

ETUDES FOR THE TENOR TROMBONE DESIGNED TO FACILITATE
LEGATO TECHNIQUE THROUGH THE USE OF
ALTERNATE POSITIONS

by

EUGENE I. HOLDSWORTH

B. M., Bethany College, 1958

914

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

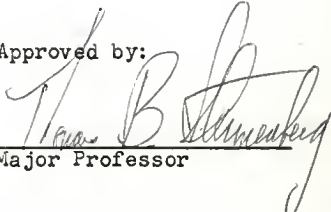
MASTER OF SCIENCE

Department of Music

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1966

Approved by:


Major Professor

2668
R4
1966
14728

TABLE OF CONTENTS

INTRODUCTION 1

 The Problem 1

 Related Material 2

 Definitions 3

 The Mechanics of Slides and Valves Related to
 the Legato Style 8

 Differences Between the Slide and Valve Technique . . . 11

PROCEDURE 13

 Selection of the Interval Combinations 13

 Compilation of Slide Position Patterns for
 the Interval Combinations 15

 Organization of the Slide Position Patterns
 Into Appendixes 16

THE ETUDES 17

 Purpose 17

 Construction 17

 Presentation 17

SUMMARY AND CONCLUSIONS 34

ACKNOWLEDGMENTS 35

BIBLIOGRAPHY 36

APPENDIX A--SLIDE POSITION PATTERNS FOR THREE NOTE
 INTERVAL COMBINATIONS OF MINOR SECONDS
 AND MAJOR SECONDS 39

APPENDIX B--SLIDE POSITION PATTERNS FOR FOUR NOTE
 INTERVAL COMBINATIONS OF MINOR SECONDS
 AND MAJOR SECONDS 48

APPENDIX C--SLIDE POSITION PATTERNS FOR THREE NOTE
 INTERVAL COMBINATIONS OF MINOR THIRDS AND
 MAJOR THIRDS (ROOT POSITION TRIADS) 64

APPENDIX D--SLIDE POSITION PATTERNS FOR FOUR NOTE INTERVAL COMBINATIONS OF MINOR THIRDS AND MAJOR THIRDS (ROOT POSITION SEVENTH CHORDS) . . .	77
APPENDIX E--SLIDE POSITION PATTERNS FOR THREE NOTE INTERVAL COMBINATIONS OF MINOR THIRDS, MAJOR THIRDS, AND PERFECT FOURTHS (FIRST AND SECOND INVERSIONS OF TRIADS)	88
APPENDIX F--SLIDE POSITION PATTERNS FOR FOUR NOTE INTERVAL COMBINATIONS OF MAJOR SECONDS, MINOR THIRDS, AND MAJOR THIRDS (FIRST, SECOND, AND THIRD INVERSIONS OF THE MAJOR-MINOR SEVENTH CHORD)	101

INTRODUCTION

The full potential of the trombone is not realized until the student is exposed to the advantages offered to the legato style by the use of alternate positions.

The concepts of the possibilities of the slide trombone have been extended through the virtuosity exhibited by improvisation-oriented performers.¹ The possession of improvisatory ability implies technical agility, control of the legato style, and a thorough knowledge of the alternate positions. The alternate positions are an indispensable part of the development of an advanced technique on the slide trombone.

The Problem

The writer's concern as an educator and performer prompted a survey of available information about alternate positions. The apparent lack of systematized information on the subject was the factor which led to a compilation of slide movement possibilities for selected interval combinations. To illustrate the information gained from the study, etudes in the legato style were constructed.²

¹Eric Blom, Grove's Dictionary of Music and Musicians, V. VIII p. 558.

²Willi Apel, Harvard Dictionary of Music, p. 249, defines Etude as "A piece designed to aid the student of an instrument in the development of his mechanical and technical ability.... usually devoted entirely to one of the special problems of instrumental technique....".

Related Material

A survey of trombone methods and etudes revealed the treatment of alternate positions to be fragmentary. With few exceptions, the approach was found to be limited to non-slurred passages or to exercises using notes within a single overtone series.

One of the exceptions, a method book, contained a section on alternate positions and intonation.¹ The exercises illustrating the points of the discussion were not constructed in the legato style, however. A classification of trombone optional slide position movements and their application to excerpts from the symphonic repertoire was found, but again, was not specifically concerned with the legato style.²

Recently published has been an extensive treatment of trombone slide position placement for the pitch variations of the partials of the overtone series.³ Although all of the regular and alternate positions were included, no material exclusively concerned with alternate position usage was presented by the authors.

¹Simone Mantia, The Trombone Virtuoso, pp. 5-24.

²Harry Ralph Lenhoff, A Study of the Use of Optional Positions in Trombone Slide Technique, 36 pp. Unpublished Master's Report, Kansas State College, 1950.

³Mark R. McDunn and Clifford P. Barnes, Trombone Artistry, pp. 1-3.

Definitions

A. Standard Slide Positions. The standard slide positions which form the basis of the technique of the trombone are shown to the left of the dividing line on Plate I.¹

B. Alternate Slide Positions. The notes to the right of the dividing line on Plate I are called alternate positions and provide additional opportunities for the production of notes in the trombone range.

C. Variance of Slide Placement. The placement of the slide for the notes of the seven overtone series on the trombone varies from partial to partial. For example, the fifth partial, ordinarily too low in pitch, must be raised by shortening the slide slightly or by tightening the embouchure while the sixth partial, usually too high, must be lowered by lengthening the slide slightly or by relaxing the embouchure.² These alterations and others, although slight, are sometimes indicated by special markings.³ For the purposes of this paper, however, the only variance from the seven positions to be acknowledged by special marking is for the seventh, eleventh, and fourteenth partials. These partials are flat to the extent that the adjustment for them amounts to placing the slide between normal positions. Therefore, the slide positions for the seventh, eleventh, and

¹Eric Blom, op. cit., p. 553.

²Hugh E. McMillen, Trombone and Baritone Lecture-Demonstration, p. 3.

³McDunn and Barnes, op. cit., pp. 2-3.

EXPLANATION OF PLATE I

The Seven Positions of the Tenor Trombone, Showing All Available Notes from the Fundamental to the Sixteenth Partial

The notes for partials one to twelve to the left of the dividing line are standard slide positions; those to the right are alternate positions.¹

For all practical purposes, two of the alternate position notes (circled) are used as standard positions. However, they are treated as alternate positions in this paper.

The fourteenth, fifteenth, and sixteenth partials, although not in the practical range of the tenor trombone, are included because of their use in the appendixes.

The thirteenth partial is not included on Plate I because of unfavorable blowing characteristics.

The fundamental tones for slide positions five, six, and seven (enclosed in brackets) are seldom used because they lack sonority and are difficult to produce.²

¹Blom, loc. cit.

²Loc. cit.

PLATE I

The Notes Available in the Seven Slide Positions of the Tenor Trombone

Slide Positions:

Partials:	Pos. 1	Pos. 2	Pos. 3	Pos. 4	Pos. 5	Pos. 6	Pos. 7
16	b^2	a	b^2	a	b^2	a	a
15	a	b^2	a	b^2	a	a	b^2
14	b^2	a	b^2	a	a	b^2	a
12	a	a	b^2	a	b^2	a	a
11	a	b^2	a	b^2	a	a	b^2
10	a	b^2	a	a	b^2	a	b^2
9	a	a	b^2	a	b^2	a	b^2
8	b^2	a	b^2	a	b^2	a	a
7	b^2	a	b^2	a	a	b^2	a
6	a	a	b^2	a	b^2	a	a
5	a	b^2	a	a	b^2	a	b^2
4	b^2	a	b^2	a	b^2	a	a
3	a	a	b^2	a	b^2	a	a
2	b^2	a	b^2	a	b^2	a	a
1	b^2	a	b^2	a	b^2	a	a

Handwritten annotations: A bracket groups positions 1-3. A bracket groups positions 4-7. A circle highlights the note b^2 in position 3 on the 12th partial line. A circle highlights the note a in position 4 on the 8th partial line. Arrows point from these circles to the notes in positions 2 and 3. Labels include "STANDARD SLIDE" and "ALTERNATE SLIDE POSITIONS".

Legend for notes: b^2 , a , b^2 , a , $[b^2]$, $[a]$, $[a]$

fourteenth partials will be marked in a manner similar to that used for altered tones in figured bass, i.e., with a slash through the numeral indicating a shortening of the slide, thus: 2, 3, 4, 5, 6, and 7. The seventh, eleventh, and fourteenth partials in first position are not used.

D. Natural Slur. An uninterrupted movement of the tone from one overtone partial to another is a natural slur. The same result occurs whether the slide is stationary or moving.

