The 'marimba-vibe' double keyboard: An explorative investigation of a nascent solo percussion idiom

Paul Tanner

Edith Cowan University

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The ‘Marimba-Vibe’ Double Keyboard: An Explorative Investigation of a Nascent Solo Percussion Idiom

Comprising
• Written dissertation
• Portfolio of recorded performances
• Portfolio of compositions (original and commissioned)

This research is presented for the degree of

Doctor of Philosophy

Paul Arthur Tanner

Edith Cowan University
Western Australian Academy of Performing Arts
2022
Abstract

The development of the concert marimba and invention of the vibraphone in the twentieth century was accompanied by a concomitant growth in repertoire for each instrument. Both belong to the core instrumentation of many new music groups, and percussionists are at times required to perform the instruments simultaneously, combining their distinct timbral personalities. However, the number of solos for the ‘marimba-vibe’ (the term I use to describe a marimba and vibraphone arranged in close proximity to each other in order to be performed by one player) without additional percussion instruments, is minimal. This gap in keyboard percussion repertoire and research remains to be thoroughly examined.

While a large body of performers, repertoire, research, and pedagogical material exists for each instrument, this research makes an examination of musical and non-musical challenges involved in the nascent solo marimba-vibe idiom, aiming to explore its potential and develop strategies to overcome technical limitations. The project involved the composition and commissioning of new works, whilst also creating annotational tools and notational approaches. These works were researched through reflexive practice as they were developed, performed, and recorded. The project aims to contribute to repertoire, technical understandings, and pedagogy for the marimba-vibe, thereby broadening the scope of the ever-expanding field of solo percussion literature.
**Declaration**

I certify that this thesis does not, to the best of my knowledge and belief:

(i) incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher degree or diploma in any institution of higher education;

(ii) contain any material previously published or written by another person except where due reference is made in the text of this thesis;

(iii) contain any defamatory material.

Signed: [Signature]  Date: 7/10/22
Acknowledgements

A huge debt of gratitude is owed to my principal supervisor, Dr Matthew Styles, for his invaluable advice and hours of supervision and encouragement (and for persuading me to undertake this project in the first place). I wish to thank my associate supervisor, Associate Professor Jonathan Paget, for his technical advice, editing tips, and initial moulding of the research questions and proposal. I would also like to thank the third member of my supervisory panel, Mr Timothy White, for his endless encouragement and percussion-related advice.

I would like to express my gratitude and admiration for the wonderful composers who contributed to this project: David Pye, Kathy Potter and Dr Lindsay Vickery.

This work is dedicated to my wife Catherine Cahill and children Ruby and Ben, whose patience and support allowed me to undertake the hours of practice and writing required for this project.
Glossary of Terms

‘Marimba-vibe’ refers to the combination of marimba and vibraphone, set up in close proximity to each other, allowing a single performer to play them simultaneously.

‘Setup’ refers to the physical arrangement of instruments. In this thesis, the ‘marimba-vibe setups’ discussed are:

‘V-formation’ and ‘reverse V’: I set up the marimba-vibe with the vibraphone approximately at a right angle to the marimba, and on the right (‘V-formation’). If the vibraphone is positioned to the left, I call the setup a ‘reverse V’.

‘Stacked’ and ‘reverse stacked’: arranging the two instruments parallel, with the vibraphone between the performer and marimba, is a ‘stacked’ setup. If the marimba is between the performer and the vibraphone, I describe this as a ‘reverse stacked’ setup.

Mallets 1 to 4 are numbered from left to right. The left hand holds mallets 1 and 2, the right hand holds mallets 3 and 4. For ease of recognition, mallet numbers are notated with Arabic numerals throughout this thesis.

‘Graduated set’: when playing with four mallets, percussionists may employ mallets ranging from a softer, larger mallet for the bass notes (mallet 1), to a harder, smaller mallet for the highest register (mallet 4).

‘Multi-percussion’, or ‘multiple-percussion’ refers to a setup of a number of percussion instruments, to be played by one performer. These may be tuned, untuned, or a combination of both.

‘One-handed linear’: ‘the alternation of mallets in each hand for linear passages.’

‘Percussionist-composer’: a composer who has trained as a percussionist and therefore has an insight into performance challenges.

‘(Row of) Accidentals’: although a B-sharp, E-sharp, F-flat and C-flat are ‘white notes’ on a piano, I have used the term ‘accidentals’ to describe the row of pitches corresponding to the ‘black notes’ on a piano.

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1 Thomas Allen Zirkle, “Developing a four-mallet marimba technique featuring the alternation of mallets in each hand for linear passages and the application of this technique to transcriptions of selected keyboard works by J.S. Bach” (DMA LSU, 2003), https://digitalcommons.lsu.edu/gradschool_dissertations/3099 (3099).
‘(Row of) Naturals’: likewise, I use the term ‘naturals’ to describe the row of pitches corresponding to the white notes on a piano.

C₂ to C₇: the range of the modern concert marimba. C₂ is two octaves lower than ‘middle-C’. Octave numberings begin with C. Therefore, A₂ is a major sixth above C₂.

Dead-stroke: striking and pushing into the bar with a mallet in one motion, rather than allowing the mallet to rebound. This technique causes a choked (or ‘dead’) sound, rather than a freely-ringing tone.

Polymetre: in its literal sense, a superimposition of two or more time-signatures (or ‘metres’). In this thesis, ‘polymetric’ may refer to the aural effect of music conceived in two-time signatures, but notated in one for simplicity of reading. This effect may be achieved by the use of accents (marking the beginning of each ‘metre’); the use of different timbres to articulate each metre (usually a superimposition of marimba and vibraphone ostinatos); or superimposed rhythmic (and often, melodic) ostinatos, notated within a single time-signature.
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CHAPTER 1: Introduction

The concert marimba and vibraphone are two of the most recent additions to the instrumentarium of Western art music: the marimba was introduced to the United States at the turn of the twentieth century; and the vibraphone was invented and developed there throughout the 1920s. As their popularity amongst performers has grown, performers have aided and benefitted from a contemporaneous growth in repertoire and literature surrounding the instruments.

Although occasional flirtations with the use of both instruments by one performer in a solo context have been attempted, a continuous development of the idiom and literature surrounding this music is lacking. This research project aims to address the lack of repertoire and literature, and to provide practical information for performers and composers. It is hoped that this will encourage these musicians to embrace the ‘marimba-vibe’ as a fascinating, challenging, and rewarding musical idiom.

Are the benefits of the marimba-vibe sufficient to encourage development of this idiom? Can rigorous examination of the idiom’s unique challenges lead to solutions, thereby encouraging future performers and composers? These questions provide the basis for an examination of the idiom, through analysis of compositional aspects and discussion of performance issues.

This thesis includes a substantial contribution to the repertoire of this idiom, through the commissioning and composition of new works. It likewise contributes a body of literature surrounding the marimba-vibe repertoire, with suggestions and advice for future composers and performers. Recorded performances of these works provide a useful reference tool and have been utilised to demonstrate many of the points made within this thesis.

Accelerating the growth of repertoire and literature surrounding the marimba-vibe is an objective that requires a multi-pronged attack. The simultaneous performance of two large instruments unsurprisingly presents many challenges, which are documented in this thesis. Likewise, the challenge of writing idiomatically for percussion may have prevented non-percussionist composers from undertaking composition for this idiom. This research project includes detailed documentation of solutions to performative and compositional challenges, and clearly articulates the many benefits of solo double-keyboard composition.

Solo repertoire for both instruments has grown exponentially over the last century, and a duo repertoire for marimbist and vibraphonist has also emerged, exploiting the possibilities of two distinct timbres and textural possibilities. Combining the two in a work for one performer, however, presents many unique challenges. Although composers have been attracted to the possibilities, the solo repertoire remains small.
Roman Haubenstock-Ramati’s *Liaisons*,\(^3\) written for marimba and vibraphone, may be performed by a soloist, or as a duet. Composed in 1958, it is the first notated work for solo marimba-vibe. Despite this early interest in the idiom, notated repertoire for solo marimba-vibe – without additional percussion instruments – does not appear again until Daniel Godfrey’s *Music for Marimba and Vibraphone* (1981).\(^4\) Since this date, other composers have written for the idiom, and Luciano Berio’s reply to my request for information regarding a percussion *Sequenza* (Figure 1.1) indicates that he too was attracted to the idea of combining the instruments. Unfortunately, this did not eventuate before his death in 2003.

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In this research project, I use the ‘marimba-vibe’ appellation to describe an arrangement of the marimba and vibraphone in close proximity to each other, so that they may be performed by a soloist, sometimes simultaneously. The scarcity of solo marimba-vibe repertoire available at the commencement of my investigation in 2019, and lack of research into the possibilities of the idiom, invited a substantial contribution to this field. This was achieved through the study of works written between 1981 and 2018; collaboration with composers to develop three new works; my own composition of five solos; and examination of the resulting repertoire. Artefacts produced to broaden the scope of the study include a composers’ guide (with technical advice and tables); a performers’ guide; video and audio recordings; and annotated scores for performers.

Although not discussed in this examination of the marimba-vibe, Darius Milhaud’s *Concerto for Marimba and Vibraphone*,\(^5\) written in 1947, provides an early example of the appeal of this idiom.

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to composers of historical importance. It does not require the simultaneous performance of both instruments and is accompanied by an orchestra, therefore falling outside of the scope of this study. Also falling outside of the solo marimba-vibe repertoire are ensemble works including the use of both instruments by one performer, and solo multi-percussion works such as Stockhausen’s *Zyklus*.\(^6\) Prior to the commencement of this research project, only eleven notated marimba-vibe solos existed in the public realm. Although a brief discussion of the ‘stacked’ setup is included in Samuel Solomon’s book, *How to Write for Percussion*,\(^7\) a substantial contribution to literature surrounding this nascent idiom is yet to be written.

The combination of marimba and vibraphone offers many opportunities for timbral transformation, contrast, combination, and clarification. My own experience of arranging for small ensembles, in which I have transcribed piano, harp and guitar parts for myself to play, has frequently required the use of both instruments, due to their very different qualities. Whilst the marimba possesses a range far exceeding that of the vibraphone, only the latter instrument may affect a vibrato with its motor turned on and a long sustain with its pedal depressed. Transforming, contrasting, and combining timbres provides great scope for creative arrangements, and composers have experimented with these techniques within a multi-percussion context, and for one performer in both ensemble and solo settings. Little has been written about the successful employment of these instruments, however, and this project aims to inform composers about the myriad of techniques available when writing for the marimba-vibe.

Two questions arise when considering the challenge of simultaneous marimba and vibraphone performance by one player, and form the basis of my research:

- What unique techniques and timbres have been, or remain to be, explored in the marimba-vibe repertoire, and how can these musical advantages be used to encourage development of this idiom?
- What are the musical and extra-musical challenges of this instrumentation, and can rigorous examination of these challenges lead to solutions, thereby encouraging future performers and composers?

It is my assertion that a lack of familiarity with mallet instrument techniques – and especially the simultaneous use of two instruments – impedes the process of composition. Likewise, the performance of double-keyboard music presents many challenges. If the repertoire is to grow, non-percussionist composers need inspiration in the form of extant examples, their own interest in the

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idiom, or encouragement from performers. Performers will be motivated to perform in this idiom if they are able to find pieces that fulfil their requirements. Aiding practitioners in both musical fields will encourage an interchange of ideas, as future performers inspire the composition of new works, and successful compositions attract interest from performers.

Before discussing issues that may arise within the marimba-vibe idiom, it is necessary to describe three possible arrangements of the two instruments for one performer, or what will be known simply as ‘setups’:

1. ‘Stacked’ (Figure 1.2): as employed by Charles Wuorinen in *Janissary Music.* In this arrangement, the marimba and vibraphone are roughly parallel to each other, with the vibraphone placed between the marimba and the performer, to allow access to the pedal (which would be difficult if the positions were reversed).

![Figure 1.2: The ‘stacked’ setup.](image)

2. The ‘V-formation’: marimba and vibraphone placed at an angle to each other, as illustrated by Karlheinz Stockhausen in his seminal multiple-percussion work, *Zyklus,* and recommended by Ney Rosauro (Figure 1.3) in his *Sonata, the Periods of Life.*

![Figure 1.3: The ‘V-formation’ setup diagram, as suggested by Ney Rosauro.](image)

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9 Stockhausen, "Zyklus."
11 Rosauro, "Sonata the Periods of Life."
3. The ‘reverse V-formation’ (Figure 1.4): another set-up with the instruments placed at an angle to each other, but with the smaller end of the vibraphone nestled into the bass notes of the marimba.

Figure 1.4: The ‘reverse V-formation’ used by Christoph Sietzen in Emmanuel Séjourné’s *Attraction*.12

Although the use of one setup for all works was preferred, a survey of extant compositions from 1981 until 2017 revealed benefits and problems associated with all three setups. These are discussed further in the methodology (Chapter 3).

A mixed methodology was used to answer the research questions and achieve the aims of this thesis. Thematic and musical analysis of works; exegetical writing on my own compositional processes; and a performance-led examination of practice methods, was used to investigate the repertoire. These processes are discussed in detail in the methodology.

Specifically, this project set out to develop and promote the nascent solo marimba-vibe idiom, aided by the production of musical scores, recordings, and instructional guides. These artefacts were produced after an examination of extant repertoire; the commissioning and composition of eight new works; and an extended period of journalled practice sessions.

Endeavouring to answer the first research question, the musical advantages presented in the repertoire are documented and discussed in Chapter 4. Further exploration of the unique possibilities of this idiom were explored in my own compositions, with an exegesis of my compositional processes presented in Chapter 5. These chapters informed *A Guide to Composing for the Marimba-Vibe* (Appendix 1), created to promote the potential and encourage the use of this instrumentation by composers. In endeavouring to answer the second research question, solutions to the musical and extra-musical challenges within the repertoire were proposed after an extended period of journalled practice sessions. Chapters 6 and 7 include reflections on setup, performance technique and musical considerations — and the success of these approaches – and informed the creation of *A Guide to Performing Works for the Marimba-Vibe* (Appendix 2).

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12 Christoph Sietzen, "Emmanuel Séjourné: Attraction (short version) performed by Christoph Sietzen," (2017). https://www.youtube.com/watch?v=ix-QW-BShPY.
In the *Encyclopedia of Percussion*, Steven Schick articulates the benefit of repertoire development:

The difficulty in trying to make encyclopedic statements about multiple percussion lies in its very brief history as an art form. As with other instruments, the expertise required to play multiple percussion is defined by problems posed by composers in various pieces and in the solutions found by performers over a period of time...The most fruitful form of speculation in the area of multiple percussion performance practice remains the active commissioning and performing of new works.\(^{13}\)

Eleven solo works for the marimba-vibe (without additional instruments), were composed before the undertaking of this project, and it has been my aim to contribute to the development of this nascent idiom. ’Commissioning and performing’ new works were, therefore, major objectives of this study. Eight works were created as part of this project, involving the commissioning of three composers, and composition of five works by myself. These compositional outputs contributed to the production of artefacts, including guides for composition and performance; audio and video recordings; and annotated scores of the new works. These artefacts are intended to aid in the dissemination of new repertoire, and promote its growth. Additionally, since the beginning of this project in 2019, and independent of my own commissioning requests, a work has been written for the ‘reverse V-formation’\(^{14}\) and a set of three pieces for my preferred ‘V-formation’.\(^{15}\)

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CHAPTER 2: Contextual and Literature Review

Whilst the marimba and vibraphone are a very recent addition to the field of Western art music, relatives of these tuned idiophones have existed for thousands of years and are found in diverse cultures throughout the world. In section 2.1, the development of the marimba from its Central American roots and the later invention of the vibraphone will be discussed, before a brief overview of important performance pioneers on each instrument (section 2.2). Section 2.3 reviews the literature surrounding the marimba-vibe idiom, including repertoire for the solo marimba-vibe combination; instructional material for performers and composers; and movement studies (which include research into kinaesthetic development and efficient body movements and positions).

2.1 History of the Instruments

2.1.1 Early Twentieth Century Instrument Development and Invention

The word ‘marimba’ is thought to be of Bantu origin (rimba = flat projecting object; ma = plural), and originally described a larger, mellower-toned xylophone originating in Africa. Both the instrument and its Bantu name are thought to have been introduced to Central America in the sixteenth or seventeenth century, during the period of African slavery. Similarities in design reinforce this assertion, including the tuned calabash gourds hung under each bar (acting as resonators), and the use of mirlitons (thin membranes) attached to these, giving the instrument its distinctive buzzing timbre. Major developments of the Central American version of the instrument occurred in the nineteenth century, with the addition of a chromatic keyboard, a taller frame for standing musicians, individually tuned wooden resonators, and an extended range. Guatemalan marimba bands toured the United States in the early years of the twentieth century, and were popular enough for the Hurtado Brothers to extend their ‘six-month’ tour to almost five years of performances. In 1910, both the Deagan and Leedy companies (the two leading xylophone manufacturers) began producing marimbas for the American market.

17 Daniel Rager, "The History of the Marimba" (Cleveland State University, 2008), https://engagedscholarship.csuohio.edu/clmusic_facpub/1/.
manufacturers in the United States), began producing wooden marimbas featuring metal resonators and no mirliton.  

The Deagan and Leedy companies experimented with mallet instrument design and manufacture, and various instruments made their appearance in vaudeville, and on the emerging medium of radio.  In 1916, Herman Winterhoff, working for Leedy, began looking for a vibrato mechanism for a steel-keyed marimba. By 1922, he had succeeded in adding rotatable discs inside the resonators, which were attached to a long spindle and rotated by a motor mounted at the high end of the instrument. The ability to open and close the top of the resonators continuously, gave him his sought-after *vox humana* sound, and about 25 instruments were produced by 1927, when Leedy ceased manufacture.

Meanwhile, Henry J. Schluter of the Deagan company (the original developer of the steel marimba), developed the Model 145 ‘vibraharp’, featuring aluminium bars of graduated width that were suspended by cord, rather than sitting on top of tapered felt. Tuning the harmonics and adding a damper pedal and adjustable-speed motor resulted in an instrument that has remained largely unchanged. When Leedy resumed manufacture in 1928, adding the new innovations, the terms ‘vibraphone’ and ‘vibraharp’ were therefore being used to describe very similar instruments.

In 1933, the ‘Century of Progress’ Exhibition in Chicago featured Clair Omar Musser’s marimba orchestra, for which Deagan manufactured 75 three-and-a-half octave marimbas, 25 four-and-a-half octave marimbas, a single one-and-a-half octave bass marimba, and a two-and-a-half octave bass marimba. Touring as the ‘International Marimba Symphony Orchestra’, the orchestra travelled to Europe in 1935 with 101 new Deagan ‘King George’ marimbas and bass marimbas. Although these models were manufactured for Musser’s orchestra only, the ‘Imperial’ range of Deagan marimbas were built from 1937 to 1942, and included models with three, three-and-a-half, four, and four-and-a-half-octave ranges (Figure 2.1 illustrates some particularly effusive marketing).

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23 Trommer, "The Vibraphone, Vibraharp, and Vibes."
Financial limitations and a lack of metal supplies during the Second World War led to the replacement of these models with the four-octave Model 36, produced between 1943 and 1945, featuring cardboard resonators. Although resonators reverted to metal in the post-war period, the 4-octave range became standard, and Deagan only began producing four-and-a-third octave marimbas, extending to the bottom A of the bass stave (A₂), in 1972.

Having worked for Deagan as a salesperson, engineer and designer from 1930, Musser left Deagan after the Second World War to start the company bearing his name. From 1948, Musser adopted the term ‘vibe’ in the company’s promotional material, thereby avoiding the confusion surrounding the vibraphone and vibraharp. However, whilst modern Musser instruments bear model names such as the ‘Pro-Vibe’ and ‘Century Vibe’, the instruments are described by the Conn-Selmer company (who acquired Ludwig-Musser in 1981) as ‘vibraphones’ in their promotional material, whilst the term ‘vibraharp’ has become much less-common.

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26 “Deagan Marimbas.”
27 Hambright, "Milestones in the Recent History of the Marimba."; "Deagan Marimbas.”
28 Trommer, “The Vibraphone, Vibraharp, and Vibes.”
2.1.2 Post-war Japanese Development and Extension of Range

Miyakawa Takeshi, the managing director of Bridgestone Tyres, was approached by the Minister of Education in 1947, following the introduction of instrumental music study into schools. Xylophones were mandated as a necessary instrument for classroom education, and he was given a Deagan xylophone and encouraged to produce desktop instruments (Bridgestone had a department devoted to the manufacture of wooden propellers and gunstocks during the war, and a large oversupply of timber when it ended).³⁰ Although Miyakawa was the first Japanese manufacturer, Yamaha followed suit in 1949, and by 1955 a number of companies were struggling to keep up with the demand, with many xylophones being bought by students for use at home.

A tour by an American missionary group led by Lawrence and Mildred Lacour in 1950³¹ introduced many more prospective performers, including a young Keiko Abe, to the sound and potential of the marimba. With the appearance of Abe as a major commissioner and performer of marimba solo repertoire in the 1960s³² the marimba was developed and extended further. After years of collaboration with Abe, Yamaha introduced the YM-6000:³³ a five-octave concert instrument with a range that extended two octaves below middle-C. Although larger instruments are occasionally made, this has become the standard range for concert instruments.

Although developments and variations of the vibraphone have occurred, including three-and-a-half and four-octave versions,³⁴ most vibraphones conform to the three-octave standard range, which may explain the smaller amount of concert solo repertoire when compared to that of the marimba. Advocates for the vibraphone are seeking to redress this repertoire imbalance with some success, and Brian Graiser has this to say about the possibilities of an extended-range vibraphone:

Were it not for the vibraphone’s limited range, I believe that its many unique capabilities (e.g. sustain, pedaling, mallet-dampening, vibrato, and numerous extended techniques such as harmonics, bowing, and pitch-bending) would likely have placed the vibraphone, and not the marimba, at the forefront of solo keyboard percussion literature long ago. Fortunately, this constraint may one day be a thing of the past, as a small but growing number of companies are producing four-octave vibraphones…³⁵

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³¹ Rebecca Kite, Keiko Abe: a virtuosic life (Virginia, USA: GP Percussion, 2007). p17
³⁵ Graiser, "Four-octave vibraphone resources."
2.2 Performance Pioneers

In the USA, the importation and development of the marimba in the early twentieth century encouraged the formation of ensembles performing arrangements of orchestral music, alongside foxtrots, ragtime, and other popular favourites. In contrast, early popularisation of the vibraphone – invented later and refined throughout the third decade of the century – was achieved by jazz musicians during the swing era of the 1930s. Whilst the introduction of the five-octave concert marimba was particularly successful in encouraging composers to write for the instrument, the efforts of performers has resulted in a large body of works for both instruments.

2.2.1 Marimbists

Having formed his hundred-person marimba orchestra for the ‘Century of Progress’ Exhibition in Chicago, under the auspices of the Deagan Company in 1933, Clair Omar Musser (1901-1998) became the most influential figure in the concert marimba’s early development. The repertoire performed consisted largely of arrangements of orchestral favourites (Dvorak’s *New World Symphony* and Wagner’s *Pilgrim’s Chorus* were two examples on the Century of Progress programme), reflecting the instrument’s lack of commissioned repertoire. He performed mainly arrangements of Romantic repertoire, but also wrote etudes and preludes that became standard pedagogical repertoire for students, and was regarded as the pre-eminent marimba teacher of his time.

Clair Omar Musser’s most famous student, Vida Chenoweth (1928-2018), has been described as ‘the first concert marimbist’, and sought to perform repertoire that was written especially for the marimba. She was the first marimbist to perform a concerto in Carnegie Hall, premièring Robert Kurka’s *Concerto for Marimba* in 1959, and toured Europe in 1962 before releasing her first record.

In Japan, Keiko Abe (1937- ) initially studied xylophone with Asabuki, hearing a marimba for the first time in a 1950 performance by Lawrence Lacour’s missionary group. After winning a talent contest for the Japanese broadcaster, NHK, in 1951, she began recording for radio. She released multiple albums as soloist and with the Xebec Marimba Trio, including recordings of popular melodies such as *Tico Tico*, *Black Orpheus*, and *Beer Barrel Polka*; movie themes; and Japanese folksongs. By 1968 though, Abe decided to focus on commissioning and performing concert

36 Kathleen S. Kastner, "The emergence and evolution of a generalized marimba technique" (DMA University of Illinois at Urbana, 1989), https://www.ideals.illinois.edu/handle/2142/21949.
37 Kastner, "The emergence and evolution of a generalized marimba technique."
40 Xebec Marimba Trio, *Love is a Many Splendored Thing* (Polydor, 1965), SLJM-1208.
repertoire,\textsuperscript{42} just as Chenoweth had in the United States. Since the time of Abe’s first solo recital in 1968, she has championed the commissioning and composition of new works, and Yamaha’s decision to develop the five-octave concert marimba was at Abe’s request.\textsuperscript{43} The advantages of an extended range, and Abe’s commitment to expanding the repertoire, has led to the creation of a formidable catalogue of works. Abe has herself contributed to this repertoire, with works such as Variations on Japanese Children’s Songs (1982),\textsuperscript{44} Dream of the Cherry Blossoms (1984),\textsuperscript{45} and Tambourin Paraphrase (1993)\textsuperscript{46} utilising the full expressive potential and pitch range of the five-octave marimba.

Following the lead of Chenoweth and Abe, American marimbist Leigh Howard Stevens (1953- ) has commissioned an extensive list of works by leading composers, and contributed to the repertoire with works of his own.\textsuperscript{47} His ‘Stevens grip’ or ‘Musser-Stevens grip’ is noteworthy for the independence and control a performer can achieve with each mallet, and has become one of the three most commonly grips in use today (which are discussed in 2.3.1 – a review of performance instructional books). The first Leigh Howard Stevens International Marimba Competition was held in 1995, and has spawned a multitude of competitions revolving around the marimba and its development.

The pioneering work of Chenoweth, Abe, and Stevens continues amongst performers, with commissioning and composition of new repertoire playing a major part in the development of this instrument and its associated techniques.

2.2.2 Vibraphonists/Vibraharpists/Vibists

As a young boy, Lionel Hampton (1908-2002) played drums before moving with his mother to Chicago, home of the Deagan Company. Here, he received xylophone lessons, before beginning professional life as a drummer.\textsuperscript{48} By 1929, he was recording with Louis Armstrong in California, who in 1931 asked him to play a Deagan vibraharp that had been left in the recording studio.\textsuperscript{49} ‘Memories of You’ and ‘Shine’ are the earliest surviving recordings of this instrument with improvised soloing, and the success of the experiment led Hampton to include vibraphone in the bands he led. In 1936, he was approached by Benny Goodman to join his orchestra, and eventually led a series of his own

\textsuperscript{42} Scott, "The Art of Marimba in Tokyo: Emergence in the Twentieth Century."
\textsuperscript{43} Kite, Keiko Abe: a virtuosic life.
\textsuperscript{44} Keiko Abe, "Keiko Abe: Works for Marimba," (Tokyo: Schott Japan Company Ltd., 1987).
\textsuperscript{45} Keiko Abe, "Dream of the Cherry Blossoms," (Frankfurt: Musikverlag Zimmerman, 1984).
\textsuperscript{47} Leigh Howard Stevens, Method of Movement for Marimba (New York: Marimba Productions, 1979).
\textsuperscript{49} Trommer, "The Vibraphone, Vibraharp, and Vibes."
successful bands. Hampton continued to perform into his 90s and is credited by Gary Burton as being the “guy who really got us established”.  

Milt Jackson (1923-1999) is best remembered for his long-time association with the Modern Jazz Quartet (or ‘Milt Jackson Quartet’ before 1952). Aside from the years 1974 to 1981, this ‘cool jazz’ chamber group performed with the same personnel from 1954 until Jackson’s death. They are notable for the elegance of their chamber sound, with a less hard-edged approach to bop than Parker and Gillespie, and a willingness to incorporate elements of classical music.

Of the plethora of subsequent performers, Gary Burton (1943- ) has led the development of techniques and musical possibilities on the vibraphone, utilising his own four-mallet grip, and releasing some of the earliest recordings of ‘fusion’ (a combination of jazz and rock elements). Of particular relevance to this study are his performances and recordings of unaccompanied solos, and his extraordinary ability to accompany and improvise simultaneously. Although utilising an instrument with a significantly smaller pitch range than the marimba, the inspirational example of Burton and other popular jazz musicians has helped to initiate a growing concert repertoire for solo vibraphone.

2.3 Literature Surrounding the Marimba-Vibe

Although a small repertoire exists for the nascent idiom of solo marimba-vibe, this dissertation provides the first substantial contribution to knowledge surrounding this idiom. Extant literature of some relevance is divided into three broad fields and discussed in the following section:

1. The marimba-vibe repertoire, including compositions that contributed to the emergence of this idiom; early works for the ‘stacked’ setup; works composed for the ‘V-formation’ utilised in this research project; and two works for the ‘reverse V-formation’.

2. Instructional books for performers and composers. Pedagogical literature exists for marimba, vibraphone, and a broader ‘mallet instrument’ performance category. These include technical advice, discussion of ‘grips’ (different ways to hold four mallets), and pedalling and dampening techniques for the vibraphone. At present, no marimba-vibe performance guides exist, and Appendix 2 of this dissertation, A Guide to Performing Works for the Marimba-Vibe, offers advice to percussionists wishing to engage with this repertoire. Likewise,

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50 Mattingly, "Lionel Hampton."
Appendix 1, *A Guide to Composing Works for the Marimba-Vibe*, offers the first substantial contribution for composers wishing to write for this solo idiom.

3. Movement studies, including research on kinaesthetic skills (or ‘muscle memory’) to aid pitch-accuracy when the performer is unable to watch the placement of all four mallets; and the specific body movements required for performers of these instruments.

### 2.3.1 Towards a Solo Marimba-Vibe Repertoire

A substantial body of work has been written by composers featuring the marimba and vibraphone played by a single performer in an ensemble context. These works, however, fall outside the scope of this study, due to their inclusion of instruments other than the (solo) marimba-vibe. Of particular historical interest is Darius Milhaud’s *Concerto for Marimba and Vibraphone.* Written in 1947, it features four-mallet technique and rapid movement between the two instruments. As it is an accompanied work and never requires simultaneous playing of both instruments, it is mentioned only as an example of an early double-keyboard work by an influential composer.

In 1959, Karlheinz Stockhausen composed *Zyklus* for solo multi-percussionist – the first published unaccompanied solo work for one percussionist at a battery of instruments. This work, penned by one of the leaders of the European avant-garde, featured a marimba and vibraphone placed in a V-formation, and surrounded by a large collection of non-pitched instruments (Figure 2.2).

![Figure 2.2: Setup diagram for Stockhausen: Zyklus.](image)

In 1966, Charles Wuorinen, a major figure of the American avant-garde, composed another multiple-percussion work including marimba and vibraphone. *Janissary Music,* which includes a

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53 Milhaud, "Concerto for Marimba and Vibraphone."
54 Stockhausen, "Zyklus."
55 Stockhausen, "Zyklus."
56 Wuorinen, "Janissary Music."
timpano in F, twelve metal instruments and twelve drums, employs the mallet instruments in a stacked arrangement, to facilitate reading and accurate movement between the instruments.

Although the influence of Stockhausen on solo percussion repertoire cannot be overstated, his use of marimba and vibraphone by a single player was preceded by a less well-known work by Roman Haubenstock-Ramati. Liaisons was composed in 1958, one year prior to Zyklus, although not published until 1962. It may be performed as a marimba-vibe solo, marimba-vibe solo with tape, vibraphone solo, or as a duo. Haubenstock-Ramati was an editor at Universal Edition at this time, so may well have influenced (or been influenced by) Stockhausen’s work.

In 1981, Daniel Godfrey composed a solo marimba-vibe work that was also conceived in the stacked setup (and may also be played as a duo). Music for Marimba and Vibraphone primarily juxtaposes passages of music on the two instruments, although the amount of simultaneity and complexity increases as the work progresses.

Rand Steiger’s Kennedy Sketches was composed a year later. This is a concise three movement work focusing on the combination of timbres and extended techniques associated with these instruments (including bowed vibraphone). Following Liaisons and Music for Marimba and Vibraphone, this work was conceived in the stacked setup. Unlike the prior works, Kennedy Sketches was conceived as an exclusively solo work, and explores techniques that are more successfully executed by one performer, such as the rapid alternation of pitches between instruments.

Brazilian percussionist-composer, Ney Rosauro published his Sonata, the Periods of Life in 1985, in which the first and final movements feature the instruments played simultaneously. Although the marimba and vibraphone in Stockhausen’s work are arranged in a V-formation, they are only two instruments within an extensive multi-percussion setup surrounding the performer. Rosauro’s work can therefore lay claim to being the first solo marimba-vibe work in which the composer suggests the use of a V-formation. Rosauro’s simultaneous sections are not complex: although the last movement is written at a fast tempo, repeated pitches and ostinato patterns allow for comfortable accuracy. During simultaneous sections, the performer’s right-hand plays only vibraphone, while the left hand remains above the marimba, allowing the use of specific vibraphone or marimba mallets if desired. In the contrasting sections of solo marimba or vibraphone, Rosauro allows time to exchange mallets, should the performer wish to do so.

Stefan Niculescu’s Solo pentru Marimbafon si Vibrafon (1989) is notable for its harmonic stasis, and employment of a single hexatonic scale throughout (C-D-Eb-G-Ab-Bb). The dissonances between pitches are tempered by the contrasting timbres of the vibraphone and marimba, creating a

57 Haubenstock-Ramati, "Liaisons."
58 Godfrey, "Music for Marimba and Vibraphone."
60 Ney Rosauro, "Sonata, the Periods of Life," (Frankfurt: Musikverlag Zimmerman, 1985).
subdued sense of unease throughout the piece. Whilst the vibraphone often plays grace notes at an interval of a second or seventh to the marimba (often displaced by an octave), numerous examples of repeated unison pitches maintain the sense of calm.

Finnish composer, Veli-Matti Puumala, published *Pulses* in 1992. Fast tempos, cross rhythms, metric modulations, irregular metres, six-mallet technique, an extended-range vibraphone (three-and-a-half octaves to C₃, one octave below middle-C) and simultaneous vibraphone-marimba sections combine in a work of extreme difficulty, and Puumala has confirmed that a recording of this *tour de force* of mallet technique is yet to be made.

As in Steiger’s work, combination of timbres is explored in *Dance VI* of Roger Smalley’s 1993 multiple-percussion work *Music for an Imaginary Ballet*, commissioned by and dedicated to this author. Although a limited number of non-pitched percussion instruments are employed in previous movements, *Dance VI* is written for solo marimba-vibe, positioned in the V-formation.

Two further (stacked) solos were written in the 1990s: Robert Pollock’s *Three Pieces for Marimba and Vibraphone* (1994) and Wayne Peterson’s *Antiphonies* (1999). Pollock’s work is available for purchase through the composer (with a recording on his website), but sheet music and recordings of *Antiphonies* appear unavailable.

Composer-percussionist Thad Anderson was the first to write a marimba-vibe solo utilising the five-octave concert marimba. In *OPEN/shut*, composed in 2010, Anderson suggests the use of the V-formation and instructs the performer to place a weight on the vibraphone pedal, allowing greater freedom of movement. As with Rosauro’s work, the simultaneous sections allow for the placement of the right hand above the vibraphone and left hand above the marimba.

Emmanuel Séjourné composed *Attraction* in 2017, accompanied by a digital audio track. Although I perform *Attraction* in my preferred V-formation, it is often performed in a reverse V. Séjourné’s work is considerably more virtuosic than Rosauro’s, but as with the Rosauro work, he has been cautious with the simultaneous sections. Figure 2.3 shows the first four bars of an eight-bar section, beginning at bar 104, in which both instruments are struck at the same time. Séjourné achieves simultaneity of timbres in other sections by sustaining the vibraphone while striking the marimba, but Figure 2.3 is the only section requiring simultaneous attacks. Although the performer may follow Rosauro’s example in playing marimba with the left hand only, the rapid vibraphone passages require the use of both hands.

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66 http://www.robertemilpollock.com
67 Thad Anderson, "OPEN/shut," (+TwoMedia, 2010).
Since the commencement of this study, two percussionist-composers have published marimba-vibe compositions: Michael Burritt composed *The Fragile Corridor* (2019)\(^{70}\) for a ‘reverse V-formation’ setup (and minimal simultaneity), whilst Leonard Waltersdorfer performs his *3 Pieces on 2 Instruments for 1 Player* (2020)\(^{71}\) in the V-formation. Waltersdorfer’s performances on YouTube\(^{72}\) reveal his variable setup of the V-formation, as he moves the vibraphone along the length of the marimba to be closer to the marimba range required in each piece.

Works commissioned and composed for this study will be discussed in detail in an exegesis (Chapter 6) detailing reflective and reflexive practice, analysis, and collaboration with the respective composers. Chapter 6 also discusses Rand Steiger’s work, affording a discussion around the benefits and challenges of the stacked and V-formation setups. *A Guide to Performing Works for the Marimba-Vibe* is included as Appendix 2, and annotated scores of the following works, commissioned or composed for this project, may be found in Appendix 3.

