

UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

REBONDS BY IANNIS XENAKIS:

PEDAGOGICAL STUDY AND PERFORMANCE ANALYSIS

A DOCUMENT

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

Degree of

DOCTOR OF MUSICAL ARTS

By

BRIAN CHRISTOPHER TINKEL

Norman, Oklahoma

2009

REBONDS BY IANNIS XENAKIS:
PEDAGOGICAL STUDY AND PERFORMANCE ANALYSIS

A DOCUMENT APPROVED FOR THE
SCHOOL OF MUSIC

BY

Dr. Lance Drege, Co-Chair

Dr. William Wakefield, Co-Chair

Dr. Roland Barrett

Dr. Michael Lee

Dr. John Fagan

© Copyright by BRIAN CHRISTOPHER TINKEL 2009
All Rights Reserved.

This work is dedicated to my family, friends, and students.

ACKNOWLEDGMENTS

Bringing this document to fruition would not have been possible without the support of numerous individuals to whom I extend my deepest gratitude. I express my sincere appreciation to my co-chairs Dr. Lance Drege and Dr. William Wakefield for their support, scholarship, and willingness to serve on my committee, as well as for their guidance, insight, and inspiration during my doctoral studies at the University of Oklahoma. For their support and guidance throughout the writing process, I would like to thank the following members of my committee: Dr. Roland Barrett, Dr. Michael Lee, and Dr. John Fagan.

















I would like to thank my two other principal teachers, Thomas P. Hannum and Eduardo Leandro, for leaving their indelible mark on my development as a person, musician, and teacher.

I thank my parents Terry and Carol Tinkel for their generous support making my college education possible. I thank my father Terry specifically for his support and guidance throughout the writing process.

Finally, a special thank you to my beautiful wife Cynthia for her constant and unwavering encouragement. I am eternally grateful for your love, patience, and support. And to my lovely daughter Lydia, thank you for giving me a new perspective in life.

TABLE OF CONTENTS

LIST OF TABLES	vii
LIST OF FIGURES	viii
ABSTRACT	xii
CHAPTER I.	1
THE PROBLEM, PURPOSE, AND DESIGN OF THE STUDY	
Introduction	1
Statement of the Problem	6
Need for the Study	7
Purpose of the Study	7
Limitations of the Study	8
Design of the Study	8
Organization of the Study	9
CHAPTER II.	11
SURVEY OF RELATED LITERATURE	
Biography	11
Xenakis's Percussion Works	12
Related Literature on Solo Percussion Music	16
Other Resources on <i>Rebonds</i>	19
CHAPTER III.	23
<i>REBONDS</i> : PEDAGOGICAL STUDY AND PERFORMANCE ANALYSIS	
Introduction	23
Errata	26
Practice Guide	26
<i>B</i> : Single marcato accent vs. double marcato accent	27
<i>A</i> : Single staccatissimo accent vs. double staccatissimo accent	28
<i>B</i> : High bongo pulse vs. five-note cycle	29
<i>B</i> : High bongo grace-note figures: Identification and Approach	29
Right-hand drag sticking method (RD)	37
Left-hand drag sticking method (LD)	60
Consecutive right-hand drag sticking method (CRD)	83
Alternate-hand drag sticking method (AD)	90

<i>A</i> : Subdivisions of the beat (S)	97
<i>A</i> : Polyrhythm types (PT): Identification and Approach	98
• Polyrhythm type 1: 2  : 3 	104
• Polyrhythm type 2: 3  : 2 	105
• Polyrhythm type 3: 2  : 3 	106
• Polyrhythm type 4: 3  : 2 	109
• Polyrhythm type 5: 3  : 4 	112
• Polyrhythm type 6: 3  : 4 	114
• Polyrhythm type 7: 4  : 3 	117
• Polyrhythm type 8: 5  : 3 	120
Performance Questions	126
CHAPTER IV.	127
SUMMARY, CONCLUSION, AND RECOMMENDATIONS FOR FURTHER RESEARCH	
Summary	127
Conclusion	128
Recommendations for Further Research	129
BIBLIOGRAPHY	131
BOOKS	131
DISSERTATIONS AND THESES	132
PAPER PRESENTED AT A CONFERENCE	134
ARTICLES FROM PERIODICALS	134
DICTIONARIES AND ENCYCLOPEDIAS	137
INTERNET RESOURCES	139
REVIEWS	140
MUSIC SCORES	140
RECORDINGS AND LINER NOTES	141
APPENDIX ONE: <i>Rebonds B</i> : Errata	142
APPENDIX TWO: <i>Rebonds B</i> : High Bongo Grace-note Figures Table	143
APPENDIX THREE: <i>Rebonds A</i> : Polyrhythm Types Table	149
APPENDIX FOUR: List of Exercises	153

LIST OF TABLES

3.0 - <i>Rebonds B</i> : Errata	26
3.1 - <i>Rebonds B</i> : High Bongo Grace-note Figures Table (p. 1 of 5)	31
3.2 - <i>Rebonds B</i> : High Bongo Grace-note Figures Table (p. 2 of 5)	32
3.3 - <i>Rebonds B</i> : High Bongo Grace-note Figures Table (p. 3 of 5)	33
3.4 - <i>Rebonds B</i> : High Bongo Grace-note Figures Table (p. 4 of 5)	34
3.5 - <i>Rebonds B</i> : High Bongo Grace-note Figures Table (p. 5 of 5)	35
3.6 - <i>Rebonds A</i> : Polyrythm Types Table (p. 1 of 3)	101
3.7 - <i>Rebonds A</i> : Polyrythm Types Table (p. 2 of 3)	102
3.8 - <i>Rebonds A</i> : Polyrythm Types Table (p. 3 of 3)	103

LIST OF FIGURES

3.0 - <i>Rebonds</i> : Instrumental set-up	25
--	----

ABSTRACT

REBONDS BY IANNIS XENAKIS: PEDAGOGICAL STUDY AND PERFORMANCE ANALYSIS

This document provides a pedagogical study and performance analysis of *Rebonds*, a solo percussion work by Iannis Xenakis. Educators and performers of contemporary solo percussion literature can use this document as a reference work to prepare *Rebonds* for performance.

The document begins with a brief discussion on the history of solo percussion music and its increased popularity as a genre. A detailed explanation of the problem, purpose, and design of the study follows. A biographical sketch of Xenakis includes an overview of the composer's all-percussion works. Based on a survey of related literature, the document emphasizes the pedagogical study and performance analysis of *Rebonds*. The analysis begins with a discussion on instrumentation and set-up. An errata was prepared and included that identifies five publisher editorial errors found during a comparative review of Xenakis's 1988 manuscript and the 1991 score edition. A practice guide was created as an educational tool for performers of *Rebonds*. The practice guide is divided into three parts: 1) identification of technical challenges; 2) directions to overcome each identified technical challenge; and 3) specific exercises written to develop and improve advanced techniques necessary for performing *Rebonds*. Performance questions were written and included to aid performers in preparing

Rebonds for performance. Lastly, a summary and conclusion were prepared and recommendations are included for further research.

REBONDS BY IANNIS XENAKIS:
PEDAGOGICAL STUDY AND PERFORMANCE ANALYSIS

CHAPTER I

THE PROBLEM, PURPOSE, AND DESIGN OF THE STUDY

Introduction

Solo percussion¹ “is a growing and vital part of the larger percussion world.”² Historical works including Igor Stravinsky’s *L’histoire du soldat* (1918),³ Darius Milhaud’s *La création du monde* (1924)⁴ and *Concerto pour batterie et petit orchestre* (1929),⁵ required multiple percussion, “the simultaneous or sequential performance of more than one percussion instrument.”⁶ These important works were predecessors to today’s solo percussion music.

¹ Solo percussion music is written for a single percussionist playing one percussion instrument or more than one percussion instrument.

² Steven Schick, *The Percussionist’s Art: Same Bed, Different Dreams* (Rochester, NY: University of Rochester Press, 2006), xv.

³ Igor Stravinsky, *L’histoire du soldat* (London: J. and W. Chester, Ltd., 1924).

⁴ Darius Milhaud, *La création du monde* (Paris: Editions Max Eschig, 1929).

⁵ Darius Milhaud, *Concerto pour batterie et petit orchestre* (Wien: Universal Edition, 1931).

⁶ James William Lambert, “Multiple Percussion Performance Problem as Illustrated In Five Different Works Composed by Stockhausen, Smith Brindle, Colgrass, Dahl, and Kraft Between 1959 and 1967” (D.M.A. diss., The University of Oklahoma, 1983), 1. In *Dissertations & Theses @ University of Oklahoma* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 8324890; accessed October 30, 2008).

In Steven Schick's book on solo percussion music *The Percussionist's Art: Same Bed, Different Dreams*, the author states:

Not long ago the very notion of a percussion soloist would have seemed ludicrous. Imagine a soloist taking the stage. However, instead of tuning a Stradivarius or dusting off the keyboard of a Steinway, a percussionist takes a bow and sits amid a junk heap of instruments often bought (or found) at the auto salvage yard, kitchen supply and hardware stores, garden shops, and (a few) specialty percussion stores.⁷

Written in 1918, *L'histoire du soldat* premiered that year in Lausanne, Switzerland under the direction of conductor Ernest Ansermet.⁸ In a research document on notation in selected repertoire for multiple percussion, Alyssa Smith states: "The 1918 work *L'histoire du soldat* is particularly significant to the genre of multiple percussion. This is due to the fact that it is the first percussion part utilizing a multiple percussion set-up."⁹ Milhaud's ballet *La création du monde*, scored for an orchestra of seventeen performers, includes "a challenging multiple percussion part written for one player."¹⁰ During the first half of the twentieth century, music for multiple-percussion existed among small instrumental

⁷ Ibid, xv.

⁸ William Kraft, "On Performance: *Histoire du soldat* – A Music Review of Chester's Publication," *Percussive Notes* 30, no. 5 (June 1992): 47.

⁹ Alyssa Gretchen Smith, "An examination of notation in selected repertoire for multiple percussion" (D.M.A. diss., The Ohio State University, 2005), 23-49. In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3182725; accessed September 8, 2008).

¹⁰ Warren Howe, "The Percussionist's Guide to Darius Milhaud's *La création du monde*," *Percussionist* 17, no. 1 (Fall 1979): 38-48.

ensembles. This repertoire required advanced techniques from percussionists that laid the groundwork for further innovation and development of solo percussion music throughout the second half of the twentieth century and beyond.¹¹

Other works of historical significance to the solo percussion genre are Amadeo Roldán's *Rítmicas No. 5* and *No. 6* (1930)¹² and Edgard Varèse's *Ionisation* (1931).¹³ The *Rítmicas* were experimental pieces and represented the first compositions written for percussion ensemble. John Richard Hall, who wrote significantly about the importance of the *Rítmicas*, argues: "No known works prior to the *Rítmicas* are so clearly stand-alone, percussion-only compositions."¹⁴ Written one year later and scored for thirteen players, *Ionisation* is "a landmark composition"¹⁵ utilizing forty percussion instruments. Similar to aforementioned compositions by Stravinsky and Milhaud, the *Rítmicas* and *Ionisation* employ multiple-percussion techniques.

¹¹ Ibid.

¹² Amadeo Roldán, *Rítmicas No. 5: for Percussion Instruments* (New York City: Southern Music, 1967).

¹³ Edgard Varèse, *Ionisation: for Percussion Ensemble of 13 Players* (Milano, Ricordi, 2000).

¹⁴ John Richard Hall, "Development of the percussion ensemble through the contributions of the Latin American composers Amadeo Roldán, José Ardévol, Carlos Chávez, and Alberto Ginastera" (D.M.A. diss., The Ohio State University, 2008), 14-22. In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3312979; accessed November 6, 2008).

¹⁵ Thomas Siwe, "Edgard Varèse's *Ionisation*: Analysis and Performance Problems," *Percussive Notes* 32, no. 5 (October 1994): 73.

From 1935 to 1943, John Cage wrote several compositions for percussion ensemble. Cage's contributions profoundly influenced development of contemporary music and compositions written for percussion.¹⁶ In a dissertation on John Cage's early percussion music, Barry Michael Williams states: "It is partially due to Cage's efforts within the percussion medium that the repertoire for percussion ensembles has expanded and the percussion medium itself has gained acceptance as a genuine musical art form."¹⁷ With the objective of discussing the percussion revolution formulated by John Cage, Steven Schick has written:

Percussion music as we know it today is truly a child of the twentieth century. It took flight in a culture where velocity and cacophony were mirrored in a music founded upon striking and friction. But the twentieth century did not invent percussion. Percussion playing was alive and well at the time of Haydn and Mozart and indeed well before that. What separates that music from today's percussion music is not the amount of noise it made, but how that noise was used.¹⁸

To further support accomplishments of John Cage and the composer's contributions to the percussion genre, Steven Schick states: "Cage's ragtag percussion revolution punctuated the end of a decade of volatile change in

¹⁶ Barry Michael Williams, "The early percussion music of John Cage, 1935-1943" (Ph.D. diss., Michigan State University, 1990), 1. In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 9117879; accessed September 10, 2008).

¹⁷ Ibid.

¹⁸ Steven Schick, *The Percussionist's Art: Same Bed, Different Dreams* (Rochester, NY: University of Rochester Press, 2006), 1.

contemporary music. Classical composers who had once written string quartets and piano sonatas now marched under the banner of brake drums, pod rattles, conch shells, and tin cans.”¹⁹

In the mid-1950s, John Cage composed *27'10.554" for a Percussionist* (1956).²⁰ As the first composition of its kind for solo percussion, Cage scored this pioneering work for unspecified instruments.²¹ Three years later, Karlheinz Stockhausen composed *Zyklus* (1959). *Zyklus* represents “the first major percussion solo for a prescribed collection of instruments in the history of Western Music.”²² In 1964, Morton Feldman composed *The King of Denmark* for solo percussion. “In fact, *The King of Denmark* was born as an antipiece—as a rebuttal to Karlheinz Stockhausen’s *Zyklus* composed five years earlier.”²³

The number of compositions for solo percussion increased during the mid-1970s. “It was a period that saw rapid growth in solo percussion repertoire with

¹⁹ Ibid.

²⁰ James Pritchett, *The Music of John Cage* (New York, NY: Cambridge University Press, 1993), 102.

²¹ Morris S. Palter, “The solidification of performance practice issues in solo percussion performance” (D.M.A. diss., University of California, San Diego, 2005), 1. In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3171113; accessed October 24, 2008).

²² Stuart W. Gerber, “Karlheinz Stockhausen’s solo percussion music: A comprehensive study” (D.M.A. diss., University of Cincinnati, 2003), 4. In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3121080; accessed November 9, 2008).

²³ Steven Schick, *The Percussionist’s Art: Same Bed, Different Dreams* (Rochester, NY: University of Rochester Press, 2006), 170.

new major works by Vinko Globokar, Frederic Rzewski, and James Wood among many other composers.”²⁴ Emerging from this rapid growth in solo percussion repertoire was *Rebonds*, a composition written by Iannis Xenakis from 1987 to 1989.

Rebonds consists of two movements: *Rebonds A* and *Rebonds B*. The movements can be played in either order and without interruption as indicated on the composer’s 1988 manuscript.²⁵ Sylvio Gualda premiered *Rebonds* in July 1988 at the Villa Medici in Rome.²⁶ The French music critic Jacques Lonchamp described the work as “an immense abstract ritual, a suite of movements and of hammerings without any folkloristic ‘contamination,’ pure music full of marvelously efflorescent rhythms, going beyond drama and tempest.”²⁷

Statement of the Problem

The rhythmic complexities and technically challenging drumming passages in *Rebonds* make this composition one of the most difficult works in solo percussion music. The literary search performed for this document revealed that interest in studying and performing solo percussion music expanded

²⁴ Ibid., 203.

²⁵ Iannis Xenakis, *Rebonds: Pour Percussion Solo* (Paris: Éditions Salabert, 1988).

²⁶ James Harley, *Xenakis: His life in music* (New York: Routledge, 2004), 192.

²⁷ Iannis Xenakis, *Rebonds: Pour Percussion Solo* (Paris: Éditions Salabert, 1988).

significantly during the last decade. But, few scholarly documents were found that specifically discuss pedagogy for solo percussion music. The search also identified many scholarly documents and articles about Xenakis and his methods of music composition. But, none were found that primarily emphasize percussion pedagogy for learning *Rebonds*.

Need for the Study

The rhythmic complexities and technically challenging drumming passages in *Rebonds* stand apart from those found in other solo percussion compositions. Consequently, percussionists need to acquire advanced techniques to successfully perform *Rebonds*. To address these advanced techniques, a practice guide was created as an educational tool for performers of *Rebonds*.

Purpose of the Study

This document provides a pedagogical study and performance analysis of *Rebonds*, a solo percussion work by Iannis Xenakis. *Rebonds* was chosen for a pedagogical study and performance analysis because the composition contains rhythmic complexities and technically challenging drumming passages. Furthermore, the work is currently in print and available for study and performance. Due to the standard instrumentation of *Rebonds*, instruments are more likely to be available for the percussionist's use. A practice guide was

created as an educational tool for performers of *Rebonds*. The practice guide identifies inherent technical challenges in *Rebonds* and provides solutions for addressing these advanced techniques through efficient practice.

Limitations of the Study

While several compositions for solo percussion were reviewed, research was confined to a single example of contemporary solo percussion music. Since existing resources related to *Rebonds* discuss the theoretical analysis, no attempt was made to discuss this aspect of the composition.

The review of Xenakis's percussion works was limited to the composer's all-percussion compositions. In regards to related literature on solo percussion music, the review was limited to published, original compositions for solo percussion. The practice guide created for this document is an educational tool for learning and performing *Rebonds*.

The bibliography includes other works of historical importance in addition to Xenakis's percussion works. Biographical references are limited to those relating to specific compositions mentioned in this document.

Design of the Study

This document provides a pedagogical study and performance analysis as a reference work to prepare *Rebonds* for performance. Information regarding the

general description of the composition was examined, including instrumentation and suggested instrument set-up. An errata was prepared and included that identifies five publisher editorial errors found during a comparative review of Xenakis's 1988 manuscript and the 1991 score edition.

A practice guide was created and includes the identification of technical challenges that arise during the learning process for *Rebonds*. The practice guide includes directions and exercises to address each identified technical challenge. These exercises were written to develop and improve advanced techniques necessary for performing *Rebonds*. Performance questions were written and included to aid performers in preparing *Rebonds* for performance.

Organization of the Study

Chapter II consists of a brief biographical sketch of Iannis Xenakis including an overview of the composer's all-percussion works. Significant emphasis was placed on a review of related literature pertaining to solo percussion music. Chapter III discusses instrumentation and set-up of *Rebonds* followed by an errata that identifies five publisher editorial errors found during a comparative review of Xenakis's 1988 manuscript and the 1991 score edition. A practice guide was created as an educational tool for performers of *Rebonds*. The practice guide is divided into three parts: 1) identification of technical challenges; 2) directions to overcome each identified technical challenge; and 3) specific exercises written

to develop and improve advanced techniques necessary for performing *Rebonds*. Performance questions were written and included to aid performers in preparing *Rebonds* for performance. Lastly, a summary and conclusion were prepared and recommendations are included for further research.

CHAPTER II

SURVEY OF RELATED LITERATURE

Biography

Iannis Xenakis (1922-2001), a Romanian-born Greek composer, engineer, architect, and music theorist, is known for a prolific compositional output that includes over one hundred thirty musical works for all sound media.²⁸ Early in life Xenakis fled his home country because of his involvement with the resistance of the communist-led National Liberation Front against the German occupation.²⁹ As a result, Xenakis spent most of his life in France where he worked as an architect in Le Corbusier's electronic music studio and studied music composition with Darius Milhaud and Olivier Messiaen.³⁰ Xenakis is among "the pioneering generation of composers who revolutionized 20th Century music after World War II."³¹ In addition, he was one of the first composers "to replace traditional musical thinking with radical new concepts of sound composition."³² Consequently, Xenakis profoundly influenced many young composers. His theories subscribe to the ancient Pythagorean doctrine that numbers (or the principles thereof) are the

²⁸ Iannis Xenakis, *Formalized Music: Thought and Mathematics in Music Revised Edition* (Hillsdale, NY: Pendragon Press, 1992).

²⁹ Peter Hoffmann, "Xenakis, Iannis," in *The New Grove Dictionary of Music and Musicians*, ed. S. Sadie and J. Tyrrell (London: Macmillan, 2001), xxvii, 606.

³⁰ Ibid.

³¹ Ibid., 605.

³² Ibid.

root of all things.³³ Stochastic music,³⁴ computer music, and mathematical and architectural methods inform Xenakis's music composition processes. Composing for orchestras enabled Xenakis to realize his conception of sound masses.³⁵

Xenakis's Percussion Works

As a pioneer of the post-war avante-garde movement, Xenakis wrote several percussion works. His first percussion composition, *Persephassa* (1969)³⁶, is scored for percussion sextet. *Les Percussions de Strasbourg* commissioned *Persephassa* for the first-ever Shiraz Festival (organized by the Empress of Iran) held at the historic desert site of Persepolis.³⁷ Each percussion part contains an array of skin, wood, metal, and stone instruments. The spatial relationship for each of the six percussion set-ups is very important to the aesthetic and "critical to

³³ Ellen Rennie Flint, "An Investigation of Real Time as Evidenced by the Structural and Formal Multiplicities in Iannis Xenakis' *Psappha*" (PhD diss., The University of Maryland, 1989), 1.