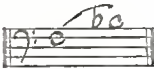
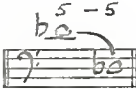
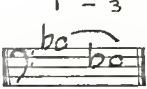
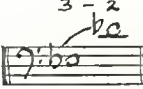
1. Slide stationary, adjacent partials. Position: 1 - 1	2. Slide stationary, skip of a partial. 5 - 5	3. Slide moving, adjacent partials. 1 - 3	4. Slide moving, skip of a partial. 3 - 2
			
Partial: 3rd - 4th	6th - 3rd	4th - 3rd	3rd - 5th

Fig. 1. Examples of natural slurs.

E. Against-the-slide Slur. A natural slur occurring as the pitch is raised while the slide is being lengthened, and conversely, a lowering of the pitch while the slide is shortened is called an against-the slide slur.


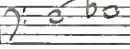

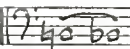
Position: 1 - 2	1 - 5	3 - 2	7 - 1
			
Partial: 3rd - 4th	3rd - 4th	5th - 4th	3rd - 2nd

Fig. 2. Examples of against-the-slide slurs.

F. With-the-slide Slur. Raising the pitch while shortening the slide or lowering the pitch while lengthening the slide creates a technical problem for the trombone if the tone remains in the same partial. If the same partial is retained, some manner of articulation is required to prevent a portamento effect.

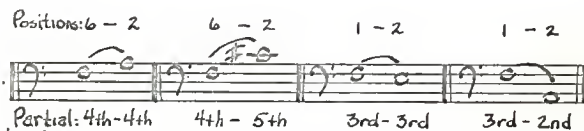


Fig. 3. Examples of with-the-slide slurs.

G. Parallel Position Patterns. The transposition of a slide movement sequence for a given group of notes to a lower or higher pitch while retaining the same sequence of partials and intervals results in parallel position patterns. For example, the pitches d-e-f#-g, played in slide positions 1-2- β -4 are parallel to the pitches c-d-e-f, positions 3-4- β -6, as shown in Fig. 4. Both interval patterns employ the sequence of the fifth, sixth, seventh, and eighth partials.

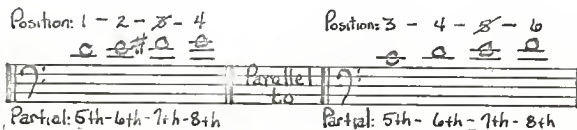


Fig. 4. Examples of parallel position patterns.

The Mechanics of Slides and Valves Related to the Legato Style

An advantage of the slide trombone over valved instruments is its potential for perfect pitch placement. The offsetting disadvantage is the problem of disguising the period of time required to move the slide from one position to another.

The three basic procedures for moving from one note to another on the trombone are: 1) complete interruption of the tone between notes, 2) no interruption of the tone between notes, and 3) an incomplete interruption of the tone between notes called the legato attack.

First Procedure. The separation of notes by complete interruption of the tone creates a period of time during which the slide can be moved without unwanted effects. For this reason, the first procedure has been excluded from consideration in this paper.

(Time allowing for slide movement)



Fig. 5. First procedure: complete interruption of the tone.

Second Procedure. Moving from note to note with no interruption of the tone is a major obstacle to attaining a smooth technique. There are four types of note to note movement without interruption of the tone. These are illustrated as follows:

Second Procedure, Type One. With the slide, no change of partial. This procedure requires that the performer employ some means of separating the two tones in order to avoid the production of a portamento.



Fig. 6. Second procedure: type one.

Second Procedure, Type Two. With the slide, change of partial. In the execution of the second type, the tone is automatically separated in a natural slur.



Fig. 7. Second procedure: type two.

Second Procedure, Type Three. Slide stationary, change of partial. Again, as the tone changes from one partial to another without interruption, the notes are separated by a natural slur.



Fig. 8. Second procedure: type three.

Second Procedure, Type Four. Against the slide, change of partial. As in types two and three, type four results in a natural slur.



Fig. 9. Second procedure; type four.

Third Procedure. The final method of note to note movement is facilitated by an incomplete interruption of the tone known as the legato attack. This semi-interruption of the tone is caused by articulation with syllables beginning with "D" or "L" and helps disguise the period of time needed to move the slide from position to position. While the legato attack is applicable to all three procedures of note to note movement for purposes of style, it has been advocated specifically as a means of achieving uniformity in the second and third procedures of note to note movement.¹

¹James Graham, "The Legato Style of the Trombone," The Instrumentalist, p. 80.

Differences Between the Slide and Valve Techniques

Basically, the three-valved baritone horn and the slide trombone operate on the same principle. The seven chromatic tones necessary for the production of a chromatic scale are produced by the addition of six lengths of tubing, each length being proportioned to add one semi-tone to the note above it. Figure 10 shows the seven trombone slide positions with corresponding baritone valve combinations.

Trombone Position:	1st (slide closed)	2nd	3rd	4th	5th	6th	7th
Semi-Tones Added:	0	1	2	3	4	5	6
Baritone Valve Combination*:	0 (open)	2nd	1st	1st 2nd	2nd 3rd	1st 3rd	1st 2nd 3rd
*Baritone Valve Equivalents:	1st valve = 2 semi-tones 2nd valve = 1 semi-tone 3rd valve = 3 semi-tones						

Fig. 10. Trombone slide positions and equivalent baritone valve combinations.

Although the means by which tubing is added to both the slide trombone and the three-valve baritone are similar in principle, they differ in operation. Certain valve combination

¹The normal range of the three-valve baritone horn is the same as that of the tenor trombone.

sequences (e.g., rapid alternation of the first valve with the second and third valves together, etc.) are more awkward than others, but the change of length of the instrument is immediate and the interruption of the tone automatic.

On the trombone the change of length is gradual as the slide is moved from position to position, and there are several procedures by which notes are connected. For these reasons, the trombonist must take advantage of every opportunity to reduce slide movement, choose slide movements which make use of natural slurs, and develop the legato attack.

The two principle solutions to the problem of note to note movement on the slide trombone are to use shortcuts (alternate positions) and to disguise the time required for slide motion (legato attack).

PROCEDURE

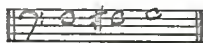
Selection of the Interval Combinations

A systematic organization of slide movement possibilities for selected interval combinations was undertaken. Intervals included were minor seconds, major seconds, minor thirds, major thirds, and perfect fourths. These were grouped into six categories according to the number and order of intervals in each combination of tones.

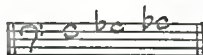
The interval combinations which were selected for use are illustrated as follows:

I. Three note combinations of minor seconds and major seconds (four possibilities).

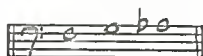
A. m2 - m2 :



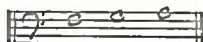
B. m2 - M2 :



C. M2 - m2 :

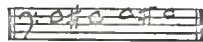


D. M2 - M2 :

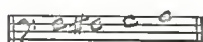


II. Four note combinations of minor seconds and major seconds (eight possibilities).

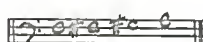
A. m2 - m2 - m2 :



B. m2 - m2 - M2 :


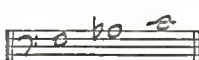
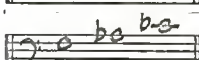
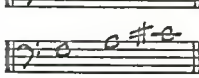


C. m2 - M2 - m2 :


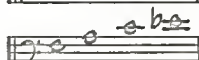
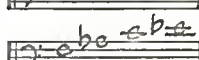
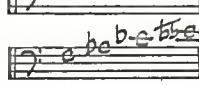


- D. m2 - M2 - M2 : 
- E. M2 - m2 - m2 : 
- F. M2 - m2 - M2 : 
- G. M2 - M2 - m2 : 
- H. M2 - M2 - M2 : 

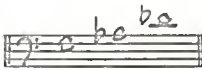

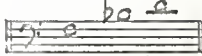
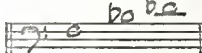
III. Three note combinations of minor thirds and major thirds (root position triads - four possibilities).

- A. M3 - m3 :
(major triad) 
- B. m3 - M3 :
(minor triad) 
- C. m3 - m3 :
(diminished triad) 
- D. M3 - M3 :
(augmented triad) 

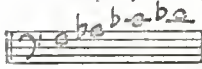
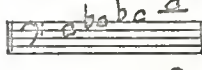

IV. Four note combinations of minor thirds and major thirds (root position seventh chords - eight possibilities, of which four were selected for use).

- A. M3 - m3 - M3 :
(major-major seventh chord) 
- B. M3 - m3 - m3 :
(major-minor seventh chord) 
- C. m3 - M3 - m3 :
(minor-minor seventh chord) 
- D. m3 - m3 - m3 :
(diminished seventh chord) 

V. Three note combinations of minor thirds, major thirds, and perfect fourths (first and second inversions of major and minor triads - four possibilities).