Western Australian composer, David Pye, composed *euler’s identity*\(^{73}\) for this project in 2019, including an accompanying audio track. Pye originally trained as a percussionist, and was able to compose a very challenging work with a high level of simultaneity. Due to his own knowledge of the instruments, and an openness to performer feedback and revisions, his work is ultimately performable, despite the complexities involved. Our composer-performer collaborative process is discussed further in Chapter 6.

*Symmetries 1…Györgynak; Symmetries 2…à Claude; and Symmetries 3…to Nigel*\(^{74}\) were composed in early 2020. My composition of this set of three pieces enabled further exploration of compositional ideas from the extant works, and the development of ideas that had not been explored. A table of compositional ‘codes’ (*Table 4.1*) is included in Chapter 4.

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\(^{70}\) Burritt, "The Fragile Corridor."

\(^{71}\) Waltersdorfer, "3 Pieces on 2 Instruments for 1 Player."


\(^{73}\) David Pye, "euler’s identity," (Fremantle, West Australia: self-published, 2019).

Kathy Potter’s *Just Maybe* was composed for this project in May 2020. A feature of this work is a bowed vibraphone melody, accompanied by a marimba ostinato. In this extended passage, the frequent and rapid movement of the bow between the row of ‘accidentals’ and the row of ‘naturals’ inspired the writer to invent a double-sided bow, removing the need for uncomfortable bending of the performer’s wrist.

I composed *An Unfinished Rhyme* (2021) for inclusion in an Honours student’s examination of solo works for singing percussionist. By employing the marimba-vibe setup as the ‘percussion’ component, further compositional ‘codes’ and generative ideas were able to be explored, and the piece may be performed without the vocal part. *Without Delay* was written later in the same year and was conceived as a companion piece to *An Unfinished Rhyme* (without voice).

Lindsay Vickery’s *the tears of things* was composed for this project in 2020, but extensively revised following collaborative meetings during 2021. Also featuring an audio accompaniment, this piece features graphic elements and is published as a scrolling score on the ‘Decibel Score Player’ software for iPad.

![Figure 2.4: The opening bars of Vickery’s *the tears of things*, published as a scrolling score on the Decibel Score Player.](image)

All works from the solo marimba-vibe repertoire discussed above are presented in the table below. Works commissioned or composed for this project are marked with an asterisk.

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Table 2.1: A list of solo marimba-vibe works (*works marked with an asterisk were composed for this project).

Stacked:
1958 Roman Haubenstock-Ramati *Liaisons*
1981 Daniel Godfrey *Music for Marimba and Vibraphone*
1982 Rand Steiger *Kennedy Sketches*
1989 Stefan Niculescu *Solo pentru Marimbafon si Vibrafon*
1992 Veli-Matti Puumala *Pulses* (no recording available)
1994 Robert Pollock *Three Pieces for Marimba and Vibraphone*
1999 Wayne Peterson *Antiphonies* (no recording or score available)

V-formation:
1985 Ney Rosauro *Sonata, the Periods of Life*
1993 Roger Smalley *Dance VI, from Music for an Imaginary Ballet*
2010 Thad Anderson *OPEN/shut*
2019 David Pye *euler’s identity*
2020 Leonhard Waltersdorfer *3 Pieces on 2 Instruments for 1 Player*
2020 Paul Tanner *Symmetries 1-3*
2020 Kathy Potter *Just Maybe*
2021 Paul Tanner *An Unfinished Rhyme*
2021 Paul Tanner *Without Delay*
2020/21 Lindsay Vickery *the tears of things*

Reverse V:
2017 Emmanuel Séjourné *Attraction* (also playable in the V-formation)
2019 Michael Burritt *The Fragile Corridor*

2.3.2 Instructional Books

When Schick asserts that ‘the expertise required to play multiple percussion is defined by problems posed by composers in various pieces and in the solutions found by performers over a period of time’, 79 he articulates a process that is not restricted to percussion instruments. Concomitant with the development of mallet keyboard repertoire has been the production of a number of technical methods and essays by leading percussionists, researchers, and pedagogues.

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79 Schick, ”Multiple Percussion.”
Practice Methods

A number of grips are used currently, the three most popular being ‘traditional’, a cross-stick grip used extensively in Japan; ‘Burton’, a variation of the traditional grip developed by Gary Burton in the 1970s; and ‘Stevens’ (or ‘Musser-Stevens’), a development of the Musser grip, in which the mallets do not cross each other in the hand. All three grips have been the subject of specific instructional method books: Leigh Howard Stevens and Gary Burton describe their eponymous grips themselves, whilst traditional grip is discussed thoroughly in Nancy Zeltzman’s *Four Mallet Marimba Playing*.  

There are, of course, many method books dealing with standard technical issues common to all grips, such as scales, interval changing, roll types and reading skills. A pedagogical approach to marimba-vibe performance has not been previously undertaken though, and my practice-led research aims to explore some of the unique challenges found in the double-keyboard idiom. Discoveries and suggestions for performers are presented in *A Guide to Performing Works for the Marimba-Vibe* (Appendix 2).

Compositional Guides

Marimba virtuoso Nancy Zeltzman includes a ‘Memo to Composers’ on her website, which discusses a brief list of technical and notational preferences associated with composing music for marimba. Although Zeltzman’s advice is exclusively for the marimba, many suggestions are transferrable to the marimba-vibe. Her approach, with musical examples and pragmatic advice for composers, was a good starting point for my own composers’ guide (Appendix 1).

Samuel Z. Solomon’s *How to Write for Percussion* is a remarkably detailed book, and a useful template for compositional guides. With so many timbral resources available to percussionists, but not always available to individuals, his advice on what not to include in a score (for instance, overly specific instrument or mallet selection), is as helpful as what should be included (for instance, the character of sound required, which allows the performer to choose from available instruments and mallets). He stresses and reinforces on multiple occasions the advantages of collaboration with a percussionist when composing.

When collaborating with composers writing for four mallets, a useful analogy is that of a pianist playing with the thumb and little finger of each hand, as the range and dexterity is similar.

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80 Stevens, *Method of Movement for Marimba*.

Solomon describes this approach in ‘Thumbs and Pinkies – Writing Idiomatically for Keyboards’ (page 105) and discusses the similarities (and pitfalls) of this useful analogy.

When Solomon discusses the use of ‘stacked instruments’ (as seen in Figure 1.2), he advises composers to limit the use of the lowest notes on a modern five-octave instrument, particularly if ‘fast, difficult passages are written between the instruments’. A stacked setup works well in works such as Rand Steiger’s *Kennedy Sketches*, in which the lowest marimba pitch is A₂, a tenth below middle-C. This is easily reachable across the vibraphone, unlike the lower C₂ on a modern five-octave instrument. He additionally points out that mallets selected for the vibraphone do not necessarily produce a suitable tone on the lowest notes of a five-octave marimba.

When considering four-note chords spread between two instruments and rapid switches between instruments, Solomon reintroduces the pianistic analogy, and suggests maintaining one hand above each keyboard where possible. The issue of inaccessible notes when bowing, due to the positioning of instruments, is also discussed. A solution to this issue is proposed in section 6.1.1’s study of Steiger’s *Kennedy Sketches*.

### 2.3.3 Movement Studies

**Kinaesthetics**

One of the most difficult aspects of mallet percussion performance is the ability to accurately play pitches arranged over a large physical distance (approximately two-and-a-half metres on a five-octave marimba). The non-tactual nature of mallet-percussion performance amplifies this difficulty, and when reading a printed score, the ability to visually track the position of mallets is reduced significantly. Many performers overcome this challenge by memorising, which has the added benefit of removing the need for page-turning while holding four mallets. However, the ability to perform accurately while reading music is vital for most solo and ensemble practitioners. The requirements of sight-reading scores, and rehearsing or performing pieces when there is insufficient time to memorise in advance, demand that a mallet player be able to watch a score and use ‘muscle memory’ to locate the correct pitches, often in conjunction with peripheral vision and well-developed aural skills to ensure immediate correction when inaccuracies occur. Joseph Combs addresses this issue in his 1967 doctoral dissertation:

> [W]hat are the respective roles of vision, touch, and kinesthesia in sight-reading on mallet-played instruments? The performer on a mallet-played instrument is the only musician who cannot rely on his tactual sense, since he makes no direct contact with the instrument itself.\(^86\)

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85 Steiger, "Kennedy Sketches."
Combs is principally concerned with the problems of following a score in front of a single instrument, and he conducts a number of experiments on his seven subjects. The two senses he investigates are the visual, in which a subject plays an interval by looking at their mallet placement on an instrument; and the tactual-kinæsthetic, in which the subject plays an interval without looking at their mallets, as is necessary when sight-reading. In a series of experiments, he measured the margin of error between a subject’s attempt to play an interval on one instrument and reproduce it on an instrument of the same size. He concluded that playing and reproducing intervals using the visual sense resulted in a high degree of accuracy as expected; playing and reproducing intervals using the tactual-kinæsthetic sense resulted in a slightly higher degree of accuracy; and that playing and reproducing intervals using a mixture of senses (visual to kinæsthetic, or kinæsthetic to visual), gave the least accurate reproductions. The superior outcome of the consistently used tactual-kinæsthetic attempts, although marginal, was consistent with previous experiments conducted in non-musical fields.

The ramifications of Combs’ findings have resulted in the deliberate development of this aspect of mallet percussion performance, and Gordon Stout’s highly influential method book, ‘Ideo-Kinetics’, presents a series of exercises for training a practitioner’s kinæsthetic sense.

Mary Broughton extends Stout’s pedagogical method by comparing the different approaches between student and professional marimba players when preparing marimba solos, specifically in the use of ‘visual imagery’ and ‘kinæsthetic imagery’. The distinction between the two is clarified by Guillot et al: ‘Visual imagery (VI) requires self-visualization of movement whereas kinesthetic imagery (KI) requires one to “feel” the movement, i.e. to perceive muscle contractions mentally.’ As predicted, the professional players utilise kinæsthetic imagery in their practice more than the students. Their use of visual imagery, however, is not noticeably greater. Broughton proposes a reason for this, and suggests further research:

[T]he spatial nature of movement required to play the marimba and hit specific targets explicitly incorporates the visual sense early in training…Results offer some support for a pedagogical approach to marimba playing specifically aimed at developing note-accurate performance through kinesthetic awareness and imagery.

Thomas Zirkle explores the idea of one-handed linear playing (that is to say, playing a melodic line with alternating mallets in one hand, rather than the traditional alternation of right and

88 Mary Broughton and Catherine Stevens, "Physical movement and imagery in professional and undergraduate student solo marimba practice,” (10/29 2021).
left hands). A series of exercises is developed, in order to improve this ability, and he discusses the benefits of kinaesthetic awareness:

The increased stability mentioned above may also aid the marimbist’s kinaesthetic sense of the bars, thereby improving accuracy in one hand and freeing more of the player’s visual attention for the non-linear (or “other-linear”) hand. Finally, this improved kinaesthetic sense can assist in sight-reading, where the player must rely on the “mind’s eye” (a combination of the player’s kinaesthetic sense and a mental picture of the keyboard) for both hands while the eyes remain trained on the unfamiliar page.  

Combs, Stout, Zirkle and Broughton have emphasised the importance of kinaesthetic development for mallet percussionists, and this awareness becomes even more important when performing upon two instruments. Zirkle’s use of ‘one-handed linear’ playing, in particular, provided a method by which rapid switching between instruments could sometimes be avoided. Future research may develop a comprehensive set of exercises to aid in the development of kinaesthetic awareness for the marimba-vibe ‘V-formation’. These may include the application and development of Stout’s ‘ideo-kinetic’ pedagogical approach and Zirkle’s independent use of hands.

**Body Movements**

In his 2014 doctoral dissertation, Ruo-ying Ke examines the difference in movements required for marimba and vibraphone performance. Listing a number of instructional methods, including the ones mentioned above, he points out that ‘wrist and arm motions are the only concern for the majority of the authors in regard to physical movement.’ Expanding on this observation, Ke ‘emphasizes Tai Chi philosophies and physical movements’, with reference to the position of ‘arms, wrists, hands, torso, legs and overall stance’. Analyses of performances by Ney Rosauro and Nathan Daughtrey, for ‘shift in center-of-gravity, stroke height and stroke rebound’ aim to document differences in the approaches of performers to each instrument. Interviews with leading performers are sometimes contradictory, but his consideration of body positioning to maintain a stable centre of gravity and relaxed posture are particularly relevant to my own study. The discoveries of Chapter 7 in this thesis may be refined in the future by a practitioner of Tai Chi or a bio-mechanist. Further research may validate some of the decisions made (for example, bending of knees, rather than back where possible) or suggest alternatives.

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90 Zirkle, "Developing a four-mallet marimba technique featuring the alternation of mallets in each hand for linear passages and the application of this technique to transcriptions of selected keyboard works by J.S. Bach."

91 Ruo-ying Ke, "Differences in Physical Movement between the Techniques Used on the Marimba and the Vibraphone" (Doctor of Musical Arts dissertation, University of Miami, 2014).
Further discussion of body movements other than those of the wrists and arms may be found in an article by Jeffrey Barudin, in which he discusses ‘marimba choreography’. The article includes a system for annotating scores with the position of a performer’s ‘feet, knees, hips and shoulders’ similar to that outlined in Chapter 7 of this thesis. Whilst Barudin illustrates the position of both feet in the context of a solo marimba performance, the ‘choreography’ of this thesis is indicated for the left foot only, due to the stationary position of the right foot on the vibraphone pedal.

Knee-bends and hip-rotations are marked in the annotated scores (Appendix 3) of this thesis, for similar reasons to Barudin’s: bending the knees lowers the torso, thereby achieving a greater arm span (and intervallic reach) as the shoulders drop to the level of the wrists. Rotating the hips allows the performer to face in the desired direction and reposition uncomfortable wrist-angles. Unlike Barudin’s system, Chapter 7 in this thesis provides no illustration for the positioning of shoulders, as the movements indicated are usually a means by which to transport the shoulders to an appropriate playing position.

2.4 Conclusion

Since the beginning of the twentieth century, the development of percussion instruments, repertoire, research, and pedagogy has been remarkable. Today’s undergraduate student is presented with a bewildering array of genres, instruments, and techniques, such that the structure of university programmes is changing to accommodate the many professional career-paths available.

Within this maelstrom of development, mallet instruments have become an increasingly viable area of specialisation. J.C. Deagan’s prolific period of experimentation from the 1880s through to the invention of the vibraharp was made possible by the concurrent popularity of vaudeville; Edison’s discovery of the recording process; the early years of radio broadcasting; and the birth of jazz, enabling a number of xylophonists to carve out a musical niche in this era. The introduction of the Central American marimba to North American audiences, and its subsequent development, led to an explosion of solo repertoire and international performance opportunities. Finally, the invention of the vibraphone at the dawn of the swing era offered a new timbre to musicians, and their willingness to explore its possibilities within the jazz world ensured the survival of this ‘novelty’ instrument.

A substantial body of work has been written by composers featuring the marimba and vibraphone in an ensemble context. Sixty years after Stockhausen used both instruments within a larger collection of sound sources though, the number of solo works employing marimba and vibraphone, without additional instruments, is frustratingly small. Chenoweth, Abe, and Stevens were

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tirelessly proactive in their acquisition of challenging new marimba repertoire, and through their efforts were able to succeed in the popularisation of the instrument. By pursuing a similar process of commission, composition, performance, documentation and promotion, I hope that the marimba-vibe idiom will grow from its nascent stages into a well-developed, rewarding field of pursuit.
CHAPTER 3: Methodology

With the prime motivation behind this project being the development and examination of a significant amount of repertoire for the marimba-vibe double keyboard, a mixed methodology was adopted, reflecting the multiple facets of study required. Chapters 4 to 7 present the results of my investigations within three fields of the musical domain: analysis, composition, and performance. Following Östersjö’s proposition that ‘musical interpretation can be divided into two kinds: analytic interpretation and thinking-through-practice’ (the latter method contributing to the literature surrounding Schön’s articulation and discussion of ‘reflection-in-action’), I begin with the analyses of compositional issues in Chapter 4, before discussing the ‘thinking-through-practice’ involved in my own compositional and performance processes.

I have observed the distinction between ‘practice-based research,’ in which ‘claims of originality and contribution to knowledge may be demonstrated through creative outcomes in the form of designs, music, digital media, performances and exhibitions’ and ‘practice-led’ research, in which ‘the primary focus of the research is to advance knowledge about practice, or to advance knowledge within practice’. The terms are used primarily to highlight the differences between the approaches of Chapter 5, which uses the act of composition – or musical ‘writing’ – as the main method of qualitative inquiry; and Chapters 6 and 7, which document my practice sessions and resultant discoveries. A degree of overlap between methods occurs: the process of composition (Chapter 5) relied heavily on reflective practice to ‘advance knowledge about [the] practice’ of composition within the marimba-vibe idiom; and the performance exegesis (Chapters 6 and 7) describes a process that led to ‘creative outcomes’ in the form of performances and annotated musical compositions. The distinction, nonetheless, was a useful navigational tool when writing the text of these chapters and clarified my own objectives in the compositional and performance fields of this study.

Whilst in this thesis the ‘identity of the musical work’ is rarely discussed in terms of ‘the result of interaction between composer, performer, instrument, score and electronics, among others’, the two interpretative methods proposed by Östersjö (analytic interpretation and ‘thinking-through-practice’) may be clearly seen at work in all three fields.

93 Stefan Östersjö, "SHUT UP ’N’ PLAY! Negotiating the Musical Work" (PhD Doctoral, Lund University, 2008).
96 Candy, "Practice based research: A guide."
98 Östersjö, "SHUT UP ’N’ PLAY! Negotiating the Musical Work."
3.1 Investigating the Repertoire (Analysis, Composition, Performance)

3.1.1 Thematic and Musical Analysis

Chapter 4 presents an investigation of generative compositional ideas; compositional and instrumental techniques; and notational methods used by composers within the marimba-vibe repertoire, including benefits and challenges. The findings of this investigation informed the creation of *A Guide to Composing for the Marimba-Vibe*, presented in Appendix 1.

The first iteration of this guide identified specific techniques that could be used in compositions requiring the simultaneous performance of marimba and vibraphone by one performer. Whilst many of the techniques were found in the extant works, original suggestions were included in the guide as an invitation and reference for future composers to explore.

Upon the completion and investigation of commissioned works, the dataset was expanded and refined. Adapting the ‘streamlined codes-to-theory model’ of Johnny Saldaña (see Figure 3.1), I identified specific compositional ‘codes’ (particular aural effects and the performance technique required to perform them) and looked for commonalities between them. Related codes were grouped into broader ‘categories’, according to their connection to a more general compositional objective or technique. These categories were further generalised into five broader generative ‘themes’.

![Figure 3.1: Specific ‘codes’, broader ‘categories’ and general ‘themes’, (adapted from Saldaña, The Coding Manual for Qualitative Researchers).](image)

Applying thematic analysis of qualitative research data in a musical context was utilised by Sonya Lifschitz in her Doctoral dissertation and served to inform my own employment of this model. Like Lifschitz, I use this method to create a taxonomy of compositional techniques. However,

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100 That is, the search for patterns within a set of data (rather than the analysis of musical or melodic ‘themes’). See Virginia Braun and Victoria Clarke, "Using thematic analysis in psychology," *Qualitative Research in Psychology* 3, no. 2 (2006/01/01 2006), https://doi.org/10.1191/1478088706qp063oa, https://www.tandfonline.com/doi/abs/10.1191/1478088706qp063oa.  

101 Sonya Lifschitz, "Creative Collaboration in and as contemporary performance practice." (PhD University of Melbourne, 2014).
whereas Lifschitz draws heavily on a bi-directional feedback loop between composer and performer to discuss collaborative processes, my analysis is almost exclusively a unidirectional classification of ideas from within the repertoire. A bi-directional loop only appeared in the presentation of the findings to the composers commissioned by me, and their subsequent use of these findings.

Creating a guide for composers involved a reversal of the ‘code-category-theme’ progression. By doing so, I aimed to provide broad generative compositional themes as a starting point for composers, before specifying more specific detail within those themes. Figure 3.2 is an example of this approach, as presented in Chapter 4, Table 4.1.

Figure 3.2: The ‘code-category-theme’ order was reversed for subsequent composers in this idiom.

The presentation of all codes as audio files is included to clearly articulate the aural possibilities of this idiom, and it is hoped that the broad generative themes will be a source of inspiration to composers. Final video versions of the works I have commissioned and composed are presented as YouTube links, and all available works (including extant works recorded by performers other than myself) are collated as a single playlist on that platform.102

3.1.2 Practice-Based Exegesis on the Process of Composition

Chapter 5 examines the reflective and reflexive processes employed during the composition of *Symmetries 1 to 3, An Unfinished Rhyme,* and *Without Delay*; and includes the production of artefacts in the form of published musical scores (the annotated versions are found in Appendix 3). Following Richardson’s assertion of (creative) writing as a method of qualitative inquiry,103 I composed the five works to further examine my assumptions and discoveries. As a researcher situated within the Western art music tradition, and specialising in the marimba-vibe idiom, I was able to explore and

102 https://www.youtube.com/playlist?list=PLJcIcYuaMOlop-EPv8DsIOVxsSW_cxN2
develop compositional techniques from a highly personal (and personally invested) perspective within this specialised field of performance practice. With my ‘subjectivities engaged’, I could write music informed by an embodied knowledge of the performance challenges inherent in a double-keyboard instrumentation.

The ‘iterative cyclic web’ as described by Smith and Dean (see Figure 3.3) illustrates the multi-directional nature of compositional planning, practical implementation and æsthetic success of the creative process, within a research framework.

Identifying the starting point of my compositional process within a web of multi-directional decisions and effects, presented a ‘chicken or the egg’ conundrum. My chosen starting point for the purposes of Chapter 5 was therefore based on my own recollection and prioritisation of the cognitive processes involved, and when they began. Although I begin the description of each piece’s compositional process with a list of primary generative codes (Smith and Dean’s ‘application of theories and techniques’) as the impetus for ‘idea generation’, I could not have selected generative ideas without the previously created list of codes categorised in Table 4.1. The beginning of An

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104 Richardson and Adams St Pierre, "Writing: A Method of Inquiry."
105 Hazel Smith and Roger T Dean, "Introduction: practice-led research, research-led practice-towards the iterative cyclic web," *Practice-led research, research-led practice in the creative arts* (2009).

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Figure 3.3: Smith and Dean’s ‘iterative cyclic web’ illustrates a number of starting points and some of the interactions and considerations involved in the creation of the compositional ‘Output: artwork’.

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Unfinished Rhyme (see Figure 3.4 below), in which code 6b, ‘phrased single notes’ was selected as a compositional starting point, and subsequently developed with a subjective choice of pitches and rhythm, is an example of this, as the use of ‘phrased single notes’ was identified as a code awaiting exploration.

Figure 3.4: Tanner – An Unfinished Rhyme explores Code 6b, ‘phrased single notes’.

While most of Chapter 5 describes the results of the feedback loop created by the alternation between planning (‘composition’) and implementation (‘performance’) stages of my works, Smith and Dean’s web gives a more-detailed picture of the complete research environment, in which the ‘practice’ elements contribute to the ‘academic’ ideas and documentation. Although the practice-based/practice-led dichotomy is not referenced in Figure 3.3, Smith and Dean’s diagram may be read as a representation of multiple research methods and their overlapping approaches, including the output-driven methodology of practice-based research.

By exploring generative ideas; compositional and instrumental techniques; and notational methods within my own creative work, I was able to collect further data for analysis in Chapter 4. ‘Reflection-on-action’ during the compositional process also contributed to the discussion of performance issues in Chapters 6 and 7. The compositional-performative feedback loop, in which I would plan or improvise a section of music; notate the section; practise and reflect upon the section’s aesthetic and technical success; and subsequently revise the section, therefore produced outputs from both sides of the cyclic web. Artworks (five compositions) and their documentation (scores and recordings) were produced, as well as ‘new techniques, methods, results, critical accounts, theorisations’ (see Figure 3.3) and thematic analyses.

Using An Unfinished Rhyme (Figure 3.4) as an example, the right-hand side of Smith and Dean’s diagram may be adapted. Blue text will be discussed in 3.1.3 (performance preparation).

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Identifying as a person within the ‘creative writing’ domain, Skains\textsuperscript{107} discusses his cognitive processes during the composition of a new work, and his incorporation of three elements identified by Flower and Hayes:\textsuperscript{108}

- ‘knowledge’ (or ‘long-term memory’) of the domain
- ‘task environment’ (the idea to be explored, and developing text)
- ‘writing process’ (planning, writing and revision)

Flower and Hayes’ description of the first two elements’ effect on – and how they are affected by – the writing process, provides a transferrable framework for discussion of my own musical ‘creative writing’. How my ‘knowledge’ affects my approach to the ‘task environment’ is reflected in the educated guesses and decisions made during the reflective component of the compositional-performative feedback loop. Further to this discussion is an elaboration of the reasons behind the ‘generation of pre-inventive structures’ (as articulated by Finke et al.\textsuperscript{109} in the ‘Geneplore Model’), and the ‘pre-inventive exploration and interpretation’ of these ideas. Generative ideas and the pre-inventive stage of composition are discussed in relation to the decisions made during the composition of \textit{Symmetries 1} to 3, \textit{An Unfinished Rhyme}, and \textit{Without Delay}. The use of the ‘generative ideas’


descriptor also appears throughout Chapter 4, when investigating the works of other composers and identifying techniques and broader compositional ‘themes’.

3.1.3 Practice-Led Exegesis on Performance Preparation

Chapters 6 and 7 document the preparation of all the works commissioned and composed for this study, and selected works composed independently of this project, in a predominantly practice-led approach, seeking ‘to advance knowledge about practice’. Referring to my adaptation of Smith and Dean’s web in Figure 3.5, the blue text represents my primary objective in this research, with the output of *A Guide to Performing Works for the Marimba-Vibe* articulating my performance ‘theories and techniques.’ These are applied in the subsequent output of annotated scores (Appendix 3).

Chapter 6 is an exegetical account of my performance investigation (and the ‘thinking-through-practice’ it involved). Extensive journalling and recording of practice sessions was undertaken, allowing me to reflect on my practice approaches; setup considerations; interpretation of scores; collaboration with composers when possible; performance considerations and problems (including bow technique); and notational issues. By evaluating possible solutions to performance problems, data was collected and used to suggest an effective approach to performance in the marimba-vibe idiom.

Chapter 7 develops the findings of Chapter 6, exploring body movements (feet positions and steps, knee-bends, waist rotations and bends, elbow orientation, wrist-angles); final positions of instruments and music; and a method for quickly hooking or unhooking the sustain pedal at the beginning and end of extended ‘pedal down’ passages. An annotational system was developed (Table 7.2), enabling the production of annotated scores for performers (Appendix 3). Other artefacts from this process include *A Guide to Performing Works for the Marimba-Vibe* (Appendix 2), audio recordings, accessible by clicking [HERE](#), and an online playlist of videos, accessible by clicking [HERE](#).

The influence of Smith and Dean’s web may therefore be observed throughout Chapters 6 and 7, focusing on the process of learning new works; and the recordings and annotated scores (outputs) found in the appendices. The ‘academic research’ bubbles of Figure 3.3 informed the ‘practice-led research’, which in turn led to the output of scores; recordings; and ‘theories and techniques’ for performers. By including these outputs in this dissertation, future performers are given a means by which to evaluate the artistic merit of each work (and whether it is worth the effort of preparation), and to aid in their own interpretation of works.

A further advantage of this study was an extended period of entrainment of new or adapted techniques: the development of accurate muscle memory and kinæsthetic awareness (as described by

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110 Candy, "Practice based research: A guide."
Joseph Combs\textsuperscript{111} to achieve accuracy between two instruments, was an arduous but rewarding long-term process. The application of a ‘one-handed linear’ approach, as articulated by Thomas Zirkle,\textsuperscript{112} was necessary in many instances and is discussed in greater detail in Chapter 6. Issues of setup, interpretation, technique, sticking, accuracy, and composer intent were journaled in situ, and the ‘after-the-fact’\textsuperscript{113} process of reflection described. A reflexive approach enabled me to adapt my pre-conceived ideas and embodied technique, as ‘trouble[s]’\textsuperscript{114} were revealed.

Journal comments and score annotations made in situ, enabled me to ‘fact-check’ my written assertions made at a later date, thereby providing a ‘more robust approach to examination of creative practice than reflection or post-textual analysis provide on their own’.\textsuperscript{115} Haseman and Mafe describe the reflexive element of negotiating complexity in practice-led research as ‘messy’\textsuperscript{116} and making sense out of this mess required the observation of commonalities, and the suggestion of solutions to the many challenges created by this idiom.

3.2 Cataloguing All Repertoire and Selecting Repertoire for Investigation

A complete list of solo marimba-vibe works is included in \textit{A Guide to Performing Works for the Marimba-Vibe} (Appendix 2). This includes works not examined in this thesis, as a reference for performers interested in this idiom. To obtain further data for analysis in Chapters 4 to 7, the extant material was supplemented by the creation of new material. The process of accumulation was achieved by four methods:

1. Collecting (identifying and purchasing) works written independently of this investigation, before and during the period of study (2019-2021)
2. Arranging non-marimba-vibe works
3. Commissioning marimba-vibe works
4. Composing marimba-vibe works
   - Set One (2020)
   - Set Two (2021)

Drawing on Saldâna and Lifschitz, thematic analysis was used to examine the data and organise the generative concepts and results found in Chapter 4: ‘compositional codes, categories and themes’.

\textsuperscript{111} Combs, “The problems of sight-reading on mallet-instruments and their relationship to kinesthetic sensation.”
\textsuperscript{112} Zirkle, “Developing a four-mallet marimba technique featuring the alternation of mallets in each hand for linear passages and the application of this technique to transcriptions of selected keyboard works by J.S. Bach.”
\textsuperscript{113} Skains, “Creative Practice as Research: Discourse on Methodology, Media Practice and Education.”
\textsuperscript{115} Skains, “Creative Practice as Research: Discourse on Methodology, Media Practice and Education.”
\textsuperscript{116} Haseman and Mafe; Haseman and Mafè, in \textit{Practice-led Research, Research-led Practice in the Creative Arts}, ed. Smith and Dean (2009).
The discoveries and gaps were then used to create *A Guide to Composing for the Marimba-Vibe* (Appendix 1). The performance challenges and notational problems (‘problems, options and decisions’) discussed in Chapters 6 and 7, led to the creation of *A Guide to Performing Works for the Marimba-Vibe* (Appendix 2). It also enabled me to identify gaps in compositional techniques, and to use existing and missing techniques in five compositions of my own, as discussed in Chapter 5.

3.2.1 Collecting Repertoire Written Independently of My Investigation

The collection of extant works enabled the creation of a composers’ guide, by examining the generative possibilities explored in these works. By demonstrating some of the techniques used, and suggesting ideas that I, as an experienced marimba-vibe practitioner, believed would prove productive, I was able to outline possible compositional approaches and limitations to prospective composers.

The extant marimba-vibe solos listed in section 1.3.3\(^{117}\) were purchased, and four chosen for closer examination, producing a collection of relevant and substantive data. The four works were included for a variety of reasons:

- An examination of different setups:
  - Stacked: Steiger (1982)
  - Reverse V: Séjourné (2017), which may be performed successfully in the V-formation
- Historical importance: Steiger’s work is the first example of the idiom that does not offer the duo performance option; and Rosauro is the first to suggest the V-formation in a solo marimba-vibe work.
- Quantity of original data relevant to an analysis of generative themes, categories, and codes (particularly apparent in Steiger and Smalley’s investigative compositional ethos).
- Reinforcement of my belief that certain techniques specific to this idiom provide generative ideas of interest to composers (such as Steiger and Smalley’s use of ‘timbral transformation’).
- Popularity of the composer’s work within the percussion community, ensuring broader exposure and longevity for the repertoire, and therefore the idiom (Rosauro and Séjourné).

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\(^{117}\) Haubenstock-Ramati; Godfrey; Steiger; Rosauro; Niculescu; Puumala; Smalley; Pollock; Peterson; Anderson; Séjourné

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Although the pieces examined in Chapter 6 are almost exclusively pieces commissioned or composed for this study, Steiger’s work is examined in 6.1.1, due to its historical importance and use of the stacked setup. Compositional considerations from all four works are discussed in Chapter 4.

Two percussionist-composers published new works during this project: Michael Burritt (The Fragile Corridor, 2019) and Leonard Waltersdorfer (3 Pieces for 1 Player on 2 Instruments, 2020). Scores of both works were purchased but are not discussed in detail: Michael Burritt’s work was conceived in a reverse V-formation, which – following the early investigation of setups (6.1.1 and 6.1.2) – was excluded from this study. This is not a commentary on the quality of the piece, but rather a reflection of my decision to commission, compose and perform works exclusively in the V-formation. Waltersdorfer’s pieces are discussed briefly but not investigated in detail, due to their later (post-commencement) publication dates and a degree of similarity in generative ideas between these and the extant works.

Thad Anderson’s OPEN/Shut, written in 2010, was discovered during the period of study, and is the first marimba-vibe solo to utilise the five-octave marimba. Although not examined in Chapter 6, it provided further data for consideration in Chapter 7, and is included (as are Waltersdorfer’s pieces) in Table 7.4 ‘V-formation repertoire notes’.

3.2.2 Arranging Repertoire

Arranging works afforded an opportunity to explore techniques and timbres discussed in the previous works or proposed for further exploration. Arrangements, and therefore the data obtained, were used primarily to explore performance issues and aid in the development of performance skills.

When Thomas Zirkle discusses his ‘one-handed linear’ approach, he espouses the benefits of playing melodic lines with the two mallets held in one hand. In contrapuntal passages, as found in the Two-Part Inventions of Bach, one ‘part’ is to be played by the mallets held in the performer’s left hand, and the other part is to be performed by the mallets of the right hand. In Zirkle’s thesis, the primary benefit is one of stability, as the lateral movement of a performer’s hands is reduced (assuming that a melodic ‘line’ maintains its aural integrity by its use of intervals within a limited range). This technique is of particular importance in the execution of simultaneous lines being played on two different instruments, and the arrangement of Bach’s Two-Part Invention No. 8 in F Major provided an opportunity to examine the benefits and practicality of this approach (see 6.1.3).

118 Burritt, "The Fragile Corridor."
119 Waltersdorfer, "3 Pieces on 2 Instruments for 1 Player."
120 Anderson, "OPENshut."
121 Zirkle, "Developing a four-mallet marimba technique featuring the alternation of mallets in each hand for linear passages and the application of this technique to transcriptions of selected keyboard works by J.S. Bach."
This and other performance approaches were practised and refined further within an ensemble context. As the ‘sixth member’ of a wind quintet, I re-arranged a harp part from an arrangement of Canteloube’s *Songs of the Auvergne*;\(^{122}\) and a piano part from an arrangement of Ravel’s *Mother Goose Suite*.\(^{123}\) Although these performances fall outside the ‘solo’ idiom and are not discussed in this thesis, they afforded an opportunity to reinforce skills and ideas presented in this dissertation.

### 3.2.3 Commissioning Repertoire

Following Webster,\(^{124}\) cataloguing, collecting and investigating repertoire was augmented by the commissioning of three new works, providing a significant amount of compositional data (Chapter 4), including unanticipated techniques and generative ideas. The new works also generated data for the performance considerations of Chapters 6 and 7.

Three composers were commissioned for this project, chosen primarily due to my respect for their abilities, but also to provide a spectrum of musical genres and compositional approaches:

- **David Pye**, chosen due to his experience as a professional percussionist and composer
- **Kathy Potter**, for her ‘cross-genre’ approach
- **Lindsay Vickery**, for an experimental musical approach, and his use of graphic notation.

Pye's work, written in 2019, is discussed in detail in 6.1.2, and provided an early opportunity to compare the benefits of the V-formation to those of the stacked setup. Alterations to the V-formation and attempts to perform his work in the reverse V are also discussed in 6.1.2. Potter’s piece is examined in 6.2.2, and provided an opportunity to adapt the *See, Think, Wonder*\(^{125}\) thinking routine developed by Project Zero, a research centre at the Harvard Graduate School of Education. The resultant ‘POD’ (‘Problems-Options-Decisions’) system of reflective and reflexive practice is utilised throughout the study of her work, and helped to clarify many performance decisions, such as sticking and mallet positions on the bars. The subsequent examination of Vickery’s work (published as a scrolling score on an iPad, and discussed in 6.2.3) also benefitted from this approach, enabling me to provide Vickery with notational and performative options. The final study (6.2.4) examines a composition written by me after the development of this process, and further illustrates the successful application of this method. Although *Without Delay*\(^{126}\) is the only work by myself to be discussed

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\(^{123}\) Arranged by Lisa Portus M. Ravel, "Mother Goose Suite " (Portus Press).


