mallet approach, depending on the strengths of the technique in relation to what each piece calls for. As a result of the paper and its conclusion, I became well acquainted with a variety of six-mallet approaches.

This led me to experimentation to find an approach that would satisfy both the advantages of the Stevens method as well as the strength and longevity of crossed grips. The desire was not for stubborn insistence on using the Stevens method as a basis, but for others like me that think of the Stevens method as their “home technique.” In other words, a catch-all six-mallet approach that has immediate transfer value from its analogous four-mallet technique, without any downsides.

All the seeds had been planted for such a breakthrough. Once while improvising with six mallets, the addition of a fourth mallet in each hand fit nicely into place, my hands responded well to dynamic interval control, and at the end of the session, I was not exhausted. I had wandered into my theorized catch-all technique with full interval spread and solved a known but undefined problem in the process, imbalance of the six-mallet iterations solved by mallet pairs with eight. Burton and traditional-based six-mallet grips have no such imbalance, since the weight is evenly distributed, meeting in one part of the hand. Stevens-based six-mallet techniques have an imbalance of two mallets in one part of the hand, with one mallet in the other

part of the hand. With this new eight-mallet approach, maximal interval spread is achievable, fatigue is minimized, direct transfer from the Stevens method is maintained, and an additional mallet is added as a bonus. This document is the synthesis of and answer to a variety of puzzles that had previously prohibited a successful Stevens-based eight-mallet method.

Purpose of the Study

The use of extended multiple mallet techniques has steadily gained traction over time in the world of keyboard percussion.³ Extended multiple mallet techniques include the use of five or more mallets at a time.⁴ Various scholars have documented the progression of extended multiple mallet use over time in dissertations and theses, specifically in the work of Timothy Jones, Marcus Reddick, Joseph Porter, and Tyler Kulp.⁵ Given that the history has been well documented by these, the document will instead focus on the development of the Stevens-based eight-mallet approach through exercises and the musical application of techniques through the example of a new piece.

The study of the technical resources available to the keyboard percussionist reveals a lack of specific materials written for eight-mallet keyboard percussion. Though method books exist for two, four, and six-mallet playing, eight-mallet techniques are primarily adopted to suit the needs of the individual player in repertoire and are not currently focused on developing technical foundation through exercises and/or etudes.⁶ This document seeks to provide players that are

³ Evidenced in the literature review of chapter two, driven by an interest in creating resources for these techniques.

⁴ Timothy Jones, "A Survey of Artists and Literature Employing Extended Multiple Mallets in Keyboard Percussion: Its Evolution, Resulting Techniques and Pedagogical Guide" (Doctoral diss., University of Nevada, Las Vegas, 2003), iii, ProQuest Dissertations & Theses Global.

⁵ See "Theses and Dissertations Providing Background History and a 'New' Technique" subsection of chapter two.

⁶ The use of eight-mallet techniques has been almost exclusively by composers for their own works with their own techniques. See commentary on Tyler Kulp's thesis in chapter two for composer/performers. Jane Boxall, notably, performs extended multiple mallet works of others, but the others all play their own music.

inexperienced with extended multiple mallet techniques in general, including a lack of experience with six-mallet playing, with actionable steps to develop technique that works for their anatomy. A broader purpose is to encourage the use of extended multiple mallet techniques in general, including in large and chamber ensembles, which are comparatively few in example but untapped in potential. Widespread adoption of these techniques is dependent upon codification through text and/or method books, composers' utilization in repertoire, and performers providing visibility. These strategies have found success for four and six-mallet techniques.⁷

Need for the Study

My new Stevens-based eight-mallet technique offers the greatest individual mallet independence and largest controlled interval spread of all eight-mallet approaches. An impressive angle beyond 180° between the outside mallets is achievable. With the cross-grips, the maximum interval spread is less than 180°. It also remedies the fatigue issues of six-mallet Stevens-based iterations caused by weight imbalances in the hand by balancing the load distribution in pairs of mallets. The increases in control afford unforeseen musical possibilities, leading to improved functionality in works that demand mallet independence and interval spread, and open the door for future compositions that explore these parameters.

A Stevens-based eight-mallet technique also fills a clear gap in technical resources for the keyboard percussionist, evidenced in Table 1.1. The table includes the three primary approaches to four-mallet playing, each with analogous six and eight-mallet approaches. There have been many iterations of six-mallet techniques on each branch of four-mallet technique; the names

⁷ Evidenced in the widespread adoption of the three main four-mallet techniques and the growth of six-mallet techniques alongside method books and repertoire. See chapter two for specific literature supporting this.

listed below each technique are practitioners with fundamental innovations and/or significant alterations to the techniques used as a basis, solving the greatest number of issues among approaches on that branch of technique, and/or serving as the basis of an eight-mallet artist's technique. The literature review of chapter two points to sources that provide more comprehensive lists of artists, particularly in the work of Timothy Jones and Tyler Kulp. It must be mentioned that in Tyler Kulp's thesis describing his Burton-based technique, "Exploration of Eight Mallet Keyboard Percussion Techniques," he offers two potential eight-mallet Stevens technique adaptations, as well as similar ten and twelve-mallet Stevens adaptations, but deems them impractical for serious use.⁸ These attempted adaptations will be discussed as well, specifically in relation to the newly proposed approach in this document.

The years listed beside artists' names align with their method books and/or published works utilizing their approaches. The timeline is readable top-to-bottom then left-to-right, with a few exceptions. Keiko Abe actively used a traditional-based six-mallet technique as early as the 1960s, but her first publication utilizing the technique was not until 1993. The Burton and Stevens branches feature two artists each, with slightly different approaches that are all used and/or credited as eight-mallet bases. With eight-mallet techniques in relative infancy, the first artists to propose a serviceable technique for each basis are listed. As the literature review will demonstrate, subtle variations among players in the eight-mallet category distinguish them beyond their bases.

⁸ Tyler Kulp, "Exploration of Eight-Mallet Keyboard Percussion Techniques," (Master's thesis, Indiana University of Pennsylvania, Indiana, 2014), ProQuest Dissertations & Theses Global, 25-30.

4-Mallet Technique (Technical Basis)	6-Mallet Technique	8-Mallet Technique
Traditional (developed independently in Africa, South America, Asia)	Abe (Active in 1960s, published <i>Itsuki Fantasy for Six Mallets</i> in 1993)	Albert (2001)
Burton (1970)	Paterson (1992), Porter (2013)	Kulp (2014)
Musser-Stevens (1979)	Stensgaard (1980), Gronemeier (1994)	Duncan (2025)

Table 1.1. A list of six and eight-mallet practitioners organized by four-mallet technical basis.⁹

No method books currently exist for eight-mallet playing. Though not a typical method book, this document seeks to promote this new approach in the same way a method book codifies a technical approach with thorough explanations of physical positions and movements, exercises, and musical applications of the material. Further innovations may lie in waiting for extended multiple mallet techniques to become more viable, with concurrent or eventual support of a method book, in the form of other six or eight-mallet techniques and beyond.

A prevailing attitude toward eight-mallet playing is for the extremely small number of players to simply figure out what works best for their body, which contrasts with the mostly uniform application of techniques in the typical two and four-mallet curricula. However, the adoption of method books written specifically for eight-mallet techniques would change this attitude. The eight-mallet method will develop just as the Burton and Stevens methods did, where commonly used techniques became standardized in *Four Mallet Studies*¹⁰ and *Method of Movement*, respectively.¹¹

⁹ Years are derived from the publication info listed in the sources found in the bibliography and literature review.

¹⁰ Gary Burton, *Four Mallet Studies* (Boston: Berklee Press, 1970).

¹¹ Leigh Howard Stevens, *Method of Movement for Marimba* (Asbury Park, NJ: Keyboard Percussion Publications, 1979).

Limitations of the Study

The study of extended multiple mallet techniques is relatively new. Serious attempts to perform with five or more mallets have slowly become more commonplace in the last half century, but the pool of performers, composers, and teachers that utilize extended multiple techniques is still small in comparison to the body of keyboard percussionists that utilize two or four-mallet techniques only. More time will need to pass before there is enough information on the physiological effects of widespread adoption of extended multiple techniques.

It will also take more time and experimentation with these techniques before a discussion of these techniques' role in the undergraduate keyboard percussion curriculum, graduate study, and beyond higher education is available. Data could be compiled in the future once methods for eight mallets are readily available to percussionists at these various points of entry. The acquisition of four-mallet techniques, for instance, occurs earlier in student percussionists' development. It is driven by a growing body of accessible resources for the building of technique in marching and concert band, percussion ensemble, and social media.

This document only makes claims in reference to the efficacy of this technique on the marimba, though specific applications for other keyboard instruments are a worthy topic of future research.

Design of the Study

The introduction of the author's new Stevens-based eight-mallet technique is the primary goal of the document. Chapter two provides context by citing related literature that details the history of the discipline and/or introduces another "new" approach to the discipline at the time of writing for each document. Examples of extended multiple mallet techniques in articles, method

books, and performances demonstrate the growth of these techniques over time, but not to the extent of two and four-mallet techniques. In other words, the related literature shows there is both an interest in the topic and a need for further research. Next, in chapter three, detailed descriptions of my new technique and its specific benefits will be given. In chapter four, exercises organized by stroke type will assist in acquiring the technique. This will begin with referencing the analogous techniques in the four-mallet Stevens method, followed by the novel coordination afforded in the eight-mallet adaptation. In chapter five, selected portions of an eight-mallet piece by the author will be discussed. The piece was written specifically for the application of the technique, and this document will demonstrate musical applications of the techniques outlined in the descriptions of chapter three and the exercises of chapter four. Finally, topics for future research will conclude the document in chapter six.

CHAPTER 2: RELATED LITERATURE

Introduction

A great variety of media exists for the promulgation of six-mallet techniques and repertoire, including theses and dissertations, method books on six mallets, articles on extended multiple mallet techniques, video and audio recordings of performances and tutorials, and a repertoire list for extended multiple mallet works. Eight-mallet techniques are less popular and appear less frequently in the above resources but are typically mentioned alongside six-mallet techniques or repertoire. The standout omission among media is the method book for eight mallets. Today's students, percussionists, and scholars have access to the resources listed below with relative ease, allowing for these techniques to surge in popularity. The chapter is organized by media type for direct comparisons for six and eight-mallet technique treatment.

This literature review has three goals. The first is to establish a dual interest and need for research for extended multiple mallet techniques in a wide variety of media, accomplished by comparing the wealth of resources available for six mallets to the scattered information available for eight mallets. The second goal is to use six-mallet literature as a model for the promotion of eight-mallet techniques. Finally, to review existing eight-mallet approaches to compare to my technique.

Repertoire for eight mallets comes almost exclusively from the creators of their individual techniques, which is another significant reason for the disparity among six and eight mallet visibility. Without intimate knowledge of these techniques, it is difficult for composers to write for them. The solution is detailed explanation through texts like this document. The relative

simplicity and transfer value from the four and six-mallet Stevens iterations makes my technique even easier to write for.

Theses and Dissertations Providing Background History and a “New” Technique

In this section I will focus on the innovations and minimize restating the history and technical pioneers’ contributions to the disciplines. There are two doctoral dissertations that advocate for a Stevens-based six-mallet technique, the Gronemeier technique. The authors of the master’s theses argue for their personal Burton-based techniques, the six-mallet Porter and eight-mallet Kulp techniques, respectively.

The first, a doctoral dissertation completed in 2003, was written by Timothy Jones, entitled: “A Survey of Artists and Literature Employing Extended Multiple Mallets in Keyboard Percussion; Its Evolution, Resulting Techniques and Pedagogical Guide.” His document provides ample historical information regarding the evolution of various iterations of six-mallet techniques, based on the traditional, Burton, and Stevens approaches. Photographs and explanations of each, organized by keyboard percussion artist, are included. He defines “extended multiple mallet techniques” as “keyboard percussion performance involving the employment of more than two mallets in one or both hands.”¹² He includes a repertoire list of solo and chamber works that utilize extended multiple mallet techniques with short descriptions of each piece. He also argues for the development of the six-mallet Stevens-based technique his dissertation advisor Dean Gronemeier created through a pedagogical guide with exercises.¹³ Jones’s dissertation is a foundational text for extended multiple mallet techniques, representing

¹² Jones, “A Survey of Artists and Literature,” iii.

¹³ Jones, “A Survey of Artists and Literature,” 31-45.

an intentional shift towards the legitimacy of performance and pedagogy with these techniques in academia and beyond.

In Marcus Reddick's 2004 dissertation, "A Pedagogical Approach to Six-Mallet Independence for Marimba,"¹⁴ he provides a more comprehensive pedagogical guide for developing a six-mallet Stevens-based technique. He uses anatomical descriptions of technique that inform exercises with greater specificity, with considerations for the rest of the body and sound production. He also analyzes a five-movement work for six mallets written by Dean Gronemier, *Five Short Works for Marimba (six mallets)*, detailing musical applications of the technique. This is a more focused dissertation, zooming in specifically on applications of the Gronemeier method, rather than the more general survey of history and repertoire offered by Jones.

Joseph Porter's master's thesis, "A New Six-Mallet Marimba Technique and Its Pedagogical Approach"¹⁵ was written in 2013, and it includes a new six-mallet Burton-based technique, technical exercises, and an updated repertoire list for six-mallet marimba. The repertoire list includes a leveled progression for the development of techniques over time, as well as video performances of significant compositions for six mallets.¹⁶ In my search for a catch-all six-mallet Stevens-based technique, Porter's technique seemed to be as close to a "perfect" six-mallet approach as was currently available, limited only by the inherent interval spread limits of cross grips. Independence and power are achieved with great fluidity in his approach, and his

¹⁴ Marcus Reddick, "A Pedagogical Approach to Six-Mallet Independence for Marimba," (DMA diss., 2004), ProQuest Dissertations & Theses Global.

¹⁵ Joseph Porter, "A New Six-Mallet Marimba Technique and Its Pedagogical Approach," (Master's thesis, University of Lethbridge, 2013), ProQuest Dissertations & Theses Global.

¹⁶ Ibid, 61-78.

advocacy for six mallets, and percussion in general through his extensive YouTube presence is admirable.

Finally, in Tyler Kulp's 2014 master's thesis, "Exploration of Eight Mallet Keyboard Percussion Techniques," serious attempts at performing with eight mallets are documented. He includes the work of Ludwig Albert, first mentioned in Jones's dissertation for his eight-mallet traditional-based technique, Fiona Pui-yee Foo, who employs another traditional-based eight-mallet technique, Jane Boxall, who uses a traditional/Burton-based hybrid eight-mallet technique, and Kulp's own Burton/Paterson-based technique. He also analyzes Ludwig Albert's *Marimba Moods II* and his own work, *Passing*, as performed with his eight-mallet approach.¹⁷ Kulp's work occupies a similar space as Jones's. He summarizes many of the important artists and their techniques, now including more eight-mallet artists, as a serious attempt to demonstrate the validity of these performance practices and compositions.

Kulp also includes two eight-mallet adaptations of the Stevens technique in his document, although both are deemed unusable. The Stevens-based six-mallet technique is the foundation, with added mallets in the grouping with the thumb for one suggestion, and the added mallet with the pinky alone in the other, leaving the previously outermost mallet to be held with the ring finger alone. The first attempt exacerbates an imbalance of load in the two parts of the hand with a three-to-one ratio of mallets. The second entrusts the full weight of a mallet to both the ring and pinky finger on their own, another imbalanced ratio of two-to-one-to-one in different contact areas.¹⁸ He continues, creating adaptations for his Burton-based approach in ten and twelve-mallet forms, as well as his Stevens-based adaptations in ten and twelve-mallet forms. All

¹⁷ Kulp, "Exploration of Eight-Mallet Keyboard Percussion Techniques."

¹⁸ Ibid, 25-7.

four approaches, whether crossed or uncrossed, rely on the full responsibility of a mallet in both the ring and pinky fingers, which make them especially cumbersome to manipulate and fatiguing. He concedes that interval control is virtually non-existent, and that the disadvantages far outweigh the advantages for any musical applications.¹⁹ Time will tell whether anyone can proceed in the manner of Jones and Kulp with a ten mallet focused survey of performers and repertoire.

Method Books for Six Mallets

Several method books for six mallets have been written for vibraphone, marimba, or both, in a variety of languages. The first six-mallet method book was written in 1981, by Lionel Hampton and Jean-Claude Forestier entitled *The New Vibraphone Method*.²⁰ It includes illustrations and vibraphone-oriented sticking patterns. *6-Mallet-Compendium*, written in 1995 by Mark Andres Giesecke and Wessela Kostowa covers both vibraphone and marimba performance considerations in German text.²¹ Zeferino Nandayapa writes about the Mexican style of marimba performance in two, four, and six-mallet settings, in *Método para marimba*, written in Spanish in 1998.²² Available in both Polish and English since 2007, Karol Szymanowski's *The Six-Mallet Technique for the Vibraphone. Pt. 1* separates the techniques into two functions, chords and melody.²³ Most recently, Kai Stensgaard advocates for his Stevens-based technique in *The Six Mallet Grip*, written in 2009.²⁴ Evidently, method books for six-mallet playing have existed in various forms for decades, all around the world. They are listed

¹⁹ For pictures and descriptions of these adaptations, see his document, 28-30.

²⁰ Lionel Hampton and Jean-Claude Forestier, *The New Vibraphone Method* (Zurich: Edition Hug & Co., 1981).

²¹ Mark Andres Giesecke and Wessela Kostowa, *6-Mallet Compendium* (Edition Swiss Music, 1995).

²² Zeferino Nandayapa, *Método para marimba* (Mexico City: Dirección General de Culturas Populares, 1998).

²³ Karol Szymanowski, *The Six-Mallet Technique for the Vibraphone, Pt. 1* (Wydawnictwo Uczelniane, Akademia Muzyczna im. Feliksa Nowowiejskiego, Bydgoszcz, Poland, 2007).

²⁴ Kai Stensgaard, *The Six-Mallet Grip* (Aarhus: self-published via MarimPercussion, 2009).

here to demonstrate the broad interest in the endeavor in contrast with the lack of method books for eight mallets.

Articles on Extended Multiple Mallet Techniques

Articles on extended multiple mallet techniques are also plentiful, demonstrating academic interest prior to Jones's historic compilation. Wesley Bulla introduces a variety of approaches with specific musical applications in "A Study in Expanded Five- and Six-Mallet Solo Vibraharp Techniques Part 1 and 2", in 1991.²⁵ Dean Gronemeier first introduces his technique, including detailed hand positions through his system of locks and manual push/pull in "Six-Mallet Independence: A New Twist on an Old Idea" in 1996.²⁶ Rebecca Kite's 2008 "Six Mallet Writing for Marimba" describes her six-mallet grip through descriptions, pictures, and musical examples.²⁷ These articles are included to demonstrate interest in extended multiple mallet techniques in forms beyond dissertations and method books.

Dissertations that Analyze Six-Mallet Repertoire

Though not for eight mallets, there are three dissertations that are relevant to this document because they reflect on how technique influences musical decision making for the performer and composer. These include the 2005 "Extended Multiple Mallet Performance in Keyboard Percussion Through the Study of Performing Techniques of Flame Dance and Water Fairies by Wan-Jen-Huang" by Pei-Ching Wu²⁸, Yi-Hsuan Llin's 2015 "Six-mallet Technique in

²⁵ Wesley Bulla, "A Study in Expanded Five- and Six-Mallet Solo Vibraharp Techniques Part I and II," (*Percussive Notes* 29, no. 3 (February 1991): 47–50), (*Percussive Notes* 29, no. 4 (April 1991): 72–73).

²⁶ Dean Gronemeier, "Six-Mallet Independence: A New Twist on an Old Idea," (*Percussive Notes* 34, no. 6: December 1996), 41–45.

²⁷ Rebecca Kite, "Six Mallet Writing for Marimba," (*Percussive Notes* 46, no. 3: June 2008), 50–57.

²⁸ Pei-Ching Wu, "Extended Multiple Mallet Performance in Keyboard Percussion Through the Study of Performing Techniques of Flame Dance and Water Fairies by Wan-Jen Huang," (DMA diss., West Virginia University, 2005), ProQuest Dissertations & Theses Global.

Selected Marimba Solos From 1998 to 2011 by Bruce Hamilton, Andrew Thomas, Evan Hause, Noah Taylor, Marcos Cabezas, Robert Paterson, and Pius Cheung,”²⁹ and Andrew Michael Lynge’s 2017 “An Analysis of Itsuki Fantasy for Six Mallets by Keiko Abe with a Guide to Six-Mallet Technique.”³⁰ All three include a discussion on technique choice, highlighting the fluidity and advantages/disadvantages of six and eight-mallet technique choice in contrast with the relatively more formulaic technique choice of four-mallet playing. The analyses also demonstrate the efficacy of these techniques in performance, further validating this type of study.

In written literature, media primarily exists for the explanation and promotion of six-mallet techniques, and eight-mallet techniques ought to follow suit through the already successful pathways demonstrated above. That is, analyses of eight-mallet works and technical explanations through articles, theses/dissertations, and/or method books. Audio and video recordings exist for both six and eight-mallet techniques, but eight-mallet techniques primarily exist in this sphere rather than the written word and shall be the primary focus in the remainder of the chapter.

Recordings, Video Resources, and Repertoire List

Various audio and/or video recordings exist of six and eight-mallet performance and/or instruction. Ludwig Albert presents *Marimba Moods II for solo marimba (8 mallets)*,³¹ the first published work for eight mallets, on his *Marimba Paraphrases: 6 and 8 mallets* album of 2001.³²

²⁹ Yi-Hsuan Llin, “Six-mallet Technique in Selected Marimba Solos From 1998 to 2011 by Bruce Hamilton, Andrew Thomas, Evan Hause, Noah Taylor, Marcos Cabezas, Robert Paterson, and Pius Cheung,” (Doctoral dissertation, University of Illinois, Urbana-Champaign, 2015), ProQuest Dissertations & Theses Global.