- A. $m_3 - P_4$:
(major triad, first inversion) 
- B. $M_3 - P_4$:
(minor triad, first inversion) 
- C. $P_4 - M_3$:
(major triad, second inversion) 
- D. $P_4 - m_3$:
(minor triad, second inversion) 

VI. Four note combination of major seconds, minor thirds, and major thirds (first, second, and third inversions of the major-minor seventh chord - three possibilities).

- A. $m_3 - m_3 - M_2$: $\begin{matrix} 6 \\ 5 \\ 3 \end{matrix}$ inversion) 
- B. $m_3 - M_2 - M_3$: $\begin{matrix} 6 \\ 4 \\ 3 \end{matrix}$ inversion) 
- C. $M_2 - M_3 - m_3$: $\begin{matrix} 6 \\ 4 \\ 2 \end{matrix}$ inversion) 

Compilation of Slide Position Patterns
for the Interval Combinations

A constant factor in the choice of slide positions for the interval combinations was that a change of at least one partial upward was necessary between the two tones of every interval.

The maintenance of a difference of at least one partial between the tones of the intervals guaranteed a natural slur.

Organization of the Slide Position Patterns
Into Appendixes

The information compiled in the slide position pattern-interval combination study was assembled into appendixes as follows:

- Appendix A--Slide position patterns for three note interval combinations of minor seconds and major seconds.
- Appendix B--Slide position patterns for four note interval combinations of minor seconds and major seconds.
- Appendix C--Slide position patterns for three note interval combinations of minor thirds and major thirds (root position triads).
- Appendix D--Slide position patterns for four note interval combinations of minor thirds and major thirds (root position seventh chords).
- Appendix E--Slide position patterns for three note interval combinations of minor thirds, major thirds, and perfect fourths (first and second inversions of triads).
- Appendix F--Slide position patterns for four note interval combinations of major seconds, minor thirds, and major thirds (first, second, and third inversions of the major-minor seventh chord).

THE ETUDES

Purpose

The etudes were constructed to illustrate the application of the alternate position study to the legato style. The legato style, to be effectively performed on the slide trombone, demands a combination of efficient slide handling and control of the legato attack.¹

Construction

Three sources used in the construction of the etudes were:

1. Selected passages from trombone literature which were developed and expanded.
2. Scale and chord sequences, e.g., a harmonic sequence based upon the circle of fifths.
3. Original material based upon the parallel position patterns contained in the appendixes.

Presentation

Each etude is accompanied by a descriptive paragraph which explains its purpose, illustrates points of technique, and identifies source material.

Because of the chromatic nature of the etudes, all notes are considered to be natural in successive measures unless

¹Apel, op. cit., p. 396, defines legato as performance "without any perceptible interruption between the notes."

altered by an accidental.

All alternate slide positions have been marked with a circle around the numeral. Notes without position markings are to be played in the regular positions. Some regular positions have been marked where doing so serves to clarify the slide position relationships or to show the use of parallel position patterns. Repetition of a slide position for successive notes is indicated by a horizontal line following the slide position numeral.

EXPLANATION OF PLATE II

Etude No. 1 uses as a motive two four-note parallel position patterns based on an interval combination taken from Appendix B (indicated by brackets a and b).

EXPLANATION OF PLATE III

In Etude No. 2, the same interval combination (a major tetrachord taken from Appendix B) is retained throughout, alternating between two parallel slide position patterns. The slide position patterns a , a^1 , a^2 , etc., are parallel, as are b , b^1 , b^2 , etc.

PLATE III

Etude No. 2

1 $\overset{3}{x}$ 2 $\textcircled{5}$ \textcircled{a} x 2 2 $\textcircled{3}$ \textcircled{b} 2 $\overset{3}{3}$ 5 $\textcircled{4}$ $\textcircled{a'}$ $\overset{3}{3}$ 3 3 $\textcircled{b'}$

$\textcircled{4}$ $\textcircled{3}$ $\overset{4}{4}$ $\textcircled{4}$ $\textcircled{5}$ $\textcircled{a^2}$ $\textcircled{4}$ $\overset{4}{4}$ $\textcircled{4}$ $\textcircled{5}$ $\textcircled{b^2}$ $\textcircled{4}$ $\overset{5}{5}$ $\textcircled{5}$ $\textcircled{6}$ $\textcircled{5}$ $\textcircled{5}$ $\textcircled{5}$

$\textcircled{6}$ $\textcircled{5}$ $\overset{6}{6}$ $\textcircled{6}$ $\textcircled{7}$ $\overset{6}{6}$ $\textcircled{6}$ $\textcircled{6}$ $\textcircled{7}$ 1 $\overset{3}{x}$ 2 $\textcircled{3}$

EXPLANATION OF PLATE IV

Etude No. 3 is constructed of a series of ornamental figures which retain the same interval combination, plus arpeggios. The harmonic construction of the etude is based upon the descending circle of fifths.

PLATE IV

Etude No. 3

The musical score for Etude No. 3 is written on seven staves. The first six staves contain a single melodic line with various fingerings and articulations. The seventh staff shows a final chord with an accent (^) above it. The music features a mix of natural and flat notes, with some accidentals changing throughout the piece.

Staff 1: $(4) (3) (4) 2 (4) (3) (5) (4) (6) 5 (4)$

Staff 2: $(6) (7) (6) 4 (6) (7) (7) (6) (4)$

Staff 3: $(5) (6) (5) 2 (5) (6) (7) (6) (5) (6) (6) (6) (5)$

Staff 4: $(5) - (4) (6) - (6) (5) 3 - (5) (4) (6) (4) (5) 3 2 1$

Staff 5: $(3) (3) (3) 1 (3) (5) (3) (3) (4) (3) (4)$

Staff 6: $(3) (5) (3) 3 (3) (5) (5) (3)$

Staff 7: \hat{c}

EXPLANATION OF PLATE V

The fourth etude is a chromatic treatment of second inversion triads. The material is taken from Appendix E.

PLATE V
Etude No. 4

First line of musical notation, showing a treble clef, a key signature of one flat (B-flat), and a 3/8 time signature. The melody consists of four measures. The first measure has a slur over a quarter note B-flat and a quarter note A. The second measure has a slur over a quarter note G and a quarter note F-sharp. The third measure has a slur over a quarter note E and a quarter note D. The fourth measure has a slur over a quarter note C and a quarter note B. Fingerings are indicated by circled numbers: (4) (3) under the first two notes, (4) (5) (6) (5) 4 under the last two notes.

Second line of musical notation, continuing the melody. The first measure has a slur over a quarter note B-flat and a quarter note A. The second measure has a slur over a quarter note G and a quarter note F-sharp. The third measure has a slur over a quarter note E and a quarter note D. The fourth measure has a slur over a quarter note C and a quarter note B. Fingerings are indicated by circled numbers: (5) (6) (5) (6) (7) (6) under the first two notes, (7) (5) (7) (6) (4) 2 under the last two notes.

Third line of musical notation, continuing the melody. The first measure has a slur over a quarter note B-flat and a quarter note A. The second measure has a slur over a quarter note G and a quarter note F-sharp. The third measure has a slur over a quarter note E and a quarter note D. The fourth measure has a slur over a quarter note C and a quarter note B. Fingerings are indicated by circled numbers: (5) 3 (5) (4) 2 4 under the first two notes, 3 1 3 2 3 2 under the last two notes.

Fourth line of musical notation, continuing the melody. The first measure has a slur over a quarter note B-flat and a quarter note A. The second measure has a slur over a quarter note G and a quarter note F-sharp. The third measure has a slur over a quarter note E and a quarter note D. The fourth measure has a slur over a quarter note C and a quarter note B. Fingerings are indicated by circled numbers: 1 2 1 1 2 1 under the first two notes, 1 (4) (5) under the last two notes.

EXPLANATION OF PLATE VI

The fifth etude is based upon the inversions of the major-minor seventh chord. Constructed in two measure segments, the pitches and slide positions of each chord are first presented in quarter notes to establish the pitches, then in triplets for facility.

PLATE VI

Etude No. 5

Handwritten musical score for Etude No. 5, Plate VI. The score consists of eight staves of music in 4/4 time, featuring various fingerings, slurs, and triplets.

Staff 1: 1 2 (3) (4) 3 3 3 3

Staff 2: (4) — (3) (5) 3 3 3 3

Staff 3: (4) (4) (5) (6) (7) (6) 3 3 3 3

Staff 4: (4) (3) (4) (4) 3 3 3 3

Staff 5: 3 2 2 1 3 3 3 3

Staff 6: 3 3 (4) (4) (5) 3 3 3 3

Staff 7: 1 1 3 (5) (5) 3 3 3 3

Staff 8: 3 2 (4) (5) (6) 3 3 3 3

EXPLANATION OF PLATE VII

Etude No. 6 is a sequential treatment of a selected passage of the trombone solo "Morceau Symphonique" by Guilmant.