\(^{126}\) Tanner, "Without Delay.”
with reference to PODs, the earlier examination of *Symmetries 1 to 3*\(^\text{127}\) and Chapter 5’s discussion of my compositional processes rely heavily on a similar consideration of problems, options and decisions.

### 3.2.4 Composing Repertoire

Composing five works provided a ‘ground-level’ creation of material; utilising, developing, and suggesting new compositional techniques that I believed to be worthwhile. The composition of a set of works provided an opportunity to explore the codes and generative themes that had not been explored hitherto. In Appendix 3, these compositions are presented as a set of three pieces (2020), and a set of two (2021), following the example of Ligeti’s collections of *Études pour piano*\(^\text{128}\) and Debussy’s *Preludes pour piano*.\(^\text{129}\) Again, the additions to the repertoire provided compositional and performance-related data. Chapter 5 discusses the compositional processes in detail, including the extensive use of the ‘iterative cyclic web’ (Smith and Dean).\(^\text{130}\) In this way, the creation of works was begun with a pre-compositional generative idea, reflected upon during and at the end of each practice session, and subsequently revised. This cycle was repeated as the work was extended or employed in a reflexive way to modify the composition.

In *Symmetries 1 to 3* (presented as a single study in 6.2.1), compositional processes based around the mid-points of the marimba and vibraphone were utilised. *An Unfinished Rhyme* – composed after a table of compositional codes had been created (Table 4.1, which uses data from all the works written before 2021) – explores a generative ‘gap’ in its use of ‘phrased single notes’ (code 6b in Table 4.1). As this piece was written for another percussionist to première, a detailed account of performance preparation has not been included. However, consideration of performance techniques and experimentation with passages as a part of the compositional process, provided data for Chapter 7, and is included in Table 7.4 ‘V-formation repertoire notes’.

*Without Delay*, examined in 6.2.4, explores another gap in the compositional benefits of the marimba-vibe idiom: the ‘clarification of counterpoint’ (category 9 in Table 4.1). In this piece, I employ canonic writing between the instruments to acoustically replicate the effect of a digital delay unit, playing the original gesture on the marimba and its ‘echo’ on the vibraphone. A more traditional use of counterpoint occurs towards the end of the piece, in a three-part fugue. The use of polymetric motifs (code 10b) is also clarified by the use of two distinct instrumental timbres.

\(^{127}\) Tanner, “Symmetries 1-3.”

\(^{128}\) György Ligeti, *“Études pour piano,”* (Schott Musik, 1986).

\(^{129}\) Claude Debussy, *“Preludes pour piano,”* (Paris: Durand & Cie., 2010).

\(^{130}\) Smith and Dean, “Introduction: practice-led research, research-led practice-towards the iterative cyclic web.”
CHAPTER 4: Compositional Benefits and Challenges

In section 4.1, I analyse extant works for solo marimba-vibe by identifying techniques and generative themes that have been used in this idiom. This investigation informed the preparation of a guide for composers, which is discussed in section 4.2, and was created as a reference tool for the three composers I had commissioned to contribute pieces to this research project.

In section 4.3, I add to the data with techniques and generative themes discovered in the new commissions of 2020, and five of my own compositions. This information is subsequently used to expand and refine the initial composers’ guide of section 4.2, with the final artefact being presented as a stand-alone document for composers (Appendix 1). As it is intended for future dissemination to a broader audience, A Guide to Composing for the Marimba-Vibe uses a formatting style that differs from the rest of this document (as does A Guide to Performing Works for the Marimba-Vibe, presented in Appendix 2).

4.1 Discovering Composer Intent, Identifying Themes

Analysing four extant works (Steiger, 1982; Rosauro, 1985; Smalley, 1993; Séjourné, 2017) revealed data that enabled the identification of themes that have been explored when writing for this idiom. By cataloguing techniques that have been (or could be) used to achieve a composer’s intentions, I was able to discuss a number of performance issues and advise composers on how to successfully apply these techniques in their own works. Examples from the extant works are presented in this section, with most figures accompanied by an audio file to demonstrate the aural effect of each technique. Readers should note that the examples from Rand Steiger’s work are notated with the vibraphone music on the lower of the two staves. In the figure below, the picture of the ‘stacked’ setup is superimposed on the staves to reveal why this is so, with the marimba appearing ‘above’ the vibraphone.

![Figure 4.1: Steiger – Kennedy Sketches, in which the marimba staff is placed above the vibraphone staff.](image-url)
The examples from works by Ney Rosauro, Roger Smalley, and subsequently, all other composers, are notated with the vibraphone on the upper staff, due to the position of the vibraphone to the right of the performer in the V-formation. This follows a different logic – that of traditional keyboard notation – in which the notes at the bottom of the lower keyboard staff are on the performer’s left, whilst the notes at the top of the upper staff are on the performer’s right. It should be noted, however, that in Christopher Sietzen’s performance of *Attraction*, he opts to perform with the vibraphone on his left, reducing the distance between mallets in the moments of simultaneous striking of both instruments. If *Attraction* was the only piece to use simultaneous playing in a concert performance of mallet works, I would also set up in this way. However, due to the increased amount of simultaneity in the repertoire I have composed and commissioned, and my embodied practice of the keyboard logic described above, I have chosen to situate the vibraphone on the right, as seen in Ney Rosauro’s setup diagram (Figure 1.3).

The following figures in this chapter, with the exception of Figures 4.7 and 4.8 (excerpts from solo marimba and solo vibraphone works) are provided with audio examples. These may be heard online by clicking HERE. Each figure (a notated excerpt) appears in the video link, with an onscreen pause indication at the end of each figure. It is thus advisable to read each figure on the video screen, rather than from this document.

4.1.1 Theme: Timbral Transformation

Suggestive of electronic ‘cross-fade’ techniques, a marimba or vibraphone timbre may be gradually transformed into the timbre of the other instrument. ‘Timbral transformation’ as a generative idea was deliberately and extensively employed in Rand Steiger’s *Kennedy Sketches* and Roger Smalley’s *Music for An Imaginary Ballet*.

Steiger’s use of timbral transformation as a generative tool is made explicit from the opening gesture of *Kennedy Sketches* (Figure 4.2). The aural effect is that of a unison dyad between the two instruments, which gradually transforms from a predominantly marimba timbre to solo vibraphone, as the louder marimba attack rapidly decays to reveal the softer, sustained vibraphone. The reverse process is demonstrated in the second bar, as a solo vibraphone dyad is gradually overwhelmed by a marimba tremolo. This vibraphone-to-predominantly-marimba transformation is extended to become a ‘palindromic cross-fade’, as the marimba decrescendos to reveal the original vibraphone dyad.

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131 Sietzen, "Emmanuel Séjourné: Attraction (short version) performed by Christoph Sietzen."
132 described in the Merriam-Webster online dictionary as ‘to fade in (a sound or image) in a motion picture or a radio or television program while fading out another sound or image’
133 Steiger, "Kennedy Sketches."
134 Smalley, "Music for An Imaginary Ballet."
Whilst the second half of the third bar could be described as a timbral transformation from vibraphone to predominantly marimba, the marimba dyad is perceived as a rearticulation of the vibraphone dyad. Rather than functioning as a ‘cross-fade’, the immediacy and brevity of the transformation may be considered a moment of hocket – a technique that is thoroughly explored in the second and third ‘Sketch’.

Palindromic timbral transformation is similarly employed by Smalley, although with additional pitches in the sustained vibraphone chord and pulsing quavers, rather than a tremolo, in the marimba part.

The palindromic approach to timbral transformation is used by Smalley in four iterations, with the duration of the crescendo and decrescendo bars being augmented by one quaver on each iteration. On the fifth iteration (11 + 11 quavers), Smalley creates a forward momentum by utilising a continuous marimba crescendo to achieve a unidirectional vibraphone-to-marimba transformation:
4.1.2 Theme: Timbral and Pitch Transformation

Whilst Figures 1.2 to 1.4 presented the timbral transformation of identical pitches played on the marimba and vibraphone, it is possible to affect a timbral transformation with a simultaneous pitch transformation. A bridge passage for solo marimba in Smalley’s work, featuring independent crescendos and decrescendos between hands, introduces this concept, as changing dyads rise and fall in dynamic. When the timbral transformations return between the vibraphone and marimba, four of the six iterations include this process of pitch transformation, as seen in the following figure:

Similar compositional intent is observed between the two composers once more, when Steiger introduces a grace-note gesture with B and E pitches played on the vibraphone (notated on the lower staff in Steiger’s work), allowing the dyad to sustain while the marimba crescendos and decrescendos. The result, as in the Smalley example above, is a transformation of both timbre and pitch, and is extended by Steiger to create another ‘palindromic cross-fade’.
It may be observed that vibraphone-to-marimba transformation, achieved by a crescendo in the marimba starting inaudibly or very softly, is the preferred unidirectional ‘cross-fade’. Although marimba-to-vibraphone transformation (Figure 4.2) is the simpler unidirectional effect to achieve (a single attack that transforms itself without further activity), it is utilised only once. All other examples of a predominantly marimba texture transforming to a vibraphone timbre are achieved within a palindromic vibraphone-to-marimba-to-vibraphone transformation (see Figures 4.2, 4.3 and 4.6).

Neither composer utilises a palindromic marimba-to-vibraphone-to-marimba transformation within a single gesture.

4.1.3 Theme: Sustain vs Rhythm

A vibraphone tone played whilst depressing the sustain pedal will last for many seconds, whilst a single articulation on the marimba will decay rapidly. This contrast is highlighted by the superimposition of sustained vibraphone pitches and rhythmic marimba material in the works by Steiger, Smalley, Rosauro and Séjourné, and will be discussed in this section. It should be noted though, that it is possible to superimpose long and short durations on the marimba or vibraphone alone, by employing the following techniques:

i. Marimba alone: by utilising a one-handed roll while the other hand plays shorter durations.
ii. Vibraphone alone: by striking pitches with the pedal down, then playing other pitches as dead strokes, or with rapid dampening.

Figure 4.8: Mark Glentworth – *Blues for Gilbert,*

136 bars 63 to 64. The pedal is depressed for the duration of each bar. ‘x’ indicates mallet-dampening, which mutes the previous pitch (no audio).

The use of both instruments to present a similar passage (sustained vibraphone, rhythmic marimba) presents a number of benefits when compared to the solo marimba version (see Figure 4.7), by:

i. avoiding the need for independent techniques between simultaneous right and left-hand marimba gestures.

ii. allowing articulation of a four-note chord on the vibraphone, as opposed to the dyad playable by the mallets of one hand when performing on marimba alone.

iii. allowing greater facility for the rhythmic marimba component, with the possibility of hand-to-hand execution of the passage.

The use of both instruments (sustained vibraphone, rhythmic marimba) presents a number of benefits when compared to the solo vibraphone version (see Figure 4.8), by:

i. allowing a free choice of pitches within the rhythmic passage. If a vibraphone chord is played and followed by a passage of staccato dead strokes that include one of the chord-tones, that chord-tone will be dampened and thereby removed from the chord. By dampening all notes except the chord tone after they have been played, this can be avoided, although the rearticulated chord-tone may be dynamically unbalanced within the sustained chord.

ii. simplifying the technique required to play the rhythmic passage, as the requirement for dead strokes or dampened tones has been removed.

Although every iteration of the transformation process within *Dance VI of Music for An Imaginary Ballet* could be perceived as an example of this, I will prioritise the categorisation of these gestures as ‘timbral transformations’, and not present them as examples of this compositional theme.

This leaves one example, in which the transformation to marimba timbre leads into an extended passage for solo marimba.

Whilst the superimposition of sustained vibraphone and rhythmic marimba is used in the first of Steiger’s three *Kennedy Sketches* (Figure 4.10) his exploration of the theme is considerably more extensive in the second (Figure 4.11).

Although Rosauro does not indicate vibraphone pedalling, his notation of legato phrases implies a degree of sustain. The effect of sustained vibraphone and rhythmic marimba is not the main objective in the first movement, arising rather as a consequence of marimba ‘echoes’ of vibraphone phrases.
Emmanuel Séjourné employs the two instruments in a similar manner, with the sustained pitches of slow vibraphone phrases being interrupted by rhythmically active (but non-imitative) marimba interjections.

![Figure 4.13: Séjourné – Attraction, bars 167 to 170.](image)

A more explicit example of superimposed sustain and rhythm is Rosauro’s use of a sustained marimba dyad at the end of the first and fourth (final) movements, which provides a static harmonic foundation for the more rhythmic vibraphone melody (and marimba imitation). This passage reverses the role of each instrument (when compared to Figures 4.9 to 4.13), by using the marimba as a sustaining instrument and the vibraphone in the more rhythmic role.

![Figure 4.14: Rosauro – Dawn, bars 10 to 13.](image)

### 4.1.4 Theme: ‘Split Melody’

By alternating and doubling pitches between the two instruments, a ‘joint resonance’ is created, providing a fuller texture and more-complex timbre. Although the two instruments balance well dynamically with little difficulty, slight shifts in the listener’s aural perception can create an interesting sense of timbral instability, creating a ‘split melody’. Steiger exploits this phenomenon in four distinct forms in his *Kennedy Sketches*:

i. alternation of pitches between instruments within a melody (‘split melody’)

In the third of his *Kennedy Sketches*, Steiger explores the theme of ‘split melody’ thoroughly (see Figure 4.15), as it becomes the main generative idea of the movement, employed within all but two of the bars.
ii. division of a ‘split melody’ into groups of pitches on each instrument

The division of split melodies into groups of pitches on each instrument can be seen in the grace notes of Figure 4.6 and soon after in bars 8 to 13 (refer to Figure 4.10).

iii. alternation of identical single pitches or dyads between instruments (‘split repeated notes’)

The use of ‘split repeated notes’ begins in the second of the *Kennedy Sketches*, with the first bar of Figure 4.16 appearing four times.

Although the ‘split repeated notes’ are not played simultaneously by the vibraphone in the ninth bar, the use of the sustain pedal creates a dyad that is repeated by the marimba.
‘Split repeated notes’ in pairs, are seen in the second bars of Figures 4.18 and 4.19.

Figure 4.18: Third Kennedy Sketch, bars 1 to 4, ‘split melody’ includes multiple repeats of a single E in the first bar, pitches in pairs in the second bar (‘split repeated notes’ – circled), four pairs in the third, and one repeated note in the fourth.

Figure 4.19: Third of the Kennedy Sketches, bars 5 to 7, ‘split repeated notes’.

Harmonic ‘split repeated notes’, in the form of dyads, may be observed in the third Kennedy Sketch.

Figure 4.20: Third of the Kennedy Sketches. Repeated dyads (harmonic split repeated notes) begin nine bars from the end.

iv. homophonic (an equal ‘split’, where instruments play a melody in unison).

Homophony may be observed in the seventh bar (Figure 4.21) and at the end of the first of the Kennedy Sketches (Figure 4.22).

Figure 4.21: Steiger, first of the Kennedy Sketches, bar 7, homophonic split melody.
4.1.5 Theme: Imitation

The use of two instruments within a solo work affords the possibility of colouristic variation in passages of motivic imitation. Whilst Figure 4.12 and Figure 4.14 were used to illustrate Rosauro’s superimposition of sustained and rhythmic material, his prime motivation for the employment of both instruments appears to be a contrast in timbres and function. *Dawn* (Movement 1), from which these two examples were taken, is only twenty bars long, and consists entirely of short vibraphone motives imitated by the marimba in a less-sustained, quieter ‘echo’.

![Figure 4.23: Rosauro – *Dawn*, opening bars. Imitation of the vibraphone motif by the marimba, for colouristic and dynamic variation.](image)

Although Smalley’s work involves the occasional reiteration of a vibraphone tetrachord on the marimba (see Figures 4.3 and 4.5), the imitative component of each gesture is confined to the harmony established, rather than rhythm or melody. Steiger and Séjourné do not employ imitation between the instruments.

4.1.6 Theme: Clarification of Lines

Colouristic variation between the two instruments is a primary consideration in Rosauro’s work, as suggested by the above discussion of imitative passages in the first movement. The distinct timbres of the two instruments may also clarify individual lines, such as a melodic passage accompanied by a bassline, or individual voices within a contrapuntal passage.
Rosauro uses colouristic variation to clarify the character of a complete movement, employing marimba alone in the second movement, *Children’s Game*, to imbue the music with a spritely, rhythmic character, while the third movement, *Song*, is for vibraphone alone, exploiting the lyricism available to an instrument with sustain pedal. When the instruments are employed simultaneously again in the ‘A’ sections of Movement 4, *Rondo* (Figure 4.24), and in a coda that reiterates the final bars of the first movement, the right hand plays the melodic dyads in the treble clef on the vibraphone, while the left hand plays bass line patterns on the marimba. Whilst this movement could have been successfully written for marimba alone, the colouristic variation between the left hand (marimba) and right hand (vibraphone) clarifies the distinction between the bassline and melody.

![Figure 4.24: Rosauro – *Rondo*, bars 9 to 12. Melody and bass patterns are accentuated using different timbres.](image)

In similar fashion, Emmanuel Séjourné exploits the differences in timbre and performance techniques of the two instruments in solo passages before combining them in a truly synchronous manner. The slow opening section (Figure 4.25) features a melodic line for vibraphone, utilising extended vibraphone techniques such as bowed and bent notes. Brief fragments of a bassline appear in the marimba interjections.

![Figure 4.25: Séjourné – *Attraction*, bars 6 to 13. Melodic vibraphone solo (introduction) with occasional marimba bass interjections.](image)

This is followed by a syncopated, double-speed marimba passage with only one vibraphone interjection (Figure 4.26).

![Figure 4.26: Séjourné, bars 27 to 36. Marimba solo (recurring theme) with vibraphone interjection.](image)
Whilst the excerpt from bar 167 (Figure 4.13) involves rapid interaction between the two instruments, *Attraction*’s only synchronous passage, in which both instruments are struck at the same moment, occurs from bar 104. Although similar to the Rosauro in its use of the marimba to perform a bass line and the vibraphone to play the melody, the sustain of the vibraphone and the extended range of the five-octave marimba allow even greater differentiation between the two parts.

![Figure 4.27: Séjourné – *Attraction*, bars 108 to 110. Synchronous marimba and vibraphone begin in bar 104.](image)

### 4.1.7 Summary of Themes and Identifying ‘Gaps’

The examination of Steiger, Rosauro, Smalley and Séjourné has revealed six primary themes:

1) Timbral transformation  
2) Timbral and pitch transformation  
3) Sustain vs rhythmic activity  
4) Split melody (‘quasi-hocket’)  
5) Imitation  
6) Clarification of lines

Of these, timbral transformation with and without pitch transformation (themes 1 and 2) has been shown to be a fundamental generative theme in the works of Steiger and Smalley. Both works include passages of rhythmic marimba superimposed over sustained vibraphone pitches (theme 3), and Steiger’s third *Sketch* utilises split melody (theme 4) as the fundamental generative idea. Imitation (theme 5) permeates the first movement of Rosauro’s work, and both Rosauro and Séjourné exploit differences between the instruments (bass notes on the marimba, sustain on the vibraphone) to present melodic passages with accompanying bass lines (theme 6).
4.2 Composers’ Guide – First Iteration

The themes identified above provided a useful starting point for a composers’ guide, in which I suggested possible generative ideas for composers to explore, including a number of ‘gaps’ identified in the exploration of the extant works. Ten generative themes were catalogued under the following headings:

1) Timbral transformation (see Figures 4.2 to 4.4)
2) Timbral and pitch transformation (Figures 4.5 and 4.6)
3) Sustained vibraphone over rhythmic marimba (Figures 4.9 to 4.11)
4) ‘Hocket’- at this stage, only two possibilities were presented: ‘split melody’ (Figures 4.15 to 4.19) and ‘phrased hocket’, my own variation of this concept (see Figure 4.28).

![Figure 4.28: Example of ‘phrased hocket’ from the first iteration of my composers’ guide. Each example is played twice in the corresponding audio file.](image)

A ‘gap’ in the existing themes was identified and suggested in this iteration of my composers’ guide, as a useful technique for emphasis within a melodic phrase:

5) Phrasing melodies (by splitting the melody, or playing the melody on one instrument while doubling selected pitches on the other).
‘Imitation’, as identified in the works by Rosauro and Séjourné, was included, as was the previously-listed ‘Clarification of lines’ (now labelled ‘Contrapuntal clarity’, as I had undertaken a large amount of practice on Bach’s Two-Part Invention in F major, in an effort to develop my ability to perform independent melodic lines with the use of alternating mallets in one hand).

6) Imitation (between instruments)
7) Contrapuntal clarity

Further ‘gaps’ in the themes of the works composed prior to 2019 were suggested, including an original idea by David Pye, who completed euler’s identity shortly before I completed the first iteration of the composers’ guide:

8) Playing two instruments with the mallets of one hand (allowing for the execution of a passage of untuned percussion and marimba with the fingers of the left hand):

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137 Pye, "euler’s identity."
9) Dampening/replacing notes within a chord (see Figure 4.31)\textsuperscript{138}

Figure 4.31: Dampening/replacing notes.

10) ‘Your surprise’ (an invitation to the composers to imagine new explorations)

By commissioning, composing and recording new works, I sought to expand the catalogue of successful techniques, with aural references for future composers to consult. A more detailed examination of these themes will be presented in discussions of subsequent commissions, in which the six themes are sometimes redefined as ‘categories’ within broader compositional ‘themes’, and frequently give rise to more specific ‘codes,’ used to describe explicit facets of composer intent.

Three composers were commissioned for this project:

- David Pye\textsuperscript{139} is a composer-percussionist with whom I have a long association. I studied with David as a sixteen-year-old secondary student, and during my undergraduate studies. Our long-term collaborative relationship in Nova (new music ensemble), enabled us to discuss issues and solutions readily via email, phone calls and meetings.
- Kathy Potter\textsuperscript{140} is a viola player and composer whose works are notable for a pop-influenced sensibility, informed by a highly inventive musical intellect.
- Lindsay Vickery\textsuperscript{141} coordinates the Composition and Music Technology Program at the Western Australian Academy of Performing Arts.\textsuperscript{142} I premièred his *The Giant is Speaking Through You*\textsuperscript{143} in 1993, and he was keen to write a companion piece for this beautiful process-driven work for vibraphone, large drums and electronics.

\textsuperscript{138} Although I have listed this as my suggestion, it is an idea developed from a previous work by one of the composers – Lindsay Vickery’s *The Giant Is Speaking through You* (1993). Whilst there is no marimba in this work, the vibraphone part utilises the method shown in the first three bars of Figure 4.31. No notes are replaced, leaving a four-note chord ringing after each series of pitches and dampened notes.

\textsuperscript{139} More information on David may be found at https://www.australianmusiccentre.com.au/artist/pye-david

\textsuperscript{140} Kathy’s website: http://www.kathyplaysviola.com/about

\textsuperscript{141} Lindsay’s website: https://www.lindsayvickery.com

\textsuperscript{142} https://www.waapa.ecu.edu.au/about/our-staff/profiles/music/composition-and-music-technology/dr-lindsay-vickery

\textsuperscript{143} Lindsay Vickery, "the giant is speaking through you," (Perth, Western Australia: self-published, 1991).
Whilst David – a percussionist – was able to produce a work very quickly, I delayed the collaboration with Lindsay and Kathy until I had created the composers’ guide for their reference, using examples from the extant works and David’s new work.

4.3 Identifying Codes, Categories and Themes

By composing three new works, I was able to collect compositional data from five new compositions, including the two completed commissions by David Pye and Kathy Potter. Following the music-specific example of Lifschitz, I adapted Saldaña’s ‘streamlined codes-to-theory model’ to analyse the resultant works and identify techniques, or ‘codes’, which could be used specifically in compositions requiring the simultaneous performance of marimba and vibraphone by one performer. Commonalities were discovered, enabling the grouping of codes into ‘categories’. As the broader compositional intent around each category was perceived, five ‘themes’ were created – those of transformation, contrast, combination, clarification and ‘other’.

Although the process of cataloguing primarily followed the code-category-theme progression, Table 4.1 presents the findings in reverse order. This is to provide a logical starting point for composers: each theme describes a unique benefit of this combination and is suggested as a generative idea for composers to explore. Categories describe ways to explore these themes, and the codes provide very specific examples that have been used successfully in extant works or offer promise for future explorations.

From pages 80 to 102, an exhaustive list of 59 musical figures demonstrates the five themes, twelve categories, and 32 codes of Table 4.1. These may be heard online by continuing to follow the online examples and audio found HERE. Figure 4.32 begins at the 07:25 timestamp. As with Figures 4.2 to 4.31, each figure appears in the video link, with an onscreen pause indication at the end of each figure. It is thus advisable to read each figure on the video screen, rather than from this document.

For a more selective demonstration of these codes, the reader may consult Appendix 1, A Guide to Composing for the Marimba-Vibe. This is a stand-alone document for composers and provides a more succinct version of the following pages, with 25 musical examples.

144 Tanner, "Symmetries 1-3."
145 Sonya Lifschitz, "Creative collaboration in and as contemporary performance practice" (2014), http://hdl.handle.net/11343/55369.
<table>
<thead>
<tr>
<th>THEME:</th>
<th>CATEGORY:</th>
<th>CODE:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transformation</strong></td>
<td>a) predominantly vibe to marimba</td>
<td>b) predominantly marimba to vibe</td>
</tr>
<tr>
<td>1) Timbre only</td>
<td>c) balanced to vibe</td>
<td></td>
</tr>
<tr>
<td>2) Timbre and pitch</td>
<td>d) vibe to balanced</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) balanced to marimba</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f) marimba to balanced</td>
<td></td>
</tr>
<tr>
<td><strong>Contrast</strong></td>
<td>3) Sustain vs rhythmic activity</td>
<td>a) sustained vibe, rhythmic marimba</td>
</tr>
<tr>
<td></td>
<td>b) sustained marimba, rhythmic vibe</td>
<td></td>
</tr>
<tr>
<td>4) Imitation</td>
<td>a) immediate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) delayed</td>
<td></td>
</tr>
<tr>
<td>5) Actuators and effects</td>
<td>a) bow and mallet(s)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) effect and mallets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) unpitched percussion and mallets</td>
<td></td>
</tr>
<tr>
<td><strong>Combination</strong></td>
<td>6) Split melody</td>
<td>a) alternating single pitches</td>
</tr>
<tr>
<td></td>
<td>b) phrased single pitches</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) alternating groups of pitches</td>
<td></td>
</tr>
<tr>
<td>7) Split repeated notes</td>
<td>a) unison or in octaves (monodic)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) harmonic</td>
<td></td>
</tr>
<tr>
<td>8) Homophony</td>
<td>a) unison or in octaves</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) harmonic</td>
<td></td>
</tr>
<tr>
<td><strong>Clarification of</strong></td>
<td>9) Counterpoint</td>
<td></td>
</tr>
<tr>
<td>10) Poly-</td>
<td>a) rhythm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) metre</td>
<td></td>
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<tr>
<td></td>
<td>c) phrase length</td>
<td></td>
</tr>
<tr>
<td>11) Phrasing</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>12) Cut-offs</td>
<td>a) marimba cuts off vibe</td>
</tr>
<tr>
<td></td>
<td>b) vibe cuts off marimba</td>
<td></td>
</tr>
<tr>
<td>13) One hand playing two instruments</td>
<td></td>
<td></td>
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</tbody>
</table>
Categories 1 to 4 and 6 to 8; and codes 5a and 10b, were discussed in the analysis of data from works by Steiger, Smalley, Rosauro and Séjourné, and have subsequently been employed in the five compositions of 2020. The examples used to demonstrate these categories and codes in the discussion below have been taken from the five recent compositions. In 2021, I composed two works to add to the repertoire, and to explore codes and categories that had not been used by the end of 2020. Examples from these works are used to demonstrate the hitherto-unexplored code 6b (phrased single pitches), category 9 (clarification of counterpoint) and code 10a (clarification of polyrhythm).

4.3.1 THEME 1: Transformation (Categories 1 and 2)

Transformation of timbres was used extensively in the works of Steiger and Smalley, and variations in the aural balance between the two instruments have been discussed. Whilst all transformations pass through a moment in which the instruments balance dynamically, the final arrival points determined the use of the descriptive phrases ‘marimba to predominantly vibraphone’ and ‘vibraphone to predominantly marimba’. Anticipating that ‘marimba to balanced’ and ‘balanced to marimba’ transformations would appear in subsequent works, I added these to the emerging list of codes within Theme 1. Whilst all of these codes belonged to the theme of ‘transformation’, an important difference enabled the grouping of codes into two categories, previously described as ‘themes’ in 4.1.7: ‘Timbre only’ and ‘Timbre and pitch’. Within each category, identical descriptors were used to describe six main codes.

It was unsurprising that, having performed and admired the works of Smalley and Steiger, I should incorporate timbral transformation into my own works, as it is the timbral possibilities that initially drew me to the idea of developing a repertoire for the two instruments played together. My first two compositions, Symmetries 1 and Symmetries 2, contain many examples of such manipulation (transformation was not an important theme in Symmetries 3, nor in the works of Pye and Potter, so all the figures for Theme 1 are taken from my first two Symmetries only).

Figure 4.32, taken from Symmetries 1, may be used to illustrate a number of these processes, with crescendos and diminuendos occurring within an unspecified number of repeats. If the timbral transformation maintains a consonant harmony, I have identified it as category 1 (no pitch change). If the timbral transformation introduces a pitch that doesn’t belong to a major or minor triad, it is identified as category 2 (timbre and pitch). In Symmetries 1, the vibraphone and marimba parts are often notated on one staff, with upward stems indicating vibraphone pitches, and downward stems indicating marimba pitches.
Category 1: Timbral transformation (no pitch change)

Code 1a: Predominantly vibraphone to marimba timbre

Bars 33 to 35 of Figure 4.32 illustrate an overall transformation from vibraphone to marimba timbre. Although the dyads are not identical between the instruments, I have chosen to codify this process in this way, due to the common central pitch (an A) and consonant harmony (a simple A major triad, first inversion). Figures 4.33a and 4.33b present clearer, less-ambiguous examples than Figure 4.32.

Code 1b: Predominantly marimba to vibraphone timbre

The most obvious timbral transformations without pitch-alteration may be found at the opening of Symmetries 1 (Figure 4.34) and function as a statement-of-intent for the rest of the movement. Within the first four bars, a sustained vibraphone dyad is gradually overwhelmed by pulsing marimba quavers (code 1a), before the vibraphone re-establishes its timbral dominance in the multiple repeats of bar four (code 1b). The opening bars of Symmetries 2 (Figure 4.35) likewise introduce the main generative elements of the movement: a chord progression and my approach to the idea of ‘symmetry’, as discussed in 5.1.2 Symmetries 2.
Figure 4.34: Symmetries 1, code 1a is demonstrated in bars 1 to 2 (Vib. to Mar.) and code 1b in bars 3 to 4 (Mar. to Vib.).

Figure 4.35: Symmetries 2. In the opening bars, the marimba tones decay rapidly to reveal B minor and Ab major vibraphone triads. This motive returns in bar 55, without the marimba interjections in the latter half of each bar.

**Code 1c: Balanced to predominantly vibraphone timbre**

Although this timbral transformation is apparent in Figure 4.32, the addition of pitch transformation identifies this example as code 2c.

**Code 1d: Predominantly vibraphone to balanced timbre**

Although the marimba dyad is not identical to the vibraphone in Figure 4.32, I have identified bar 33 as code 1d, due to the shared single pitch (A), and highly consonant harmony. This is also part of the longer code 1a process described above.

**Code 1e: Balanced to predominantly marimba timbre**

In Figure 4.32, timbres are balanced from the final repeat(s) of bar 33 and become marimba-dominated in bar 35

**Code 1f: Predominantly marimba to balanced timbres**

Although this timbral transformation is apparent in Figure 4.32 (bar 36), the change in pitch identifies this example as code 2f.
Category 2: Timbral and pitch transformation

Code 2a: Predominantly vibraphone to marimba timbre (with pitch transformation)

In Figure 4.32, a highly consonant harmony was included in category 1 (timbral transformation only), whilst the introduction of a fourth pitch into the A major triad was included in category 2 (timbre and pitch). Adhering to this principle, Figure 4.36 has been identified as code 2a. Figure 4.37, in which no pitches are shared between instruments, is unambiguous in its transformation of both timbre and pitch.

![Figure 4.36: Symmetries I, bars 6 to 8 transform timbrally (vibraphone to marimba) and harmonically. Stems up = vibraphone, stems down = marimba.](image)

Code 2b: Predominantly marimba to vibraphone timbre (with pitch transformation)

In Figure 4.38, the final bar provides an example of code 2b, having moved through codes 2f (as the marimba decrescendo and vibraphone crescendo arrive at a moment of balanced timbre) and 2c (from the moment of balanced timbres to the dominant vibraphone timbre). Upward stems indicate vibraphone pitches, and downward stems indicate marimba pitches.

![Figure 4.37: Symmetries I, bars 60 to 61. Unambiguous timbral and pitch transformation.](image)

![Figure 4.38: Symmetries I, bars 31 to 36. In bar 36, the vibraphone gradually replaces the marimba as the dominant timbre.](image)
Figure 4.35, from *Symmetries 2*, provided an example of code 1b (unison pitches on the second quaver of bars 1 and 2, transforming only timbrally, from a predominantly marimba timbre to vibraphone). The same figure demonstrates code 2b, in which the *mezzoforte* marimba dyad in each bar ‘hides’ the sustained *pianissimo* vibraphone dyad, before the rapid decay of the marimba affects a timbral and pitch transformation into the pitches of the softer vibraphone dyad.

**Code 2c: Balanced to predominantly vibraphone timbre (with pitch transformation)**
Bar 32 of *Symmetries 1* (see Figure 4.38 above) includes changing pitches and timbre, as the marimba pitches (the third and seventh of an A-major seventh chord) fade to nothing.

**Code 2d: Predominantly vibraphone to balanced timbres (with pitch transformation)**
Although this timbral transformation is apparent in bar 33 of *Symmetries 1* (Figure 4.38), I have identified this as code 1d (timbral only), due to the unchanging central pitch and highly consonant harmony.

**Code 2e: Balanced to predominantly marimba timbre (with pitch transformation)**
Although this timbral transformation is apparent in bar 35 of *Symmetries 1* (Figure 4.38), I have identified this as code 1e (timbral only), due to the unchanging central pitch and highly consonant harmony.

**Code 2f: Predominantly marimba to balanced timbres**
Bar 67 of *Symmetries 1* begins with inaudible vibraphone. A gradual crescendo brings the instruments into a balanced dynamic, which is maintained as they both diminuendo to piano.

![Figure 4.39: Symmetries 1, bars 67 to 69.](image)

4.3.2 THEME 2: Contrast (Categories 3, 4, 5)

The use of two instruments offers an opportunity to explore contrasts in timbre and technical possibilities. The superimposition of sustained pitches on one instrument over rhythmic passages on the other was discussed in 4.1.3 Theme: Sustain vs rhythm, in the analysis of works by Steiger, Rosauro, Smalley and Séjourné. Imitative possibilities also arise, with contrasting metallic and ‘woody’ timbres affording an opportunity for colouristic differentiation between iterations of a
gesture. Further to this timbral shading is the use of differing actuators (mallets, bows, fingers) and effects, between the two instruments.

**Category 3: Sustain vs rhythmic contrast**

**Code 3a: Sustained vibraphone and rhythmic marimba**

The use of sustained vibraphone superimposed on rhythmic marimba has been discussed with reference to Steiger, Smalley, Rosauro and Séjourné (Figures 4.9 to 4.14). This effective and straightforward technique was unsurprisingly used by Pye, Potter and myself on numerous occasions, benefitting from the contrast of long, sustained metallic tones from the vibraphone against articulate, ‘woody’ tones on the marimba. The first major section of Pye’s work employs code 3a consistently, in an unambiguous and deliberate manner.

![Figure 4.40: Pye – euler’s identity, bars 1-6. Vibraphone notes sustain due to the placement of a weight on the sustain pedal.](image)

The contrast remains deliberate and evident in the central section (see Figure 4.41), in which the durations of the sustained vibraphone dyads are determined by the duration of reversed vibraphone timbres on the audio track.

![Figure 4.41: euler’s identity, bars 221 to 222. Vibraphone dyads are sustained for the notated durations.](image)

Reminiscent of Figures 4.3 to 4.5 (Smalley), I have described my own use of sustained vibraphone dyads gradually overwhelmed by pulsing marimba quavers as ‘timbral transformation’. A more deliberate example of sustained vibraphone and rhythmic marimba in *Symmetries 1* is illustrated in Figure 4.42, in which the highest pitch of a three-note right-hand ostinato (G-B-D) is sustained, rather than predictably re-articulated as a part of the G-B-(D) ostinato.
Symmetries 1, bars 17 to 18. The high D is sustained, rather than rearticulated within the G-B-D right-hand ostinato (stems up = vibraphone, stems down = marimba).

Symmetries 2, in contrast, features the use of sustained vibraphone and marimba rhythms in a very deliberate manner. Whilst the very soft dynamic of the sustained vibraphone creates timbral and pitch transformation (as the marimba tone decays and the triad is revealed), the staccato interjections of the marimba are a deliberate use of contrasting durations and articulation, as presented in the opening bars below.