³⁰ Andrew Michael Lynge, “An Analysis of Itsuki Fantasy for Six Mallets by Keiko Abe with a Guide to Six-Mallet Technique,” (DMA Lecture Recital Document, University of Texas, Austin, 2017), ProQuest Dissertations & Theses Global.

³¹ Ludwig Albert, *Marimba Moods II for solo marimba (8 mallets)* (Beurskens Muziekuitgeverij, 2001).

³² Albert, *Marimba Paraphrases: 6 and 8 mallets* (Marimba Projects, 2001)

Jane Boxall's 2012 album *Zero to Eight Mallets: A Progressive Method for Multiple Mallet Technique* includes works that each utilize a different number of mallets, from zero to eight.³³ Joseph Porter released *Six Mallet Technique Diversified: A Comprehensive Book and DVD to Learn Six Mallet Marimba Technique* as a method book with video companion that walks through his technique and exercises.³⁴ Finally, Kai Stensgaard has a heavy web presence advocating for six mallets, including an updated version of the repertoire list initially listed in Jones's dissertation on his website³⁵ and various resources on his YouTube channel.³⁶

Social Media Performances

In 2026, the novelty of extended multiple mallet techniques performs well on social media platforms, such as Facebook, Instagram, YouTube, and the like. The rapid spread of information has proved helpful to the research process in this area, with a seemingly limitless quantity of content found on these platforms. Group activities, particularly with the younger generations of performers, such as marching band, drum corps, and percussion ensemble have undoubtedly aided in the spread of these techniques as well on these platforms as part of the social experiences of these activities. My colleagues, knowing my interest in the topic, have sent me a variety of artists employing extended multiple mallet techniques, helping sift through the large pool of content. Of the social media content demonstrating eight-mallet techniques, none of them employ a Stevens-based eight-mallet technique like the one proposed in this document.

³³ Jane Boxall, *Zero to Eight Mallets: A Progressive Method for Multiple Mallet Technique* (United Kingdom, self-published, 2015)

³⁴ Joseph Porter, *Six Mallet Technique Diversified: A Comprehensive Book and DVD to Learn Six Mallet Marimba Technique* (Porter Publications, 2013)

³⁵ Kai Stensgaard, *Kai Stensgaard* (YouTube channel, Accessed 2/13/2026, <https://www.youtube.com/channel/UCwbpy-J3QTJ88oLYpQHJJA>).

³⁶ Kai Stensgaard, "Works for Six Mallets," (*Kai Stensgaard — marimba & aluphone artist*, accessed 2/13/2026, <https://kaistensgaard.com/works-for-six-mallets/>)

Social media examples range from a click baiting, challenge-like and/or satirical archetype of “Can I Play the Marimba with Eight Mallets?!” to more serious uses of a specific technique they have developed or learned. This document focuses on the latter, though a YouTube search with the hypothetical title can lead one to examples of the former as well.

Jonathan Neal posted a video in 2014 entitled “8 Mallet Technique for Marimba” that effectively describes his Burton adaptation for eight-mallets, with an orientation from the palm down towards the keyboard of 4-3-2-1. He states that one should find a piece of music they enjoy preparing the technique for, tack on practice little by little, and implicitly, to use the technique they are most comfortable with as a basis, as he does for the Burton grip.³⁷ The video is an exceptionally efficient delivery of the technique and beneficial for direct transfer from Burton to Paterson/Porter (six) to his technique. For individuals that are set on using the Burton grip as the basis of their eight-mallet technique, this video is an excellent primer.

In February of 2026, Yiukwong Chung posted boldly to Instagram with the caption, “6-mallet and 8-mallet will put 4-mallet away. The time has come.” In the video, there is text that says “8-mallet Independence Fundamental Technique” overlaying him playing rippled arpeggiations in the right hand, followed by showing the bottom of his hand to capture the orientation of the mallets.³⁸ To my surprise, he seems to be implementing one of Kulp’s Stevens adaptations, specifically the two-to-one-to-one ratio iteration. That is, two mallets in an inside pair as in Gronemeier (six), then individual mallets held by the ring finger alone and the pinky finger alone. This adaptation, both Kulp and I agree to be impractical. Perhaps “the time has

³⁷ Jonathan Neal, *8 Mallet Grip for Marimba* (YouTube video, Accessed 5/14/2026, <https://www.youtube.com/watch?v=OL2FqrfR6k8>).

³⁸ Yiukwong Chung, “6-mallet and 8-mallet will put 4-mallet away. The time has come,” (Instagram video, Accessed 5/14/2026, <https://www.instagram.com/p/DUYvG20Ehli/>).

come” for individuals to invest in the inherent physical challenge extended multiple mallet techniques require, rather than asserting that the technique he is using is sufficient in addressing the issues of eight-mallet playing. Though this is not explicitly stated, the claim is strong and elicits this response. I respectfully disagree and offer my approach as a more efficient endeavor for more applications. I also do not think six or eight-mallets will ever “put four-mallets” away, as percussionists still use two mallets regularly.

Finally, Alexey Chizhik has posted regularly on his social media pages regarding his five-eight-mallet techniques. He shows a vibraphone application in the left-hand of the eight-mallet, crossed-grip technique in a short-form YouTube video, “The technique of 8 sticks. Latin jazz Montuno. Alexey Chizhik vibes.” In this video, he appears to be using a rubber band between mallets two and three, allowing for interval changes to be achieved with different applications of tension to it.³⁹ Elsewhere he has described merely holding them in his hands without any additions. The technique lays the mallets in order from closest to the palm down towards the keyboard, 4-2-1-3, a configuration different from Kulp’s descriptions of Albert and Boxall’s crossed grips, 4-1-3-2 and 7-8-6-5 (2-1-3-4), respectively.⁴⁰ He has ample videos of performances on his Facebook and YouTube pages that show his Burton/traditional hybrid grip in action. My main critique remains the same for all crossed grips; the lack of complete interval spread the Stevens foundation affords. Similarly, transfer value of the same kind from the Stevens method to my approach is absent for his more involved grip. The crossed grips’ mallet orientations are more complex in their orientating than the functionally similar mallet pairs of my proposed technique. The separation of the pairs also limits the mental taxation and increases

³⁹ Alexey Chizhik, “*The technique of 8 sticks. Latin jazz Montuno. Alexey Chizhik vibes*,” (YouTube video, Accessed 5/14/2026, <https://www.youtube.com/shorts/jOREC7QRFPO>).

⁴⁰ Kulp, “Exploration of Eight-Mallet Keyboard Percussion Techniques,” 17-19.

controlled independence, given the manipulation of one mallet need not influence the three others.

Though social media provides visibility for eight-mallet techniques, increased written literature with more comprehensive instructions, applications, exercises, and the like are necessary to continue pushing the discipline to equal footing as four and six-mallet techniques.

Adjacently Related Dissertation, Anatomical Survey of Four-Mallet Techniques

Though not necessarily concerning extended multiple mallet techniques, a vocabulary for the anatomy of the fingers, wrist, hand, and arms is helpful in navigating the subject. It is also fruitful grounds for future research concerning extended multiple mallet techniques specifically. Technique choice/usage is often subjective, situational, and/or dependent upon one's teacher or resources. Kyle Bissantz argues for a baseline physical and contextual knowledge of each of the three major techniques regardless of one's primary technique(s) in his 2023 dissertation, "Get a Grip: An Anatomical Survey of Four-Mallet Grips for Solo Marimba."⁴¹ Though not explicit in his work, the knowledge points to future discussions on mallet techniques, their widespread effects over time, and helps draw comparisons among the techniques in four, six, and eight-mallet iterations. His document mirrors my initial interest in this sphere, as a comparative analysis of the different multiple mallet techniques. A document engaging with the six and/or eight mallet approaches from an anatomical standpoint would be invaluable future research. Another related document examining propensity for injury based on technique choice would also be of value. Does the use of six and eight-mallet techniques only increase one's risk of injury, or

⁴¹ Kyle Bissantz, "Get a Grip: An Anatomical Survey of Four-Mallet Grips for Solo Marimba," (DMA Project, University of Nevada, Las Vegas, 2023). ProQuest Dissertations and Theses Global.

do the added stresses with proper recovery time strengthen one's ability to play with any number of mallets?

CHAPTER 3: EXPLANATION OF THE DUNCAN TECHNIQUE

Technical Foundation in *Method of Movement*, The Stevens Method

During one of many experimentation sessions I have had with extended multiple mallets, the use of an additional mallet held in a cross grip with the outer mallet in each hand felt surprisingly comfortable and easy to reproduce. Upon the realization that the hand could evenly balance two similar pairs of mallets, in the same manner as the four-mallet Stevens technique, I proceeded in earnest with developing as many applications for the technique as possible, leading to this document.

The new technique builds upon the knowledge and coordination involved in playing with a four-mallet Stevens technique. *Method of Movement* should be read in conjunction with this document for the most effective acquisition of the new approach. Stevens anticipates advances in the art of playing the marimba but makes a point of emphasizing the benefits of studying basic mechanics in service of any development of technique or greater demands of application.⁴² This document recognizes the Stevens approach and the method of movement it requires as fundamental to the success of this extended multiple mallet technique.

The technique functions in pairs of mallets independently divided in the hand where the individual mallets are held in the four-mallet Stevens technique. This is the first independent eight-mallet technique, in contrast to previous iterations as crossed grips, in the same way the Stevens technique is the primary independent technique of the four-mallet techniques. It must be recognized that the Stevens method was developed using the Musser technique as a basis.

⁴² Stevens, *Method of Movement*, 2.

However, it is very rare for performers to use the Musser approach instead of the Stevens technique today.⁴³

Companion Video

This chapter explains each technique thoroughly. However, a video companion to the dissertation is posted using the link in the footnote⁴⁴ and bibliography. The video cuts through the dense language and clearly shows the connection among the mallet pairs, Stevens, and Burton techniques, which may be sufficient to get started.

I include visual demonstrations of building the inside and outside pair, the pairs' connection to the Stevens and Burton methods, the vertical offsets needed for single independents and verticals, double-single independent strokes, quadruple verticals, double-single alternating strokes, double-double laterals, loose and offset multiples, one-handed/independent rolls for four mallets in one hand as well as the outside mallets alone, and as a bonus a sextuple vertical with the twelve-mallet adaptation described in chapter six. Reference the video before or during acquisition of each technique.

Hand Anatomy Terms

Background anatomical and technical terms are helpful for clarity and consistency when discussing technique. The common names for the fingers and thumb will be used, corresponding to standard piano fingerings. Therefore, the thumb is 1, the index finger is 2, the middle finger is 3, the ring finger is 4, and the pinky finger is 5, applying to both hands. In addition to referencing the joints in figure 3.2, common descriptions such as the flesh, pad, and tip can provide greater

⁴³ Emily Tannert Patterson and Josh Gottry, "Playing with Four Mallets: How to Hold Them," PAS blog post, posted April 19, 2021, <https://pas.org/pas-blog/playing-with-four-mallets-how-to-hold-them/>.

⁴⁴ Cameron Duncan, "*Stevens-Based Eight-Mallet Dissertation Companion Video*," YouTube video, posted by Cameron Duncan, June 30, 2026, Accessed June 30, 2026, <https://youtu.be/cwzfkAHdZRQ>.

specificity. Flesh is used to describe portions of the skin that use muscular or fatty tissue to serve as consistent contact points as reference in contrast with the flat portions of skin that correspond with a joint. The pad refers to the flesh of the distal bone on the palmar side. It is the wide part of the finger/thumb where the finger or thumb print is found. The tip is the flesh found between the nail and the pad of each finger at the point of the nail. Finally, when discussing placement, “inside” refers to the portion of each finger that is oriented towards the center of the body when in playing position, and “outside” refers to the portion of each finger oriented away from the center of the body when in playing position. The opposite is true for the thumbs.

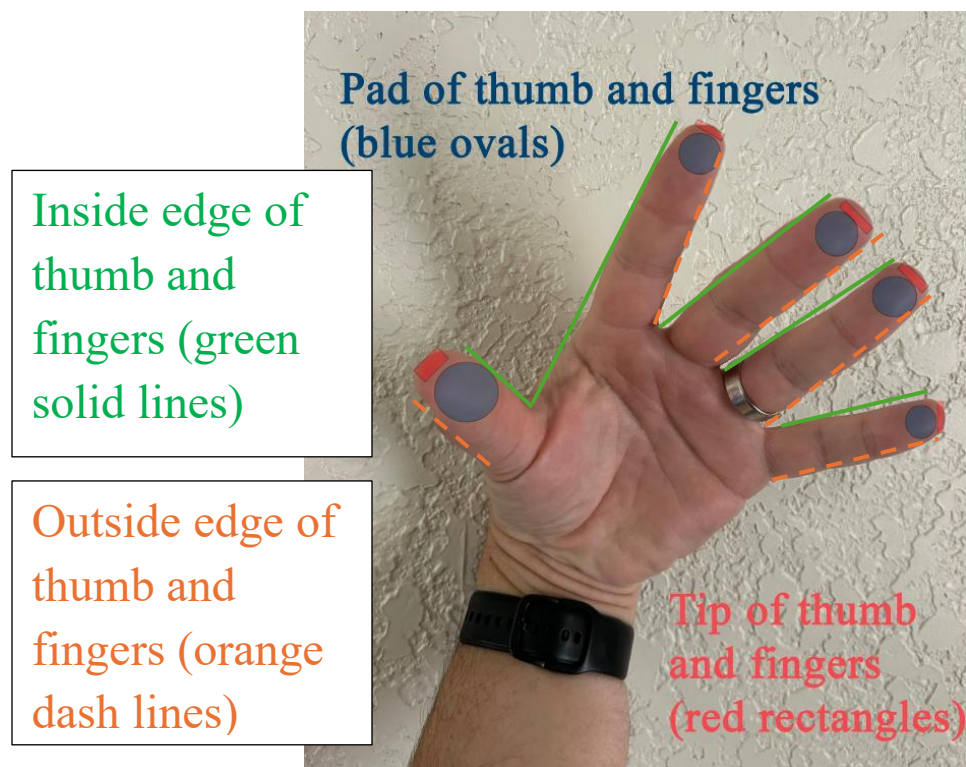


Figure 3.1: Pad, tip, and inside/outside edge placement on the left hand.⁴⁵

⁴⁵ Photo taken and edited by author.

Eight-mallet techniques are typically labeled as 1-8 in Arabic numbers, beginning on the low end of the keyboard from the viewpoint of the performer and moving to the high end. A thorough discussion on mallet numbering occurs later. At times, very specific anatomical instructions are given when building or manipulating the technique. The image below provides the names for the joints and bones of the hand, from the perspective of looking at the palm of the left hand.

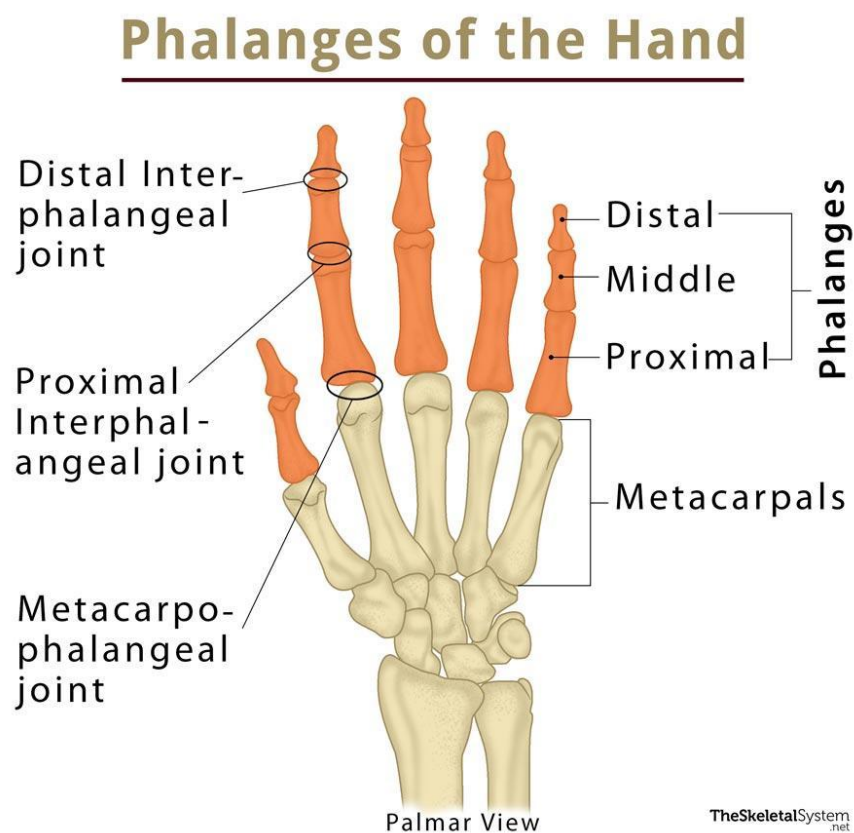


Figure 3.2: Bones and joints of the hand.⁴⁶

⁴⁶ The Skeletal System: “Phalanges,” Image, (Accessed March 24, 2026.
<https://www.theskeletalsystem.net/wp-content/uploads/2018/08/Phalanges.jpg>)

Alignment, Planes of Motion, and Three Dimensional Space

Alignment is a common concern in discussing and using this technique and must be defined clearly. The performer, mallets, and marimba exist in a three dimensional space, limiting the efficacy of “vertical” and “horizontal” as descriptors. When unclear, lines and/or planes of motion are specified. “Vertical” is consistent throughout the document, referring to the distance of the mallet heads or shafts above the playing surface. This is movement along what I will refer to as the “y-axis.” “Horizontal” is situational, referring to what I will call the “x-axis” and “z-axis.” The x-axis runs the length of the keyboard from the lowest bars to the highest, laid out from left to right from the performer’s perspective. Discussions of interval sizes, octave designation, and the like are along this line of motion. The z-axis extends in front of the performer, more useful when discussing the upper shelf of accidental notes compared to the lower shelf of natural notes. To that end, z-axis alignment is frequently coupled with the y-axis difference in height of the accidental bars above the naturals. Compensation along the y-axis when discussing alignment across the z-axis is thus understood unless otherwise specified. Finally, the “horizontal plane” refers to a combination of the x-axis and z-axis in position, fixing a mallet or mallets in a vertical orientation along the y-axis. Maintaining vertical alignments therefore allow for movements to occur within the horizontal plane alone.

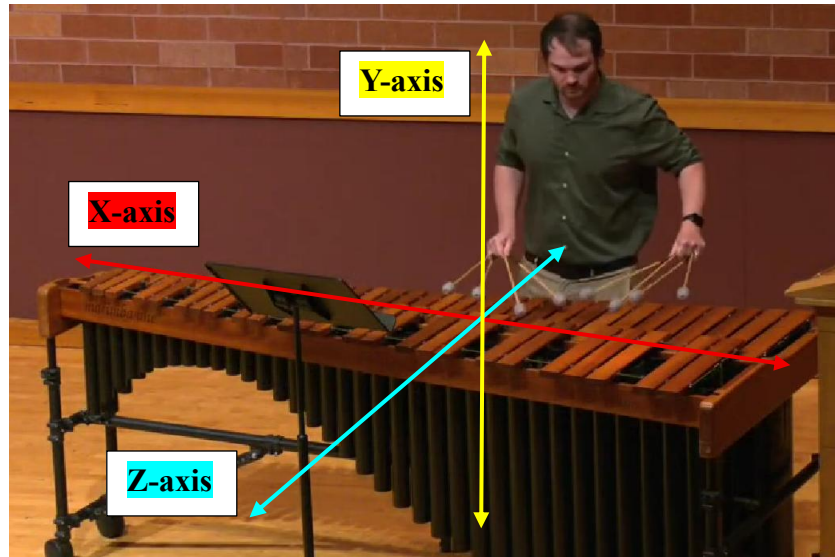


Figure 3.3: Axes used in this document.⁴⁷

It was brought to my attention that the vertical axis in mathematics is typically labeled as the z-axis, rather than the y-axis in my framework, and vice versa. Given the limited frequency that the z-axis in my framework is used, it made sense for it to be the last to be labeled. In other words, playing the marimba mostly involves striking the instrument up and down across the range of the keyboard, moving through two primary axes, x and y (which would be x and z in the mathematics framework). The occasional adjustment towards the accidentals and away from the performer as a third z-axis (y in math) lead me to this distinction intuitively. My apologies for any confusion this may cause while reading. Figure 3.3 is consistent with the document.

The changing bar size from the low end of the keyboard to the high end may change the experience from one instrument to the next but is a consideration marimbists should already be cognizant of. The descriptions in this document assume technical acquisition beginning near the center of the range of the instrument, where the exercises are notated. For applications beyond this baseline range, manipulations in the horizontal plane are augmented as the pitches trend

⁴⁷ Photo taken and edited by the author.

towards the low end and diminished as pitches trend towards the high end. This consideration does not apply in the x-axis on instruments with consistent bar widths (width meaning the space taken by a given bar along the x-axis) such as the typical vibraphone but still apply in the z-axis since bar lengths (length meaning space taken by a given bar along the z-axis) change across the range. Most electronic mallet instruments have bars of consistent width and length across the full range, so such considerations are also not applicable to them.

Mallet Choice

One potential barrier to eight-mallet performance is the need for eight mallets to be of equal or near equal weight, hardness, and length. It is rare for a keyboard percussionist to have eight of any one kind of mallet. It is more common to have four of any one kind at most, which, in practice, is actually two pairs of matched mallets, meaning there may be subtle differences between mallet pairs or even individual mallets under the highest level of scrutiny. Fortunately, the difference is negligible or easily managed in most situations when using four or more mallets in performance. Playing with two sets of four in the same series and one degree of hardness away, or even a combination of four-two-two, two-four-two, or two-two-four with one degree of hardness between each grouping is still effective. For the premiere of my new piece, *Stalactite*, *Stalagmite*, *Column*, I used a set of four of the same hardness in the left hand, then a pair one degree harder in the right hand inside pair, and another pair another degree harder for the right hand outside pair: four-two-two. Mallet choice is an area that has tremendous potential, including more extreme graduations, or use of differing implements on multiple instruments. This document only concerns itself with either an ideal set of eight matched mallets, or more practically, combinations of groupings of four or two with minimal graduation of mallets to hone a uniform, foundational sound on the marimba specifically.

