

(ASYMMETRIES OF MATTER)

A DISSERTATION IN
Music Composition

Presented to the Faculty of the University
of Missouri-Kansas City in partial fulfillment of
the requirements for the degree

DOCTOR OF MUSICAL ARTS

by
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(ASYMMETRIES OF MATTER)

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University of Missouri-Kansas City, 2020

ABSTRACT

(asymmetries of matter) is a work for chamber ensemble comprised of voice, trumpet, trombone and bass clarinet, as well as a series of four shorter solo works, one for each instrument of the ensemble, that are embedded within the larger work. Both the ensemble work and the solo works may be performed independently or in sequence collectively.

This conglomerate of works was created using a prescriptive system of notation designed by the composer to highlight the physical actions of the performers. In this system, sounds are not specifically indicated, but are notated graphically via combinations of lines, shapes, colors, and gradients. The sonic results of these actions, indeed the sounds of the five works themselves that comprise *(asymmetries of matter)*, are therefore somewhat indeterminate and will vary from performance to performance depending on the distinctive characteristics of the performers and their instruments.

Materiality and physicality are central to both the ethos and construction of *(asymmetries of matter)*. These works focus on the physiological components of sound production in order to foreground the interaction of body and instrument. Physical actions, rather than sounds, are the primary compositional materials and have been prioritized in the notational hierarchy as a means to generate new sonic possibilities. This approach proposes new ways of listening to and interpreting this music and allows me, the performers, and the listeners to engage with new modes of creative expression.

APPROVAL PAGE

The faculty listed below, appointed by the Dean of the UMKC Conservatory, have examined a dissertation titled “(asymmetries of matter),” presented by Jonathan Booker, a candidate for the Doctor of Musical Arts degree, and certify that in their opinion it is worthy of acceptance.

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I wish to express my deepest gratitude to the members of loadbang ensemble—Jeff, Andy, Will, and Adrian—for generously sharing their ideas about this work and its notation. I am very fortunate to have been able to work for an extended period of time with musicians of their caliber and this work has been made better by their input.

I would also like to recognize Jim Mobberley, who spent a semester of composition lessons guiding me through the process of developing my ideas about this type of music while those ideas were still in their infancy.

Finally, I would like to wholeheartedly thank the members of my supervisory committee—Chen Yi, Alison DeSimone, Larson Powell, Paul Rudy, and Zhou Long. They have been eternally supportive, encouraging, and thoughtful both during the process of creating this dissertation and throughout my time at UMKC. Their mentorship has challenged me to be a better thinker, scholar, and composer.

PREFACE

General Performance Instructions

Notation & Sound World

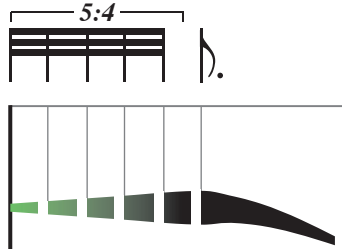
This work employs a prescriptive system of notation that focuses on the physical actions of the performers. Sounds are not specifically indicated in the notation and are only implied by means of the sound-producing actions that are notated graphically using combinations of lines, shapes, colors, and gradients. The sonic results of these actions are therefore somewhat indeterminate and will vary depending on the distinctive characteristics of the performers and their instruments.

Durations

(*asymmetries of matter*): approx. 10 minutes; *Asymmetry 1*: approx. 3 1/2 minutes; *Asymmetry 2*: approx. 3 1/2 minutes; *Asymmetry 3*: approx. 3 minutes; *Asymmetry 4*: approx. 2 3/4 minutes.

Rhythm

Rhythms are notated without noteheads above each instrument's top staff. They may correspond to events notated in either/any of an instrument's staves. For visual clarity, gray vertical lines extend downward from the stems and attach to the rhythmesized action(s). On the voice's staff, some rhythms only correspond to changes to phonetic symbols. In these cases, dashed gray lines are used in place of the solid ones.



Breaks in lines/shapes indicate rests outside of the notated rhythms. These breaks are generally used in instances of detached attacks, as the example on the left shows, whereas unbroken lines/shapes indicate connected/legato attacks.

Fermatas are roughly proportionate to one another (e.g. a two-beat fermata should have approximately twice the duration of a one-beat fermata), however, the exact durations of fermatas are to be determined by the performers.

Pitches & Accidentals

In this work, pitches are unquantified and relative only to the ranges of the performers' instruments. They have no relationship to temperament or ordered frequency-related scales.

Dynamics

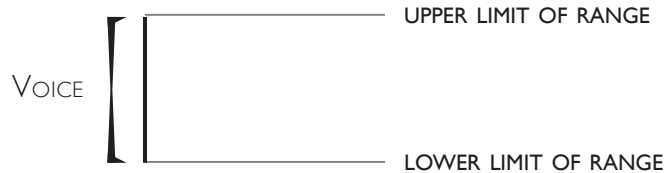
Dynamics are indicated by the width of lines/shapes. In this notational system, dynamics refers to a physical state (i.e. the amount of air flow from the lungs), while the audible loudness of the resulting sound may be different.



Instrument-Specific Instructions

Voice (any type)

This part may be performed by a singer with any vocal range. The vocalist's actions are notated on a single staff. Pitch material is shown by the vertical positioning of lines/shapes on the staff with the top and bottom lines of the staff representing the upper and lower limits, respectively, of the singer's range. It is unnecessary for these upper and lower limits of the range to be fixed throughout the piece. Instead, they may be redefined by other techniques and materials (such as dynamics, types of phonations, phonemes, vibrato, etc.) but should always remain at the edge of the threshold of the possible.

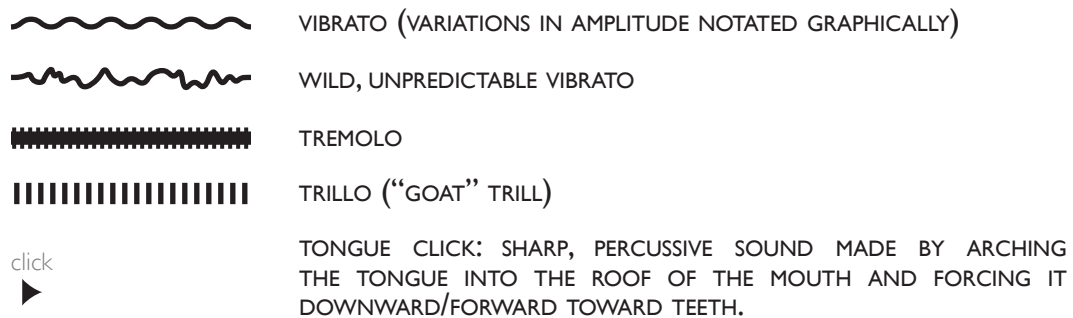


Color is used to differentiate between three types of phonations that the vocalist produces through changes in glottis position and tension.



There is no text in this work. Instead, the singer produces sounds taken from the International Phonetic Alphabet. These phonetic symbols appear below the vocal staff.

Other vocal techniques:



Trumpet in B^b or C (+ Harmon mute)

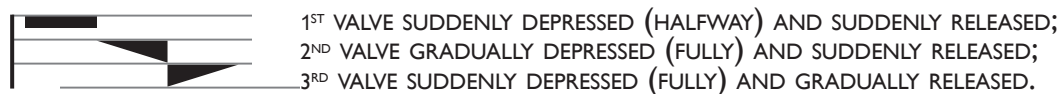
This part may be performed on either a B^b or C trumpet. The trumpeter's actions are notated on two staves. The top staff contains information regarding embouchure, pitch, and dynamics, while the bottom staff contains information regarding the valves and slides

Pitch material (irrespective of valves) is shown by the vertical positioning of lines/shapes on the top staff with the top and bottom lines of the staff representing the highest and lowest partials, respectively, within the player's range. It is unnecessary for these highest and lowest partials to be fixed throughout the piece. Instead, they may be redefined by other techniques and materials (such as dynamics, types of embouchure, etc.), but should always remain at the edge of the threshold of the possible.