³⁴ A term implying an approach to composing music, based on sonic entities and compositional procedures, adapted from probability functions. James Harley, *His life in music* (New York: Routledge, 2004), 21.

³⁵ Peter Hoffmann, "Xenakis, Iannis," in *The New Grove Dictionary of Music and Musicians*, ed. S. Sadie and J. Tyrrell (London: Macmillan, 2001), xxvii, 605-613.

³⁶ Iannis Xenakis, *Persephassa: pour Six Percussionistes* (Paris: Edition Salabert, 1969).

³⁷ Robert Gluck, "The Shiraz Arts Festival: Western Avante-Garde Arts in 1970s Iran," *Leonardo Music Journal* 40, no. 1 (February 2007), <http://www.mitpressjournals.org/doi/pdf/10.1162/leon.2007.40.1.20> (accessed November 12, 2008).

the ultimate success of any performance.”³⁸ As an example, Xenakis specifies that percussion players should perform in a hexagonal ring surrounding the audience. As a result, performers and their instruments encapsulate the audience. During a performance of *Persephassa*, both audience members and performers can perceive they are amid a warzone, caught in the crossfire of gunshots, explosions, and air raid sirens. In 1987, well-known performer and educator Jan Williams introduced *Persephassa* in his article published in *Percussive Notes* stating:

Persephassa is a ‘massive’ work. This is obvious to anyone who has heard a live performance. By massive, I mean that its impact is both visceral and dramatic. Ambivalent listening is out of the question. From the opening tremolos, audiences are put on notice that they are in for an incredible journey. This work unfurls in a continuous yet apparently unsymmetrical way in its formal elements. The use of silence is particularly effective in delineating the formal structure. Energy builds unrelentingly until the masterfully composed, mercilessly slow accelerando which ends the piece.³⁹

Xenakis’s first composition for solo percussion is entitled

Ψ α π φ α: *Psappa: Percussion Solo*⁴⁰ and was written in 1975. This work was written for unspecified percussion instruments. In an interview with Simon Emmerson published in *Music and Musicians*, May 1976, Xenakis describes the sounds within *Psappa*. “The new piece is for percussion solo. It is a purely

³⁸ Jan Williams, “Iannis Xenakis, *Persephassa: An Introduction*,” *Percussive Notes* 25, no. 4 (Spring 1987): 11.

³⁹ *Ibid.*, 9.

⁴⁰ Iannis Xenakis, Ψ α π φ α: *Psappa: Percussion Solo* (Paris: Éditions Salabert, 1976).

rhythmical composition, which means that colour is used only to render more clearly the polyrhythmic construction.”⁴¹ Based on the composer’s explanation within the score, *Psappha* is scored for six groups of instruments, A through F. Each group consists of three instruments except group E that contains a single instrument. Instruments for group A through C are chosen from skin or wooden instruments and groups D through F are chosen from metallic instruments.⁴² Consequently, this allows performers to choose specific instruments.

On May 2, 1976, Sylvio Gualda premiered *Psappha* in London. *Psappha* had a profound effect on solo percussion music. As stated by Steven Schick:

Psappha, as we now know, is savage and frightening. The sheer loudness of it, the naked rhythms, the brutal mechanics of composition—the implications were staggering. It has been so widely played, taught, and discussed that it is very nearly a piece of classical music. There are even schools of thought about interpretative approaches. *Psappha* has become a principal model with which to compare all other percussion solos. It changed everything about how we listened to and played percussion music from *Zyklus* onward. In spite of differences among interpretive approaches and teaching strategies, understanding the material of *Psappha* remains a simple (if not easy) matter.⁴³

In 1978, Xenakis composed *Pléïades (Pluralities)* for *Les Percussions de Strasbourg*. This work is scored for six performers who play a variety of drums,

⁴¹ Simon Emmerson, “Xenakis Talks to Simon Emmerson,” *Music and Musicians* 24, no. 9 (May 1976): 24-26.

⁴² Iannis Xenakis, $\Psi \alpha \pi \varphi \alpha$: *Psappha: Percussion Solo* (Paris: Éditions Salabert, 1976).

⁴³ Steven Schick, *The Percussionist’s Art: Same Bed, Different Dreams* (Rochester, NY: University of Rochester Press, 2006), 193.

metals, and keyboards. “In this work, the percussionists are asked to build a sixxen, named for both the number of instruments required (six) and the composer’s last name (xen).”⁴⁴ These sixxens are specially constructed metallic instruments, each having nineteen bars, or “pitches,” not tuned to common equal temperament. Xenakis uses the sixxens in the *Metaux* and *Mélange* movements of the work. In Wilma Salisbury’s review of the United States premiere performance of *Pléiades* by the Oberlin Percussion Group, the writer states: “Precisely notated, the complex four-movement work builds in cumulative power through the intricate layering of rhythmic textures and the continuous shifting of subtle timbres.”⁴⁵

In 1989, Xenakis composed *Okho* for *Trio Le Cercle* scoring this work for three djembes (African hand drums). This work was premiered in Paris on October 20, 1989.⁴⁶ *Okho* was commissioned by the Festival d’Automne and was one of many commissions awarded in France that year to recognize the French Revolution bicentennial.⁴⁷ *Okho*, similar to *Pléiades*, is more rhythmically driven

⁴⁴ Brett Reed, “Building a Set of Sixxen,” *Percussive Notes* 41, no. 3 (June 2003): 48.

⁴⁵ Wilma Salisbury, “New Percussion Ensemble Work Premiered,” *Percussive Notes* 20, no. 2 (February 1982): 15.

⁴⁶ Peter Hoffmann, “Xenakis, Iannis,” in *The New Grove Dictionary of Music and Musicians*, ed. S. Sadie and J. Tyrrell (London: Macmillan, 2001), xxvii, 611.

⁴⁷ James Harley, *Xenakis: His life in music* (New York: Routledge, 2004), 193.

than Xenakis's earlier percussion works. Over the twenty-year interval from the creation of *Persephassa* to *Okho*,

Xenakis himself had also changed considerably. His early ideas about composition for percussion – the often brutal opposition of blocks of sound and psychologically shattering silences of *Psappha* and *Persephassa* – had given way to the more continuous, rhythmically driven music of *Pléiades*, *Okho*, and finally *Rebonds*.⁴⁸

Related Literature on Solo Percussion Music

John Cage composed the first work written for solo percussion. His 1956 opus *27'10.554" for a Percussionist* was composed for a soloist performing on four categories of percussion instruments: wood idiophones, metal idiophones, skin membranophones, and others. While the decision on instrumentation is left to the performer, Cage suggests that the “other” category consist of electronic devices, mechanical apparatuses, radios, and similar instruments. In addition, Cage encourages performers to use a wide variety of playing techniques and implements.⁴⁹

Douglas H. Nottingham's document on *27'10.554" for a Percussionist* is primarily dedicated to a chronology of the recording process of Cage's work that

⁴⁸ Steven Schick, *The Percussionist's Art: Same Bed, Different Dreams* (Rochester, NY: University of Rochester Press, 2006), 203.

⁴⁹ Douglas H. Nottingham, “A digital recording of two realizations of John Cage's "27'10.554" for a Percussionist"” (DMA diss., Arizona State University, 2001), 2. In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3031471; accessed October 26, 2008).

culminated in a live performance. This study addresses aesthetic and musical considerations that Nottingham discovered while interpreting Cage's graphically-notated score. Nottingham also discusses the importance of similar works of that time period including but not limited to *Zyklus Nr. 9* (1959) and *The King of Denmark* (1964).

Stuart W. Gerber's document is a comprehensive study on Karlheinz Stockhausen's solo percussion music including *Zyklus*, *Nasenflügeltanz* (1983), and *Komet* (1999).⁵⁰ Gerber's study created an interpretive guide to the aesthetic and technical demands required of the performer. In addition, Gerber indicates how performers can address these demands to create the best possible interpretation of Stockhausen's solo percussion music.

Patti J. Cudd's document consists of an analysis of four works for solo percussion. The following works, *The King of Denmark* by Morton Feldman, *27'10.554" for a Percussionist* by John Cage, *The Red Shoes* by Pamela Madsen, and *Four Passions* by Nathaniel Phillips are discussed. The compositions by Madsen and Phillips were commissioned for Cudd's dissertation recital while

⁵⁰ Stuart W. Gerber, "Karlheinz Stockhausen's solo percussion music: A comprehensive study" (D.M.A. diss., University of Cincinnati, 2003) . In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3121080; accessed November 9, 2008).

works by Feldman and Cage represent musical compositions of classic percussion repertoire.

With respect to *The King of Denmark*, Cudd addresses Feldman's inspiration for writing the composition. In addition, Cudd discusses instrument selection process, importance of varying playing techniques, and interpreting different symbols throughout the score. Cudd further explains the need for "experimentation on the part of the performer to discover the 'sonic world' of each instrument"⁵¹ and the need to "discover striking techniques which bring out more of the timbres of the instruments."⁵²

James Lambert's document on multiple percussion discusses the identification and cross-relationship of three categories of performance problems related to multiple-percussion performance: notation, instrument placement, and movement.⁵³ These problems are found in the works of Karlheinz Stockhausen (*Nr. 9 Zyklus*), Reginald Smith Brindle (*Orion M. 42*), Michael Colgrass (*Fantasy*

⁵¹ Patti J. Cudd, "A percussion module" (D.M.A. diss., University of California, San Diego, 1998), 7. In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 9839493; accessed October 28, 2008).

⁵² Ibid.

⁵³ James William Lambert, "Multiple Percussion Performance Problem as Illustrated In Five Different Works Composed by Stockhausen, Smith Brindle, Colgrass, Dahl, and Kraft Between 1959 and 1967" (D.M.A. diss., The University of Oklahoma, 1983). In *Dissertations & Theses @ University of Oklahoma* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 8324890; accessed October 30, 2008).

Variations), Ingolf Dahl (*Duettino Concertante*), and William Kraft (*Suite for Percussion*) that were collectively written between 1959 and 1967.

David P. Shively's document discusses works for solo percussion by Morton Feldman (*The King of Denmark*), Iannis Xenakis (*Psappha*), and John Cage (*Composed Improvisation for Snare Drum Alone*) in terms of their approaches to material indeterminacy. Shively further discusses the interpretive processes relevant to the realization of these three works for performance.⁵⁴

Other Resources on *Rebonds*

The survey performed for this document revealed numerous published scholarly articles written about *Rebonds*. William Longshore's document, "Reflections on the Preparation and Performance of Three Works for Contemporary Percussion", includes one chapter dedicated to *Rebonds*. This chapter details how *Rebonds* was introduced to Longshore including a discussion on his enthusiasm for learning the piece, as well as outlining instrumentation and the implement selection process. With respect to analysis, Longshore makes a

⁵⁴ David P. Shively, "Indeterminacy and interpretation: Three realizations" (D.M.A. diss., University of California, San Diego, 2001), 12-61. In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3077797; accessed November 7, 2008).

brief observation in regards to the five-note cycle in *Rebonds B* and the use of polyrhythms in *Rebonds A*.⁵⁵

James Harley's book, "Xenakis: His Life in Music", gives an overview of Xenakis's complete output. The book proceeds chronologically and presents the scope of Xenakis's compositional styles. Focus is given to the formal organization and structural outline of each work. Harley's formal analysis of *Rebonds* is specific but limited to only a portion of each movement.⁵⁶

Alyssa Smith's document, "An Examination of Notation in Selected Repertoire for Multiple Percussion", includes one chapter specifically dedicated to *Rebonds*. Smith lists instrumentation for each movement as listed in the 1991 score edition. Additionally, Smith juxtaposes the notational system Xenakis used for writing both *Psappha* and *Rebonds*.⁵⁷

Greg Beyer's article in *Percussive Notes*, "All is Number: Golden section in Xenakis' *Rebonds*", begins with a contention that Xenakis used the Golden

⁵⁵ William Terrell Longshore, "Reflections on the preparation and performance of three works for contemporary percussion" (D.M.A. diss., University of California, San Diego, 1999), 16-20. In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3001265; accessed November 8, 2008).

⁵⁶ James Harley, *Xenakis: His life in music* (New York: Routledge, 2004), 192-193.

⁵⁷ Alyssa Gretchen Smith, "An examination of notation in selected repertoire for multiple percussion" (D.M.A. diss., The Ohio State University, 2005), 23-49. In *Dissertations & Theses: Full Text* [database on-line], <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3182725; accessed September 8, 2008).

Section concept as a device to determine formal organization. Beyer continues with a brief biography discussing how Xenakis was introduced to the classical Greek concept of Golden Section and how Xenakis used the Golden Section in both movements of *Rebonds*.⁵⁸

Lee Ferguson's *duo Contour* website <<http://www.duocontour.org>> contains a single page of information pertaining to some performance practice issues in *Rebonds*, mostly in regards to material in *Rebonds B*. Specifically, Ferguson addresses a logistical issue pertaining to set-up of wood sounds (woodblocks) and offers suggestions on how to execute some music written for woodblocks. Ferguson provides a brief insight for grace-note figures that occur on the high bongo drum throughout *Rebonds B*. The website includes a picture of each issue addressed with respect to woodblocks.⁵⁹

Steven Schick's book, *The Percussionist's Art: Same Bed, Different Dreams*, includes a section dedicated to *Rebonds*. In addition to discussing compositional differences between *Psappha* and *Rebonds*, Schick draws a compositional comparison to Xenakis's *Okho*, a work written for three djembes. Schick reiterates *Rebonds* instrumentation and references a discrepancy between the 1988 manuscript legend and the 1991 score edition. Schick continues by

⁵⁸ Greg Beyer, "All is Number: Golden section in Xenakis' 'Rebonds'" *Percussive Notes* 43, no. 1 (February 2005): 40-50.

⁵⁹ Lee Ferguson, "Duo contour," <http://www.duocontour.org>.

discussing the formal arc of each movement and identifies specific moments in the movements to support his conclusions.⁶⁰

⁶⁰ Steven Schick, *The Percussionist's Art: Same Bed, Different Dreams* (Rochester, NY: University of Rochester Press, 2006), 203-213.

CHAPTER III

REBONDS: PEDAGOGICAL STUDY AND PERFORMANCE ANALYSIS

Introduction

Rebonds pour percussion solo by Iannis Xenakis was composed from 1987 to 1989 and was premiered by Sylvio Gualda in July 1988 at the Villa Medici in Rome.⁶¹ Xenakis wrote two works for solo percussion. *Rebonds* represents the second and final work written for solo percussion by the composer. *Rebonds* is a work in two movements, called *Rebonds A* and *Rebonds B*. The order in which the movements are to be played is free and can be decided by performers; either *A/B* or *B/A*. *Rebonds A* is centered around rhythm and unfolds through a gradual increase in density. *Rebonds B* is built upon repetition and variation. *Rebonds B* consists of a driving sixteenth-note pulse on the high bongo and an underlying five-note cycle articulated on the remaining drums.

Rebonds was written using the conventional five-line stave. Each instrument appearing in the work is mapped to a corresponding stave by Xenakis. In *Rebonds A*, one system of conventional notation is used to identify instruments and their placement on the staff. In *Rebonds B*, two systems of conventional notation are used to identify instruments and their placement on the staff. The additional staff in *Rebonds B* is used to notate woodblocks.

⁶¹ James Harley, *Xenakis: His life in music* (New York: Routledge, 2004), 192.

Rebonds is written for thirteen percussion instruments divided between two basic timbral groups – skins and woods. Instruments in the skin group are further divided among four instrument types: two bongos, one tumba, three tom-toms, and two large bass drums. Instruments in the wood group are divided into five registers of woodblocks. In the 1988 manuscript legend, Xenakis states that the scale represented by skin instruments and woodblocks extend over a very wide range.

Rebonds A is scored for skins instruments alone. The instrumentation of *Rebonds A* consists of two bongos, three tom-toms, and two large bass drums. In the 1988 manuscript legend, Xenakis lists only two tom-toms. This appears to be an oversight in the legend as Xenakis clearly writes music for three tom-toms in addition to bongos and bass drums.⁶² In the 1991 score edition, editor Patrick Butin clearly states proper instrumentation.

Rebonds B is scored for a combination of skins and woods. The instrumentation of *Rebonds B* consists of two bongos, one tumba (a large, single-headed, Afro-Cuban barrel drum), one tom-tom, one bass drum, and five woodblocks.

⁶² Steven Schick, *The Percussionist's Art: Same Bed, Different Dreams* (Rochester, NY: University of Rochester Press, 2006), 203.

The practice guide in this document was prepared and based on a specific instrumental set-up. The instrumental set-up used for the practice guide is given in figure 3.0. While several instrumental set-ups are possible, it is important to be aware of which instrumental set-up was used in creating this practice guide (see figure 3.0).



Figure 3.0 *Rebonds*: Instrumental set-up

Errata

Several errors were found in the written notation of the latest 1991 score edition. The following table lists each error found during a comparative review of the 1988 manuscript and the 1991 edition. The correct notation in the 1988 manuscript is juxtaposed with the incorrect notation in the 1991 score edition. Each error is accompanied by a brief description (see Table 3.0).






Measure Number	Beat & Partial	1988 Manuscript	1991 Edition	Description of error
16	2 e	tom 2	tom 3	Wrong drum notated
18	3			Inclusion of note on center line instead of rest
49	1 +	"et"	omitted	Missing information
59	4 e		omitted	Missing grace note
63	4			Inclusion of note on center line instead of rest

Table 3.0 *Rebonds B*: Errata

Practice Guide

The practice guide is the primary focus and product of the research effort in this document. Special attention was given to the process of learning *Rebonds*. Specifically, several technical challenges are identified that arise during the

learning process. The practice guide includes directions and exercises to address each identified technical challenge. These exercises were written to develop and improve advanced techniques necessary for performing *Rebonds*. These exercises were written using Sibelius (music notation software).

Rebonds B : Single marcato accent vs. double marcato accent

Two types of articulations are present in *Rebonds B*: single marcato accent [>] and double marcato accent [>̂]. Careful attention must be given to these contrasting articulations. As information pertaining to interpretations of articulations is omitted from the *Rebonds* score, a reference to *Psappha*, Xenakis's prior work for solo percussion, was examined. In *Psappha*, Xenakis clearly states how accents can be interpreted within a certain sequence or musical passage as follows:

1. louder, greater intensity
2. abrupt change in timbre
3. abrupt change of weight
4. addition of another sound played simultaneously
5. simultaneous combination of all preceding suggestions

Rebonds A : Single staccatissimo accent vs. double staccatissimo accent

Two types of articulations are present in *Rebonds A*: single staccatissimo accent [\vee] and double staccatissimo accent [$\vee\vee$]. Careful attention must be given to these contrasting articulations. As information pertaining to interpretations of articulations is omitted from the *Rebonds* score, a reference to *Psappha*, Xenakis's prior work for solo percussion, was examined. In *Psappha*, Xenakis clearly states how accents can be interpreted within a certain sequence or musical passage as follows:

1. louder, greater intensity
2. abrupt change in timbre
3. abrupt change of weight
4. addition of another sound played simultaneously
5. simultaneous combination of all preceding suggestions

The single staccatissimo accent [\vee] and double staccatissimo accent [$\vee\vee$] indicates that notes are to be played in a detached, separated, and distinct manner that affects the notated duration. This stylistic approach, achieved through increased stroke velocity and height, delineates the articulation, thus allowing more space between stroke preparations. This is especially effective at the

beginning of *Rebonds A* and will assist the performer in creating contrast to the single marcato accent [>] and double marcato accent [≫].

Rebonds B : High bongo pulse vs. five-note cycle

In *Rebonds B*, a few global decisions must be made before, or in conjunction with, determining an approach to high bongo grace-note figures. This movement consists primarily of a high bongo pulse juxtaposed by a slightly varied, melodic five-note cycle on the remaining drums. Performers need to consider and establish if one hand will primarily deliver the high bongo pulse while the other hand articulates the five-note cycle. In order to communicate these two contrasting ideas, the decision to dedicate each hand respectively is clear. Therefore, the right hand is dedicated to the high bongo pulse and the left hand is dedicated to the melodic five-note cycle. This global decision will inherently affect performers approach to high bongo grace-note figures.

Rebonds B : High bongo grace-note figures: Identification and Approach

In *Rebonds B*, technical challenges arise with approaching high bongo grace-note figures. These high bongo grace-note figures include: *divided drum* and *simultaneous drum*. *Divided drum* refers to high bongo grace-note figures occurring on sixteenth-note partials separately from a drum in the five-note cycle.

Simultaneous drum refers to high bongo grace-note figures occurring on sixteenth-note partials that correspond with a drum in the five-note cycle.

Several sticking methods are available to performers when addressing difficulties associated with *divided drum* and *simultaneous drum* high bongo grace-note figures. These sticking methods include: *right-hand drag*, *left-hand drag*, *consecutive right-hand*, and *alternate-hand*. Performers may implement only one sticking method, or may implement all sticking methods.

The author recommends using the *right-hand drag* (RD) and *left-hand drag* (LD) sticking methods when approaching *divided drum* high bongo grace-note figures. These two methods are technically less challenging and will aid performers in approaching *divided drum* high bongo grace-note figures.