Stevens advocates for the use of birch shafts instead of rattan shafts to compliment his relatively flexible technique with shafts that are inflexible.⁴⁸ I have found success with both rattan and birch shafts, but birch shafts can make double-single independent and alternating strokes easier as the unit moves with less flexibility. In contrast, the loose or offset multiples may be better serviced with the flexibility of rattan shafts. Players may choose whichever approach they find most effective for each musical situation.

Mallet Wrapping

The subtle sound of a stick click between shafts of each pair is occasionally noticeable, as with any crossed grip where the shafts are in near constant contact. The lack of this click in the four-mallet Stevens approach is attractive, so I sought out a means of negating it in my eight-mallet iteration. Using tennis tape as wrapping for mallets 2, 4, 5, and 7, the vertically lower shaft in each pair has a bed of material that minimizes the clicking sound. In most cases, it is completely removed and can only be heard with the most drastic of impacts in which the sound of the keyboard drowns it out from the audience's perspective. Close, sensitive microphones will be able to pick up even subtle clicks, so mallet wrapping should be done with extreme care to minimize as much click as possible. The added wrapping does change the width of the mallet shaft, which can potentially make shifts more difficult, but has never been enough to hinder my ability to play. The gripping tennis tape also aids in mitigating fatigue from clutching and making locks for the outer pair easier as well. I initially wrapped all eight mallets, but the increase in width made shifting too cumbersome. My proposed wrapping solution works well for my experience, but if the subtle clicking sounds are of no concern to you, you do not need to wrap

⁴⁸ Stevens, *Method of Movement*, 107.

the mallets. Other materials may be effective for wrapping beyond tennis tape as well, including the ability to wrap all eight if the material is thin enough.

Building the Technique, Inside Pair

A six-mallet Stevens adaptation is utilized to begin, accounting for the inner pair. The contact points may shift slightly to accommodate changes in interval, but the basis for supporting the weight is maintained from the Stevens approach. In his dissertation Timothy Jones instructs, concerning the inside pair of the Gronemeier technique, “Add the third mallet (mallet 4) underneath and crossing mallet 5,”⁴⁹ which would be mallets 5 and 6 in the right hand of the eight-mallet technique. The same is done for the mirrored left hand for mallets 3 and 4.

Build the left-hand inner pair as an example. You may find the video companion particularly helpful in this process. Mallet 2 in four-mallet Stevens remains in its position but will become mallet 3 with eight mallets. Receive an additional mallet crossed and under this mallet with your index and middle fingers, holding the new mallet in a similar manner, occupying the position of mallet 4. Greater specificity follows below.

Assuming the eight-mallet approach for the remainder of the section, all four mallets, 3 through 6, connect with the palmar flesh of the thumb surrounding the metacarpal as a hanging point at the butt end of the mallets. Mallet 3 and 6 will contact the flesh of the thumb above mallets 4 and 5, closer to the thumb for mallets 3 and 6 and closer to the center of the palm for mallets 4 and 5. The cross of the mallets is just outside of the palmar contact points, about 0.5 to 2 inches away from the butt ends of the mallets, meaning their contact points will shift slightly as intervals change, but will always be supported with the flesh of the thumb. Each mallet hangs

⁴⁹ Jones, “A Survey of Artists and Literature,” 86.

down from this primary contact point parallel to the keyboard and rests on the inside of either or both the index or middle finger, depending on interval size. The apparatus should be supported with the middle finger regardless of interval size, which may not always be obvious when attending to interval size.

For instance, in Figure 3.4, a comfortable interval of a third in the left hand will have mallet 3 visibly touching the inside skin of the proximal interphalangeal joint and mallet 4 touching the inside skin of the distal interphalangeal joint. In this example, support is provided first with the palmar flesh of the thumb, next with the proximal interphalangeal joint of the middle finger for mallet 4, then at the cross point of the mallets for mallet 4 to support mallet 3, then finally at the contact points of each mallet on the joints of the index finger. Removing the support on the middle finger causes unnecessary tension to build on the index finger that can otherwise gracefully be balanced among multiple contact points as described. The thumb will rest on top of the apparatus but need not exert force until a stroke is implemented.



Figure 3.4: Contact points for a third formed with the inside pair of the left hand.⁵⁰

Generally, resting on joints allows for the greatest amount of control to let the mallets naturally settle, though it is not a requirement. The mallets can freely roll along the middle and index fingers as in the original four-mallet Stevens technique to accomplish intervals.

Figure 3.5 could be considered an extreme use case where utilizing a joint can make an otherwise unruly interval possible. The palmar contact points are implemented as usual, though unusually spread over an inch apart. Next, the pair is upheld by the distal interphalangeal joint of the middle finger via contact with mallet 4. The cross point supports mallet 3 normally. Mallet 3 meets the inside of the index finger, spread across the skin of the middle phalange, situated between proximal and distal joints. The thumb is placed in a nuanced way, primed for a single independent stroke with mallet 4. Rather than the pad of the thumb, the outside edge of the distal bone near the nail would provide for the greatest ease of operation due to the presence of mallet 3 requiring support from the base of the thumb simultaneously.

⁵⁰ Photo taken by author.



Figure 3.5: Extreme use case of a large interval using the inside pair of the left hand.⁵¹

Up to this point in describing the inside pair, the thumb has played a passive role. Aside from the palmar flesh of the thumb as the basis, supporting the weight of the mallets does not depend on the thumb until strokes are implemented, an assumption made when comparing with the Gronemeier technique.

The technical considerations of the Gronemeier technique generally apply, with one clarification. Jones lists two approaches related to the stroke actions of the inside pair. They involve leaving the thumb on mallet 2 or 5 of the six-mallet approach, or applying a movable Stevens technique, moving the thumb between mallet 2 to 3 or 5 to 4 as needed.⁵² In my eight-mallet approach, the thumb is used in the activation of two basic types of strokes: single independents, and double-single independents. The pad of the thumb, or other parts of the thumb as in Figure 3.5, can be used in the activation of independent strokes for mallets 3-6 individually using a movable Stevens technique. Alternatively, the thumb can be used to apply pressure to

⁵¹ Photo taken by author.

⁵² Jones, "A Survey of Artists and Literature," 89.

mallets 3 and 4 or 5 and 6 evenly to achieve inside double-single independent strokes. These strokes will be elaborated on in their own section later in the chapter but are relevant in their deviation from the six-mallet basis as a pair of mallets that function similarly to that of a single inside mallet of the four-mallet Stevens technique.

A final note for the inside pair in comparison with the outside pair. The inside pair ought to be thought of as hanging and freely manipulable from all positions. The palmar flesh of the thumb and gravity are sufficient to support the complex movements involved in the inside pair. Tension introduced with the thumb downwards onto the index and middle fingers should be reduced as much as possible to maintain relaxation and mitigate fatigue. The outer pair, though it can still be operated smoothly, is held with greater firmness. Mallets 2 and 7 occupy the initial positioning of mallets 1 and 4 of the four-mallet Stevens method and should be mostly stationary (in terms of interval changes) while the outermost mallet moves for interval changes.

Building the Technique, Outside Pair

The outer mallet pair is a novel component of the technique that originated from my experimentation session. It resembles the Burton grip and can easily be constructed by starting with four-mallet Burton, then shifting the exit point of the mallets between the ring and third finger, held with the ring and pinky fingers. This is shown visually in the video companion. Where the index finger is used in the typical Burton grip for fine tuning interval spacing, the pinky finger can be used for similar manipulations, albeit tucked toward the palm rather than extending out from the hand. For the left hand, the outermost mallet, mallet 1, will be closer to the palm above mallet 2.

Stevens includes an exercise for the development of the back fingers, suggesting to “Attempt to scratch an imaginary itch in the first joint of (the ring and pinky fingers) with the tips of (these fingers)...Repeat until it doesn’t itch anymore.”⁵³ In the spirit of his humor, I suggest “scratching” the complete range of motion of these two fingers without holding them, as if you have poison ivy. In seriousness, both fingers are now responsible for the supporting of two mallets rather than one, with constant support from the ring finger, and increased activity from the pinky for interval manipulation. The pinky finger ought to be used to “scratch” on its own as well, to support this additional responsibility by building speed, power, and independence from the ring finger.

The shafts of the mallets exiting the back of the hand may be greater than the eighth of an inch recommended for the typical Stevens method’s outer mallets.⁵⁴ This change more closely resembles the Burton grip, and mallets can even utilize different lengths for manual pulls that allow for access to diverse chord shapes. For learners, I recommend starting with one inch for both, followed by subtle experimentation depending on context and/or one’s preferences/body. In practice, slight adjustments within the range of one to two inches works best, possible with manual pushes/pulls of the mallets and adjustments to beating spots on the bars.

The pinky and ring fingers hold the outer pair of mallets just below the crossing point, where the shafts exit the hand towards the keyboard. In the left hand, mallet 2 is held with the proximal interphalangeal joint gently pressed against mallet 1, which in turn is held firmly against the palm at the exit point from the hand, between the metacarpophalangeal joints of the middle and ring fingers. The interval spread can be manipulated both smoothly and/or with locks

⁵³ Stevens, *Method of Movement*, 14. The finger names have been changed from the original for consistency across the document.

⁵⁴ *Ibid*, 10.

as desired with movements of the pinky while the ring finger supports the outermost mallet consistently in contact with the pad or outside edge of the ring finger's distal bone.

The locked positions are helpful in giving a general guideline for the manipulation of the intervals. In a closed position as in Figure 3.6, yielding an interval of a second, both fingers can wrap around both mallets, with the pinky nearly able to wrap in and touch the palm. In Figure 3.7, to lock a third, the tip of the pinky can press firmly against the outermost mallet. Figure 3.8 demonstrates a fourth. The tip of the pinky can wedge between the two mallet shafts touching the palm, locking in contact with both shafts. Pulling back towards the other knuckles of the pinky allows for even wider intervals.



Figure 3.6: Locked position of a second in the outer pair of the left hand.



Figure 3.7: Locked position of a third in the outer pair of the left hand.



Figure 3.8: Locked position of a fourth in the outer pair of the left hand.⁵⁵

⁵⁵ Photos taken by author.

Holding Eight Mallets, General Striking, Neutral Positioning

After building each pair individually, the player should spend some time considering each hand as a complete unit made up of balanced pairs, which in turn, are balanced within themselves in a neutral position. For my hands, this neutral position means the least amount of tension is felt with both pairs resting in a nearly identical interval of roughly a third in the upper register of the marimba. They are separated by roughly a third in the lowest octave of space between the two pairs, a slightly larger gap than a consistent stacked-third seventh chord shape if the distance between all the mallet heads were to be nearly the same. In my hands, there is a slight horizontal, z-axis misalignment in the outer mallet heads of each pair, 1, 3, 6, and 8, extending further out from the body compared to their paired counterparts. The inner pair is also extended further from the body than the outer pair. Due to differences in hand size and shape, others may have natural resting points that align more or less closely with a consistent stacked-third seventh chord shape and/or an even fanning of their mallet heads. Individuals will need to consider potential misalignments in their most relaxed positions. Subtle remedies to these misalignments come at a virtually negligible cost. If alignment is a consistent issue, sticks of different lengths can be used.

Given the nature of the marimba being organized in upper and lower shelves, corresponding to the accidentals and naturals, respectively, mastery of alignment is critical to playing notes of the same hand at the same time. Players should experiment with chord shapes across the full range of the marimba and interval changes in each pair to get a sense of their own body's mechanics before concerning themselves with stroke types and exercises.

Once the pairs feel natural as units, similar to the individual mallets of the Stevens technique, players should begin experimenting with strokes, referring to descriptions of each individual stroke type in the succeeding sections.

A piston stroke is advised for all stroke types as a general rule. This means that a stroke will proceed from a height that directly correlates to the desired dynamic, strike the bar(s) in the specified manner, then recover to the initial position if the note is followed by rests, or the next position if followed by additional notes. The goal is to limit the amount of wasted energy lost to prepping a stroke that can simply proceed downward, halting a stroke after striking and discouraging the natural rebound of the stroke, and/or implementing excessive motion beyond the height needed for the next stroke or return to the baseline height. Though non-piston strokes are possible, they are only to be used to produce a musical effect, since general playing without a piston stroke leads to these energy losses. Energy lost with eight mallets has a higher cost since the overall weight is double that of four mallets.

Numbering System Using Individual Mallets and Mallet Pairs

Typically, mallets are numbered in four, six, and eight-mallet configurations from left to right above the keyboard with Arabic numerals. However, mallets are also referred to in terms of relative positioning in each hand as well. Four-mallet techniques therefore include “outside” mallets that correspond to mallets 1 and 4, and “inside” mallets as 2 and 3. This kind of terminology becomes more complex with eight-mallet techniques, but a two-part label can still accomplish the same goals. Refer to the location of the pairs first, then the individual mallet’s relation to the hand, presuming a hand has been designated. The terms are best demonstrated with a table:

Relative Position	“Outer-Outer”	“Outer-Inner”	“Inner-Inner”	“Inner-Outer”
Corresponding Mallets, Left Hand	1	2	3	4
Corresponding Mallets, Right Hand	8	7	6	5

Table 3.1. Two-part relative positioning of mallets.

Though these distinctions work, in practice the system is cumbersome and defeats the purpose of quick, spatial relation between hands. My advisor, Dr. Connor Stevens (no relation to Leigh Howard Stevens) proposed a naming convention that rightfully connects the concept of the mallet pairs to the standard Stevens method. In our conversations we discussed the way the typical system is serviceable, but lacks this critical connection on its own, and stacks of notes labeled in the same way as piano fingerings can get messy quickly. To supplement, pay homage to Leigh Howard Stevens’s foundation, and aid in reading, I propose the use of Roman Numerals to represent the mallet pairs from lowest to highest. Therefore, permutations could be labeled using a combination of Arabic and Roman numerals to toggle between techniques with ease and lessen the characters on the page without losing information. While Roman Numerals already have an association with tonal harmony, this is not something that is often included in a publication, and the naming convention could be reinforced with a legend or the table below in the score. The table demonstrates the clarity of this distinction and allows players to make quick spatial relations.

Mallet Pair	1 and 2	3 and 4	5 and 6	7 and 8
Roman Numeral	I	II	III	IV

Table 3.2. Roman Numeral numbering of mallet pairs.

Furthermore, the coordination involved in these mallet pairs is nearly identical to performing with the permutations of the four-mallet Stevens technique. Any permutation

exercises are easily transferable. Reading with the new system intuitively matches the pairs' numerical values to the values of individual mallets in the four-mallet system.

Another valid critique is the combination of using the pronoun “I” with the pair, “I” in written text. In this document, I simply use the former normally and where needed specify “the pair, I.”

Single Independent Strokes, Double-Single Independents

The use of four mallets in each hand requires multiple approaches to single independent strokes, with their operation centered around the positioning of the other mallets. Individual mallets are all accessible for single independents, as well as what I am calling “double-single independents.” This new stroke type involves the motion of a single independent, but two mallets strike at the same time in a pair of mallets in the same part of the hand. The technical foundation of the Stevens method allows for direct transfer of coordination for all mallets in terms of stroke activation and sound production. *Method of Movement* is sufficient in describing the physical actions in a broad sense. For the activation of a single independent stroke with two mallets in one hand, the non-playing mallet is functionally the axis of rotation and should remain relatively stationary aside from the spin of the shaft/head about the axis. The playing mallet is thus moved via rotation of the wrist and forearm.⁵⁶

In applying this principle to four mallets in one hand, with attention to the unused mallets it is the essentially the same. The key transfer from four to eight mallets is that the non-playing pair will now serve as the axis of rotation, with three effective forms. Using a single shaft as an axis of rotation is easiest to visualize but does not necessarily make it the most efficient in all

⁵⁶ Stevens, *Method of Movement*, 27.

cases. The player may designate one of the two mallets in the axial pair for some passages and the other for slightly different ones. The third option for an axis of rotation is the midpoint in space of the pair where the weight is evenly balanced in that part of the hand. One could think of an imaginary third shaft extending through the middle of the pair from the crossing point in the hand. All three options can be executed smoothly by using as small of an interval as possible for the axial pair, to minimize wasted energy with the sympathetic wobbles of the non-playing mallets. If a passage uses consistently large intervals to be played in the axial pair following single independents in the opposite pair, holding the large interval open is preferable in terms of energy consumption.

Using pairs as axes allows for double-single independent stroke activation with ease, wherein one pair's mallets are played simultaneously using the axis of the other pair with any of the three options, though the midpoint of weight in the axial pair is easier to understand in the context of double-single independents. This motion matches the four-mallet Stevens method's intention cleanly by replacing the two mallets of the hand from the four-mallet approach with pairs in identical roles in the eight-mallet approach.

One must ensure that the two mallets in each pair strike at the exact same time. To access double-single independents that do not align vertically from a relaxed position, a slight firming of the hold on each pair can allow the player to feel the sticks as a unit rather than individual mallets. This move capitalizes on the crossing nature of the pairs, as they can be influenced from a single point in the hand, where the shafts meet. The transfer value from the Stevens method allows for smooth motion in double-single independents in general, lowering the cost of added tension required for the alignment of some intervals.

For true single independents, the other mallet in the pair that is playing is still a problem. The performer must isolate each individual mallet by moving the non-playing mallet in its pair up and out of the way. Once these careful placements are mastered, individual mallet independence is achievable.

On the left hand, beginning with mallet 1, relaxing the tension on mallet 1 and holding mallet 2 as one would with the typical Stevens method is a simple way to call on previously acquired coordination. Relax the pressure from the pinky that typically pushes mallet 1 towards the palm to position mallet 1 to rotate about the inner pair's axis. Mallet 1 is the most natural single independent of the four.

Mallet 2 is the least natural, but that does not defeat this approach. Uses for this mallet to execute single independents in future repertoire would not and need not be exhaustive regardless of its shortcoming. This is to say, the problem facing eight-mallet composition has not been mallets 2 and 7 all along, but rather lack of introduction of a balanced, full-interval spread eight-mallet approach with detailed descriptions to accompany it. Hence this text. Mallets 2 and 7 require the careful moving out of place of all three of the other mallets, including the axial pair, which causes the greatest amount of tension among the four single independent strokes. To begin, push the shafts of the outer pair against the palmar metacarpal flesh of the ring and pinky fingers, orienting mallet 2 offset from mallet 1 closer to the playing surface. Next, lift the axial pair up above the horizontal plane of mallet 2 using the index and middle fingers. All mallets will need to be held firmly to ensure only mallet 2 is played. To facilitate this stroke, considering mallet 4 as the axis of rotation is the best of the three options, though all three are still possible.

Mallets 3 and 4 function similarly, and both can be used to play single independents two ways. All four strokes involve the movable Stevens technique, shifting the thumb to the desired

mallet to be played. The first approach allows for strokes to be implemented with either mallet by firmly grasping the inner pair's apparatus using the thumb, index, and middle finger with an offset in height relative to the playing surface and moving about the other pair's axis, more closely following the Stevens method. For mallet 3 to play, the index finger will be the main operator in pushing the shaft of mallet 4 above the playing area of mallet 3, with the butt end of mallet 3 seated lower in the palm than usual. For mallet 4 to play, the thumb will be the main operator, pushing down slightly on mallet 4 with greater tension on the middle finger to achieve the offset of mallets. Alternatively, the thumb can push down on either mallet to be played while the other mallet in the pair is allowed to move freely. This option has a more limited range of motion, and in practice should incorporate a bit of rotation about the outer pair as well so that the load is not isolated to the thumb only to prevent buildup of fatigue over time.

Individuals should experiment with single independents as they relate to one's own body. With the fundamental knowledge of axes of rotation and management of offsets, individuals may find their own physical cues to achieve single independents with greater fluidity.

Single Alternating Strokes, Double-Single Alternating

Stevens makes a simple, effective case for his method of movement for single alternating strokes. The core idea is that of dependence, rather than independence, and it remains true for eight mallets.⁵⁷ In single alternating strokes, the two mallets are alternated in succession without regard for the positioning of the other mallets, given that the two playing mallets perform with the desired dynamic levels achieved by manipulating the axis of rotation between them and the necessary offsets to ensure the other mallets do not accidentally play.

⁵⁷ Stevens, *Method of Movement*, 30-31.

Any *grouping* (to distinguish from *pairs*) of two mallets in opposite pairs can achieve single alternating strokes by moving about an axis of rotation somewhere in the space between them. In the left hand this includes 1 and 3, 1 and 4, 2 and 3, and 2 and 4. Additionally, it is possible for 1 and 2 to work, or 3 and 4, though they are both extremely limited dynamically as one or both mallets is almost always very close to the axis of rotation, and/or the cost of offsetting the non-playing mallets is too great.

Certain groupings work better than others due to the axes of rotation available and the cost of offsetting the non-playing mallets. The greater the distance from each mallet to the axis of rotation created between them has an impact on the ease of achieving louder dynamics. In the case of 1 and 4, for instance, the natural positioning of this grouping affords moderate to loud dynamics easily in the range of about a fifth to a tenth. The physical cost of offsetting mallets 2 and 3 in the process of maintaining this alternation is also low, meaning this grouping is especially effective for this technique as well as one-handed rolls with a nuanced approach attending to resonances, shown visually in the video companion. In contrast, mallets 2 and 3 require a more costly offset for mallets 1 and 4 and are closer together. Despite the same theoretical axis of rotation as 1 and 4, their overall dynamic output is weaker. For an example with a slightly imbalanced axis of rotation, one mallet may play louder than the other in a desirable way. If the performer wants to emphasize a bass note in alternation with a softer inner voice, the combination of 1 and 3 may be ideal.