The actions of the valves and slides are notated on the bottom staff. The staff is oriented so that the first valve is notated in the top space and the third valve in the bottom space.



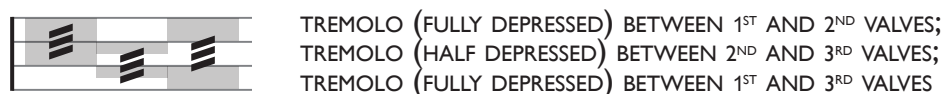
Valves may be either fully or partially depressed and may be depressed and released either suddenly or gradually over time. For example...



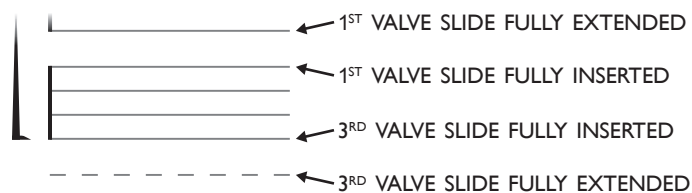
Valve trills (rapid depressing and releasing of valves over a specified duration) are notated in gray with a trill symbol (examples below). When a valve trill involves multiple valves, the valves should be depressed and released at the same time.



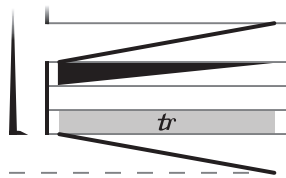
Valve tremoli (rapid alternation between multiple valves) are notated in gray with a tremolo symbol (examples below). When a valve tremolo involves all three valves, the valves should be alternated between randomly and irregularly.



Black lines above and/or below the valve staff indicate movement of the first and third valve slides. The default position for valve slides is fully inserted. The first valve slide is notated above the valve staff, while the third valve slide is notated below it. For the first valve slide, the limit of extension is represented by the bottom line of the embouchure staff. For the third valve slide, a dashed line is used to represent the limit of extension.



As the lines move away from the valve staff (upward for the first valve slide and downward for the third valve slide) valve slides are extended (example below). When the black lines are absent, valve slides should always be in the fully inserted position.



1ST VALVE SLIDE MOVES FROM FULLY INSERTED TO FULLY EXTENDED WHILE 1ST VALVE IS SUDDENLY DEPRESSED AND GRADUALLY RELEASED

3RD VALVE SLIDE MOVES FROM FULLY INSERTED TO FULLY EXTENDED WHILE 3RD VALVE IS TRILLED

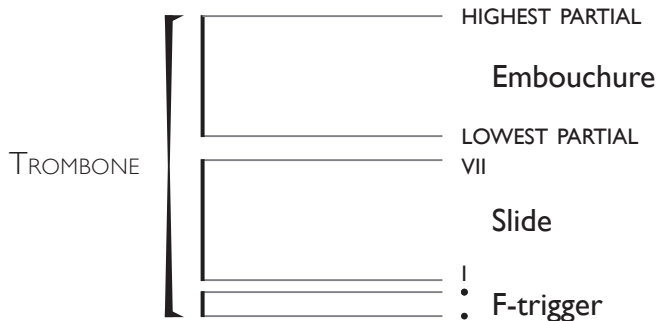
Tenor Trombone with F-attachment

This part must be performed on a tenor trombone with an F-attachment. The trombonist's actions are notated on three staves. The top staff contains information regarding embouchure, pitch, and dynamics; the middle staff contains information regarding the slide; and the bottom staff contains information regarding the F-trigger.

Pitch material (irrespective of slide position) is shown by the vertical positioning of lines/shapes on the top staff with the top and bottom lines of the staff representing the highest and lowest partials, respectively, within the player's range. It is unnecessary for these highest and lowest partials to be fixed throughout the piece. Instead, they may be redefined by other techniques and materials (such as dynamics, types of embouchure, etc.), but should always remain at the edge of the threshold of the possible.

The movement of the slide is notated on the middle staff. Slide position is shown by the vertical positioning of lines on the staff with the top line of the staff representing seventh position (VII) and the bottom line of the staff representing first position (I). Although not notated, the player may need to adjust the position of the slide during silences in order to prepare the subsequent attack.

The actions of the F-trigger are notated on the bottom staff. The top line of this staff represents the F-trigger in its fully engaged position, while the bottom line represents the F-trigger in its fully disengaged position.




The movement of the slide physically independent of the embouchure and F-trigger. Slide positions should remain constant even when the F-trigger is engaged and disengaged.




WILD, ERRATIC MOVEMENT OF THE SLIDE

The F-trigger may be either fully or partially engaged and may be engaged and disengaged either suddenly or gradually. For example...



F-TRIGGER SUDDENLY ENGAGED (FULLY), SUDDENLY DISENGAGED;
 F-TRIGGER SUDDENLY ENGAGED (FULLY), GRADUALLY DISENGAGED;
 F-TRIGGER GRADUALLY ENGAGED (HALFWAY), SUDDENLY DISENGAGED


F-trigger trills (rapid engaging and disengaging the F-trigger over a specified duration) are notated in gray with a trill symbol (examples below). F-trigger trills should be executed as fast as possible.



F-TRIGGER TRILLED (FULLY);
 F-TRIGGER TRILLED (HALFWAY)

Brass Embouchure Types & Techniques (Trumpet & Trombone)

There are four types of embouchure used in the brass parts of this work.



GREEN: FLABBY; BREATHY; DIFFUSE
 LOOSE AND EXTRUDING (“ROLLED OUT”) EMOUCHURE
 EMPHASIZING LOW PARTIALS/PEDAL TONES WITH AIR LEAKING OUT

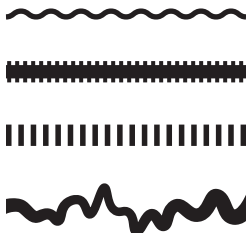
BLACK: NORMAL BUZZ; PURE, CLEAN TONE

RED: COARSE; GUTTERAL; VULGAR
 OFTEN UTILIZING SPLIT TONES (THE EXACT PARTIALS TO BE SPLIT ARE CHOSEN BY THE PLAYERS) AND/OR GROWLING

BLUE: PINCHED; SQUEALING; COMPRESSED
 VERY TIGHTLY PURSED (“ROLLED IN”) EMOUCHURE AND TAUT CHIN
 EMPHASIZING HIGH PARTIALS

TRANSITIONS SHOWN WITH GRADIENTS

Other embouchure techniques:



LIP TRILL (TO ADJACENT HIGHER OR LOWER PARTIAL)

FLUTTER TONGUE

DOUBLE/TRIPLE/DOODLE TONGUE

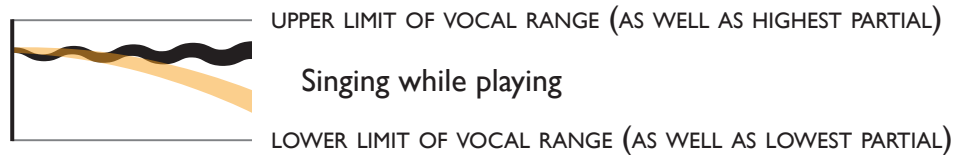
WILD, UNPREDICTABLE EMOUCHURE

Tongue Ram is a percussive air sound (a rounded “pop” with distinct pitch content) made by forcing air into the instrument without vibrating the lips, then abruptly stopping the air flow by thrusting the tongue into the mouthpiece. Resulting pitches are controlled solely by the valves/slide (pedal tones only). Notated in the center of the emouchure staff.