PLATE VII

Etude No. 6

Handwritten musical score for Etude No. 6, Plate VII. The score consists of six staves of music in bass clef with a key signature of two flats (B-flat and E-flat). The music features various chords, including triads and dyads, with accidentals (sharps and flats) and slurs. Fingerings are indicated by circled numbers 1-5. The piece concludes with a double bar line on the sixth staff.

EXPLANATION OF PLATE VIII

Etude No. 7 is original, with emphasis upon legato style, phrasing, and intonation.

PLATE VIII

Etude No. 7

Handwritten musical score for Etude No. 7, Plate VIII. The score consists of seven staves of music, primarily in treble clef with a 2/4 time signature. The notation includes various fingerings (circled numbers 1-5), slurs, accents, and dynamic markings. The first staff begins with a circled '8' above the first measure. The second staff has a circled '4' below the first measure. The third staff has circled fingerings '4', '4-4', '3', '4', '4', '3' below it. The fourth staff has circled fingerings '4', '4', '3', '4', '5', '6', '6', '6', '5', '6', '5', '3' below it. The fifth staff has circled fingerings '3', '2', '4', '4' below it. The sixth staff has circled fingerings '5', '5', '5', '4', '6', '6' below it. The seventh staff has circled fingerings '6', '2', '4', '4', '4', '5', '4', '5' below it, followed by the instruction 'D.S. al Coda' and a circled '4', '3' below. The final staff has a circled '3' below it. The score concludes with a double bar line and a repeat sign.

SUMMARY AND CONCLUSIONS

The slide position patterns for the interval combinations, organized into appendixes, provide a manual of alternate position possibilities for the tenor trombone. In addition to providing information for the construction of etudes as a part of this study, the assembled data serves as a source for additional original studies, as reference for existing literature, and as a catalogue of reference for performers, composers, and arrangers.

If the etudes were successfully constructed, practice of them should lead to increased knowledge of the location of the alternate and regular positions, more efficient slide movements in combining regular and alternate positions, better control of the legato style, and more accurate intonation through the use of parallel position patterns.

ACKNOWLEDGMENTS

The writer expresses his appreciation to Professor Thomas B. Steunenberg, director of graduate studies in music, and to Professors Clyde F. Jussila and Paul E. Shull for their helpful criticism during the preparation of this paper.

BIBLIOGRAPHY

Books

- Apel, Willi. Harvard Dictionary of Music. Cambridge: Harvard University Press, 1944.
- Blom, Eric, editor. Grove's Dictionary of Music and Musicians. Fifth edition. New York: St. Martin's Press, Inc., 1959.
- Winter, James H. The Brass Instruments. Boston: Allyn and Bacon, 1964.

Method and Etude Books

- Blume, O. 36 Exercises for Slide Trombone (or Bassoon). Translated by G. Saenger. New York: Carl Fischer, 1899.
- Blazhevich, Vladislav. Clef Studies for Trombone. Edited by Jacob Raichman. New York: Leeds Music Corporation, 1948.
- Blazhevich, Vladislav. 26 Sequences for Trombone. Edited by Harold Sheldon. New York: Leeds Music Corporation, 1945.
- Cimera, Jaroslav. 170 Studies for Trombone. New York: Belwin, Inc., 1940.
- Cimera, Jaroslav. Seventy-Nine Trombone Studies. New York: Belwin, Inc., 1949.
- Cimera, Jaroslav. 221 Progressive Etudes for Trombone. New York: Belwin, Inc., 1942.
- Cimera, Jaroslav, and Nilo W. Hovey. Cimera-Hovey Method for Trombone or Baritone. New York: Belwin, Inc., 1940.
- Colin, Charles. Lip Flexibilities. New York: Charles Colin, 1948.
- Couillaud, Henri, transcriber. Pieces Melodiques Pour Trombone-Tenor. Paris: Alphonse Leduc, Vol. 3, 1946.
- Couillaud, Henri, transcriber. 24 Pieces Melodiques Pour Trombone-Tenor. Paris: Alphonse Leduc, Vol. 1, 1928; Vol. 2, 1929.
- Endresen, R. M. Supplementary Studies for Trombone. Chicago: Rubank, Inc., 1935.

- Gower, William, and H. Voxman. Advanced Method, Trombone or Baritone Vol. I. Chicago: Rubank, Inc., 1941.
- Gower, William, and H. Voxman. Advanced Method, Trombone or Baritone, Vol. II. Chicago: Rubank, Inc., 1956.
- Hering, Sigmund. 40 Progressive Etudes for Trombone. New York: Carl Fischer, Inc., 1945.
- Kopprasch, C. 60 Studies for Trombone. Edited by Simon Kovar. Two volumes. New York: International Music Company, 1956.
- LaFosse, Andre. Complete Method of Slide Trombone. Paris: Alphonse Leduc, 1946.
- LaFosse, Andre. School of Sight Reading and Style for Tenor Trombone. Five volumes. New York: M. Baron Co., 1949.
- LaFosse, Andre, adapter. Suites de J. S. Bach pour Violoncelle seul adaptees au Trombone Tenor. Paris: Alphonse Leduc, 1946.
- Little, Lowell. Embouchure Builder for Trombone or Baritone. Westbury, L. I., New York: Pro Art, 1954.
- Mantia, Simone. The Trombone Virtuoso. New York: Carl Fischer, Inc., 1921.
- McDunn, Mark R., and Clifford P. Barnes. Trombone Artistry. Kenosha, Wisconsin: Leblank Publications, Inc., 1965.
- Mueller, Robert. Technical Studies for Trombone in Three Volumes. New York: Carl Fischer, Inc., 1944.
- Randall, Charles L., and Simone Mantia, adapters and editors. Arban's Famous Method for Slide and Valve Trombone and Baritone in Bass Clef. New York: Carl Fischer, Inc., 1936.
- Reinhardt, Donald S. Donald S. Reinhardt's Selection of Concone Studies Compiled and Arranged for Trombone. Philadelphia: Elkan-Vogel Co., Inc., 1943.
- Rochut, Johannes, transcriber and arranger. 120 Melodious Etudes for Trombone in Three Volumes. New York: Carl Fischer, Inc., 1928.
- Schlossberg, Max. Daily Drills and Technical Studies for Trombone. Edited by C. K. Schlossberg. New York: M. Baron Co., 1947.
- Skornicka, J. E., and E. G. Boltz. Intermediate Method for Trombone or Baritone. Chicago: Rubank, Inc., 1938.

- Stefaniszin, Karl. 55 Posaunen-Etuden im Altschlüssel.
Leipzig-Berlin, Germany: Pro Musica Verlag, 1953.
- Stefaniszin, Karl. Posaunen-Etuden im Tenorschlüssel.
Leipzig-Berlin, Germany: Pro Musica Verlag, 1953.
- Voxman, H. Selected Studies for Trombone. Chicago: Rubank, Inc.,
1952.

Periodicals

- Beverdord, Thomas. "Problems Influencing Trombone Intonation."
The Instrumentalist, Oct. 1952, 7 (2): 24-25.
- Graham, James. "The Legato Style of the Trombone." The Instru-
mentalist, May 1965, 19 (10): 79-86.
- Kosakoff, Gabriel. "Playing Trombone in Tune." The Instru-
mentalist, Oct. 1959, 14 (2): 92-94.
- Lyon, Ernest. "Improving Slide Technique." The Instrumentalist,
Jan.-Feb. 1951, 5:18 ff.
- Phillips, June C. "The Trombone Slur." The Instrumentalist,
May-June 1951, 5:20 ff.
- Pulis, G. "On Trombone Technique." Symphony, June 1954,
8 (3): 13-14.
- Tanner, Paul. "Contemporary Concepts of Trombone Playing."
The Instrumentalist, Dec. 1965, 20 (5): 63-65.

Unpublished Material

- Lenhoff, Harry Ralph. A Study of the Use of Optional Positions
in Trombone Slide Technique. Unpublished Master's Report,
Kansas State College, Manhattan, Kansas, 1950.
- McMillen, Hugh E. Trombone and Baritone Lecture-Demonstration.
A Printed but Unpublished Lecture Outline, n.d.