Consequently, both the *consecutive right-hand* (CRD) and *alternate-hand* (AD) sticking methods have benefits for approaching *simultaneous drum* high bongo grace-note figures. The inherent sticking of these two methods allows faster left-hand stroke preparation towards the simultaneous drum in the five-note cycle.

The following *High Bongo Grace-note Figures Table* organizes high bongo grace-note figures according to their location in the music (measure number and beat placement within a measure) of *Rebonds B*. The table lists recommended sticking methods for specific occurrences of the *divided drum* and *simultaneous drum* high bongo grace-note figures. In addition, corresponding page numbers are included for each suggested exercise.

Table 3.1 *REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE (p. 1 of 5)*

Location in the music		Sticking Methods							
		Divided drum				Simultaneous drum			
		Right-hand		Left-hand		Consecutive right		Alternate-hand	
Measure Number	Beat	Exercise	Page #	Exercise	Page #	Exercise	Page #	Exercise	Page #
1	1					CRD5a	88	AD5a	95
1	3					CRD3a	86	AD3a	93
2	1	RD2a	39	LD2a	62				
2	3	RD4a	41	LD4a	64				
		RD6c	43	LD6c	66				
3	1	RD6a	43	LD6a	66				
3	3	RD6a	43	LD6a	66				
		RD5b	42	LD5b	65				
4	1					CRD6a	89	AD6a	96
4	3					CRD5a	88	AD5a	95
5	1					CRD4a	87	AD4a	94
5	3					CRD6a	89	AD6a	96
6	1	RD6c	43	LD6c	66				
6	2					CRD4d	87	AD4d	94
6	4					CRD6d	89	AD6d	96
7	2					CRD5d	88	AD5d	95
7	4					CRD4d	87	AD4d	94
9	3					CRD6b	89	AD6b	96
10	1	RD7b	44	LD7b	67				
10	3	RD2b	39	LD2b	62				
11	1					CRD3a	86	AD3a	93
11	3	RD6c	43	LD6c	66				
12	1	RD6b	43	LD6b	66				
		RD5c	42	LD5c	65				
12	2	RD2d	39	LD2d	62				
12	4	RD11a	48	LD11a	71				
		RD12c	49	LD12c	72				
13	2	RD2c	39	LD2c	62				
13	4	RD16c	53	LD16c	76				
14	2	RD14b	51	LD14b	74				
		RD11c	48	LD11c	71				
14	4	RD14a	51	LD14a	74				
		RD13b	50	LD13b	73				
15	2	RD16b	53	LD16b	76				
15	4	RD18a	55	LD18a	78				
		RD15c	52	LD15c	75				
16	2	RD17b	54	LD17b	77				

Table 3.2 *REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE* (p. 2 of 5)

Location in the music		Sticking Methods							
		Divided drum				Simultaneous drum			
		Right-hand		Left-hand		Consecutive right		Alternate-hand	
Measure Number	Beat	Exercise	Page #	Exercise	Page #	Exercise	Page #	Exercise	Page #
18	3	RD4a	41	LD4a	67				
19	1	RD6a	43	LD6a	69				
19	2					CRD4d	87	AD4d	94
20	1					CRD3a	86	AD3a	93
20	3					CRD5b	88	AD5b	95
21	1	RD16a	53	LD16a	76				
		RD18c	55	LD18c	78				
21	3	RD15b	52	LD15b	75				
22	1	RD17a	54	LD17a	77				
		RD18b	55	LD18b	78				
22	4	RD10a	47	LD10a	70				
		RD7c	44	LD7c	67				
23	2	RD18a	55	LD18a	78				
		RD17b	54	LD17b	77				
		RD18c	55	LD18c	78				
24	1	RD6a	43	LD6a	66				
24	3	RD6a	43	LD6a	66				
		RD5b	42	LD5b	65				
25	1	RD4a	41	LD4a	64				
25	3	RD3b	40	LD3b	63				
26	1	RD9a	46	LD9a	69				
		RD10b	57	LD10b	70				
26	4	RD6a	43	LD6a	66				
27	2	RD6a	43	LD6a	66				
		RD5b	42	LD5b	65				
27	4	RD3a	40	LD3a	63				
28	2	RD2a	39	LD2a	62				
28	3	RD10b	47	LD10b	70				
28	4	RD11a	48	LD11a	71				
		RD13c	50	LD13c	73				
29	1	RD18b	55	LD18b	78				
		RD17c	54	LD17c	77				
29	3	RD10a	47	LD10a	70				
		RD7b	44	LD7b	67				
29	4	RD12b	49	LD12b	72				
		RD14c	51	LD14c	74				
30	2	RD6b	43	LD6b	66				

Table 3.3 *REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE (p. 3 of 5)*

Location in the music		Sticking Methods							
		Divided drum				Simultaneous drum			
		Right-hand		Left-hand		Consecutive right		Alternate-hand	
Measure Number	Beat	Exercise	Page #	Exercise	Page #	Exercise	Page #	Exercise	Page #
30	4	RD6a	43	LD6a	66				
		RD5b	42	LD5b	65				
35	2					CRD5c	88	AD5c	95
35	4	RD14a	51	LD14a	74				
36	2					CRD3c	86	AD3c	93
36	4	RD7c	44	LD7c	67				
37	2	RD13a	50	LD13a	73				
		RD11b	48	LD11b	71				
37	4	RD11c*	48	LD11c*	71				
38	2	RD12a	49	LD12a	72				
		RD14b	51	LD14b	74				
		RD12c	49	LD12c	72				
38	4	RD11a	48	LD11a	71				
39	2	RD2a	39	LD2a	62				
39	3	RD15b	52	LD15b	75				
		RD18c	55	LD18c	78				
40	1	RD13b	50	LD13b	73				
		RD14c	51	LD14c	74				
40	3	RD7b	44	LD7b	67				
		RD8c	45	LD8c	68				
41	1	RD3b	40	LD3b	63				
41	2	RD11c	48	LD11c	71				
41	3					CRD4b	87	AD4b	94
41	4	RD7c	44	LD7c	67				
42	1	RD3b	40	LD3b	63				
42	2	RD10b	47	LD10b	70				
		RD9c	46	LD9c	69				
42	3	RD8a	45	LD8a	68				
		RD7c	44	LD7c	67				
42	4	RD3b	40	LD3b	63				
43	1	RD2a	39	LD2a	62				
		RD2d	39	LD2d	62				
43	2	RD14a	51	LD14a	74				
		RD13b	50	LD13b	73				
		RD11c	48	LD11c	71				
43	3	RD10a	47	LD10a	70				
		RD2d	39	LD2d	62				

Table 3.4 *REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE (p. 4 of 5)*

Location in the music		Sticking Methods							
		Divided drum				Simultaneous drum			
		Right-hand		Left-hand		Consecutive right		Alternate-hand	
Measure Number	Beat	Exercise	Page #	Exercise	Page #	Exercise	Page #	Exercise	Page #
43	4	RD7a	44	LD7a	67				
48	2	RD14a	51	LD14a	74				
		RD13c	50	LD13c	73				
48	3	RD16b	53	LD16b	76				
		RD18c	55	LD18c	78				
49	1	RD3a	40	LD3a	63				
49	2	RD6a	43	LD6a	66				
		RD5b	42	LD5b	65				
49	3	RD10b*	47	LD10b*	70				
49	4					CRD4c	87	AD4c	94
50	1	RD15b	52	LD15b	75				
50	2	RD18a	55	LD18a	78				
		RD17b	54	LD17b	77				
50	4	RD5a	42	LD5a	65				
		RD4c	41	LD4c	64				
51	1	RD7a	44	LD7a	67				
		RD9b	46	LD9b	69				
		RD10c	47	LD10c	70				
51	2	RD14c	51	LD14c	74				
51	3	RD11b	48	LD11b	71				
		RD13c	50	LD13c	73				
51	4	RD12a	49	LD12a	72				
		RD11b	48	LD11b	71				
		RD13c	50	LD13c	73				
52	1	RD12b	49	LD12b	72				
		RD14c	51	LD14c	74				
52	2	RD15b	52	LD15b	75				
		RD18c	55	LD18c	78				
52	3	RD17b	54	LD17b	77				
		RD15c	52	LD15c	75				
53	1	RD6a	43	LD6a	66				
		RD4b	41	LD4b	64				
		RD3c	40	LD3c	63				
53	2	RD5a	42	LD5a	65				
		RD6b	43	LD6b	66				
		RD17b	54	LD17b	77				
		RD18c	55	LD18c	78				

Table 3.5 *REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE (p. 5 of 5)*

Location in the music		Sticking Methods							
		Divided drum				Simultaneous drum			
		Right-hand		Left-hand		Consecutive right		Alternate-hand	
Measure Number	Beat	Exercise	Page #	Exercise	Page #	Exercise	Page #	Exercise	Page #
53	3	RD15a	52	LD15a	75				
		RD17b	54	LD17b	77				
53	4	RD2c	39	LD2c	62				
58	1	RD1d	37	LD1d	60				
58	4	RD1b	37	LD1b	60				
59	1	RD1b	37	LD1b	60				
59	2	RD1a	37	LD1a	60				
		RD1d	37	LD1d	60				
59	4	RD7a*	44	LD7a*	67				
		RD9b	46	LD9b	69				
60	1	RD8b	45	LD8b	68				
60	2	RD6a	43	LD6a	66				
		RD4b	41	LD4b	64				
		RD3c	40	LD3c	63				
60	4	RD5a	42	LD5a	65				
		RD17b	54	LD17b	77				
61	1	RD16a	53	LD16a	76				
		RD18c	55	LD18c	78				
61	3	RD1a	37	LD1a	60				
		RD1d	37	LD1d	60				
62	1	RD1a	37	LD1a	60				
62	2	RD1a	37	LD1a	60				
		RD1d	37	LD1d	60				
62	3	RD1d	37	LD1d	60				
62	4	RD1c	37	LD1c	60				
63	1	RD1d	37	LD1d	60				
63	3	RD1a	37	LD1a	60				
		RD1d	37	LD1d	60				
64	1	RD2a	39	LD2a	62				
		RD2d	39	LD2d	62				
64	3	RD2a	39	LD2a	62				
		RD2c	39	LD2c	62				
64	4	RD2a	39	LD2a	62				
		RD2d	39	LD2d	62				
65	1	RD2b	39	LD2b	62				
65	2	RD1a	37	LD1a	60				

* - Denotes slight variation from exercise to musical passage

Several exercises were written for each of the four sticking methods. Exercises are presented pedagogically to develop and improve advanced techniques associated with the different sticking methods. Each exercise should be repeated until the required advanced technique is achieved consistently and effortlessly. Rest measures have been inserted allowing performers to synthesize the passage perfectly in the mind. In addition, articulations are purposely omitted. Performers should apply these learned advanced techniques to corresponding musical passages in *Rebonds B*.

Right-hand drag sticking method (RD):

The *right-hand drag* sticking method requires performers to play two consecutive left-hand grace-note strokes. The primary note, or release immediately following the grace-note figure, is played using the right hand. This is similar to playing a right-hand “drag” rudiment (originally called “ruffs”). Use the *right-hand drag* (RD) sticking method for approaching *divided drum* high bongo grace-note figures.

Exercise RD1 isolates the high bongo grace-note figure on each sixteenth-note partial. Measure one of the first variation (Var. a) isolates a single stroke on beat one followed by the grace-note figure on beat two. This ordering allows performers to determine an approach to single strokes prior to playing grace-note figures. This process is repeated for three remaining variations while occurring on subsequent sixteenth-note partials of the beat.

Exercise RD1.5 isolates the high bongo grace-note figure preceded by a divided drum instance. Measure one of the first variation (Var. a) isolates a two-hand stroke on beat one followed by the grace-note figure on beat two. This ordering allows performers to determine an approach to two-hand strokes prior to playing grace-note figures. This process is repeated for three remaining variations while occurring on each possible divided drum.

For both exercises below (Ex. RD1 and Ex. RD1.5), careful attention should be given to the interpretation of grace-note figures while maintaining a

constant internal sixteenth-note pulse. Performers should strive for consistent interpretation, specifically with respect to a refined clarity of diction.

Exercise RD1:

Exercise RD1 consists of four variations (a, b, c, d) for a percussion ensemble. The tempo is marked as quarter note = 60. The instruments are 2 Bongos, Tumba, Tom, and Gr. C. Each variation shows a specific rhythmic pattern with right-hand (R) and left-hand (LLR) strokes. The patterns are as follows:

- Var. a:** R LLR
- Var. b:** R LLR
- Var. c:** R LLR
- Var. d:** R LLR

Exercise RD1.5:

Exercise RD1.5 consists of four variations (a, b, c, d) for a percussion ensemble. The tempo is marked as quarter note = 60. The instruments are 2 Bongos, Tumba, Tom, and Gr. C. Each variation includes a grace note and a specific instrument (low bongo, tumba, tom, or low bass drum). The patterns are as follows:

- Var. a - Grace note and low bongo:** R LLR
- Var. b - Grace note and tumba:** R LLR
- Var. c - Grace note and tom:** R LLR
- Var. d - Grace note and low bass drum:** R LLR

Exercise RD2 isolates the high bongo grace-note figure on each sixteenth-note partial. The first measure of each variation (a-e) presents the sixteenth-note pulse by subdividing beat one into four sixteenth notes. The second measure of each variation presents grace-note figures on each sixteenth-note partial. This ordering allows performers to establish a sixteenth-note pulse prior to playing grace-note figures on each sixteenth-note partial.

Exercise RD2:

Var. a - 1st partial grace note

♩ = 60

R R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note

R R R R R RLLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note

R R R R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note

R R R R R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Var. e - Beat 2 grace note

R R R R R R R RLLR

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD3 combines a high bongo grace-note figure occurring on the first sixteenth-note partial with a divided low bongo. The second measure of each variation presents the divided low bongo on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat one prior to playing the varied pattern of the divided low bongo.

Exercise RD3:

Var. a - 1st partial grace note and 2nd partial low bongo

♩ = 60

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 1st partial grace note and 3rd partial low bongo

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 1st partial grace note and 4th partial low bongo

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 1st partial grace note and beat 2 low bongo

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD4 combines a high bongo grace-note figure occurring on the first sixteenth-note partial with a divided tumba. The second measure of each variation presents the divided tumba on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat one prior to playing the varied pattern of the divided tumba.

Exercise RD4:

Var. a - 1st partial grace note and 2nd partial tumba

♩ = 60

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 1st partial grace note and 3rd partial tumba

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 1st partial grace note and 4th partial tumba

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 1st partial grace note and beat 2 tumba

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD5 combines a high bongo grace-note figure occurring on the first sixteenth-note partial with a divided tom. The second measure of each variation presents the divided tom on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat one prior to playing the varied pattern of the divided tom.

Exercise RD5:

Var. a - 1st partial grace note and 2nd partial tom

♩ = 60

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 1st partial grace note and 3rd partial tom

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 1st partial grace note and 4th partial tom

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 1st partial grace note and beat 2 tom

LLR R R R R LLR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD6 combines a high bongo grace-note figure occurring on the first sixteenth-note partial with a divided low bass drum. The second measure of each variation presents the divided low bass drum on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat one prior to playing the varied pattern of the divided low bass drum.

Exercise RD6:

Var. a - 1st partial grace note and 2nd partial low bass drum

♩ = 60
 LLR R R R R LLR R R R R

2 Bongos
 Tumba
 Tom
 Gr. C.

Var. b - 1st partial grace note and 3rd partial low bass drum

LLR R R R R LLR R R R R

2 Bongos
 Tumba
 Tom
 Gr. C.

Var. c - 1st partial grace note and 4th partial low bass drum

LLR R R R R LLR R R R R

2 Bongos
 Tumba
 Tom
 Gr. C.

Var. d - 1st partial grace note and beat 2 low bass drum

LLR R R R R LLR R R R R

2 Bongos
 Tumba
 Tom
 Gr. C.

Exercise RD7 combines a high bongo grace-note figure occurring on the second sixteenth-note partial with a divided low bongo. The second measure of each variation presents the divided low bongo on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the second sixteenth-note partial prior to playing the varied pattern of the divided low bongo.

Exercise RD7:

Var. a - 2nd partial grace note and 1st partial low bongo

♩ = 60

RLLR R R R RLLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note and 3rd partial low bongo

RLLR R R R RLLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 2nd partial grace note and 4th partial low bongo

RLLR R R R RLLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 2nd partial grace note and beat 2 low bongo

RLLR R R R RLLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD8 combines a high bongo grace-note figure occurring on the second sixteenth-note partial with a divided tumba. The second measure of each variation presents the divided tumba on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the second sixteenth-note partial prior to playing the varied pattern of the divided tumba.

Exercise RD8:

Var. a - 2nd partial grace note and 1st partial tumba

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R LLR R R R R LLR R R R

Var. b - 2nd partial grace note and 3rd partial tumba

R LLR R R R R LLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 2nd partial grace note and 4th partial tumba

R LLR R R R R LLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 2nd partial grace note and beat 2 tumba

R LLR R R R R LLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD9 combines a high bongo grace-note figure occurring on the second sixteenth-note partial with a divided tom. The second measure of each variation presents the divided tom on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the second sixteenth-note partial prior to playing the varied pattern of the divided tom.

Exercise RD9:

Var. a - 2nd partial grace note and 1st partial tom

♩ = 60

R LLR R R R R R LLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note and 3rd partial tom

R LLR R R R R R LLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 2nd partial grace note and 4th partial tom

R LLR R R R R R LLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 2nd partial grace note and beat 2 tom

R LLR R R R R R LLR R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD10 combines a high bongo grace-note figure occurring on the second sixteenth-note partial with a divided low bass drum. The second measure of each variation presents the divided low bass drum on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the second sixteenth-note partial prior to playing the varied pattern of the divided low bass drum.

Exercise RD10:

The image displays four variations of Exercise RD10, each consisting of a musical staff for 2 Bongos, Tumba, Tom, and Gr. C. The tempo is marked as ♩ = 60. Each variation includes a rhythmic notation for the right hand (R) and left hand (L) on the bongos, and a specific low bass drum pattern on the Tumba. The variations are:

- Var. a - 2nd partial grace note and 1st partial low bass drum**: The low bass drum pattern is on the first partial of the second sixteenth-note partial.
- Var. b - 2nd partial grace note and 3rd partial low bass drum**: The low bass drum pattern is on the third partial of the second sixteenth-note partial.
- Var. c - 2nd partial grace note and 4th partial low bass drum**: The low bass drum pattern is on the fourth partial of the second sixteenth-note partial.
- Var. d - 2nd partial grace note and beat 2 low bass drum**: The low bass drum pattern is on the second beat of the measure.

Exercise RD11 combines a high bongo grace-note figure occurring on the third sixteenth-note partial with a divided low bongo. The second measure of each variation presents the divided low bongo on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the third sixteenth-note partial prior to playing the varied pattern of the divided low bongo.

Exercise RD11:

Var. a - 3rd partial grace note and 1st partial low bongo

♩ = 60

R RLLR R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 3rd partial grace note and 2nd partial low bongo

R RLLR R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note and 4th partial low bongo

R RLLR R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 3rd partial grace note and beat 2 low bongo

R RLLR R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD12 combines a high bongo grace-note figure occurring on the third sixteenth-note partial with a divided tumba. The second measure of each variation presents the divided tumba on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the third sixteenth-note partial prior to playing the varied pattern of the divided tumba.

Exercise RD12:

Var. a - 3rd partial grace note and 1st partial tumba

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R RLLR R R R RLLR R R

Var. b - 3rd partial grace note and 2nd partial tumba

R RLLR R R R R LLR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note and 4th partial tumba

R RLLR R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 3rd partial grace note and beat 2 tumba

R RLLR R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD13 combines a high bongo grace-note figure occurring on the third sixteenth-note partial with a divided tom. The second measure of each variation presents the divided tom on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the third sixteenth-note partial prior to playing the varied pattern of the divided tom.

Exercise RD13:

Var. a - 3rd partial grace note and 1st partial tom

♩ = 60

R RLLR R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 3rd partial grace note and 2nd partial tom

R RLLR R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note and 4th partial tom

R RLLR R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 3rd partial grace note and beat 2 tom

R RLLR R R R RLLR R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD14 combines a high bongo grace-note figure occurring on the third sixteenth-note partial with a divided low bass drum. The second measure of each variation presents the divided low bass drum on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the third sixteenth-note partial prior to playing the varied pattern of the divided bass drum.

Exercise RD14:

Var. a - 3rd partial grace note and 1st partial low bass drum

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R RLLR R R R RLLR R R

L

Var. b - 3rd partial grace note and 2nd partial low bass drum

R RLLR R R R RLLR R R

L

Var. c - 3rd partial grace note and 4th partial low bass drum

R RLLR R R R RLLR R R

L

Var. d - 3rd partial grace note and beat 2 low bass drum

R RLLR R R R RLLR R R

L

Exercise RD15 combines a high bongo grace-note figure occurring on the fourth sixteenth-note partial with a divided low bongo. The second measure of each variation presents the divided low bongo on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the fourth sixteenth-note partial prior to playing the varied pattern of the divided low bongo.