TONGUE RAM

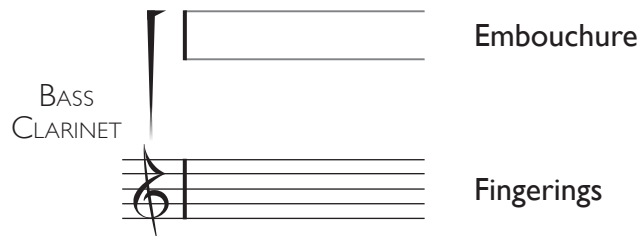
Singing while playing is notated with **orange** shapes on the embouchure staff. The top and bottom lines of the embouchure staff represent the upper and lower limits, respectively, of the player's vocal range. It is unnecessary for these upper and lower limits to be fixed throughout the piece. Instead, they may be redefined by other techniques and materials (such as register of the instrumental sound, type of tonguing, etc.) but should always remain at the edge of the threshold of the possible. The voice is independent of the instrument. No attempt should be made to match the pitch produced by the voice with the pitch produced by the instrument. The voice always sounds through the instrument.








Bass Clarinet in B \flat

This part must be performed on a bass clarinet in B \flat . The clarinetist's actions are notated on two staves. The top staff contains information regarding embouchure and dynamics, while the bottom staff contains information regarding pitch and fingerings.

Pitch material is shown with accidentals on a five line staff. Semi-opaque red lines are also used for visual clarity—thin red lines for accidentals notated on staff lines and thick red lines for accidentals notated in spaces. Pitches sound a major ninth lower than written (French notation), however, pitch is frequently altered by changes in embouchure such as in the cases of overblown spectral multiphonics.



There are four types of embouchure used in the bass clarinet part of this work.

- 
GREEN: AIRY; BREATHY; PALE; HOLLOW
 OPEN/LOOSE EMOUCHURE PRODUCING AIR SOUND WITH NO PITCH. TO TRANSITION TO NORMAL TONE (SHOWN WITH GRADIENT), GRADUALLY CLOSE EMOUCHURE AND ALLOW PITCHES TO CREEP IN.
- 
BLACK: NORMAL TONE; PURE; CLEAN
- 
RED: GROWLING; GUTTERAL; GRINDING
 GROWL/THROAT FLUTTER (DISTINGUISHABLE FROM FRONT FLUTTER)
- 
BLUE: OVERBLOWN; SQUEALING; SQUAWKING
 SPECTRAL MULTIPHONICS AND UNPREDICTABLE SPECTRAL SWEEPS IN LOWER REGISTERS; PINCHED SQUEALS/SHRIEKS IN UPPER REGISTERS
- 
 TRANSITIONS SHOWN WITH GRADIENTS

Other embouchure techniques:



FLUTTER TONGUE



DOUBLE/TRIPLE/DOODLE TONGUE



DOWNWARD PITCH BENDS ARE INDICATED BY SHAPES THAT CURVE BELOW THE BOTTOM LINE OF THE EMOUCHURE STAFF. DEPENDING ON THE REGISTER IN WHICH THEY OCCUR, THESE PITCH BENDS MAY BE ACCOMPLISHED BY CHANGING THE SHAPE OF THE ORAL CAVITY, AND/OR PLACING THE TONGUE ON THE REED.



SLAP TONGUE

No notational distinction is made between trills and tremoli. Both actions are notated using the trill symbol with the “trill-to” note in parentheses. Double trills also appear frequently and, in most cases, involve alternating between the left and right hand keys of the same pitch. On fingering diagrams, trilled keys appear within boxes.

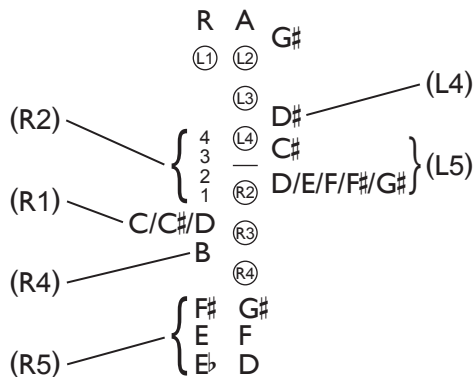
The composer has consulted the following resources to select bass clarinet fingerings:

Jason Alder, “Bass Clarinet Quarter-Tone Fingering Chart, 2nd ed.,” Jason Alder, 2013, accessed December 9, 2019, http://www.jasonalder.com/fingeringchart/Bass-clarinet_quarter_tone_fingering-chart_2ndEd--Jason_Alder.pdf.

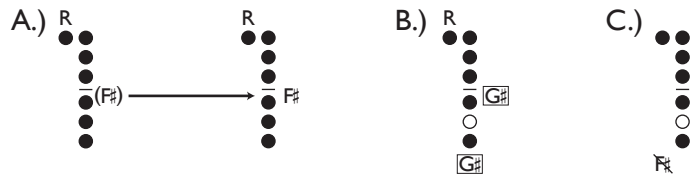
Heather Roche, “Four Octave Tremolo/Moving Passages Chart with Quarter Tones for Bass Clarinet,” Heather Roche, February 12, 2017, accessed December 9, 2019, <http://www.heatherroche.net/2017/02/12/four-octave-tremolomoving-passages-chart-with-quarter-tones-for-bass-clarinet/>

Harry Sparnaay, *The Bass Clarinet: A Personal History*, 3rd ed. (Barcelona: Periferia Music, 2012), 128-29.

Fingering diagrams are arranged according to the following scheme:



On fingering diagrams: A.) Keys that appear within parentheses are to be gradually depressed over the indicated duration; B.) Trilled holes/keys appear within boxes; C.) Holes/keys with slashes through them are covered/depressed halfway.



Program Note

A coalescence. The convergence of flows of material processes (unfoldings, fusions, vaporizations, sublimations, erosions). Energy arises from the collision of body and instrument. Forms (asymmetries of matter) are forged/assembled/woven, which is to say that they are chiseled out of the void of limitless uniformity. They are warped, fractured, stretched, compressed, and smeared. The instrument is fixed with the body (consubstantial). The noise (unbound by time; existing forever in the now) is corporeal—churning, crystalizing, grinding, spiraling, gurgling, filamenting, erupting, dissolving.

(asymmetries of matter) contains within it four shorter solo works—one for each of the four instruments—that have been dissected and reassembled within the larger chamber work. These *asymmetries* may be performed independently or in sequence collectively.

(asymmetries of matter)

JONATHAN BOOKER

$\text{♩} = 104$ energetic, pushing forward; dramatic swells and wooshes emphasizing dynamic contrasts

3
16

The score is divided into four systems, each with a vertical dotted line separating the first three measures from the last three measures.

- VOICE:** Lyrics: da z fa r a ta kə pə di. Above the notes, there are time signatures: 3/8, 3/8, 5:4, and 3/8. The notes are marked with 'increasingly unstable' and 'decisive'.
- TRUMPET:** Includes a dynamic marking 'to Harmon mute (no stem)'.
- TROMBONE:** Includes a dynamic marking 'wild'.
- BASS CLARINET:** Includes a dynamic marking 'abrupt'.

At the bottom right, there is a fingering diagram for the Bass Clarinet:

○ ○ G#
○ ○ ○
3 ○ ○ ○ ○ ○
○ ○ ○ ○ ○

A

$\frac{3}{16}$

$\frac{3}{8}$

$\frac{10}{16}$

$\frac{2}{8}$

$\frac{4}{8}$

⑤

Voc

v u na ø d̄z a fa o ʃɔ a sə y

TPT

TBN

5:3 5:4 4:3 5:4 5:3 3

BCL

tr

4
8

2
8

5
16

10

unsteady

Voc

ta kā te te fλ _____ sɔ fλ ru _____ ε

TPT

TBN

BCL

3 5:4

slap tr slap

⑬

5/16 $5:4$ 4/8 5/8 *shaky, disuniform* 1/8 3/8

Voc

da pè nè a a hi sò d̄30 vò a rä

TPT

TBN

BCL

3 tr (eb)

B ♩ = 84 still pushing forward, but against slightly more resistance

3/8 2/8 3/8

5:4

17

Voc

u z o i u e ni y pa zo fo zo m3

TPT

TBN

7:4 3

BCL

slap

tr

F

(E) → E

22

na tsi bri e dary c bΛ bΛ I na

TPT

TBN

BCL

7/16

7:4

3

5:4

click

slap

(25)

