ABSTRACT

Title of Document: STRING QUARTET
Jacob Abraham Polasky, DMA, 2012
Directed By: Dr. Lawrence Moss, Music Theory/Composition

This is a String Quartet in three movements. It is an example of the use of set theory and combinatorial analysis in music composition. Harmony is created by the combination of four-tone sets into eight-tone sets. Contrapuntal devices, such as the arrangement of set elements to create maximum intervallic variety are explored in the second movement. This movement is also the focus of a complex pattern based on eight tone sets. Five of the tones are used regularly, while the other three tones are used to disrupt a sense of regularity.
STRING QUARTET

By

Jacob Abraham Polasky

Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Musical Arts
2012

Advisory Committee:

Dr. Lawrence, Moss, Chair
Dr. Thomas DeLio
Dr. James Fry
Dr. Daniel Zimmerman
Dr. Jerrold Levinson
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String Quartet No. 1

Allegro \( j = 120 \)

Jacob Polasky

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APPENDIX I

Set A [C, C#, D, Eb]
Set B [C, C#, G, A]

<table>
<thead>
<tr>
<th>A U A</th>
<th>A U B</th>
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<tbody>
<tr>
<td>A₀  C  C#  D  Eb  IV</td>
<td>B₀  C  C#  G  A  II</td>
</tr>
<tr>
<td>A₁  C#  D  Eb  E  III</td>
<td>B₁  C#  D  G#  Bb  II</td>
</tr>
<tr>
<td>A₂  D  Eb  E  F  II</td>
<td>B₂  D  Eb  A  B  II</td>
</tr>
<tr>
<td>A₃  Eb  E  F  F#  I</td>
<td>B₃  Eb  E  Bb  C  II</td>
</tr>
<tr>
<td>A₄  E  F  F#  G  0</td>
<td>B₄  E  F  B  C#  I</td>
</tr>
<tr>
<td>A₅  F  F#  G  G#  0</td>
<td>B₅  F  F#  C  D  II</td>
</tr>
<tr>
<td>A₆  F#  G  G#  A  0</td>
<td>B₆  F#  G  C#  Eb  II</td>
</tr>
<tr>
<td>A₇  G  G#  A  Bb  0</td>
<td>B₇  G  G#  D  E  1</td>
</tr>
<tr>
<td>A₈  G#  A  Bb  B  0</td>
<td>B₈  G#  A  Eb  F  I</td>
</tr>
<tr>
<td>A₉  A  Bb  B  C  I</td>
<td>B₉  A  Bb  E  F#  0</td>
</tr>
<tr>
<td>A₁₀ Bb  B  C  C#  II</td>
<td>B₁₀ Bb  B  F  G  0</td>
</tr>
<tr>
<td>A₁₁ B  C  C#  D  III</td>
<td>B₁₁ B  C  F#  G#  I</td>
</tr>
</tbody>
</table>

Set combinations with zero notes in common

A₀ + A₄  A₀ + A₈
A₀ + A₅  A₀ + B₉
A₀ + A₆  A₀ + B₁₀
A₀ + A₇
APPENDIX II

Set $Z = \{C, A, B, G\#, F\#\}$

\[
[Bb, C] \cap Z
\]

\[
\begin{array}{cccccc}
Z_0 & C & A & B & G\# & F\# \\
Z_1 & C\# & Bb & C & A & G \\
Z_2 & D & B & C\# & Bb & G\# \\
Z_3 & Eb & C & D & B & A \\
Z_4 & E & C\# & Eb & C & Bb \\
Z_5 & F & D & E & C\# & B \\
Z_6 & F\# & Eb & F & D & C \ast \\
Z_7 & G & E & F\# & Eb & C\# \\
Z_8 & G\# & F & G & E & D \\
Z_9 & A & F\# & G\# & F & Eb \ast \\
Z_{10} & Bb & G & A & F\# & E \\
Z_{11} & B & G\# & Bb & G & F \\
\end{array}
\]

Sets $Z_2$ and $Z_4$ contain the notes Bb and C.
Appendix III

V31
G B c# A - Bb - Eb B Db G - E - C - 0 F A B C A B, A - F# - C

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<tbody>
<tr>
<td>F</td>
<td>Bb</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>G</td>
<td>A</td>
<td>B</td>
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<tr>
<td>Db</td>
<td>Eb</td>
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<tr>
<td>Min 7</td>
<td>Maj 3</td>
<td>Maj 2</td>
<td>Min 6</td>
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Diagram of musical chords and their relationships.