Exercise RD15:

Var. a - 4th partial grace note and 1st partial low bongo

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R R RLLR R R R RLLR R

Var. b - 4th partial grace note and 2nd partial low bongo

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 4th partial grace note and 3rd partial low bongo

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and beat 2 low bongo

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD16 combines a high bongo grace-note figure occurring on the fourth sixteenth-note partial with a divided tumba. The second measure of each variation presents the divided tumba on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the fourth sixteenth-note partial prior to playing the varied pattern of the divided tumba.

Exercise RD16:

Var. a - 4th partial grace note and 1st partial tumba

$\text{♩} = 60$

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 4th partial grace note and 2nd partial tumba

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 4th partial grace note and 3rd partial tumba

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and beat 2 tumba

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD17 combines a high bongo grace-note figure occurring on the fourth sixteenth-note partial with a divided tom. The second measure of each variation presents the divided tom on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the fourth sixteenth-note partial prior to playing the varied pattern of the divided tom.

Exercise RD17:

Var. a - 4th partial grace note and 1st partial tom

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R R RLLR R R R RLLR R

Var. b - 4th partial grace note and 2nd partial tom

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 4th partial grace note and 3rd partial tom

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and beat 2 tom

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD18 combines a high bongo grace-note figure occurring on the fourth sixteenth-note partial with a divided low bass drum. The second measure of each variation presents the divided low bass drum on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the fourth sixteenth-note partial prior to playing the varied pattern of the divided low bass drum.

Exercise RD18:

Var. a - 4th partial grace note and 1st partial low bass drum

♩ = 60

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

L

Var. b - 4th partial grace note and 2nd partial low bass drum

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

L

Var. c - 4th partial grace note and 3rd partial low bass drum

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

L

Var. d - 4th partial grace note and beat 2 low bass drum

R R RLLR R R R RLLR R

2 Bongos
Tumba
Tom
Gr. C.

L

Exercise RD19 combines a high bongo grace-note figure occurring on beat two with a divided low bongo. The second measure of each variation presents the divided low bongo on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat two prior to playing the varied pattern of the divided low bongo.

Exercise RD19:

Var. a - Beat 2 grace note and 1st partial low bongo

♩ = 60

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Var. b - Beat 2 grace note and 2nd partial low bongo

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Var. c - Beat 2 grace note and 3rd partial low bongo

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Var. d - Beat 2 grace note and 4th partial low bongo

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD20 combines a high bongo grace-note figure occurring on beat two with a divided tumba. The second measure of each variation presents the divided tumba on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat two prior to playing the varied pattern of the divided tumba.

Exercise RD20:

Var. a - Beat 2 grace note and 1st partial tumba

♩ = 60

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Var. b - Beat 2 grace note and 2nd partial tumba

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Var. c - Beat 2 grace note and 3rd partial tumba

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Var. d - Beat 2 grace note and 4th partial tumba

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD21 combines a high bongo grace-note figure occurring on beat two with a divided tom. The second measure of each variation presents the divided tom on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat two prior to playing the varied pattern of the divided tom.

Exercise RD21:

Var. a - Beat 2 grace note and 1st partial tom

♩ = 60

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Var. b - Beat 2 grace note and 2nd partial tom

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Var. c - Beat 2 grace note and 3rd partial tom

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Var. d - Beat 2 grace note and 4th partial tom

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

Exercise RD22 combines a high bongo grace-note figure occurring on beat two with a divided low bass drum. The second measure of each variation presents the divided low bass drum on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat two prior to playing the varied pattern of the divided low bass drum.

Exercise RD22:

Var. a - Beat 2 grace note and 1st partial low bass drum

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R R R R LLR R R R R LLR

L

Var. b - Beat 2 grace note and 2nd partial low bass drum

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

L

Var. c - Beat 2 grace note and 3rd partial low bass drum

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

L

Var. d - Beat 2 grace note and 4th partial low bass drum

R R R R LLR R R R R LLR

2 Bongos
Tumba
Tom
Gr. C.

L

Left-hand drag sticking method (LD):

The *left-hand drag* sticking method requires performers to play two consecutive grace-note strokes on the right hand. The primary note, or the release immediately following the grace-note figure, is played using the left hand. This is similar to playing a left-hand “drag” rudiment (originally called “ruffs”). Use the *left-hand drag* (LD) sticking method for approaching *simultaneous drum* high bongo grace-note figures.

Exercise LD1 isolates the high bongo grace-note figure on each sixteenth-note partial. Measure one of the first variation (Var. a) isolates a single stroke on beat one followed by the grace-note figure on beat two. This ordering allows performers to determine an approach to single strokes prior to playing grace-note figures. This process is repeated for three remaining variations while occurring on subsequent sixteenth-note partials of the beat.

Exercise LD1.5 isolates the high bongo grace-note figure preceded by a divided drum instance. Measure one of the first variation (Var. a) isolates a two-hand stroke on beat one followed by the grace-note figure on beat two. This ordering allows performers to determine an approach to two-hand strokes prior to playing grace-note figures. This process is repeated for three remaining variations while occurring on each possible divided drum.

For both exercises below (Ex. LD1 and Ex. LD1.5), careful attention should be given to the interpretation of grace-note figures while maintaining a

constant internal sixteenth-note pulse. Performers should strive for consistent interpretation, specifically with respect to a refined clarity of diction.

Exercise LD1:

Exercise LD1 musical notation. Tempo: $\text{♩} = 60$. Variations: Var. a, Var. b, Var. c, Var. d. Instruments: 2 Bongos, Tumba, Tom, Gr. C. Hand assignments: L, RR, L.

Exercise LD1.5:

Exercise LD1.5 musical notation. Tempo: $\text{♩} = 60$. Variations: Var. a - Grace note and low bongo, Var. b - Grace note and tumba, Var. c - Grace note and tom, Var. d - Grace note and low bass drum. Instruments: 2 Bongos, Tumba, Tom, Gr. C. Hand assignments: R, RR, L.

Exercise LD2 isolates the high bongo grace-note figure on each sixteenth-note partial. The first measure of each variation (a-e) presents the sixteenth-note pulse by subdividing beat one into four sixteenth notes. The second measure of each variation presents grace-note figures on each sixteenth-note partial. This ordering allows performers to establish a sixteenth-note pulse prior to playing grace-note figures on each sixteenth-note partial.

Exercise LD2:

Var. a - 1st partial grace note

♩ = 60

L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note

R L R R R RRR L R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note

R R L R R R RRRL R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note

R R R L R R R RRRL R

2 Bongos
Tumba
Tom
Gr. C.

Var. e - Beat 2 grace note

R R R R L R R R RRRL

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD3 combines a high bongo grace-note figure occurring on the first sixteenth-note partial with a divided low bongo. The second measure of each variation presents the divided low bongo on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat one prior to playing the varied pattern of the divided low bongo.

Exercise LD3:

Var. a - 1st partial grace note and 2nd partial low bongo

♩ = 60

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 1st partial grace note and 3rd partial low bongo

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 1st partial grace note and 4th partial low bongo

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 1st partial grace note and beat 2 low bongo

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD4 combines a high bongo grace-note figure occurring on the first sixteenth-note partial with a divided tumba. The second measure of each variation presents the divided tumba on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat one prior to playing the varied pattern of the divided tumba.

Exercise LD4:

Var. a - 1st partial grace note and 2nd partial tumba

♩ = 60

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 1st partial grace note and 3rd partial tumba

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 1st partial grace note and 4th partial tumba

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 1st partial grace note and beat 2 tumba

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD5 combines a high bongo grace-note figure occurring on the first sixteenth-note partial with a divided tom. The second measure of each variation presents the divided tom on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat one prior to playing the varied pattern of the divided tom.

Exercise LD5:

Var. a - 1st partial grace note and 2nd partial tom

♩ = 60

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 1st partial grace note and 3rd partial tom

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 1st partial grace note and 4th partial tom

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 1st partial grace note and beat 2 tom

RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD6 combines a high bongo grace-note figure occurring on the first sixteenth-note partial with a divided low bass drum. The second measure of each variation presents the divided low bass drum on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat one prior to playing the varied pattern of the divided low bass drum.

Exercise LD6:

$\text{♩} = 60$

Var. a - 1st partial grace note and 2nd partial low bass drum
 RR L R R R R RR L R R R R

Var. b - 1st partial grace note and 3rd partial low bass drum
 RR L R R R R RR L R R R R

Var. c - 1st partial grace note and 4th partial low bass drum
 RR L R R R R RR L R R R R

Var. d - 1st partial grace note and beat 2 low bass drum
 RR L R R R R RR L R R R R

2 Bongos
Tumba
Tom
Gr. C.

2 Bongos
Tumba
Tom
Gr. C.

2 Bongos
Tumba
Tom
Gr. C.

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD7 combines a high bongo grace-note figure occurring on the second sixteenth-note partial with a divided low bongo. The second measure of each variation presents the divided low bongo on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the second sixteenth-note partial prior to playing the varied pattern of the divided low bongo.

Exercise LD7:

Var. a - 2nd partial grace note and 1st partial low bongo

♩ = 60

R R R L R R R R R R R L R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note and 3rd partial low bongo

R R R L R R R R R R R L R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 2nd partial grace note and 4th partial low bongo

R R R L R R R R R R R L R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 2nd partial grace note and beat 2 low bongo

R R R L R R R R R R R L R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD8 combines a high bongo grace-note figure occurring on the second sixteenth-note partial with a divided tumba. The second measure of each variation presents the divided tumba on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the second sixteenth-note partial prior to playing the varied pattern of the divided tumba.

Exercise LD8:

Var. a - 2nd partial grace note and 1st partial tumba

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note and 3rd partial tumba

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 2nd partial grace note and 4th partial tumba

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 2nd partial grace note and beat 2 tumba

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD9 combines a high bongo grace-note figure occurring on the second sixteenth-note partial with a divided tom. The second measure of each variation presents the divided tom on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the second sixteenth-note partial prior to playing the varied pattern of the divided tom.

Exercise LD9:

Var. a - 2nd partial grace note and 1st partial tom

♩ = 60

R R R L R R R R R R R L R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note and 3rd partial tom

R R R L R R R R R R R L R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 2nd partial grace note and 4th partial tom

R R R L R R R R R R R L R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 2nd partial grace note and beat 2 tom

R R R L R R R R R R R L R R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD10 combines a high bongo grace-note figure occurring on the second sixteenth-note partial with a divided low bass drum. The second measure of each variation presents the divided low bass drum on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the second sixteenth-note partial prior to playing the varied pattern of the divided low bass drum.

Exercise LD10:

Var. a - 2nd partial grace note and 1st partial low bass drum

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R R R L R R R R R R R L R R R

Var. b - 2nd partial grace note and 3rd partial low bass drum

2 Bongos
Tumba
Tom
Gr. C.

R R R L R R R R R R R L R R R

Var. c - 2nd partial grace note and 4th partial low bass drum

2 Bongos
Tumba
Tom
Gr. C.

R R R L R R R R R R R L R R R

Var. d - 2nd partial grace note and beat 2 low bass drum

2 Bongos
Tumba
Tom
Gr. C.

R R R L R R R R R R R L R R R

Exercise LD11 combines a high bongo grace-note figure occurring on the third sixteenth-note partial with a divided low bongo. The second measure of each variation presents the divided low bongo on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the third sixteenth-note partial prior to playing the varied pattern of the divided low bongo.

Exercise LD11:

Var. a - 3rd partial grace note and 1st partial low bongo

♩ = 60

R RRR L R R R RRR L R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 3rd partial grace note and 2nd partial low bongo

R RRR L R R R RRR L R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note and 4th partial low bongo

R RRR L R R R RRR L R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 3rd partial grace note and beat 2 low bongo

R RRR L R R R RRR L R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD12 combines a high bongo grace-note figure occurring on the third sixteenth-note partial with a divided tumba. The second measure of each variation presents the divided tumba on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the third sixteenth-note partial prior to playing the varied pattern of the divided tumba.

Exercise LD12:

Var. a - 3rd partial grace note and 1st partial tumba

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R RRR L R R R RRR L R R

Var. b - 3rd partial grace note and 2nd partial tumba

R RRR L R R R R RRR L R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note and 4th partial tumba

R RRR L R R R RRR L R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 3rd partial grace note and beat 2 tumba

R RRR L R R R RRR L R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD13 combines a high bongo grace-note figure occurring on the third sixteenth-note partial with a divided tom. The second measure of each variation presents the divided tom on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the third sixteenth-note partial prior to playing the varied pattern of the divided tom.

Exercise LD13:

Var. a - 3rd partial grace note and 1st partial tom

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R RRR L R R R RRR L R R

Var. b - 3rd partial grace note and 2nd partial tom

2 Bongos
Tumba
Tom
Gr. C.

R RRR L R R R RRR L R R

Var. c - 3rd partial grace note and 4th partial tom

2 Bongos
Tumba
Tom
Gr. C.

R RRR L R R R RRR L R R

Var. d - 3rd partial grace note and beat 2 tom

2 Bongos
Tumba
Tom
Gr. C.

R RRR L R R R RRR L R R

Exercise LD14 combines a high bongo grace-note figure occurring on the third sixteenth-note partial with a divided low bass drum. The second measure of each variation presents the divided low bass drum on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the third sixteenth-note partial prior to playing the varied pattern of the divided bass drum.

Exercise LD14:

Var. a - 3rd partial grace note and 1st partial low bass drum

$\text{♩} = 60$

2 Bongos
Tumba
Tom
Gr. C.

R RRR L R R R RRR L R R

Var. b - 3rd partial grace note and 2nd partial low bass drum

R RRR L R R R RRR L R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note and 4th partial low bass drum

R RRR L R R R RRR L R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 3rd partial grace note and beat 2 low bass drum

R RRR L R R R RRR L R R

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD15 combines a high bongo grace-note figure occurring on the fourth sixteenth-note partial with a divided low bongo. The second measure of each variation presents the divided low bongo on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the fourth sixteenth-note partial prior to playing the varied pattern of the divided low bongo.

Exercise LD15:

Var. a - 4th partial grace note and 1st partial low bongo

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 4th partial grace note and 2nd partial low bongo

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 4th partial grace note and 3rd partial low bongo

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and beat 2 low bongo

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD16 combines a high bongo grace-note figure occurring on the fourth sixteenth-note partial with a divided tumba. The second measure of each variation presents the divided tumba on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the fourth sixteenth-note partial prior to playing the varied pattern of the divided tumba.

Exercise LD16:

Var. a - 4th partial grace note and 1st partial tumba

$\text{♩} = 60$

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 4th partial grace note and 2nd partial tumba

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 4th partial grace note and 3rd partial tumba

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and beat 2 tumba

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD17 combines a high bongo grace-note figure occurring on the fourth sixteenth-note partial with a divided tom. The second measure of each variation presents the divided tom on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the fourth sixteenth-note partial prior to playing the varied pattern of the divided tom.

Exercise LD17:

Var. a - 4th partial grace note and 1st partial tom

$\text{♩} = 60$

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 4th partial grace note and 2nd partial tom

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 4th partial grace note and 3rd partial tom

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and beat 2 tom

2 Bongos
Tumba
Tom
Gr. C.

Detailed description of the musical notation: The exercise consists of four variations, each presented as a two-measure phrase. The tempo is marked as quarter note = 60. Each variation is written for four parts: 2 Bongos, Tumba, Tom, and Gr. C. The notation uses a common time signature (C) and a 4/4 time signature. The first measure of each variation features a grace-note figure on the fourth sixteenth-note partial of the first sixteenth-note partial, followed by a divided tom pattern. The second measure features a varied pattern of the divided tom. The variations are: Var. a - 4th partial grace note and 1st partial tom; Var. b - 4th partial grace note and 2nd partial tom; Var. c - 4th partial grace note and 3rd partial tom; Var. d - 4th partial grace note and beat 2 tom. The notation includes rhythmic patterns with grace notes and specific drum sounds indicated by 'R' and 'L' above notes.

Exercise LD18 combines a high bongo grace-note figure occurring on the fourth sixteenth-note partial with a divided low bass drum. The second measure of each variation presents the divided low bass drum on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on the fourth sixteenth-note partial prior to playing the varied pattern of the divided low bass drum.

Exercise LD18:

Var. a - 4th partial grace note and 1st partial low bass drum

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R R RRR L R R R RRR L R

Var. b - 4th partial grace note and 2nd partial low bass drum

R R RRR L R R R RRR L R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 4th partial grace note and 3rd partial low bass drum

R R RRR L R R R RRR L R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and beat 2 low bass drum

R R RRR L R R R RRR L R

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD19 combines a high bongo grace-note figure occurring on beat two with a divided low bongo. The second measure of each variation presents the divided low bongo on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat two prior to playing the varied pattern of the divided low bongo.

Exercise LD19:

Var. a - Beat 2 grace note and 1st partial low bongo

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

Var. b - Beat 2 grace note and 2nd partial low bongo

2 Bongos
Tumba
Tom
Gr. C.

Var. c - Beat 2 grace note and 3rd partial low bongo

2 Bongos
Tumba
Tom
Gr. C.

Var. d - Beat 2 grace note and 4th partial low bongo

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD20 combines a high bongo grace-note figure occurring on beat two with a divided tumba. The second measure of each variation presents the divided tumba on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat two prior to playing the varied pattern of the divided tumba.

Exercise LD20:

Var. a - Beat 2 grace note and 1st partial tumba
 Tempo: ♩ = 60
 Rhythmic notation: R R R RRR L R R R RRR L

Var. b - Beat 2 grace note and 2nd partial tumba
 Rhythmic notation: R R R RRR L R R R RRR L

Var. c - Beat 2 grace note and 3rd partial tumba
 Rhythmic notation: R R R RRR L R R R RRR L

Var. d - Beat 2 grace note and 4th partial tumba
 Rhythmic notation: R R R RRR L R R R RRR L

Staff labels: 2 Bongos, Tumba, Tom, Gr. C.

Exercise LD21 combines a high bongo grace-note figure occurring on beat two with a divided tom. The second measure of each variation presents the divided tom on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat two prior to playing the varied pattern of the divided tom.

Exercise LD21:

Var. a - Beat 2 grace note and 1st partial tom

♩ = 60

R R R RRR L R R R RRR L

2 Bongos
Tumba
Tom
Gr. C.

Var. b - Beat 2 grace note and 2nd partial tom

R R R RRR L R R R RRR L

2 Bongos
Tumba
Tom
Gr. C.

Var. c - Beat 2 grace note and 3rd partial tom

R R R RRR L R R R RRR L

2 Bongos
Tumba
Tom
Gr. C.

Var. d - Beat 2 grace note and 4th partial tom

R R R RRR L R R R RRR L

2 Bongos
Tumba
Tom
Gr. C.

Exercise LD22 combines a high bongo grace-note figure occurring on beat two with a divided low bass drum. The second measure of each variation presents the divided low bass drum on each sixteenth-note partial within a divided drum musical passage. This ordering allows performers to establish a sixteenth-note pulse with a grace-note figure on beat two prior to playing the varied pattern of the divided low bass drum.

Exercise LD22:

Var. a - Beat 2 grace note and 1st partial low bass drum

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R R R RRR L R R R RRR L

Var. b - Beat 2 grace note and 2nd partial low bass drum

R R R RRR L R R R RRR L

2 Bongos
Tumba
Tom
Gr. C.

Var. c - Beat 2 grace note and 3rd partial low bass drum

R R R RRR L R R R RRR L

2 Bongos
Tumba
Tom
Gr. C.

Var. d - Beat 2 grace note and 4th partial low bass drum

R R R RRR L R R R RRR L

2 Bongos
Tumba
Tom
Gr. C.

Consecutive right-hand drag sticking method (CRD):

The *consecutive right-hand drag* sticking method requires performers to play three consecutive right-hand strokes. Specifically, two right-hand strokes for the grace note followed by a final and third stroke representing the primary note on the downbeat. Use the *consecutive right-hand drag* (CRD) sticking method for approaching *simultaneous drum* high bongo grace-note figures.

Exercise CRD1 isolates the high bongo grace-note figure on each sixteenth-note partial. Measure one of the first variation (Var. a) isolates a single stroke on beat one followed by the grace-note figure on beat two. This ordering allows performers to determine an approach to single strokes prior to playing grace-note figures. This process is repeated for three remaining variations with each occurring on subsequent sixteenth-note partials of the beat.

Exercise CRD1.5 isolates the high bongo grace-note figure preceded by a divided drum instance. Measure one of the first variation (Var. a) isolates a two-hand stroke on beat one followed by the grace-note figure on beat two. This ordering allows performers to determine an approach to two-hand strokes prior to playing grace-note figures. This process is repeated for three remaining variations with each occurring on each possible divided drum.

For both exercises below (Ex. CRD1 and Ex. CRD1.5), careful attention should be given to the interpretation of grace-note figures while maintaining a

constant internal sixteenth-note pulse. Performers should strive for consistent interpretation, specifically with respect to a refined clarity of diction.

Exercise CRD1:

Exercise CRD1 musical notation. Tempo: ♩ = 60. Variations: Var. a, Var. b, Var. c, Var. d. Instruments: 2 Bongos, Tumba, Tom, Gr. C. The notation shows rhythmic patterns for the right hand (R) and left hand (L) across four variations.

Exercise CRD1.5:

Exercise CRD1.5 musical notation. Tempo: ♩ = 60. Variations: Var. a - Grace note and low bongo, Var. b - Grace note and tom, Var. c - Grace note and tumba, Var. d - Grace note and low bass drum. Instruments: 2 Bongos, Tumba, Tom, Gr. C. The notation shows rhythmic patterns with grace notes and specific instrument assignments for the left hand (L).