Voc

pli e nə k wε — d̄zʊ zu r ki bi bi n tu fa lɔ — ta ha n gʊ o —

MUTE ON

spluttering

TPT

Harmon mute (no stem)

struggling to emerge

TBN

ram

tr

gradually becoming more erratic

BCL

tr

8^{va} *tr*

slap

3

fighting to maintain linearity as the material begins to fracture/crumble

5/16

28

Voc

(o) a su du ε he ga na to z ot vot a hot

TPT

TBN

BCL

7:4

5:4

3

tr

31

Voc

m 3 nã v i e cli r3 ti i u rei fu tu iu ha

TPT

TBN

tr

BCL

tr

R

(F#)

F#

R

G#

G#

D increasingly frenetic and heterogenous; trumpet and trombone begin to gradually assert more influence over the texture

34

Voc

na o rə ia u a za z o fi y a

TPT

TBN

BCL

thick, tangled

MUTE OFF

3/8 4:3 5:4 7:4

tr

③7 $\frac{4}{8}$ $\frac{2}{8}$ $\frac{7}{16}$

Voc

bru ya zu _____ e fu fa ia te ilo o vha ti ti si e _____ fopazo

TPT

MUTE ON

tr

TBN

BCL

slap

slap

tr

tr



7/16 4/8 3/16 2/8 5:4 4/8

(40)

Voc

o so ja a ta sa _____ ni e _____ takaka 3 su_

TPT

TBN

increasingly agitated; manic

BCL

Detailed description of the musical score: The score is divided into five measures. Measure 12 (7/16) features a vocal line starting with 'o so ja a ta sa' and a clarinet part with a 5:3 ratio. Measure 13 (4/8) has 'ni' and a clarinet part with a 3 ratio. Measure 14 (3/16) has 'e' and a clarinet part with a 3 ratio. Measure 15 (2/8) has 'takaka' and a clarinet part with a 3 ratio. Measure 16 (5:4) has '3 su_' and a clarinet part with a 3 ratio. The vocal line is accompanied by instrumental parts for Trumpet (TPT), Trombone (TBN), and Clarinet (BCL). The TPT part includes a green shaded area and a trill. The TBN part includes a blue shaded area and a trill. The BCL part includes a red shaded area and a trill. The tempo/meter changes are indicated at the top of each measure.

$\text{♩} = 120$ wild, unstable, leaping;
unpredictable and impulsive

$\frac{4}{8}$

$\frac{9}{16}$

$\frac{5}{8}$ legato possibile
3:2

$\frac{3}{8}$

44

Voc

(u) _ u ba ia fo zu ti ti ti ka betrika _ o liu kokuu ka

Detailed description: This block shows the vocal line for measures 44-48. It includes a musical staff with notes and rests, and a pitch contour graph below it. The lyrics are: (u) _ u, ba ia fo zu, ti ti ti ka, betrika _ o liu, kokuu, ka. The pitch contour shows a series of peaks and valleys corresponding to the notes. There are blue shaded areas under the first two measures and green shaded areas under the next two measures.

TPT

put mute down

MUTE OFF

Detailed description: This block shows the trumpet part for measures 44-48. It includes a musical staff with notes and rests, and a dynamic contour graph below it. The dynamic contour shows a gradual increase in volume, followed by a sharp drop labeled 'MUTE OFF', and then a gradual increase again. The text 'put mute down' is written above the staff. There are also some markings like 'MUTE OFF' and a downward arrow.

TBN

5:4 3

Detailed description: This block shows the trombone part for measures 44-48. It includes a musical staff with notes and rests, and a dynamic contour graph below it. The dynamic contour shows a series of peaks and valleys. There are red shaded areas under the first two measures and orange shaded areas under the next two measures. There are also markings like '5:4' and '3' above the staff.

BCL

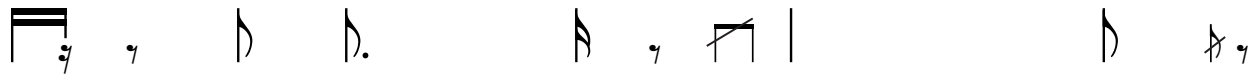
tr (#) slap slap tr (#)

Detailed description: This block shows the bass clarinet part for measures 44-48. It includes a musical staff with notes and rests, and a dynamic contour graph below it. The dynamic contour shows a series of peaks and valleys. There are blue shaded areas under the first two measures and black shaded areas under the next two measures. There are also markings like 'tr (#)', 'slap', and 'tr (#)' above the staff.





47



Voc

su i e a v tu o su



TPT

tr *tr*



TBN

tr



BCL

tr *tr* *tr*

slap

slap



7
16

8

4
8

8
8

50

Voc

e iε pli u a

TPT

TBN

BCL

slap

16 **F** ♩ = 72 fragmentary, unsteady, spasmodic

54

Voc

TPT

TBN

BCL

The score is divided into four systems. The first system is for the vocal line (Voc), showing a series of vertical bars. The second system is for the trumpet (TPT) and trombone (TBN) parts, with graphical annotations: a blue line for the trumpet and an orange line for the trombone. The third system is for the bassoon (BCL) part, with graphical annotations: a red line for the first staff and a black line for the second staff. The fourth system is for the bassoon (BCL) part, with graphical annotations: a red line for the first staff and a black line for the second staff. The score includes various musical notations such as notes, rests, and dynamic markings.

2/8 5/8 3/16 2/8

ram

tr

8

(d)

59

3/8

7/16

4/8

5/16

Voc

TPT

TBN

BCL

18 **G** ♩ = 84

5
16

4
8

3
16

11
16

1
8

4
8

63

Voc

TPT

TBN

BCL

4
8

68

68

Voc

TPT

TBN

BCL

72

Voc

4/8 3/8 2/2 4/8

TPT

Pick up Harmon mute (no stem), but do not insert into bell yet.

TBN

5:4

BCL

4/8 7/16 15/8 4/8 1/8

78

Voc

TPT

TBN

BCL

exaggerated contrasts between loose/breathy and very tight/constricted embouchures—both with high amounts of noise content

The image displays a musical score for measures 78 through 82. The time signatures are 4/8, 7/16, 15/8, 4/8, and 1/8. The score includes parts for Voc, TPT, TBN, and BCL. The analysis section shows waveforms and spectrograms for TBN and TPT. The TBN analysis shows a transition from a blue waveform to a green one, indicating changes in timbre or embouchure. The TPT analysis shows a similar transition. The text notes 'exaggerated contrasts between loose/breathy and very tight/constricted embouchures—both with high amounts of noise content'.

1
8

9
16

4
8

2
8

3
8

5
16

83

Voc

TPT

actions are a bit more direct and deliberate,
even if the sounds are somewhat precarious

TBN

BCL

5
16

6
8

4
8

3
8

88

Voc

loud, boisterous, inelegant
(MUTE OFF)

MUTE ON

MUTE OFF

TPT

TBN

BCL

The image displays a musical score for Trombones (TPT) and Bass Clarinet (BCL). The score is divided into four measures, with time signatures 5/16, 6/8, 4/8, and 3/8 indicated above. A circled number 88 is in the top left. The Trombone section (TPT) includes a staff with a dynamic marking 'loud, boisterous, inelegant (MUTE OFF)' and a 'MUTE ON' instruction. The Bass Clarinet section (BCL) includes a staff with a dynamic marking 'loud, boisterous, inelegant (MUTE OFF)' and a 'MUTE OFF' instruction. The score also features a staff with a trill (tr) and a staff with a tremolo (tr). The Trombone section (TBN) includes a staff with a dynamic marking 'loud, boisterous, inelegant (MUTE OFF)' and a 'MUTE OFF' instruction. The score also features a staff with a trill (tr) and a staff with a tremolo (tr).