Figure 4.43: Symmetries 2. In the opening bars, sustained vibraphone contrasts with the articulate marimba interjections.

From bar 8, the harmonic ‘reveals’ (Figure 4.43) are played as a series of vibraphone triads at a slightly higher dynamic than the marimba scales, and the durational contrast allows for a clear delineation between harmonic and melodic material.

Figure 4.44: Symmetries 2, bars 8 to 9. The sustained vibraphone provides harmonic accompaniment to the marimba scales.

The stacking of sustained vibraphone pitches in Figure 4.45 builds intensity over continuous quintuplets in the marimba part.
Potter utilises a similar contrast between sustained vibraphone and rhythmic marimba, exaggerating the contrast by employing a bow to gradually articulate the vibraphone pitches (this is also discussed in code 5a, ‘bow and mallets’).

**Code 3b: Sustained marimba and rhythmic vibraphone**

Pye sustains marimba pitches with one-handed marimba rolls in Figure 4.47. Although the vibraphone sustain pedal is depressed, the rattan ends of the mallets produce highly articulated rhythms above the sustained bass notes.
Category 4: Imitation

**Code 4a: Immediate imitation**

The use of both marimba and vibraphone allows for imitation with colouristic variation, which Pye utilises throughout the second extended section of his work. The contrast in timbre is coupled with dynamic contrast to create marimba ‘echoes’.

![Figure 4.48: euler’s identity, bars 218 to 219. The marimba immediately imitates the vibraphone at a lower dynamic.](image)

The timbral contrast afforded by imitation between the marimba and vibraphone was coupled with other variations in *Symmetries 3*, such as transposition and inversion. Imitation is one of the main generative ideas, as seen in Figures 4.49 and 4.50.

![Figure 4.49: Symmetries 3. The opening marimba gesture is immediately imitated and transposed by the vibraphone.](image)

![Figure 4.50: Symmetries 3, bars 43 to 46, in which the vibraphone imitates the marimba in inverted and transposed form.](image)
Code 4b: Delayed imitation

Pye describes the final section of his work as an ‘expanding rondo’ (sections A, AB, ABC, ABCD, ABCDE). Section A presents six bars of material, before immediately repeating in a second iteration extended by a ten-bar B-section, to give AB. The third iteration of A extends to ABC, introducing the nine-bar melody illustrated in Figure 4.51, played on vibraphone (section C). Delayed imitation occurs in the fourth iteration (ABCD) when the same melody is performed on the marimba. It occurs again in the final iteration (ABCDE) when the melody returns to the vibraphone.

![Figure 4.51: euler’s identity](image)

Delayed imitation is also evident in *Symmetries 3*, as the vibraphone iteration of the opening phrase in bar 6 (see Figure 4.49) returns with a crotchet pulse in the kick-drum part.

![Figure 4.52: Symmetries 3](image)

The opening marimba phrase (see Figure 4.49) is repeated in bar 108, also with kick-drum accompaniment.

![Figure 4.53: Symmetries 3](image)

Category 5: Actuators and effects

Whilst the use of contrasting mallets may increase the timbral differences between instruments, unusual and interesting sounds may be achieved with bows, fingers, feathers, rubber balls and other ‘actuators’ (all of the above were employed by Pye). In some instances, articles are placed on the top of an instrument to create a unique ‘effect’, such as Potter’s use of chain laid across the vibraphone. A
brief list of effective actuators and effects used within the pieces by Pye, Potter and myself, are listed below.

**Code 5a: Bow and mallets**

A combination of low, bowed marimba notes and struck vibraphone and marimba pitches is used by Pye extensively in the second main section of his work, to create a ‘breathy’ bass line beneath the vibraphone and marimba melodic interplay (Figure 4.54).

![Figure 4.54: euler’s identity. From bar 218, bowed bass notes on the marimba produce a slower, ‘breathy’ articulation.](image)

Bowed notes are more commonly (and more easily) employed on the vibraphone, and are employed by Steiger and Séjourné (see Figures 4.11, 4.16 and 4.25 for examples). They are used towards the final moments of *Symmetries 3* (Figure 4.55) and in bars 39 and 67 of Potter’s *Just Maybe* (Figure 4.56).

![Figure 4.55: Symmetries 3, bars 98 to 101. Bowed vibraphone, struck marimba.](image)

![Figure 4.56: Potter – Just Maybe, from bar 67. Bowed vibraphone pitches over sustained (tremolo) marimba dyads.](image)

**Code 5b: Effect and mallets**

Potter instructs the percussionist to lay chains across the naturals and accidentals on the vibraphone, which create a ‘buzzing’ effect when the vibraphone is played. From bar 63, these chains

![Figure 4.57: Effects and mallets.](image)
are removed, by dragging them audibly across the keyboard while a low marimba ostinato is played with mallets.

**Figure 4.57: Potter, bars 63 to 65.**

**Code 5c: Unpitched percussion and mallets**

The use of unpitched percussion by Pye, as demonstrated in the first iteration of the composers’ guide is accompanied by a one-handed ostinato, in which alternating pitches are played in octaves across both mallet instruments.

**Figure 4.58: Euler’s identity, bars 234 to 236.**

4.3.3 THEME 3: Combination (Categories 6, 7, 8)

With the increase in data made available by the more recent works, the theme of ‘split melody’ (see page 60) has been reidentified as a category within the broader compositional theme, ‘combination’.

By alternating and doubling pitches between the two instruments, a ‘joint resonance’ is created, providing a fuller texture and more-complex timbre. Although the two instruments balance well dynamically with little difficulty, slight shifts in the listener’s aural perception can create an interesting sense of timbral instability.

**Category 6: Split melody**

‘Split melody’ and ‘split repeated notes’ (category 7) were seen to be the primary generative ideas in Steiger’s third *Kennedy Sketch* and have been used extensively in *Symmetries 1* and 3.
Code 6a: Alternating single pitches

Although *Symmetries 1* uses ‘split repeated notes’ as its prime generative idea, it also contains
scalic passages in which the pitches are executed between the instruments in a strictly alternating
manner. Bars 21 and 22 (figure 4.59) return in inverted form in bars 29 and 30.

![Figure 4.59: Symmetries 1, bars 21 to 22.](image)

A number of short melodic ostinatos are employed in similar fashion, as illustrated by bars 25 to 27 in
Figure 4.60.

![Figure 4.60: Bars 23 to 27. Splitting the melody into alternating single pitches occurs from the anacrusis into bar 25.](image)

In *Symmetries 3*, a melody is presented, transposed, inverted and transposed back to its
original starting pitch. When it returns (Figure 4.61), it does so as a split melody, introducing code 6a
as a major generative idea for this piece.

![Figure 4.61: Symmetries 3, bars 67 to 68.](image)

Whilst the melody was split in this way primarily as a technical experiment for my own interest, the
‘joint resonance’ introduced another element of variation to the many permutations of this melodic
material. As before, it was transposed, and inverted (Figure 4.62).
Figure 4.62: Symmetries 3, bars 77 to 79, in which Figure 4.61 is inverted and transposed up a perfect fourth.

**Code 6b: Phrased single pitches**

Although presented in the original composers’ guide (Figure 4.19), the collection of data from the 2020 compositions revealed this code to be a ‘gap’ in the codes employed. In *An Unfinished Rhyme* (2021), I sought to explore the expressive potential of this technique. The figure below creates a ‘weeping’ effect by phrasing off sustained vibraphone dyads with a softer, single marimba pitch.

Figure 4.63: Tanner – *An Unfinished Rhyme*, bars 1 to 4. Phrasing from vibraphone to marimba produces a ‘weeping’ effect.

**Code 6c: Groups**

As noted in the Steiger (see Figure 4.6), split melodies may not always alternate between instruments on every stroke.

Splitting the melody into groups of pitches on each instrument may create and clarify a polymetric effect, such as that found in the following excerpt from Potter’s work, in which the groups of 3 semiquavers create a $\frac{12}{16}$ metre across the notated $\frac{4}{4}$.

Figure 4.64: Potter splits the melody into groupings of 3 semiquavers, creating a $\frac{12}{16}$ metric ‘feel’.
The final section of Pye’s work employs code 6c throughout, as chromatic passages are allocated to the vibraphone and lower pitches to the marimba (the bottom staff is for unpitched percussion instruments).

![Figure 4.65: Split melody juxtaposing fifths in the marimba part and chromatic scales on the vibraphone.](image)

**Category 7: Split repeated notes**

The initial inspiration for *Symmetries 1* came from Gyorgy Ligeti’s *Continuum*\(^{147}\) (1973), featuring a rapid stream of dyads made possible by a double-manual harpsichord (Figure 4.66).

![Figure 4.66: Ligeti Continuum, opening bars.](image)

Steiger’s use of split repeated notes in the third of his *Kennedy Sketches* (Figure 4.18) resembles a monodic paraphrase of Ligeti’s consecutive dyads, and like *Continuum*, creates a subtly shifting timbre with its alternating keyboards.

**Code 7a: unison or octave repeated notes**

Whilst Steiger’s work features monodic repeated notes, unison in this context may also refer to dyads played in unison between instruments. This is the first and most important generative idea of *Symmetries 1* and is a deliberate attempt to capture the unusual resonance and timbral complexity of *Continuum*. A fortuitous result of symmetrically diminishing intervals is the arrival at bar 12 (Figure 4.67) of an enharmonic equivalent of Ligeti’s dyads.

Split repetition may occur as a unison between the two instruments (Figure 4.67) or an octave apart between instruments (Figure 4.68) The notation of the following examples from *Symmetries 1* includes both instruments on one staff. Vibraphone pitches are notated with stems up, and marimba pitches are notated with stems down.

---

\(^{147}\) Ligeti, G. *Continuum*
Figure 4.67: Symmetries 1, bar 12. Repeated G/A# dyads, split between the two instruments (stems up = vibraphone, stems down = marimba).

Figure 4.68: Symmetries 1, bars 23 to 24. Repeated dyads in octaves.

The separation of dyads into rapid consecutive pitches continues the exploration of subtly shifting timbres within harmonic stasis (Figure 4.69).

Figure 4.69: Symmetries 1, bars 53 to 54. Separating dyads into rapid consecutive pitches gives a varied timbre.

A highly demanding example of split repetition can be found in Potter’s work, where a melody is split between the marimba and vibraphone, played by the mallets of one hand. In the figure below, the right-hand pitches are joined across staves, with the marimba pitches sounding an octave higher than written (thereby avoiding the use of three staves).

Figure 4.70: Just Maybe, bars 56 to 58. Split repeated notes in octaves (C-C-B-B–…) played by the mallets of the right hand.

**Code 7b: harmonic repeated notes**

Whilst identical or octave dyads alternating between instruments were regarded as unison repeated notes, different pitches alternating between instruments were described as ‘harmonic
repeated notes’, creating four and three-note chords in split dyads (Figure 4.71), or simple two-note harmonies using different single pitches on each instrument (Figure 4.72).

![Figure 4.71: Symmetries 1, bars 31 to 34. Split repeated dyads create four-note chords and triads.](image)

Figure 4.72: Symmetries 3, bars 91 to 94. Split repeated notes create a perfect fourth.

**Category 8: Homophony**

Homophony in this context will refer to passages in which single pitches, dyads, triads or four-note chords are split between the two instruments and struck at the same time. Homophonic passages of less than three consecutive events will not be included.

**Code 8a: Unison or octave homophony**

It is perhaps surprising that very little use of homophony was found in the pieces commissioned for this study in 2019 and 2020. Whilst the first section of Pye’s work has scattered examples of single unisons between the instruments, only one passage (Figure 4.73) contains three consecutive homophonic octaves.

![Figure 4.73: Pye – euler’s identity, bars 154 to 157. Homophonic octaves.](image)
Likewise, *Symmetries 1* has one brief homophonic unison passage in bar 64 (circled in Figure 4.74).

![Figure 4.74: Symmetries 1, bars 62 to 64, with a brief (homophonic) unison passage in bar 54.](image)

The second section of Pye’s work utilises homophony for a longer period, played by the mallets of one hand. This creates a more complex timbre during a texturally bare passage, as seen in Figure 4.75.

![Figure 4.75 (also Figure 4.58): euler’s identity, bars 234 to 236. Homophony in the right hand.](image)

In the first draft of Pye’s work, homophony between the two instruments concluded the piece, but the difficulty of a fast, descending scale in four octaves between two instruments (Figure 4.76) resulted in the removal of these.

![Figure 4.76: euler’s identity, final bars. Homophonic four-octave scales (treble clef vibraphone, bass clef marimba). In later versions, two octaves were removed, and the scales were played on the marimba only.](image)

**Code 8b: Harmonic homophony**

Although the interjections of the marimba in the opening bars of *Symmetries 2* (Figure 4.77) prevent three consecutive homophonic events, the removal of the marimba interjections during its recapitulation (Figure 4.78) provides an example of harmonic homophony. These homophonic passages utilise the sustain of the vibraphone (in tandem with dynamically unbalanced dyads) to create harmonies that transform as the marimba timbre decays (also code 2b: pitch transformation with timbral transformation from predominantly marimba to vibraphone).
Figure 4.77: Symmetries 2, bars 1 to 2. Almost inaudible B minor and Ab major chords on the vibraphone are revealed as the marimba tone decays.

Figure 4.78: Recapitulation of the above idea in bar 55, with no marimba interruptions to the harmonic homophony.

The final example of at least three consecutive homophonic events occurs in bar 18 of Symmetries 2, illustrated below.

Figure 4.79: Symmetries 2, bars 16 to 19. Harmonic homophony is employed in bar 18.

In the first two bars of the above figure, the homophonic articulations are interrupted by solo vibraphone pitches and timbral transformation (achieved with a marimba crescendo tremolo). This desire to feature and combine the distinct timbres of the instruments in a multitude of ways may help to explain the lack of simple homophony in most works.

4.3.4 THEME 4: Clarification (Categories 9, 10, 11)

The use of two instruments to perform a solo work presents obvious benefits when seeking to highlight independent melodic lines, rhythms and phrasing. The broad intent of this set of categories can be described as the ‘clarification’ of musical ideas.
Category 9: Clarification of counterpoint

Although Rosauro and Séjourné clarified the separation of melodic and bass parts by allocating them to different instruments, as did I in Symmetries 2 (see Figure 4.44), the deliberate use of counterpoint in which two or more melodic lines are presented simultaneously as a generative tool, was not found in marimba-vibe works composed before 2021. Using two instruments to practise Bach’s Two-Part Inventions enabled the clarification of lines through the use of a distinct timbre for each line. The effectiveness of this timbral clarification was employed towards the end of my work, Without Delay (2021), in which one of the voices in a three-part fugue is played on the vibraphone, while two are played on the marimba.

![Figure 4.80: Without Delay, bars 221 to 225. Voice 1 is played on the vibraphone, voices 2 and 3 are played on the marimba.]

Category 10: Clarification of poly-

Code 10a: Polyrhythm

The lack of sophisticated polyrhythmic passages in marimba-vibe works composed before 2021 – in which both instruments perform independent, non-repetitive rhythms – was unexpected. Although code 10b may be considered a subset of this code, the regularity of the ostinato rhythms on each instrument precludes it from my interpretation of this description. Without Delay (2021) addressed this gap in its short fugue (see Figure 4.80 above).

Code 10b: Polymetre

The superimposition of two time-signatures, although not notated as such, can be observed in the works of Kathy Potter and myself. In Figure 4.81a, the vibraphone remains in $\frac{3}{4}$, while the marimba suggests $\frac{8}{3}$ by accenting every third quaver. The marimba in Figure 4.81b suggests a $\frac{12}{8}$ metre.

![Figure 4.81a: Symmetries 1. $\frac{3}{4}$ vibraphone, $\frac{8}{3}$ marimba. Figure 4.81b: $\frac{3}{2}$ vibraphone, $\frac{12}{8}$ marimba.]
The following passage from Potter’s work notates the semiquavers of each bar in groups of 3+4+3. Whilst this conforms to the $\frac{10}{16}$ time-signature in both hands, the left hand creates a polymetric aural effect with a three-semiquaver ostinato (marked with blue brackets in the figure below). This polymetric superimposition of $\frac{10}{16}$ and $\frac{3}{16}$ is found in inverted form at the beginning of Potter’s work (left hand $\frac{10}{16}$, right hand $\frac{3}{16}$).

![Figure 4.82: Potter - Just Maybe, bars 85 to 88, with the left hand’s three-semiquaver ostinato marked by blue brackets in the marimba part. The opening bars invert this right-hand/left-hand organisation of metres.](image)

**Code 10c: ‘Poly’ phrase-length**

From bar 39 in Potter’s work, the marimba begins an ostinato of eight dotted-quaver duration (5+3). Whilst the vibraphone part is also in compound time, the duration of each bowed melodic phrase is twelve dotted quavers.

![Figure 4.83: Potter, bars 39 to 44. The vibraphone phrases are twelve dotted quavers in duration, the marimba ostinato is eight dotted quavers in duration.](image)

**Category 11: Clarification of phrasing**

The third main section of euler’s identity utilises the extended range of the marimba to intone the lowest pitches, thereby articulating the beginning of each short ascending phrase.
4.3.5 THEME 5: Other (Categories 12 and 13)

A small number of unique codes were identified, and new codes will undoubtedly be discovered or created with the composition of new works. These may eventually be numerous enough to warrant further categorisation. Currently, I have included them in this non-prescriptive theme.

Category 12: ‘Cut-offs’

**Code 12a: Marimba cuts off vibraphone**

The extremes of the marimba range trigger the release of the vibraphone sustain at the end of \textit{Symmetries 1}.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{symmetries1}
\caption{Symmetries 1, final bars. As the C\textsubscript{3} and C\textsubscript{7} of the marimba are struck, the pedal is released, immediately cutting off the sustained vibraphone dyad.}
\end{figure}

This technique can be found again in \textit{Symmetries 2} (Figures 4.86 and 4.87), and on the final page of \textit{Symmetries 3} (Figure 4.88).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{symmetries2}
\caption{Symmetries 2, bars 57 to 59. The highest pitch on the marimba ‘cuts off’ the vibraphone’s G\textsubscript{b} major triad.}
\end{figure}
Figure 4.87: *Symmetries 2*, final bars. The lowest pitch on the marimba is struck as the vibraphone triad is released.

Figure 4.88: *Symmetries 3*, bar 101. The marimba’s low F-sharp ‘cuts off’ a sparse and sustained vibraphone passage.

**Code 12b: Vibraphone cuts off marimba**

This technique may involve a marimba tremolo being abruptly cut short by a vibraphone articulation. The compositions (including my compositions of 2021) revealed no obvious examples of this code.

**Category 13: One hand playing two instruments**

Pye utilises the mallets of the right hand to play a passage of octave Cs and Bs (also code 8a, ‘homophonic octaves’ and 5c, ‘unpitched percussion and mallets’). As mentioned previously, this was a new, unanticipated concept, and interesting enough to inspire Potter’s use of this technique (and pitches). Potter’s development of this technique is illustrated in Figure 4.90. This passage is only possible in the V-formation, as discussed in 6.1.2.

Figure 4.89: *euler’s identity*, bars 234 to 236.
4.4 Conclusion, Identifying Gaps

I have identified five generative compositional themes within existing works: transformation, contrast, combination, clarification, and ‘other’.

Codes that were not explored in the works written prior to 2021 are:

- 1c timbral transformation from balanced to predominantly vibraphone
- 1f timbral transformation from predominantly marimba to balanced
- 2d timbral and pitch transformation from predominantly vibraphone to balanced
- 2e timbral and pitch transformation from balanced to predominantly marimba
- 6b phrased single pitches
- 9 clarification of counterpoint
- 10a clarification of polyrhythm
- 12b vibraphone cuts off marimba

The composition of two further works in 2021 allowed me to methodically explore missing codes 6b, 9, 10a and 12b. In this way I was able to fill in the gaps in Chapter 4 with audio and notated examples. In Chapter 5, I discuss the processes involved in composing these and my previous three works, and the primary codes explored in each piece.

Appendix 1, *A Guide to Composing for the Marimba-Vibe*, was created as a reference tool for composers. The first section of the guide introduces the solos that have been written specifically for the marimba-vibe, and possible setups for these pieces. Section two offers notational advice, specifically for the marimba-vibe. The third section offers generic advice for writing music for any keyboard percussion instrument played with four mallets. Finally, the discoveries of Chapter 4 inform the compilation of compositional themes, categories and codes; and a selection of notated examples with accompanying audio files. Although elements described in Chapter 4 are included, *A Guide to Composing for the Marimba-Vibe* is presented as a stand-alone reference tool for composers. As such, it uses a different formatting, and ‘notes of interest’ are presented as boxed text.
CHAPTER 5: Original Compositional Aims and Processes

This chapter presents an exegetical account of the processes involved in my own compositional output, beginning with a discussion of my Symmetries 1…Györgynak; Symmetries 2…à Claude; and Symmetries 3…to Nigel, composed in 2020 and informed by my first iteration of a guide for composers (see section 4.2). Compositional codes in these works and Potter’s Just Maybe (2020), were included in a final table of generative codes, categories and themes (Table 4.1) and allowed for the identification of ‘gaps’ in the use of compositional codes, prior to 2021. These gaps are presented in the current chapter, before an examination of my compositions, An Unfinished Rhyme and Without Delay, which deliberately explored the missing codes.

5.1 Adding to the Dataset: 2020

Aiming to increase the amount of data surrounding the marimba-vibe idiom, I undertook the composition of five works. My own embodied knowledge, some of which had been gained or refined during the study of solo marimba-vibe works by Rosauro, Steiger, Smalley, Séjourné, Pye and my marimba-vibe arrangement of Bach, informed the composition of these works, minimising technical impossibilities. Nonetheless, compositional processes would occasionally produce a passage requiring revision, and notational issues were considered and reconsidered throughout the process. The composition of these pieces, and examination of Kathy Potter’s Just Maybe (also composed in 2020) facilitated an expansion of the list of compositional themes, ultimately resulting in the list of ‘generative codes, categories and themes’ presented in Table 4.1. The notational and technical issues arising from the composition and preparation of these works also informed the notational guidelines and performance advice in Appendix 1, A Guide to Composing for the Marimba-Vibe.

Many existing techniques and generative ideas discovered in the works composed before 2020 were used to further explore the benefits of a double-keyboard arrangement, and I was particularly keen to explore the unique possibilities facilitated by the blending and contrasting of marimba and vibraphone timbres. New ideas explored in these compositions include the use of a marimba articulation as an aural ‘cut-off’ of sustained vibraphone pitches, and the use of two instruments of different timbre to clarify polymetres. In the following sections, I list the ‘primary generative codes’ utilised in the composition of each piece.

A further, previously unlisted benefit of the marimba-vibe was utilised in the composition of the three Symmetries. Pitch selection was reliant on processes that utilised symmetry around the central pitches of each instrument (F#4 on the marimba, B4 on the vibraphone) and the conflict and interaction between these non-identical pitch-centres generated specific pitch-sets, as discussed in the exegetical description for each work. This compositional process was not used to affect the timbral
result in the same way as the generative codes of Table 4.1, which were catalogued and categorised for the aural effects made possible by the use of two instrumental timbres and characteristics. It did, however, provide a highly productive method by which to generate material, thereby adding to the list of benefits of a double-keyboard arrangement.

5.1.1 Symmetries 1...Györgynak

In this discussion of Symmetries 1, figures may not include bar numbers, as the music of an early iteration may have been deleted or revised substantially. Although typeset, these figures often present an initial ‘rough sketch’ of a thematic idea or process (I write at the computer). A later decision to employ ‘open’ repeats, leaving the number of repeats to the discretion of the performer, involved a major renumbering of bars. The final score for Symmetries 1, with annotations and final bar numbers, may be found in Appendix 3. Online audio may be found HERE, and a video recording HERE.

PRIMARY GENERATIVE CODES:

Transformation:  
1a (timbre only: predominantly vibe to marimba)  
1b (timbre only: predominantly marimba to vibe)  
2a (timbre and pitch: predominantly vibe to marimba)

Contrast:  
3a (sustained vibraphone, rhythmic marimba)

Combination:  
6a (split melody – alternating single pitches)  
7a&b (split repeated notes: monodic and harmonic)

György Ligeti’s Continuum, composed in 1968, is a keyboard work that has always fascinated me. It exploits a wonderful property of the harpsichord, that is, the ability to play identical pitches on two different manuals. By rapidly repeating the pitches Bb to G in the right hand, and G to Bb in the left hand (Figure 5.1), a rapid stream of identical dyads is achieved. Unachievable on a piano, due to the velocity-limiting mechanics of a single keyboard, the subtle change of timbre and resonance between each dyad creates an impressive sonic effect.

György Ligeti’s Continuum, composed in 1968, is a keyboard work that has always fascinated me. It exploits a wonderful property of the harpsichord, that is, the ability to play identical pitches on two different manuals. By rapidly repeating the pitches Bb to G in the right hand, and G to Bb in the left hand (Figure 5.1), a rapid stream of identical dyads is achieved. Unachievable on a piano, due to the velocity-limiting mechanics of a single keyboard, the subtle change of timbre and resonance between each dyad creates an impressive sonic effect.

Figure 5.1: György Ligeti – Continuum (opening).

---

After attempting to read through this work on the marimba-vibe (with initial success at the outset and a rapid descent into disappointment as the subsequent rapid scales in each hand frustrated my attempt), I resolved to emulate the sonic effect of repeated dyads in a more idiomatic marimba-vibe composition of my own, and began composing a new work on March 31, 2020. Under the working title *Symmetries*, many of the compositional considerations of this piece were based around the central pitches of each instrument: B₄ on the vibraphone, and F♯₄ on the marimba, both in the octave ascending from middle-C. The rapid repetition of dyads between two instruments (see category 7, ‘split repeated notes’, Table 4.1) afforded a similar timbral complexity, and by fading each instrument in and out, I was able to exploit the timbral transformation of identical pitches (category 1 in Table 4.1).

Figure 5.2: Bars 1 to 3 (code 1a), in which the initial vibraphone timbre transforms aurally into repeated marimba dyads.

By moving in contrary motion from the central F♯₄ and B₄, and ensuring that every descending interval was mirrored by the same ascending interval, the first symmetrical scale and tonality of the work was derived. The opening interval, a perfect fourth, suggested a dominant-tonic relationship within a key of B, and by moving a tone inwards to G♯₄ and A₄, the upper tetrachord of a B natural-minor scale was created (see Figure 5.3).

This short scalic motif was renotated, illustrating a suggestion found in Appendix 1, *A Guide to Composing for the Marimba-Vibe*, in which both instruments are notated on one staff. Vertical eye movement between two staves is a common challenge for percussionists wishing to guide their mallets accurately to rapidly shifting pitches, as are page turns while holding mallets in either hand. Single-staff notation reduces both the vertical eye movement and the number of page turns.

Figure 5.3: The upper tetrachord of a B natural-minor scale, from the first draft of *Symmetries*. In this example, the right hand (vibraphone) is notated with stems up, and the left hand (marimba) with stems down.

Whilst the addition of the D₅, (a minor third above the central vibraphone B) affirmed the B minor tonality, the subsequent introduction of its symmetrical equivalent (D♯₄, a minor third below the central marimba F♯), created tension. The false-relation between the lower D♯ and upper D of this
example is not uncommon in music, and is found in the ‘sharp-nine’ chord, as described in jazz terminology. If I had observed musical semantics, the ninth would have been notated as a C double-sharp, rather than a D-natural.

This ‘sharp-nine’ chord has been used extensively in Western classical and jazz genres, and by ‘classical’ composers as an overt reference to the jazz idiom, as shown below in an example from Bernstein’s *West Side Story*.

With the addition of an E♭ (a perfect fourth above the vibraphone’s central B) and a C♯ (a perfect fourth below the marimba’s F♯), a symmetrical eight-note pitch-set was completed.

As can be seen in the progression from Figure 5.2 to 5.6 (excluding Figure 5.5), the two-note pitch-set was gradually expanded from alternating dyads (‘split repeated notes’ – category 7 in Table 4.1) to a longer ‘split melody’ between the two instruments (category 6), in an attempt to emulate the complex timbral effect of Ligeti’s *Continuum*. By April 2, the presentation of the final eight-note pitch-set as a split melody (Figure 5.6) had been discarded in favour of a return to timbral transformation (Figure 5.7) retaining the outer pitches found in Figure 5.6 (C♯ and E♭).
Subsequent use of a split melody, constructed with contrary motion interval-expansion and omitting the D#-D false-relation (dissonance) of Figure 5.6, established a tonality that suggested C-sharp minor. Although the unaltered key signature and lack of a second degree (D#) left this open to an F-sharp minor or A major interpretation, the C# at the bottom of the pitch-set created an aurally unambiguous tonic.

Concurrent with the decision to expand pitch collections in a symmetrical manner, was the desire to adopt a polymetric approach to this additive process. Put simply, the two pairs of pitches in Figure 5.3 (vibraphone G# and B; marimba F# and A) subsequently became a group of three in the vibraphone part (G#, B and D) and two in the marimba part (F# and A); followed by three and three; and finally four pitches in the vibraphone part (E, B, A and G#) and three in the marimba part (C#, F#, and A). Illustrated in the second and third bars of Figure 5.8, this gives rise to a resultant pattern that requires a duration of twelve quavers (in which the vibraphone part was conceived as three bars of $\frac{4}{8}$ and the marimba part as four bars of $\frac{3}{8}$).

The alternation of the continuous semiquavers between instruments continues my adaptation of the rapid-fire ‘Ligeti-esque’ continuum of sound, and the benefits of one performer on two instruments is multi-faceted in this instance. Whilst a conglomerate melody may be heard, the articulation of polymetre is emphasised and clarified aurally by the allocation of the two distinct rhythmic ostinatos to different instruments. Likewise, rhythmic accuracy at this speed is easily achieved by a single player at two instruments, whereas rapid hocket between two players on single instruments would be exceedingly difficult.

The generative ideas being utilised to this point, as found in Table 4.1, were a combination of timbrally-transforming dyads (category 1), presented as harmonic ‘split repeated notes’ (category 7); and the gradual expansion of a pitch-set, presented in split melodic style (category 6).

The above combination of categories 1 and 7 gave rise to further exploration, as seen in Figures 5.9 and 5.10, and deconstructing the alternating dyads of Figure 5.9 into a monodic stream of...
demisemiquavers resulted in a fascinating aural effect. As in much of this composition, a ‘shimmering’ timbral complexity was achieved by the combination and rapid alternation of instrumental timbres. The technical difficulty of left and right-hand alternating dyads, which often results in contact between mallets due to the rapid alternation of mallets on the same beating spot, was alleviated, and may thus be considered a highly idiomatic marimba-vibe technique. Figure 5.9 remains in the final version, with revised beaming of demisemiquavers, as do the first two bars of Figure 5.10. The return to key and rhythmic canon in bars 3 to 5 of Figure 6.10 were discarded.

Figure 5.9: Category 7 – split repeated notes (dyads) dissolve into a rippling stream of single demisemiquavers.

Figure 5.10: Category 1 – timbral transformation. Bars 3 to 5 were later deleted.

Another gesture utilising split melody and melodic symmetry between the instruments was introduced at this point, with a final timbral transformation from marimba to vibraphone (Figure 5.11). This also remains in the final version of the score, appearing in bar 55 (see Appendix 3).

Figure 5.11: Code 6a (‘split melody’ in alternating single pitches).

A new split-melodic gesture was inserted before and after the timbral transformation passage of Figure 5.7. Figure 5.12 afforded the opportunity to reverse the B ‘sharp-nine’ positioning of the D and D#, with the D-natural now in the lower octave, and the D-sharp in the upper.

Figure 5.12: A new gesture maintains the symmetrical relationship to the central F# and B.
Further tension was introduced into the largely consonant and static (or gradually unfolding) tonality of the piece. Continuing the exploration of pitch symmetry derived from the central notes of the two instruments (vibraphone B₄ and marimba F#₄), contrary motion in the outer voices resulted in the most dissonant passage of the work. The crescendo, accompanied by a decreasing number of repetitions of each pair of dyads, increased the forward momentum into the next section.

![Figure 5.13: A crescendo, decreasing number of repetitions and increasing dissonance creates forward momentum.](image)

The subsequent section was created by reordering bars from previous iterations: Figure 5.9 followed immediately by Figure 5.11, followed by the first two bars of Figure 5.10.

Although a chart of all symmetrical dyads and chords around the central F# and B was typeset on the first day of composition, initial drafts of the opening section had only used the C#-D#-F#-G#-A-B-D-E pitch-set of Figures 5.2 to 5.9, excluding Figure 5.5. A new symmetrical pitch-set was now introduced, replacing the previous figures as the opening section in a similar process of melodic expansion. The previous figures now appear after this revised opening.

Whereas Figure 5.3 (F#-G#-A-B) was created by stepping inwards by a whole-tone from the central F# and B pitches of the marimba and vibraphone, the new pitch-set was derived by stepping in by one semitone to give F#-G-A#-B: the upper tetrachord of a B harmonic minor scale. This suggestion of a scale was subjected to the now-familiar process of symmetrical intervallic expansion, ultimately arriving at the first bar of Figure 5.14. The interjection of Figure 5.12 was adapted to fit the new scale, and inverted to give the final bar of Figure 5.14.

![Figure 5.14: By moving inwards by one semitone (rather than a whole-tone) from the original F# and B, the suggestion of a B sharp-nine chord of earlier iterations became a B harmonic minor scale.](image)

Once the updated opening had reached this point, the alternation of dyads returned, followed by the original expansion process illustrated in Figures 5.2 to 5.4 (now beginning in the third bar of Figure 5.15) and in similar fashion ended with an interjection derived from Figure 5.12 (Figure 5.16).
Figure 5.15: The upper tetrachord of the B natural minor scale (Figure 5.3) returns at a later point in the final version of Symmetries 1 (approximately a third of the way through).

Figure 5.16: The second and third bars of Figure 5.14 are inverted.

Whilst the final draft of Symmetries 1 has changed very little in content since April 3, 2020, the notation has been reconsidered. In Figure 5.2 (the original draft), one bar of $\frac{15}{16}$ was employed to reposition the subsequent vibraphone attack onto the downbeat. To my ear, the vibraphone was ‘on the beat’, and I wished to convey that in the notation. However, I decided to avoid irregular metres, and notated the marimba as uninterrupted, non-syncopated quavers (see the final bar of Figure 5.17). Although the metric notation does not indicate the aural effect of the beat shifting from the marimba to vibraphone to marimba (as each instrument becomes louder than the other), the aural result is unchanged.

As a result of the compositional-performative loop (discussed in the methodology, section 3.1.2), in which I realised I was happier (primarily as performer, but also as composer and pragmatic notator) to repeat most bars until ready, the notation was altered again to allow for the use of an indeterminate number of repeats (see Figure 5.17).

Symmetries 1

Figure 5.17: The notation of Figure 5.2 was revised to allow for an optional number of repeats during the vibe ‘fade-in’.

Paul Tanner

(fade-in Vibe)
The opening alternation of dyads was extended, with the marimba B descending to an A# and the vibraphone F# subsequently ascending to a G, both at the performer’s discretion. Continuing this contraction of intervals, a moment of synchronicity was observed, with the realisation that alternating G-A# dyads between the instruments emulated the opening G-Bb dyads of Ligeti’s work (Figure 5.1). Whilst the enharmonic spelling in the following example may visually disguise the appropriation of Ligeti, an attempt has been made to make this aural inspiration overt, with increased dynamic and changing articulations highlighting the reference (Figure 5.18). A bar of silence was also inserted to isolate the passage from the previous section.

Dynamics and phrasing have become more specific, as a result of ‘thinking-through-practice’,¹⁴⁹ and pedalling indications have been included after practical experiments with the many pedalling possibilities.

The timbral distinction between the vibraphone and marimba facilitated the generative codes listed at the beginning of this section (which belong to the broader ‘themes’ of transformation, contrast, and combination), and generated compositional ideas throughout Symmetries 1. A further generative idea – that of symmetrical pitch organisation – is not uniquely applicable to these instruments. However, by structuring the pitch organisation of Symmetries 1 around the two distinct central pitches of the marimba and vibraphone, a productive approach to pitch-organisation was derived, in which the relationship between the two instruments created the initial pitches of the opening dyads. From here, the ‘pull’ of the marimba’s F# on the vibraphone’s B (and vice-versa) gave rise to the first ‘in-between’ notes (G# and A), and all subsequent pitch derivations. By composing another two Symmetries, I hoped to further explore methods of symmetrical pitch creation, made possible by contrasting the different ranges of each instrument.

¹⁴⁹ Östersjö, “SHUT UP ’N’ PLAY! Negotiationg the Musical Work.”
5.1.2 Symmetries 2...à Claude

In this discussion of Symmetries 2, figures may appear unfinished or untidy. As in the discussion of Symmetries 1, these figures illustrate early drafts (or pre-compositional workings), and as such may include coloured fonts and noteheads; abbreviated harmonic indications (utilising jazz terminology); and obscured accidentals caused by the compression of music into a single line (Figure 5.31). These ‘untidy’ examples were created as a visual aid (to myself) and are included here in their original, unedited form. The final annotated score for Symmetries 2, without chord symbols; numerical indication of interval-sizes; or other compositional aids, may be found in Appendix 3. Online audio may be downloaded HERE, and a video recording may be found HERE.