APPENDIX A

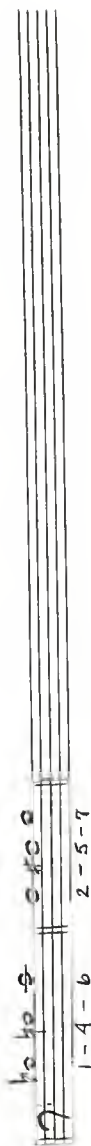
SLIDE POSITION PATTERNS FOR THREE NOTE INTERVAL
COMBINATIONS OF MINOR SECONDS AND MAJOR SECONDS

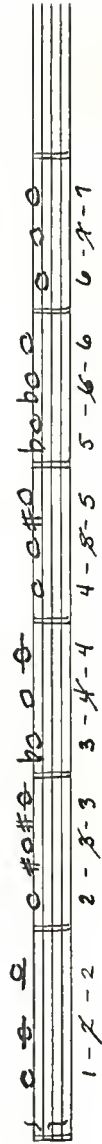
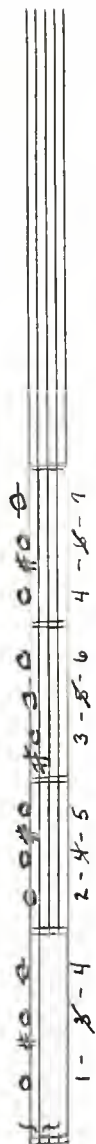
Handwritten musical staff with a treble clef. The word "NONNE" is written below the staff.

Handwritten musical staff with a treble clef. The word "NONNE" is written below the staff, with the number sequence "1-5-7" written below the word.

Handwritten musical staff with a treble clef. The word "NONNE" is written below the staff, with the number sequence "1-4-7" written below the word.

Handwritten musical staff with a treble clef. The word "NONNE" is written below the staff, with the number sequence "1-4-6 2-5-7" written below the word.





Handwritten musical notation on a five-line staff. The notes are: b2, e2, #a2, e3, b3, a3, b3, e4, #f4, e4. Below the staff are the following numbers: 1-2-3, 2-3-4, 3-4-5, 4-5-6, 5-6-7.

Handwritten musical notation on a five-line staff. The notes are: b2, e2, #f2, a2, e3, b3, a3, e4, #f4, e4. Below the staff are the following numbers: 1-2-2, 2-3-3, 3-4-4, 4-5-5, 5-6-6, 6-7-7.


Handwritten musical notation on a five-line staff. The notes are: b2, e2, #f2, a2, e3, b3, a3, e4, #f4, e4. Below the staff are the following numbers: 1-1-2, 2-2-3, 3-3-4, 4-4-5, 5-5-6, 6-6-7.

Handwritten musical notation on a five-line staff. The notes are: b2, e2, #f2, a2, e3, b3, a3, e4, #f4, e4. Below the staff are the following numbers: 1-1-1, 2-2-2, 3-3-3, 4-4-4, 5-5-5, 6-6-6, 7-7-7.


 Musical staff with notes and fingerings: 1-3-5, 2-4-6, 3-5-7, #0, 0, #0, 0, 0, 0, 0.


 Musical staff with notes and fingerings: 1-3-4, 2-4-5, 3-5-6, 4-6-7, #0, 0, 0, #0, 0, 0.


 Musical staff with notes and fingerings: 1-2-4, 2-3-5, 3-4-6, 4-5-7, #0, 0, 0, 0, #0, 0, 0.


 Musical staff with notes and fingerings: 1-2-3, 2-3-4, 3-4-5, 4-5-6, 5-6-7, #0, 0, 0, 0, #0, 0, 0.

APPENDIX B

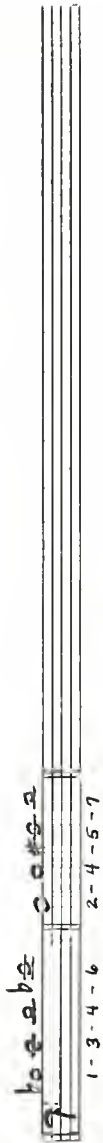
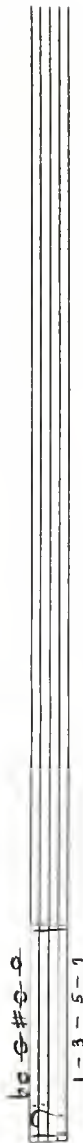
SLIDE POSITION PATTERNS FOR FOUR NOTE INTERVAL
COMBINATIONS OF MINOR SECONDS AND MAJOR SECONDS



A five-line musical staff with handwritten notes. The notes are 'P', 'e', 'e', 'e', 'e' written on the lines from bottom to top. Below the staff, the date '1-4-6-7' is written vertically.









1-2-4-5 2-3-4-6 3-4-6-7 #0-#0-c-c 0-0-b-0-b-0

1-2-4-4 2-3-4-5 3-4-6-6 4-5-7-7 #0-#0-c-c 0-0-b-0-b-0

1-2-3-4 2-3-4-5 3-4-6-6 4-5-6-7 b-0-b-0-b-0 0-c-c-c

1-2-3-3 2-3-4-4 3-4-6-5 4-5-6-6 5-6-7-7 #0-#0-c-c 0-0-b-0-b-0

Handwritten musical notation on a five-line staff. The notes are: 1, 0, #0, e, #e, 0, 0, #0, e, h, a, h, e, 0, b, e. Below the staff, the numbers 1-3-4-5 and 2-#4-5-6 3-5-6-7 are written.

Handwritten musical notation on a five-line staff. The notes are: 0, #0, e, a, 0, a, b, e, b, e, #0, 0, a, 0, e, #0, e, #0. Below the staff, the numbers 1-3-4-1 and 2-#4-5-5 3-5-6-6 4-#6-7-7 are written.

Handwritten musical notation on a five-line staff. The notes are: 0, #0, e, a, 0, 0, e, b, a, #0, e, #0, e, 0, b, e, a, b, e. Below the staff, the numbers 1-3-3-4 and 2-#4-4-5 3-#5-5-6 4-#6-6-7 are written.

Handwritten musical notation on a five-line staff. The notes are: 0, b, e, b, e, a, b, e, 0, 0, e, a, #0, e, #0, e, 0, b, e, a, e, #0, a, e, #0. Below the staff, the numbers 1-3-3-3 and 2-#4-4-4 3-#5-5-5 4-#6-6-6 6-#7-7-7 are written.

f c e #e a e f a #e e b c b e #e a e b e
1-2-3-4 2-2-4-5 3-4-5-6 4-5-6-7

f c e b a b e e f a e a b c b e b a a e e e
1-2-3-3 2-2-4-4 3-4-5-5 4-5-6-6 5-4-7-7

f c e a b e e #f a #e e b c e b a b e b e b e
1-2-2-3 2-2-3-4 3-4-4-5 4-5-5-6 5-4-6-7

f c e a e e #f a #e #a b c e e c #a #e #a c c e #a
1-2-2-2 2-2-3-3 3-4-4-4 4-5-5-5 5-6-6-6 6-7-7-7



f a c e a b e c e f a c e a b e
 2-2-3-4 2-4-4-5 4-5-5-6 2-6-6-7

f a c b e a c e a b e c e f a c e a b e b e c a
 2-2-3-3 2-3-4-4 4-4-5-5 2-5-6-6 4-6-7-7

f a c a c e a c e a b e c e f a c e a b e
 2-2-2-3 2-3-3-4 4-4-4-5 2-5-5-6 4-6-6-7

f a c e a b e b e c e a c e f a c e a b e
 2-2-2-2 2-3-3-3 4-4-4-4 2-5-5-5 4-6-6-6 2-7-7-7

Handwritten musical notation on a five-line staff. The notes are: b2, e3, b3, e4, b4, e5, b5, a5, b5, e5, b4, e4, b3, e3, b2. Below the staff are two measures of fingerings: 1-2-3-5 and 2-3-4-6 3-4-5-7.

Handwritten musical notation on a five-line staff. The notes are: a2, e3, b3, e4, b4, e5, b5, a5, b5, e5, b4, e4, b3, e3, a2. Below the staff are two measures of fingerings: 1-2-3-4 and 2-3-4-5 3-4-5-6 4-5-6-7.

Handwritten musical notation on a five-line staff. The notes are: b2, e3, b3, e4, b4, e5, b5, a5, b5, e5, b4, e4, b3, e3, b2. Below the staff are two measures of fingerings: 1-2-2-4 and 2-3-3-5 3-4-4-6 4-5-5-7.

Handwritten musical notation on a five-line staff. The notes are: b2, e3, b3, e4, b4, e5, b5, a5, b5, e5, b4, e4, b3, e3, a2. Below the staff are two measures of fingerings: 1-2-2-3 and 2-3-3-4 3-4-4-5 4-5-5-6 5-6-6-7.

$G \ A \ B \ C \ D \ E \ F \ G \ A \ B \ C \ D \ E$
 1-2-4-6 2-3-5-7

$G \ A \ B \ C \ D \ E \ F \ G \ A \ B \ C \ D \ E$
 1-2-4-5 2-3-5-6 3-4-6-7

$G \ A \ B \ C \ D \ E \ F \ G \ A \ B \ C \ D \ E$
 1-2-3-5 2-3-4-6 3-4-5-7

$G \ A \ B \ C \ D \ E \ F \ G \ A \ B \ C \ D \ E$
 1-2-3-4 2-3-4-5 3-4-5-6 4-5-6-7

Handwritten musical notation on a five-line staff. The notation consists of a sequence of notes with stems, and a sequence of numbers below the staff: 1-2-4-5, 2-3-5-6, 3-4-6-7.