Exercise CRD2 isolates the high bongo grace-note figure on each sixteenth-note partial. The first measure of each variation (a-e) presents the sixteenth-note pulse by subdividing beat one into four sixteenth notes. The second measure of each variation presents grace-note figures on each sixteenth-note partial. This ordering allows performers to establish a sixteenth-note pulse prior to playing grace-note figures on each sixteenth-note partial.

Exercise CRD2:

Var. a - 1st partial grace note

$\text{♩} = 60$

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note

2 Bongos
Tumba
Tom
Gr. C.

Var. e - Beat 2 grace note

2 Bongos
Tumba
Tom
Gr. C.

Exercise CRD3 combines a high bongo grace-note figure with a simultaneous low bongo. The first measure of each variation presents sixteenth notes in the right hand and the low bongo in the left hand on each sixteenth-note partial. The second measure of each variation combines the grace-note figure with the simultaneous low bongo on each sixteenth-note partial.

Exercise CRD3:

Var. a - 1st partial grace note and low bongo

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R R R R R RRR R R R R

L

Var. b - 2nd partial grace note and low bongo

R R R R R RRRR R R R

L

Var. c - 3rd partial grace note and low bongo

R R R R R R RRRR R R

L

Var. d - 4th partial grace note and low bongo

R R R R R R R RRRR R

L

Var. e - Beat 2 grace note and low bongo

R R R R R R R RRR R

L

Exercise CRD4 combines a high bongo grace-note figure with a simultaneous tumba. The first measure of each variation presents sixteenth notes in the right hand and the tumba in the left hand on each sixteenth-note partial. The second measure of each variation combines the grace-note figure with the simultaneous tumba on each sixteenth-note partial.

Exercise CRD4:

Var. a - 1st partial grace note and tumba

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note and tumba

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note and tumba

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and tumba

2 Bongos
Tumba
Tom
Gr. C.

Var. e - Beat 2 grace note and tumba

2 Bongos
Tumba
Tom
Gr. C.

Exercise CRD5 combines a high bongo grace-note figure with a simultaneous tom. The first measure of each variation presents sixteenth notes in the right hand and the tom in the left hand on each sixteenth-note partial. The second measure of each variation combines the grace-note figure with the simultaneous tom on each sixteenth-note partial.

Exercise CRD5:

Var. a - 1st partial grace note and tom

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note and tom

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note and tom

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and tom

2 Bongos
Tumba
Tom
Gr. C.

Var. e - Beat 2 grace note and tom

2 Bongos
Tumba
Tom
Gr. C.

Exercise CRD6 combines a high bongo grace-note figure with a simultaneous low bass drum. The first measure of each variation presents sixteenth notes in the right hand and the low bass drum in the left hand on each sixteenth-note partial. The second measure of each variation combines the grace-note figure with the simultaneous low bass drum on each sixteenth-note partial.

Exercise CRD6:

$\text{♩} = 60$

Var. a - 1st partial grace note and low bass drum

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note and low bass drum

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note and low bass drum

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and low bass drum

2 Bongos
Tumba
Tom
Gr. C.

Var. e - Beat 2 grace note and low bass drum

2 Bongos
Tumba
Tom
Gr. C.

Alternate-hand drag sticking method (AD):

The *alternate-hand drag* sticking method requires the performer to play two grace-note strokes using alternate hands. The first grace note is played with the left hand followed by the second grace note played with the right hand. The primary note, or the release immediately following the grace-note figure, is played using the right hand. Use the *alternate-hand drag* (AD) sticking method for approaching *simultaneous drum* high bongo grace-note figures.

Exercise AD1 isolates the high bongo grace-note figure on each sixteenth-note partial. Measure one of the first variation (Var. a) isolates a single stroke on beat one followed by the grace-note figure on beat two. This ordering allows performers to determine an approach to single strokes prior to playing grace-note figures. This process is repeated for three remaining variations with each occurring on subsequent sixteenth-note partials of the beat.

Exercise AD1.5 isolates the high bongo grace-note figure preceded by a divided drum instance. Measure one of the first variation (Var. a) isolates a two-hand stroke on beat one followed by the grace-note figure on beat two. This ordering allows performers to determine an approach to two-hand strokes prior to playing grace-note figures. This process is repeated for three remaining variations with each occurring on each possible divided drum.

For both exercises below (Ex. AD1 and Ex. AD1.5), careful attention should be given to the interpretation of grace-note figures while maintaining a

constant internal sixteenth-note pulse. Performers should strive for consistent interpretation, specifically with respect to a refined clarity of diction.

Exercise AD1:

Exercise AD1 consists of four variations (a, b, c, d) for a drum set. The tempo is marked as $\text{♩} = 60$. The drum set includes 2 Bongos, Tumba, Tom, and Gr. C. Each variation shows a rhythmic pattern with stick notation (R, LR, R) and corresponding drum notation on a five-line staff. The patterns are as follows:

- Var. a:** R, LR, R
- Var. b:** R, LR, R
- Var. c:** R, LR, R
- Var. d:** R, LR, R

Exercise AD1.5:

Exercise AD1.5 consists of four variations (a, b, c, d) for a drum set. The tempo is marked as $\text{♩} = 60$. The drum set includes 2 Bongos, Tumba, Tom, and Gr. C. Each variation shows a rhythmic pattern with stick notation (R, LR, R) and specific drum notation (L, L) for grace notes. The variations are:

- Var. a - Grace note and low bongo:** R, LR, R
- Var. b - Grace note and tom:** R, LR, R
- Var. c - Grace note and tumba:** R, LR, R
- Var. d - Grace note and low bass drum:** R, LR, R

Exercise AD2 isolates the high bongo grace-note figure on each sixteenth-note partial. The first measure of each variation (a-e) presents the sixteenth-note pulse by subdividing beat one into four sixteenth notes. The second measure of each variation presents grace-note figures on each sixteenth-note partial. This ordering allows performers to establish a sixteenth-note pulse prior to playing grace-note figures on each sixteenth-note partial.

Exercise AD2:

Var. a - 1st partial grace note

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R R R R R LRR R R R R

Var. b - 2nd partial grace note

R R R R R RLRR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note

R R R R R R RLRR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note

R R R R R R R RLRR R

2 Bongos
Tumba
Tom
Gr. C.

Var. e - Beat 2 grace note

R R R R R R R RLRR

2 Bongos
Tumba
Tom
Gr. C.

Exercise AD3 combines a high bongo grace-note figure with a simultaneous low bongo. The first measure of each variation presents sixteenth notes in the right hand and the low bongo in the left hand on each sixteenth-note partial. The second measure of each variation combines the grace-note figure with the simultaneous low bongo on each sixteenth-note partial.

Exercise AD3:

$\text{♩} = 60$

Var. a - 1st partial grace note and low bongo

R R R R R LRR R R R R

2 Bongos
Tumba
Tom
Gr. C.

L

Var. b - 2nd partial grace note and low bongo

R R R R R RLRR R R R

2 Bongos
Tumba
Tom
Gr. C.

L

Var. c - 3rd partial grace note and low bongo

R R R R R R RLRR R R

2 Bongos
Tumba
Tom
Gr. C.

L

Var. d - 4th partial grace note and low bongo

R R R R R R R RLRR R

2 Bongos
Tumba
Tom
Gr. C.

L

Var. e - Beat 2 grace note and low bongo

R R R R R R R R RLRR

2 Bongos
Tumba
Tom
Gr. C.

L

Exercise AD4 combines a high bongo grace-note figure with a simultaneous tumba. The first measure of each variation presents sixteenth notes in the right hand and the tumba in the left hand on each sixteenth-note partial. The second measure of each variation combines the grace-note figure with the simultaneous tumba on each sixteenth-note partial.

Exercise AD4:

$\text{♩} = 60$

Var. a - 1st partial grace note and tumba

R R R R R LRR R R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. b - 2nd partial grace note and tumba

R R R R R RLRR R R R

2 Bongos
Tumba
Tom
Gr. C.

Var. c - 3rd partial grace note and tumba

R R R R R R RLRR R R

2 Bongos
Tumba
Tom
Gr. C.

Var. d - 4th partial grace note and tumba

R R R R R R R RLRR R

2 Bongos
Tumba
Tom
Gr. C.

Var. e - Beat 2 grace note and tumba

R R R R R R R RLRR

2 Bongos
Tumba
Tom
Gr. C.

Exercise AD5 combines a high bongo grace-note figure with a simultaneous tom. The first measure of each variation presents sixteenth notes in the right hand and the tom in the left hand on each sixteenth-note partial. The second measure of each variation combines the grace-note figure with the simultaneous tom on each sixteenth-note partial.

Exercise AD5:

Var. a - 1st partial grace note and tom

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R R R R R LRR R R R R

Var. b - 2nd partial grace note and tom

R R R R R RLRR R R R

Var. c - 3rd partial grace note and tom

R R R R R R RLRR R R

Var. d - 4th partial grace note and tom

R R R R R R R RLRR R

Var. e - Beat 2 grace note and tom

R R R R R R R RLRR

Exercise AD6 combines a high bongo grace-note figure with a simultaneous low bass drum. The first measure of each variation presents sixteenth notes in the right hand and the low bass drum in the left hand on each sixteenth-note partial. The second measure of each variation combines the grace-note figure with the simultaneous low bass drum on each sixteenth-note partial.

Exercise AD6:

Var. a - 1st partial grace note and low bass drum

♩ = 60

2 Bongos
Tumba
Tom
Gr. C.

R R R R R LRR R R R R

Var. b - 2nd partial grace note and low bass drum

R R R R R R LRR R R R

Var. c - 3rd partial grace note and low bass drum

R R R R R R RLRR R R

Var. d - 4th partial grace note and low bass drum

R R R R R R R RLRR R

Var. e - Beat 2 grace note and low bass drum

R R R R R R R RLRR

Rebonds A : Subdivisions of the beat (S)

The ability to maintain consistent tempo during practice and performance of *Rebonds A* is a significant challenge. Throughout *Rebonds A*, each beat is divided into a variety of smaller subdivisions (S). Exercises S1 and S2 display the different types of subdivisions. The subdivisions presented in exercise S1 are more common, while the metric subdivisions presented in exercise S2 are less common. Complete mastery of each subdivision will be very helpful in preparing *Rebonds A* for performance.

Exercise S1

Exercise S1 consists of eight variations (Var. a to Var. h) of subdivisions of the beat. The tempo is marked as quarter note = 40. The variations are as follows:

- Var. a: Quarter note, quarter rest.
- Var. b: Quarter note, eighth note, eighth note, quarter rest.
- Var. c: Quarter note, eighth note, eighth note, quarter note, quarter rest.
- Var. d: Quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, quarter rest.
- Var. e: Quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, quarter rest.
- Var. f: Quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, quarter rest.
- Var. g: Quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, quarter rest.
- Var. h: Quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, eighth note, eighth note, quarter note, quarter rest.

Exercise S2

Var. a

$\text{♩} = 40$ 5:4

Var. b

5:3

Var. c

5:4

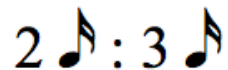
Rebonds A : Polyrhythm types (PT): Identification and Approach

The ability to maintain tempo while constantly changing the subdivision of the beat is made increasingly difficult by the inclusion of several polyrhythms throughout *Rebonds A*. Polyrhythms are two rhythms, occurring simultaneously, which divide the beat at different rates. Pertaining to *Rebonds*, polyrhythms require the hands to act independently resulting in a technical challenge.

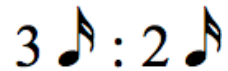
Consequently, percussionists need to acquire advanced techniques to successfully perform *Rebonds A*.

Eight different polyrhythm types exist in *Rebonds A*. Each polyrhythm type is listed below with its corresponding ratio.

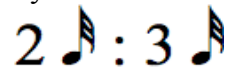
Type 1: two sixteenth notes over three sixteenth notes



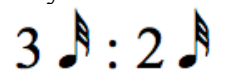
Type 2: three sixteenth notes over two sixteenth notes



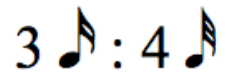
Type 3: two thirty-second notes over three thirty-second notes



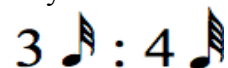
Type 4: three thirty-second notes over two thirty-second notes



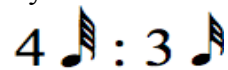
Type 5: three sixteenth notes over four thirty-second notes



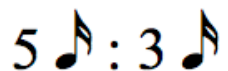
Type 6: three thirty-second notes over four sixty-fourth notes



Type 7: four sixty-fourth notes over three thirty-second notes
























































Type 8: five sixteenth notes over three sixteenth notes



The following *Polyrhythm Types Table* organizes polyrhythms according to their location in the music (measure number, beat placement, and sixteenth-note partial within a measure) of *Rebonds A*. The table lists each polyrhythm type and polyrhythm ratio followed by recommended exercises. In addition, corresponding page numbers are included for each suggested polyrhythm type exercise.

Table 3.6 **REBONDS A: POLYRHYTHM TYPES TABLE (p. 1 of 3)**

Measure Number	Beat	 Partial	Polyrhythm Type	Polyrhythm Ratio	Exercise	Page #
6	3	2nd & 3rd	1	2  : 3 	PT1	104
7	1 & 2	4th & 1st	1	2  : 3 	PT1	104
8	4	1st & 2nd	2	3  : 2 	PT2	105
9	2	3rd & 4th	1	2  : 3 	PT1	104
10	2	3rd & 4th	2	3  : 2 	PT2	105
11	2	2nd & 3rd	1	2  : 3 	PT1	104
12	1	1st & 2nd	1	2  : 3 	PT1	104
12	2	2nd & 3rd	2	3  : 2 	PT2	105
13	2	1st & 2nd	2	3  : 2 	PT2	105
13	3 & 4	4th & 1st	2	3  : 2 	PT2	105
14	1	3rd & 4th	1	2  : 3 	PT1	104
14	3	3rd & 4th	2	3  : 2 	PT2	105
14	4	3rd & 4th	1	2  : 3 	PT1	104
15	1 & 2	4th & 1st	2	3  : 2 	PT2	105
15	3	3rd & 4th	5	3  : 4 	PT5	113
17	3	4th	4	3  : 2 	PT4	109
17	4	1st	4	3  : 2 	PT4	109
19	2	3rd & 4th	2	3  : 2 	PT2	105
21	1	2nd, 3rd & 4th	8.1	5  : 3 	PT8	120
23	1	2nd	3	2  : 3 	PT3	106
23	1	3rd	4	3  : 2 	PT4	109
24	2	1st	6	3  : 4 	PT6	114
25	2	2nd	6	3  : 4 	PT6	114
25	4	1st	7	4  : 3 	PT7	117
26	2	2nd	6	3  : 4 	PT6	114
26	3	4th	7	4  : 3 	PT7	117

Measure Number	Beat	Partial	Polyrhythm Type	Polyrhythm Ratio	Exercise	Page #
28	2 & 3	4th, 1st & 2nd	8.2	5 ♪ : 3 ♪	PT8	120
32	1	4th	7	4 ♪ : 3 ♪	PT7	117
33	2	3rd	6	3 ♪ : 4 ♪	PT6	114
33	4	2nd	6	3 ♪ : 4 ♪	PT6	114
34	3	2nd	7	4 ♪ : 3 ♪	PT7	117
35	2	1st	7	4 ♪ : 3 ♪	PT7	117
36	1	3rd	6	3 ♪ : 4 ♪	PT6	114
36	4	2nd	6	3 ♪ : 4 ♪	PT6	114
38	1	2nd	6	3 ♪ : 4 ♪	PT6	114
38	3	1st	7	4 ♪ : 3 ♪	PT7	117
39	1	2nd	7	4 ♪ : 3 ♪	PT7	117
40	2	3rd	6	3 ♪ : 4 ♪	PT6	114
41	2	4th	6	3 ♪ : 4 ♪	PT6	114
41	4	4th	6	3 ♪ : 4 ♪	PT6	114
42	2	3rd	6	3 ♪ : 4 ♪	PT6	114
42	4	2nd	6	3 ♪ : 4 ♪	PT6	114
43	2	3rd	6	3 ♪ : 4 ♪	PT6	114
45	1	1st	6	3 ♪ : 4 ♪	PT6	114
46	1	3rd	6	3 ♪ : 4 ♪	PT6	114
48	2	4th	7	4 ♪ : 3 ♪	PT7	117
48	3	4th	3	2 ♪ : 3 ♪	PT3	106
48	4	3rd	7	4 ♪ : 3 ♪	PT7	117
49	1	3rd	6	3 ♪ : 4 ♪	PT6	114
49	2	1st	7	4 ♪ : 3 ♪	PT7	117
49	2	3rd	7	4 ♪ : 3 ♪	PT7	117
49	3	1st	6	3 ♪ : 4 ♪	PT6	114

Measure Number	Beat	Partial	Polyrhythm Type	Polyrhythm Ratio	Exercise	Page #
49	3	4th	3	2 ♪ : 3 ♪	PT3	106
49	4	2nd	7	4 ♪ : 3 ♪	PT7	117
49	4	3rd	7	4 ♪ : 3 ♪	PT7	117
50	1	2nd	7	4 ♪ : 3 ♪	PT7	117
50	1	4th	4	3 ♪ : 2 ♪	PT4	109
50	2	4th	6	3 ♪ : 4 ♪	PT6	114
50	3	1st	3	2 ♪ : 3 ♪	PT3	106
50	4	3rd	3	2 ♪ : 3 ♪	PT3	106
51	1	1st	4	3 ♪ : 2 ♪	PT4	109
51	1	3rd	3	2 ♪ : 3 ♪	PT3	106
52	4	3rd	6	3 ♪ : 4 ♪	PT6	114
53	1	2nd	7	4 ♪ : 3 ♪	PT7	117
53	1	3rd	6	3 ♪ : 4 ♪	PT6	114
53	3	3rd	6	3 ♪ : 4 ♪	PT6	114
53	4	3rd	4	3 ♪ : 2 ♪	PT4	109

Each of the polyrhythm types identified in this document place elevated technical demands on the performer. As a result, several exercises were created as an aid for developing advanced techniques associated with each polyrhythm type. For maximum benefit, all polyrhythm exercises should be repeated until each advanced technique is achieved consistently and effortlessly. Rest measures were inserted allowing performers to synthesize the passage perfectly in the mind. In

addition, articulations were purposely omitted. Performers should apply these learned advanced techniques to corresponding musical passages in *Rebonds A*.

Polyrhythm type 1: 2 ♪ : 3 ♪

Exercise PT1 presents sixteenth notes in the right hand while simultaneously presenting sixteenth-note triplets in the left hand. The first variation (var. a) establishes a sixteenth-note pulse in the right hand. Each successive variation introduces sixteenth-note-triplet figures beginning on each sixteenth-note partial respectively.

Exercise PT1: 2 ♪ : 3 ♪

The musical score for Exercise PT1 is presented on a single staff with a tempo marking of quarter note = 40. The exercise is divided into five variations, labeled Var. a through Var. e. Variation a begins with a right-hand pulse of sixteenth notes, indicated by an 'R' and an arrow, and a left-hand triplet of sixteenth notes. Variation b shows the left-hand triplet starting on the second sixteenth-note partial. Variation c shows the triplet starting on the third partial. Variation d shows the triplet starting on the fourth partial. Variation e shows the triplet starting on the fifth partial. Each variation is marked with a double bar line and repeat dots. The right hand maintains a consistent pulse of sixteenth notes throughout all variations.

Polyrhythm type 2: 3 ♪ : 2 ♪

Exercise PT2 presents sixteenth notes in the left hand while simultaneously presenting sixteenth-note triplets in the right hand. The first variation (var. a) establishes a sixteenth-note pulse in the left hand. Each successive variation introduces sixteenth-note-triplet figures beginning on each sixteenth-note partial respectively.

Exercise PT2: 3 ♪ : 2 ♪

♩ = 40

Var. a

Var. b

Var. c

Var. d

Var. e

Polyrhythm type 3: 2 ♪ : 3 ♪

In the check variation of exercise PT3, measure one presents sixteenth notes in the right hand followed by a further subdivided second measure. Careful attention should be given to the thirty-second-note subdivision of the sixteenth note in measure two. Likewise, in measure three, the left hand plays sixteenth notes followed by a thirty-second-note-triplet subdivision in measure four.

Exercise PT3: 2 ♪ : 3 ♪

The image shows a musical score for a piano exercise. It consists of two staves, right hand (RH) and left hand (LH). The tempo is marked as ♪ = 40. A box labeled "Check var." is positioned above the first measure. The right hand part starts with a quarter note followed by a half note, then a quarter note followed by a half note, and finally a quarter note followed by a half note. The left hand part starts with a quarter note followed by a half note, then a quarter note followed by a half note, and finally a quarter note followed by a half note. The notation includes various rhythmic markings such as slurs, accents, and triplet markings.

Exercise PT3 (var. a-c) targets the 2 ♩ : 3 ♩ polyrhythm technique specifically. The first variation (var. a) allows for performers to establish a thirty-second-note/sixteenth-note rhythm in the right hand prior to introducing a thirty-second-note-triplet/sixteenth-note rhythm in the left hand. Conversely, the second variation (var. b) establishes a thirty-second-note-triplet/sixteenth-note rhythm in the left hand prior to introducing a thirty-second-note/sixteenth-note rhythm in the right hand. The first two variations systematically isolate one instance of the 2 ♩ : 3 ♩ polyrhythm. The third variation (var. c) allows for continuous repetition of the 2 ♩ : 3 ♩ polyrhythm.