PRIMARY GENERATIVE CODES:
Transformation:  
1a (timbre only: predominantly vibe to marimba)  
1b (timbre only: predominantly marimba to vibe)  
Contrast:  
3a (sustained vibraphone, rhythmic marimba)  
Other:  
12a (marimba cuts off vibraphone sustain)

Although conceived as three independent pieces, Symmetries may be performed as a suite of three ‘movements’. Symmetries 2 was therefore intended to be the ‘slow movement’ within a traditional fast-slow-fast arrangement. My initial concept was to develop an idea I had utilised in a much earlier piece, based around the central A#/B of a four-and-a-third-octave marimba. By using the G#/A central notes (one tone inwards from the central B of the vibraphone and the central F# of the modern five-octave marimba), this became a simple exercise in transposition (Figure 5.19).

![Figure 5.19: Dyads arranged symmetrically around the central G#/A of the marimba-vibe.](image)

Although I enjoy playing this highly consonant passage, with its meditative in-out movements in each hand, I resolved to explore ideas that would require greater compositional deliberation and produce more complex harmonies. Workings from April 22 show some of the pre-compositional research being undertaken. In Figure 5.20, I considered the number of semitone intervals on each instrument (60 on the marimba, 36 on the vibraphone). By utilising a ‘five against three’ cross-rhythm, a chromatic scale could be played from the lowest to the highest note of either instrument over a
duration of twelve crotchet beats. The preference for contrary motion, in the quest to maintain symmetry, continued from *Symmetries 1.*

**CONTRARY MOTION SCALES** (Any combination/melody will work as long as intervals are symmetrical and allow for 5:3 rhythm)

![Contrary Motion Scales](image)

Figure 5.20: Pre-compositional workings for *Symmetries 2*. A five-octave chromatic scale on the marimba may be played in the same time as a three-octave chromatic scale on the vibraphone, by employing a 5:3 rhythmic ratio (‘cross-rhythm’).

Other comparisons were catalogued, with the most notable outcome being the methods by which the two instruments could play equivalent melodies:

i) If attempting to cover the entire range of the instrument (as in Figure 5.20) using identical melodic intervals, rhythmic units would need to be in the ratio of five (on the marimba) to three (on the vibraphone).

ii) If using identical rhythmic units (as in Figure 5.21) intervals of a perfect fourth (five semitones) on the marimba would equate to intervals of a minor third (three semitones) on the vibraphone.
The following pages utilised these realisations in several ways, and a template was created in which the ascending and descending chromatic scales of Figure 5.20 were repeated multiple times. The intent here was to create extended two-part melodies by deleting pitches from each template, rather than constructing versions by individually calculating intervals. Although this seemed to be a time-saving exercise, the results were deemed unacceptable.

I adapted a method used recently in a work for saxophone, piano and marimba-vibe, in which the piano and marimba progressed through the same set of pitches, one octave apart. Starting with the lowest note of the piano, and ending on the highest, the ascending intervals gradually decreased in size from fourteen semitones to one, and by ignoring the twelve and six-semitone intervals (that is, the octave and half-octave), the series of pitches formed a dominant seventh chord on D, with a major sixth added to the harmony. Starting on the third note of the piano pitch-set, and progressing through the same series, the marimba pitches also covered the entire range of the instrument.

Using the previous method to determine a pitch-set for use on the vibraphone, with a smaller interval range of nine semitones decreasing to three, a simple B-flat major chord was created (with the resulting pitch-sets notated in Figure 5.22). Again, the resulting series of pitches fortuitously covered the instrument’s entire range.
Numerous experiments were conducted with the two pitch-sets, using the previously mentioned rhythmic ratio of five against three. Figure 5.23 is a notation of the vibraphone and marimba series in their original positions, followed by an adaptation using the same pitch-sets, with octave transpositions to confine pitches to a one-octave range. Of the 28 pages of musical notation from that day, these pitch-sets would provide the most important generative ideas for Symmetries 2.

Following construction of further pitch-sets, a draft saved on April 24 included my decision to prioritise the generative ideas of Figure 5.23. The first passage included the scales that could be constructed around the pitches of each resultant chord. At this stage the descriptions given to the marimba chords differed. Whilst Figure 5.23 describes the marimba chords as ‘D7,13’ and ‘Eb minor 6,7’, Figure 5.24 uses ‘Bm/D7’ and ‘Gb6(#11)."
Initially conceived as the opening bars of *Symmetries 2*, a passage of ascending and descending quintuplets (Figure 5.25) articulated both marimba pitch-sets from Figure 5.23.

Identifying them as ‘D7’ and ‘E bmi7’, these harmonic centres provided the framework for the harmonic progression of the first theme of *Symmetries 2* (Figure 5.26).

The second and third bars of Figure 5.26 belong to neither pitch-set, and were chosen by way of ‘thinking-through-practice’\(^{150}\) at the instruments, rather than through pre-determined processes. This subjective choice was possibly influenced by recollections of Debussy’s *Des pas sur la neige*, from his first book of *Préludes pour Piano* (1910).\(^ {151}\)

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\(^{150}\) Östersjö, “SHUT UP ’N’ PLAY! Negotiationg the Musical Work.”

\(^{151}\) Claude Debussy, "Préludes pour piano,” (1910).
Code 1 (timbral transformation) was again explored in these opening bars. In contrast to the opening of *Symmetries 1*, the timbral transformation progresses from a marimba-dominated sonority to quietly sustained vibraphone chords (code 1b). As seen from the chord symbols in Figure 5.26, the four-pitch marimba-vibe chords at the beginning of each bar give way to sustained vibraphone triads, and this harmonic progression generates the following section (Figure 5.28). The first octatonic scale of Figure 5.24 appears in descending and ascending quintuplets, before modulating to the second octatonic scale for the subsequent two bars.

At this stage, the first theme was repeated before moving into a passage derived from the triplet arpeggios found in Figure 5.23. Just as the marimba pitch-sets of Figure 5.23 were employed to create the first theme (Figure 5.26), the vibraphone pitch-sets of this passage (B-flat major and F minor triads) were used to create a motivically-related passage (Figure 5.29). This was adapted relatively freely by experimenting with options on the instruments themselves.

The generative ideas of Figure 5.23 were developed further, without the desire to restrict pitches or cover the entire range of the marimba. The six-semitone interval was reintroduced into the
number series used to derive the marimba’s pitch-set (11, 10, 9, 8, 7, 5, 4, 3, 2, 1) and the eleven-semitone interval was removed to remain within the five-octave range. The marimba series now featured a minor seventh chord in the lower range, and a minor seventh with added minor ninth chord in the upper register (Figure 5.30). In the following example, the size of consecutive intervals diminishes from ten semitones to one. In the first bar of each staff, this happens in an ascending manner, with the highest pitch (the minor ninth of the upper minor seventh chord) also being the fifth of the lower chord. In the second bar of each staff, the number series is reversed in a descending series of pitches, with the lowest pitch being the third of the upper chord. Starting with the lowest pitch of the marimba, the first staff is transposed five times before it reaches the highest pitch of the marimba in a D minor seventh chord. Figure 5.30 catalogues all six transpositions of the pitch-sets, with combinations colour-coded to clarify the relationships of the two minor seventh chords in each bar. Whilst all chord pairs are separated by a tritone, the red and blue inversions maintain their registral position in a second iteration of each pair, with Ami7 above Ebmi7; Bbmi7 above Emi7; and Bmi7 above Fmi7. Pink and purple chord pairs are ‘flipped’ in the second iteration, with F#mi7 above Cmi7 in the original form, but below in the inversion. The G above C# and Ab above D pairings also reverse registral position in the inverted form.

Figure 5.30: In this chart of marimba pitch-sets, ‘blue’ chords retain their position above ‘red’ chords when inverted. ‘Purple’ chords are higher than ‘pink’ chords in the ascending form, but lower in the descending form.
The ascending and descending melodic wave pattern of Figure 5.25 was used in conjunction with the chord pairs of Figure 5.30 to create the basic gesture of this extended section. All six transpositions of the original and inverted chord pairs were used, although at this time, I was unsure in which order the harmonies would appear. Wishing to avoid the aural instability caused by multiple shifts to distant harmonic relations, the low and high Dmi7 chords (‘originals’ and ‘inversions’) were separated from their high and low Abmi7 partners and played consecutively (see Figure 5.31). Although the Abmi7 originals and inversions immediately followed, the brief postponement and reduction in frequency of the tritone modulation helped to calm the unease of rapid and dramatic harmonic shifts. The same decision was made for the G to C# pairing.

![Figure 5.31: Original (‘untidy’) attempt. Rather than following the sequences of Figure 5.30 (low ascending D minor 7th to high ascending Ab minor 7th to high descending D minor 7th to low descending Ab minor 7th), I rearranged the sequence to maintain a D minor 7th chord for 2 bars, and an Ab minor 7th chord for a whole bar.](image)

Vibraphone chords were added to this section to clarify and improve the perceived harmonic progression. Although ambiguities such as Dmi7 could now be reinforced as an Fmaj7 chord if desired, this added to the technical difficulty. A subsequent reordering of harmonies to achieve a more stable harmonic progression rendered the added chords unnecessary. To relieve the monotony of the quintuplet rhythm, the quintuplets of some harmonies were replaced with semiquaver and triplet semiquaver groupings.

Whilst most of the pitch material thus far was derived from the pitch-sets of the marimba (Figure 5.23 for the opening of the movement, and Figure 5.30 for the extended quintuplet section that I was now working on), a new pitch-set was created for the vibraphone for inclusion in the quintuplet passage. Using the same method that had been employed for the marimba pitches of Figure 5.30, diminishing intervals of eight semitones to one semitone were used in ascending (original) and descending (inverted) forms.

![Figure 5.32: Following the process of Figure 5.30, vibraphone pitch-sets were derived.](image)
Subsequently, the pitch-sets of the vibraphone were superimposed on their corresponding harmonies in the marimba part (the Bbmi7 chord of the marimba part contains all three notes of the vibraphone’s D-flat major chord), with the final high E serving as a pivot note to the marimba’s C#mi7 chord (Figure 5.33).

Another high-pitched marimba ‘tune’ of descending crotchets was created for the ‘original’ low F to high B chord-pair (from Figure 5.30), employing the highest pitch – belonging to the Fmi7 harmony – before descending through the increasing intervals of the Bmi7 chord. The inverted form of Bmi7 over Fmi7, seen in the third and fourth bars of Figure 5.34, logically inverted the crotchet melody.
A short introduction was added to the beginning of the piece, using the highest and lowest Cs of the marimba. Further interjections were introduced from the original marimba pitch-series of Figure 5.23.

In the final bars of the piece, the opening marimba and vibraphone themes were restated in reverse order, without interjections. A complete statement of the inverted form of the marimba pitch series in Figure 5.23 was inserted between the original and inverted forms of theme 1 (Figure 5.36).
The original form of the marimba series was used to complete the movement (Figure 5.37).

![Figure 5.37: The original, ascending series of marimba pitches completes Symmetries 2.](image)

The final major change for this movement involved the six transpositions of Figure 5.30, rearranged into the following order:

<table>
<thead>
<tr>
<th>ORIG:</th>
<th>INV:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eb low – A high;</td>
<td>C high – F# low</td>
</tr>
<tr>
<td>Eb low – A high;</td>
<td>F# high - C low</td>
</tr>
<tr>
<td>F low – B high;</td>
<td>B high – F low</td>
</tr>
<tr>
<td>D low – D high;</td>
<td>Ab high – Ab low</td>
</tr>
<tr>
<td>E low – Bb high;</td>
<td>Bb high – E low</td>
</tr>
<tr>
<td>C# low – C# high;</td>
<td>G low – G high</td>
</tr>
</tbody>
</table>

Throughout this process of composition and revision, *Symmetries 2* was practised frequently, with ‘thinking through practice’ playing a major role in the final product. Practice sessions during the final days of composition led to small non-structural changes, such as the use of mallet shafts in Figure 5.38 and the final note of the movement being performed as a vibraphone harmonic.

![Figure 5.38: Mallet shafts create a change in timbre.](image)
5.1.3 Symmetries 3...to Nigel

The annotated score for *Symmetries 3* may be found in Appendix 3. Online audio may be downloaded [HERE](#), and a video recording may be found [HERE](#).

**PRIMARY GENERATIVE CODES:**

*Contrast:* 4a, 4b (imitation: immediate; delayed)

*Combination:* 6a, 6c (split melody: rapid, dynamically-even single pitches; groups)

*Clarification:* 10b (polymetre)

*Symmetries 3* was conceived as a reaction to the previous two pieces: an animated, light-hearted romp, mainly composed through improvisation, rather than preconceived generative processes. Although it is probably the least musically complex of the three works, the relative freedom in organising form and pitch invited a large amount of reflection and multiple revisions.

The initial melodic figure of *Symmetries 3* (see Figure 5.39 below) used another number series to determine the pitches, which were subsequently employed in the improvised melodic passages (Figure 5.46). In Figure 5.39 ‘groups’ of pitches always begin with the central F#4 of the marimba and are indicated with slurs. The number of pitches in each group is indicated above the staff for ascending intervals, and below the staff for descending intervals. The initial ‘group’ of two semiquavers descends one semitone, and is immediately inverted and augmented, producing an ascending interval of two semitones. This two-semiquaver ‘group’ is repeated and followed by a third pitch that augments the previous interval to third semitones.

These additive processes become the main generative component of this eighteen-bar introduction, and can be described thus:

i) ascending groups (highlighted in blue boxes in Figure 5.39) progress in pairs of progressively longer ‘groups’. The first group in a new pair is the same as the second group in the previous pair (indicated with a blue arrow above the staff in Figure 5.39). With the exception of the first pair of ascending groups, the second group in each pair is two semiquavers longer then the first (3+5, 5+7); descending groups occur between these ascending pairs, using the same process (2+4, 4+6).

ii) within each pair of groups, each new interval is one semitone larger than the previous interval, except for the consecutive six-semitone intervals, which were used to retain a degree of consonance. The inclusion of these consecutive tritones offered a fortuitous balance to the rejection of tritones in *Symmetries 2* (Figure 5.22). The sequence is reproduced numerically above the Figure 5.39, where red negative numbers indicate the number of semitones in each descending interval; blue positive...
numbers indicate ascending intervals; and square brackets indicate each slurred group.

Iron 5.39: A new number series determined the opening of Symmetries 3. Arrows indicate the carry-over of the final group in each pair of ascending or descending groups, to give the first of the next pair of ascending or descending groups.

In the first practice session for this new passage, I realised that notating time signatures to coincide with the pairs of ‘groups’ would aid memorisation. I resolved to retain the final dotted crotchet duration of Figure 5.39, despite being unnecessary in this irregularly metred approach (Figure 5.40). This was due to a ‘hunch’ that I may want to return this passage to common-time notation in a later iteration. Although the final pitch exceeded the range of the marimba, I had decided that I would not confine myself too rigidly to a set of guiding principles in this movement, and a glockenspiel was added to the setup to make this $F\#_7$ possible.

By repeating the process on the vibraphone, with its contrasting timbre and central B as the starting point for each slurred group, I was able to create a ‘call-and-response’ effect. The modulation to the next key in the ascending cycle of fourths accommodated the ‘light-hearted’ aesthetic I was hoping to convey. This produced a shorter passage, due to the smaller range of the vibraphone, and I again allowed myself to exceed the range. In common-time notation, this low A-sharp at the bottom of a descending six-note group arrived on the last quaver of the bar. By assigning this pitch to the

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152 I have long believed that understanding the structure of a piece aids in memorisation. In this instance, the simple additive process can be recited in the performer’s head: “12, 12 123, 12 1234, 123 12345, 1234 123456” etc.

153 Another long-term fascination has been the superimposition of irregular metres over a regular pulse, so this was a highly likely possibility.
marimba, the quicker transition to the subsequent (marimba) downbeat was fortuitously made less
difficult.

The third passage was a straightforward inversion of the first, starting on the central F-sharp
and exceeding the lowest pitch of the marimba. Again, I chose to employ another instrument, and a
kick-drum from a drum kit was added, to achieve the desired (albeit, unpitched) bass effect. Knowing
that the introductory pitch derivations would lead to improvised melodies and a more celebratory
ambience, the kick-drum’s association with commercial dance music seemed entirely appropriate.
The fourth passage was an inversion of the second, again played on vibraphone with the final high
pitch assigned to the glockenspiel.

Following the eighteen-bar, process-driven introduction, I ascribed possible tonalities to each
pitch series: the first passage (Figure 5.39) suggested F-sharp major clearly enough to warrant a key
signature, despite utilising only the five pitches of its associated dominant chord with a suspended
fourth. The second passage, a straightforward transposition beginning on the central vibraphone B,
suggested B major, and the key signature indicates this. A third (Figure 5.42) and fourth passage –
inverted forms of the previous two passages – were notated with D and G major key signatures
respectively. Although the missing root and fifth of these scales gave rise to a number of options, I
decided that the aural effect was a phrygian mode (in F-sharp and B).

With two occurrences of a mode that is commonly used in Balkan music, a decision was
made to improvise a short melodic phrase on the marimba, in $\frac{7}{16}$ metre (as is common in dance music
of this region).
In well-established form, this four-bar phrase was immediately repeated by the vibraphone, in inverted form and starting on its central B. While at the instruments, I finally decided to employ a ‘fun’ technique, whereby I played consecutive notes on alternating instruments. Although expecting it to create a disjointed melodic phrase, the instruments balanced well, and the rapidly alternating timbres gave an extra resonance to the sound, reminiscent of the Ligeti work that had inspired the creation of these pieces.

The final addition on the first day of composition was a relatively clichéd bass ostinato and the polymetric addition of a crotchet melody, shared between the glockenspiel and vibraphone. Whilst the first four bars of Figure 5.44 exist in the final version, the melodic idea of the subsequent bars would be discarded. The idea of polymetre (in this instance, a rhythmic bass ostinato in $\frac{7}{16}$ with a common-time melody moving in crotchets) would be explored in future iterations.

Allowing myself to control the compositional process through practice and reflection, rather than pre-compositional generative ideas, became the goal on the following day, and several simple ideas were created. Rather than describe the numerous inventions and rejection, I will describe elements that were retained. Although I didn’t plan the musical elements away from the instruments, the melodic and instrument-specific ideas were subjected to a process of symmetry (melodic inversion and instrument alternation), and were created with this in mind. The following line (Figure 5.45) was ultimately split into two phrases and used as interjections between variations of the main four-bar melodic phrase (Figure 5.43). Each vibraphone dyad was struck once and sustained, in contrast to the inverted version, played by the marimba with multiple articulations of each dyad.

Figure 5.44: The glockenspiel-vibraphone melody was conceived in $\frac{4}{4}$ and superimposed onto a $\frac{7}{16}$ rhythmic ostinato.

Figure 5.45: Whereas the vibraphone articulated single sustained dyads, the marimba used multiple articulations.

Figure 5.45: Whereas the vibraphone articulated single sustained dyads, the marimba used multiple articulations.
Continuing with my appropriation of Balkan musical gestures, I retained the F-sharp tonality of the fourth phrase in a typical harmonic and rhythmic riff, which was inverted and transposed for the vibraphone reply. This call-and-response technique continued with the jazz-inspired dissonance of a ‘B7#9’ chord\textsuperscript{154} and a vibraphone response with more rhythmic activity.

![Figure 5.46: Inverted vibraphone responses, with increased activity in the second answer.](image)

All aspirations to elegance were abandoned at this point, and the newly-included kick-drum was employed to provide a polymetric, regular crotchet pulse beneath the \( \frac{7}{16} \) melodic phrase. In this first notational iteration, the \( \frac{7}{16} \) time-signature was employed.

![Figure 5.47: The first iteration of this passage employed a \( \frac{7}{16} \) time-signature.](image)

A symmetrical response to the first four bars of Figure 5.44 was also created, again using the sustain of the metallic instruments as a contrast to the repeated dyads of the marimba passage.

![Figure 5.48: The F#/C# to E/B dyads of Figure 5.44 were inverted, and each dyad played as two single pitches. The chromatic passing-note was still employed on the final semiquaver of every second bar to connect the principal dyads.](image)

Figure 5.47 was subsequently re-notated, initially in \( \frac{7}{4} \), but eventually as a bar of \( \frac{7}{8} \) followed by two bars of \( \frac{7}{16} \). This allowed me to to split the music across staves, reducing the number of page-

\textsuperscript{154} The dominant 7\textsuperscript{th} chord on B (the B is omitted in this example), would be B-D#-F#-A. The ‘sharp’ (or raised) 9\textsuperscript{th} would be a C double-sharp. In this example, D#-A-C double-sharp is written enharmonically as Eb-A-D.
turns\(^{155}\) without creating a cluttered visual appearance. The two bars of \(\frac{7}{16}\) were aurally reinforced by altering the kick-drum to emphasise the metric structure of the melody.

Figure 5.49: Rather than maintain a crotchet pulse, the kick-drum emphasises the \(\frac{7}{16}\) metre with its final two notes.

A shortened, transposed version of the melodic passage beginning in Figure 5.44 was introduced, notated as one bar of \(\frac{7}{4}\) followed by two bars of \(\frac{7}{8}\). This inconsistency with the metric structure of Figure 5.49 was allowed, as the melodic figure here is not in \(\frac{7}{16}\), and one time-signature change could be avoided. Maintaining the desire for pitch-symmetry between the instruments, the fifths of the glockenspiel move in contrary motion to the marimba part (the symmetrical response to the first two bars of Figure 5.50 are found in Figure 5.51).

Figure 5.50: Bars 73 to 76, utilising the polymetre and melodic material (transposed) from Figure 5.44.

The recapitulation followed, bringing back the original four passages in a new order, with the first passage appearing at the end. Kick-drum accompaniment was added, mostly in crotchets to provide a regular pulse (as anticipated in the choice of durations in Figure 5.40), but with some syncopation added to fit the original melodic ‘groups’. Before the original passage returned to finish the piece, an extended calm passage was inserted. This consisted of three ideas:

i) Repeated F-sharps on the marimba and Bs on the vibraphone (the symmetrical pitch response to the first two bars of Figure 5.50) utilising a variety of timbres achieved by striking with different mallets or the shaft of a mallet.

\(^{155}\) One of a percussionist’s main considerations when preparing parts is how to minimise page turns, due to the difficulty of reaching across instruments and/or turning pages whilst holding multiple mallets.
ii) A bowed passage on the vibraphone with melodic inversion in the low range of the marimba. The vibraphone ‘melody’ begins with the final B of Figure 5.51 (above) followed by the first note, C-natural, of Figure 5.52 (below). The subsequent B is revealed upon dampening the C, and followed by the struck A. Marimba durations decrease, creating a forward momentum.

iii) A final contemplative moment on the glockenspiel and marimba, which, through a process of rhythmic contraction in the marimba part, propelled the music forward into the final iteration of the opening passage (again with kick-drum accompaniment).
The final restatement of the original passage in common time includes occasional dyads (and octave transposition in the penultimate bar) and a final high F#7, which may be played as a long or short note, at the performer’s discretion.

Figure 5.54: The opening passage returns with added kick-drum and occasional dyads.

Although each element of *Symmetries 3* has remained constant since the ‘final’ version of May 13, this celebratory movement has been revised repeatedly, with the order of elements changing, and kick-drum accompaniment removed and added in various sections. The glockenspiel was moved from its position in front of the vibraphone, to a central position in front of the marimba, to facilitate easier access in Figures 5.50 and 5.53. As a result, the pitches of the opening phrases that exceeded the marimba and vibraphone ranges (F-sharp and C) have been allocated to single crotales (or bells), which may be positioned in more convenient locations. Although the inclusion of kick-drum has remained in the score, I have substituted a muffled cajon in my own performances. The performance instructions in the sheet music include a description of this option, and the performer is invited to be the final arbiter of instrument choice as long as the function of the instrument is acknowledged.\(^{156}\)

\(^{156}\) That is, it must replace the pitches that exceed the low range of the marimba, and provide an obsessive, regular, low-pitched beat, suggestive of commercial dance music.
5.2 Filling ‘Gaps’: 2021

In Chapter 4, I analysed works from the marimba-vibe repertoire to create a list of compositional ‘codes’, or specific techniques. These codes were grouped into larger ‘categories’ and ultimately, five broad generative ‘themes’: those of transformation, contrast, combination, clarification, and ‘other’. ‘Transformation’ was a common theme employed in the repertoire (including my compositions of 2020), and the only codes not explored within this theme were the transformation of a ‘balanced timbre to a solo vibraphone timbre’ (code 1c), and of a ‘predominantly marimba timbre to a balanced timbre’ (code 1f). ‘Combination’ was also explored thoroughly, with only ‘split melody: phrased single notes’ (code 6b) and ‘harmonic homophony’ (code 8b) remaining unused.

‘Clarification’ of polymetres; juxtaposed phrase-lengths; and phrasing, benefitted from the use of two instruments. Simple examples of counterpoint and polyrhythm (codes 9 and 10a – see section 4.3.4), were identified, although an example of deliberate and sustained superimposition of independent, non-repetitive lines was missing. The absence of sophisticated melodic and rhythmic superimposition (counterpoint and polyrhythm) led me to consider these codes ‘unused’ in original works for marimba-vibe.

Code 12b, ‘vibe cuts off marimba’, completed the above list of unused codes, and by referring to this list, I was able to highlight six gaps in the use of generative ideas in the solo marimba-vibe works composed prior to 2021. In my subsequent compositions, I deliberately explored these ideas: An Unfinished Rhyme, utilises ‘phrased single notes’ (code 6b), ‘harmonic homophony’ (code 8b) and ‘marimba cuts off vibe’ (code 12a) throughout, and in Without Delay, I explore ‘counterpoint’ (code 9), ‘polyrhythm’ (code 10a) and ‘polymetre’ (code 10b) extensively. These two works are discussed in the following sections (5.2.1 and 5.2.2).
5.2.1 An Unfinished Rhyme

The annotated score for An Unfinished Rhyme may be found in Appendix 3. Online audio may be downloaded [HERE](#), and a video recording may be found [HERE](#).

**PRIMARY GENERATIVE CODES:**

<table>
<thead>
<tr>
<th>Combination</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6b</td>
<td>phrased single notes</td>
</tr>
<tr>
<td>8</td>
<td>homophony</td>
</tr>
<tr>
<td>12a</td>
<td>marimba cuts off vibe</td>
</tr>
</tbody>
</table>

In 2021 I supervised an Honours student, Gabrielle Lee, in her examination of repertoire for ‘the solo singing-percussionist’. By composing a marimba-vibe solo with a vocal component for Gabby, and by asking her to do the same for me, we would have two new pieces to examine as a part of our dissertations and performances. Whilst I was hoping Gabby may address some of the ‘gaps’ identified at the end of the first round of commissions, I did not wish to interfere with her compositional process, so I ensured that my own work would utilise and explore the efficacy of some of the unused compositional codes catalogued in Chapter 4.

The code that I was most keen to explore was an idea that I had employed in ensemble arrangements: 6b, ‘phrased single notes’. The effect was intended to replicate the ‘weeping’ character of, for instance, the opening of Bach’s *St John Passion* BWV245 (1724). By playing the first of a pair of pitches as a sustained vibraphone note and slurring it into a softer (and shorter) marimba pitch, I hoped to achieve an obvious phrasing effect (see Figure 5.55), exaggerated by the shift in timbre. The suspensions and passing notes favoured in the Bach example provided further technical means by which to affect a musical ‘weeping’.

![Figure 5.55: Tanner – An Unfinished Rhyme. By employing code 12a (marimba cuts off vibe), in combination with code 6b (phrased single notes), a musical ‘weeping’ was affected.](#)

Although the melodic and harmonic material began to emerge with the above inspiration in mind, Lee and I had not agreed upon a text. I expected to use a deliberately sombre piece of prose to

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match the ‘weeping’ effect of the phrasing between the instruments. January 2021 will be remembered for the events in the United States that reflected (and elicited) this mood, including an insurrection amidst an endlessly spreading pandemic and the dying days of a tumultuous American presidency.

The temporary utilisation of a nursery rhyme while searching for a more sophisticated text provoked a strange reaction, with the naïveté of the text becoming a guiding aesthetic in the composition. Although the plague references in ‘Ring-a-ring-o’-roses’ have been disputed, this interpretation of the text seemed appropriate to the American situation, and the juxtaposition of a simple children’s rhyme to describe the tragedy of recent events was intended to add an uncomfortable poignancy. Although the sense of hope accompanying the impending inauguration of a new president is reflected in the central section of this work, the overall mood is sombre, and the final ‘unfinished’ phrase suggests the ongoing business of dealing with the pandemic.

The piece uses two eight-bar harmonic passages in the way a pop song may order verses and choruses: the first is presented at the beginning, with no vocal part, and begins with the harmonic motion of the slow movement of Beethoven’s Seventh Symphony (tonic minor to dominant, dominant to tonic minor). I hoped to achieve a degree of harmonic ambiguity, by avoiding the root of the tonic and the raised seventh (G-sharp, the third of the dominant-seventh chord). The second passage moves through a cycle of fourths and features a much-longer sustain in the vocal part. Ultimately, I decided to make the vocal part optional. Once the decision was made to include a predictable cycle of fourths, it made sense to include a vibraphone solo. Bars 33 to 41 precede this in a major version of the opening chord progression.

Messiaen-inspired bird-call imitations are used to evoke the ‘robin’ of verse 4 (Figure 5.56), played in the upper range of the marimba, and benefitting from its ‘woody,’ staccato articulation.

Figure 5.56: Bird calls in the marimba part.

In contrast, the sustaining properties of the vibraphone are exploited to intone the plainchant setting of the *Dies Irae*\(^\text{159}\) as a dark commentary to the ‘wedding bells’ of verse 5 (Figure 5.57).

![Figure 5.57: Accented notes intone the Dies Irae.](image)

The final word – ‘down’ – is held for three bars in the vocal part only, performed as a downward *glissando*.

![Figure 5.58: The final bars remain harmonically unresolved.](image)

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\(^{159}\) This plainchant melody has been used in many compositions to evoke deathly associations, including Berlioz’ *Symphonie Fantastique* (1830), and Liszt’s *Totentanz* (1849).
5.2.2 Without Delay

The annotated score for Without Delay may be found in Appendix 3. Online audio may be downloaded HERE, and a video recording may be found HERE.

**PRIMARY GENERATIVE CODES:**

*Clarification:* 9 (counterpoint)

10a (polyrhythm)

10b (polymetre)

Conceived as a companion piece to An Unfinished Rhyme, the title of Without Delay refers to the new American president tackling the pandemic immediately after his inauguration. The use of canon as a compositional tool creates an acoustic echo effect ‘without (digital) delay’; and more-elaborate counterpoint and polyrhythm was explored in a short fugal passage. The use of counterpoint and polyrhythm (codes 9 and 10a) filled gaps in the generative ideas used to create marimba-vibe works, and again exploited the benefit of different timbre between the instruments to achieve clarity.

The genesis of this composition occurred whilst walking around a rural property in Bridgetown, Western Australia. As a percussionist, I often practise superimposing two or more rhythmic ostinatos, and this is an activity that I find enjoyable when walking undisturbed. I imagined a simple melodic and rhythmic ostinato of five-quavers duration. Tapping this in my right hand, I attempted to superimpose it on a left-hand ostinato of seven-quavers duration.

Resolution (the moment at which both ostinatos return to the first note of their respective patterns) occurs after five iterations of the seven-quaver ostinato or seven iterations of the five-quaver ostinato. Repeating the process with a shorter left-hand ostinato of six-quavers duration required five iterations of the six-quaver ostinato or six iterations of the five-quaver ostinato to achieve resolution.

In *Poles Apart: The Music of Roger Smalley*, I describe the use of rhythmic diminution to achieve forward momentum in Smalley’s *Ceremony I* for percussion quartet.\(^{160}\) I adapted this process by progressively shortening the duration of the left-hand ostinato, from seven quavers to one. By employing time-signatures determined by the duration of the left-hand ostinato, each superimposed pair of ostinatos required five bars to achieve resolution. As the duration of the left-hand ostinato decreased, the number of iterations of the unchanging right-hand ostinato followed the same numerical progression (seven to one), with an exception occurring when both hands played a five-quaver ostinato. This reciprocal phenomenon may be described thus:

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\(^{160}\) Paul Tanner, "The Structure of ‘Ceremony I’," in *Poles Apart: The Music of Roger Smalley*, ed. Judy Thönell (Western Australia: Evos Music and CIRCME, School of Music The University of Western Australia, 1994).
When superimposing two ostinatos \((a\text{ and }b)\) of different quaver durations, the number of iterations of \(a\) required to reach resolution will equal the number of quavers in \(b\), and vice versa.

Table 5.1 illustrates the seven superimpositions of ostinatos in numerical form. The decreasing number of quavers in the left-hand ostinatos are recorded as time signatures in the ‘LH (7q to 1q)’ column, and the number of iterations of the right-hand five-quaver ostinato are listed in the ‘RH (5q)’ column. The total number of quavers required to reach resolution is determined by multiplying the number of quavers in each hand’s ostinato, and is listed in the ‘Total q’ column.

<table>
<thead>
<tr>
<th>Numerical representation:</th>
<th>LH (7q to 1q):</th>
<th>RH (5q):</th>
<th>Total q:</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH: 123451234512345123451234512345123451...</td>
<td>7 x5</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>LH: 123456712345671234567123456712345671...</td>
<td>5 x8</td>
<td>30</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
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<td>5 x8</td>
<td>10</td>
<td></td>
</tr>
<tr>
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<td>5</td>
<td></td>
</tr>
<tr>
<td>LH: 123451...</td>
<td>5 x8</td>
<td>5</td>
<td></td>
</tr>
<tr>
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<td>4 x5</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>LH: 123412341234123412341...</td>
<td>3 x8</td>
<td>15</td>
<td></td>
</tr>
<tr>
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<td>2 x5</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>LH: 12121212121...</td>
<td>1 x8</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

I began the first draft of 
*Without Delay* on our return to Perth, utilising the same compositional-performative feedback loop of previous compositions. Reflecting on the opening ostinato superimpositions, I decided to double the iterations of each pair, in an attempt to avoid an overly frenetic opening. Notation was simplified by notating five bars of \(7/8\) as one bar of \(5/4\), and five bars of \(1/8\) were notated as one bar of \(5/8\). The \(4/8\) bars were notated in \(2/4\).
The polymetric effect (code 10b) of superimposed ostinatos was again clarified by the use of two instruments. This was particularly important in this example, as the overlapping pitch-ranges would otherwise have disguised the separate melodic and rhythmic lines. The passage in Figure 5.59 emphasises the two resolutions marked by arrows, and by alternating marimba and vibraphone timbres creates a ‘call-and-response’ effect.

The forward momentum created by the process of rhythmic diminution achieves its goal at bar 43. In the initial draft, this bar reintroduced the pitches of the first superimposition in a rhythmically modified form, one octave higher. A short text was included, to link Without Delay to its companion piece, An Unfinished Rhyme. In later drafts, the text was deleted and the polymetre returned to the seven and five-quaver ostinatos of the opening.

The following section played on the double meaning of ‘delay’. Whilst the title refers primarily to the new American president’s approach to pandemic vaccination, I sought to emulate the effect of a ‘digital delay’ unit, which creates echoes (or canons) by capturing sound and reproducing it after a short user-programmed ‘delay’. More than one echo may be produced, resulting in a multi-layered texture.

Although written well before the invention of the digital delay, This Little Babe, from Britten’s Ceremony of Carols,\(^1\) provided a template for achieving the desired effect. In this movement, Britten states a melody, repeats it as a two-part canon and subsequently as a three-part canon. With each repeat, the canonic parts enter more quickly, propelling the music forward in dramatic fashion. In a similar manner, I stated a melody (reminiscent of Britten’s), reiterated it in

canon, and subsequently reiterated it as a three-part canon. Although the two-part canon was played on one instrument, by the second day of composition, this had been split between the two instruments for ‘clarification of counterpoint’ (code 9).

![Figure 5.61: Bars 59 to 63 (top staff) from the original draft reappear in bars 75 to 79 as a two-part canon (bottom staff).]

Canonic writing is continued in bar 104, with repetitive dyads played in the marimba and echoed by the vibraphone. Although each instrument independently emulates a digital delay, due to the repetition of dyads with a diminuendo in each part, the effect is thickened and coloured by the layering of marimba and vibraphone timbres.

![Figure 5.63: Bars 104 to 110. The repetition of dyads with diminuendo (‘harmonic canon’), creates a digital delay effect.]