92

Voc

independent, soloistic;
quieter, but still exuberant
↓ MUTE ON

TPT

embouchure: dense, intricate, linear
slide: wildly active; restless

TBN

pale, hazy; coming
in and out of focus

BCL

97

Voc

5
16

8
8

↓ MUTE OFF

TPT

TBN

ram

BCL

3 3 5:4 3 3

tr

Detailed description of the musical score: The score is for measures 97-100. The vocal part (Voc) is shown as a bracketed empty space. The trumpet part (TPT) includes a green waveform and a red-to-black gradient wedge. The trombone part (TBN) features a blue waveform and a green 'ram' annotation. The bassoon part (BCL) includes rhythmic markings (3, 3, 5:4, 3, 3), a green waveform, and a red 'tr' annotation. Vertical dotted lines mark measures 97, 98, and 99. A 'MUTE OFF' instruction is placed above the trumpet staff at the start of measure 99.

101

Voc

2 3 4 6

sudden shifts between bright, focused sounds and awkward, "flabby" sounds

MUTE ON

MUTE OFF

TPT

TBN

ram ram ram

BCL

suddenly more stable, methodical

slap

6
8

13
16

4
8

5
8

105

Voc

Musical score for TPT (Trumpet) section. The score is divided into four measures corresponding to the time signatures 6/8, 13/16, 4/8, and 5/8. The notation includes a melodic line with a green-to-black gradient and a lower line with trills (tr) and triplets (represented by three slanted lines). The first measure of 6/8 contains a quarter note followed by a dotted quarter note. The second measure of 13/16 contains a quarter note, a dotted quarter note, and a half note. The third measure of 4/8 contains a quarter note and a dotted quarter note. The fourth measure of 5/8 contains a quarter note, a dotted quarter note, and an eighth note.

TBN

Musical score for BCL (Bass Clarinet) section. The score is divided into four measures corresponding to the time signatures 6/8, 13/16, 4/8, and 5/8. The notation includes a melodic line with a blue-to-black gradient and a lower line with slurs, triplets (3), septuplets (7:6), and a 3:2 ratio. The first measure of 6/8 contains a quarter note followed by a dotted quarter note. The second measure of 13/16 contains a quarter note, a dotted quarter note, and a half note. The third measure of 4/8 contains a quarter note and a dotted quarter note. The fourth measure of 5/8 contains a quarter note, a dotted quarter note, and an eighth note. The lower line features a "slap" instruction, a triplet (3), a septuplet (7:6), and a 3:2 ratio.

108

Voc

5/8 5/16 11/8 3/8 6/8

explosive! ↓ MUTE OFF

put mute down

TPT

TBN

wholly continuous glissando (at least in action, if not in resulting sound); fingers slink across mechanism

3 3 7:6

BCL

(1/2) →

1

$\text{♩} = 63$ collapsed, enclosed, brittle;
pitch is quite tenuous

6/8 15/8 1/8 2/8 4/8 2/8

(112)

Voc

TPT

TBN

BCL

The score is divided into measures by vertical dotted lines. The time signature changes from 6/8 to 15/8, then to 1/8, 2/8, 4/8, and finally 2/8. The score features various musical notations including notes, rests, and trills (tr). The TPT part has a blue color-coded section. The BCL part has a red color-coded section. The TBN part is mostly empty. The Voc part has a bracketed section. The score is divided into measures by vertical dotted lines.



5
16



117

Voc

TPT

TBN

BCL

embouchure: murky, vague
fingers: lively, flickering

Detailed description of the musical score: The score is for measures 117 to 122. The top staff is for the Vocalist (Voc), showing a long note with a slur. The Trumpet (TPT) staff has a blue-shaded line that starts flat and curves upwards with a dotted line. The Tuba (TBN) staff has a green-shaded line. The Bass Clarinet (BCL) staff has trills and fingerings, with notes marked with red boxes and circled numbers (2, 3, 4, 5, 6, 7, 8). The time signature is 5/16. There are vertical dotted lines at measures 117, 120, and 122. A musical symbol resembling a stylized infinity or figure-eight is at the top left and right. The number '117' is in a circle at the top left. The text 'embouchure: murky, vague' and 'fingers: lively, flickering' is written above the BCL staff.

$\text{♩} = 72$

K

31

121

3/8

2/8

12/8

3/8

2/8

Voc

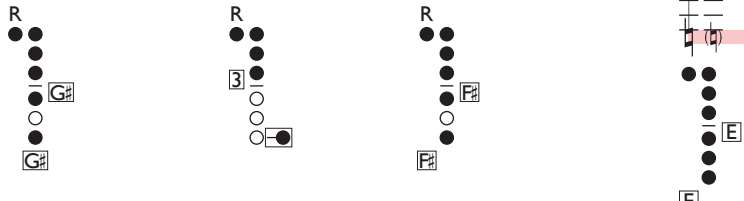
u ha m i r z ia u a latovka

TPT

TBN

BCL

Extremely fragile and delicate. Embouchure should be very loose, producing only air sound. Carefully close embouchure to allow ghostly, veiled pitches to creep in.



125

2/8 7/8 3/16 2/8 3/8

Voc

i e i a bi bru u flo tsi fu

TPT

TBN

BCL



129

increasingly agitated, wild, and tumultuous

Voc

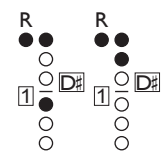
r ia a ä a v o lo a io a o a

TPT

TBN

BCL

5:4 7:6



132

Voc

m ia ku tsu o u o ε ra t̃i ε t̃i a o

TPT

TBN

BCL

5:4

tr

tr

Massively cacophonous, frenzied, overwhelming.

L Each part is completely independent until **M**.
No attempt should be made to align parts rhythmically.

2/8 (♩ = 72) **11/16** **4/8** **2/8** **1/8** **2/8**

Voc

(o) a ne te su cru z tu pe i tu m ka e a ko

5/8 (♩ = 120) **4/8** **3/8**

TPT

7/8 (♩ = 72) **3/8** (♩ = 84) **5/16** **4/8**

TBN

3/8 (♩ = 84) **5/8** **2/8** **3/8**

BCL

•••••
F

This musical score page features a vocal line and four instrumental parts: Trumpet (TPT), Trombone (TBN), and Bass Clarinet (BCL). The vocal line includes lyrics: "hi r da r ja su fu a ri na cu de o na t̃so e". The score is annotated with various time signatures (e.g., 2/8, 3/8, 1/8, 2/8, 3/8, 4/8, 7/16, 5/8, 3/8, 4/8) and ratios (e.g., 3:2, 5:4, 7:4). Each instrument part includes a musical staff with notes and rests, a spectrogram above it, and a waveform below it. The spectrograms use color gradients (black, red, orange, blue) to represent frequency content. The BCL part includes a trill marked "tr".

The score is divided into five systems, each with a different time signature:

- System 1:** Time signature $\frac{2}{8}$. Tempo $\text{♩} = 104$. Includes vocal line and trumpet part with trills.
- System 2:** Time signature $\frac{4}{8}$. Tempo $\text{♩} = 72$. Includes vocal line and trumpet part with a triplet.
- System 3:** Time signature $\frac{13}{16}$. Tempo $\text{♩} = 72$. Includes vocal line and trombone part with a triplet.
- System 4:** Time signature $\frac{5}{8}$. Tempo $\text{♩} = 84$. Includes vocal line and trombone part.
- System 5:** Time signature $\frac{4}{8}$. Tempo $\text{♩} = 72$. Includes vocal line and bass clarinet part with trills and the instruction "frenetic, wild".

The vocal line lyrics are: de go e zo ni ru ho va. The bass clarinet part includes trills and the instruction "frenetic, wild".