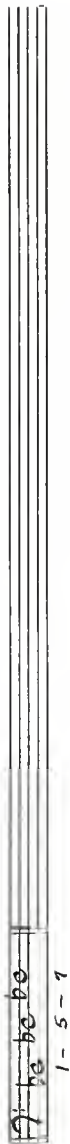
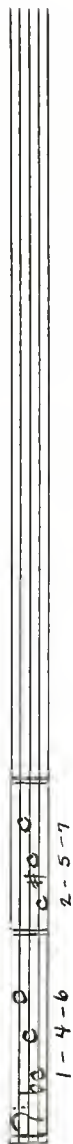
Handwritten musical notation on a five-line staff. The notation consists of a sequence of notes with stems, and a sequence of numbers below the staff: 1-2-4-4, 2-3-5-5, 3-4-6-6, 4-5-7-7.

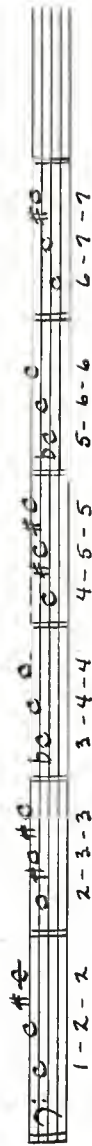
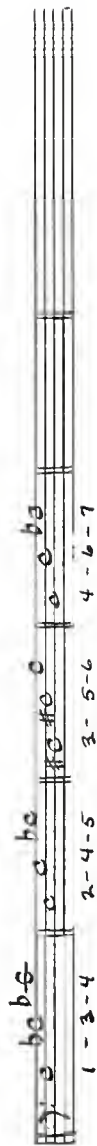
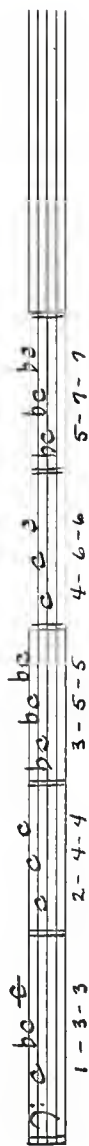
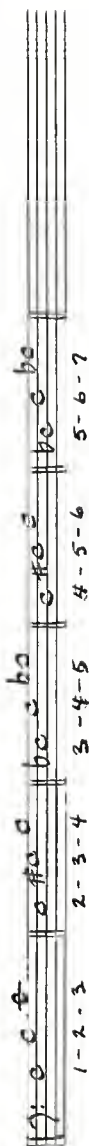
Handwritten musical notation on a five-line staff. The notation consists of a sequence of notes with stems, and a sequence of numbers below the staff: 1-2-4-4, 2-3-4-5, 3-4-5-6, 4-6-6-7.

Handwritten musical notation on a five-line staff. The notation consists of a sequence of notes with stems, and a sequence of numbers below the staff: 1-2-3-3, 2-3-4-4, 3-4-5-5, 4-5-6-6, 5-6-7-7.

APPENDIX C

SLIDE POSITION PATTERNS FOR THREE NOTE INTERVAL
COMBINATIONS OF MINOR THIRDS AND MAJOR THIRDS
(ROOT POSITION TRIADS)





a. $h o a \underline{a} \underline{c} \# e \underline{e} \underline{b e} \underline{b e} \underline{e} \underline{b e} \underline{b e} \underline{e} \underline{e} \underline{e} \underline{a} \underline{a} \underline{a} \underline{a}$
 2. 1-4-6 2-5-1 3-6-6 4-7-9 5-5-5 6-6-6 7-7-7
 b. 1-4-4 2-5-5 3-5-6 4-4-4 5-5-5 6-6-6 7-7-7
 c. 1-1-4 2-2-5 3-3-6 4-4-4 5-5-5 6-6-6 7-7-7
 d. 1-1-1 2-2-2 3-3-3 4-4-4 5-5-5 6-6-6 7-7-7

a. $b o b a \underline{a} \underline{c} \underline{e} \underline{e} \underline{b e} \underline{b e} \underline{b e} \underline{b e} \underline{b e} \underline{e} \underline{e} \underline{e} \underline{e} \underline{e} \underline{e} \underline{e} \underline{e}$
 2. 1-5-6 2-6-7 3-4-6 4-5-7 5-6-5 6-7-6
 b. 1-2-4 2-3-5 3-4-6 4-5-7 5-6-5 6-7-6
 c. 1-2-1 2-3-2 3-4-3 4-5-4 5-6-5 6-7-6

Handwritten musical notation on a five-line staff. The notation consists of a sequence of notes and rests, with some notes marked with accidentals (sharps and naturals). Below the staff, there are four rows of numbers, each corresponding to a letter (a, b, c, d) and a measure of the music.

Notes: b a b a b e e b e $\sharp a$ c b a b a $\sharp e$ e b a b e

a	1-5-7	2-6-6	3-7-7	4-5-5	5-6-6	6-7-7
b	1-5-7	2-3-6	3-4-7	4-5-5	5-6-6	6-7-7
c	1-2-5	2-3-6	3-4-7	4-5-5	5-6-6	6-7-7
d	1-2-2	2-3-3	3-4-4	4-5-5	5-6-6	6-7-7

Handwritten musical notation on a five-line staff. The notation consists of a sequence of notes and rests, with some notes marked with accidentals (sharps and naturals). Below the staff, there are four rows of numbers, each corresponding to a letter (a, b, c, d) and a measure of the music.

Notes: b a $\sharp a$ $\sharp e$ $\sharp e$ b e e c $\sharp e$ b a b a $\sharp e$ e e $\sharp e$ c $\sharp a$ $\sharp c$

a	1-4-5	2-5-6	3-6-1	4-7-7	5-5-7	6-6-5
b	1-4-7	2-5-7	3-6-7	4-7-7	5-5-7	6-6-5
c	1-1-7	2-2-7	3-3-7	4-4-7	5-5-7	6-6-5
d	1-1-7	2-2-1	3-3-2	4-4-3	5-5-7	6-6-5

Handwritten musical notation for a piece with four staves. The notation includes notes, rests, and fingerings. The first staff has notes: a, #o, a, ba, o, e, o, #o, fo, ba, s, c, o, e, o, bo, e, bo. The second staff has fingerings: 2-4-5, 2-4-3, 2-1-3, 3-8-6, 3-8-4, 3-2-4, 3-2-7, 4-4-1, 4-4-5, 4-3-5, 4-3-3, 5-7-6, 5-4-6, 5-4-4, 6-5-7, 6-5-8, 7-6-4.

Handwritten musical notation for a piece with four staves. The notation includes notes, rests, and fingerings. The first staff has notes: a, o, a, a, #o, o, #e, o, bc, e, o, o, e, o, o, #o, c, #o. The second staff has fingerings: 2-4-6, 2-4-4, 2-1-2, 2-8-1, 2-8-5, 2-2-3, 3-4-6, 3-4-6, 3-3-2, 4-7-1, 4-4-5, 4-4-8, 5-5-6, 5-5-4, 6-6-7, 6-6-8, 7-7-6.

Handwritten musical notation for a piece, likely a guitar or piano arrangement. The notation is written on a single staff with a treble clef and a key signature of one sharp (F#). The piece is divided into four measures by double bar lines. The notes and their corresponding fret numbers are as follows:

Measure	Notes (Fret Numbers)
1	F# (2), C (2), G (2), E (2), B (3), E (3)
2	F# (2), C (2), G (2), E (2), B (3), E (3)
3	F# (2), C (2), G (2), E (2), B (3), E (3)
4	F# (2), C (2), G (2), E (2), B (3), E (3)

Below the staff, the fret numbers for each note are listed in a columnar format:

String	Measure 1	Measure 2	Measure 3	Measure 4
a	2	2	2	2
b	3	3	3	3
c	2	2	2	2
d	2	2	2	2

Handwritten musical notation for a piece, likely a guitar or piano arrangement. The notation is written on a single staff with a treble clef and a key signature of one sharp (F#). The piece is divided into four measures by double bar lines. The notes and their corresponding fret numbers are as follows:

Measure	Notes (Fret Numbers)
1	F# (2), C (2), G (2), E (2), B (3), E (3)
2	F# (2), C (2), G (2), E (2), B (3), E (3)
3	F# (2), C (2), G (2), E (2), B (3), E (3)
4	F# (2), C (2), G (2), E (2), B (3), E (3)

Below the staff, the fret numbers for each note are listed in a columnar format:

String	Measure 1	Measure 2	Measure 3	Measure 4
a	2	2	2	2
b	3	3	3	3
c	2	2	2	2
d	2	2	2	2

RH: 2-3-4, 2-3-2, —, —
 LH: 3-4-5, 3-4-3, 3-2-3, 3-2-1

RH: 4-5-6, 4-3-4, 4-3-4, 4-3-2
 LH: 5-6-1, 5-6-5, 5-4-3, 5-4-3

RH: 6-7-6, 6-5-6, 6-5-4
 LH: 7-6-7, 7-6-5, 7-6-5

RH: 2-4-4, 2-4-2, 2-2-2
 LH: 3-5-5, 3-5-3, 3-3-1

RH: 4-6-6, 4-6-4, 4-4-4
 LH: 5-7-1, 5-7-5, 5-5-3

RH: 6-6-6, 6-6-4, 6-6-4
 LH: 7-7-7, 7-7-5, 7-5-3

Handwritten musical notation for a piece with four staves. The notation includes notes, rests, and fingerings. The first staff has a treble clef and a key signature of one sharp (F#). The second staff has a bass clef. The third and fourth staves are empty. The piece is divided into two measures by a double bar line.