Subsequent revisions of the initial draft involved the reordering of sections, in which the ‘harmonic canons’ (repeated dyads) appeared before the Britten-esque ‘melodic canons’. The passages discussed thus far were ultimately arranged in the following order:

1. Opening superimpositions (code 10b – ‘polymetre’)
2. Harmonic canons (code 9 – very simple ‘counterpoint’)
3. Melody and two-part melodic canon (code 9 – more-sophisticated ‘counterpoint’)
4. Harmonic canons
5. Three-part melodic canon

A bridge passage between the opening superimpositions and the first harmonic canons was composed and revised in the second and third drafts, featuring sustained, high-pitched vibraphone pitches. This passage exploited the combination of marimba and vibraphone in idiomatic fashion, with a ringing, bell-like vibraphone melody accompanied by rhythmic repetitive dyads: initially on the vibraphone, and subsequently moving to the marimba (code 3a – ‘sustained vibe, rhythmic marimba’).

![Figure 5.64: Bars 53 to 58. Sustained vibraphone pitches, accompanied by a rhythmic ostinato (code 3a from bar 56).](image)

A gradual transformation into a recapitulation of the opening bars was added, with bars 152 to 157 continuing the canonic approach in the right hand. The rhythmic framework from the beginning is maintained, and both hands revert to their original ostinato durations in bar 158.

![Figure 5.65: Bars 152 to 155. Although the metric structure of the right hand maintains the five-quaver durations of the opening, the vibraphone repeats the melody created by the previous canonic writing, rather than the original melodic patterns.](image)

Having adjudicated at ‘Marimbafest 2021’\(^{162}\) in the previous week, I made the decision to add a chorale (code 8b – ‘harmonic homophony’ – a common feature of the many works performed). Wishing to display the aural benefits of the marimba-vibe double keyboard, when compared to music for solo marimba, this chorale features sustained vibraphone dyads over pulsing or rolled dyads in the low register of the marimba, and a two-bar solo marimba progression without rolls. This contrasts with the common homophonic approach of a marimba chorale, in which a performer demonstrates

\(^{162}\) [https://www.marimbafest.com/2021faculty](https://www.marimbafest.com/2021faculty).
their expressiveness and skill in an extended passage of rolled chords, but is confined to a single basic timbre.

Figure 5.66: Bars 198 to 201. Vibraphone dyads over ‘rolled’ marimba bass notes; marimba chorale with ‘non-rolled’ notes.

To finish the work, the falling sixth melodic elements of the opening right-hand ostinato were combined with the Britten-esque melody and woven into a short three-part fugue (utilising the hitherto-unexplored code 9 – ‘counterpoint’; and code 10a – ‘polyrhythm’). The first statement of the theme is accompanied by a ‘bouncing’ bass line, suggested by the preceding four bars and the repeated dyads of the harmonic canon.

Figure 5.67: Bars 210 to 213. The theme in bar 212 is accompanied by a ‘bouncing’ bassline, suggested by the previous bars.

Whilst the first two entries of the theme are notated on the marimba, the third entry is performed on the vibraphone to add timbral brightness and clarify the new statement of the theme. This three-part statement is modulated and repeated, heralding a return to the harmonic canons.

Figure 5.68: Bars 229 to 232. The final bars of the three-part fugue resolve in a final passage of harmonic canons.

A diminuendo on both instruments reaches a piano dynamic, before a long crescendo on the final harmonic canon arrives at a two-handed resolution, with the vibraphone left to ring indefinitely.
5.3 Conclusion

Timbral and textural benefits of the marimba-vibe double keyboard were discussed and taxonomised from a compositional perspective in Chapter 4. In Chapter 5’s exegetical account of my composition of five marimba-vibe solo works, I have outlined the primary generative codes used in each piece. Extant works, composed before 2020, provided a precedent for my application of many of these performance techniques and compositional ideas. Unexplored codes from Table 4.1 presented ‘gaps’ in knowledge, and were also explored – especially in the compositions of 2021.

Whilst a number of these timbral and textural benefits were reinforced and developed in my three Symmetries, another (non-textural and non-timbral) benefit of a double keyboard was discovered and employed during the composition of these pieces. As discussed in section 5.1, the non-identical pitch-centres and ranges of the marimba and vibraphone allowed for conflict and interaction, and were utilised to determine almost all of the pitches in Symmetries.

By composing works as a percussionist-composer, I was able to bring my embodied knowledge of mallet-instrument performance to this idiom. Reflecting on my original compositional ideas in situ, I was able to consider ‘benefits and challenges’ posed by the double-keyboard arrangement; resolve problematic or unsuccessful passages; and develop successful ideas further. Discussions and recordings of each new work added to the information available to composers wishing to write for this nascent idiom.

In Chapters 6 and 7, I discuss my performance preparation of marimba-vibe repertoire. Whilst Chapter 4 focused primarily on the timbral and textural benefits of the marimba-vibe, the following chapters discuss the many challenges encountered when performing works from this repertoire, along with my solutions. Collaboration with the commissioned composers allowed for notational and technical challenges to be addressed, and solutions to these issues informed A Guide to Composing for the Marimba-Vibe (Appendix 1). The performance research undertaken in these chapters informs A Guide to Performing Works for the Marimba-Vibe (Appendix 2) and the annotated scores and recordings of Appendix 3.
CHAPTER 6: A Performer’s Perspective (Part I)

In Chapter 4, the benefits and challenges of the marimba-vibe double keyboard were examined from a compositional perspective. In Chapters 6 and 7, I discuss the many performance challenges presented by this idiom, proposing solutions to various performance challenges and suggesting ways to approach these works.

A degree of analytical investigation of the works was instructive, and a table of performance problems and solutions was created (see Table 6.1). Whilst an artefact (Appendix 2, *A Guide to Performing Works for the Marimba-Vibe*) was produced at the end of this investigation, the bulk of the research was not directed at creating the artefact to answer a research question. Rather, the aim of the research was to identify challenges through personal practice, record these challenges, experiment with possible solutions and identify successful solutions to the questions arising from specific challenges. As a result, the bulk of this investigation required a more practice-led approach, with extensive notes recorded *in situ* during and after each practice session for reflective consideration, and ultimately a reflexive adaptation of my technique or approach to practice.

6.1 Exploring Setups, Identifying Performance Considerations

The development of Table 4.1, in which concepts and techniques were categorised, was conceived as an aid to compositional activity. In much the same manner, I sought to establish a methodical framework for entraining practitioners of this idiom and embodying some of the more-challenging technical demands. Setup was investigated thoroughly in *Kennedy Sketches* and a newly-commissioned solo from David Pye. By the time subsequently commissioned composers began working, I had determined that the V-formation was more appropriate than the stacked setup when using a five-octave marimba, and that Ney Rosauro’s suggested positioning of the vibraphone in his *Sonata, the Periods of Life* would be my setup for all pieces. Subsequent commissions and compositions were therefore composed for this setup, and other considerations became more important in the investigations of each work.

The compositions of Potter and Vickery afforded an opportunity to determine the optimal notation for specific issues, whilst my own works (in which notation and technical issues were optimised concurrently with the compositional process) required significant consideration of body
positions. Other considerations, such as mallet selection, are already vital to a marimbist or vibraphonist, but a double keyboard presents specific issues that need to be considered. In some passages, the mallets of one or both hands must be suitable for playing both the vibraphone and the marimba. Conversely, if each instrument is played by the mallets of one hand only, a standard pair of vibraphone mallets may be used in the right hand, while a pair of marimba mallets may be used in the left.

Chapter 7 continues the discussion of body positions and movement, and suggests annotations to be used as an aid to reproducing positions during the practice of these works. The discoveries of Chapter 6 and 7 are used to inform *A Guide to Performing Works for the Marimba-Vibe* (Appendix 2) and the annotated scores of Appendix 3.

6.1.1 *Kennedy Sketches* (Rand Steiger, 1982)

My preferred V-formation proved moderately successful in the first 45-minute practice session for this piece. By using appropriate sticking patterns, such as repeated right-hand strokes for consecutive vibraphone pitches, rather than alternating hands, impossibly quick movements from one instrument to another were avoided. The least accurate reading occurred in a short unison passage that involved very large intervals in both hands, primarily caused by an inability to observe all mallet contacts directly or peripherally.

![Figure 6.1: Rand Steiger – Kennedy Sketches, bar 7. Accuracy is an issue when large intervallic leaps are required on both instruments.](image)

In the following practice session of equivalent duration, I utilised the stacked setup (Figure 6.2) and this problem was mitigated. By aligning the vibraphone’s A4 (the geometrical centre point) with the same pitch on the marimba, I could watch the music (also aligned with the central A) and retain enough peripheral vision to prepare the initial unison (Figure 6.1), then utilise kinæsthetic skill (and some peripheral vision) for the challenging leaps. As vibraphone keys are slightly narrower than those of the marimba, the highest vibraphone notes were located to the left of the corresponding marimba pitches. Conversely, the lowest vibraphone notes were located slightly to the right of their identical marimba pitches (by a lesser degree). By consciously pulling my right-hand mallet inwards
(the red arrow in Figure 6.2 reveals the amount of ‘pulling in’ required) to play a C#6 on the vibraphone, I was able to achieve a high degree of accuracy in this unison passage. Whilst I could have spent time mastering the muscle memory for this passage in the V-formation, a number of other issues presented themselves, reinforcing my decision to place both instruments in front of me.

![Figure 6.2: The 'stacked' setup. The three parallel blue lines reveal the discrepancy in bar-size between the two instruments and the need to consciously 'pull in' the right-hand mallet to play the high vibraphone C# of Figure 6.1.](image)

As I generally prefer to set up in a V-formation, with the vibraphone on my right, I find it easier to read scores with the vibraphone part written above the marimba part. For this reason, I re-typeset the music and practised in both the V-formation and stacked setup. Even with the less-confusing arrangement of parts, the stacked setup proved more comfortable. As discussed in the introduction, one of the reasons for this is the range of the marimba required (four-and-a-third octaves), and the stretch to the lowest note (A3, a tenth below middle-C) was not uncomfortable. There were also no lengthy passages of virtuosic writing on the marimba, so the problem of backpain resulting from stretching across the vibraphone did not present itself.

Bowed passages in the second movement presented a difficulty for the stacked arrangement, as described by Solomon in his brief discussion of this setup. By pulling the smaller end of the vibraphone away from the marimba slightly (enough to create a suitable space between the central C-sharp of the vibraphone and the keys of the marimba), I was able to bow passages comfortably, while maintaining a close enough proximity to the marimba (Figure 6.3). An added benefit of this alteration was a more parallel arrangement, with vibraphone and marimba keys aligning far more closely (compare the angle of the blue lines in relation to the keys in Figures 6.2 and 6.3).

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Figure 6.3: Stacked, with room for bowing in vibraphone upper register. Marked with a blue line, A is the physical centre of the range used by each instrument. The yellow line indicates the marimba range employed.

By increasing the height of the marimba and moving the resonators forward (Figures 6.4a and 6.4b), I was able to push the front edge of the vibraphone under the marimba, thereby reducing the distance between marimba and vibraphone notes in the low register (Figure 6.5).

Figure 6.4a: Resonators in normal position, under centre of bars.          Figure 6.4b: Resonators moved forward.

Figure 6.5: Vibraphone moved forward slightly and tucked under the marimba.

Although this reduced the distance between vibraphone and marimba pitches, I ultimately decided to leave the resonators in their optimal resonant position, and that the discrepancy in height of the playing surfaces was not beneficial. My resetting of the score was also discarded at this stage, as the original positioning of staves, with marimba above the vibraphone, appeared more logical for the stacked setup.
6.1.2 euler’s identity (David Pye, 2019)

In February 2019, I contacted David Pye, regarding the possibility of composing a work for solo marimba-vibe as part of my research project. Pye originally trained as a percussionist, was timpanist for the Western Australian Symphony Orchestra, and directed the Nova new music ensemble for three decades, before deciding to focus on composition. At our first meeting, he measured distances between notes, tested timbral possibilities (including baking paper on top of the resonators and light chain on the vibraphone keys), asked questions about my preferences, and took photographs to consult during the compositional process. The first draft was completed eleven days later.

Although David’s piece was composed for my V-formation, I experimented with other setups. Passages that combined the low register of the marimba with the high register of the vibraphone were easier to execute in a ‘reverse V’ (vibraphone on the left, Figure 6.7b) due to proximity of pitches. The passage commencing at bar 234 however, precluded this possibility.

In this passage, the mallets of the right hand simultaneously play a vibraphone C₄ and marimba C₅, requiring a stretch of 40 centimetres in my V-formation, or 138 centimetres in the reverse V-formation (distances are marked in Figures 6.7a and 6.7b with yellow arrows). An added detraction was the inability to bow the bass register of the marimba due to the obstruction of the vibraphone.
The same passage required a 61.5 centimetre stretch in the stacked setup, which is unusually large but playable, due to the passage’s repetitive and minimal horizontal motion, low dynamic, and steady tempo. Bowing access to the D₃, E₃ and F₃ in the second octave of the marimba was obstructed by the vibraphone, and although moving the vibraphone to the right allowed access, the resultant lack of alignment between similar pitches on each instrument ultimately precluded the use of this setup.

**Figure 6.8:** Stacked formation. Although the span of the right-hand mallets (yellow arrow) is possible, the bowed notes of the marimba (yellow dots) are inaccessible.

During a subsequent practice session, I reduced the angle of the V by pulling in the high end of the vibraphone and repositioned the music stand to the high end of the marimba. The ‘closed V-formation’ had dual benefits: reducing the distance between the low register of the marimba and high register of the vibraphone; and improved peripheral vision while playing passages in these registers.

**Figure 6.9:** ‘Closed V-formation’, with trap table. Line of sight to the repositioned music stand is marked with a white line.

The white line in Figure 6.9 illustrates the new direction in which I was looking, and the 52-degree angle of the V, with a triangular trap table placed between the instruments. As with the ‘closed V-formation’, the design of the table had dual benefits: when moving the instruments, the angle could be
reproduced easily; and placing the woodblocks and cowbells on this trap table allowed for closer access than the initial placement in front of the marimba, which had required uncomfortable bending.

Mallet choice in the first section of Pye’s work was discussed with the composer. David desired an inarticulate ‘ghostly’ opening, played with very soft and large bass marimba mallets. From bar 119, however, he desired a more ‘playful’ sound, which extended into a higher register. The mallets also needed to be suitable for the sustained vibraphone pitches. As a compromise, soft mallets with wooden cores were used (Malletech LHS10), allowing me to play with more articulation in the louder, more playful moments. Whilst these mallets are usually inappropriate for a vibraphone, the low dynamic of its occasional pitches permitted their use, and David approved this selection.

In the second section of the work, a bass bow is used in the performer’s left hand, while two mallets are required in the right. These mallets needed to be suitable for vibraphone dyads, marimba dyads, and the passage of octaves between instruments, played by the mallets of one hand (see Figure 6.6). A medium pair of vibraphone mallets were used (Innovative Percussion AA30). Likewise, the third section required mallets in both hands that could be used for either instrument.

Pye, with his experience in percussion performance and logistically-minded approach, had considered the setup I had requested and composed a piece that required little revision. Whilst he was able to solve most playability issues himself (notwithstanding my occasional request for something to be simplified), many of the insights noted above would not be readily apparent to a non-percussionist, and I anticipated a higher level of collaboration and revision for future commissions.

Further Practice: Standardisation of Setup (Rosauro’s V-formation) and Technical Approaches

Using a different marimba in an August recital, I found that the low bowed marimba notes were problematic. As I favoured dragging the bow upwards, the keys lifted. I had experienced this on my vibraphone, and tied down the affected pitches, but the low marimba keys had not been subject to this issue. Bowing downwards became the preferred option from this time.

In the early months of 2020, the decision was made to standardise the positioning of the V-formation, for use in the works by Rosauro, Pye, Séjourné and future composers. By returning the angle of the V to Rosauro’s V-formation (approximately eighty degrees), the angle of my wrists was reduced in many simultaneous double keyboard passages. Other performers may decide to adjust the vibraphone position between individual works, as it is possible to reduce the distance between vibraphone and marimba pitches in certain passages. Figure 6.10, from euler’s identity, provides an example, in which the ‘closed V-formation’ brings the high pitches of the vibraphone closer to the low pitches of the marimba. As a performer wishing to develop a substantial repertoire for this

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168 At higher dynamic levels, the sound of the wooden core comes through, creating a very ‘bright’, often harsh timbre. Metal bars played loudly may also crack the mallet cores.
instrumental idiom though, I endeavoured to create a fixed setup, to entrain my kinæsthetic ability and improve accuracy.

I made the decision to place the music stand slightly left-of-centre in front of the marimba, close to the range with the most activity in the opening section. This aided accuracy by improving my peripheral vision of the marimba bars while reading the notation (the final section repeats progressively longer passages, and is therefore easier to memorise, so the improved peripheral vision between instruments in Figure 6.9 was of less import). Further considerations on music stand placement will be discussed in relation to more recent pieces, as its central placement in Figure 6.9 remains beneficial to peripheral vision when playing passages with a similar amount of activity on each instrument.

Thomas Zirkle’s detailed examination of ‘the alternation of mallets in each hand for linear passages’ was beneficial in the passage illustrated in Figure 6.11, in which a two-handed execution of the chromatic scales would require very rapid movement to and from the marimba pitches. Whilst the strength of a repetition-based (one mallet only) sticking was appealing, the stability, speed and efficiency provided by an alternation-based approach (due to less lateral movement across distances) allowed for accurate and comfortable performance. Reinforcing the argument for alternating strokes (as opposed to repeated strokes with one mallet) was the distance between the centre of each pitch of the chromatic scales: alternating between the row of ‘accidentals’ and the row of ‘naturals’ required significant travel for one mallet, but the use of both mallets within one hand allowed for the placement of mallet 4 above the centre of the accidentals, and mallet 3 above the centre of the naturals, where they could remain for the five-and-a-half bar excerpt. The challenge of small rotations between semitones was circumvented cleverly by Pye, with the avoidance of semitones between ‘natural’ keys (B to C, and E to F). Consistently alternating between the natural and accidental rows

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169 Zirkle, "Developing a four-mallet marimba technique featuring the alternation of mallets in each hand for linear passages and the application of this technique to transcriptions of selected keyboard works by J.S. Bach."

170 The up-and-down motion of repeated strokes with one mallet allows for great force (unless high speed renders large upstrokes impossible). As the motion between two mallets in one hand is a rotational one, a small interval results in a smaller stroke (and lesser dynamic) than a large interval.

171 Although some accidentals (E-sharp, B-sharp, C-flat, F-flat) are white notes on the piano, I describe the marimba notes corresponding to the white notes on a piano as ‘naturals’ and the black notes as ‘accidentals’. All the bars on a marimba are tints of brown, so the ‘black’ and ‘white’ distinction is equally inaccurate.
required a larger distance between mallet-heads, resulting in a larger rotational arc and thereby less muscle-strength to execute a forceful dynamic.

![Figure 6.11](image)

Having discovered a compositional ‘gap’ in Category 9: Clarification of counterpoint (see Table 4.1), I resolved to explore counterpoint in a future work (an example is found in *Without Delay*, Figure 5.68). In preparation for the alternation of mallets in one-handed linear passages, I followed Zirkle’s lead by studying contrapuntal works by Bach, as described in the following section.

### 6.1.3 Two-Part Invention No. 8 in F major (J.S. Bach)

Zirkle’s dissertation includes a ‘brief history’ of four-mallet technique, outlining early usage employing dyads in the mallets of one hand, through to occasional alternation of mallets in one hand (useful for arpeggiated figures). He notes that early one-handed linear passages were ‘meant to be played by the repetition of a single mallet’ – a practice that is still common in recent repertoire – and that rotation between the mallets of one hand was (and often is) reserved for larger intervallic leaps. Figure 6.12, from Mitchell Peters’ *Yellow After the Rain* (1971), is an example of an early four-mallet work utilising repetition strokes with one mallet, as marked by the composer.

![Figure 6.12](image)

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172 Zirkle pp4-10
173 Zirkle p5
Zirkle’s most important point of discussion then, is the alternation of mallets within one hand when performing small melodic intervals\textsuperscript{174} and he provides exercises by which to develop the finger and wrist muscles required to utilise this technique effectively.

**The ‘one-handed linear, alternation’ approach**

Bach’s *Two-Part Invention No. 8 in F Major (BWV 779)* provided an exercise to develop the use of an alternating-mallet technique in which the right hand would remain above the vibraphone, and the left hand would remain above the marimba. The use of separate hands for the melodic lines of this two-part contrapuntal work aided my conception of the independent lines, and the contrasting timbres of the two instruments aurally ‘clarified’ the contrapuntal writing. This decision also removed the need for mallets that could be used on either instrument. I held my favourite vibraphone mallets in my right hand, and marimba mallets in my left hand.

The increased physical distance between the two lines, due to their performance across two instruments, reinforced Zirkle’s argument for performing each line solely with the mallets of one hand. By alternating the two mallets in one hand, rather than striking repeatedly with one mallet, the frequency of each hand’s lateral adjustment was halved. The distance to be travelled in passages incorporating larger intervallic leaps, such as bar 7 (Figure 6.13) was also reduced by alternating mallets. The right-hand part of bar 7 could be performed by rotating from mallet 4 to mallet 3 for each pair of pitches (B to G, D to B, F to D, marked with blue arrows in Figure 6.13), before moving the hand a small distance (B to D, D to F, at the beginning of each blue arrow), rather than large and frequent left and right motions with one mallet (B to G to D to B to F to D).\textsuperscript{175}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure613.png}
\caption{J.S. Bach – *Two-Part Invention No.8*, bars 7 to 9. In bar 7, mallets 4 and 3 rotate inwards (marked with blue arrows) to execute two pitches (B and G), before the hand moves laterally for subsequent pairs of pitches.}
\end{figure}

\textsuperscript{174} Performing small intervals allows for a minimal amount of rotation, and thus, significant exertion to achieve louder dynamics. Conversely, large intervals allow for a greater distance to be travelled by each mallet, allowing for easier execution of loud passages.

\textsuperscript{175} For a detailed analysis of hand movements and placement, see Zirkle’s discussion of this work (with annotations).
Pedalling

The use of the vibraphone’s sustain pedal allows for exaggeration and clarification of phrasing, and I notated the pedalling decisions that I had made within the work (see Figure 6.14, below). This enabled me to focus my attention on my right-foot movements: a necessary restriction, as the independence required to perform these motions whilst playing the marimba simultaneously was beyond my embodied use of pedal to aid phrasing. Blue arrowheads were used to indicate the basic phrasing ‘units’ (each unit consisting of a single down and up motion of the pedal).

![Two Part Invention Nr. 8 in F Major](image)

Figure 6.14: Pedalling 'units'.
Figure 6.14 clarifies the use of four distinct pedalling units:

- A quaver unit, consisting of a depression and release on consecutive semiquavers (Pattern A).
- A crotchet unit, consisting of a depression and release on consecutive semiquavers and a subsequent quaver of inactivity (Pattern B).
- A crotchet unit, consisting of a depression and release on consecutive quavers (Pattern C).
- A minim unit, displayed in the final bar of the notation above, and consisting of a depression on a crotchet downbeat and release on the subsequent crotchet rest.

Small variations were also notated, with Patterns D and E utilising the same unit as that of pattern A within a rhythmically unique one-bar rhythmic phrase, and Pattern F repeating the unit of Pattern C in three consecutive beats.

6.1.4 A Table of Considerations and Possible Solutions

Following the examination of Steiger, Pye and Bach (and previous study of the Rosauro\(^{176}\) work), a number of considerations and solutions, unique to the double-keyboard idiom, were noted. Solutions for Steiger’s work often differed from the others, due to the unique setup employed. Whilst some of the considerations in this table may also pertain to the study of a single mallet instrument, they have been included due to their unique solution (or reason for the solution).

\(^{176}\) Rosauro, “Sonata, the Periods of Life.”
Table 6.1: Considerations (and solutions) for performers.

1 Setup

- Pye, Bach, Rosauro
  - Reducing the angle between instruments to 52 degrees (see Figure 6.9) reduced distances between high vibraphone pitches and low marimba pitches but Rosauro’s 80-degree angle was the best overall solution.

- Steiger
  - When using a stacked setup, pulling the vibraphone towards the player to create a gap between the high pitches of the vibraphone and marimba allowed room to bow accidentals. It also created parallel centrelines between the instruments, aligning identical pitches along straight lines (see Figure 6.3).

2 Music (iPad) position

- Bach, Rosauro
  - Inside the apex (or point of the V) – good for dual peripheral vision

- Pye
  - Close to area of maximum activity (left-of-centre of marimba)

- Steiger (stacked)
  - In front of marimba (to left or right, depending on range being used). Distributing music in non-sequential page order is sometimes useful.

3 Bowing and mallet dexterity

a) Rapid switching between instruments required?

- Bach, Rosauro
  - No: vibraphone played by right hand; marimba played by left hand

- Pye
  - Infrequently, when the alternation of mallets in each hand cannot be employed

- Steiger
  - Yes
b) Simultaneous playing of both instruments with the mallets of one hand?
   • Pye
     o Yes
   • Steiger, Bach, Rosauro
     o No

4 Frequent application of ‘one-handed linear, alternation’ technique?
   • Pye
     o I – Occasional: left-handed application of technique occasionally for low marimba opening, to avoid rapid leap to single vibe notes. Otherwise, usual sticking considerations (singles and occasional doubles) for extended marimba-only passages.
     o II – No: left hand holds bass bow, right hand plays scales with one mallet or dyads.
     o III – Yes: right-hand application of technique for chromatic vibraphone scales between left-hand marimba pitches.
   • Bach
     o Yes: right hand remains above vibraphone, left hand above marimba.
   • Steiger, Rosauro
     o No

5 Angle of wrist
   • Pye, Bach, Rosauro
     o Variable: ‘closed-V’ results in more outward bending when playing mid-range passages on both instruments
   • Steiger
     o N/A (the same limitations as single-instrument performance)

6 Body angle
   • Bach, Rosauro, Pye III
     o Facing apex of V (playing both instruments with one-handed linear, alternation technique): less bending of wrists, and improved peripheral vision
   • Pye
     o I – mostly facing marimba (area of most activity)
     o II – mostly facing apex, rotate left when playing marimba pitches with bass bow (left hand) or mallets (right hand)
     o III – mostly facing apex, leaning right and rotating left when playing chromatic scales on the vibraphone with mallets of the right hand.
   • Steiger
     o N/A (facing forward as for single instrument performance)
7 Bowing

Bow downwards, to avoid lifting keys. If keys are tied down, upward bowing may be employed to save transition time between two bowed notes.

- V-formation:
  - some naturals (B₄, C₅, D₅) on marimba inaccessible

- Stacked:
  - pulling vibe towards player allows access to (vibraphone) accidentals in upper octave.
  - Mid-range marimba naturals and low-range vibraphone accidentals inaccessible

8 Instrument height (to the top of the ‘natural’ bars)

87cm for the marimba and 83cm for the vibraphone.

9 Mallet choice (timbres/compromise to allow for two instruments)

- Pye
  - I – four very soft mallets. Malletech LHS10, although not intended for vibraphone, work well – the use of four identical mallets ensures homogeneity of the tones during the marimba double-stops in bar 98, and inarticulate vibraphone tones are appropriate.

![Figure 6.16: Pye, bars 96 to 98, requiring four matching mallets to execute rapid and balanced double-stops.](image)

  - II – right hand holds two medium-hard vibraphone mallets, left hand holds bass bow or two very soft mallets for the subsequent soft rolls
  - III – right hand holds two medium-hard vibraphone mallets, left hand medium and medium-hard marimba mallets. In this way, mallets 2 and 3 may be identical for hand-to-hand passages

- Bach, Rosauro
  - left hand (marimba only) medium-hard mallets, right hand (vibraphone only) hard vibraphone mallets

- Steiger:
  - medium-hard vibraphone/marimba mallets

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177 I use Innovative Percussion AA30.
179 Marimba One, LVB1
180 LVB Vibe
181 Malletech, DS16
### 10 Position of extra instruments
- **Pye**
  - Trap table inside the V
- **Steiger, Bach, Rosauro**
  - Not required

### 11 Unique techniques or challenges
- **Pye**
  - The mallets of the right hand play two instruments simultaneously (while left hand plays with fingers)
  - bowed low-range marimba with struck vibes – angle of wrist in right hand

### 12 Memorisation
- **Pye**
  - advantageous in sections I and II (indirect sightline to the music stand)
- **Bach, Rosauro**
  - helpful (continuous simultaneous activity on both instruments)
- **Steiger**
  - no, due to stacked setup (direct sightline across instruments to music stand)

### 13 Audio/headphone options
- **Pye**
  - left channel headphone click, right channel speaker
- **Steiger, Bach, Rosauro**
  - Not required

### 14 Bass bow(s)
- on mallet trap table
6.2 Further Commissions and Compositions (2020-21), Cataloguing PODs

The earlier investigations allowed me to determine my preferred position for instruments, music and mallets (considerations 1, 2, 8, 10 and 14). Issues of mallet and bow technique (3, 4 and 7) required a variety of approaches, depending on the composer’s use of the instruments. Wrist and body angles were examined (5 and 6), revealing some restrictions of movement imposed by playing two instruments almost at right-angles to each other, and will be discussed in greater detail in Chapter 7. Although largely subjective, restrictions on the choice of mallets were apparent (consideration 9), due to the timbral differences of the two instruments. Some pieces contained unique challenges (11) and more were anticipated in future commissions.

6.2.1 Symmetries 1 to 3 (Paul Tanner, 2020)

Further examination of considerations – and testing of my preferred positions – was made possible by composing three pieces, Symmetries 1 to 3, in Rosauro’s V-formation. Two considerations from Table 6.1 were tested as permanent solutions: ‘setup’, as I had adopted Rosauro’s V-formation as my permanent setup; and ‘instrument height’, which was set from the floor to the top of the ‘natural’ bars at 87cm for the marimba and 83cm for the vibraphone.

Further considerations were expected to share solutions from Table 6.1, due to alternatives having been explored and discounted during the development of Pye’s composition, or examined in the works by Steiger, Smalley, Bach and Rosauro. ‘Music position’ was expected to be at the apex (inside the point of the V) in most instances; ‘ideal body angle’ was likewise expected to be facing the apex or occasionally towards the area of maximum activity; ‘bowing’ would be downwards on most occasions to avoid lifting the keys; ‘memorisation’ would be advantageous; ‘audio/headphone options’ were discounted in my compositions; and ‘bass bows’ would be placed on the trap tables.

‘Bowing and mallet dexterity’ continued to present significant challenges. Where possible, uncomfortable ‘rapid switching between instruments’ was mitigated using one-handed linear alternation technique, allowing the right hand to be positioned above the vibraphone, and the left hand above the marimba. In examples such as Figure 6.17, in which the arpeggiated (and therefore, less recognisably linear) marimba figures hinder the accuracy of this technique, a combination of one-handed alternation and hand-to-hand strokes was employed.
‘Rapid switching’ in Figure 6.18 was avoided with the ‘application of one-handed linear, alternation’ technique, or by the use of repetition strokes.

The remaining considerations from Table 6.1 required further examination and are summarised below. The numeral before each consideration refers to its position in Table 6.1.

5 Angle of wrist

*Symmetries 1* is a physically straightforward piece, as the symmetrical pitch-construction of the piece ensures a central standing position at all times. This comfortable stance may be disrupted by ‘inner’ or ‘outer’ orientation of the wrists. When the wrists bend outwards, or away from the centre, I use the term ‘outer’ orientation: necessary when an inner mallet (mallet 2 or 3) plays an accidental while the outer mallet (1 or 4) plays a natural. This may cause a severe wrist-angle, and uncomfortable
examples of left-hand outer orientation were alleviated by leaning to the right (see Figure 6.19). An inner orientation exhibits the opposite characteristics. Consideration of wrist-orientation is discussed further in Chapter 7.

![Figure 6.19: ‘Outer orientation’ describes the rotation of the wrist in relation to the performer’s centre. Playing G4 and Bb4 on both instruments causes a severe outward angle for the left wrist. The image on the right shows the less severe angle achieved by moving the shoulders (marked with a red line) forward and to the right.]

9 Mallet choice
When ‘rapid switching between instruments’ is required, mallets must be appropriate for both instruments. If no switching is required, as intended in Symmetries 1, a performer may hold mallets intended only for the vibraphone in their right hand, and marimba mallets in their left hand.

- Symmetries 1:
  - Two medium-hard marimba mallets (left hand – marimba only), two hard vibraphone mallets (right hand – vibraphone only)
- Symmetries 2:
  - One medium (marimba low notes), two medium-hard (mallets 2 and 3), one hard (high pitches)
- Symmetries 3:
  - One medium-hard, two hard (mallets 2 and 3), one plastic (Malletech ‘Becker Blue’ for glockenspiel and bells), one bass bow (bars 98 to 101)

10 Position of extra instruments
- Symmetries 3:
  - Glockenspiel in front of marimba, approximately midway along its length; kick-drum beneath marimba; high F♯7 bell mounted at the high end of the marimba; high C7 bell mounted at the high end of the vibraphone.

11 Unique techniques/difficulties involved
- Symmetries 1:
  - Extremes of range – lowest and highest notes on the marimba struck simultaneously
Symmetries 2:

- Differentiated dynamics between instruments (Figure 6.21).

Searching = 48-56

- Playing marimba with the right hand (more articulate) mallets and vibraphone with a left-hand mallet, to ensure highest marimba pitches speak clearly (Figure 6.22).
I met with Kathy Potter and Lindsay Vickery at my studio on February 26, 2020, to demonstrate techniques from the original composers’ guide. One such technique involved laying a light chain across the vibraphone keys to create a buzzing timbre. This had been requested by Pye in the original version of his work, but was ultimately abandoned, to avoid the distraction (and possible noise) of chain-removal during a quiet passage. Potter expressed interest in the technique, and included it in her piece, with the chain-removal becoming an audible and gestural feature of her work.

Vickery and Potter were encouraged to use the composers’ guide as a starting point for content generation, although I decided not to assign a particular category or theme to a particular composer. I was confident that a variety of techniques would be explored, without the need to dictate what those techniques should be.

Potter’s first draft arrived on the night of the 10th of May.

**Practice and Observations/Reflections on Technical and Notational Problems.**

Potter’s piece presented many notational and technical challenges, leading me to experiment with options to ascertain the most efficient means by which to mitigate these. To guide me in this process, I followed the *See, Think, Wonder* reflective thinking routine developed by the Harvard Graduate School of Education’s ‘Project Zero’. Originally conceived as an aid to students’ understanding of ‘works of art and other interesting things’, I adapted this simple three-step approach to create the ‘P.O.D.’ (Problems, Options, Decisions) system for discovering solutions to the notational and performance challenges of new musical works.

Working through this piece, I often found multiple notational and technical ‘problems’ within a single bar, and created journal entries for each ‘problem’, its ‘options’ and ultimate ‘decision’. Decisions were justified with explanations of the reasons for rejecting an option and the benefits of the successful option. Journalling these decisions had begun from the first practice session and were readily adapted to the reflective POD process. The first journalling sessions for *Just Maybe* produced a substantial body of reflective notes, describing each POD in detail.

**Problem 1** (Technical #1)
In the opening bars of the original draft, a mallet in the right hand plays an E between the mallets of the left hand.

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182 https://pz.harvard.edu/sites/default/files/See%20Think%20Wonder_2.pdf
As these pitches are all in the ‘natural’ row (corresponding to the white notes of a piano), contact between the mallets is a possibility (Figure 6.24).

**Options**

a) practise with the mallet of the right hand striking the marimba bar at the end closest to the player, a standard technique amongst marimba players (Figure 6.25a).

b) practise with the mallet of the right hand striking the marimba bar off-centre towards the end of the bar farthest from the player. By holding the shaft parallel to the central support beams of the marimba (Figure 6.25b) there is no possibility of mallet collisions.

c) Transpose up a tone (right-hand mallet will be out of the way, striking an F-sharp while the left-hand mallets strike naturals).
Decision

Whilst the second option was comfortable, the parallel alignment of the right-hand mallet could not be maintained in subsequent dyads, and the first option was chosen. This option subsequently became unnecessary when Kathy agreed to transpose the score up a tone (the third and final option), as the right-hand mallet was now positioned above the row of ‘accidentals’ removing the chance of mallet collisions (see Figure 6.26).

Problem 2 (Notational #1)

The opening bars also presented independence challenges, with a three-semiquaver right-hand rhythmic ostinato superimposed on a ten-semiquaver pattern in the left hand, creating a rhythmic cycle of three bars (see figure below).

![Figure 6.26: Potter, bars 1 to 4 (transposed draft). Arrows indicate the beginning of each three-semiquaver ostinato (a quaver + semiquaver rhythm, with quaver durations written as tied semiquavers when necessary). After ten iterations of the right-hand ostinato, and three iterations of the one-bar (ten semiquaver) left-hand rhythmic ostinato, the beginnings of both rhythmic ostinatos coincide (orange arrows).](image)

Whilst entrainment of the three-bar polymetric cycle above was achieved with practice, my resolution throughout this project has been to build kinesthetic skill, thereby improving my sight-reading accuracy within this idiom, and avoiding the necessity for memorisation. Reading both staves was possible, but I sought to focus on one staff.