The manipulability of all four mallets in single alternating combinations supplies limitless dynamic voicings ripe for implementation in new literature. This includes the implementation of double-single alternating strokes. Combinations of three- and four-note alternating strokes are achievable via axes of rotations between a pair and a single mallet or both

pairs in alternation. Four-note double-single alternating strokes with an even dynamic distribution across all four voice require the player to treat the pairs as contained units, meaning that enough pressure must be applied so that the transfer of energy is evenly distributed into both mallets of each pair as if they are a single mallet, given that naturally mallets 1 and 4 have a greater distance from the axis of rotation than mallets 2 and 3. If an uneven simultaneous sound is desired, however, the hold on each pair can be relaxed, but the mallets must still be played at the same time. Evenness between all four mallets with this technique is more difficult than evenness achieved with double-single independents, particularly as speed, and thus reliance on the axis of rotation instead of individual strokes, increases.

Non-Pair Double Verticals, Triple Verticals, Quadruple Verticals

Vertical strokes require the playing of two or more non-paired mallets at the same time. Mallets 1 and 2, for instance, would be considered a double-single independent stroke, but 1 and 3 would be considered a non-pair double vertical, executed differently. Using three or four mallets in a single hand at a time requires usage of mallets across pairs, and therefore entails the same physical action, named triple and quadruple verticals respectively. Every vertical stroke is produced by the same movement of the mallets down towards the keyboard from the desired playing height above the keyboard, with motion like the French grip in rotation of the forearm.

Striking the mallet heads on the bars with the shafts perpendicular to the keyboard produces maximum volume. The affordances of dynamics in terms of wrist angle and offsets of mallets due to individual mallet independence is a staple of the Stevens technique and reaps dividends with the eight-mallet approach. Crossed grip approaches do not have the same level of independence, given that the mallet shafts often come into contact with one or more others in the hand, limiting the range of motion. The ability to freely manipulate mallets, therefore, allows for

much greater fine tuning in position for dynamic control, appropriate beating spots, and dexterity of interval changes.

The key to successful vertical strokes is mastery of positioning and/or offsets so that the mallet heads truly strike at the same time. Offsets are achieved with the same procedures outlined in the “Single Independents, Double-Single Independents” section of this document. For an example, the triple vertical involving mallets 1, 2, and 3, requires a vertical offset of mallet 4 held above the horizontal plane of the playing mallets. The fine tuning required includes a firm grip on the outer pair so that the mallets function as a unit and the pulling upward on mallet 4 with the index finger while the thumb pushes mallet 3 to the horizontal plane of mallets 1 and 2.

Multiples: Laterals, Loose Multiples, and Offset Multiples

The next category of stroke type greatly increases the variety of musical applications. Multiples implement a single piston stroke but play multiple notes in succession through various means. The three types correspond to physical actions with specificity. The lateral is linked to the vertical stroke with a rotary motion in non-paired mallets, the loose multiple is linked to the vertical or single independent stroke with a loose grip within a pair or pairs, and the offset multiple is linked to the vertical or single independent stroke with a rotary motion and/or reorientation of striking angles within a pair. Aside from their commonality as being one contained piston stroke, three broader physical resources emerge that correspond to one or more of these techniques: mid-stroke rotation (lateral and offset), initial vertical alignment (all three), and reorientation of vertical alignment (all three).

Laterals

The starting point for multiples comes from the Stevens method in implementation of the double lateral stroke. In the eight-mallet context, a lateral will specifically apply to non-paired mallets occupying the two distinct roles found in the Stevens method, inside and outside, with either one or both mallets in each pair. The two parts of the lateral consist of an inside pair/mallet followed by an outside pair/mallet or vice versa. To paraphrase Stevens, laterals should not look, feel, or operate like either single independents in quick succession or single alternating strokes.⁵⁸ They should begin with the same downward motion as the vertical stroke, with the first to strike held closer to the keyboard, then rotate as in single independents, resulting in contacts with one or two mallets in both mallet pairs with a controlled rhythmic displacement. In short, they begin with the action of a vertical stroke in an offset, rotate in the middle in the striking period, then recover for the next notes to be played. The rotation provides the desired power for the second note, with the axis of rotation in the center of mass of the hand-plus-mallets apparatus. Smaller overall interval spreads are more difficult to generate volume than larger ones. Dynamics are implemented in order of motion. The initial contact is tied to the vertical component and the second contact to the rotational component. I colloquially refer to double laterals as the “two-for-one deluxe special” to students to emphasize the idea that a single piston stroke is used to produce two notes in a four-mallet context. In an eight-mallet context, the “four-for-one deluxe special” could be called the double-double lateral with the naming conventions of the double-single independent and alternating strokes. This lateral involves the motions of the Stevens technique double lateral but consists of a simultaneously striking inside pair followed by a simultaneous striking outside pair in quick succession, or vice versa.

⁵⁸ Stevens, *Method of Movement*, 35.

Multiple Laterals

Multiple laterals consisting of triple, quadruple, and as many humanly possible strokes in succession with one piston motion are possible by simply following through with rotations in opposite directions before the recovery period. A left-handed outside double-triple lateral would thus entail the striking of the pair of mallets 1 and 2 followed by the pair of mallets 3 and 4, then rotating back to strike the pair of mallets 1 and 2 before returning to the starting height.

Loose Multiples

Aside from the multiple lateral, multiple notes in a single stroke are possible through two other procedures: the loose multiple and the offset multiple. Neither of these are new concepts but are considered extended techniques without detailed instructions in past technical frameworks. In practice, they are significantly more difficult and/or limited in application than the simplistic applications of other stroke types due to their variable requirements of grip tension and/or vertical alignment. The intention of this document is to provide the reader with as many resources for the successful implementation of this technique as possible in both performance and composition, so these techniques should not be excluded on account of difficulty.

The loose multiple refers to the loosening of the grip on a pair to allow for the mallets to contact at different times despite being generated from the same vertical or independent stroke. Power is applied evenly to the pair as a unit to the shafts at the crossing point while the gripping portion of each pair responsible for vertical alignment, and thus the difference in timing, should be relaxed. Though this is the basis of the move, some compensatory rotation may assist in playing the mallets evenly. The mind-body connection to various parts of each pair must be well practiced to achieve consistent loose multiples across a variety of interval structures.

Looseness adds a timing variable, where a firmer hold produces more closely timed strikes and a looser hold produces distantly timed strikes. Though there are infinitely many rhythmically closely timed applications, the most extreme, furthest timing of strikes is roughly a quarter of a second before independent strokes are a more reliable method of striking. The lagging of the second strike may stifle the momentum of the initial strike that initially arrives and can cause the two strikes to sound different. Closer rhythmic timing allows for the energy of the rebound of each individual stick to be preserved more efficiently to achieve a more unified sound. When practicing loose multiples, the ear works in tandem with the hands. The player must trust the hands to manipulate the firmness of the grip while the ear guides the sound quality and control.

A loose multiple is beneficial in situations where the rotary motions involved in laterals or offset multiples are more complex or cumbersome. A loose grip on both pairs in the left hand, mallets 1 and 3 primed closer to the keyboard, with the motion of an inside double lateral generates a rippling arpeggiation of mallets 1, 2, 3, and 4 in rhythmic succession. Similarly, a loose grip on both pairs of the left hand, mallets 2 and 3 in an offset closer to the keyboard, with the motion of a vertical generates the multiple of mallets 2 and 3 striking together followed by mallets 1 and 4 together. This sequence of mallets in a single piston stroke context is best achieved with the loose multiple. In theory, an offset multiple could achieve this with a rapid reorienting of the two pairs' striking angles following the contact of mallets 2 and 3, but this is significantly more challenging. Offset multiples, discussed in the next paragraph, are better suited to situations involving rotation of mallets in the same pair, though reorientation is not completely off the table.

Offset Multiples

The offset multiple refers to multiple strikes in succession that are specifically generated in the same pairing of mallets with a rotary motion in the striking period of an otherwise vertical or single independent stroke. This is done by firmly holding a vertical offset of the mallets in the desired pair, then relaxing it during the stroke to allow the mallets to follow through, rebounding normally. The distinction is necessary in technical discussion to demonstrate a nuance specific to eight-mallet contexts involving mallet pairs. Since the Stevens method refers to individual mallets in a four-mallet context that translate to the placement of mallet pairs in the eight-mallet context, a gesture that utilizes a rotary motion in the same pair of mallets is different than a rotary motion that addresses mallets in opposite pairs. The offset multiple operates in the spirit of the Stevens method, but in a manner he never intended since he was not dealing with more than two mallets in one hand. In both contexts the mallets approach the keyboard in a vertical offset, rotate in the striking period, and recover for the next set of notes.

The left-hand inside ripple of mallets 1, 2, 3, and 4 in succession provided as an example of a loose multiple can also be executed as an offset multiple with precise rotation and careful offsetting of mallets in their pairs. This example is analogous to a four-string flourish moving up a stringed instrument such as the violin, where the mallets replace the individual strings and the keyboard itself is the bow. The break in analogy is that the player's role occurs in opposite physical entities, with the flat or near flat bow on the violin playing the vertically offset strings, and with the vertical offsetting of the mallets playing the flat or near flat keyboard. The marimbist's intervention evidently seems more complicated, but it affords more control since the placement of the strings is unmoving and the mallets can be moved with great specificity.

Rotation of the offset multiple is responsible for both the power needed for the desired dynamics (as in laterals) as well as the timing of the successive strokes (as in loose multiples).

Since rotation is responsible for two variables, power and timing, the offset multiple is the most complex of the three procedures and should be used only when the other two options are insufficient, and/or the power generated with appropriate timing is congruent. Rotation from one mallet to the next in the sequence can even change direction, as in multiple laterals. Mastery of offset multiples requires practice with a wide variety of interval structures and experimentation with the rotations necessary to produce desired timing and dynamics.

Multiples in Action, Striking Order Possibilities of Mallets 1, 2, and 4.

Freedom of groupings is possible with multiples with and without regard to pairings using the different methods for multiples. The results of the next example involving all groupings of mallets 1, 2, and 4 performed as a multiple are explained in text in the following paragraphs and demonstrated visually in table 3.3.

	Multiple Procedure: Lateral? Loose? Offset?
1+2 then 4	Lateral
4 then 1+2	Lateral
2+4 then 1	Loose, easier for full sound. Offset, possible with specific rotary power to match dynamics.
1 then 2+4	Offset, easier to align mallets 2+4. Lateral + Loose, mallet 2 meets 4 in a “loose lateral” motion.
1+4 then 2	Loose
2 then 1+4	Loose
1 then 2 then 4	Offset + Lateral, hold in a vertical alignment wedge and rotate evenly. Loose + Lateral, calibrate timing of mallet 2 held loosely with rotation for mallet 4.
1 then 4 then 2	Lateral + Loose, lateral motion operates faster than the rhythmic displacement of mallet 2 as a result of a loose hold.

	Lateral + Offset, lateral motion from mallet 1 to 4 is followed by a subtle change in alignment of outer pair with change in direction resembling a triple lateral. Exceptionally difficult.
2 then 1 then 4	Loose + Lateral, loose portion must proceed rotation of the lateral. Offset + Lateral, overall gesture resembles triple lateral, with outer pair beginning recovery early.
2 then 4 then 1	Loose + Lateral, lateral portion must proceed second contact of loose pair. Offset + Lateral, overall gesture is a triple lateral with reoriented vertical alignment of the outside pair.
4 then 1 then 2	Lateral + Loose, loose portion must match rotary power of the lateral. Lateral + Offset, overall gesture is a triple lateral with robust change in rotation and early recovery of mallet 4.
4 then 2 then 1	Lateral + Offset, hold in a vertical alignment wedge and rotate evenly. Loose + Lateral, calibrate timing of mallet 1 held loosely with rotation for mallet 2.

Table 3.3. Mallets 1, 2, and 4 played as multiples in various ways.

Mallet 3 will thus be held firmly up and out of the way for all multiples in the exercise. It will be helpful to refer to the table, read the corresponding paragraph, then attempt the grouping at the keyboard for each. The example and table will assume that all notes should be played in the same dynamic, so that the benefits and limits of each procedure can be clearly articulated. The description paragraphs are very detailed to capture the nuances of each movement while the table is reduced to the bare minimum required to execute each. Note the cases where both loose and offset multiples are possible, the striking ordering can play a role in which method is easier and/or more effective in accomplishing the goal of this exercise being consistent dynamics. Timing of strokes will therefore be considered variable in service of even dynamics. Another exercise of this nature seeking the most effective implementation of a specific timing or a range

of timings would yield different results. Consistency of dynamics was chosen as the most helpful baseline for players interested in developing this technique, with the more complex variable of timing to be experimented with after a unified sound is achieved. Finally, the perceptions of “easier” or “more difficult” were the result of experimentation with my body and certain techniques may come more or less naturally to others depending on the context. I encourage interested players to create tables with even more specific contexts that introduce new variables such as specifics of intervals, tempi, variable dynamics, mallet head and shaft choice, and the like in their own journey of developing this technique.

The table lists each grouping organized by gesture in the left column, separated with thicker lines in rows and explanation paragraphs. In the right column, the available procedures for each are organized in each cell in order of practicality from most to least. The table is limited to using the same three mallets in one hand for conciseness and ease of reproducibility. Using four mallets in one hand, one may even use all three procedures in a single multiple. In practice, players may prefer not to think too long and hard about the specifics of the procedures and may settle on what looks, feels, and sounds best for each musical situation. Working through the table will, however, equip the player with the maximum means of finding such ideal solutions and provide a foundation to explore new textures to be added to the eight-mallet repertory.

The first option for the grouping is the striking of the outside pair of mallet 1 and 2 grasped firmly in vertical alignment followed by mallet 4 offset below mallet 3. Alternatively, mallet 4 could strike first followed by the pairing of mallets 1 and 2. Both of these options are simply laterals that translate well to the Stevens method.

Multiples involving the succession of mallets in the same pair are possible in this grouping with both loose and offset multiples. For the arrangement of mallets 2 and 4 together

followed by mallet 1, it is easier to treat the initial strike like a double vertical, then to allow the looseness of the outer pair to carry the second strike in the desired rhythm. An offset multiple is also possible with relative ease but will require rotary power to ensure an even sound. The opposite striking order favors an offset multiple instead since it is easier to vertically align mallets 2 and 4 by offsetting in the outer pair before beginning the stroke. A loose multiple is also possible, but mallet 4 will need to meet the arrival of mallet 2 loosely held in its pairing and succeeding mallet 1 via outside rotation. The resulting gesture resembles a lateral that accounts for the timing displacement of mallet 2. This scenario could be called a “loose lateral.”

The final grouping of two contact periods in this exercise involves the outside mallets as one simultaneity against the inner mallet. Mallets 1 and 4 followed by mallet 2 can be accomplished as a loose multiple by holding mallets 1 and 4 in initial vertical alignment and the outside pair loosely. The opposite ordering, mallet 2 followed by mallets 1 and 4, is the same procedure where mallets 1 and 4 are held in vertical alignment and mallet 2 is held loosely with the initial vertical alignments swapped. These examples serve as a reminder and contrast for the role of mallet 3, held firmly up and out of the way in the inner pair while the outer pair is held loosely.

The remaining groupings separate each individual mallet as a distinct contact in succession. They will be listed in separate paragraphs organized by initially playing mallet as a reference aid but are all functionally more complex than the two contact groupings. 1, 2, and 4 in succession requires a loose or offset multiple procedure. Since mallets 1 and 2 are in the same pair and mallet 4 is not, the outline of the gesture is that of a lateral with either a loose or offset multiple in the outer pair to account for the third moment of contact. For a loose multiple, the rotary motion for mallet 4 must match that of the dynamics and timing of the tension held in the

loose outer pair. As an offset multiple, hold the mallets in a wedge formation of vertical alignment, then rotate through the wedge, changing speed as necessary to accommodate the interval structure. The wedge would place mallets 1 and 4 above mallet 2 in vertical space, all held firmly enough to rotate through the shape with even dynamics. For the succession of mallets 1, 4, and 2, the gestures require high speeds relative to the requirements of others in the table. For the loose multiple, the lateral motion from mallet 1 to 4 must precede the impact of mallet 2 that is the result of a loose grip on the outer pair. An offset multiple is technically possible but requires dexterity of the vertical alignment of the outer pair, where the two mallets' vertical alignment swaps in the course of what feels like an outside triple lateral stroke. The impact of mallet 2 occurs closer to the axis of rotation, so extra fervor is required in generating the power needed to match dynamics in the second rotation. Though outside the point of the table, such a situation may better be suited with a true triple lateral using mallets 1, 4, and 1 again in succession, by simply moving the wrist or arm to allow mallet 1 to play the required notes in two locations.

The next two three-contact multiples begin with mallet 2. The first proceeds next with mallet 1, then mallet 4. For the loose multiple, the contact of mallet 1 as a result of the looseness of the pair must proceed the rotary motion required for mallet 4. For the offset multiple, even though mallet 2 is in the same pair as mallet 1, the succession will feel like a modified inside triple lateral in overall rotary motion. Mallet 2 must move out of the way so as not to contact again when mallet 4 is played. It may be helpful to think of the outer pair as beginning its recovery period prior to mallet 4 to move it out of the way more efficiently. In the succession of mallets 2, 4, and 1, the loose multiple requires that the rotary motion precedes the contact of mallet 1. Given that the final contact is the result of a loose grip, this multiple is relatively quick

compared to the others in the table. For the offset option, the outer pair must reorient vertical alignment to allow mallet 1 to contact alone, avoid contacting with mallet 2 again following mallet 4. This gesture is an outside triple lateral. Reorienting the outer pair is relatively easy in this multiple but given that mallet 1 is further from the axis of rotation, care is needed to ensure this mallet is not overpowering the others, making it overall less practical for the purposes of the table.

The final set of three-contact multiples begin with mallet 4. The first proceeds to mallet 1 before mallet 2. To execute with a loose multiple, the contact of mallet 2 in the loose outer pair must match the rotary power of the lateral portion from mallet 4 to 1. To execute with an offset multiple, the gesture resembles a triple lateral with a robust final rotation since mallet 2 is closer to the axis of rotation than the others. Finally, the ripple downward from mallet 4 to 2 to 1 is fairly straightforward. The wedge used in the reverse succession of mallets 1, 2, and 4 can be applied here as well, rotated evenly to match dynamics and timing for an offset multiple. For a loose multiple, the timing of mallet 1 must be calibrated in reference to the rotation from mallet 4 to mallet 2.

Rolls

A wealth of rolls are possible with this document's proposed eight-mallet technique. Rolls provide the illusion of sustained sound at the marimba through a steady or near steady alternation of the designated notes to be sustained. In terms of physical movements, the stroke types listed above are sufficient in providing strokes for most rolls, excluding the mandolin roll. The ear is used to guide the player to an even, smooth sounding sustain of pitches without overemphasizing any one pitch, except in the case where this is desired. In this document, exercises for rolls will be given but will not be exhaustive, as the underlying stroke types will be

more fruitful for overall mastery, including the implementation of rolls. The roll types included demonstrate key features made possible by the eight-mallet technique.

Roll types include the traditional roll, the cracked/rippled “roll,” the “mandolin roll,” and the independent roll. The traditional roll matches the basic definition of a roll best as a steady or near steady alternation between the notes to be sustained, specifically in an alternation of the two hands. This may include both hands alternating on a single bar or as many as eight bars. The limits of sustaining are governed by perception, so it is technically possible to give the illusion of more than eight bars sustaining. To do this, the hands are to change to different locations at the instrument sounding similar enough to the original locations for the collective sound to be perceived as a single homogenous entity. In other words, if the ear perceives a change in the composite sustain, the resulting sound would be considered two rolls in alternation rather than one large roll. Since perception is personal, these two scenarios may be true simultaneously. A sustain using eight mallets is nonetheless a remarkable addition to the repertoire in any use.

A cracked or rippled roll, sometimes referred to as a roll due to the illusion of sustain, is better understood in the framework of this document as a “loose lateral” multiple, where the combined procedures of mallet pairs held loosely with double lateral rotary motion allow the mallets to strike in ascending or descending order, depending on the desired direction.

The “mandolin roll” is a technique that requires the performer to play the underside and top side of the bars in succession to produce a sustain. Though usually performed on a single bar, it can be applied across multiple bars as well. In a four-mallet context the inside mallet will be placed on one side while the outside mallet is on the other, moving the wrist up and down to play. Since this technique is often regarded as extended, players implement the motion in a variety of context-dependent ways including motion of the wrist alone, rotation of the wrist via

the forearm, hinging the forearm at the elbow, and/or motion of the arm generated from the shoulder. Mirroring the original usage of a sustain on a single bar in an eight-mallet context, mallets 2 and 3 or 6 and 7 are best as they are the closest to the original physical motions of the four-mallet context. The mandolin roll has extended applications in the eight-mallet context beyond the seemingly limited uses in four-mallet playing. A one-handed, all-natural (that is, non-accidental notes like the white keys of the piano) four-note cluster can easily be sustained by placing one mallet in each pair on the underside of the keyboard and one mallet in the same pair on the top side. Alternatively, the outside pair can be used on the underside while the inside pair is used on the top side. Using the mandolin roll for a one-handed roll is a viable alternative to the independent one-handed roll that is worth exploring further, especially in a close interval configuration, even if it is limited to natural bars only.

Finally, the independent roll can be used to sustain rolls using a single hand alone on the top side of the marimba, in contrast with the mandolin roll. Stevens insists the independent roll is not to be confused with fast single alternating strokes as the look and feel are entirely different.⁵⁹ Fast single alternating strokes are excellent starting points for realizing the physical movements involved in the independent roll but are indeed insufficient on their own. Even rotation about an axis of rotation occurs in both techniques. The independent roll must be coupled with the ear's sense of what a sustain sounds like to be effective. The perception of rhythm is baked into the execution of single alternating strokes, but rolls strive to give the perception of sustained sound in a broader rhythm made of the composite of all the strokes' resonances. The two techniques are different in their goals, which translate to the way they look, feel, and sound.