Exercise PT3 (a-c): 2 ♩ : 3 ♩

The image displays three variations of a 2:3 polyrhythm exercise, labeled Var. a, Var. b, and Var. c. Each variation is written on a grand staff (treble and bass clefs).

- Var. a:** The right hand (R) plays a steady eighth-note pattern (quarter note = 40). The left hand (L) enters with a triplet of eighth notes. An arrow labeled 'R' points to the right-hand part, and an arrow labeled 'L' with a '3' below it points to the left-hand triplet.
- Var. b:** The left hand (L) plays a steady eighth-note pattern. The right hand (R) enters with a triplet of eighth notes. Arrows labeled '3' are placed below the left-hand part, and an arrow labeled 'R' points to the right-hand triplet.
- Var. c:** Both hands play a continuous, alternating pattern of eighth notes and triplets, maintaining the 2:3 polyrhythm throughout.

Exercise PT3 (var. d –f) is designed to continue work on the 2 ♩ : 3 ♩ polyrhythm while incorporating the appropriate sixteenth-note rests into the pattern. Performers should use the muscle memory gained from practicing the previous exercise variations to assist in executing the correct rhythm of the following exercise variations.

Exercise PT3 (d-f): 2 ♩ : 3 ♩

Var. d

♩ = 40 R →

Var. e

Var. f

Polyrhythm type 4: 3 ♪ : 2 ♪

In the check variation of exercise PT4, measure one presents sixteenth notes in the left hand followed by a further subdivided second measure. Careful attention should be given to the thirty-second-note subdivision of the sixteenth note in measure two. Likewise, in measure three, the right hand plays sixteenth notes followed by a thirty-second-note-triplet subdivision in measure four.

Exercise PT4: 3 ♪ : 2 ♪

Check var.

♩ = 40

L →

R →

3 3

Exercise PT4 (var. a-c) targets the 3 ♪ : 2 ♪ polyrhythm technique specifically. The first variation (var. a) allows for performers to establish a thirty-second-note/sixteenth-note rhythm in the left hand prior to introducing a thirty-second-note-triplet/sixteenth-note rhythm in the right hand. Conversely, the second variation (var. b) establishes a thirty-second-note-triplet/sixteenth-note rhythm in the right hand prior to introducing a thirty-second-note/sixteenth-note rhythm in the left hand. The first two variations systematically isolate one instance of the 3 ♪ : 2 ♪ polyrhythm. The third variation (var. c) allows for continuous repetition of the 3 ♪ : 2 ♪ polyrhythm.

Exercise PT4 (a-c): 3 ♪ : 2 ♪

The image displays three variations of a 3:2 polyrhythm exercise, labeled Var. a, Var. b, and Var. c. Each variation is written on a grand staff (treble and bass clefs). A tempo marking of ♩ = 40 is shown at the beginning of the first variation.

- Var. a:** The left hand (L) plays a steady eighth-note pattern. The right hand (R) starts with a triplet of eighth notes, followed by a sixteenth-note rest, and then continues with eighth notes. Arrows labeled 'L' and 'R' indicate the direction of the parts.
- Var. b:** The right hand (R) plays a triplet of eighth notes, followed by a sixteenth-note rest, and then continues with eighth notes. The left hand (L) plays a steady eighth-note pattern.
- Var. c:** Both hands play the same polyrhythmic pattern simultaneously: a triplet of eighth notes followed by a sixteenth-note rest, then eighth notes.

Exercise PT4 (var. d –f) is designed to continue work on the 3 ♪ : 2 ♪ polyrhythm while incorporating the appropriate sixteenth-note rests into the pattern. Performers should use the muscle memory gained from practicing the previous exercise variations to assist in executing the correct rhythm of the following exercise variations.

Exercise PT4 (d-f): 3 ♪ : 2 ♪

The image displays three variations of Exercise PT4, each on a grand staff (treble and bass clefs).
Var. d: Labeled with a tempo of ♩ = 40. The notation shows a 3:2 polyrhythm. The upper staff contains a triplet of eighth notes (marked '3') and a single eighth note with a slash. The lower staff contains a triplet of eighth notes and a single eighth note with a slash. An 'R' with an arrow above it points to the start of the triplet in the upper staff.
Var. e: Shows a 3:2 polyrhythm. The upper staff has a triplet of eighth notes (marked '3') and a single eighth note with a slash. The lower staff has a triplet of eighth notes and a single eighth note with a slash.
Var. f: Shows a 3:2 polyrhythm. The upper staff has a triplet of eighth notes (marked '3') and a single eighth note with a slash. The lower staff has a triplet of eighth notes and a single eighth note with a slash.

Polyrhythm type 5: 3 ♪ : 4 ♪

In the check variation of exercise PT5, measure one presents sixteenth notes in the left hand followed by a further subdivided second measure. Careful attention should be given to the thirty-second-note subdivision of the sixteenth note in measure two. Likewise, in measure three, the right hand plays eighth notes followed by a sixteenth-note-triplet subdivision.

Exercise PT5: 3 ♪ : 4 ♪

♩ = 40

Check var.



The musical notation consists of two staves. The first staff is the right hand and the second is the left hand. The tempo is marked as quarter note = 40. The first measure shows the left hand playing sixteenth notes. The second measure shows the left hand playing a further subdivided sixteenth note. The third measure shows the right hand playing eighth notes. The fourth measure shows the right hand playing a sixteenth-note triplet. The notation includes repeat signs and hand indicators 'L' and 'R'.

Exercise PT5 (var. a-c) targets the 3 ♪ : 4 ♪ polyrhythm technique specifically. The first variation (var. a) allows for performers to establish a sixteenth-note/thirty-second-note rhythm in the left hand while playing eighth notes in the right hand. The second variation (var. b) includes the addition of sixteenth-note triplets beginning on the third sixteenth-note partial. The third variation (var. c) omits the eighth-note downbeat prior to the sixteenth-note triplets.



Exercise PT5 (a-c): 3 ♪ : 4 ♪

The image displays three variations of a 3:4 polyrhythm exercise. Each variation is presented on a grand staff with a treble clef on the upper staff and a bass clef on the lower staff. The tempo is marked as ♪ = 40.

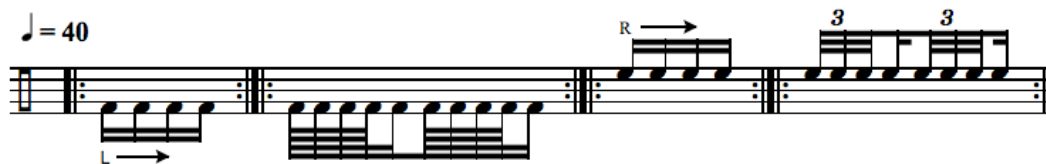
- Var. a:** The right hand (R) plays a sequence of eighth notes: quarter, eighth, quarter, eighth, quarter, eighth, quarter, eighth. The left hand (L) plays a sequence of sixteenth notes: quarter, eighth, quarter, eighth, quarter, eighth, quarter, eighth. Arrows labeled 'R' and 'L' indicate the respective parts.
- Var. b:** The right hand plays the same eighth-note sequence as in Var. a. The left hand plays the same sixteenth-note sequence as in Var. a, but with a triplet of sixteenth notes starting on the third sixteenth-note partial of the first measure.
- Var. c:** The right hand plays the same eighth-note sequence as in Var. a. The left hand plays the same sixteenth-note sequence as in Var. a, but omits the eighth-note downbeat prior to the triplet of sixteenth notes in the second measure.

Polyrhythm type 6: 3  : 4 

In the check variation of exercise PT6, measure one presents sixteenth notes in the left hand followed by a further subdivided second measure. Careful attention should be given to the sixty-fourth-note subdivision of the sixteenth note. Likewise, in measure three, the right hand plays sixteenth notes followed by a thirty-second-note-triplet subdivision.

Exercise PT6: 3  : 4 

$\text{♩} = 40$



Exercise PT6 (var. a-c) targets the 3 ♪ : 4 ♪ polyrhythm technique specifically. The first variation (var. a) allows for performers to establish a sixty-fourth-note/sixteenth-note rhythm in the left hand prior to introducing a thirty-second-note-triplet/sixteenth-note rhythm in the right hand. The second variation (var. b) establishes a thirty-second-note-triplet/sixteenth-note rhythm of the right hand prior to introducing a sixty-fourth-note/sixteenth-note rhythm in the left hand. The third variation (var. c) allows for continuous repetition of the 3 ♪ : 4 ♪ polyrhythm.

Exercise PT6 (a-c): 3 ♪ : 4 ♪

The image displays three variations of a 3:4 polyrhythm exercise, each on two staves (Right and Left hands). The tempo is marked as ♪ = 40.

- Var. a:** The left hand (L) plays a steady stream of sixteenth notes. The right hand (R) starts with a triplet of thirty-second notes, followed by a triplet of sixteenth notes. Arrows labeled 'R' and 'L' indicate the direction of the polyrhythm.
- Var. b:** The right hand (R) starts with a triplet of thirty-second notes, followed by a triplet of sixteenth notes. The left hand (L) then enters with a steady stream of sixteenth notes.
- Var. c:** Both hands play continuous repetitions of the 3:4 polyrhythm. The right hand has a triplet of thirty-second notes followed by a triplet of sixteenth notes, while the left hand plays a steady stream of sixteenth notes.

Exercise PT6 (var. d –f) is designed to continue work on the 3 ♪ : 4 ♪ polyrhythm while incorporating the appropriate sixteenth-note rests into the pattern. Performers should use the muscle memory gained from practicing the previous exercise variations to assist in executing the correct rhythm of the following exercise variations.

Exercise PT6 (d-f): 3 ♪ : 4 ♪

Var. d

♩ = 40

Var. e

Var. f

Polyrhythm type 7: 4 ♪ : 3 ♪

In the check variation of exercise PT7, measure one presents sixteenth notes in the right hand followed by a further subdivided second measure. Careful attention should be given to the sixty-fourth-note subdivision of the sixteenth note. Likewise, in measure three, the left hand plays sixteenth notes followed by a thirty-second-note-triplet subdivision.

Exercise PT7: 4 ♪ : 3 ♪

Check var.

♩ = 40 R →

L →



3 3



Exercise PT7 (var. a-c) targets the 4 ♪ : 3 ♪ polyrhythm technique specifically. The first variation (var. a) allows for performers to establish a sixty-fourth-note/sixteenth-note rhythm in the right hand prior to introducing a thirty-second-note-triplet/sixteenth-note rhythm in the left hand. The second variation (var. b) establishes a thirty-second-note-triplet/sixteenth-note rhythm in the left hand prior to introducing a sixty-fourth-note/sixteenth-note rhythm in the right hand. The third variation (var. c) allows for continuous repetition of the 4 ♪ : 3 ♪ polyrhythm.

Exercise PT7 (a-c): 4 ♪ : 3 ♪

The image displays three variations of a 4:3 polyrhythm exercise, labeled Var. a, Var. b, and Var. c. Each variation is written on a grand staff (treble and bass clefs).

- Var. a:** The right hand (R) plays a continuous stream of sixteenth notes. The left hand (L) plays a triplet of thirty-second notes followed by a sixteenth note. A tempo marking of $\text{♩} = 40$ is present. Arrows indicate the right hand's rhythm starting first, followed by the left hand's triplet.
- Var. b:** The left hand (L) plays a triplet of thirty-second notes followed by a sixteenth note. The right hand (R) plays a continuous stream of sixteenth notes. Arrows indicate the left hand's triplet starting first, followed by the right hand's sixteenth notes.
- Var. c:** Both hands play the 4:3 polyrhythm continuously. The right hand has sixteenth notes and the left hand has triplet thirty-second notes followed by sixteenth notes.

Exercise PT7 (var. d –f) is designed to continue work on the 4  : 3  polyrhythm while incorporating the appropriate sixteenth-note rests into the pattern. Performers should use the muscle memory gained from practicing the previous exercise variations to assist in executing the correct rhythm of the following exercise variations.

Exercise PT7 (d-f): 4  : 3 

Var. d

R 

$\text{♩} = 40$



Var. e

L  3



Var. f



Polyrhythm type 8: 5 ♪ : 3 ♪

The exercises in this section target two of the most difficult polyrhythm techniques in *Rebonds A*. Exercise PT8 targets the 5 ♪ : 3 ♪ polyrhythm technique in measure 21; beat 1. In this example, the sixteenth-note pulse associated with the 5 ♪ : 3 ♪ polyrhythm (within the 2nd, 3rd, & 4th sixteenth-note partial) is subdivided into thirty-second-note groupings of 2+3+2.

The check variation of exercise PT8 establishes the rhythmic groupings of the left hand. Measure one presents a sixteenth-note pulse followed by a further subdivided third measure. Careful attention should be given to the rhythmic accuracy of the thirty-second-note groupings of 2+3+2. This represents the complete rhythmic groupings of the left hand. The fifth measure introduces the right-hand sixteenth-note subdivision prior to the 5 ♪ : 3 ♪ polyrhythm.

Exercise PT8: 5 ♪ : 3 ♪

Check var.

♩ = 40

L →

R →

3

3

Exercise PT8 (var. a-d) systematically rebuilds the left-hand rhythmic groupings previously learned from exercise PT8 (Check var.) while playing the 5 ♪ : 3 ♪ polyrhythm on the right hand. The first measure of each variation isolates the left-hand rhythmic grouping. Measure three of each variation adds the 5 ♪ : 3 ♪ polyrhythm to the pre-established left-hand rhythmic grouping. The final pattern of this exercise (var. d, third measure) represents the complete 5 ♪ : 3 ♪ polyrhythm technique in measure 21; beat 1.

Exercise PT8 (a-d): 5 ♪ : 3 ♪

The image displays four variations (Var. a, Var. b, Var. c, and Var. d) of a musical exercise. Each variation is presented on a grand staff (treble and bass clefs). The tempo is marked as ♪ = 40. The exercise is a 5:3 polyrhythm, indicated by 'R → 5:3' above the right-hand staff and 'L →' below the left-hand staff. Each variation consists of two measures, separated by a double bar line with repeat dots. The first measure of each variation isolates a specific left-hand rhythmic grouping, and the second measure adds the 5:3 polyrhythm to it. The groupings are as follows:

- Var. a:** The first measure shows a single eighth note in the left hand. The second measure shows the 5:3 polyrhythm with the eighth note from the first measure.
- Var. b:** The first measure shows a pair of eighth notes in the left hand. The second measure shows the 5:3 polyrhythm with the pair of eighth notes.
- Var. c:** The first measure shows a triplet of eighth notes in the left hand. The second measure shows the 5:3 polyrhythm with the triplet.
- Var. d:** The first measure shows a triplet of eighth notes in the left hand. The second measure shows the 5:3 polyrhythm with the triplet.

Exercise PT8.1 is designed to continue work on the 5 ♪ : 3 ♪ polyrhythm while incorporating the appropriate sixteenth-note rests into the pattern. Performers should use the muscle memory gained from practicing the previous exercise variations to assist in executing the correct rhythm of the following exercise variations.

Exercise PT8.1 (Check var.): 5 ♪ : 3 ♪

Check var.
 ♪ = 40

The notation shows a single staff with a treble clef. It is divided into two measures by a double bar line. The first measure contains a sequence of notes for the left hand, indicated by an 'L' with an arrow pointing right. The second measure contains a sequence of notes for the right hand, indicated by an 'R' with an arrow pointing right. Both measures feature a 5:3 polyrhythm. The right hand part includes triplet markings (the number '3' below the notes) under the final three notes of each measure.

Exercise PT8.1 (a-d): 5 ♪ : 3 ♪

Var. a
 ♪ = 40

Var. b

Var. c

Var. d

The notation shows four staves, each representing a variation. Each staff is divided into two measures by a double bar line. The first measure contains notes for the left hand (indicated by 'L' with an arrow) and the second measure contains notes for the right hand (indicated by 'R' with an arrow). The polyrhythm is 5:3. In all variations, the right hand part includes triplet markings (the number '3' below the notes) under the final three notes of each measure. Variation 'a' has a '5:3' marking above the right hand notes in the second measure. Variations 'b', 'c', and 'd' have '5:3' markings above the right hand notes in the second measure, and '3' markings below the right hand notes in the first measure.

Exercises PT8.2 targets the 5 ♪ : 3 ♪ polyrhythm technique in measure 28; beats 2 & 3. In this example, the sixteenth-note pulse associated with the 5 ♪ : 3 ♪ polyrhythm is subdivided into groupings of 2+2+2.

The check variation of exercise PT8.2 establishes the rhythmic groupings of the left hand. Measure one presents a sixteenth-note pulse followed by a further subdivided third measure. Careful attention should be given to the rhythmic accuracy of the thirty-second-note groupings of 2+2+2. This represents the complete rhythmic groupings of the left hand. The fifth measure introduces the right-hand sixteenth-note subdivision prior to the 5 ♪ : 3 ♪ polyrhythm.

Exercise PT8.2 (Check var.): 5 ♪ : 3 ♪

Check var.

♩ = 40

The image shows a musical score for a piano exercise. It consists of a single staff with a treble clef. The tempo is marked as ♩ = 40. The exercise is labeled 'Check var.' and features a 5:3 polyrhythm. The notation includes sixteenth-note pulses and thirty-second-note groupings (2+2+2). Hand positions are indicated by 'L' (left hand) and 'R' (right hand) with arrows pointing to the respective parts of the score. The score is divided into measures by double bar lines, with repeat signs in some measures.

Exercises PT8.2 (var. a-d) systematically rebuilds the left-hand rhythmic groupings previously learned from exercise PT8.2 (Check var.) while playing the 5 ♩ : 3 ♩ polyrhythm on the right hand. Measure three of each variation adds the 5 ♩ : 3 ♩ polyrhythm to the pre-established left-hand rhythmic grouping. The final pattern of this exercise (var. d, third measure) represents the complete 5 ♩ : 3 ♩ polyrhythm technique in measure 28; beats 2 & 3.

Exercise PT8.2 (a-d): 5 ♩ : 3 ♩

The image displays four variations (Var. a, b, c, d) of Exercise PT8.2. Each variation is presented as a two-measure sequence on a grand staff. The tempo is indicated as quarter note = 40. The right hand part in the second measure of each variation is labeled with a 5:3 polyrhythm. The left hand part in the second measure shows the pre-established rhythmic grouping for each variation. The variations are: Var. a (quarter notes), Var. b (eighth notes), Var. c (quarter notes with beamed eighth notes), and Var. d (quarter notes with beamed eighth notes and sixteenth notes).

Exercise PT8.3 is designed to continue work on the 5 ♪ : 3 ♪ polyrhythm while incorporating the appropriate sixteenth-note rests into the pattern. Performers should use the muscle memory gained from practicing the previous exercise variations to assist in executing the correct rhythm of the following exercise variations.

Exercise PT8.3 (Check var.): 5 ♪ : 3 ♪

Check var.

♩ = 40

The notation shows a single staff with a 5:3 polyrhythm. The left hand (L) plays five notes in the first measure, and the right hand (R) plays three notes in the second measure. The pattern is repeated twice. Arrows labeled 'L' and 'R' indicate the direction of the hands.

Exercise PT8.3 (var. a-d): 5 ♪ : 3 ♪

Var. a

♩ = 40

Var. b

Var. c

Var. d

The notation shows four variations (a, b, c, d) of the 5:3 polyrhythm. Each variation consists of two staves. The left hand (L) plays five notes in the first measure, and the right hand (R) plays three notes in the second measure. The pattern is repeated twice. Arrows labeled 'L' and 'R' indicate the direction of the hands. The 5:3 polyrhythm is explicitly labeled above the right-hand part of each variation.

Performance Questions

The following performance questions were written to aid performers in preparing *Rebonds* for performance. Answers to these performance questions are purposely omitted from this document because the performance questions are intended to stimulate creative thought from performers of *Rebonds* rather than dictate each aspect of performance.

Question 1: As Xenakis calls for two slightly different instrumentations for *Rebonds A* and *Rebonds B*, are two different instrumental set-ups necessary and practical?

Question 2: What are the advantages of using two sets of five woodblocks in a stacking (one on top of the other) fashion?

Question 3: Should single-headed toms or double-headed tom-toms be used?

Question 4: Should plastic heads or Fiberskyn heads be used?

Question 5: How should the drums be tuned?

Question 6: What type of implements should be used?

Question 7: What are the benefits of memorizing the music?

Question 8: If memorization of the music isn't possible, how can the music stands be arranged for performance?

CHAPTER IV
**SUMMARY, CONCLUSION, AND RECOMMENDATIONS FOR
FURTHER RESEARCH**

Summary

During the first half of the twentieth century, music for multiple-percussion existed among small instrumental ensembles. This repertoire required advanced techniques from percussionists establishing the groundwork for further innovation and development of solo percussion music. Early works for percussion ensemble were historically significant to solo percussion music. The contributions of John Cage and his contemporaries dramatically expanded interest in composing music for percussion. Since the mid-1950s, the amount of repertoire written for solo percussion increased substantially. Since the mid-1970s, interest in studying and performing solo percussion music grew significantly. However, contrary to the increased interest and growth in solo percussion, few scholarly documents exist that specifically discuss solo percussion pedagogy. As a result, this document provides a pedagogical study and performance analysis of *Rebonds*, one of the most difficult works in solo percussion music.