4/8 **3/16** **4/8** **5/16** $\text{♩} = 104$ **7/16**

5:4

Voc
 m e r i e ke dza u po a r n i a r ko

5/8 **3/8** **4/8** **8/8**

TPT

2/8 **3/8** **3/8** **3/16** $\text{♩} = 72$ **7/16**

3:2

TBN

unpredictable, flamboyant squawking

1/8 **9/16** **5/8**

3 **6:4**

BCL
 slap tr tr tr

The score is divided into five systems, each with a different instrument or voice part:

- Voc:** The vocal line features lyrics: "ka i re za tu fo bri v z de z pa to fa mi". It includes complex time signatures (7/16, 2/8, 4/8, 5/16, 2/8) and a "grinding" section in 4/8 time with a tempo marking of ♩ = 84.
- TPT:** The Trumpet part includes a section with a red highlight and a trill (tr).
- TBN:** The Trombone part includes a section with a red highlight and a trill (tr).
- BCL:** The Bass Clarinet part includes a "slap" technique and a trill (tr) section.

The score is characterized by frequent changes in time signature and the use of complex rhythmic patterns, such as triplets and slurs.

The score is divided into four systems, each with a different time signature: $\frac{2}{2}$, $\frac{4}{8}$, $\frac{3}{8}$, and $\frac{4}{8}$. The tempo is marked as $\text{♩} = 72$. The vocal line (Voc) includes lyrics: "za fa m nu jə tɪ tɪ pə pə li r jə pə fra z tʃɪ". The trumpet (TPT) and trombone (TBN) parts feature complex rhythmic patterns and trills (tr). The bassoon (BCL) part includes a trill (tr) and a sequence of notes. A diagram at the bottom right shows a vertical stack of notes: A, E, E, E, E, E.

System 1: Time signature $\frac{2}{2}$. Tempo $\text{♩} = 72$. Includes a 5:4 interval. The vocal line has a long note. The TPT part has a blue wave. The TBN part has a red bar. The BCL part has a blue wave.

System 2: Time signature $\frac{4}{8}$. Includes a 5:4 interval and a 7:6 interval. The vocal line has notes for "nu jə tɪ tɪ pə pə". The TPT part has a red wave. The TBN part has a red bar. The BCL part has a blue wave.

System 3: Time signature $\frac{3}{8}$. Includes a 9:6 interval and a 7:4 interval. The vocal line has notes for "li r jə pə". The TPT part has a green wave. The TBN part has a black bar. The BCL part has a blue wave.

System 4: Time signature $\frac{4}{8}$. Includes a 3:2 interval. The vocal line has notes for "fra z tʃɪ". The TPT part has a green wave. The TBN part has a black bar. The BCL part has a blue wave.

Diagram: A vertical stack of notes: A, E, E, E, E, E.

Voc
so fi r e jə də zɜ

TPT
tr tr tr tr tr tr tr

TBN

BCL
slap tr tr tr tr

Rest until trumpet reaches **M**.

3:2

7:4

7/16 jerky, sudden

4/8

3

3/8 = 120

4/8 = 84 quite erratic

5:4

6/8

R
●
●
●
●
○
●
●

Voc

TPT

TBN

BCL

Annotations: $7:4$, $5:4$, $3:2$, $7:6$, tr , M , R , E

Measure numbers: 8, 9, 16

Diagram: A vertical stack of five black dots with the letter 'R' above the top dot and 'E' to the right of the second and fifth dots.

Detailed description: This page contains a musical score for four instruments: Vocals (Voc), Trumpet (TPT), Trombone (TBN), and Bass Clarinet (BCL). The score is divided into measures, with measure numbers 8, 9, and 16 indicated. The TPT part features a large red trapezoidal area in the second measure, and the TBN part has a note with a box labeled 'M' and the instruction 'Rest until trumpet reaches M.'. The BCL part includes a green-to-blue wavy line in the second measure and a red-to-pink wavy line in the fourth measure. Various ratios (7:4, 5:4, 3:2, 7:6) are placed above notes, and 'tr' (trills) are marked in several places. At the bottom, there is a diagram consisting of five black dots in a vertical line, with 'R' above the top dot and 'E' to the right of the second and fifth dots.

Voc

7/8 5:4 6/8 3:2 4/8

TBN

9/16 8/8 13:12 6/8 3 3:2 1/8



Voc

3/8

$\text{♩} = 104$

7:6

4/8

tr

TBN

3/8

3

Rest until trumpet reaches **M**.

Voc

TPT

TBN

BCL

The image displays a musical score for page 45, featuring four parts: Voc (Vocal), TPT (Trumpet), TBN (Trombone), and BCL (Bass Clef). The score is oriented vertically on the page. The vocal part at the top consists of two empty brackets. The trumpet part (TPT) is the most detailed, showing rhythmic notation with a 3:2 ratio, a 6:4 ratio, and various musical symbols like beams and notes. The trombone part (TBN) and bass clef part (BCL) are represented by empty brackets. The bass clef part includes a single musical staff with a treble clef and a few notes. The page number '45' is located in the top right corner.

Voc

5/8 7/16 2/8 3/8 4/8

TPT

TBN

BCL

Voc

4/8 2/8 7/16 5/8 4/8 1/8 5/8

4:3 3

5:4

TPT

TBN

BCL

The musical score for page 47 is organized into three main sections: Vocal (Voc), Trumpet (TPT), and a combined section for Trombone (TBN) and Clarinet (BCL). The vocal part is indicated by a large bracket on the left and right. The instrumental parts are also bracketed. The time signatures are 4/8, 2/8, 7/16, 5/8, 4/8, 1/8, and 5/8. Above the 4/8 time signature, there are markings for 4:3 and 3. Above the 4/8, 1/8, and 5/8 time signatures, there is a marking for 5:4. The TPT part consists of two staves. The top staff has a series of notes with a wavy line underneath, and a large black rectangular block covering a portion of the staff. The bottom staff has a series of notes with a wavy line underneath, and a large black rectangular block covering a portion of the staff. The TBN and BCL parts are indicated by brackets on the left and right, but no musical notation is visible for these parts.

48 **M** $\text{♩} = 63$ somewhat hesitant, subtle; compressed, enclosed;
 mostly quiet with a few dramatic swells

2
8

7
16

4
8

5
16

(135)

Voc

ia z n a

almost entirely noise
 (very little pitch content)

TPT

to Harmon mute

TBN

BCL



5
16

7
8

3
8

2
8

3
16

4
8

139

Voc

v z f a z

TPT

MUTE ON

f a z

flamboyant, soloistic

3:2

TBN

f a z

BCL

f a z

144 intricately connected $\frac{4}{8}$ $\frac{5:4}{8}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{8}$

Voc: (f) i e a v 310 d

TPT: flickering, shimmering $\frac{7:4}{8}$ MUTE OFF $\frac{3}{8}$ MUTE ON $\frac{3}{8}$

TBN

BCL: embouchure: delicate, wispy, sweeping
fingers: continuously sliding, creeping

The score is divided into five measures. The vocal line consists of the syllables (f) i, e, a, v, 310, and d. The trumpet part features a 'flickering, shimmering' effect in the first measure, followed by a 'MUTE OFF' section in the second measure and a 'MUTE ON' section in the third measure. The trombone and baritone saxophone parts are also detailed with performance instructions and fingering diagrams. The baritone saxophone part includes a 'tr' (trill) in the first measure and a 'tr' with a wavy line in the fifth measure. The fingering diagrams at the bottom show the right hand (R) positions for the baritone saxophone, with specific fingerings for (C#) and (G#) notes.