⁵⁹ Stevens, *Method of Movement*, 25.

Auxiliary Techniques

Beyond the stroke types, two auxiliary techniques extend the capabilities of the method even further. They are the manual push/pull and advanced mallet reordering. These techniques are helpful in realizing chord shapes that utilize both the upper shelf (accidental notes) and lower shelf (natural notes) simultaneously and in any combination.

Manual Push/Pull

The manual push/pull is a common extended multiple mallet technique wherein the opposite hand is used to push/pull a mallet shaft closer to or further from the keyboard along the z-axis in order to access otherwise impossible shapes with a flat fanning of the mallets. For instance, in a six-mallet context, the shape of a C minor triad in one hand requires a manual pull of the inner mallet towards the upper shelf of the keyboard to play the necessary Eb. Without this pull, playing appropriate beating spots on the lower shelf notes, C and G, is impossible. Alternatively, the two outer mallets could be pushed in with the middle mallet in its standard position. Though this solution requires the pushing of two mallets, it feels more stable. Players should experiment with various options for pushes and pulls with the eight-mallet technique.

The manual push/pull has two drawbacks. Though the mallet to be pushed/pulled otherwise remains in the same place in terms of alignment for horizontal, x-axis interval control, its fulcrum has shifted in an imbalance with the other mallet in the pair and/or hand, making maintaining even dynamics a potential issue. The second drawback is the need to involve the opposite hand to execute the move, which may defeat the purpose for a single use of the desired otherwise “unavailable” chord shape. Third, the support of the mallet has migrated to a less familiar location in the hand. Manual push/pull is most helpful in a passage where the mixed

shape, that is, a combination of upper and lower shelf notes in the same hand, is played repeatedly with time to make the necessary adjustments. Though comparatively difficult to use over regular operation of the technique, they nonetheless afford previously impossible textures.

Advanced Mallet Reordering

Advanced mallet reordering offers another option for mixed shapes, in some cases circumventing the need for a manual push/pull. It should be stated upfront that this technique is limited to mostly vertical strokes, as the mallet shafts must either lock into place and/or are limited in their independence since they are laying over the top of one another. However, inside pair single independents with the thumb-push method are almost always available, and modifications of strokes to accommodate the nuanced hand positions are possible via rotary motion. Despite the difficulty, this technique is monumental in its unlocking of new chord shapes, and its potential is an exciting chapter of performance and composition yet to be written.

To execute the move, consider the following. The inside pair of each hand allows the mallets to sit at a slight downward angle towards the keyboard compared to the outside pair, visible when looking at the technique from the side. The butt ends and shafts of the inner pair are thus up and out of the way of the butt ends and shafts of the outer pair and the mallet heads meet the keyboard at a level or near level height. The seasoned four-mallet Stevens player may recall this feature when attempting an interval of a unison for the first time or having read *Method of Movement*. The technique even permits the user to orient the inside mallet's head over the top of the outside mallet's head, effectively swapping positions.

With the eight-mallet approach, this concept can be utilized to position one or both of the inside pair's shafts over one or both of the shafts of the outside pair, yielding many mallet head

reorderings. The reordering can be solidified with slight opposing pressure up with the outer pair, and down with the inner pair, best serving lockable triple or quadruple verticals. Furthermore, the index finger may pull up on the outer pair to assist with little cost in stability to the inner pair with the strong foundation of the flesh of the thumb and middle finger upheld.

Combined with a manual push/pull, advanced mallet reordering allows access to the remaining chord shapes that were previously impossible in Tyler Kulp's thesis, including mallets 1 and 4 on accidentals with 2 and 3 on naturals, mallets 1, 2, and 4 on accidentals with mallet 3 on a natural, and mallets 1, 3, and 4 on accidentals with mallet 2 on a natural.⁶⁰ The shapes are possible with several reordering/push/pull combinations.⁶¹

The term "advanced" I have chosen to bake into the definition for two reasons. First, the technique should be considered a late skill to be developed in one's journey of acquiring the technique. The index finger, middle finger, and thumb are pushed beyond their already dynamic role into even greater dexterity to accomplish some shapes. Second, though the possibilities are greatly enhanced, chord shapes requiring this technique are taxing to the player, as another (or multiple) source(s) of tension must be added to the hand. When one, and especially both, of the inner mallets are reordered over the top of the outside pair's shafts, the shafts of the outer pair press firmly against the middle finger. With excessive, repeated uses of this specific type of advanced mallet reordering, fatigue can grow quickly. The potential for this technique, however, with proper overuse mitigation, is remarkable.

⁶⁰ Kulp, "Exploration of Eight-Mallet Keyboard Percussion Techniques," 62.

⁶¹ The convention for describing these shapes are discussed on the next page in the paragraph preceding "Extended Techniques." These newly possible shapes are ANNA, AANA, and ANAA.

In the exercises of chapter four, chord shapes for advanced triple and quadruple verticals are labeled with “N” for natural and “A” for accidental, corresponding to mallets to be played in ascending pitch order. An “NNNA” shape would thus entail three mallets (1, 2, and 3, or 5, 6, and 7) playing on naturals and one mallet (4 or 8) playing on an accidental in ascending order. A C dominant seventh chord would be an “NNNA” shape, for instance. Using an “x” indicates where a mallet is to be vertically aligned above the others, not playing. The same C dominant seventh chord shape, omitting the fifth, would thus be an “NNxA” shape, a triple vertical involving mallets 1, 2, and 4, or 5, 6, and 8. Some complex shapes are only available using one or both auxiliary techniques.

Extended Techniques

Keyboard percussion repertoire utilizes a plethora of extended techniques that are enhanced with my new technique. Not to be confused with “extended multiple mallet techniques,” which merely define a technique as having more than two mallets in one hand at a time, most commonly referring to five-plus mallet techniques. They are mentioned in the interest of a comprehensive method for players and composers, answering any notion that holding eight mallets at a time limits the player in execution of them. Being mechanically identical to four and six-mallet performance, I will not include exercises for these. This list is not exhaustive but highlights some of the most interesting applications for eight mallets.

It must be stated that extended techniques may pose a risk to the mallets or keyboard if used excessively, as they by definition push the gear beyond their intended uses. As a break in regular action, part of a musical program, and/or used in a controlled manner, extended techniques can be effective additions to a piece of music so long as the risk of damaging the equipment is avoided or extremely limited.

Glissando, Hammered Glissando

The glissando is an effective technique where the player drags the mallet head(s) across the keyboard along the x-axis or gives the illusion of doing so with a hammered glissando, moving the hands in alternation across the same smattering of notes. The overall effect on the marimba is a rise or cascade of successive pitches. They can be added together to occur simultaneously with more mallets. It is particularly effective using eight mallets, where full chord shapes can be drug across the marimba. With eight mallets, using a glissando across a single octave of naturals for each mallet nets 56 notes in one quick gesture, achievable in a fraction of a second. Across the full range, over 200 notes are possible!

Col legno

Col legno, or playing with the wood/shafts, is another common extended technique. This can be accomplished by either flipping the mallets over or by playing the shafts just below the mallet heads. The second approach is usually ideal to allow smooth transitions between normal playing and col legno, rather than needing to flip the mallets over. The layout of the marimba makes it difficult to play both a natural and accidental at the same time with the second method since the edge of the accidental bars is only practically accessible from the end of the marimba opposite the performer. This limits a chord's construction to two naturals in one hand and two accidentals in the other at the most complex for four mallets. With eight mallets, one hand can play up to four naturals while the other plays up to four accidentals, greatly diversifying the pitch capabilities. Naturally, with hands on the same side of the marimba, you can play up to eight natural pitches or eight accidental pitches at a time as well.

Stick/Shaft Clicking

Stick/shaft clicking is fairly straightforward and self-explanatory. Being able to click four shafts at once or in quick succession allows for some rhythmically and potentially visually interesting uses.

Other Surfaces of the Marimba

Playing on alternative surfaces of the marimba can provide a change in timbre without the need to change instruments. With eight mallets a fuller pitch presence is available with a single hand. Playing on the frame, for instance, along with three other regular notes creates a more percussive chordal sound. On the nodes of the bars, a muted, blocky sound is available with more sound and pitch content than with four or six mallets. On the resonators, a glissando, col legno, or regular strikes can produce another interesting palette of up to eight notes at once.

Dead Strokes

Dead strokes involve the stoppage of the mallet heads on the bars, essentially extending the striking period and eliminating the recovery period of a stroke for effect. Similar to playing on the nodes of the bars, dead strokes create a blocky, muted sound with the natural resonance of the bars stopped by the sustained contact of the mallet heads. Given the lack of resonance, dead strokes can be relatively much quieter than typical playing, but with eight mallets, more volume is achieved more readily than the maximum potential of four or six mallets.

CHAPTER 4: EXERCISES UTILIZING THE DUNCAN TECHNIQUE

Introduction

The following exercises have been written and chosen for the purposes of developing fundamental coordination utilizing the newfound possibilities and/or strengths of the eight-mallet, Stevens-based approach. Organized by stroke type, each section is intended to be a starting point for each technique. The exercises begin with the considerations of the Stevens method, then continue building complexity to capture the nuances of the eight-mallet technique. Players are encouraged to develop each stroke type, create their own exercises, and consider new possibilities afforded to the technique in the realms of pedagogy, performance, and composition.

When introducing broad concepts, I follow Stevens's example closely with the most basic of exercises to establish a solid foundation and pay homage to the already sufficient text for the core ideas. Next, I provide intermediary skills and applications that do not overstay their welcome as a technical bridge. The analogous "middle" exercises in *Method of Movement* are plentiful without the same redundancy that would be felt in an eight-mallet context, so I encourage interested players to extend them to eight-mallet contexts intuitively using his text. The reverse can also be done, reading the textures presented in this document with deliberate exploration of interval structures and dynamic shifts. Finally, the specific, eight-mallet applications are demonstrated to showcase the technique in ways *Method of Movement* cannot describe, simply due to the doubling of mallets and introduction of new technical possibilities.

The companion explanation for each set of exercises is found in this chapter. The complete list of exercises is included in Appendix B at the end of the document. Players should refer to the text in chapter three to ensure understanding of the technique before proceeding to

the exercises. It may be helpful to alternate between sections in both chapters organized by technique for maximal absorption. Players should also refer to chapter five to practice specific musical applications of each technique in the context of a composition in alternation with the exercises found in this chapter.

Following Stevens's Example, Formatting for Eight Mallets

Developing the exercises was no simple task. I attempted to strike a balance between showing broad concepts (risking lack of clarity) and thorough exploration (risking redundancy). These considerations were exacerbated by using *Method of Movement* as the basis, as perhaps the foremost inimitable document in the keyboard percussion discipline. I repeatedly referenced the book when deciding the importance of technical tips, specific applications, and organization. With double the mallets and far more than twice the applications and technical concerns, the list of exercises, reproduced to follow each individually introduced concept one-to-one, would be exhaustive. Pressure was felt in every decision to simultaneously respect the originality of Stevens's vision and organization by using, but not altering, his core ideas in reformatting for my eight-mallet technique. The equally important goal of iterating in a meaningful way that extends the scope of the technique without losing the approachability/practicality was also lofty.

Some readers may conclude that Stevens's spirit or intention is lacking in the chosen exercises while others may think there are too many, or that they are too complex to be practical. I have given explanations in each section for my choices of exercises for each technique in comparison to the way Stevens proceeds in *Method of Movement* where applicable. I also include suggestions to practice the musical parameters that are absent in my exercises, in some cases multiplying the possible ways to use them by orders of magnitude. I charge composers to consider these alternate parameters that extend the exercises as golden opportunities to develop

interesting textures that contribute to meaningful musical ideas. My hope is that however you choose to engage with this document and *Method of Movement*, you adapt the techniques to suit your own needs in pedagogy, performance, and composition.

Read, Prepare, Play, Evaluate, Repeat

The notation by nature shows only mechanical end goals. That is, the notes are played as written without regard to the struggle the player must go through to position the mallets as needed, the execution of the notes in time with the correct motions, and the careful consideration of consistent beating spots and dynamics. For every exercise, I encourage the player to first read the descriptions of the mechanics in chapter three, read the suggestions for the exercise in this chapter, get a sense of the mechanics in their own body, and finally, play. After playing an exercise, evaluate the result and repeat steps in the process again as needed.

Stress Test the Recovery

Each exercise was written with one to two focused goals in mind, embodied in the notes themselves. Playing music necessitates controlled movements to and from every note, planning an initial state, executing, then recovering for the next. With this in mind, playing these exercises, one-by-one without regard for preparing to play any other, is a mistake. Beyond merely returning to a neutral position after each, players must stretch their capacity to play one exercise, then use movements in the recovery to go directly into another exercise. Stress test recovery by pairing disparate techniques and/or distant physical locations in succession.

Expect a Challenge, Keep Practicing

Execution of the particularly challenging exercises will be made easier over time as general fluidity and comfortability increases. At the time of writing, even in my practice many of

the exercises are possible but remain difficult to prepare rapidly and/or execute without much investment in beating spots and pressure changes in the pairs. The player should be prepared for nothing to feel easy at first, like any new technique. Unsurprisingly, the coordination that directly transfers from the four-mallet method is fairly straightforward, accounting for most uses. The demanding interval structures, chord shapes, and the loose and offset multiples are understandably less familiar.

Single Independents, Double-Single Independents

In *Method of Movement*, the single independent exercises are more thorough, taking the player through progressive frequency of mallet changes (meaning, from sixteen of the same note in a row, to six, then four, etc.), interval changes, variable chord shapes, variable mallet ordering, variable scalar patterns, and other variables organized into individual exercises. Given the great variety available to eight-mallet chord shapes, interval changes, and mallet orderings, the exercises in this document attempt to change only one variable in each section with encouragement to expand upon each by changing the other variables. Each exercise also separates single independent strokes from double-single independent strokes, but players should alternate between these two stroke types freely by either playing two exercises without stopping in between, or by changing some strokes in an exercise from one type to the other using the same chord shape intuitively. Players may also supplement using the original exercises from *Method of Movement* with new mallet orderings, note placements, and/or mallet pairings to capture the intention(s) of the exercises in the new eight-mallet context.⁶² Other method books that

⁶² Stevens, *Method of Movement*, 40-46.

emphasize permutations, such as Kevin Bobo's *Permutations for the Advanced Marimbist*⁶³ may be used to supplement as well.

Exercises 1-6 are to be played without interval changes using each of the mallets or mallet pairs in succession, slowly. Use the period where the other hand is playing to orient the mallets into playing position, particularly when playing with the outer pairs' mallets (1, 2, 7, and 8) individually. Recall the offsetting procedures from chapter three. The exercises use shapes of stacked thirds, seconds, and fourths in order and are not necessarily "in a key." Players should transpose the interval shapes, use different intervals in each hand, and/or utilize all-accidental or mixed shapes in addition to the all-natural shapes provided. Note the use of Roman numerals to indicate mallet pairs for double-single independents.

In exercises 7-14, the chord shape and mallet orderings are the same in each exercise while mallet change frequency increases from one to the next. Players are encouraged to adopt variable mallet orderings within the same chord shape, then variable chord shapes in conjunction with variable mallet orderings. Special attention to difficult mallet orderings and/or chord shapes while progressively increasing mallet change frequency will be helpful, though need not be exhaustive.

Exercises 15-20 demonstrate the use of single and double-single independents in scalar contexts. The hands should alternate playing in every mallet combination in exercises 15-18. For exercises 19 and 20, one mallet or pair alone should play the entirety of each, a total of eight and

⁶³ Kevin Bobo, *Permutations for the Advanced Marimbist*, (Asbury Park, NJ: Keyboard Percussion Publications, 2007)

four times, respectively. The wrist and arm should smoothly glide as the notes change, allowing each stroke to feel the same in rotary action as if the notes were not changing.

Single Alternating, Double-Single Alternating

In *Method of Movement*, Stevens prepares the player to execute a variety of intervals using single alternating strokes. First with each hand individually, next in tandem back-and-forth exploring the eight possible permutations using this stroke type and then hands together simultaneously. The exercises thoroughly explore applications in the C major scale and especially arpeggio, either from repeating positions, moving about the scale and/or arpeggio, and/or in interval changes in one or both hands. He advises the player to repeat in all twelve major keys.⁶⁴ The exercises in this section may also be transposed but may not be suited to fast tempi in all keys. Practicing more difficult keys that alternate between upper and lower shelves heavily or use them simultaneously will nonetheless encourage mastery of vertical alignments and/or use of the manual push/pull if necessary. Experimentation with advanced mallet reordering may yield elegant solutions in extreme cases as well, though the assigned sticking and stroke actions in each exercise will obviously be altered.

My approach to exercises for single alternating strokes emphasizes the breadth holding four mallets in a single hand provides. Though beginning with Stevens's dynamic approach wherein two of the mallets of the given hand change intervals, the eight-mallet technique is better suited to changing mallets to be played as the interval needs change, evidenced in the change from exercise 21 to 22.

⁶⁴ Stevens, *Method of Movement*, 47-54.

Exercise 21 is to be played one hand at a time, with all the combinations of mallets in opposite pairs. Though same-pair strokes are technically possible, they are unnecessary. Exercise 22 is identical in pitch and rhythm content to exercise 21 but demonstrates breadth across each hand by switching mid-exercise to mallets that operate more naturally in the expanding and contracting interval ranges. The mallet switch in this exercise occurs from the fifth expanding to the sixth, though it can occur earlier or later if desired and/or more effective for one's body. It may be helpful to experiment switching at several locations where a sticking is marked to see what is most comfortable.

Exercises 23-38 utilize double-single alternating strokes. In exercises 23-34, the interval between pairs is maintained while one pair's interval structure expands and contracts. The exercises are grouped by the pair to be manipulated. Exercises 23-28 expands and contracts the higher pitched pair, while a single mallet plays in the lower pitched pair. Exercises 29-34 expand and contract the lower pitched pair while a single mallet plays in the upper pitched pair. Finally, exercises 35-38 use all four mallets of the hand, maintaining the interval structure of each pair within each exercise and expanding/contracting the interval between the pairs.

Exercises 39-46 revisit the eight permutation patterns in *Method of Movement*, embracing double-single alternating mallet pairs. The tempo must be quick enough to designate a single axis of rotation in each hand in each exercise, applying force at the crossing points to ensure even and simultaneous contacts in each pair. Though using two or three mallets in one hand is evidently possible, using all four in each hand, hands in tandem, seemed most efficient in acquisition of the new eight-mallet technique. The player can simply omit mallets in opposite pairs in these exercises if a more thorough study is desired, particularly in managing dynamics. Players are

encouraged to use different, changing, and/or mobile chord shapes once the written exercises are mastered as well.

Implementing two-handed simultaneous double-single alternating strokes requires precision of timing and vertical offsets. The four possible combinations of directions are implemented in exercises 47-50. Players should experiment with different, changing, and/or mobile chord shapes using these patterns as well.

Verticals

In *Method of Movement*, Stevens emphasizes interval changes, shifts (location higher or lower on the keyboard in pitch), and motion types in the double verticals section. The wealth of exercises features each hand alone, hands in alternation back and forth, and/or hands together simultaneously. His approach to organization is sufficient in the acquisition of the technique to be used in the most possible circumstances with four mallets. This allowed me to pursue more difficult applications of the eight-mallet technique, the implementation of complex chord shapes.

The variables to be explored in this document include number of mallets in the hand and chord shapes. That is, cycling through all the possible triple and quadruple verticals within all natural, accidental, and mixed shapes. Though non-pair double verticals are discussed in chapter three, I omitted their specific use since the movements involved in their successful execution are accounted for in the triple vertical shapes. The exercises are organized by the sixteen possible shapes rather than chord quality, maintaining a stacked third shape with C or C# on the bottom when possible, and Eb if not. I chose shapes with sharps only or flats only rather than mixing the two in the process of adding accidentals for ease of reading and organization. Players should

experiment with different interval structures while maintaining the number of mallets and shape to expand on each set of exercises.

All exercises in this section are single hand, and suggestions for the use of auxiliary techniques will be given from the perspective of using the right hand. The considerations are applicable to the left hand in the mirrored chord shape. Though these are all to be played hands separately, they should also be played hands together and in alternation, an octave or more apart. Playing hands together is considerably more complex in some situations, given the mirrored nature of the hands but not the chord shapes. In other words, the offset needed for a triple vertical in one hand will be in the opposite pair of the other hand and will therefore be generated through a different procedure. The hands must be well practiced separately before playing hands together.

Heavy Auxiliary Techniques in Complex Chord Shapes

A great amount of music is still yet to be written using simple chord shapes without auxiliary techniques. However, these techniques are heavily implemented in the more extreme shapes of this section of the document. Many routes to difficult shapes are explained in the interest of a comprehensive study. The reader should not feel burdened by a need to master the auxiliary techniques and the corresponding shapes that use them at first. Developing them over time, perhaps beginning in the third or fourth practice session, will make way for music to be written and performed with them as well.

Exercises

Exercises 51-55 use the NNNN shape, to be played with each hand individually. They explore all of the mallet combinations for triple and quadruple verticals within the outlined chord voicing, including NNNN, xNNN, NxNN, NNxN, and NNNx, in order. As a reminder, the non-

playing mallet in the triple verticals should be vertically aligned above the other three, which should all strike simultaneously. Do not introduce any tension beyond what is necessary to maintain vertical alignments and follow through each stroke normally.

Exercises 56-60 use the ANNN shape. In the right hand, the shape is relatively unproblematic, but not simple. See the explanation of the NNNA shape for the left hand in these exercises. For the right hand, position the elbow slightly closer to the body than neutral, and the wrist slightly turned away from the body from neutral, in the same way one would execute the maneuver in a four-mallet context with just C# and E. A subtle manual push of mallet 6 can ensure consistent, resonant beating spots for the upper three mallets while mallet 5 simply strikes the edge of the bar. Alternatively, this shape can be played without a manual push by playing on the edge of the bar with mallets 5 and 8, and equidistant from the center of the bars with mallets 6 and 7. The careful alignment of all four mallet heads across the horizontal plane in this method makes it more costly in my opinion and may be limited in other interval configurations.