Conclusion

Educators and performers of contemporary solo percussion literature are advised to use this document as a reference work to prepare *Rebonds* for performance. The practice guide was created as an educational tool for performers of *Rebonds*. This practice guide represents the primary focus and product of the research effort in this document and reflects my own experiences in preparing *Rebonds* for performance. The practice guide includes directions and exercises to address each identified technical challenge in *Rebonds*. These exercises were written to develop and improve advanced techniques necessary in performing *Rebonds*. In addition to being a reference, this document also serves to stimulate further interest in solo percussion music in particular and percussion arts in general.

My experiences performing *Rebonds* on numerous occasions have led me to the following conclusions. I use the same instrumental set-up for both movements. I have performed *Rebonds* with one and two sets of woodblocks. Consequently, I use two sets of woodblocks to assist with the woodblock tremolo passages and woodblock grace-note figures. I use double-headed tom-toms as they provide more depth to the sound. I prefer Fiberskyn top heads because they produce more warmth and resonance. I tune the drums to create the widest range possible between the high bongo and bass drum. Regarding implements, I prefer wooden timpani mallets. Through my experience both performing and watching

Rebonds, the work is more engaging when performed from memory. Although, if music memorization is not possible, strategic music stand placement is crucial.

Recommendations for Further Research

Rebonds is an intricate composition for solo percussion. Therefore, additional research and analysis should be performed. This document provides a practice guide that includes directions and exercises to address several technical challenges inherent to the composition. For future study, exercises could be written to develop and improve advanced techniques associated with woodblock passages in *Rebonds B*.

The literary search performed for this document revealed that interest in studying and performing solo percussion music has grown significantly during the last decade. Due to the limited number of scholarly writings on pedagogy for solo percussion music, a detailed pedagogical study and performance analysis could be performed on other compositions for solo percussion.

A comparison between *Rebonds* and *Psappha*, Xenakis's other work for solo for percussion, could be studied. Performers of solo percussion music would benefit in understanding similarities and differences between these two important compositions for solo percussion. Furthermore, Xenakis wrote several other works for percussion. A detailed pedagogical study and performance analysis of these other percussion works would also provide compelling research topics.

As Xenakis's compositional processes were informed by mathematics and his knowledge and experience with engineering and architecture, a theoretical analysis would provide useful information to educators and performers of solo percussion.

A survey could be conducted to determine which compositions for solo percussion are most commonly studied and performed. Documenting this type of information could positively influence percussion curriculums across the United States and further stimulate interest in solo percussion music.

BIBLIOGRAPHY

Books

- Beyers, Anders. "Iannis Xenakis: A Distinctive Profile in New Music," in *The Voice of Music: Conversations with Composers of Our Time*, edited and translated by Jean Christensen and Anders Beyers, 291-300. Aldershot, England: Ashgate Publishing Limited, 2000.
- Bois, Mario. *Iannis Xenakis: The Man and His Music*. Westport, CT: Greenwood Press; Reprint of 1967 ed. published by Boosey and Hawkes Music Publishers Ltd., London. 1980.
- Blades, James. *Percussion Instruments and Their History*. Rev. ed. Westport: Bold Strummer, 1992.
- Chicago Manual of Style*. 15th ed. Chicago: Univ. of Chicago Press, 2003.
- Cook, Gary D. *Teaching Percussion*. 2nd ed. New York: Schirmer Books, 1997.
- Deri, Otto. *Exploring Twentieth-Century Music*. New York: Holt, Rinehart and Winston, Inc., 1968.
- Ewen, David. *Composers of Tomorrow's Music: A Non-technical Introduction to the Musical Avante-garde Movement*. New York: Dodd, Mead & Company, 1971.
- Griffiths, Paul. *Modern Music: A Concise History*. New York: Thames and Hudson; first published in 1978 as *Modern Music: A Concise History from Debussy to Boulez*. 1994.
- _____. *Modern Music: The Avant Garde Since 1945*. London: J M Dent & Sons Ltd., 1981.
- Harley, James. *Xenakis: His life in music*. New York: Routledge, 2004.
- Matossian, Nouritza. *Iannis Xenakis*. London: Kahn & Averill, 1986.
- Pritchett, James. *The Music of John Cage*. New York, NY: Cambridge University Press, 1993.
- Schick, Steven. *The Percussionist's Art: Same bed, different dreams*. Rochester, NY: University of Rochester Press, 2006.

Schmidt, Christoph. *Komposition und Spiel. Zu Iannis Xenakis*. Köhn, Germany: Studio, 1995.

Varga, Bálint András. *Conversations with Iannis Xenakis*. London: Faber and Faber Limited, 1996.

Watkins, Glenn. *Soundings: Music in the Twentieth Century*. New York: Schirmer, 1995.

Wen-Chung, Chou. *Ionisation: The Function of Timbre in its Formal and Temporal Organization*, in *The New Worlds of Edgard Varèse, A Symposium*, ed. Sherman Van Solkema, Institute for Studies in American Music. New York: Brooklyn College of the City University of New York, 1979.

Xenakis, Iannis. *Arts/Sciences: Alloys: The Thesis Defense of Iannis Xenakis*. Translated by Sharon Kanach. New York: Pendragon Press, 1985.

_____. *Formalized Music: Thought and Mathematics in Composition*. Rev. ed. Harmonologia Series, no. 6. Stuyvesan, NY: Pendragon Press, 1992.

_____. *Musique. Architecture*. Tournai: Casterman, 1971.

_____. *Arts-Sciences: Alloys. Thesis Defense of Iannis Xenakis*. New York: Pendragon Press; originally published in 1979 by Editions Casterman, 1985.

_____. *Formalized Music*. Bloomington: Indiana University Press, 1971.

Dissertations and Theses

Cudd, Patti J. "A percussion module." D.M.A. diss., University of California, San Diego, 1998. In *Dissertations & Theses: Full Text* [database on-line]; available from <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 9839493; accessed October 28, 2008).

Gerber, Stuart W. "Karlheinz Stockhausen's solo percussion music: A comprehensive study." D.M.A. diss., University of Cincinnati, 2003. In *Dissertations & Theses: Full Text* [database on-line]; available from <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3121080; accessed November 9, 2008).

- Hall, John Richard. "Development of the percussion ensemble through the contributions of the Latin American composers Amadeo Roldán, José Ardévol, Carlos Chávez, and Alberto Ginastera." D.M.A. diss., The Ohio State University, 2008. In *Dissertations & Theses: Full Text* [database on-line]; available from <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3312979; accessed November 6, 2008).
- Nottingham, Douglas H. "A digital recording of two realizations of John Cage's *27'10.554 for a Percussionist*." D.M.A. diss., Arizona State University, 2001. In *Dissertations & Theses: Full Text* [database on-line]; available from <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3031471; accessed October 26, 2008).
- Flint, Ellen Rennie. "An Investigation of Real Time as Evidenced by the Structural and Formal Multiplicities in Iannis Xenakis' *Psappha*." PhD diss., University of Maryland, 1989.
- Lambert, James William "Multiple Percussion Performance Problem as Illustrated In Five Different Works Composed by Stockhausen, Smith Brindle, Colgrass, Dahl, and Kraft Between 1959 and 1967." D.M.A. diss., The University of Oklahoma, 1983. In *Dissertations & Theses @ University of Oklahoma* [database on-line]; available from <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 8324890; accessed October 30, 2008).
- Longshore, William Terrell. "Reflections on the preparation and performance of three works for contemporary percussion." D.M.A. diss., University of California, San Diego, 1999. In *Dissertations & Theses: Full Text* [database on-line]; available from <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3001265; accessed November 8, 2008).
- Palter, Morris S. "The solidification of performance practice issues in solo percussion performance." D.M.A. diss., University of California, San Diego, 2005. In *Dissertations & Theses: Full Text* [database on-line]; available from <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3171113; accessed October 24, 2008).
- Shively, David P. "Indeterminacy and interpretation: Three realizations." D.M.A. diss., University of California, San Diego, 2001. In *Dissertations & Theses: Full Text* [database on-line]; available from <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3077797; accessed November 7, 2008).

Smith, Alyssa Gretchen "An examination of notation in selected repertoire for multiple percussion." D.M.A. diss., The Ohio State University, 2005. In *Dissertations & Theses: Full Text* [database on-line]; available from <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 3182725; accessed September 8, 2008).

Williams, Barry Michael "The early percussion music of John Cage, 1935-1943." Ph.D. diss., Michigan State University, 1990. In *Dissertations & Theses: Full Text* [database on-line]; available from <http://www.proquest.com.ezproxy1.lib.ou.edu/> (publication number AAT 9117879; accessed September 10, 2008).

Paper Presented at a Conference

Beyer, Greg. "All is Number: Golden section Proportion in Iannis Xenakis' 'Rebonds'". Paper presented at the Percussive Arts Society International Convention, Louisville, KY, November 20, 2004.

Articles from Periodicals

Beyer, Greg. "All is Number: Golden section in Xenakis' 'Rebonds'." *Percussive Notes* 43, no. 1 (February 2005): 40-50.

DeLio, Thomas. "Xenakis." *Perspectives of New Music* 39, no. 1 (2001): 231-43.

Deponte, Neil. "How and Why?" *Percussionist* 12, no. 4 (Summer 1975): 136-149.

Dodge, Stephen W. "The *Concerto pour batterie et petit orchestre* by Darius Milhaud with a Look at Percussion in His Musical Life." *Percussive Notes* 17, no. 3 (Spring/Summer 1979): 58-59.

Early, David. "Percussion Performance Issues in Stravinsky's *Histoire du soldat*." *Percussive Notes* 31, no. 5 (June 1993): 69-75.

Emmerson, Simon. "Xenakis Talks to Simon Emmerson." *Music and Musicians* 25, no. 9 (May 1976): 24-26.

Estrada, Julio. "The Radiance of Iannis Xenakis (1922-2001)." *Perspectives of New Music* 39, no. 1 (2001): 215-30.

- Flint, Ellen Rennie. "Metabolae Arborecences and the Reconstruction of Time in Iannis Xenakis' *Psappha*." *Contemporary Music Review* 7, part 2 (1993): 221-248.
- Frédéric, Bonnans J. and Housnaa Zidani. "Consistency of Generalized Finite Difference Schemes for the Stochastic HJB Equation." *SIAM Journal on Numerical Analysis* 41, no. 3 (June 2003): 1008-21.
- Frock, George. "Ionisation – An Analytical Interpretation." *Percussive Notes* 25, no. 5 (Summer 1987): 31-32.
- Frisius, Rudolf. "Xenakis und das Schlagzeug." *Zeitschrift Für Musik* 157, no. 6 (Nov.-Dec. 1996): 14-18.
- Gerard, Pape. "Iannis Xenakis and the 'Real' of Musical Composition." *Computer Music Journal* 26, no. 1 (2002): 16-21.
- Gluck, Robert. "The Shiraz Arts Festival: Western Avante-Garde Arts in 1970s Iran." *Leonardo* 40, no. 1 (February 2007): 20-28.
- Harley, James. "The Electroacoustic Music of Iannis Xenakis." *Computer Music Journal* 26, no. 1 (Spring 2002): 33-57.
- _____. "Iannis Xenakis (1922-2001)." *Computer Music Journal* 25, no. 3 (Fall 2001): 7.
- _____. "Still Rich & Strange." *The Musical Times* 137, no. 1845 (November 1996): 9-15.
- Harley, Maria Anna. "Spatial Sound Movement in the Instrumental Music of Iannis Xenakis." *Journal of New Music Research* 23, no. 3 (September 1994): 291-314.
- Heubscher, Roland and Yayoi Uno. "Temporal-Gestalt Segmentation: Polyphonic Extensions and Applications to Works by Boulez, Cage, Xenakis, Ligeti, and Babbitt." *Computers in Music Research* 5 (Spring 1995): 1-37.
- Hill, Peter. "Xenakis and the Performer." *Tempo* no. 112 (March 1975): 17-22.
- Howe, Warren. "The Percussionist's Guide to Darius Milhaud's *La creation du monde*." *Percussionist* 17, no. 1 (Fall 1979): 38-48.
- Jones, Evan. "Residue-Class Sets in the Music of Iannis Xenakis: An Analytical Algorithm and a General Intervallic Expression." *Perspectives of New Music* 39, no. 2 (Summer 2001): 229-61.

- Kraft, William. "On Performance: *Histoire du soldat* – A Music Review of Chester's Publication." *Percussive Notes* 30, no. 5 (June 1992): 47-54.
- Lambert, James. "A Student's Preparation of *Zyklus*." *Percussionist* 11, no. 1 (Fall 1973): 15-18.
- Larkin, Bary. "On Research: Performance Analysis of *Psappha*." *Percussive Notes* 30, no. 6 (August 1992): 64-68.
- Neuhaus, Max. "*Zyklus*." *Percussionist* 3, no. 1 (November 1965): 6-12.
- Pratt, Daryl L. "Performance Analysis: Morton Feldman, *The King of Denmark*." *Percussive Notes Research Edition* 25, no. 3 (March 1987): 70-83.
- Rahn, John. "Iannis Xenakis: Regard, Disregard; Liberation." *Perspectives of New Music* 39, no. 1 (2001): 211-14.
- Reed, Brett. "Building a Set of Sixxen." *Percussive Notes* 41, no. 3 (June 2003): 48-50.
- Reynolds, Roger. "Iannis Xenakis: 1922-2001." *Leonardo* 35, no. 4 (2002): 353-54.
- Rosen, Michael. "Focus on Performance: An Interview with Sylvio Gualda Concerning *Psappha*." *Percussive Notes* 27, no. 4 (Summer 1989): 32-36.
- _____. "Terms Used in Percussion." *Percussive Notes* 22, no. 5 (July 1984): 75-76.
- _____. "Terms Used in Percussion." *Percussive Notes* 24, no. 4 (April 1986): 65-67.
- Rudolph, Frisius. "Xenakis and the Percussion Instrument." *Neue Zeitschrift für Musik* 157, no. 6 (November – December 1996): 14-18.
- Salisbury, Wilma. "New Percussion Ensemble Work Premiered." *Percussive Notes* 20, no. 2 (February 1982): 14-16.
- Sallak, Bill. "Informed Indeterminacy: Guidelines for Instrument Choice in Iannis Xenakis' *Psappha*." *Percussive Notes* 40, no. 2 (April 2002): 55-59.
- Siwe, Thomas. "Edgard Varèse's *Ionisation*: Analysis and Performance Problems." *Percussive Notes* 32, no. 5 (October 1994): 73-77.

- Solomos, Makis. "The Unity of Xenakis's Instrumental and Electroacoustic Music: The Case for *Brownian Movements*." *Perspectives of New Music* 39, no. 1 (2001): 244-54.
- Souza, Ricardo and Christine Conklin. "Drumming in the Dark?: An Interview with Steven Schick." *Percussive Notes* 42, no. 5 (October 2004): 51-58.
- Williams, B. Michael. "Stockhausen: *Nr. 9 Zyklus*." *Percussive Notes* 39, no. 3 (June 2001): 60-67.
- Williams, Jan. "Iannis Xenakis, *Persephassa*: An Introduction." *Percussive Notes* 25, no. 4 (Spring 1987): 9-13.
- Williams, Jan. "An Interview with Mortan Feldman." *Percussive Notes: Research Edition* 21, no. 6 (September 1983): 4-14.
- Wood, James. "A New System for Quarter-one Percussion." *Percussive Notes Research Edition* 25, no. 3 (March 1987): 61-65.
- Xenakis, Iannis. "Concerning Time." *Perspectives of New Music* 27, no. 1 (1989): 84-92.
- _____. Roberta Brown and John Rahn. "Xenakis on Xenakis." *Perspectives of New Music* 25, no. 2 (Summer, 1987): 16-63.
- _____. "Towards a Metamusic." *Tempo* no. 93 (Summer 1970): 2-19.
- _____. "Xenakis on Xenakis." *Perspectives of New Music* 25, nos. 1-2 (1987): 16-32.
- Yoken, David. "Focus on Performance: Interview with Iannis Xenakis." *Percussive Notes* 28, no. 3 (Spring 1990): 53-57.
- Zaplitny, Michael. "Conversation with Iannis Xenakis." *Perspectives of New Music* 14, no. 1 (Autumn-Winter 1975): 86-103.

Dictionaries and Encyclopedias

- Bent, Ian D., et al. "Notation." In *The New Grove Dictionary of Music and Musicians*, 2nd ed., ed. Stanley Sadie. London: Macmillan Publishers Limited, 2001.

- Bent, Ian D., et al. "Percussion." In *The New Grove Dictionary of Music and Musicians*, 2nd ed., ed. Stanley Sadie. London: Macmillan Publishers Limited, 2001.
- "Iannis Xenakis." In *The Harvard Biographical Dictionary of Music*, ed. Don Michael Randel. Cambridge, Massachusetts: The Belknap Press of Harvard University Press, 1996.
- "Membranophone." In *The New Harvard Dictionary of Music*, ed. Don Michael Randel. Cambridge, Massachusetts: The Belknap Press of Harvard University Press, 1996.
- Rockwell, John. "Experimental Music." In *The New Grove Dictionary of American Music*, eds. Hitchcock, H. Wiley and Stanley Sadie. London: Macmillan Press Limited, 1986.
- Schick, Steven. "Multiple Percussion." In *The Encyclopedia of Percussion*. ed. John H. Beck. New York: Garland, 1995.
- Slonimsky, Nicolas, Laura Kuhn, and Dennis McIntire. "Xenakis, Iannis," In *Baker's Biographical Dictionary of Musicians*, Centennial 9th ed., ed. Slonimsky, Nicolas and Laura Kuhn. New York: Schirmer Books, 2001.
- "Staff." In *The Oxford Dictionary of Music*. 2nd ed. Rev., edited by Michael Kennedy. *Oxford Music Online*, <http://www.oxfordmusiconline.com/subscriber/article/opr/t237/e9742> (accessed January 5, 2009).
- Tatlow, Ruth. "Fibonacci Series." In *The New Grove Dictionary of Music and Musicians*, 2nd ed., ed. Stanley Sadie. London: Macmillan Publishers Limited, 2001.
- Tatlow, Ruth. "Golden Number." In *The New Grove Dictionary of Music and Musicians*, 2nd ed., ed. Stanley Sadie. London: Macmillan Publishers Limited, 2001.
- Tatlow, Ruth (1-4) and Paul Griffiths (5). "Numbers and Music." In *The New Grove Dictionary of Music and Musicians*, 2nd ed., ed. Stanley Sadie. London: Macmillan Publishers Limited, 2001.

Internet Resources

- Doob, Joseph L. "Stochastic process." AccessScience@McGraw-Hill [online reference]. <http://www.accessscience.com> (accessed 24 October 2008).
- Fergusson, Lee. "Duo Contour, Trumpet and Percussion." http://www.duocontour.org/main_menu.htm. (accessed 29 January 2007).
- Gasseling, Vincent and Michael Nieuwenhuizen. "In Conversation: Morton Feldman and Iannis Xenakis." <http://www.nieuwe-muziek.nl/ianmor1.htm>. (accessed 5 November 2003).
- Girsberger, Russ. "Percussion Research Pages: Multiple Percussion History and Technique." <http://members.aol.com/russg1776/multperc.htm> (accessed 5 November 2003).
- Hoffman, Peter. "Xenakis, Iannis." *Grove Music Online. Oxford Music Online.* <http://www.oxfordmusiconline.com/subscriber/article/grove/music/30654>. (accessed 24 October 2008).
- Stochastic. Dictionary.com Unabridged (v 1.1) Random House, Inc., <http://dictionary.reference.com/browse/stochastic> (accessed: November 14, 2008).
- Tatlow, Ruth. "Fibonacci series." *Grove Music Online. Oxford Music Online.* <http://www.oxfordmusiconline.com/subscriber/article/grove/music/49578>. (accessed 24 October 2008).
- Tatlow, Ruth. "Golden number." *Grove Music Online. Oxford Music Online.* <http://www.oxfordmusiconline.com/subscriber/article/grove/music/49579>. (accessed 24 October 2008).
- Tatlow, Ruth and Paul Griffiths. "Numbers and music." *Grove Music Online. Oxford Music Online.* <http://www.oxfordmusiconline.com/subscriber/article/grove/music/44483>. (accessed 24 October 2008).
- The Library of Congress. "*Iannis Xenakis (1922-)*: Library of Congress Citations." <http://www.malaspina.edu/~mneil/cit/citlcxenakis.htm>. (accessed 5 November 2003).
- Zoutendijk., Mark. "*Compositions for Percussion.*" <http://www.xs4all.nl/~marcz/Slwcomp.html>. (accessed 5 November 2003).

Reviews

- Lambert, James. Literature Review of *Slightly Incognito IV*. *Percussive Notes* 23, no. 4 (April 1985): 72.
- Raush, John. Literature Review of *Deva 3* by Jean-Claude Tavernier. *Percussive Notes* 26, no. 1 (Fall 1987): 55-56.
- Raush, John. Book Review of *Ancient Traditions-Future Possibilities: Rhythmic Training Through the Traditions of Africa, Bali, and India*. *Percussive Notes* 26, no. 4 (Summer 1988): 49.
- Siwe, Tom. Audio Review of *Kroumata Percussion Ensemble*. *Percussive Notes* 23, no. 2 (January 1985): 69-70.