O

1
8

5
8

4
8

2
8

3
8

148

Voc

io a v

TPT

TBN

BCL

R
●
●
●
C
●
●
G#

153

Voc

o kə z i a

TPT

TBN

BCL

legato possibile

R
●
●
●
●
●
●
B
B

$\text{♩} = 72$

$\frac{2}{8}$ $\frac{7}{16}$ $\frac{4}{8}$ $\frac{2}{8}$

VOICE

ia z zn a

$\frac{2}{8}$ $\frac{5}{8}$ $\frac{3}{8}$

⑤

u ha mi r z ia u a latov ka

$\text{♩} = 104$

$\frac{2}{8}$ $\frac{3}{8}$ $\frac{3}{8}$ $\frac{5}{4}$ $\frac{2}{8}$

⑨

da z fa ra ta kope di

$\text{♩} = 63$

$\frac{2}{8}$ $\frac{17}{16}$ $\frac{2}{8}$ $\frac{5}{16}$

⑬

v z fo a z

54 ♩ = 104

①6

5/16 4/8 5/8 shaky, disuniform 3/8 11/16

dapə nə a a hi sə d̄ʒo vʊ a rä d̄z a

②0

11/16 9/16 4/8

fa ɔ fə a sə y ta kə tɛ tɛ ʃl sʊ fl

♩ = 72

②3

unsteady 3/16 3/8 5/8 legato possibile 4/8

ru ɛ bi bru u flo tsi fu r ɔ kə z i a

②7

4/8 5/16 4/8 3/8 1/8 3/8

i e i a m ia kʊ fʊ

$\text{♩} = 84$

32

pli e nə k we _____ d̄zʊ zu r kɪ bi bi n tu fa lʊ _____ ta ha

35

increasingly agitated, wild, and tumultuous

n go o _____ io a o a ja u rə ia u a za

39

z o fi y a a ne te su cru z tu

42

pe i tu _____ m ka e a kə hi r

④⑥

da r ja su fu a ri na cu de o na tso e

♩ = 104

♩ = 72

④⑨

de go e zo ni ru ho va

♩ = 104

⑤③

m e r i e ke dza u po ai ma r ko

⑤⑦

ka i re za tu fo bri v z de z pa to fa mi

⑥2

$\text{♩} = 72$

5:4

fragmenting

5:4

7:6

za _____ fa m nu fə tɪ tɪ pəpə li r fə pə fra z tʃɪ

⑥7

$\text{♩} = 63$

4/8

3/8

1/8

3

4/8

so fi r e fə dəz ɪʊ a v

remain motionless

asymmetry 2

JONATHAN BOOKER

$\text{♩} = 72$

$\text{♩} = 84$

$\frac{7}{8}$

$\frac{3}{8}$

$\frac{5}{16}$

$\frac{4}{8}$

TROMBONE

Measures 1-4 of the Trombone part. Measure 1 (7/8) contains a half note and a quarter note. Measure 2 (3/8) contains a quarter note and a quarter rest. Measure 3 (5/16) contains a quarter note and an eighth note. Measure 4 (4/8) contains a quarter note and a quarter note. The waveform below shows the pitch contour, with a black area at the bottom indicating the instrument's dynamic envelope.

④

Measures 5-8 of the Trombone part. Measure 5 (4/8) contains a quarter note and a quarter note. Measure 6 (1/8) contains a quarter note. Measure 7 (2/8) contains a quarter note and a quarter note. Measure 8 (4/8) contains a quarter note and a quarter note. The notation includes a 3:2 ratio over measures 7-8 and a 3-measure triplet. The waveform shows a complex pitch contour with a black area at the bottom.

$\text{♩} = 72$

$\frac{4}{8}$

$\frac{1}{8}$

$\frac{13}{16}$

$\frac{5}{8}$

⑩

Measures 9-12 of the Trombone part. Measure 9 (4/8) contains a quarter note and a quarter note. Measure 10 (1/8) contains a quarter note. Measure 11 (13/16) contains a quarter note and an eighth note. Measure 12 (5/8) contains a quarter note and an eighth note. The notation includes a 3-measure triplet. The waveform shows a complex pitch contour with a black area at the bottom.

⑬ $\text{♩} = 84$ $\text{♩} = 72$ ⁵⁹

$\frac{5}{8}$ $\frac{2}{8}$ $\frac{7}{8}$ $\frac{3}{8}$ $\frac{3}{16}$ $\frac{7}{16}$

⑱ $\frac{7}{16}$ $\frac{5}{8}$ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{3}{8}$

⑳ $\frac{3}{8}$ $\frac{5}{16}$ sharp, crackling $\frac{3}{8}$ $\frac{4}{8}$

$\frac{9:6}$ $\frac{7:4}$

(26)

$\frac{4}{8}$ $\frac{3:2}{}$ $\frac{3:2}{}$ $\frac{7}{8}$ $\frac{2}{8}$ $\frac{4}{8}$

Exercise 26 features a sequence of notes with various rhythmic and pitch relationships. The first two measures are marked with a 3:2 ratio, indicating a specific interval or timing. The third measure is marked with a 7:8 ratio. The fourth measure is marked with a 2:8 ratio. The fifth measure is marked with a 4:8 ratio. The spectrogram shows a wavy line representing the pitch contour, with an orange highlight on a rising section in the fourth measure.

(30)

$\text{♩} = 84$

$\frac{4}{8}$ quite erratic $\frac{6}{8}$ $\frac{5}{8}$ $\frac{5:4}{}$ $\frac{1}{8}$ $\frac{2}{8}$

Exercise 30 is characterized by its 'quite erratic' nature. It begins with a 4/8 time signature, followed by a 6/8 time signature. The score includes several measures with 5/8 and 5:4 ratios, and ends with 1/8 and 2/8 time signatures. The tempo is marked as quarter note = 84. The spectrogram shows a highly irregular pitch contour, with a 'tr' label indicating a trill or tremolo effect in the fourth measure.

(34)

$\frac{2}{8}$ $\frac{5:4}{}$ $\frac{4}{8}$ $\frac{7}{16}$ $\frac{3}{}$ $\frac{5:4}{}$ $\frac{7}{8}$ $\frac{2}{8}$

Exercise 34 features a sequence of notes with various rhythmic and pitch relationships. The first measure is marked with a 2/8 time signature and a 5:4 ratio. The second measure is marked with a 4/8 time signature. The third measure is marked with a 7/16 time signature and a 3 ratio. The fourth measure is marked with a 5:4 ratio and a 7/8 time signature. The fifth measure is marked with a 2/8 time signature. The spectrogram shows a wavy line with a blue highlight on a section in the first two measures.

39

2/8 1/8 4/8 3/8 3/8 3/8

ram ram

42

3/8 4/8 3/8 1/8 2/8

47

$\text{♩} = 63$

2/8 7/16 1/8 7/16 2/8

3:2 5:4 3

$\text{♩} = 104$

$\frac{2}{8}$

$\frac{3}{8}$ embouchure: dense, intricate, linear
slide: wildly active; restless

$\frac{1}{8}$

$\frac{3}{8}$

51

$\text{♩} = 72$

$\frac{3}{8}$

$\frac{4}{8}$ exaggerated contrasts between loose/breathy
and very tight/constricted embouchures—both
with high amounts of noise content

$\frac{3}{8}$

55

$\text{♩} = 84$

$\frac{3}{8}$

$\frac{5}{16}$

$\frac{2}{8}$

$\frac{5}{16}$

$\frac{4}{8}$

$\frac{3}{16}$

$\frac{11}{16}$

58

⑥4 $\frac{11}{16}$ $\frac{1}{8}$ $\frac{4}{8}$

This exercise is divided into four measures. The first measure is in 11/16 time and contains a triplet of eighth notes. The second measure is in 1/8 time with a dotted quarter note. The third measure is in 4/8 time with a dotted quarter note. The fourth measure is in 4/8 time with a quarter note. The spectrogram shows a series of notes with a green highlight on the triplet in the first measure. The waveform shows the amplitude of the notes over time.

⑥7 $\frac{3}{2}$ $\frac{1}{8}$ $\frac{1}{8}$

This exercise is divided into four measures. The first measure is in 3/2 time with a dotted quarter note. The second measure is in 1/8 time with a dotted quarter note. The third measure is in 1/8 time with a dotted quarter note. The fourth measure is in 1/8 time with a dotted quarter note. The spectrogram shows a series of notes with a blue highlight on the dotted quarter note in the third measure. The waveform shows the amplitude of the notes over time.

$\text{♩} = 72$
⑦0 $\frac{5}{8}$ $\frac{3}{16}$ $\frac{2}{8}$

This exercise is divided into four measures. The first measure is in 5/8 time with a dotted quarter note. The second measure is in 3/16 time with a dotted quarter note. The third measure is in 2/8 time with a dotted quarter note. The fourth measure is in 2/8 time with a dotted quarter note. The spectrogram shows a series of notes with a blue highlight on the dotted quarter note in the third measure. The waveform shows the amplitude of the notes over time.