Though exercise 57 seems unnecessary, given the lack of the characteristic accidental in this chord shape, it should still be played while maintaining the horizontal, z-axis alignment the chord shape necessitates. Though verticals are the focus of this section, adequate preparation to play the non-playing note immediately following the vertical in future contexts is the reason for its inclusion. Though exercises 57 and 52 sound the same, the look and feel of the mallets are different. These “repeat” exercises are found in every set of five but are to be treated the same way as the others in their set by maintaining the chord shape.

Exercises 61-65 use the NANN shape. In the right hand, a slight manual pull on mallet 6 can give access to this shape with ease. The pulled mallet plays on the edge of the bar while the other three are aligned just above the center of the bars in the horizontal plane.

Exercises 66-70 use the NNAN shape. This shape is involved, accessible with two practical procedures, and a third suggestion that does not work for me but could for others. The first method involves a manual pull on mallet 6 combined with advanced mallet reordering, where mallet 6 crosses over mallet 7 to take its place in the lineup. Given the minimal reliance on multiple pushes/pulls, I prefer this method. The second method requires manual pushes of mallets 5, 6, and 8. If done reliably quick, this may be preferable to some. In my right hand, mallet 7 must be oriented the closest to my body to feel stable, making it a poor candidate for a pull on its own, hence my suggestion of pushes for the other three mallets. This third procedure, pulling mallet 7, may be simple for others.

Exercises 71-75 use the NNNA shape. This is another challenging shape with various solutions each player should test. The simplest procedure is opposing pushes on the inner pair with a slight pull on mallet 8. Mallet 8 more easily supports manual pull than mallet 7, an issue with executing the previous shape. Another, more complex but practical solution is advanced mallet reordering of mallet 6 over the top of the outer pair, moving into the location of mallet 8. In my hand, there is a natural extension to mallet 6 further from the body than the others, allowing for access to the shape without manual push/pull with a tilt of the wrist towards the body and the elbow kicked out away from the body. This use of advanced mallet reordering does add significant tension to the technique, but in a locked position it is comfortable.

Exercises 76-80 use the AANN shape. This shape is straightforward and works with the neutral alignment of the mallets in my right hand. For other interval structures or variable beating spots, manual push/pull can be implemented as needed.

Exercises 81-85 use the ANAN shape. I found two methods of executing this shape to work comfortably. The first is manual pushes of mallets 6 and 8. However, the connection

between mallets within each pair feels awkward and lopsided. Given that the mallet heads are in different z-axis locations when they typically function as a unit, dynamic consistency is difficult to attain. The other method is my preferred way, using advanced mallet reordering of mallet 6 crossing over mallet 7. The neutral position of the inside pair is slightly further away from the body than the outside pair, and in my hands, especially mallet 6. This shape may have been the very inspiration of and easiest application of advanced mallet reordering when developing the technique.

Exercises 86-90 use the ANNA shape. This shape is particularly challenging, but accessible from many methods. The simplest is a manual push of mallets 6 and 7, with a similar awkwardness as the ANAN shape. The next is taxing on the middle finger, using advanced mallet reordering to cross mallet 6 over the top of the outside pair. To do this, the outside pair is pressed up and into the middle finger, causing the discomfort. Z-axis alignment of this method may be made easier with a slight manual push of the outer pair. Finally, my preferred method uses advanced mallet reordering of mallet 6 over the top of mallet 7, as in the ANAN shape. As seen in the NNNA shape, mallet 8 responds better to a manual pull to put it into position, and a push of mallet 6, now in the location of mallet 7, is simple as well. Though the most difficult to explain, this method is the most consistent in my experience.

Exercises 91-95 use the NAAN shape. This shape is simple, with the best solution involving a slight manual push of mallet 8. The combination of the elbow kicking out from the body with the wrist twisting in towards the body orients the inner pair. Other solutions of the same manner for the ANNA shape are possible and perhaps applicable in other interval configurations with the opposite prescribed pushes/pulls.

Exercises 96-100 use the NANA shape. This shape is naturally accessible from a neutral position in my right hand, but with merely passable beating spots on the natural bars. A push of mallets 5 and 7, a pull of mallets 6 and 8, or a combination of both can help correct beating spots if needed.

Exercises 101-105 use the NNAA shape. A simple elbow kick out with wrist twist in can orient the inside pair closer to the player, aiming for the close edge of the bar with mallet 5 and off-center of the bar for mallet 6. In my hand, a subtle z-axis misalignment in my outer pair requires some attention for both heads to strike the edges of the accidental bars.

Exercises 106-110 use the NAAA shape. This is a relatively easy shape. Align mallets 6, 7, and 8 across the x-axis, holding a wide interval in the inner pair to allow mallet 5 to be displaced closer to the player.

Exercises 111-115 use the ANAA shape. The manual pull on mallet 6 to ensure the necessary alignment can make the mallet's palmar contact less stable thereby weakening the functioning of the inner pair as a unit. The awkward displacement of the inner pair also conflicts with the vertical alignment with the outer pair. Instead, advanced mallet reordering of mallet 6 over mallet 7, coupled with a push of mallet 7 is much easier to access.

Exercises 116-120 use the AANA shape. For this shape, a manual push on mallet 7 allows easy access. For my right hand, I tend to hold a slightly wide angle for the inner pair to allow for mallet 5 to play the edge of the bar and mallet 6 to play just below the center of the bar, resembling the NANA shape.

Exercises 121-125 use the AAAN shape. Holding the elbow closer to the body while angling the wrist out makes this shape straightforward, essentially the opposite treatment of the NAAA shape. A wider interval for the outer pair can assist in the same way.

Exercises 126-130 use the AAAA shape, played identically to the NNNN shape from a neutral position or with very subtle alignment adjustments as needed.

Laterals

In *Method of Movement*, laterals are introduced with a strong emphasis on the execution of rhythmic displacement demonstrated visually in the notation. The initial exercises use double dotted eighth notes followed by thirty-second notes, the next set uses sixteenth note triplets followed by sixteenth note triplet rests, then sixteenth notes paired with dotted eighths before settling on continuous sixteenth notes alternating from hand to hand.⁶⁵ This rhythmic progression is necessary for the uninitiated and should be applied to the exercises in this section. For best results, adopt the first rhythmic structure for the first practice session, double dotted eighth notes with thirty-second notes. Move on to the next rhythmic structure in the next practice session, and so on. Jumping in as written may tempt the player to use double-single independent strokes or double-single alternating strokes, which are different in look and feel.

In the interest of avoiding redundancy and demonstrating unique eight-mallet applications, all exercises are written with even note values in two-handed alternation using the same double-double lateral permutation, I-II-III-IV, or ascending pairs. Practicing hands separate first is advised as well as hands striking simultaneously instead of in alternation. Working out a variety of permutations is also beneficial. Finally, all exercises in this section use all eight

⁶⁵ Stevens, *Method of Movement*, 65-75.

mallets, but laterals are also possible with two or three mallets per hand. The vertical offsets necessary for two or three mallet laterals are better practiced in the exercises focusing on single independents and verticals.

The manipulated variable in these exercises is interval structures across natural shapes with small to no arm shifts and no interval changes in the middle of each exercise. Laterals using accidental and mixed shapes, larger shifts, and interval changes within a single exercise should be explored as well.

With the set limitations, the resulting exercises seem lean in number. However, written out exploration of all these parameters would be exhaustive and unnecessary, as the mechanics of the move can be mastered by merely playing the exercises as written and in reverse order with descending pairs, IV-III-II-I. Refer to chapter three as a reminder of the distinction between laterals, single independents, and single alternating strokes.

Advice for laterals is straightforward. As the bounding interval of mallets 1 with 4 and 5 with 8 grows larger, away from the axis of rotation, there will be a tendency to accent the notes when compared to a smaller bounding interval. Mallets 2 with 3 and 6 with 7 will be closer to the axis of rotation and thus move with less speed and resulting volume than the mallets in the bounding interval. The trend is most noticeable with large interval spread in the bounding interval and close interval spread in the interval between the inside mallets of each pair. Applying compensatory force on the shafts of the inner interval's mallets can be effective in matching dynamics but is taxing if used excessively. This is better suited to double-single independent strokes with ample recovery time. Performed as true laterals, composers and performers must accept this limitation. In a context with unique accent patterns, however, it could be considered a feature!

Exercises 131-146 establish the pattern of interval structures in this section, starting with a second in the left pair, a progression of a second, third, fourth, and fifth in the right pair in each, and sets of four exercises identifiable by the middle interval between pairs. Exercises 147-151 truncate the established pattern when the bounding interval spread becomes difficult, but they are still reasonably attainable. The exercises continue in this manner with the established pattern, truncated at the upper extremes of interval spread. Some players may not be able to hover over all the notes of the more difficult exercises in a fixed x-axis position and may need a slight shift from the arm to help cover the distance of the bounding interval. It is advised, however, to maintain the interval structure within each pair throughout each exercise. To play continuously, the arm must recover quickly to set up for the next lateral, oscillating in a circle-like motion. Holding a large interval in one and especially both pairs will force the player to consider z-axis horizontal alignment to achieve appropriate beating spots. In the cases of exercise 179-180 and 189-190, combinations of fourths and fifths in the pairs necessitate playing on the edge of the bar closest to the player with mallets 1, 4, 5 and 8, and above the center of the bar with mallets 2, 3, 6, and 7. Some of these movements may not be suitable transposed to the upper end of the keyboard as natural shapes for this reason, but NAAN or even AAAA shapes with large interval spreads in one or both pairs may be successful. The section on laterals concludes with exercise 194.

Loose and Offset Multiples

Loose and offset multiples are not found in *Method of Movement*. They can be trained using similar exercises with different procedures. Both are interesting but challenging applications of the technique. Refer to the explanations, one at a time in chapter three before proceeding to the exercises. These exercises are optimized to help the player establish the

mechanics, leaving innovative textures that combine two or three types of multiples on the table for composers. The two possible orderings are explored in all four pairs using chromatic interval sizes up to a fifth.

I suggest practicing each pair alone without the other pair of mallets in the hand, then adding the other pair later. This allows for the player to determine the most successful implementation of these techniques without considering the vertical offsets needed to ensure the opposite pair is out of the way. Then, reconcile any adjustments in the reintroduction of the opposite pair, privileging the movement of the playing pair over relative positioning of all four mallets, avoiding the non-playing pair's influence as much as possible. In reintroducing the opposite pair, one should consider the likelihood that the opposite pair must play soon thereafter in a musical context, and should be held aloft out of the way, but reasonably accessible.

The first eight exercises, 195-202, explore the timing component of the moves, in an interval of a second. Though either can be trained first, I recommend starting with the loose multiple. The first exercise is intended to be played freely with little regard for timing. Play the dynamics as written, with a grace note and a primary note, then again as evenly as possible. Next, play exercises 197-202 slowly with a metronome, subdividing the rhythms consistently and with even dynamics. Repeat with the other technique before moving on to the interval control exercises.

Exercises 203-214 build interval control. As the intervals expand, there may be a tendency to accent the second note, particularly in offset multiples. For the chromatic intervals, moving the elbow away from the body and the wrist turned in towards the body works well for the right arm, and the opposite works for the left.

Traditional Rolls

Stevens does not include exercises for rolls in *Method of Movement*. The fundamental stroke types are sufficient in their execution with aid from the ear. I included exercises 215-238 for traditional rolls as a practical entry point to the management of eight mallets at a time. They also benefit in the implementation of interval changes in and between the pairs. Play each exercise slowly with even voicings first, then accenting the moving line(s) as the intervals change. Experiment with other voicings, contours, accidental and mixed chord shapes, alternating and uneven chord switches between the hands, pairs, and/or mallets, and other rhythmic schemes to extend the scope of these exercises.

Mandolin Rolls

I have only included one exercise, 239, for the development of the mandolin roll, to be played with hands separate and together, in a variety of configurations as you are able. Its inclusion is simply to demonstrate the unique affordances of the technique, and it may be attractive to some players and/or composers. In the sticking notation, I have used light-weight italics for the mallet heads that are to be placed under the keyboard and left the heads to be played above the keyboard as normal. I show practical stickings for the right hand, which can be mirrored for the left hand.

Independent/One-Handed Rolls

I included some exercises for each of the mallet combinations for independent/one-handed rolls in common intervals. Exercises 240-248 are to be played with both hands individually, exploring all sticking combinations. The left hand may be transposed down an octave as desired. Exercises 249-266 emphasize the most common use of the one-handed roll, in

which the opposite hand plays a melody simultaneously. The sticking combinations are revisited while the opposite hand plays single independent strokes with each of the four mallets. In the cases in which the hands overlap, the player may benefit from embracing the z-axis offsets needed to execute them or they may be made more comfortable with a transposition of one or both hands.

CHAPTER 5: SELECTED APPLICATIONS OF THE TECHNIQUE IN A NEW PIECE BY
THE AUTHOR: *STALACTITE*, *STALAGMITE*, *COLUMN*

Introduction

I composed and premiered a new work for eight-mallet marimba entitled *Stalactite*, *Stalagmite*, *Column*. The full score is found in Appendix A at the end of the document. I composed it with my new technique in mind. This included testing at the marimba and editing in a dialogue between the musical ideas and their technical execution. This chapter will demonstrate select applications of the techniques in a musical context, to demonstrate their efficacy beyond mere pitches and rhythms. This is not a typical formal or programmatic analysis, but rather a survey of and reflection on techniques in performance music with the intent of inspiring both similar and new textures for readers. Examples are included to explain sticking choices, demonstrate dexterity of the technique, or to simply highlight great musical effect. I have divided the chapter into sections based on technique, then chosen portions of the piece that utilize them for discussion.

In the interest of making a specific argument for the use of my new eight-mallet approach, I have chosen a primary emphasis on analyzing techniques in this piece, including a defense of eight mallets against four and six for the piece in the final section. An analysis of form, program, pitch, rhythm, contour and/or other musical parameters would be just as fruitful as a technical one, but outside the scope of this method-book style document. I encourage others to engage with this document and piece however they find interesting.

Single Independents and Double-Single Independents

The introduction of the piece features single independent strokes heavily. The opening gesture of m. 1 is best played as successive single independent strokes with either mallet 5 or 8. In m. 4, two-hand teamwork with single independents is advised. I used mallets 4 and 5 in alternation. A hammered glissando appears in mm. 5-6, with a specified sticking using the inner pairs, II and III. The traditional roll comprised of double-single independent strokes sustains for two beats, then drifts down the keyboard with the hammered glissando. In m. 14, I suggest a sticking of II, III, III, II. Passages such as m. 18 and m. 23 use complex four-note chord shapes that would be difficult to play with a single hand. In my performance, I used the inside pairs as simultaneous double-single independents in this spot as well as many others. The 7/8 bar of m. 25 uses a single independent grace note with mallet 4 that leads into a main note with a double-single independent of pair III, followed by alternating single independents using 4 and 5.

Many stickings are possible in the “More Regular, Less Rubato” section. On the upbeat of beat 3 in m. 66 progressing through the second beat of m. 67 and similarly in the melodic lines through m. 69, I used simultaneous double-single independents of II with single independents in mallet 5, though a locked or near locked triple vertical using mallets 5, 6, and 8 would also work well, reintroducing mallet 7 on beat 3 of m. 67.

Near the end of the piece, the reduced texture dominated by single independents reminiscent of the beginning returns from mm. 230-233. As an exercise, m. 230 could be played as single independents of all four mallets of the right hand, though practically it works well with just mallet 5 or 8 alone. Use two handed teamwork again in mm. 231-233. I used mallets 4 and 5 in alternation, with mallet 1 playing the lowest C of the keyboard.

I used true single independent strokes primarily in stripped back single lines in the framing sections. This allowed me to create space to explore denser textures in the middle sections. Double-single independents serve to bridge the gap between these two big-picture texture types, frequently playing a melodic role but supported by harmonic flavoring of mostly seconds and thirds. Though these are the ways I predominantly used these two techniques in this piece, they are not the only effective way of using them.

The ease of access to double-single independents in two pairs with this technique cannot be overstated. The use of two mallets at the same time corresponding to the four-mallet Stevens player's already worn pathways to single independents is a clear evolution of keyboard percussion technique, first present in the Stevens-based six-mallet techniques, and now available in both parts of the hand through this document's eight-mallet technique.

Single Alternating and Double-Single Alternating

Double-single alternating strokes are perhaps the most frequently used technique in the piece. The section beginning in m. 29 highlights them as the primary source of action in the highest octave of the marimba. This section is a musical application of the technique beyond the exercises of chapter four. The tempo range, interval makeup of changing seconds and thirds, and succession of pairs, IV-III-II-I necessitates this approach instead of energy wasting double-single independents (better suited to slower speeds and/or set intervals) or dynamically imbalanced double-double laterals (better suited to faster speeds).

Note the interval makeup in subsections of this passage. In order of pairs IV-III-II-I, mm. 29-32 use the chord shape of a second, third, third, and second, with all the pairs separated by a second. In mm. 33-36, the makeup switches to a third, second, second, and third, all pairs

separated by a second. The small moment of time following a block of natural notes with indeterminate location (see “Extended Techniques” at the end of this chapter) in the eighth and ninth eighth notes of m. 32 must be filled with the reorganization of each of the four pairs into new intervals, a technical feat made simple with practice of this technique. The separation of all the pairs with seconds was musical and programmatic, but also tactical. It is much easier to make the demanding interval changes of every pair at once when the pairs themselves are to be oriented on the bars directly adjacent to them.

A blend of both double-single independents and alternating strokes is featured prominently in mm. 55-60. The cascading pairs, IV-III-II-I return in m. 55 as alternating strokes, punctuated by a left hand quadruple vertical plus right hand inside pair double-single independent arrival on beat three. M. 56 returns to cascading pairs with double-single alternating strokes. An arrival on beat three of m. 57 using the same techniques as before is anticipated by three double-single independent strokes in the right hand. Similarly, in m. 58 I used a sticking of III, II, III, III, II, III, III, followed by another cascade of alternating strokes in m. 59. The same manner of cascade also occurs in m. 60, with a grace note pickup using the pair, I. The cascade features the same double-single alternating strokes concluding with the pair, I on beat two. A fast interval change is needed to play with the pair, I again as a double-single independent on the upbeat of beat two.

The third and fourth sixteenth note of mm. 104-110 and similar spots work better as double-single alternating strokes of the right hand than as a double-double lateral with the marked speed and recovery time.

In my performance, I did not use any true single alternating strokes, though there are certain passages that could utilize them if desired, such as the triplet figure with grace note in m.

11, using mallets 4 and 1. The focus was instead on the connection between mallet pairs occupying the same coordination through double-single alternating strokes. Without getting too detailed in the program, the jagged chord shapes presented in the examples were reminiscent of the titular cave structures to me, another clear driver in my decision making.

Verticals

Verticals, and predominantly quadruple verticals, are used heavily in the piece. In mm. 9-10, the downbeats of each measure feature an AAAA shape on successive accidental bars, followed by an NNNN shape transposed up a minor ninth, the previous shape of all flats now using all naturals spelled with the same letter names. This pairing of an NNNN and AAAA shape in close succession occurs often throughout the piece.

An interesting journey through chord shapes occurs in the left hand against right hand double-single independents in mm. 51-54. The quadruple vertical chord shapes in order are, NNNN, AAAA, AAAN, NNAN, NNNN, NNAN. Then the left hand plays a double-single independent, a pair of double-single alternating strokes, a triple vertical of xNNN, and finally a rolled arrival on an NNNN shape.

Quadruple verticals become the primary focus in the section marked “Frenetically!” Stacked third NNNN shapes move in a rhythmic 5/16 groove, interrupted in m. 115 rhythmically, and in m. 119 in pitch and shape with the left hand using AAAA and the right hand on AAAN. The section mostly progresses in this way, with grooving quadruple verticals interrupted by unexpected rhythm and pitch/chord shape shifts. Subtler development is used at times, such as the brief compression and expansion of the outer pairs of the hand in the sequence of mm. 137-139, emphasizing the dexterity of the approach with quick adjustments.

The “A Slight Boost in Energy” section features three ideas in conversation leading to the piece’s climax in m. 221. Pulsing quadruple verticals in the left hand with the meter followed by subdividing double-double laterals in the right hand are the initial idea and reference point for contrasting ideas. This idea is set up in m. 182 and is punctuated first in m. 183. Simultaneous two-handed quadruple laterals serve as the interruptive, punctuation idea with accents. This section can be helpful in the training of double-double laterals in conjunction with quadruple verticals, emphasizing the aspect of a single piston stroke yielding either split or simultaneous contact of pairs, respectively. Thematic quotes from elsewhere in the piece are also interspersed as the third idea, represented in m. 184 with an elaboration on the “Steady” motive and dead strokes from “More Regular, Less Rubato.” In my conception of this climactic section, the punctuations overtake the other two ideas in the final build from mm. 212-221. In combination with the stretching in tempo, the previously executed double-double laterals first become double-single alternating, then are stacked as quadruple verticals. The climactic measure is marked fortissimo with accents, culminating in a stretch beyond three octaves.

I used verticals for moments of heightened excitement in this piece, the most obvious way eight mallets offer more options than four or six. In my discussion on rolls later in the chapter, I also highlighted their beauty in occupying chord tones for greater lushness and complexity of voicing. Though I used mostly quadruple verticals, triple verticals and non-pair double verticals are ripe for implementation in new and exciting ways as well.

Laterals

The “A Slight Boost in Energy” section is full of double-double laterals. In m. 182, the right hand uses them with pairs in seconds separated by a third. This interval construction is to be manipulated in the development of this section. In m. 196, the inner pair uses a third, the outer

pair uses a second, and the pairs are separated by a second. This again holds until m. 208, where the double-double lateral is made up of pairs in thirds separated by a second.