Options

- a) Focus on the notation of the right hand and entrain the left-hand semiquaver pattern.
- b) Focus on the notation of the left hand and entrain the right-hand ostinato.

Decision

Ultimately, both options contributed to my decision: whilst the entrainment of the second option was an enjoyable process and required the conceptualisation of both parts within the $\frac{10}{16}$ rhythmic framework, the right-hand notation proved to be more useful as my visual focus. Beaming and bar lengths within the right-hand notation indicated the left-hand rhythmic groupings, and quick glances

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183 Table 4.1 in chapter 4 uses the term ‘poly-’ to categorise three compositional ideas: polymetre, polymetre and ‘poly-phrase length’. This example of polymetre features a (non-notated) $\frac{3}{16}$ metre in the right hand, beamed to conform to the notational groupings of the left hand’s $\frac{10}{16}$ metre.
to the lower staff were enough to read the harmonic changes. Adding simple harmonic symbols to the
right-hand staff simplified reading further, by providing left-hand pitch information and removing the
need to glance at the lower staff. The introduction of three-bar melodic phrases in bar 17 (marked in
Figure 6.27) reinforced the decision to focus on the right-hand notation, as the three-bar melodic
phrases were less predictable than the two-bar harmonic shifts in the left hand.

\[\text{e mi} \quad \text{C maj7} \quad \text{e mi}\]

Figure 6.27: Potter, bars 17 to 22. Melodic phrases (marked with blue arcs) repeat rhythmically every three bars.

**Problem 3** (Technical #2)

From bar 17, the lower naturals in the right-hand dyads increased the chance of mallet-shaft contact
with the left-hand mallets, due to the overlapping pitch-range between hands.

\[\text{e mi} \quad \text{C maj7} \quad \text{e mi}\]

Figure 6.28: Potter, bars 17 to 24. The lower pitches of the circled dyads fall between the two pitches of the left hand.

**Options**

Whilst the dyad in bar 17 presented little difficulty, bars 18, 21 and 24 forced me to make decisions
about placement of left and right-hand mallets, beginning with the following options:

a) At or near the centre of the bar.

b) At the near-end\(^{184}\) of the bars.

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\(^{184}\) ‘Near-end’ refers to the end of the bar closest to the performer.
Decisions

As the left hand plays a continuous pattern of rotation strokes, the ease of playing at or near the centre was chosen. Right-hand mallet placement could be decided for each dyad once this decision had been made. In the following photos, a yellow line marks the central beating spot on the marimba bars, and mallets are numbered left-to-right, 1 to 4. As mallets 3 and 4 were required to move rapidly from an F#-D dyad to a G-D dyad (Figure 6.29a) in bar 17, travelling to the near-end of the bars was excluded. This presented no problem, as mallets 3, 2 and 4 descend at the same time, and placing the mallets of each hand slightly off-centre, on either side of the central beating spot, results in little possibility of contact between mallet-shafts.

Figure 6.29a: Potter, bar 17 (see Figure 6.28). Right-hand mallets play G and D.

Figure 6.29b: Bar 21 (see Figure 6.28) is more problematic, as right-hand mallets play A and D.

In bar 21 (Figure 6.29b), although appearing similar, the right-hand A-D dyad reveals a more problematic mallet arrangement. The proximity of mallet 3 to mallet 2 increased the likelihood of contact between mallet-shafts substantially and was exacerbated by mallet rotations: whereas mallet 2 descends with mallets 3 and 4 in Figure 6.29a, it is ascending in Figure 6.29b in preparation for the next stroke, increasing the likelihood of contact. In this instance, playing at the near-end of the bars with the right-hand mallets (option b) was possible, as the duration of the preceding right-hand dyad was five semiquavers, rather than the single quaver duration in bar 17.

Figure 6.30: Potter, bar 21. Option b), in which mallets 3 and 4 strike the near-end of the marimba bars.

The remaining D-C dyad (see Figure 6.28) played by the right-hand mallets in bar 18 was also highly susceptible to contact. In Figure 6.31a, mallets 3 and 4 descend with mallet 1, while mallet 2 ascends. Although moving in the same direction, the head of mallet 1 interfered with the shaft of mallet 3,
which was positioned directly above, making this solution unreliable. Whilst playing at the near-end of the bars was a possibility, the unique permutation of mallets, with mallets 3 and 4 (in the right hand) on the outside of mallets 1 and 2 (in the left hand) required a significant amount of manoeuvring time. Moving all four mallets to the same side of the central beating spot allowed a more-rapid manoeuvre, creating room for the descent of mallet 3.

![Figure 6.31a: Potter, bar 18. Retaining the slightly off-centre positioning of mallets from bar 17 (Figure 6.29a) increased the chance of contact between mallets 3 and 1.](image1)

**Figure 6.31a: Potter, bar 18. Retaining the slightly off-centre positioning of mallets from bar 17 (Figure 6.29a) increased the chance of contact between mallets 3 and 1.**

![Figure 6.31b: All mallet-heads on the same side of the central line reduced the chance of contact.](image2)

**Figure 6.31b: All mallet-heads on the same side of the central line reduced the chance of contact.**

**Problem 4 (Notational #2)**

In bar 34, the left-hand groupings resemble a $\frac{3}{4}$ metre, with semiquavers beamed into three groups of four while the right-hand beams continued to indicate $\frac{12}{16}$ (four groups of three).

\[
4 \times 3 \text{ semiquavers} = \frac{12}{16}
\]

\[
3 \times 4 \text{ semiquavers} = \frac{3}{4}
\]

![Figure 6.32: Potter, bars 33 to 35. Original notation.](image3)

**Figure 6.32: Potter, bars 33 to 35. Original notation.**

**Options**

a) Think of both parts in $\frac{3}{4}$ (as per the left-hand notation in bars 34 and 35).

b) Think of both parts in $\frac{12}{16}$ (as per the right-hand notation).

c) Think of the whole bar as being in $\frac{12}{16}$, but renotate with cross-staff beaming, to create one ‘resultant’ rhythm with no duplets. In this instance, the accents in the left hand will aurally create a $\frac{3}{4}$ metre, despite the player not being required to conceptualise this (Figure 6.33).
Figure 6.33: Potter, bars 33 to 34. Beaming across staves creates a single conglomerate or ‘resultant’ rhythm between the parts, removing the need to conceptualise independent metres and duplets. The renotated B-flat to A duplet is circled.

Decision

Although the second and third options were more consistent with the composer’s concept of a right-hand \( \frac{12}{16} \) ostinato with occasional duplets, I ultimately renotated the passage to conceptualise the passage in \( \frac{3}{4} \) (option a).

Figure 6.34: Potter, bars 33 to 35. Renotated with \( \frac{3}{4} \) beaming.

I found this notation to be simpler to read than the independent metric notation of the original (Figure 6.32). Although the ‘resultant’ rhythm created between the two (see Figure 6.35) was not as visually obvious as the cross-staff beaming of Figure 6.33, the less-cluttered appearance and clearer illustration of the independent ‘long-short’ right-hand ostinato, maintained some of the clarity of the composer’s polymetric conception.

Figure 6.35: Potter, bars 33 to 35. Resultant rhythm between both hands. Although pitch is not included in this example, the indication of higher and lower notes in each hand is preserved (left hand is indicated by the lower pair of notes).

The decision to prioritise the \( \frac{3}{4} \) metre over the \( \frac{12}{16} \) notational groupings followed the same logic as the decision for Problem 2: focusing on the longer, four-semiquaver left-hand rhythmic groupings and entraining the right-hand three-semiquaver ostinato rhythm, was a helpful method by which to conceptualise this passage. In addition, I would propose that ‘simple’ beats are more common (and therefore more entrained for most performers) in Western Art Music, than ‘compound’ beats. The completely isochronous nature of the regular semiquavers in the left hand also provide a more stable foundation than the ‘long-short’ right-hand ostinato with duplet interjections.
The use of dotted semiquavers in the new notation, rather than duplets (which no longer started at the beginning of a compound rhythmic grouping), enabled a more obvious visual recognition of the resultant rhythm, despite the lack of cross-staff beaming.

**Problem 5 (Notational #3)**

From bar 39, the duplets in the ostinato, now played by the left hand, were played simultaneously with syncopated compound rhythms in the right hand.

![Original notation with duplets](image1.png)

**Figure 6.36: Potter, bars 39 to 42. Original notation with duplets.**

**Options**

a) Renotate with ‘resultant’ rhythms.

b) Be aware of the ‘resultant’ rhythm between hands, without renotating.

**Decision**

On reflection, I decided not to renotate, on the assumption that practising the passage would solve the challenge quickly. Although successful, I renotated the passage later, clarifying both the rhythmic relationship between the treble and bass clefs, and an aural sensation of changing metres, created by the alternation of five and three dotted-quaver phrases ending in duplets. The latter was made visually obvious using alternating time signatures.

![Visualisation](image2.png)

**Figure 6.37: Potter, bars 39 to 42. The aural structure of the rhythmic ostinato in the left hand is made visually obvious by alternating time signatures.**

Rather than calculating the duplet relationship to the compound syncopations, the dotted semiquavers employed in Figure 6.37 utilise standard subdivisions within the prevailing metre and make the resultant rhythm obvious. The decision from Problem 2 (Notational #1) was re-employed, as
I resolved to focus my reading attention on the longer phrases of the right-hand part, rather than the two-bar repeating phrase of the left hand.

**Problem 6 (Technical #3)**
From bar 39 (Figure 6.37), bowing pitches on both the accidental and natural rows of the vibraphone required rapid repositioning and rotation of the bow in the performer’s hand.

**Options**

a) Grasp a conventional bow in the middle of its length, bowing downwards from the tip on the naturals, and downwards from the frog on the accidentals.

b) Construct a double-sided bow, removing the need to flip ends.

c) Construct a mallet-bow and play accidentals with the mallet end.

**Decision**
Kathy was happy for me to adopt option c, which was the most convenient solution. In 2021 though, I created a double-sided bow (option b – see Figure 6.38), which enables me to shift between the two rows of vibraphone bars without the need to rotate the bow within my hand or commence the bow-stroke from alternating ends of the bow (option a).

![Figure 6.38: a leather belt was used to create a double-sided bow, removing the need for bow-rotation and wrist-twisting.](image)

**Problem 7 (Notational #4)**
In bars 54 and 55, right-hand duplets that did not align with the dotted-quaver beat presented reading difficulties.

![Figure 6.39: In bars 53 to 55, the duplets do not always align with a beat (for the resultant rhythm, see Figure 6.40).](image)
Options

a) rewrite in $\frac{3}{4}$.

b) rewrite with resultant rhythm, still in $\frac{12}{16}$.

Decision

In Problem 4, the clarification of ‘resultant rhythms’ with cross-staff beaming (see Figure 6.33) was ultimately discarded in favour of a less-cluttered notation. A clarification of the rhythmic relationship between hands was instead achieved (Figure 6.34) by maintaining a single metric structure ($\frac{3}{4}$) and renotating the duplets. Believing that resultant rhythms aid reading in polymetric and polyrhythmic passages, I adopted the cross-staff beaming approach of Figure 6.33 again. On this occasion, retaining a compound time signature preserved the well-established ostinato rhythm in the left-hand, and I continued with the alternating $\frac{15}{16}$ and $\frac{9}{16}$ bars.

Figure 6.40: Bars 53 to 55, renotated with resultant rhythms.

Problem 8 (Technical #4)

In bar 56 a hocket melody alternated between marimba and vibraphone pitches in octaves.

Figure 6.41: Bars 56 to 59. Three lines, with marimba and vibraphone lines being played by the mallets of the right hand.

Options

a) Play both marimba lines with left-hand mallets.

b) Play both treble staves with right-hand mallets, spread across two instruments.
Decision
The first option proved unplayable, due to unreachable intervals, and was no easier to read. As with the similar passage in euler’s identity (Figure 6.6) I considered this to be a compositional problem that I would only overcome with prolonged practice (using option b), which has indeed been the case.

Problem 9 (Notational #5)
The passage above (Figure 6.41) was notated across three staves, with the vibraphone appearing to be higher than the marimba. The grouping of semiquavers between the two right-hand mallets, superimposed on compound time in the left hand, was visually confusing due to the unconnected stems and vertical distance between the lines.

Options
a) Attempt to renotate on two staves.
b) Practise until comfortable.

Decision
a) Renotating both marimba lines onto one staff, with an octave transposition, alleviated the confusion of the marimba line being one octave higher than the vibraphone whilst appearing visually lower on the page. The rhythmic relationship between the right-hand semiquaver pairs and the compound beat was clarified with cross-staff beaming.

Problem 10 (Technical #4)
Accuracy was another challenge of this passage, and I experimented with striking positions.

Options
a) Near the centre of bars.
b) On the near-end of the marimba bars, and the far-end of the vibraphone bars.
Decision

Both options pushed my kinæsthetic skill to the limits (and continue to do so) and maintaining visual contact with both mallets through peripheral vision aided accuracy. The second option was more successful, due to the reduced distance between mallet heads.

Problem 11 (Notational #6, Technical #6)

From bar 67, the performer was asked to execute a one-handed roll with the left hand, while the right hand bowed vibraphone notes.

Options

a) Practise and strengthen one-handed roll with left wrist ‘outer orientation’.  
b) Take time accelerating into roll, diminuendo quickly.

Decision

Potter had included the instruction ‘tremolo slow to fast’, but I had failed to notice the small font. The second option, therefore, was what she had intended. Figure 6.44 uses feathered beams to remove the need for explanatory text.

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185 See Figure 6.19a for illustration of ‘outer orientation’.
Problem 12 (Technical #7)

Bar 79 (Figure 6.45) involved rapid switching between the two instruments and required experimentation with sticking alternatives.

![Figure 6.45: Potter, bars 79 to 80. Rapid switching between instruments.](image)

Options

a) Alternate mallets (right-left-right-left).

b) Employ one-handed alternation of mallets (mallets 343-212-343-212).\textsuperscript{186}

Decision

Having undertaken extensive practice of the one-handed linear technique to perform Bach’s eighth Two-Part Invention, a reliable stability and accuracy in the performance of this passage was achieved. As the C#₅ and A#₄ are close to each other and are both in the ‘accidental’ row, doubling of these pitches is also possible (mallets 443-212-344-212).

Problem 13 (Notational #7)

From bar 85, Problem 2 (see Figure 6.26) reappeared in an inverted iteration of the opening material. Thus, the left-hand part required 3 bars in \( \frac{10}{16} \) before the three-semiquaver ostinato rhythm coincided with the downbeat. The options, when considering which part to focus on, were logically reversed.

![Figure 6.46: From bar 85, the right and left-hand metres of Figure 6.26 are inverted.](image)

\textsuperscript{186} Mallets are numbered from 1 to 4, left to right.
Options
   a) Focus primarily on the notation of the right hand and entrain the left-hand ostinato.
   b) Focus primarily on the notation of the left hand.

Decision
As expected, the solution for Problem 2 was inverted here: the beaming and bar lengths in the left-hand notation provided a helpful indication of the right-hand rhythmic groupings, so the second option was implemented.

Problem 14 (Technical #8)
The new marimba dyad (C/Eb) in bar 111 required a significant twisting of the torso and wrist.

![Figure 6.47: Potter, bars 111 to 113. Uncomfortable twist and ‘outer orientation’ wrist-angle required in the left-hand part.](image)

Options
   a) ‘Normal’ left-hand sticking: C₃ is played with mallet 1, Eb₃ is played with mallet 2.
   b) Reverse the mallets, with a sideways stance to the marimba.

Decision
If the performer’s body faces towards the high end of the marimba, the second option is more comfortable, and reduces the strain involved in playing the dyad with an uncomfortable wrist-angle.
Lindsay Vickery has a fascination for experimentation with notational systems, and is a founding member of Decibel, a new music group specialising in the use of scrolling scores for iPad. This method of presentation presents many difficulties, including unfamiliarity with the notational system. Vickery has himself suggested ‘The time critical issues of presenting notation on the screen considered above, point to the necessity for developing notation that is as efficient as possible…‘.\textsuperscript{187} By working collaboratively, we were able to discuss alternatives to the original draft of the scrolling score and I was able to clarify notational ambiguities. In our meetings, Vickery was able to choose and clarify preferred mallets, articulations, speeds, and phrasing approaches.

**Problem 1** (Notational #1)

Vickery opted for large staves and noteheads to aid reading at a distance. The size of the three staves however, resulted in a very large field of vision required to read from top (vibraphone) to bottom (marimba bass clef).

![Notational example](image)

Figure 6.48: Vickery – *the tears of things*, opening section.

**Options**

a) Reduce the distance between staves.

b) Use fewer staves.

\textsuperscript{187} ICSCM p178 Lindsay Vickery, "Exploring a visual/sonic representational continuum" (40th International Computer Music Conference, Athens, Greece, 2014).
Decision
Vickery reduced the distance between staves (while maintaining the size of the noteheads).

Further revision:
The opening marimba passage was taken down one octave and played with soft mallets to enhance the ‘murmuring’ effect.

Problem 2 (Notational #2)
Square noteheads, although visually appealing, made it difficult to distinguish pitches.

Figure 6.49: Vickery – the tears of things, revised opening section.

Figure 6.50: The B-natural in the first Ab-B-C marimba triads (the lower staff, in treble clef) is hard to distinguish, due to the continuous nature of the black rectangle. Traditional oval heads visually separate the pitches more successfully.
Option

a) Use oval noteheads, reserving square noteheads for certain techniques if desired.

Decision

Oval noteheads were employed and separated to give an indication of how they should be played (in this instance, not simultaneously). Vickery also placed the A-flat (now a G-sharp) in the vibraphone part, reducing the need for rapid switching between the instruments (left-hand mallets remain above the bars of the marimba, right-hand mallets above the vibraphone). Transposing the three pitches down one octave clarified the independence of the upper pitch and rhythm in the vibraphone part.

![Figure 6.51: Vickery – the tears of things. Oval noteheads and separation of pitches clarified the notation; moving the G-sharp to the vibraphone reduced body-movements; and dropping the triad one octave, aurally separated the lower triads from the higher vibraphone pitches.](image)

Problem 3 (Notational #3)

Rapid repetitions of pitches were notated with multiple, close vertical lines in Figure 6.50, which did not indicate if dyads and triads should be played with rapidly alternating pitches (a roll), or with all pitches played simultaneously.

Options

a) Notate pitches in the order desired.

b) Notate dyads and triads with slashes through the stem (traditional roll notation, leaving the order of notes within the triad to the performer).

Decision

Vickery separated the dyads and triads to show the order in which pitches should be played (see Figure 6.51, above).
Problem 4 (Technical #1)

The hard mallet used to bend pitches in the highest register dampened the pitches too quickly, reducing the effect.

Figure 6.52: Bent notes approximately 41 and 51 seconds into the piece.

Options

a) Transpose bent notes down one octave.

b) Delete the ‘bend’ instructions.

Decision

b) Vickery deleted the bent notes.

Figure 6.53: Bent notes were deleted.
**Problem 5** (Technical #2)

At 102 seconds (1.42), a simultaneous D on marimba and vibraphone at the end of a fast sequence of pitches was difficult to execute without a slight hesitation caused by leaping to the vibraphone.

![Figure 6.54: Simultaneous D₅’s (circled) at 1.42](image)

**Options**

a) Slow down the sequence of pitches.

b) Allow a gap before the final unison.

**Decision**

Vickery agreed that a small gap before the D’s would be an acceptable solution.
**Problem 6** (Notational #4/Technical #3)
The duration and overlapping of bowed notes at 14.7, 15.1, and 21.1 were not achievable with one bow.

![Overlapping bowed notes](image)

**Options**
- a) Allow for random bow lengths.
- b) Notate shorter, separated, pitches.
- c) Hold bows in both hands.

**Decision**
Vickery allowed a shorter bow-stroke on each pitch (pitches sustain due to the depressed pedal).

![Overlapping bowing removed](image)
Problem 7 (Notational #5)

At 23.8, the vertical strokes did not indicate the order of pitches.

Options

a) Notate pitches in order.
b) Allow the performer to choose (with standard roll notation).

Decision

Vickery notated the order of pitches.
Problem 8 (Technical #4)

Uncomfortably rapid shifts between the marimba triads and single vibraphone caused inaccuracy.

![Figure 6.59: Rapid shifts between instruments were caused by the allocation of three pitches to the marimba part and one to the vibraphone. The circled section is shown in the revised version at the end of Figure 6.60 (below).](image)

Options

a) Allow more time between the marimba triads and vibraphone pitches.
b) Reorganise assignment of pitches on the instruments.

Decision

By assigning the middle pitch of each triad to the vibraphone (option b), the awkward leap was avoided.

Further revision:

The rapid notes were transposed down one octave.

![Figure 6.60: Rapid repeated pitches (D/G#/A and C/G#/D) dropped one octave, with two pitches assigned to the marimba and one to the vibraphone, allowing one hand to remain above each instrument, thereby avoiding rapid shifts. The vertical pitches in the triads were separated to indicate pitch-order.](image)
**Problem 9 (Notational # 6)**

I clarified the number of repetitions of a five-note descending scale by adding ‘x7’, ‘x5’, ‘x3’ and ‘x2’ annotations. Although I hadn’t added this to my list of problems, Lindsay had arrived at the same decision, and suggested adding the number of repetitions to the score.

![Figure 6.61: Vickery added ‘x7', ‘x5', ‘x3' and ‘x2' to clarify the number of repeats of a rapid descending figure.](image)

**Further revision:**

Lindsay removed the final D-C-B-A-G# vibraphone scale and subsequent Ab-B-C marimba triads between 3.51 and 3.55 (circled below), allowing more time to switch between instruments. The high C on the vibraphone at 3.51 and the G♯4 before 3.55 became ‘bounced’ notes, as seen in Figure 6.63.

![Figure 6.62: The final iteration of the descending vibraphone figure and Ab-B-C triads (circled above) were replaced with ‘bounced’ notes (see Figure 6.63 below).](image)
Problem 10 (Technical #5)
Bowing a marimba, due to the lack of sustain on marimba bars, is more challenging than bowing a vibraphone, and the overlapping notes could not be achieved with one bow.

Options
a) Reduce the duration of bowed notes.
b) Roll with mallets.

Decision
Lindsay created his own solution, combining the C and A in the vibraphone part with the A-flat and F of the marimba part. These are performed as a rapid alternation of notes played with the fingers.
Problem 11 (Technical #6)
Vickery called for long bowed notes on the vibraphone and marimba simultaneously, with an impractical reach to the far side of the marimba (G-sharp).

![Figure 6.65: Reaching across the marimba to bow G#4 (while the right hand bowed the vibraphone A4) required an uncomfortably large stretch.](image)

Options/Decision
Play both bowed notes on the vibraphone with comfortable (ad lib.) bow lengths.

Problem 12 (Technical #7)
The performer was asked to sustain a six-note chord on the vibraphone and subsequently dampen the six pitches individually (while striking identical pitches on the marimba). The final vibraphone pitches, however, decayed to inaudibility before the dampening indication was reached.

![Figure 6.66: The performer dampens each vibraphone pitch as they strike the unison marimba pitch on the middle staff.](image)
Options

a) Dampen more than one pitch at a time.
b) Dampen pitches more quickly.

Decision

b) Lindsay asked me to strike the pitches of the chord later, delay the commencement of the dampening indications, and dampen the pitches more rapidly, arriving at the final F as notated.

Problem 13 (Technical #8)

Rapid shifts between bowed vibraphone pitches and struck marimba pitches, and bowing with both hands whilst holding two bows and two mallets, proved impractical.

Figure 6.67: Striking the octave A’s at 7.07 whilst holding two bows, and a passage of overlapping bowed notes (with no time to put mallets down) proved impractical.

Options

a) One bow in the right hand, shorter durations and let ring.
b) Hold a bow and mallet in each hand.

Decision

Vickery allowed the use of shorter bow-strokes (option a).
The fourth of my own marimba-vibe compositions, *An Unfinished Rhyme*, was written in January of 2021, and has an optional vocal part for the performer. The première of this work was given by my Honours student, Gabrielle Lee. I chose a nursery rhyme for the text to complement the naiveté of her unaffected soprano voice, and enjoyed her performance so much that I have refrained from performing it myself. Although I have therefore not examined *An Unfinished Rhyme* in this chapter, performance considerations relevant to this work will be discussed briefly in Chapter 7.

My fifth composition, *Without Delay*, was written later in 2021 as a companion piece to *An Unfinished Rhyme*. In the performance preparation for *Without Delay*, setup (Rosauro’s V-formation), instrument heights, iPad position (in the apex), and ideal body angle (towards the apex) conformed to the emergent default position for each category. The degree of bowing and mallet dexterity, and rapid switching between instruments was similar to that in my other compositions and Rosauro’s work (the mallets of the right hand were usually positioned above the vibraphone, and the left-hand mallets mostly remained above the marimba). The most linear one-handed passage occurs in the small fugue at the end of the work, but the larger melodic intervals (mostly sixths) do not demand the advanced technique required of small-interval melodic lines.

![Figure 6.68: rotation between the mallets of the right hand is not difficult due to the larger intervals (mostly sixths). Sequences of seconds are played with repetition sticking (one mallet).](image)

For most of *Without Delay*, I employ a medium-soft and medium mallet in the left hand, and two hard (vibraphone) mallets in the right hand. In bars 186 to 211, I employ two very soft mallets in the left hand, whilst retaining the two hard mallets in the right hand.

Although *An Unfinished Rhyme* and *Without Delay* were composed to fill gaps suggested in the table of compositional codes (Table 4.1), preparing *Without Delay* for performance afforded an opportunity to examine body movements in greater detail.

**Problem 1**

Whilst the opening lines require little wrist-bend, due to sharps being played with the outer mallets (1 and 4) and naturals with the inner mallets (2 and 3) in a symmetrical arrangement (Figure 6.69), the descending A-natural to C-sharp in bar 18 (see Figure 6.70) requires an uncomfortable outer wrist-
orientation (the idea of problematic ‘outer orientation’ has been discussed in the *Symmetries I* discussion and illustrated in Figure 6.19).

Figure 6.69: *Without Delay*, bars 1 to 17 were composed with the comfort of a centrally positioned performer in mind.

![Figure 6.69](image)

Figure 6.70: The circled A-natural to C-sharp in the right hand requires a slightly uncomfortable outer wrist-orientation.

**Options**

a) Move shoulders back and in, by pinching them together, to angle arms outwards.

b) Move shoulders back by leaning from the waist (to allow more space).

c) Move shoulders back by stepping backwards.

d) Move shoulders back by bending the left knee towards the marimba.

![Figure 6.71](image)

Figure 6.71: The uncomfortable wrist-angle in the left image is reduced by moving the shoulders back, as seen in the image on the right.
Decision

Although I initially favoured option d, I ultimately decided to step backwards (option c), giving the necessary space and arm extension to reduce the wrist-angle of my right hand.

Problem 2

The transition from bar 33 to bar 34 requires a very fast leap to a large stretch between the low notes of the marimba and the dyads of the vibraphone (the low F-sharp is further than the low D, and the vibraphone dyads in the row of accidentals are similarly distant from the performer’s shoulders).

Figure 6.72: Bars 33 to 34 require the right hand to move quickly to vibraphone. The large leap from F#3 to D2 in the space of a quaver (circled) is also rapid.

Options

a) Step back to bring shoulders closer to playing zone and more parallel to the marimba.

b) Bend left knee towards marimba (for the same result).

Decision

Whilst trying to move the right hand rapidly from marimba to vibraphone and leap from F#3 to D2 on the marimba, the stepping movement created instability. Bending my knee (option b) allowed the movement of shoulders, whilst minimising destabilising motion.

Problem 3

As the mallets of the right hand move from the row of accidentals (bar 57) to the row of naturals (bar 59), the performer’s right wrist moves uncomfortably close to the body, causing uncomfortable outer wrist-orientation (Figure 6.74a).

Figure 6.73: Bars 57 to 63. Naturals on the vibraphone require a cramped right-hand position, as it moves close to the performer’s body.
Options

a) Step backwards with the left foot, away from the vibraphone.
b) Bend left knee away from the vibraphone.

Decision

Bending my knee (option b) was chosen. On this occasion, stepping backwards would not have significantly destabilised my stance, but a further step forward would have been required for the high marimba dyads in bar 62 (See Figure 6.73). By bending the knee, no steps were required.

Further examples of knee-bending rather than stepping occurred for similar reasons (stability, reducing wrist-angles, bringing the performer closer to a performance zone, and creating space), but have not been included in this section for reasons of space. In Chapter 7 (part 2 of this chapter), I examine knee-bending and other body-movements in greater detail. All knee-bends are illustrated in the annotated score of Without Delay, found in Appendix 3.

6.3 Conclusions

The investigations of this chapter revealed many performance challenges presented by this idiom. Setup was an early consideration, and the documented practice of works by Steiger and Pye led to the following conclusions:

- A stacked setup has a substantial advantage when performing repertoire utilising a marimba with a range of four-and-a-third octaves or less, due to the direct sightline from the performer to both keyboards and the music stand.
- Pulling the high end of the vibraphone away from the marimba in a stacked setup allows space for bowing high ‘accidentals’ on the vibraphone (see Figure 6.3). It also makes possible the alignment of the A₄ on each instrument in a continuous line, beneficial to accuracy.
- Repertoire that utilises a larger, five-octave marimba is most frequently performed in a V-formation or reverse V. This alleviates the possibility of back injury with a stacked setup, where the increased distance to the lowest notes of the marimba requires significant bending to reach across the vibraphone.

- In a V-formation, placing the vibraphone to the right of the performer is advantageous to a performer wishing to employ their entrained ‘keyboard logic’ when reading music (low notes on the left, high notes on the right).

- The ‘reverse V-formation’ (vibraphone to the performer’s left) has the advantage of obstructing less of the marimba’s range.

Following the further investigation of works by Bach, Rosauro, myself, Potter, and Vickery, Table 6.1 was created, listing considerations and their solutions within this idiom:

- Music (or iPad) placement is usually best at the ‘apex of the V’, due to its central position when playing both instruments. If playing an extended passage mostly in a reduced playing are (for example, the low octave of a marimba, with occasional pitches on the vibraphone), it may be better to set the music in front of the main playing area.

- A choice between two broad mallet approaches may be determined by the ‘mallet dexterity’ required between instruments. ‘Rapid switching between instruments’ requires the selection of mallets that can be used on either instrument. In contrast to this, if the vibraphone is only played by the mallets of the right hand and the marimba by the mallets of the left hand, the performer is free to choose specialised vibraphone mallets in the right hand and marimba mallets in the left hand. The use of ‘one handed linear, alternation’ technique may also enable this approach, by preventing an otherwise-necessary ‘rapid switching between instruments’.

- A performer of mallet instruments will usually face forward along a central line within the playing area. When playing both instruments simultaneously, this is usually towards the ‘apex of the V’. When playing a passage such as the opening of euler’s identity (in which most of the activity is in the low range of the marimba, with an occasional vibraphone pitch), the performer’s body will mostly face the marimba. When required, body leans and rotations are required. These are investigated further in the following chapter.

- Leaning to one side may reduce uncomfortable wrist-angles (‘outer’ and ‘inner orientation’) encountered in this idiom. These are investigated further in Chapter 7.

The two commissions of 2020 and 2021 afforded an opportunity to collaborate with non-percussionists writing in this idiom. Discussions around notation and technical possibilities provided a great deal of information for Appendix 1, A Guide to Composing for the Marimba-Vibe. Likewise,

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188 This position is revised slightly in Chapter 7, following a re-evaluation of body position (see Figure 7.12).
solutions to the many performance challenges posed by these works informed Appendix 2, *A Guide to Performing Works for the Marimba-Vibe*.

I developed the ‘POD’ system to document ‘Problems, Options, Decisions’ and this method provided a straightforward and methodical framework for future collaboration. By working through multiple ‘options’ for each performance ‘problem’ – over an extended period of time – I was able to make ‘decisions’ and arrive at informed solutions. The inclusion of these solutions in a performers’ guide allows for a simpler replication of results by future performers of these works.

The notational issues in Vickery’s work were often specific to his use of non-traditional notation within a scrolling score and a modified approach to noteheads and other pitch indications. Although these issues have been discussed in this chapter, I did not incorporate all of the collaborative solutions in the composers’ guide. The notational advice in the guide is therefore more instructive to composers wishing to write with traditional notation. Some solutions may apply to others working in non-traditional notation, such as the reduction of vertical distance across multiple staves, use of distinguishable noteheads, and the clarification of pitch-order and roll types within a sequence of rapidly-repeating dyads (see Figure 6.50). I hope to collaborate with Vickery in future projects, furthering the exploration of non-traditional notation for the marimba-vibe.

Many performance challenges were determined before the commencement of my final two compositions (*An Unfinished Rhyme* and *Without Delay*) and discoveries were incorporated into these. With the solution to many challenges having been standardised, the problems discussed in 6.2.4 (*Without Delay*) are limited to those of body movement, especially shoulder position.

In Chapter 7, the investigation of body movement is discussed more thoroughly, and it is this investigation that provides most of the information for annotating performance scores in this idiom.
CHAPTER 7: A Performer’s Perspective (Part II)

Data collected from the case studies of Chapter 6 and from the examination of further works by Rosauro, Anderson, Séjourné, and Waltersdorfer, was employed to determine a general list of considerations, with suggested positions and possibilities, to aid future replication of the results. By mapping body movements, creating symbols to represent these movements, and annotating scores, I sought to provide a reference tool for future performers of the marimba-vibe repertoire.

7.1 Reproducing Results: Body Movements; iPad and AirTurn Placement

Before examining specific positions and body movements, I determined a reproducible central, ‘forward-facing’ line-of-sight. To do this, I created an isosceles triangle by extending lines (ab and ac in Figure 7.1) along the centrelines of the instruments until they intersected (point a). While facing point a, I extended my arms and mallets to their furthest extent on either side of my body and found the point at which the mallet-heads of each hand intersected the lines (points b and c). Assuming my arms are of the same length, this allowed me to bisect angle a and determine the central line between the instruments (indicated by the orange arrow).

Figure 7.1: The final setup, with three body positions and a central line bisecting the 83-degree angle between the centrelines of the instruments. The yellow line illustrates Rosauro’s suggested method of positioning the vibraphone by aligning the edge of its keys with the marimba’s A4.
I noted three positions in which I could remain relatively stationary whilst playing the instruments simultaneously (see Figure 7.1). Examining the repertoire with my left foot in the three positions and my right foot on the vibraphone pedal, I determined optimal body positions for specific passages. Thad Anderson’s OPENshut, the first section of Pye’s euler’s identity and Vickery’s the tears of things were not examined, as the vibraphone pedal is held down by a weight, allowing the performer to rotate towards the marimba more easily and, when not playing the vibraphone, move both feet laterally along the marimba’s length. I did not indicate body positions for solo marimba or solo vibraphone passages, as the performer is free to face the respective instruments.

7.1.1 Types of Body Movement

Moving forward and backward along the central orange arrow of Figure 7.1 afforded a degree of stability, centrally positioned shoulders, and peripheral vision. Other body movements were used to refine my shoulder positions and improve my ability to play comfortably and accurately.

1) Forward lean: when playing the highest pitches on the marimba, a performer’s feet are obstructed by the vibraphone, and the shoulders are moved forward by leaning.

Figure 7.2: Leaning forward to reach the highest pitches of the marimba.

2) Backward lean: playing low notes on the marimba and high notes on the vibraphone simultaneously may require a backward lean to move the shoulders into position.

Figure 7.3: Leaning back to play low marimba pitches and high vibraphone pitches.
3) Leaning right: outward bending (or ‘outer orientation,’ as illustrated in Figure 6.19) of the left wrist may be alleviated by moving the shoulders to the right. Symmetries I required three degrees of ‘lean’ for the passages illustrated in Figure 7.4 below.

![Figure 7.4: In Symmetries I, vibraphone pitches are written with the stems up and marimba pitches are written with the stems down. The largest lean to the right (+3) occurs at letter B and may be seen in the photo on the right in Figure 7.5 below. A smaller lean (+2) is required at letter G and bar 67 (see Figure 7.6), and letter D requires the smallest lean (+1).](image)

Figure 7.4: In Symmetries I, vibraphone pitches are written with the stems up and marimba pitches are written with the stems down. The largest lean to the right (+3) occurs at letter B and may be seen in the photo on the right in Figure 7.5 below. A smaller lean (+2) is required at letter G and bar 67 (see Figure 7.6), and letter D requires the smallest lean (+1).

![Figure 7.5: In the image on the left, playing G-natural and B-flat results in a severe outward bend for the left wrist. The image on the right shows the less-severe angle achieved by moving the shoulders to the right (+3).](image)

Figure 7.5: In the image on the left, playing G-natural and B-flat results in a severe outward bend for the left wrist. The image on the right shows the less-severe angle achieved by moving the shoulders to the right (+3).