Staff 1 (Treble Clef, F#):
 Measure 1: $\text{b} \text{a} \text{b} \text{a}$
 Measure 2: $\text{a} \text{c} \text{b} \text{e}$

Staff 2 (Bass Clef):
 Measure 1: $\text{f} \# \text{a} \text{f} \# \text{a}$
 Measure 2: $\text{e} \text{b} \text{a} \text{b} \text{e}$

Staff 3 (Empty):
 Measure 1: $\text{a} \text{c} \text{b} \text{a}$
 Measure 2: $\text{e} \text{b} \text{a} \text{b} \text{e}$

Staff 4 (Empty):
 Measure 1: $\text{a} \text{c} \text{b} \text{a}$
 Measure 2: $\text{e} \text{b} \text{a} \text{b} \text{e}$

Fingerings:
 Staff 1: a: 2-1-3-4, 2-4-5, 2-4-3, 2-2-3, 2-2-1; b: 3-5-6, 3-5-4, 3-3-4, 3-3-2; c: 4-6-7, 4-6-5, 4-4-5, 4-4-3; d: 5-7-6, 5-8-6, 5-8-4, 5-8-3

Handwritten musical notation for a piece with four staves. The notation includes notes, rests, and fingerings. The first staff has a treble clef and a key signature of one sharp (F#). The second staff has a bass clef. The third and fourth staves are empty. The piece is divided into two measures by a double bar line.

Staff 1 (Treble Clef, F#):
 Measure 1: $\text{a} \text{c} \text{b} \text{e}$
 Measure 2: $\text{a} \text{c} \text{b} \text{e}$

Staff 2 (Bass Clef):
 Measure 1: $\text{f} \# \text{a} \text{f} \# \text{a}$
 Measure 2: $\text{e} \text{b} \text{a} \text{b} \text{e}$

Staff 3 (Empty):
 Measure 1: $\text{a} \text{c} \text{b} \text{a}$
 Measure 2: $\text{e} \text{b} \text{a} \text{b} \text{e}$

Staff 4 (Empty):
 Measure 1: $\text{a} \text{c} \text{b} \text{a}$
 Measure 2: $\text{e} \text{b} \text{a} \text{b} \text{e}$

Fingerings:
 Staff 1: a: 2-2-2, 2-3-3, 2-3-1; b: 3-4-4, 3-4-2, 3-4-2; c: 4-5-5, 4-5-3, 4-3-3, 4-3-1; d: 5-6-6, 5-6-4, 5-4-4, 5-4-2

c e e be be be
 a 6-4-4 8-5-5 4-6-6 8-7-7
 b 2-2-4 8-3-5 4-4-6 8-5-7
 c 2-2-1 8-3-2 4-4-3 8-5-4
 d 1-2 8-1-2 4-2-3 8-3-4
 e 2-3-1 8-2-3 4-2-3 8-3-2
 4-2-1 8-3-2

a be e bc bc
 a 2-3-4 8-4-5 4-5-6 8-6-7
 b 2-3-1 8-4-2 4-5-3 8-6-4
 c 2-1-1 8-2-2 4-3-3 8-4-4
 d 1-2 8-3-1 4-3-1 8-4-2
 4-4-2 8-5-3
 4-6-6
 4-6-6

Handwritten musical notation on a five-line staff. The notation consists of a sequence of notes and rests, with corresponding fingerings written below. The notes are: c, b, e, b, e, a, a, b, a, a, e, e, b, e, a, b, a, a, b, a, a, b, a, b, c.

Fingerings (written below the notes):

- a: 2-3-5, 2-3-2, 2-1-2
- b: 3-4-6, 3-4-3, 3-2-3, 3-2-1
- e: 4-5-7, 4-5-4, 4-3-4, 4-3-2
- a: 5-6-5, 5-4-5, 5-4-3
- b: 6-7-6, 6-5-6, 6-6-5
- c: 7-6-7, 7-6-5

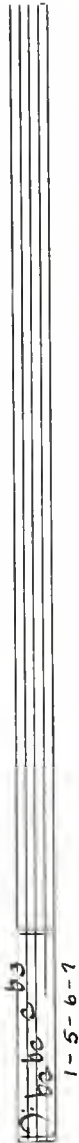
Handwritten musical notation on a five-line staff. The notation consists of a sequence of notes and rests, with corresponding fingerings written below. The notes are: c, e, #a, b, e, e, c, a, #a, a, c, #a, #a, e, b, a, e, c, #a, #a.

Fingerings (written below the notes):

- a: 2-4-3, 2-3-3
- b: 3-5-4, 3-3-4, 3-3-1, 3-1-1
- e: 4-6-5, 4-4-5, 4-4-2, 4-2-2
- a: 5-7-6, 5-5-6, 5-5-3, 5-3-3
- b: 6-6-7, 6-6-4, 6-4-4
- c: 7-7-5, 7-5-5

APPENDIX D

SLIDE POSITION PATTERNS FOR FOUR NOTE INTERVAL
COMBINATIONS OF MINOR THIRDS AND MAJOR THIRDS
(ROOT POSITION SEVENTH CHORDS)



Handwritten musical notation on a five-line staff, showing rhythmic patterns and letter sequences. The notation is organized into four columns, each with a key signature and a time signature above it.

Key Signature	Time Signature	Column 1	Column 2	Column 3	Column 4
$\text{b} \text{ } \text{a} \text{ } \text{c} \text{ } \text{m}$	$\text{c} \text{ } \text{r} \text{ } \text{e} \text{ } \text{e} \text{ } \text{c}$	$\text{b} \text{c} \text{e} \text{b} \text{e} \text{b} \text{e}$	$\text{c} \text{ } \text{o} \text{ } \text{c} \text{ } \text{m}$	$\text{h} \text{e} \text{t} \text{o} \text{t} \text{t} \text{e} \text{c}$	$\text{c} \text{ } \text{e} \text{ } \text{e} \text{ } \text{b} \text{e}$
a	$1-4-6-1$	—	—	—	—
b	$1-4-6-5$	$2-5-7-6$	—	—	—
c	$1-4-4-5$	$2-5-5-6$	$3-4-4-1$	—	—
d	$1-4-4-3$	$2-5-5-4$	$3-6-4-5$	$4-1-4-6$	—
e	$1-4-1-3$	$2-8-2-4$	$3-3-3-5$	$4-4-4-6$	—
f	$2-8-2-7$	$3-3-3-4$	$4-4-4-4$	$5-5-5-7$	$6-6-6-6$
					$7-7-7-7$

Handwritten musical notation on a five-line staff, showing rhythmic patterns and letter sequences. The notation is organized into four columns, each with a key signature and a time signature above it.