Though multiples are used only sparsely in this piece, they hold immeasurable potential for performance and composition with this technique in the future. Entire works or sections could be organized around just a single use of multiples. This piece, for instance, uses the outside double-double lateral in the right hand as the primary driver of development for the climactic section. Considering the applications with the inside right-hand double-double lateral, left-hand double-double laterals, double-single, single-double, non-pair single laterals, or combinations of them together, there is much music yet to be written. Those examples do not even account for the other two types of multiples or the combinations of several multiple types together.

Rolls

There are two large traditional roll sections in this piece and scattered uses elsewhere. The first use of rolls in the piece sets the tone for their primary programmatic role, relaxation. Marked with expression text, “warm and resonant” at triple piano with fermatas, m. 12 introduces rolls as a gentle hum of the low register.

A one-handed roll using mallets 1 and 4 is first introduced in m. 63, then the same mallets are part of a non-pair double vertical with a quadruple vertical in the right hand for the traditional rolls of m. 64. More of these mallet 1 and 4 non-pair double verticals and one-handed rolls are used through mm. 74-80 in a similar fashion. The heightening of thematic tension in these bars leads to an exhalation into the relaxed chorale section from mm. 82-103, the first large traditional roll section.

The first three measures feature a full left hand with all four mallets against a leading right-hand single-mallet melody in pianissimo rolls. Dissonance of a major second is added to the single mallet, now using the inside pair, III, accompanying hairpin dynamics in mm. 84-85. After settling back into the pianissimo fold in m. 86, the chorale is now six voices, with the full four mallets of the left hand dynamically shifting interval structures and inside pair of the right in a set third. Another swell in dynamics is again signaled with set seconds in III in mm. 88-89 before resolving again in m. 90. The action increases, combining rolls with single note strikes in mm. 92-94. Distinctly muddy, dissonant chord shapes are explored beginning on beat three of m. 94. Mallets 1-6 are in an NNAA plus ANxx shape in the bottom two octaves of the marimba. In m. 96, the shape moves to stacked thirds of C major seventh in both hands, fully embracing all eight mallets for the first time in the chorale, but retaining the soft, murky character. A slight reworking of the chord from m. 94 returns in m. 97, now as an NAAA plus Nxxx, then NAAA plus NAAA. The stacked third NNNN shapes play a melodic role in mm. 98-99, teasing the closing gesture of the chorale. One of the most interesting moments in the piece occurs in mm. 100-101. Two handed AAAA shapes are set up, occupying the eight lowest accidental bars of the marimba. Then, in m. 101, the AAAA shapes are to be rolled in an independently moving tremolo with their NNNN counterparts, resulting in a profoundly mysterious undulation of the low end of the marimba. A final thematic lift is felt in the return of all NNNN stacked third shapes in a rising melodic gesture of mm. 102-103.

The second large chorale is at the end of the piece, recalling the first in similar moves from dissonance to consonance in alternation while maintaining soft dynamics. The last dynamic push occurs in m. 229, using rolls to control the drama before single note strikes ease the tension in m. 230 to the end.

Though I sought out the low end of the marimba with soft dynamics as a source of relaxation for the program, player, and audience in this piece, rolls can be used to generate excitement, brightness, and a wealth of other emotive and textural qualities. Working through chorales as a player aids in navigating chord shapes and maintaining smooth and even sounding sustains. Working through chorales as a composer helps in considering the process of navigation for the player, pushing the idiom with new chord shapes and interval structures.

Extended Techniques

I use extended techniques for interest and programmatic effect in this piece. The hammered glissando of m. 6 is a hook, serving as a preview of the mysterious low end rolls to come. The block notes of mm. 32-50 are indeterminate NNNN clusters played in the general location designated on the staff. “R,” “L,” and “B” stickings add a visual element to these rhythmic and dynamic interruptions. A combined indeterminate NNNN cluster with a glissando occurs in the right hand in m. 42. Dead strokes are used beginning in m. 65 as a kind of echoing effect. The use of four mallets at a time with this technique is fascinating. A combined glissando in a stacked third NNNN shape in the left hand is met with a stacked third NNNN shape in the right hand as dead strokes. Dead strokes give the “More Regular, Less Rubato” section a unique identity.

Why Not Just Use Four?

Following tens of pages of discussion, my hope is that the merit for eight-mallet performance, and specifically the use of my technique, is well defended. I suspect many readers may still conceive of ways to perform the piece, or more accurately, attempt to capture the same essence of the piece, with two, four, or even six mallets, but I insist that the full musical effect requires the density provided by the eight-mallet approach.

Density

The most obvious issue is more notes, but specifically in giving sonorities pitch complexity and density. Any major chord can be voiced with the root and third only, but upper extensions and especially chromatic additions cannot be represented without the presence of all the required pitches. This is just the surface of the problem, however. Every note influences the richness of the harmonic palette, as even one marimba bar alone generates a wave that is divided into higher partials of the harmonic series. The low end of the marimba is particularly resonant, clearly demonstrating this. This observation applies to both tonal and non-tonal contexts, where every bar counts towards the full sonority. When revisiting textures in the piece as two, four, or six mallet passages, the effects of density are lost.

Warm and Resonant?

The “warm and resonant” rolls of m. 12 first demonstrate this clearly. The low register bars of the marimba conflict with one another even in consonant intervals, creating a muddy sound. Trying to voice this passage with just four mallets loses the mysterious effect. Choosing four mallets to capture the tonally most integral parts would mean the chord identities are maintained, ideally with dissonances resolving to consonances. The G dominant seventh sonority over an F pedal resolves to an F major seventh sonority. I have included three voicings for four mallets and two for six mallets that closely resemble the passage, but the lack of density is glaring when performed one after another. One or two major compromises must be made in each example, all ultimately lacking the low, muddy character. These are not the only ways to voice the chords with four mallets, but I attempted to use typical voice leading where possible and maintain key features including the melody, chord identities, and the dissonance between the lowest two notes. These are the key takeaways.

Option 1 keeps the melody, chord identities, and key bottom dissonance between F and G, but the resolution is in thirds over an octave apart, sounding hollow. Option 2 voices both chords fully but loses the key bottom dissonance. Option 3 keeps the melody but pushes the bottom dissonance up an octave as a ninth resolving to a tenth instead of a second to a third. As a result, the inner and upper voices are over an octave above the bass in a passage that is intended to be distinctly bass heavy. Option 4, the first six-mallet option, is decent. It keeps the melody, bottom dissonance, and uses solid voice leading but lacks a key conflict between E in the left hand and F in the right hand found in the eight-mallet version. To my ear, the resolution chord in this option sounds like an F major triad with the seventh tacked on as melodic embellishment more so than as part of the identity of the chord without the conflicting minor second in the inner voices. Option 5 seeks to remedy this but weakens the voice leading in the process, with both six-mallet options sounding hollow compared to the eight-mallet passage as written.

The six-mallet versions are much closer to the intended mood, but make the ear miss the density of the much warmer and resonant eight. In terms of voice leading, the large stacks of parallel motion using eight mallets are not erroneous, but advantageously familiar and predictable in a satisfying way when used as in m. 12 and are easier to execute when smooth. One may say I am treating voice leading with importance for four and six, but not for eight, which is true but a non-issue. Voice leading is of much less concern when the chord members are reinforced in multiple octaves. The planing effect is obvious here and other places in the piece and the conflict of resonances adds to the program rather than detracting from it.

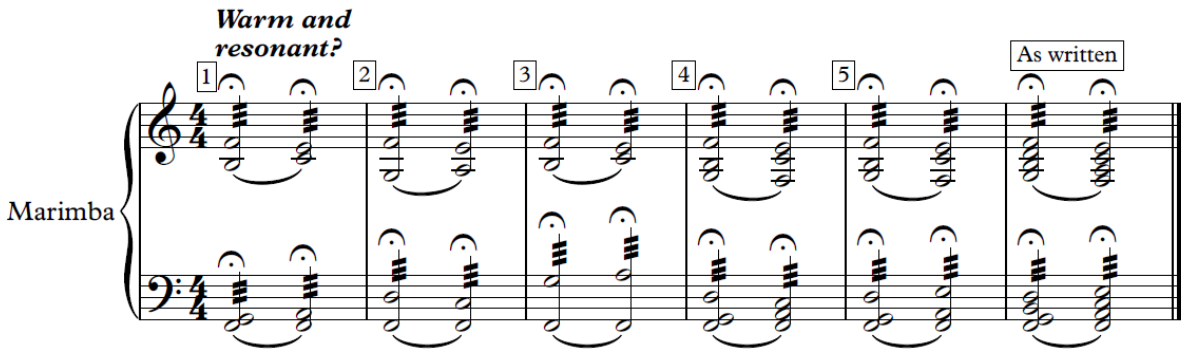


Figure 5.1: Some voicings with four and six mallets for the rolls found in m. 12, followed by the passage as written.

Adding Voices

The previous example is only two rolls out of many in the piece that completely change character with fewer voices. The large chorale from m. 82-103 builds intensity and interest by slowly incorporating more voices over time, from five to eight. The most tasteful voice leading in the world cannot extend four voices out to eight, let alone capture the sonic growth of adding voices over time.

Single Alternating or Double-Single Alternating? Or Double Verticals?

The “Steady” passage that predominantly uses double-single alternating strokes is where the eight-mallet technique demonstrates convenience and practicality. Played with a chord tone less in each pair, it simply develops the opening gesture as single alternating strokes or single independents, an obvious downgrade in density and interest.

Though it is technically possible to play with four mallets as double vertical strokes, it is much more cumbersome. The mirrored interval structure of a second, third, third, and second

means that with hands alternating as double verticals, every shift down the keyboard would require a change in interval, while maintaining a pianissimo dynamic. This is not impossible, but unnecessarily complicated when the passage can be played from a set position with eight. To solve that issue while still using four, the right hand could play all the seconds and the left could play the thirds, but it is hardly a worthwhile venture since two simultaneous seconds are played on the third beat of m. 30 anyway. Even if someone goes to the trouble of performing this section with four mallets alone, the indeterminate clusters will sound more like misplaced interjections than true blocks of sound with half the available notes.

Unmatched Power

The fortissimo marked passage beginning in m. 148 showcases the sheer volume output of eight mallets. The resonance of eight bars simultaneously naturally lends itself to more output than four or six bars. Preserving the bass, melody, and chord identity of an A minor ninth, the left hand would cover C and B while the right hand plays A and G. The result is stacked sevenths. This is uniquely haunting in its own right but misses the impact of this moment in the piece. Other voicings compromise an identifying chord tone, the registration, or both. The block chords of the eight-mallet version as written keep the bass and chord identity firmly intact with an explosion of sound.

CHAPTER 6: NEW STEVENS-BASED SIX, TEN, AND TWELVE-MALLET TECHNIQUES, OTHER IDEAS FOR FUTURE RESEARCH, AND CONCLUSION

Potential Using a Stevens-Based Six-Mallet Back-Fingers Approach: “Back-Pair Stevens”

Six-mallet Stevens-based approaches have used the inner pair of mallets with a single mallet held in the back fingers. With my eight-mallet approach, mallet pairs are held in both parts of the hand. A six-mallet Stevens-based technique that uses the back-finger pair with a single mallet in the inside part of the hand is the first of its kind. I call it “Back-Pair Stevens.”

The benefits are not as obvious as using my eight-mallet adaptation, primarily due to the presence of an imbalance of weight in the two parts of the hand. When experimenting with it, the back fingers seem relatively sturdier than the inside fingers, allowing the full apparatus to feel slightly more stable than the Gronemeier technique, with marginally less interval control. These observations may simply be the result of my biased prior experiences. The back fingers feel more stable in the four-mallet Stevens technique, so they naturally seem more stable even in new adaptations for six and eight mallets. Conversely, the Gronemeier technique’s inside pair feels more easily manipulable due to increased experience with it. Finally, I have grown accustomed to managing increased mallet weight and extended multiple mallet techniques in general, which tampers the initial friction one feels when starting a new technique.

One four-mallet Stevens player progressing to Gronemeier and another four-mallet Stevens player progressing to Back-Pair Stevens may find similar transfers of comforts and challenges. Though the Back-Pair Stevens approach is more limited than my eight-mallet Stevens-based adaptation, it may be a worthwhile steppingstone in the latter’s development, and/or may find use in six-mallet repertoire.

Two New Ten-Mallet Stevens-Based Techniques, A New Twelve-Mallet Stevens-Based Technique, and The Human and Musical Limits

Ten and twelve-mallet Stevens-based techniques are achievable through what is essentially the same method of mallet addition as the eight-mallet technique, now with one or two mallet trios in each part of the hand. Note that a weight imbalance will be incurred with either ten-mallet technique, and the weight increases significantly for all three techniques. The practicality of these techniques remains to be seen, but they are nonetheless possible and worthy of discussion.

Inside Trio

Adding a mallet to the inside pair is one option, placing the third mallet's shaft under one or both of the other two. The result is three shafts stacked one on top of the other with the butt ends meeting the palm progressively lower towards the keyboard. Alternatively, the third shaft is located directly next to the lower shaft of the initial pair, where two adjacent butt ends meet the palm at the same vertical height. In either case, the thumb, index, and middle finger are now responsible for the dynamic manipulation of three mallet shafts with corresponding heads, increasing the complexity and need for practiced control exceedingly beyond Stevens's original technique.

Outside Trio

Creating a mallet trio in the back fingers is the other option, placing the third mallet shaft under the existing pair. The middle finger is clutching with extreme pressure at the crossing point, essentially locking the middle shaft into place. The vertically lowest shaft to the keyboard is manipulable with the pinky as in the eight-mallet technique but exerts significant pressure on

the trio as the closest in contact with the back fingers. The vertically highest shaft is pressed against the palm and requires help from the middle finger, palm, or a drop in pressure at the crossing point to allow for free movement.

The Human Limit

Implementing mallet trios in both parts of the hand yields a twelve-mallet, Stevens-based technique with dizzying complexity. The practical applications of such a technique are very limited, however. Critics of extended multiple mallets in general assert that musical effects can generally be accomplished with four only, though I have amply demonstrated in this document that eight-mallet textures are unique, reasonable to use, and provide access to textures that are impossible with four or even six mallets. The primary benefit is the use of mallet pairs with direct transfer value to the four-mallet Stevens technique. Though the argument could just as easily be applied to mallet trios with direct transfer value to the four-mallet Stevens technique, the reality is very different in practice.

Interval control with the inside trio is relatively familiar, but maintaining enough pressure at the crossing point to play without one or more mallets moving out of position is a challenge. The inside part of the hand lacks stability as a unified trio. The outer trio has the opposite problem. Interval control is a chore, requiring aid from other parts of the hand for the mallet closest to the palm and a nearly locked middle mallet in the trio. Though locking the outside trio is evidently easier than the inside trio, the pressure required for consistency causes fatigue to the point of pain to build up quickly.

Though the human limit seems to evidently be reached practically with eight mallets and near the physical end of complexity with twelve mallets, time will tell if a new, more elegant

solution is lying in wait for the uncovering. Crossed grips using ten or twelve mallets may be a more reliable path forward worth experimenting with as well. This may also be merely the human limit at the marimba, where the implementation of machines in conjunction with our bodies and/or new arrangements of pitches on new mallet instruments may be the path forward. The “path forward” assumes there are more musical benefits to adding additional mallets as well, which may not be the case either.

The Musical Limit

A fanning of ten or twelve mallets out of the hand with any technique is, regardless of ease of implementation of strokes, difficult to manage in terms of a uniform sound quality in beating spots and has unavoidable limitations in the notes available. Ten or twelve simultaneous notes is attractive for the sheer power, meeting and even surpassing the pianist’s number of fingers. However, the voicings are restricted to about a twelfth in each hand, meaning with all mallets represented, there will be significant redundancy of pitch class members without visiting complex chord shapes mixing naturals and accidentals. With eight mallets, only one pitch in a typical seven-note scale would be represented twice, where twelve mallets may have as many as five doublings, or even three or more instances of the same chord tone. To that end, mixed shapes are increasingly more difficult to master, limiting each hand to mostly natural or accidental shapes only, or shapes of the NNAANN or similar variety that spread out with the fanning of the mallets. As a final concession, ten to twelve pitch classes would be available at once using two-handed teamwork and/or precise manual pushes/pulls and/or advanced mallet reordering. As a result, atonal, polytonal, or twelve-tone music with great density may be fruitful grounds for composition that can otherwise not be serviced with four, six, or even eight mallets.

Other Ideas for Future Research and Experimentation

I encourage others to engage with these ideas for future research and experimentation, and I am not listing them here as a soft claim. In fact, I would love to collaborate with others on these and additional topics of interest. I, like many other extended multiple mallet technique proponents, would like to see these techniques used more frequently. I stubbornly insist on promoting the disciplined acquisition of my new technique, encouraging and writing new music for it, developing players to perform with it, and inspiring researchers and teachers to pick up where this document ends. Some ideas include:

- An updated and/or actively maintained repertoire list for eight mallets.
 - A YouTube playlist or channel with eight-mallet performances and video resources would also be helpful.
- An analysis of eight-mallet works and their execution using my new technique, or a comparative analysis with all eight-mallet approaches.
- A comparative analysis of all mallet techniques, from two through eight, from various angles. Emphases include:
 - An emphasis on physical mechanics. Specifically, broad physical mechanics that connect techniques, such as this technique with both four-mallet Stevens and Burton.
 - An emphasis on propensity for injury, as well as mitigation and/or prevention.
 - An emphasis on health, potentially as a synthesis and/or drawing on the previous two topics: physical mechanics and propensity for injury. Exercising like an athlete, recovery, mentality, sleep, nutrition, and other healthful topics could increase viability.

- An emphasis on the distribution of implementing two, four, six, and eight-mallet techniques into large ensembles, chamber ensembles, and solo. Eight-mallet performance, for instance, is primarily solo at the moment. How do different techniques inform orchestration decisions?
- An exploration of my technique on other keyboard instruments, such as the vibraphone or glockenspiel. Further exploration involving alternating between/among two or more keyboards or playing them simultaneously would be interesting.
- A comparative analysis of multi-voice instruments, including the styles of technique, available and common textures, and limitations of each. This would include the piano, organ, harp, guitar, accordion, vibraphone, marimba, and others.
- An analysis of the potential for arrangements with my new technique, as well as transfer value from other instruments. This topic relates to the previous and could be discussed together.
- An analysis of a piece written for marimba duo rewritten for one player using eight mallets and/or an analysis of a piece written for eight-mallet marimba split into two parts, as well as the benefits and limitations of either procedure.
- An analysis of performance practice, the visual aspects of performing with eight mallets, implementation with multi-media, or the like.
- An expansion of and/or new exercises, developments of the technique, and/or a retrospective, years removed from this document.

Conclusion

My new eight-mallet Stevens-based method, the Duncan technique, gives the keyboard percussionist more technical options than ever before. The transfer from the original four-mallet

Stevens method in the form of mallet pairs simplifies the learning process. Mallet pairs also solve the imbalance issue felt in the Stevens-based six-mallet techniques, allowing for greater endurance and control of dynamics. The crossed grips' maximum interval spread and independence constraints are addressed as well. With this technique, a maximum interval spread beyond 180° is available and single independents are possible with every mallet, unencumbered by the other three mallets in the hand. With the technique thoroughly explained in this method-book style document, barriers to eight-mallet performance and composition are diminished.

A wealth of specific applications of the technique are possible through mallet pairs. Double-single independents, double-single alternating, and double-double lateral strokes are implemented with near identical coordination from the single mallets of the four-mallet Stevens method. True single independents are possible through vertically offsetting the other mallets in the hand. Any combination of mallets used in vertical strokes can be achieved through the same procedures of vertical offsetting.

It is easier to learn fundamental strokes with this technique compared to other eight-mallet techniques, and the increased control provides greater depth of complexity as well. The lateral, loose, and offset multiples showcase this depth through intricate rhythmic displacement within a single piston stroke. With the manual push/pull and advanced mallet reordering, a greater variety of chord shapes is available compared to other eight-mallet techniques. The innovations of my technique allow for advancement in keyboard percussion composition and improvisation.

This document follows the example of *Method of Movement* by explaining the physical mechanics with accompanying exercises and instructions on how to practice them. A lack of method books for eight-mallet techniques is one reason why they have limited visibility. I intend

to write an additional method book with similar exercises and etudes that address the techniques in more musical contexts. The inclusion of my piece, *Stalactite*, *Stalagmite*, *Column*, showcases musical applications in the same way, but not for all techniques listed in this document. The etudes in my future method book will emphasize one or two techniques in each and will be shorter and easier. I will include etudes for other keyboard instruments using the technique as well.

I also intend to develop high-quality instruction and performance videos of the technique on my YouTube channel. The video companion in this document supports the detailed descriptions in this text. This document is a crucial precursor to establishing a technical foundation, but delivering the information in the video itself will attract a wider audience. I will share this document, my future method book, and YouTube videos with other percussionists and composers to inspire others to engage with the technique.

The Duncan technique is the result of years of dedication to keyboard percussion performance, composition, and teaching. I am thrilled to present an eight-mallet option to other Stevens players with immediate transfer value, an easier point of entry to eight mallets in general, a solution to the imbalance felt in six-mallet iterations, and access to additional techniques, all in a single method.

The descriptions of each technique, mechanically focused exercises, musical examples in *Stalactite*, *Stalagmite*, *Column*, and ideas for future research provide readers with a comprehensive introduction and invitation to the technique. I am excited to witness its development in the future.