![Figure 7.6: (+2) The dyads at Letter G and bar 67 (Figure 7.4) require approximately equal leans to the right (+2), as the inward movement of mallet 2 from C-sharp to C is mirrored by the movement of mallet 4 from C-sharp to B-flat (indicated by curved arrows in the photo on the right).](image)

Figure 7.6: (+2) The dyads at Letter G and bar 67 (Figure 7.4) require approximately equal leans to the right (+2), as the inward movement of mallet 2 from C-sharp to C is mirrored by the movement of mallet 4 from C-sharp to B-flat (indicated by curved arrows in the photo on the right).

4) Leaning to the left: an outer orientation of the right wrist may likewise be reduced by moving the shoulders to the left (see Figures 7.8a and 7.8b).
Figure 7.7: In *Just Maybe*, parallel octaves are played with the mallets of the right hand on both instruments. The outer orientation of the right wrist for the circled octaves is illustrated in Figure 7.8a below.

Figure 7.8a: Playing the circled C’s in Fig. 7.7 requires an uncomfortable outer orientation of the right wrist.

Figure 7.8b: Outer orientation is reduced by leaning to the left.

5) Rotating feet or hips: to enable a more direct approach to an instrument (shoulders more parallel to the centreline of the instrument). Used in conjunction with leans, this may also alleviate awkward wrist-angles (as seen in Figure 7.9).

Figure 7.9: *Euler’s identity*, bars 218 to 219. The dyads in the treble clef of the marimba part must be played with the right-hand mallets. Rotating anticlockwise (marked by the red arrow) turns the body to face the marimba.

6) Bending knees for greater reach when playing extremely large intervals: the greatest distance required when performing marimba and vibraphone simultaneously is approximately 2.25 metres (the five-octave range of the marimba from C₂ to C₇, and the distance between the centre of the marimba’s C♯₂ bar and the vibraphone’s D♯₅). In this instance, a person of my
size needs to lower their shoulders to achieve a smaller angle between their arms and the keyboard, increasing the distance between left and right mallet-heads (see Figure 7.10).

![Figure 7.10: Bar 1 of *Symmetries 2* requires a five-octave stretch between the left and right mallets, which may be reached by lowering the shoulders (all blue lines are the same length).](image)

7) Stepping left: when facing the apex of the instruments (or point *a* in Figure 7.1), stepping left brings a performer closer to the marimba, and may enable larger intervals to be played. Figure 7.11 (the opening bars of *Symmetries 2*) illustrates a scale of three step-sizes. To reach the five-octave interval in bars 1 and 5, a large step to the left (-3) was required from Position 2, bringing my shoulders close to the geometric centre of the marimba. Lowering my shoulders maximised my arm span (and therefore, range), by creating the straighter line seen in the second photo of Figure 7.10. Bar 2 required a smaller step, due to the smaller intervals. Bar 4 required the smallest step, as the range is close to the line of Position 2.

![Figure 7.11: -3 is the largest step towards the left (bars 1 and 5); -2 (bar 2) is less; and -1 (bar 4) is the smallest.](image)
Table 7.1 was created to summarise the purpose behind the steps, leans, rotations and bends described above and in Chapter 6. All movements from the waist down share the common purpose of repositioning my shoulders – a vital consideration for the positioning of mallets – and I therefore recorded the motion of the shoulders in the third column. This table clarified which body movements would be required for my annotation of scores, and thus informed the final list of symbols used for annotating scores (Table 7.2). As my examination of marimba-vibe repertoire is primarily concerned with simultaneous playing, the right foot remained on the vibraphone pedal, rendering the inclusion of right-step indications unnecessary.

**Table 7.1: Body movement types and uses**

<table>
<thead>
<tr>
<th>Body part:</th>
<th>Purpose:</th>
<th>Shoulders:</th>
<th>When:</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEET:</td>
<td>toward playing zone (F, B, L, R)</td>
<td>F</td>
<td>hi Mar., lo Vib.</td>
</tr>
<tr>
<td>F step</td>
<td>F step</td>
<td>F</td>
<td>hi Mar., lo Vib.</td>
</tr>
<tr>
<td>B step</td>
<td>B step</td>
<td>B</td>
<td>lo Mar., hi Vib.</td>
</tr>
<tr>
<td>L step</td>
<td>L step</td>
<td>L</td>
<td>to Mar.</td>
</tr>
<tr>
<td>Spread</td>
<td>increase distance between hands</td>
<td>Down</td>
<td>large LH to RH distance</td>
</tr>
<tr>
<td>KNEES:</td>
<td>toward instrument, orientation (LR)</td>
<td>L,(F*),D</td>
<td>in-out orientation/range</td>
</tr>
<tr>
<td>L bend</td>
<td>L bend</td>
<td>L,(F*),D</td>
<td>in-out orientation (only^)</td>
</tr>
<tr>
<td>R bend</td>
<td>R bend</td>
<td>R,(F),D</td>
<td>in-out orientation (only^)</td>
</tr>
<tr>
<td>Both bend</td>
<td>Both bend</td>
<td>D</td>
<td>large LH to RH distance</td>
</tr>
<tr>
<td>WAIST:</td>
<td>F/B, L/R turns</td>
<td>F</td>
<td>hi M (vibes in the way)</td>
</tr>
<tr>
<td>F lean</td>
<td>alternative to F step</td>
<td>F</td>
<td>hi M (vibes in the way)</td>
</tr>
<tr>
<td>B lean</td>
<td>alternative to B step</td>
<td>B</td>
<td>lo M, hi V (too fast to step)</td>
</tr>
<tr>
<td>ACW rotate</td>
<td>face instrument</td>
<td>ACW</td>
<td>Mar. busy or large intervals</td>
</tr>
<tr>
<td>CW rotate</td>
<td>face instrument</td>
<td>CW</td>
<td>Vib. busy</td>
</tr>
<tr>
<td>ELBOWS:</td>
<td>angle to kbd (#/nat orientation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>out/bend</td>
<td>inner orientation (e.g., LH mar. G#/B4; RH vib. G#/Bb4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>out/straight</td>
<td>extend arms to sides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in/bend</td>
<td>close in front</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in/straight</td>
<td>extend arms in front</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WRISTS:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L wrist CW</td>
<td>in orientation (G#/B4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L wrist ACW</td>
<td>out orientation (G#/Bb4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R wrist CW</td>
<td>out orientation (G#/B4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R wrist ACW</td>
<td>in orientation (G#/Bb4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Whilst the forward-movement of the shoulders caused by knee-bends is not usually required, it does not adversely affect the desired L, R or D movement.

^ range (up to a five-octave interval) is a consideration for the marimba, but not for the three-octave vibraphone.
7.1.2 Instrument, iPad and *AirTurn* Placement

Seeking to simplify the method for determining a central position in relation to the instruments, I utilised the pale green triangle in Figure 7.1 as my visual reference (Figure 7.12). Whereas I had indicated my preference for positioning the iPad in the apex between the instruments in Table 6.1, the sightline indicated in Figure 7.12 suggested optimal placement of the music in front of the marimba, approximately one-octave from the top. Although the music is further from my eyes than in the previous apex position, I have found this to be a comfortable position for all works except *euler’s identity*. Although Pye’s work is playable in this arrangement, the first section is heavily centred around the lowest octaves of the marimba (with infrequent vibraphone pitches), and my preference for placing the iPad in front of the low range of the marimba (in this instance) remains.

![Figure 7.12: The final setup, with the position of all instruments and music (iPad). The iPad position to the left of the glockenspiel is for euler’s identity, the iPad to the right is for all other works. The cajon, its left and right pedals, and the AirTurn are located underneath the marimba, and the AirTurn is approximately the same distance from the centreline as the vibraphone pedal.](image)

Difficult page-turns are a major concern for a performer holding four mallets. The difficulty is compounded by possible challenges such as holding the vibraphone pedal down while turning a page in front of the marimba, or other requirements that require an extremely large reach. My earlier
positioning of the *AirTurn* pedal under the low end of the vibraphone, due to the central position in which this is found, has been revised. Figure 7.12 was once again the source of this revision, and I now place the pedal symmetrically to the vibraphone pedal. Finding the pedal with my foot whilst playing and reading scores, or on a dark stage, was challenging in the previous position, and I added a thin slice of heavy railway track in front of the pedal to prevent me kicking it away accidentally. Although the revised position is easier to find in my peripheral vision, the railway track maintains its usefulness in preventing me from accidentally triggering the left ‘back-page’ pedal. If I wish to go back a page deliberately, I can access the left pedal by lifting my foot and angling my toes downward.

The final position of instruments, pedals and music is shown in Figures 7.14 and 7.15.
7.1.3 Creating Annotated Scores

Annotating the scores produced two benefits, one deliberately sought and the other a beneficial side-product. My intent was to create a set of symbols for marking body movements accurately, to aid future performers in the preparation of this repertoire. Whilst performers will have differing opinions on the most comfortable or accurate stances (and how to arrive there), I indicated my own choices to provide a reproducible starting point for practice. An unexpected benefit of these annotations was a reflexive one, as the precise reproduction of my body positions aided their embodiment through more-accurate repetition.

To create the symbols, I used the easily reproducible floor plan of Figure 7.12. The orange arrow bisects the top 80-degree angle and bisects the line between the end of the vibraphone and marimba at a right-angle. Positions 1, 2 and 3 in Figure 7.1 were repositioned slightly, along ‘back’, ‘centre’ and ‘forward’ lines. A fourth and fifth position were added (‘full-forward’ and ‘full-back’), as were the possible placements of the left foot. When stepping to the left, only one step is possible in the forward and full-forward positions, due to the small distance across the top of the triangle. Although the full-back line has room for at least six positions, I can only reach three when my right foot is on the vibraphone pedal. My left foot gradually rotates anticlockwise with each step, until it is in line with individual marimba keys (-1FF, -1F, -2C, -2B, 2FB). Only one position has been illustrated for the right foot, due to its immovability when operating the vibraphone pedal.
Moving the shoulders to the right (right ‘lean’) is not achieved with steps when the right foot is on the vibraphone pedal. Right leans are achieved in these instances by bending the right knee (see Figure 7.17). For this reason, I did not utilise right ‘steps’ but employed three degrees of right ‘knee-bend’.

Figure 7.16: Central left-foot positions are marked along the line-of-sight arrow, from full-forward (FF) to full-back (FB). Numbers indicate the distance from the central line (negative numbers to the left, positive numbers to the right).

Figure 7.17: +3, +2 and +1 knee bends move the shoulders to the right. These three images correspond to the +3, +2 and +1 leans required in Figure 7.4.
My final system of annotations may be seen in Table 7.2 on the following page. The left half of the triangle from Figure 7.16 is illustrated (also with an orange outline), with all thirteen left-foot positions indicated by coloured ovals (including the anticlockwise rotation of the left steps). Full-forward positions are red, forward positions are orange, centre positions are green, back positions are blue, and full-back positions are purple.

Right leans are usually achieved with a knee-bend, and the three degrees of bend are indicated by the angles of the blue triangles (with the ‘knee’ pointing to the right or left).

Red arrows indicate a movement I use to step larger distances. I call this a ‘spring-step’, as I ‘spring’ upwards from a bent-knee position, to lift my foot and pivot into position.

Rotations of the body are infrequently marked, but the more noticeable (and necessary) rotations are marked with an arrow circling in a clockwise or anticlockwise direction.

Sticking indications are added only when useful, and I number the mallets ascending from left to right (1 to 4). Occasionally a simple L and R (left or right hand) is indicated. In Potter’s work, I indicate the position of the mallet-heads in relation to the centreline of the bar.

Extended ‘pedal-down’ passages may be played with a weight on the pedal. I use a heavy piece of railway track, suspended slightly above the ground to the left of the pedal (Figure 7.18), and have marked the moments at which I quickly ‘hook’ or ‘unhook’ the pedal beneath the track.

Other comments are added in text form if deemed useful.

Figure 7.18: A weight, raised slightly off the ground, allows the pedal to be ‘hooked’ for extended ‘pedal-down’ passages.

Appendix 3 includes annotated versions of works written for this project, using the symbols presented in Table 7.2: Pye’s euler’s identity; Potter’s Just Maybe; and my Symmetries 1 to 3, An Unfinished Rhyme and Without Delay.
### Table 7.2: Annotations

#### FORWARD-BACK POSITIONS (left foot):

- **Full Forward (-1FF, FF)**
- **Forward (-1F, F)**
- **Centre (-2C, -1C, C)**
- **Back (-2B, -1B, B)**
- **Full-Back (-2FB, -1FB, FB)**

Solo passages (the performer can face the instrument, so no indication is required)

#### DEGREES of KNEE-BEND (left and right):

- Left (3)
- Right (3)
- L (2)
- R (2)
- L (1)
- R (1)
- Straight

#### SPRING STEP (left and right):

- Left step
- Right step

#### BODY ROTATION:

- Anticlockwise
- Clockwise

#### MALLETS:

- 1: Outer left
- 2: Inner left
- 3: Inner right
- 4: Outer right

#### BOW DIRECTION:

- (Down - up)

#### PEDAL INSTRUCTION:

- **HOOK pedal**
- **UNHOOK pedal**

#### MALLET POSITION ON BAR (red line = centre of bar, red dot = RH, blue dot = LH)

- (In the first two examples, all mallets are close to the centre.
- In the third example, a RH mallet plays the near-end of the bar)
7.2 Summary and Final Table of Performance Considerations/Solutions

Setup considerations are a major issue in marimba-vibe repertoire, and this is an area of some contention. The major benefit of the stacked setup is the positioning of both instruments and music in front of the performer, providing a significant advantage in the field of note-accuracy. For this reason, most works written before the introduction of the five-octave marimba are performed in this arrangement, and even Rosauro’s work – conceived for the V-formation – is comfortably performed in a stacked setup.

Benefits of the V-formation include the ability to play extended passages on the marimba without the need to stretch across the vibraphone, and accessibility to the ends of keys for bowed passages. Repertoire requiring a five-octave marimba also presents the issue of extended reach: to play the lowest note on the marimba whilst stretching across a vibraphone requires significant bending of the performer’s back, and may lead to injury. For this reason, performers and composers have more-recently favoured either a V-formation, or the reverse V.

The reverse V-formation has been employed in performances of works by Séjourné189 and Burritt,190 with Burritt stating in his performance notes that the composition was conceived with this setup in mind. When compared to Rosauro’s V-formation, the distance between bass notes on the marimba and treble notes on the vibraphone are reduced, which is especially important in Burritt’s work. Furthermore, the vibraphone may be placed at the bass end of the marimba, reducing the number of inaccessible notes when compared to Rosauro’s V-formation (the high-pitched end of the vibraphone is comparatively narrow, and the bars of the marimba are wider in this register than in the upper register of Rosauro’s placement).

Figure 7.19: In the image on the left, the wider end of the vibraphone obstructs many (narrow) marimba bars. In the image on the right, the narrower end obstructs fewer (wide) marimba bars.

My own preference for Rosauro’s V-formation rather than the reverse V, where possible, is due to my embodied keyboard logic of ‘high notes to the right, low notes to the left’. The lowest note of a vibraphone is a fifth below middle-C, whereas the marimba descends to C₂, 2-octaves below

189 https://www.youtube.com/watch?v=ix-QW-BShPY
190 https://youtu.be/USZy247ST2w
middle-C. Whilst the marimba’s pitches also extend beyond the highest notes of a vibraphone, the
more common use of the marimba as a bass instrument accompanying a vibraphone melody in this
repertoire, leads me to conceive of the instruments in a ‘low marimba, high vibraphone’ arrangement.

With the removal of setup consideration, due to my permanent adoption of Rosauro’s V-
formation, a revised list of considerations and possibilities was created (Table 7.3, below). A table of
my solutions to these considerations (Table 7.4) was subsequently created, examining the repertoire in
which I employ Rosauro’s V-formation. These are listed below (works with an asterisk were
commissioned or composed by me):

1985     Ney Rosauro     Sonata, the Periods of Life
1993     *Roger Smalley   Dance VI, from Music for an Imaginary Ballet
2010     Thad Anderson    OPEN/shut
2017     Emmanuel Séjourné Attraction
2019     *David Pye       euler's identity (Sections I, II, III)
2020     Leonhard Waltersdorfer 3 Pieces on 2 Instruments for 1 Player
2020     *Paul Tanner     Symmetries 1 to 3
2020     *Kathy Potter    Just Maybe
2021     *Paul Tanner     An Unfinished Rhyme
2021     *Paul Tanner     Without Delay
2020/21  *Lindsay Vickery the tears of things

Table 7.3: V-formation performance considerations, with a list of possible solutions (as indicated in Table 7.4).

**Movement between instruments**
- ‘Rapid’ switching between instruments required
- ‘Moderate’ switching between instruments required
- ‘Occasional’ switching required (mostly playing on one instrument)
- ‘Set’: RH above the vibraphone, LH above the marimba (little or no switching)

**Sticking approach**
- Hand-to-hand (or ‘H-H’): most common approach on one instrument
- Repetition sticking (‘Rep’n’): useful for one-handed melody and pulsing dyads/chords
- Rotation strokes (Rot’n): one hand playing consecutive non-unison pitches
  - ‘one-handed linear’ (‘1-HL’): one-handed rotation strokes playing small
    intervals/melodies

**Music (iPad) position**
- Forward of apex (Figure 7.16)
- Close to area of maximum activity
Body angle

- Facing apex
- Mostly facing apex, rotate towards instrument when helpful
- Mostly facing area of high activity (M or V)

Mallet and bow choice (marked in detail in Table 7.4)

- 2+2 (when hands are ‘set’ above each instrument, the RH may hold vibraphone mallets, while the LH holds marimba mallets).
- Graduated (allows for extensive marimba range, requiring softer mallet 1 and harder mallet 4. Usually includes 1 or 2 hard vibe mallets in RH).
- 2 bows (required for legato connections or overlap)
- Naturals upbow, accidentals downbow (in an arc motion across the vibraphone)*
- Always downbow, repositioning to align bow hair for naturals or accidentals*

Unique techniques or challenges

- RH mallets play two instruments simultaneously
- Bowed marimba with struck vibes
- Bowed vibe (accidentals and naturals) with struck marimba
- ‘Sound effect’: dragging chain across vibraphone
- Extremes of range – lowest and highest notes on the marimba struck simultaneously
- Simultaneous RH marimba with LH vibraphone
- Independent dynamics between instruments (for timbral/harmonic transformation)
- Extra instruments

Position of extra instruments

- Pye
  - Trap table inside the V
- Tanner 3
  - Glockenspiel right-of-centre in front of marimba
  - Kick-drum (or foot cajon) beneath marimba
  - High F# bell at high end of marimba, high C bell at high end of vibraphone

*The author has developed a double-sided bow, removing the need for either of these options (see Figure 6.38).

Using the categories in this table, I compiled a table of works (Table 7.4), with my solution for each consideration. Both tables refer to the passages that require the simultaneous use of both instruments. Unsurprisingly, this usually results in the body facing the apex. In some cases, the instruments are not struck at the same time, but the right foot is used to hold down the vibraphone pedal while the marimba is being played. These examples of body direction are listed as ‘M’.
Likewise, ‘M/V’ is used if there is frequent rotation between the two instruments. It should be noted that I am a right-handed performer using the Musser-Stevens grip.

**Table 7.4: V-formation repertoire notes**

<table>
<thead>
<tr>
<th>Mallet colours/symbols</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SOFT: Malletech LHS10, birch handles = WHITE</td>
<td></td>
</tr>
<tr>
<td>MEDIUM: Innovative Percussion AA25, rattan handles = PALE ORANGE; Marimba One LVB3, birch = RED</td>
<td></td>
</tr>
<tr>
<td>MED-HARD: Innovative Percussion AA30, rattan = BRIGHT ORANGE; LVB1, birch = LIGHT GREY</td>
<td></td>
</tr>
<tr>
<td>HARD: Malletech DS18, rattan = DARK BLUE; LVB Vibe, birch = DARK GREY</td>
<td></td>
</tr>
<tr>
<td>XYLOPHONE: Malletech ‘Becker blue’ = LIGHT BLUE</td>
<td></td>
</tr>
</tbody>
</table>

(a superball and feather are also required for euler’s identity)

<table>
<thead>
<tr>
<th>Year</th>
<th>Work</th>
<th>Movt</th>
<th>Sticking</th>
<th>iPad</th>
<th>Body</th>
<th>Mallets</th>
<th>Unique</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>Periods of Life: Dawn</td>
<td>Mod.</td>
<td>L Rot’n, R Rep’n</td>
<td>Apex</td>
<td>Apex</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>Periods of Life: Rondo</td>
<td>SET</td>
<td>L Rot’n, R Rep’n</td>
<td></td>
<td></td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>Imaginary Ballet, VI</td>
<td>Mod.</td>
<td>Rep’n</td>
<td></td>
<td>M/V</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>OPEN/shut</td>
<td>SET</td>
<td>Rot’n &amp; Rep’n</td>
<td>Apex</td>
<td>[ ]</td>
<td>[ ]</td>
<td>+glock mallet, audio</td>
</tr>
<tr>
<td>2017</td>
<td>Attraction</td>
<td>Rapid</td>
<td>Rot’n, Rep’n, H-H</td>
<td>Apex, M/V</td>
<td></td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(arr.) 2019 2-Part Invention in F</td>
<td>SET</td>
<td>R&amp;L 1H Linear</td>
<td>Apex</td>
<td></td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>euler’s identity I</td>
<td>Occ.</td>
<td>Hand-to-hand</td>
<td>Mar (L)</td>
<td>M</td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>euler’s identity II</td>
<td>Mod.</td>
<td>(L bow) R Rep’n</td>
<td>Apex/M</td>
<td></td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>euler’s identity III</td>
<td>Rapid</td>
<td>L Rot’n, R 1HL</td>
<td>Apex</td>
<td></td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>Symmetries 1</td>
<td>SET</td>
<td>Hand-to-hand</td>
<td>Apex</td>
<td></td>
<td>[ ]</td>
<td>Independent dynms</td>
</tr>
<tr>
<td>2020</td>
<td>Symmetries 2</td>
<td>Rapid</td>
<td>Rot’n, Rep’n, H-H</td>
<td>M/Apex</td>
<td></td>
<td>[ ]</td>
<td>Lo-hi mar., RH mar., LH vib.</td>
</tr>
<tr>
<td>2020</td>
<td>Symmetries 3</td>
<td>Mod.&amp;SET*</td>
<td>Rot’n, H-H</td>
<td>Apex</td>
<td></td>
<td>[ ]</td>
<td>+BD,bells,glock</td>
</tr>
<tr>
<td>2020</td>
<td>Just Maybe</td>
<td>SET</td>
<td>Rot’n, Rep’n</td>
<td></td>
<td></td>
<td>[ ]</td>
<td>RH 2inst., chains</td>
</tr>
<tr>
<td>2020</td>
<td>Rain Chain</td>
<td>SET</td>
<td>Rot’n, Rep’n</td>
<td></td>
<td></td>
<td>[ ]</td>
<td>Bow vib./strike mar.</td>
</tr>
<tr>
<td>2020</td>
<td>Children’s Song</td>
<td>SET</td>
<td>Rot’n, Rep’n</td>
<td></td>
<td></td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>D’N’A</td>
<td>SET</td>
<td>Rot’n, Rep’n</td>
<td></td>
<td></td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>An Unfinished Rhyme</td>
<td>SET&amp;Mod.</td>
<td>Rot’n, H-H</td>
<td></td>
<td></td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>Without Delay</td>
<td>SET&amp;(Mod.)</td>
<td>Rot’n, Rep’n</td>
<td></td>
<td></td>
<td>[ ]</td>
<td></td>
</tr>
<tr>
<td>2020/21</td>
<td>the tears of things</td>
<td>Mod.</td>
<td>Rot’n, H-H</td>
<td></td>
<td></td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>

*For split melodies.  ^During ornamental motives.
In Appendix 2, information from Chapters 6 and 7 is used to inform *A Guide to Performing Works for the Marimba-Vibe*. The formatting style used in *A Guide to Composing Works for the Marimba-Vibe* (Appendix 1) is duplicated in this performance guide, and ‘points of interest’ are again included in boxed text. As this guide is written for performers, descriptions of common percussion terms are not included. Definitions of ‘multi-percussion’ and other percussion-specific terms are included in the *Glossary of Terms* at the beginning of this dissertation.
Conclusion

As with other instruments, the expertise required to play multiple percussion is defined by problems posed by composers in various pieces and in the solutions found by performers over a period of time... The most fruitful form of speculation in the area of multiple percussion performance practice remains the active commissioning and performing of new works.\footnote{Schick, "Multiple Percussion."}

I have followed Schick’s assertion by enlarging and performing the solo marimba-vibe repertoire, creating informed collaborations with composers and developing resultant compendia to encourage and enable this trend to continue and increase, particularly in context of the V-formation of the marimba-vibe instrumentation.

It is worth noting that since 2010, and independent of my own commissioning and compositional activities, four percussionist-composers have explored the benefits (and challenges) of this idiom through compositions of their own. Their practice-led contributions have added invaluable repertoire for this combination, informed by their own practical knowledge and experience. Thad Anderson (2010) was the first to require a five-octave marimba in a V-formation; Emmanuel Séjourné (2017) adds an audio track; Michael Burritt (2019) has written for the ‘reverse V-formation’\footnote{Burritt, "The Fragile Corridor."} and Leonard Waltersdorfer (2020) has composed a set of three pieces for my preferred ‘V-formation’.\footnote{Waltersdorfer, "3 Pieces on 2 Instruments for 1 Player."}

Despite these contributions, a comprehensive set of guidelines and suggestions that enables others to follow this path was not produced.

Further, the beginnings of a very gradual upward trajectory in the quantity of solo repertoire written for marimba-vibe in a V-formation may be observed from 1985 until 2021 (see Table 8.1 below). Whilst Rosauro suggested a V-formation for his work in 1985, the stacked formation remained a practical setup for repertoire throughout the 1990s, due to the use of four-and-a-third-octave marimbas. Although Smalley’s work falls within this decade and pitch-range, he wrote for a V-formation at my request. All repertoire written since 2010 however, has employed the five-octave marimba and a V-formation setup,\footnote{I include Burritt’s use of the ‘reverse-V’ in this group.} mitigating the possibility of injury caused by the increased distance across the vibraphone to the lowest pitches of the marimba.

\footnote{191} Schick, "Multiple Percussion." 
\footnote{192} Burritt, "The Fragile Corridor." 
\footnote{193} Waltersdorfer, "3 Pieces on 2 Instruments for 1 Player." 
\footnote{194} I include Burritt’s use of the ‘reverse-V’ in this group.
Table 8.1: Solo marimba-vibe compositions since 1981. V-formations are above the timeline, stacked setups are below.\textsuperscript{195}

<table>
<thead>
<tr>
<th>Percussionist-composers:</th>
<th>Non-percussionist composes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ney Rosauro</td>
<td>Daniel Godfrey</td>
</tr>
<tr>
<td>Thad Anderson</td>
<td>Rand Steiger</td>
</tr>
<tr>
<td>Emmanuel Séjourné (ES)</td>
<td>Stefan Niculescu</td>
</tr>
<tr>
<td>Michael Burritt (MB)</td>
<td>Veli-Matti Puumala</td>
</tr>
<tr>
<td>David Pye (DP)</td>
<td>Roger Smalley</td>
</tr>
<tr>
<td>Leonard Waltersdorfer (W)</td>
<td>Robert Pollock</td>
</tr>
<tr>
<td>Paul Tanner (PT)</td>
<td>Wayne Peterson</td>
</tr>
<tr>
<td></td>
<td>Lindsay Vickery (LV)</td>
</tr>
<tr>
<td></td>
<td>Kathy Potter (KP)</td>
</tr>
<tr>
<td>1982 Steiger</td>
<td>1989 Niculescu</td>
</tr>
<tr>
<td>1981 Godfrey</td>
<td>1994 Pollock</td>
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<tr>
<td>1999 Peterson</td>
<td>2010</td>
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<tr>
<td></td>
<td>'17</td>
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<td></td>
<td>'19</td>
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<td>'20</td>
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<td></td>
<td>'21</td>
</tr>
</tbody>
</table>

This project has sought to redress the dearth of repertoire and literature surrounding the marimba-vibe by developing and promoting awareness of the nascent solo marimba-vibe idiom. This objective has been supported by the production of recordings, instructional guides for composers and performers, and annotated musical scores. These artefacts were produced after an examination and analysis of extant repertoire; commissioning three composers; composing five new works; and an extended period of journalled practice sessions.

Recordings of all works written for this project and the final movement of an earlier work by Roger Smalley\textsuperscript{196} (written for this author and exploring unique properties of the marimba-vibe), may be downloaded by clicking \textcolor{blue}{HERE}.

\section*{Methodological Developments}

Although blurred, I found that the distinction between practice-based and practice-led research clarified my objectives in the compositional and performance fields. This ‘blurriness’ between the two terms may be circumvented with the adoption of the ‘artistic research’ label, but I have used the terms throughout this thesis to acknowledge my own emphases within a mixed-method approach.

My practice-based ‘claims to originality and contribution to knowledge’ were most-clearly demonstrated by the production of the following artefacts:

- Five of my own compositions (included in Appendix 3 as annotated scores)
- Compositional and performance guides (Appendix 1 and 2)

\textsuperscript{195} This table does not include the earliest solo for marimba-vibe: Haubenstock-Ramati’s \textit{Liasons} (1958).

\textsuperscript{196} I have recently renotated Smalley’s revision of this work, as the original manuscript could not be found. It has been donated to the Australian Music Centre, from whom it may be purchased. A recording of this work is available on the Tall Poppies website (http://www.tallpoppies.net, catalogue number TP256).
Recordings (included in Appendix 3 as audio files, and online in a YouTube playlist).

Within the field of practice-based research, the use of composition (‘writing’) as a mode of qualitative inquiry was particularly fruitful. Chapter 5 outlines my efforts in this area, and discoveries included new generative ideas, derived from symmetrical pitch-organisation (and the interaction between the two pitch-centres of the marimba and vibraphone upon the resultant pitch collections). Whilst embodied knowledge enabled some pre-emptive mitigation of technical challenges, the reflective and reflexive feedback loop between composition (planning) and performance (implementation) allowed me to explore new performance and compositional techniques whilst determining workable solutions.

A practice-led approach – in which my reflective practice and reflexive application of performance solutions added to knowledge surrounding this idiom – overlapped and informed this research, ultimately providing knowledge for composers (Chapter 4, Appendix 1) and performers (Chapters 6 and 7, Appendix 2 and 3). Within the field of practice-led research, the preparation of all the works composed and commissioned for this study and numerous works composed independently of this project led to new knowledge in this idiom. Journalling throughout the process led to the POD system – useful in the preparation of original works and collaboration with composers – and my annotational system for musical scores allows for future reproduction of results in the performance field. These outcomes, along with the guides for performers and composers, audio recordings, video recordings and annotated scores, add to the repertoire of knowledge available to educators in this idiom.

Following Östersjö’s proposition, ‘analytic interpretation and thinking-through-practice’ were used throughout this research. Analytic interpretation was most overt in Chapter 4’s investigation of generative themes: applying thematic analysis of qualitative research data provided an invaluable tool by which to taxonomise – in a table of ‘codes’ – the many musical and technical benefits available to composers in this idiom. These themes were developed further and discussed in Chapter 5’s exegetical description of my own compositional processes. My own compositions relied on an analytical approach to instrumental ranges to create new generative processes. The two performance chapters analyse body movements; notational and technical challenges; and ways in which to reproduce outcomes (‘practice tips’ and annotational methods for musical scores).

‘Thinking-through-practice’ was predictably evident in the performance chapters, where body movements were investigated, following the development and utilisation of the POD (‘Problems, Options, Decisions’) method. Exploring the use of body movements to move shoulders and mitigate wrist-angles – although analytical to a degree – required the reflection and reflexivity of the POD system to develop and reproduce theories of practice. This framework for dealing with the performance challenges of original music, with its straightforward articulation of problems and options, aided the decision-making process during practice. Perhaps the greatest benefit of the POD method was found during collaborative sessions with the composers, where a clear articulation of options could be quickly and efficiently judged, and a decision agreed upon. This method is
transferrable to other disciplines, with little adaptation or explanation required, and I anticipate employing it in future collaborations.

**Creative Artefacts and Findings**

*A Guide to Composing for the Marimba-Vibe* (Appendix 1), was made possible by the documentation of the unique musical advantages explored in the repertoire (Chapter 4). It was created to promote the potential – and encourage the use of – this instrumentation amongst composers. A discussion of physical limitations; the success and suggestion of techniques and timbres; and appropriate setups for individual compositions is included in *A Guide to Composing for the Marimba-Vibe*, providing a detailed reference tool for future composers in this idiom. The exegetical account of my own compositional processes (Chapter 5) offers further guidance in this area: although this exegesis is primarily a description of process-driven creative decisions, adaptations of the resulting music are described, with reference to the technical difficulties or advantages found in various solutions.

*A Guide to Performing Works for the Marimba-Vibe* (Appendix 2), was made possible following the identification of technical challenges within the repertoire; reflections on setup, performance technique and musical considerations; and a detailed examination of body movements and positions (detailed in Chapters 6 and 7). A major component of this pedagogical approach was the development of the POD system. Whilst the system was predictably effective in addressing technical challenges for performers, it revealed an equally useful benefit for composers, by determining the optimal notation for various ‘problems’. Due to the collaborative nature of the commissioning process, I was able to explore these notational problems and offer suggestions to the composers, with ‘default’ notation for specific issues included in the guide (Appendix 1).

The development of a graphic annotational system proved useful for the reproduction of precise body positions and movements, and is used as an aid to performance in Appendix 3. Mallet players experience a unique instrumental challenge, caused by the non-tactual nature of their performance. By determining the optimal positions for performer and mallets – and by reproducing these positions with precision – accuracy is developed. Whilst this necessary kinesthetic entrainment has been explored by Combs,197 Stout,198 Barudin199 and others, it has not been addressed in a specific marimba-vibe context, and the annotated scores of Appendix 3 provide a substantial contribution to this field. Although individual performers may ultimately use different positions, my annotations provide a useful starting point when approaching this repertoire.

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197Combs, "The problems of sight-reading on mallet-instruments and their relationship to kinesthetic sensation."
198 Stout, *Ideo Kinetics*.
Eight original musical works were created for this project, involving the commissioning of three Australian composers, and the composition of five works by myself. Seven of the works appear with performance annotations in Appendix 3. Vickery’s work is not included, as the vibraphone pedal is weighed down throughout his piece, allowing the performer’s right foot to move freely, and therefore removing the need for annotations of left-foot positions. The commissioned scores of Pye and Potter have likewise been redacted during passages with no annotations.

Future Applications and Research

This study was restricted to the investigation of solo notated repertoire for the marimba-vibe idiom. Future research, however, may be undertaken in an ensemble context or in a largely-improvised genre. The methods used in this project may be useful in a similar cataloguing, investigation and preparation of repertoire. Composer-performer collaboration benefits from the articulation of challenges using the POD system, as does performance preparation. Musical score annotation aids the accurate reproduction of performance results and hopefully simplifies the process. Whether in an ensemble or solo context, the table of generative compositional codes is likely to be expanded. The audio and YouTube links in this document will aid future marimba-vibe composers and performers in this undertaking.

The movement issues and discoveries of Chapter 7 may be refined in the future by collaborations between performers and movement specialists, validating some of the decisions made (for example, bending of knees, rather than back where possible) or suggest alternatives.

Final Thoughts

With the curation of an online playlist of these works; readily available scores from publishing houses or composer websites; and increased access to information for performers and composers, I expect the upward trajectory of this repertoire to continue. In the last five years, a particularly encouraging trend has seen the composition of works by well-established performer-educators Séjourné and Burritt, and younger performers such as Waltersdorfer. The appeal of this idiom will be substantially enhanced by the composition of works by mallet percussionists themselves, and their

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200 Commissioned works have redacted passages to protect intellectual property, my own compositions are published in their entirety.

201 This instruction may also be found in Anderson’s OPEN/shut (not included as an annotated score, as it was written independently of this project) and the first section of Pye’s euler’s identity (which allows for significant redactions). My own Without Delay includes sections in which the pedal is weighed down, and these sections contain no annotations for knee-bends or foot-positions.

202 https://youtube.com/playlist?list=PLJcJeYuaYOlop-EPv8DslOVxsSW_cxN2

203 This playlist includes four of the seven works in a stacked formation, composed in the years from 1958 to 1999. Works by Puumala, Pollock and Peterson are not included: audio of Pollock’s work may be heard at his website http://www.robertemilpollock.com/music.html, Puumala’s is yet to be recorded, and I have been unable to find a score or recording of Peterson’s work.
capacity to demonstrate and educate will ensure the future vitality and validity of this fascinating and challenging addition to percussion repertoire.

**Bibliography**

**Texts**


https://digitalcommons.lsu.edu/gradschool_dissertations/3099 (3099).

Musical Scores

http://www.robertemilpollock.com/music.html


**YouTube Performances**


Jimbu, Makana. “Attraction for solo percussion and tape by Emmanuel Séjourné.”
https://youtu.be/HAIxKumpSao


https://youtu.be/TLleD14JLsY


**LP/CD Recordings**


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