Music Scores

- Cage, John. *27'10.554" for a Percussionist*. New York: Henmar Press, .
- Cage, John. *Composed Improvisation for Snare Drum Alone*. New York: C.F. Peters Corporation, 1990.
- Feldman, Morton. *King of Denmark*. New York: C.F. Peters Corporation, 1965.
- Milhaud, Darius. *Concerto pour batterie et petit orchestre, Reduction pour batterie et piano*. Wien: Universal Edition, 1931.
- Milhaud, Darius. *La creation du monde*. Paris: Editions Max Eschig, 1929.
- Roldán, Amadeo. *Rítmicas No. 5: for Percussion Instruments*, New York City: Southern Music, 1967.
- Roldán, Amadeo. *Rítmicas No. 6: for Percussion Instruments*, New York City: Southern Music, 1967.
- Stockhausen, Karlheinz. *Zyklus Nr. 9 (für einen Schlagzeuger)*. London: Universal Edition, 1961.
- Stravinsky, Igor. *L'histoire du soldat*. London: J. and W. Chester, Ltd., 1924.
- Varèse, Edgard. *Ionisation: for Percussion Ensemble of 13 Players*. Milano, Ricordi, 2000.

- Xenakis, Iannis. *Okho: pour trios djembes et un peau africaine de grande taille*. Paris: Éditions Salabert, 1989.
- _____. *Persephassa: pour six percussionnistes*. Paris: Éditions Salabert, 1969.
- _____. *Pléïades*. Paris: Éditions Salabert, 1979.
- _____. $\Psi \alpha \pi \varphi \alpha$: *Psappha: Percussion Solo*. Paris: Éditions Salabert, 1976.
- _____. *Rebonds: pour percussion solo*. Paris: Éditions Salabert, 1988.

Recordings and Liner Notes

- Kroumata and Keiko Abe. *Perform works by Nishimura, Miyoshi, Takemitsu, Matsushita, and Miki*. BIS recording BIS-CD-462. Stockholm, Sweden: BIS, 1989.
- Kroumata Percussion Ensemble. *Kroumata*. BIS recording BIS-CD-232. Stockholm, Sweden: BIS, 1983.
- Kroumata Percussion Ensemble and Gert Mortensen. *Iannis Xenakis*. BIS recording BIS-CD-482. Stockholm, Sweden: BIS, 1990.
- Larson, Philip, Timothy Adams, Juan Pablo Izquierdo conducts the Carnegie Mellon Philharmonic. *Xenakis/Varèse*. Mode Records recording Mode 58. New York: Mode Records, 1997.
- Larson, Philip, Timothy Adams, Juan Pablo Izquierdo conducts the Carnegie Mellon Philharmonic. *Xenakis/Varèse*. Mode Records recording Mode 58. New York: Mode Records, 1997.
- Leoson, Mark. *Percussion*. Caprice Records recording CAP 21466. Stockholm, Sweden: Caprice Records, 1996.
- Moersch, William. Essay accompanying Newport Classic recording NPD 85528, *The Modern Marimba: New Works for an Ancient Instrument*. William Moersch, marimbist. Providence, RI: Newport Classic Ltd., 1990.

APPENDIX ONE

REBONDS B: ERRATA

Several errors were found in the written notation of the latest 1991 score edition. The following table lists each error found during a comparative review of the 1988 manuscript and the 1991 edition. The correct notation in the 1988 manuscript is juxtaposed with the incorrect notation in the 1991 score edition. Each error is accompanied by a brief description (see Table 3.0).






Measure Number	Beat & Partial	1988 Manuscript	1991 Edition	Description of error
16	2 e	tom 2	tom 3	Wrong drum notated
18	3			Inclusion of note on center line instead of rest
49	1 +	“et”	omitted	Missing information
59	4 e		omitted	Missing grace note
63	4			Inclusion of note on center line instead of rest

Table 3.0 – *Rebonds B*: Errata

APPENDIX TWO

REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE

The following *High Bongo Grace-note Figures Table* organizes high bongo grace-note figures according to their location in the music (measure number and beat placement within a measure) of *Rebonds B*. The table lists recommended sticking methods for specific occurrences of the *divided drum* and *simultaneous drum* high bongo grace-note figures. In addition, corresponding page numbers are included for each suggested exercise.

Table 3.1 *REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE (p. 1 of 5)*

Location in the music		Sticking Methods							
		Divided drum				Simultaneous drum			
		Right-hand		Left-hand		Consecutive right		Alternate-hand	
Measure Number	Beat	Exercise	Page #	Exercise	Page #	Exercise	Page #	Exercise	Page #
1	1					CRD5a	88	AD5a	95
1	3					CRD3a	86	AD3a	93
2	1	RD2a	39	LD2a	62				
2	3	RD4a	41	LD4a	64				
		RD6c	43	LD6c	66				
3	1	RD6a	43	LD6a	66				
3	3	RD6a	43	LD6a	66				
		RD5b	42	LD5b	65				
4	1					CRD6a	89	AD6a	96
4	3					CRD5a	88	AD5a	95
5	1					CRD4a	87	AD4a	94
5	3					CRD6a	89	AD6a	96
6	1	RD6c	43	LD6c	66				
6	2					CRD4d	87	AD4d	94
6	4					CRD6d	89	AD6d	96
7	2					CRD5d	88	AD5d	95
7	4					CRD4d	87	AD4d	94
9	3					CRD6b	89	AD6b	96
10	1	RD7b	44	LD7b	67				
10	3	RD2b	39	LD2b	62				
11	1					CRD3a	86	AD3a	93
11	3	RD6c	43	LD6c	66				
12	1	RD6b	43	LD6b	66				
		RD5c	42	LD5c	65				
12	2	RD2d	39	LD2d	62				
12	4	RD11a	48	LD11a	71				
		RD12c	49	LD12c	72				
13	2	RD2c	39	LD2c	62				
13	4	RD16c	53	LD16c	76				
14	2	RD14b	51	LD14b	74				
		RD11c	48	LD11c	71				
14	4	RD14a	51	LD14a	74				
		RD13b	50	LD13b	73				
15	2	RD16b	53	LD16b	76				
15	4	RD18a	55	LD18a	78				
		RD15c	52	LD15c	75				
16	2	RD17b	54	LD17b	77				

Table 3.2 *REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE* (p. 2 of 5)

Location in the music		Sticking Methods							
		Divided drum				Simultaneous drum			
		Right-hand		Left-hand		Consecutive right		Alternate-hand	
Measure Number	Beat	Exercise	Page #	Exercise	Page #	Exercise	Page #	Exercise	Page #
18	3	RD4a	41	LD4a	67				
19	1	RD6a	43	LD6a	69				
19	2					CRD4d	87	AD4d	94
20	1					CRD3a	86	AD3a	93
20	3					CRD5b	88	AD5b	95
21	1	RD16a	53	LD16a	76				
		RD18c	55	LD18c	78				
21	3	RD15b	52	LD15b	75				
22	1	RD17a	54	LD17a	77				
		RD18b	55	LD18b	78				
22	4	RD10a	47	LD10a	70				
		RD7c	44	LD7c	67				
23	2	RD18a	55	LD18a	78				
		RD17b	54	LD17b	77				
		RD18c	55	LD18c	78				
24	1	RD6a	43	LD6a	66				
24	3	RD6a	43	LD6a	66				
		RD5b	42	LD5b	65				
25	1	RD4a	41	LD4a	64				
25	3	RD3b	40	LD3b	63				
26	1	RD9a	46	LD9a	69				
		RD10b	57	LD10b	70				
26	4	RD6a	43	LD6a	66				
27	2	RD6a	43	LD6a	66				
		RD5b	42	LD5b	65				
27	4	RD3a	40	LD3a	63				
28	2	RD2a	39	LD2a	62				
28	3	RD10b	47	LD10b	70				
28	4	RD11a	48	LD11a	71				
		RD13c	50	LD13c	73				
29	1	RD18b	55	LD18b	78				
		RD17c	54	LD17c	77				
29	3	RD10a	47	LD10a	70				
		RD7b	44	LD7b	67				
29	4	RD12b	49	LD12b	72				
		RD14c	51	LD14c	74				
30	2	RD6b	43	LD6b	66				

Table 3.3 *REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE (p. 3 of 5)*

Location in the music		Sticking Methods							
		Divided drum				Simultaneous drum			
		Right-hand		Left-hand		Consecutive right		Alternate-hand	
Measure Number	Beat	Exercise	Page #	Exercise	Page #	Exercise	Page #	Exercise	Page #
30	4	RD6a	43	LD6a	66				
		RD5b	42	LD5b	65				
35	2					CRD5c	88	AD5c	95
35	4	RD14a	51	LD14a	74				
36	2					CRD3c	86	AD3c	93
36	4	RD7c	44	LD7c	67				
37	2	RD13a	50	LD13a	73				
		RD11b	48	LD11b	71				
37	4	RD11c*	48	LD11c*	71				
38	2	RD12a	49	LD12a	72				
		RD14b	51	LD14b	74				
		RD12c	49	LD12c	72				
38	4	RD11a	48	LD11a	71				
39	2	RD2a	39	LD2a	62				
39	3	RD15b	52	LD15b	75				
		RD18c	55	LD18c	78				
40	1	RD13b	50	LD13b	73				
		RD14c	51	LD14c	74				
40	3	RD7b	44	LD7b	67				
		RD8c	45	LD8c	68				
41	1	RD3b	40	LD3b	63				
41	2	RD11c	48	LD11c	71				
41	3					CRD4b	87	AD4b	94
41	4	RD7c	44	LD7c	67				
42	1	RD3b	40	LD3b	63				
42	2	RD10b	47	LD10b	70				
		RD9c	46	LD9c	69				
42	3	RD8a	45	LD8a	68				
		RD7c	44	LD7c	67				
42	4	RD3b	40	LD3b	63				
43	1	RD2a	39	LD2a	62				
		RD2d	39	LD2d	62				
43	2	RD14a	51	LD14a	74				
		RD13b	50	LD13b	73				
		RD11c	48	LD11c	71				
43	3	RD10a	47	LD10a	70				
		RD2d	39	LD2d	62				

Table 3.4 *REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE (p. 4 of 5)*

Location in the music		Sticking Methods							
		Divided drum				Simultaneous drum			
		Right-hand		Left-hand		Consecutive right		Alternate-hand	
Measure Number	Beat	Exercise	Page #	Exercise	Page #	Exercise	Page #	Exercise	Page #
43	4	RD7a	44	LD7a	67				
48	2	RD14a	51	LD14a	74				
		RD13c	50	LD13c	73				
48	3	RD16b	53	LD16b	76				
		RD18c	55	LD18c	78				
49	1	RD3a	40	LD3a	63				
49	2	RD6a	43	LD6a	66				
		RD5b	42	LD5b	65				
49	3	RD10b*	47	LD10b*	70				
49	4					CRD4c	87	AD4c	94
50	1	RD15b	52	LD15b	75				
50	2	RD18a	55	LD18a	78				
		RD17b	54	LD17b	77				
50	4	RD5a	42	LD5a	65				
		RD4c	41	LD4c	64				
51	1	RD7a	44	LD7a	67				
		RD9b	46	LD9b	69				
		RD10c	47	LD10c	70				
51	2	RD14c	51	LD14c	74				
51	3	RD11b	48	LD11b	71				
		RD13c	50	LD13c	73				
51	4	RD12a	49	LD12a	72				
		RD11b	48	LD11b	71				
		RD13c	50	LD13c	73				
52	1	RD12b	49	LD12b	72				
		RD14c	51	LD14c	74				
52	2	RD15b	52	LD15b	75				
		RD18c	55	LD18c	78				
52	3	RD17b	54	LD17b	77				
		RD15c	52	LD15c	75				
53	1	RD6a	43	LD6a	66				
		RD4b	41	LD4b	64				
		RD3c	40	LD3c	63				
53	2	RD5a	42	LD5a	65				
		RD6b	43	LD6b	66				
		RD17b	54	LD17b	77				
		RD18c	55	LD18c	78				

Table 3.5 *REBONDS B: HIGH BONGO GRACE-NOTE FIGURES TABLE (p. 5 of 5)*

Location in the music		Sticking Methods							
		Divided drum				Simultaneous drum			
		Right-hand		Left-hand		Consecutive right		Alternate-hand	
Measure Number	Beat	Exercise	Page #	Exercise	Page #	Exercise	Page #	Exercise	Page #
53	3	RD15a	52	LD15a	75				
		RD17b	54	LD17b	77				
53	4	RD2c	39	LD2c	62				
58	1	RD1d	37	LD1d	60				
58	4	RD1b	37	LD1b	60				
59	1	RD1b	37	LD1b	60				
59	2	RD1a	37	LD1a	60				
		RD1d	37	LD1d	60				
59	4	RD7a*	44	LD7a*	67				
		RD9b	46	LD9b	69				
60	1	RD8b	45	LD8b	68				
60	2	RD6a	43	LD6a	66				
		RD4b	41	LD4b	64				
		RD3c	40	LD3c	63				
60	4	RD5a	42	LD5a	65				
		RD17b	54	LD17b	77				
61	1	RD16a	53	LD16a	76				
		RD18c	55	LD18c	78				
61	3	RD1a	37	LD1a	60				
		RD1d	37	LD1d	60				
62	1	RD1a	37	LD1a	60				
62	2	RD1a	37	LD1a	60				
		RD1d	37	LD1d	60				
62	3	RD1d	37	LD1d	60				
62	4	RD1c	37	LD1c	60				
63	1	RD1d	37	LD1d	60				
63	3	RD1a	37	LD1a	60				
		RD1d	37	LD1d	60				
64	1	RD2a	39	LD2a	62				
		RD2d	39	LD2d	62				
64	3	RD2a	39	LD2a	62				
		RD2c	39	LD2c	62				
64	4	RD2a	39	LD2a	62				
		RD2d	39	LD2d	62				
65	1	RD2b	39	LD2b	62				
65	2	RD1a	37	LD1a	60				






















































* - Denotes slight variation from exercise to musical passage

APPENDIX THREE

REBONDS A: POLYRHYTHM TABLE

The following *Polyrhythm Types Table* organizes polyrhythms according to their location in the music (measure number, beat placement, and sixteenth-note partial within a measure) of *Rebonds A*. The table lists each polyrhythm type and polyrhythm ratio followed by recommended exercises. In addition, corresponding page numbers are included for each suggested polyrhythm type exercise.

Table 3.6 **REBONDS A: POLYRHYTHM TYPES TABLE (p. 1 of 3)**

Measure Number	Beat	 Partial	Polyrhythm Type	Polyrhythm Ratio	Exercise	Page #
6	3	2nd & 3rd	1	2  : 3 	PT1	104
7	1 & 2	4th & 1st	1	2  : 3 	PT1	104
8	4	1st & 2nd	2	3  : 2 	PT2	105
9	2	3rd & 4th	1	2  : 3 	PT1	104
10	2	3rd & 4th	2	3  : 2 	PT2	105
11	2	2nd & 3rd	1	2  : 3 	PT1	104
12	1	1st & 2nd	1	2  : 3 	PT1	104
12	2	2nd & 3rd	2	3  : 2 	PT2	105
13	2	1st & 2nd	2	3  : 2 	PT2	105
13	3 & 4	4th & 1st	2	3  : 2 	PT2	105
14	1	3rd & 4th	1	2  : 3 	PT1	104
14	3	3rd & 4th	2	3  : 2 	PT2	105
14	4	3rd & 4th	1	2  : 3 	PT1	104
15	1 & 2	4th & 1st	2	3  : 2 	PT2	105
15	3	3rd & 4th	5	3  : 4 	PT5	113
17	3	4th	4	3  : 2 	PT4	109
17	4	1st	4	3  : 2 	PT4	109
19	2	3rd & 4th	2	3  : 2 	PT2	105
21	1	2nd, 3rd & 4th	8.1	5  : 3 	PT8	120
23	1	2nd	3	2  : 3 	PT3	106
23	1	3rd	4	3  : 2 	PT4	109
24	2	1st	6	3  : 4 	PT6	114
25	2	2nd	6	3  : 4 	PT6	114
25	4	1st	7	4  : 3 	PT7	117
26	2	2nd	6	3  : 4 	PT6	114
26	3	4th	7	4  : 3 	PT7	117

Measure Number	Beat	Partial	Polyrhythm Type	Polyrhythm Ratio	Exercise	Page #
28	2 & 3	4th, 1st & 2nd	8.2	5 ♪ : 3 ♪	PT8	120
32	1	4th	7	4 ♪ : 3 ♪	PT7	117
33	2	3rd	6	3 ♪ : 4 ♪	PT6	114
33	4	2nd	6	3 ♪ : 4 ♪	PT6	114
34	3	2nd	7	4 ♪ : 3 ♪	PT7	117
35	2	1st	7	4 ♪ : 3 ♪	PT7	117
36	1	3rd	6	3 ♪ : 4 ♪	PT6	114
36	4	2nd	6	3 ♪ : 4 ♪	PT6	114
38	1	2nd	6	3 ♪ : 4 ♪	PT6	114
38	3	1st	7	4 ♪ : 3 ♪	PT7	117
39	1	2nd	7	4 ♪ : 3 ♪	PT7	117
40	2	3rd	6	3 ♪ : 4 ♪	PT6	114
41	2	4th	6	3 ♪ : 4 ♪	PT6	114
41	4	4th	6	3 ♪ : 4 ♪	PT6	114
42	2	3rd	6	3 ♪ : 4 ♪	PT6	114
42	4	2nd	6	3 ♪ : 4 ♪	PT6	114
43	2	3rd	6	3 ♪ : 4 ♪	PT6	114
45	1	1st	6	3 ♪ : 4 ♪	PT6	114
46	1	3rd	6	3 ♪ : 4 ♪	PT6	114
48	2	4th	7	4 ♪ : 3 ♪	PT7	117
48	3	4th	3	2 ♪ : 3 ♪	PT3	106
48	4	3rd	7	4 ♪ : 3 ♪	PT7	117
49	1	3rd	6	3 ♪ : 4 ♪	PT6	114
49	2	1st	7	4 ♪ : 3 ♪	PT7	117
49	2	3rd	7	4 ♪ : 3 ♪	PT7	117
49	3	1st	6	3 ♪ : 4 ♪	PT6	114

Measure Number	Beat	Partial	Polyrhythm Type	Polyrhythm Ratio	Exercise	Page #
49	3	4th	3	2 ♪ : 3 ♪	PT3	106
49	4	2nd	7	4 ♪ : 3 ♪	PT7	117
49	4	3rd	7	4 ♪ : 3 ♪	PT7	117
50	1	2nd	7	4 ♪ : 3 ♪	PT7	117
50	1	4th	4	3 ♪ : 2 ♪	PT4	109
50	2	4th	6	3 ♪ : 4 ♪	PT6	114
50	3	1st	3	2 ♪ : 3 ♪	PT3	106
50	4	3rd	3	2 ♪ : 3 ♪	PT3	106
51	1	1st	4	3 ♪ : 2 ♪	PT4	109
51	1	3rd	3	2 ♪ : 3 ♪	PT3	106
52	4	3rd	6	3 ♪ : 4 ♪	PT6	114
53	1	2nd	7	4 ♪ : 3 ♪	PT7	117
53	1	3rd	6	3 ♪ : 4 ♪	PT6	114
53	3	3rd	6	3 ♪ : 4 ♪	PT6	114
53	4	3rd	4	3 ♪ : 2 ♪	PT4	109

APPENDIX FOUR

LIST OF EXERCISES

Rebonds B : High bongo grace-note figures: Identification and Approach
Right-hand drag sticking method (RD)

RD1	37
RD1.5	37
RD2	39
RD3	40
RD4	41
RD5	42
RD6	43
RD7	44
RD8	45
RD9	46
RD10	47
RD11	48
RD12	49
RD13	50
RD14	51
RD15	52
RD16	53
RD17	54
RD18	55
RD19	56
RD20	57
RD21	58
RD22	59

Rebonds B : High bongo grace-note figures: Identification and Approach
Left-hand drag sticking method (LD)

LD1	60
LD1.5	60
LD2	62
LD3	63
LD4	64
LD5	65
LD6	66

LD7	67
LD8	68
LD9	69
LD10	70
LD11	71
LD12	72
LD13	73
LD14	74
LD15	75
LD16	76
LD17	77
LD18	78
LD19	79
LD20	80
LD21	81
LD22	82

Rebonds B : High bongo grace-note figures: Identification and Approach
 Consecutive right-hand drag sticking method (CRD)

CRD1	83
CRD1.5	83
CRD2	85
CRD3	86
CRD4	87
CRD5	88
CRD6	89

Rebonds B : High bongo grace-note figures: Identification and Approach
 Alternate-hand drag sticking method (AD)

AD1	90
AD1.5	90
AD2	92
AD3	93
AD4	94
AD5	95
AD6	96

Rebonds A : Subdivisions of the beat (S)

S1	97
S2	98

Rebonds A : Polyrhythm types (PT): Identification and Approach

PT1	104
PT2	105
PT3	106
PT4	109
PT5	112
PT6	114
PT7	117
PT8	120
PT8.1	122
PT8.2	123
PT8.3	125