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APPENDICES

Appendix A: *Stalactite, Stalagmite, Column*

Stalactite, Stalagmite, Column

Delicately, Freely ♩ = 92
(♩ = ♩ throughout)

Cameron Duncan

Marimba

8va

pp

n.

pp

p

3

5

Mar.

mf sub.

hammered gliss.

pp

3

1

3

9

Patiently ♩ = 70

Mar.

p

3

12

Warm and resonant

Mar.

ppp

poco accel.

mf

3

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2

14 **With More Motion** ♩ = 78 (♩. = 52)

Mar. *mp*

19

Mar. *mf*

23

Mar. *mf* 4:5 *mp sub.* *mf*

27 *molto rit.* *Steady* ♩ = 120

Mar. *f* *pp*

30 (8)

Mar. *sfz*

33 3

Mar. *p* *sfz mp* *mf*

36 *sfz*

40 *f* *normal gliss.* *rit.* *mp*

44 *accel.* *Steady ♩ = 120* *sfz* *mf*

48 *p* *f* *sfz* *molto rit.*

4 **Freely, Chaotic** ♩ = 100

51 **accel.**

Mar. *mp* *mf* *p* *mf* *f*

55 **Joyful, with Rubato** ♩ = 120

Mar. *f*

60

Mar. *ff* *p sub.*

More Regular, Less Rubato ♩ = 120

65 **dead strokes**

Mar. *f molto espressivo*

69 **normal gliss.**

Mar. *p*

74

Mar.

f *p* *f* *p* *p*

78

Mar.

f sub. > p *mf* *mp*

poco rit. *8^{va}*

82

Slower, Grounded ♩ = 80

Mar.

pp

88

Mar.

mp *pp sub.*

93

Mar.

mf *pp* *n.* *pp*

97

Mar.

hands move independently, tremolo

102

Mar.

Frenetically! ♩ = 180

pp sub.

mf

107

Mar.

cresc.

f

115

Mar.

mp

f sub.

p sub.

cresc.

122

Mar.

mf

124

Mar.

mf

128

Mar.

cresc.

f

136

Mar.

fp

f

144

Mar.

p

ff

153

Mar.

3

3

164

Mar. *pp cresc. poco a poco* **3** **3** *mf*

173

Mar. **3** *ff* *mf sub.* *ff sub.* **6/16** **6/16**

181

Mar. *G. P.* *mp* *mf* *mp* **6/16** **5/16** **25/32** **6/16** **5/16**

A Slight Boost in Energy ♩. = 140

186

Mar. *f* *mp* **5/16** **22/32** **5/16** **6/16** **5/16**

191

Mar. *cresc.* *mf* *pp* **5/16** **5/4** **6/16**

8va

196 9

Mar. *mf* *ff sub.*

201 poco rit.

Mar. *mp cresc.* *f*

206 a tempo

Mar. *p sub.* *cresc.* *poco a poco*

212 molto rit.

Mar. *fp* *cresc.*

216

Mar. *ff*

222 **Slow, Resolute** ♩ = 60

Mar. *pp espressivo* *p* *pp*

227

Mar.

229 **molto rall.** **Slower** ♩ = 48
Not rolled! *f* *p*

Mar.

232

Mar. *n.* *ppp* *n.*

Appendix B: 8-Mallet Exercises

8-Mallet Exercises

Cameron Duncan

$\text{♩} = 120 - \text{♩} = 100$

Marimba

1

5 4

Mar.

6 3

Mar.

7 2

Mar.

8 1

Mar.

2

III II

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Mar.

IV

1

3

5

4

6

3

7

2

8

1

4

III

Mar.

8

1

6

III

II

IV

I

$\text{♩} = 60 - \text{♩} = 90$

7

6

5

4

6

6

3

6

7

2

6

8

1

8

6

III

II

6

IV

I

6

9

3

3

3

3

5

4³

6

3³

7

2³

8

1

10

3

3

III

II

3

3

IV

I

3

3

♩ = 80 - ♩ = 150

5

Mar. 11 12

5 4 6 3 7 2 8 1 III II IV I

Mar. 13 14

5 4 6 3 7 2 8 1 1... III II IV I 1...

Mar. 15

4 5/6/7/8 4... 5/6/7/8...
3 . 3... .
2 . 2... .
1 . 1... .

Mar. 16

II III/IV II... III/IV...
I . I... .

Mar. 17 18

4 5/6/7/8 4... 5/6/7/8...
3 . 3... .
2 . 2... .
1 . 1... .
II III/IV II... III/IV...
I . I... .

6

♩ = 70 - ♩ = 120

Mar. 19 20

1/2/3/4/5/6/7/8 sempre I/II/III/IV sempre

♩ = 70 - 210

Mar. 21

1 3/4
2 .
5 7/8
6 .

Mar.

Mar. 22

1 3 3 3 4
2
5 7 7 7 8
6

Mar.

4 4 3 3
· · · ·
8 8 7 7
· · · ·

Mar. 23



1 II
2 .
5 IV
6 .

Mar. 24



1 II
2 .
5 IV
6 .

Mar. 25



1 II
2 .
5 IV
6 .

Mar. 26



1 II
2 .
5 IV
6 .

Mar. 27



1 II
2 .
5 IV
6 .

Mar. 

1 II
2 .
5 IV
6 .

Mar. 

I 3
. 4
III 7
. 8

Mar. 

I 3
. 4
III 7
. 8

Mar. 

I 3
. 4
III 7
. 8

Mar. 

I 3
. 4
III 7
. 8

Mar.



I 3
· 4
III 7
· 8

Mar.



I 3
· 4
III 7
· 8

Mar.



I II
III IV

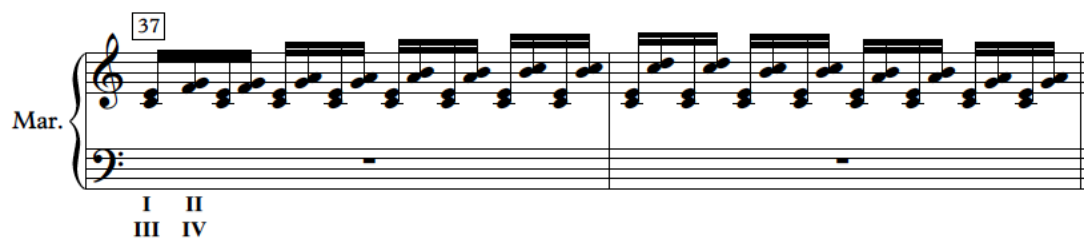
Mar.



Mar.



I II
III IV

Mar. 

I II
III IV

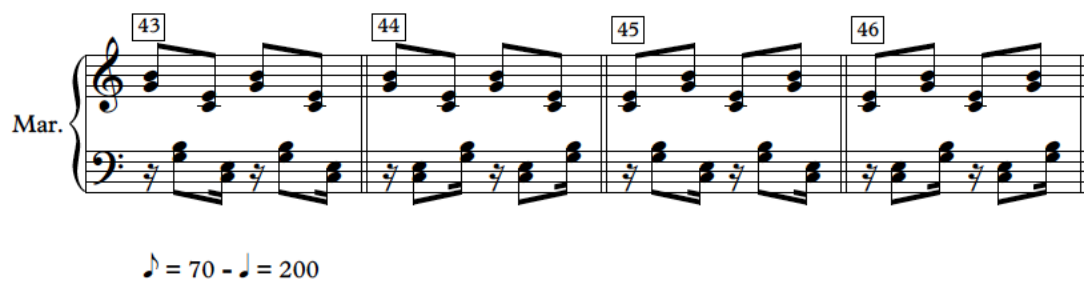
Mar. 

I II
III IV

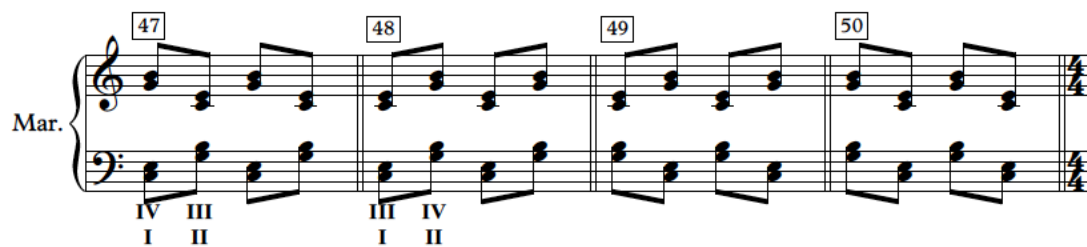
$\text{♩} = 130 - \text{♩} = 180$

Mar. 

II IV I III II III I IV...

Mar. 

$\text{♩} = 70 - \text{♩} = 200$

Mar. 

IV III III IV
I II I II

$\text{♩} = 50 - 250$

Mar.

51 52 53 54 55

R R:IV IV 8 7
6 5 III III
L L:II II 4 3
2 1 I I

56 57 58 59 60

R R:6+IV 5+IV III+8 III+7
L L:2+II 1+II I+4 I+3

61 62 63 64 65

66 67 68 69 70

71 72 73 74 75

Mar.

76 77 78 79 80

81 82 83 84 85

86 87 88 89 90

91 92 93 94 95

96 97 98 99 100

101 102 103 104 105

The musical score for Maracas (Mar.) consists of six systems, each containing five measures. The measures are numbered 76 through 105. The key signature changes from B-flat major (measures 76-80) to D major (measures 81-85) and then back to B-flat major (measures 86-105). The right hand plays chords, and the left hand plays a steady eighth-note accompaniment.

Mar.

Measures 106, 107, 108, 109, 110

Mar.

Measures 111, 112, 113, 114, 115

Mar.

Measures 116, 117, 118, 119, 120

Mar.

Measures 121, 122, 123, 124, 125

Mar.

Measures 126, 127, 128, 129, 130

$\text{♩} = 100 - 170$

Mar.

Measures 131, 132

I II III IV

Mar. 133 134

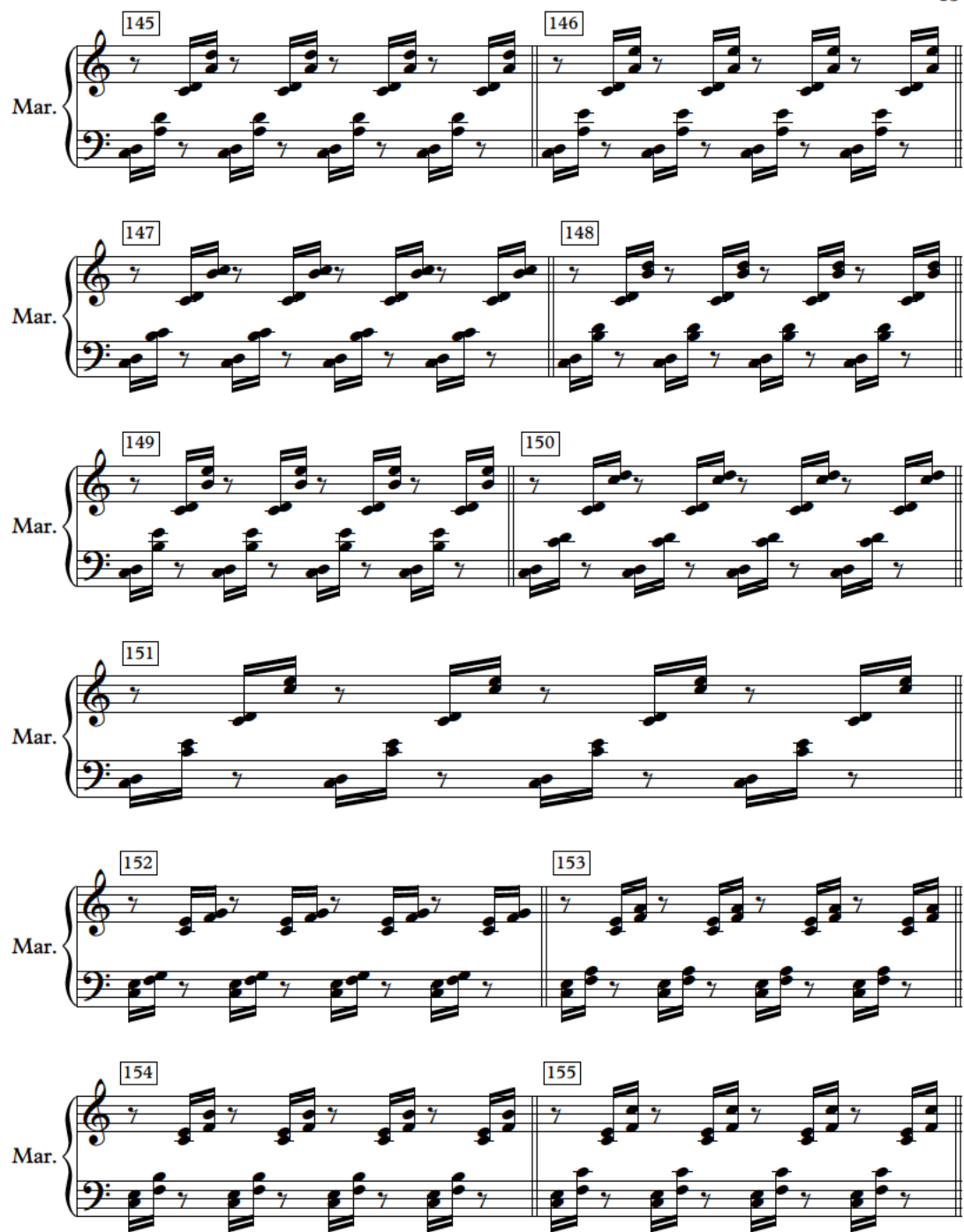
Mar. 135 136

Mar. 137 138

Mar. 139 140

Mar. 141 142

Mar. 143 144

Mar. The image displays a musical score for a maraca part, spanning measures 145 to 155. The notation is presented in six systems, each consisting of a treble and bass staff joined by a brace. The key signature is one flat (B-flat), and the time signature is 4/4. Measures 145 and 146 show a rhythmic pattern of eighth notes in the treble and eighth notes with rests in the bass. Measures 147 and 148 continue this pattern. Measures 149 and 150 show a variation where the treble staff has eighth notes and the bass staff has eighth notes with rests. Measures 151 and 152 show a further variation with eighth notes in the treble and eighth notes with rests in the bass. Measures 153 and 154 show a variation with eighth notes in the treble and eighth notes with rests in the bass. Measures 155 and 156 show a variation with eighth notes in the treble and eighth notes with rests in the bass. The maraca part is indicated by the 'Mar.' label to the left of each system.

145 146

147 148

149 150

151 152

153 154

155

Mar. 156 157

Mar. 158 159

Mar. 160 161

Mar. 162 163

Mar. 164 165

Mar. 166 167

Mar. 168

Mar. 169 170

Mar. 171 172

Mar. 173 174

Mar. 175 176

Mar. 177 178

Mar. The musical score for the Maracas part consists of six systems, each containing two measures. The measures are numbered 179 through 190. The notation is written on a grand staff (treble and bass clefs). The melody in the treble clef is a sequence of eighth notes, while the bass clef provides a rhythmic accompaniment with chords and eighth notes. The key signature is one flat (B-flat), and the time signature is 4/4. The piece is in a 3/4 time signature, with the eighth notes in the treble clef indicating a 3/4 time signature. The Mar. label is placed to the left of each system.

179 180

181 182

183 184

185 186

187 188

189 190

Mar. 191

Mar. 193

♩ = 50 - 70

♩ = 70 - 200

Mar. 195

1 2 2 1 1 2 2 1
3 4 4 3 3 4 4 3
5 6 6 5 5 6 6 5
7 8 8 7 7 8 8 7

♩ = 90 - 210

Mar. 199

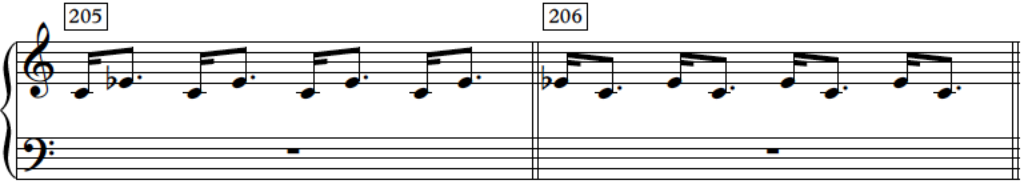
1 2 2 1
3 4 4 3
5 6 6 5
7 8 8 7

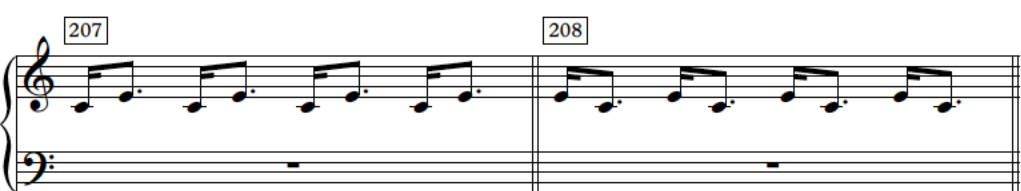
Mar. 201

1 2 2 1
3 4 4 3
5 6 6 5
7 8 8 7

Mar. 

1	2	2	1
3	4	4	3
5	6	6	5
7	8	8	7

Mar. 

Mar. 

Mar. 

Mar. 

Mar. 

$\text{♩} = 50 - 180$

Mar. 

Mar. 

Mar. 

Mar. 

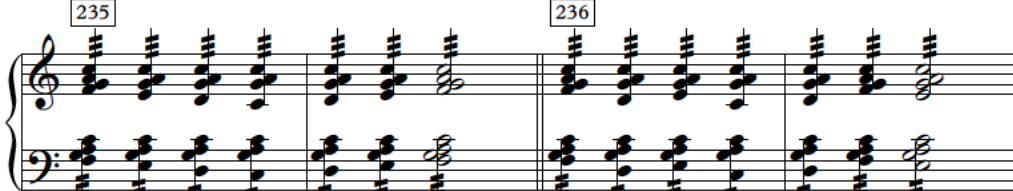
Mar. 

Mar.  Musical score for measures 225-227. The score is for a maracas instrument, indicated by the 'Mar.' label. It consists of three systems of two staves each (treble and bass clef). Measure 225 starts with a treble clef and a key signature of one sharp (F#). The music features a rhythmic pattern of eighth notes and quarter notes, with a consistent accompaniment in the bass. Measure 226 continues the pattern, and measure 227 concludes the system.

Mar.  Musical score for measures 228-230. The score continues from the previous system. Measure 228 shows a continuation of the rhythmic pattern. Measure 229 introduces a slight variation in the treble staff. Measure 230 concludes the system.

Mar.  Musical score for measures 231-232. The score continues with measures 231 and 232. The rhythmic pattern remains consistent, with the bass staff providing a steady accompaniment.

Mar.  Musical score for measures 233-234. The score continues with measures 233 and 234. The musical notation shows a continuation of the established rhythmic and melodic themes.

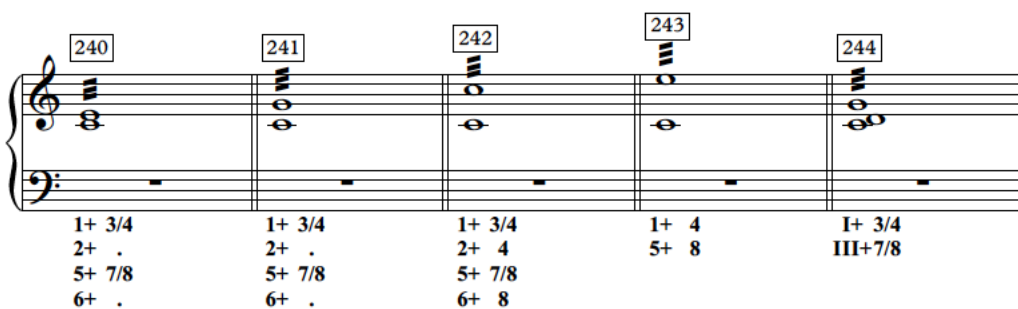
Mar.  Musical score for measures 235-236. The score concludes with measures 235 and 236. The final measures maintain the consistent rhythmic pattern of the preceding system.

Mar. 

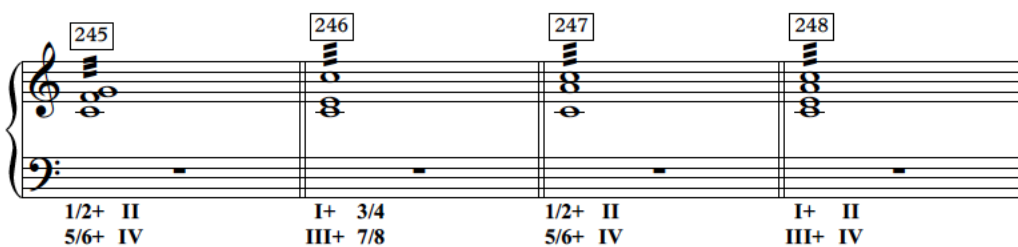
$\text{♩} = 50 - 200$

Mar. 

III...IV
5...6...7...8

Mar. 

1+ 3/4	1+ 3/4	1+ 3/4	1+ 4	I+ 3/4
2+ .	2+ .	2+ 4	5+ 8	III+ 7/8
5+ 7/8	5+ 7/8	5+ 7/8		
6+ .	6+ .	6+ 8		

Mar. 

1/2+ II	I+ 3/4	1/2+ II	I+ II
5/6+ IV	III+ 7/8	5/6+ IV	III+ IV

$\text{♩} = 50 - 150$

Mar. 

5+ 7/8+ 1/2/3/4	1+ 3/4+ 5/6/7/8
6+ . .	2+ . .

Mar. 251 252

5+ 7/8+ 1/2/3/4
6+ . .

1+ 3/4+ 5/6/7/8
2+ . .

Mar. 253 254

5+ 7/8+ 1/2/3/4
6+ 8+ .

1+ 3/4+ 5/6/7/8
2+ 4+ .

Mar. 255 256

5+ 8+ 1/2/3/4

1+ 4+ 5/6/7/8

Mar. 257 258

III+ 7/8+ 1/2/3/4

1+ 3/4+ 5/6/7/8

Mar. 259 260

5/6+ IV+ 1/2/3/4

1/2+ II+ 5/6/7/8

Mar. 261 262

III+ 7/8+ 1/2/3/4

I+ 3/4+ 5/6/7/8

Mar. 263 264

5/6+ IV+ 1/2/3/4 1/2+ II+ 5/6/7/8

Mar. 265 266

III+ IV+ 1/2/3/4 I+ II+ 5/6/7/8