$\text{♩} = 84$

$\frac{4}{8}$ MUTE ON

$\frac{8}{8}$ Harmon mute (no stem)

spluttering

$\frac{3}{8}$

$\frac{1}{8}$

TRUMPET

Musical notation for the first section of the trumpet part, including notes and rests. Below the notation is a waveform visualization showing the amplitude of the sound over time. A green highlight is present on a note in the waveform.

④

$\frac{1}{8}$ $\frac{4}{8}$ $\frac{2}{8}$ $\frac{1}{8}$

↓ MUTE OFF

Musical notation for the second section of the trumpet part, including notes and rests. Below the notation is a waveform visualization showing the amplitude of the sound over time. A blue highlight is present on a note in the waveform, and a green arrow labeled "ram" points to a note.

⑧

↓ MUTE ON $\frac{1}{8}$ $\frac{2}{8}$ $\frac{1}{8}$ $\frac{1}{8}$

↓ MUTE OFF

↓ MUTE ON

5:4

tr

Musical notation for the third section of the trumpet part, including notes and rests. Below the notation is a waveform visualization showing the amplitude of the sound over time. A green highlight is present on a note in the waveform, and a "tr" marking is visible on the waveform.

⑪ $\text{♩} = 104$
 ↓ MUTE OFF
 ↓ MUTE ON

5:4 5:3

⑰ ↓ MUTE OFF

$\text{♩} = 72$

put mute down

⑳

3

66 ♩ = 120

②③

4/8

②⑥

3/8

③①

3/8

③④

8/8 3/8 4/8 8/8

③⑦

8/8 2/8 4/8 grinding 7/16

$\text{♩} = 84$

④⑩

7/16 4/8 2/8 6/8 15/16

④④

15/16 15/8 3/8

④⑧

15/8 2/8 7/8

7:4

④⑫

7/8 6/8 4/8

5:4 3:2

55

$\frac{4}{8}$ $\frac{3}{8}$ $\frac{7}{6}$ $\frac{4}{8}$

$\text{♩} = 104$

59

$\frac{4}{8}$ $\frac{3}{2}$ $\frac{3}{8}$

62

$\frac{7}{8}$ $\frac{6}{4}$ $\frac{3}{8}$ $\frac{7}{16}$

⑥5

$\frac{2}{8}$ $\frac{3}{8}$ $\frac{4}{8}$ $\frac{2}{8}$

$\frac{3}{8}$ $\frac{4:3}{8}$ $\frac{3}{8}$

7 3 4:3 3

⑥9

$\frac{7}{16}$ $\frac{3}{8}$ $\frac{4}{8}$

$\frac{5:4}{8}$

7 3 4 5:4

asymmetry 4 71

JONATHAN BOOKER

$\text{♩} = 72$

3/8 **2/8** **3/8** **4/8**

5:4 7:6

BASS CLARINET

$\text{♩} = 104$

4/8 **5/8** **6/8** **5/16**

5

pale, hazy; coming in and out of focus

5:4 3 3 5:4

5/16 **3/8** **9/16** **4/8** **5/8**

8

3 3 3

⑫

3/8 4/8 1/8 3/8

3 5:4

tr

slap

tr

$\text{♩} = 84$

⑮

3/8 3/8 3/8

3

tr

tr

F

⑳

3/8 1/8 4/8 3/8

5:4 3 3 7:4

tr

tr

24

3/8 4/8 frenetic, wild 5:4 3 5:4 3/8 3:2 2/8

tr

28

2/8 7/8 unpredictable, flamboyant squawking 1/8 9/16 6/4 2/8

tr

slap

32

2/8 3/8 6:4 7:6 2/8

slap

tr

36

5:4 3 3 3:2

39

4:3 7:4 4/8

slap tr tr tr

A R

43

3:2 7:6

tr tr tr

R

9
16

48

5
8

13:12

6
8

3

3:2

tr

R

B

D

APPENDIX A
 MEASURE-TO-MEASURE COMPARISON OF VOCAL PART IN *(ASYMMETRIES OF MATTER)*
 FOR CHAMBER ENSEMBLE AND ASYMMETRY 1 FOR SOLO VOICE

Asymmetry 1

m. #	1-4	5-7	9-12	14	16-18	19-23	24-25	26	28-29	30	32-35	36	38-40	41-69	71
1-4															
6-11															
13-15															
25-28															
34-36															
122-124															
125-126															
127-129															
131															
132															
R. L															
135-138															
139-140															
150															
154-155															

APPENDIX B
 MEASURE-TO-MEASURE COMPARISON OF TROMBONE PART IN (ASYMMETRIES OF
 MATTER) FOR CHAMBER ENSEMBLE AND ASYMMETRY 2 FOR SOLO TENOR TROMBONE

Asymmetry 2

m. #	1- 32	34- 37	39- 40	41	42- 45	47- 49	50- 51	52- 54	55	56- 57	59- 60	61- 68	70- 74
26- 27													
30- 31													
33													
55- 59													
61- 62													
63- 70													
71- 74													
76- 79													
81- 82													
87													
93- 96													
R. L													
135- 138													

(asymmetries of matter)

APPENDIX C
 MEASURE-TO-MEASURE COMPARISON OF TRUMPET PART IN (ASYMMETRIES OF
 MATTER) FOR CHAMBER ENSEMBLE AND ASYMMETRY 3 FOR SOLO TRUMPET

Asymmetry 3

m. #	1	2	4	5-6	8-9	10	12-16	18-20	21-22	23-71
27										
31										
32-33										
35-36										
68-69										
92-96										
97-98										
126-128										
129-131										
R. L										

APPENDIX D
 MEASURE-TO-MEASURE COMPARISON OF BASS CLARINET PART IN (ASYMMETRIES OF
 MATTER) FOR CHAMBER ENSEMBLE AND ASYMMETRY 4 FOR SOLO BASS CLARINET

Asymmetry 4

m. #	1-2	3-4	6	7- 10	11- 12	13- 14	16- 50
10- 11							
14- 15							
96- 101							
101- 103							
128- 129							
132- 133							
R. L							

VITA

Jonathan Booker was born on February 20, 1987 in Lakewood, California. He grew up in Colorado Springs, Colorado and studied piano and guitar from a young age. He graduated from General William J. Palmer High School in 2005, where he met his first major musical influence, the locally renowned music educator Robert Crowder, with whom he studied piano and music theory.

Mr. Booker received academic and music scholarships to attend Seattle Pacific University, from which he graduated cum laude in 2009 with a Bachelor of Arts degree in Music. He earned his Master of Music degree in Composition in 2015 from the University of Houston, where he studied with Rob Smith and served as a Teaching Assistant, instructing music fundamentals, music theory, and aural skills courses to first- and second-year students in the Moores School of Music. From 2014 through 2016, Mr. Booker was a Young Artist Fellow and Composer in Residence for Da Camera's prestigious Young Artist Program. In this role, he fulfilled three commissions for new works, served numerous students within the Houston Independent School District, and received a grant to create Literacy Through Music, an outreach initiative that used music to teach English creative writing to adult ESL students.

Mr. Booker began work toward his D.M.A. in Composition at the University of Missouri-Kansas City in the Fall of 2016. For two years, he served as a Graduate Teaching Assistant for the Composition area, instructing the Composition Lab and teaching individual composition lessons to undergraduates. While a student at UMKC, Mr. Booker attended several conferences and festivals, including The Composers Conference at Wellesley College,

the New Music for Strings Festival in Denmark, the Thailand International Composition Festival, and the Bowling Green University Graduate Conference in Music. He has fulfilled commissions for a variety of organizations and has received awards from the American Prize, the Lyra Society, the UMKC Conservatory, the University of Houston's Moores School of Music, the Robert Avalon International Competition for Composition, and the Other Competition at the University of Miami's Frost School of Music.