Key Signature	Time Signature	Column 1	Column 2	Column 3	Column 4
$\text{b} \text{ } \text{a} \text{ } \text{c} \text{ } \text{m}$	$\text{c} \text{ } \text{r} \text{ } \text{e} \text{ } \text{e} \text{ } \text{c}$	$\text{b} \text{e} \text{b} \text{e} \text{b} \text{e} \text{c}$	$\text{c} \text{ } \text{o} \text{ } \text{c} \text{ } \text{m}$	$\text{b} \text{a} \text{b} \text{a} \text{c}$	$\text{c} \text{ } \text{e} \text{ } \text{e} \text{ } \text{c}$
a	$1-4-6-6$	$2-5-7-1$	—	—	—
b	$1-4-4-6$	$2-5-4-7$	—	—	—
c	$1-4-4-4$	$2-5-5-5$	$4-7-4-1$	—	—
d	$1-1-1-2$	$2-2-2-3$	$4-4-4-5$	$5-5-5-6$	$6-6-4-7$
e	—	$3-3-3-2$	$4-4-4-4$	$5-5-5-4$	$6-6-6-8$
					$7-7-7-6$

Handwritten musical notation on a five-line staff. The notation consists of a sequence of notes and rests, with a key signature of one sharp (F#) and a common time signature (C). The notes are labeled with letters: b, o, b, o, e, e, b, o, e, e, e, e, b, o, o, #, o, o, e, b, o, e, b, e. Below the staff, four rows of numbers (a, b, c, d) are written, corresponding to the notes above. The numbers are: a. 8 1 - 2 - 4 - 5, b. 1 - 2 - 4 - 3, c. 1 - 2 - 1 - 3, d. —. The numbers are grouped by vertical lines. The notation is repeated twice, with a double bar line in the middle.

a. 8 1 - 2 - 4 - 5 2 - 3 - 8 - 6 3 - 4 - 6 - 7 3 - 4 - 6 - 6 4 - 5 - 7 - 6 4 - 5 - 7 - 6 5 - 6 - 5 - 7 6 - 7 - 6 - 6

b. 1 - 2 - 4 - 3 2 - 3 - 8 - 4 3 - 4 - 6 - 5 4 - 5 - 7 - 6 4 - 5 - 7 - 6 4 - 5 - 7 - 6 5 - 6 - 5 - 7 6 - 7 - 6 - 6

c. 1 - 2 - 1 - 3 2 - 3 - 2 - 4 3 - 4 - 3 - 5 4 - 5 - 4 - 6 4 - 5 - 7 - 6 4 - 5 - 7 - 6 5 - 6 - 5 - 7 6 - 7 - 6 - 6

d. — 2 - 3 - 2 - 4 3 - 4 - 3 - 8 4 - 5 - 4 - 4 4 - 5 - 7 - 6 4 - 5 - 7 - 6 5 - 6 - 5 - 7 6 - 7 - 6 - 6

Handwritten musical notation on a five-line staff. The notation consists of a sequence of notes and rests, with a key signature of one sharp (F#) and a common time signature (C). The notes are labeled with letters: b, o, b, o, e, e, b, o, e, b, e, b, o, o, e, b, o, e, b, e, b, o, o, e, b, o, e, b, e. Below the staff, four rows of numbers (a, b, c, d) are written, corresponding to the notes above. The numbers are: a. 1 - 2 - 8 - 6, b. 1 - 2 - 8 - 4, c. 1 - 2 - 2 - 4, d. 2 - 2 - 2 - 4. The numbers are grouped by vertical lines. The notation is repeated twice, with a double bar line in the middle.

a. 1 - 2 - 8 - 6 2 - 3 - 6 - 7 3 - 4 - 7 - 6 4 - 5 - 5 - 7 4 - 5 - 7 - 6 4 - 5 - 7 - 6 5 - 6 - 6 - 6 6 - 7 - 7 - 7

b. 1 - 2 - 8 - 4 2 - 3 - 6 - 5 3 - 4 - 7 - 6 4 - 5 - 5 - 7 4 - 5 - 7 - 6 4 - 5 - 7 - 6 5 - 6 - 6 - 6 6 - 7 - 7 - 7

c. 1 - 2 - 2 - 4 2 - 3 - 3 - 5 3 - 4 - 4 - 6 4 - 5 - 5 - 7 4 - 5 - 7 - 6 4 - 5 - 7 - 6 5 - 6 - 6 - 6 6 - 7 - 7 - 7

d. 2 - 2 - 2 - 4 2 - 3 - 3 - 8 3 - 4 - 4 - 4 4 - 5 - 5 - 8 4 - 5 - 7 - 6 4 - 5 - 7 - 6 5 - 6 - 6 - 6 6 - 7 - 7 - 7

Handwritten musical notation on a grand staff (treble and bass clefs). The notation consists of six staves, each with a letter label (a-f) and a sequence of numbers. Above the staves are handwritten letters and symbols: a-o-a-o, #f-c-f-c-e, c-b-c-e-b-e, c-o-f-f-c, b-a-b-c-a-b-a, e-e-e-e, and #f-c-a-b-f-f-a.

Staff a: a-o-a-o, #f-c-f-c-e, c-b-c-e-b-e, c-o-f-f-c, b-a-b-c-a-b-a, e-e-e-e, #f-c-a-b-f-f-a
 2-1-4-4-6, 2-2-5-4, 3-4-6-5, 4-4-7-6, 4-4-5-6, 5-5-6-7, 6-6-7-6, 7-7-6-7

Staff b: 2-1-4-4-3, 2-2-3-4, 3-3-4-5, 4-4-5-6, 5-5-6-7, 6-6-7-6, 7-7-6-7

Staff c: 2-1-1-2-3, 2-2-3-4, 3-3-4-5, 4-4-5-6, 5-5-6-7, 6-6-7-6, 7-7-6-7

Staff d: 2-1-1-2-1, 2-2-3-2, 3-3-4-3, 4-4-3-4, 5-5-4-5, 6-6-5-6, 7-7-6-7

Staff e: 3-3-3-1, 4-4-3-2, 5-5-4-3, 6-6-5-4, 7-7-6-5

Staff f: 3-3-3-1, 4-4-3-2, 5-5-4-3, 6-6-5-4, 7-7-6-5

Handwritten musical notation on a grand staff (treble and bass clefs). The notation consists of six staves, each with a letter label (a-f) and a sequence of numbers. Above the staves are handwritten letters and symbols: a-b-a-b-a, #f-c-f-c-e, c-a-b-c, c-o-f-f-c, b-a-b-c-a-b-a, e-e-e-e, and #f-c-a-b-f-f-a.

Staff a: a-b-a-b-a, #f-c-f-c-e, c-a-b-c, c-o-f-f-c, b-a-b-c-a-b-a, e-e-e-e, #f-c-a-b-f-f-a
 2-1-4-5-7, 2-2-6-6-5, 3-4-7-4, 4-4-6-7-4, 4-4-6-7, 5-5-7-6, 6-6-7-6, 7-7-6-7

Staff b: 2-1-4-5-4, 2-2-4-5, 3-4-5-6, 4-4-6-7, 5-5-7-6, 6-6-7-6, 7-7-6-7

Staff c: 2-1-4-3-4, 2-2-4-5, 3-3-5-6, 4-4-6-7, 5-5-7-6, 6-6-7-6, 7-7-6-7

Staff d: 2-1-1-3-4, 2-2-4-3, 3-3-4-4, 4-4-4-5, 5-5-6-7, 6-6-7-6, 7-7-6-7

Staff e: 2-2-2-3, 3-3-3-2, 4-4-4-3, 5-5-6-7, 6-6-7-6, 7-7-6-7

Staff f: 2-2-2-1, 3-3-3-2, 4-4-4-3, 5-5-6-7, 6-6-7-6, 7-7-6-7

Handwritten musical notation for a piece titled "be be be". The notation consists of six staves, each with a melodic line and a corresponding number line below it. The notes are represented by circles with stems, and the numbers are written below the staves. The key signature is one sharp (F#).

Staff 1: *be be be*
 Staff 2: *be be be*
 Staff 3: *be be be*
 Staff 4: *be be be*
 Staff 5: *be be be*
 Staff 6: *be be be*

Number lines:
 a. 1-3-3-3 2-4-4-4 3-5-5-5 4-6-6-6 5-7-7-7
 b. 1-3-1-3 2-4-2-4 3-5-3-5 4-6-4-6 5-7-5-7
 c. ——— 2-2-2-4 3-3-3-5 4-4-4-6 5-5-5-7
 d. ——— 2-2-2-1 3-3-3-2 4-4-4-3 5-5-5-4 6-6-6-5
 e. ——— ——— 1-2-1-2 4-4-2-3 5-5-3-4 6-6-4-5 7-7-7-6
 f. ——— ——— 4-4-2-1 4-4-2-1 5-5-3-2 6-6-4-3 7-7-5-4

Handwritten musical notation for a piece titled "the be be be". The notation consists of six staves, each with a melodic line and a corresponding number line below it. The notes are represented by circles with stems, and the numbers are written below the staves. The key signature is one sharp (F#).

Staff 1: *the be be be*
 Staff 2: *be be be*
 Staff 3: *be be be*
 Staff 4: *be be be*
 Staff 5: *be be be*
 Staff 6: *be be be*

Number lines:
 a. 1-3-4-4 2-4-5-5 3-5-6-6 4-6-7-7
 b. 1-3-2-1 2-4-3-2 3-5-4-3 4-6-5-4
 c. ——— 2-2-3-2 3-3-4-3 4-4-5-4 5-5-6-5
 d. ——— 2-2-1-2 3-3-2-3 4-4-3-4 5-5-4-5
 e. ——— ——— 3-2-1-2 4-4-3-2 5-5-4-3 6-6-5-4
 f. ——— ——— ——— ——— 7-7-6-5

	$\text{a} \text{ o} \text{ e} \text{ e} \text{ e} \text{ e}$	$\text{a} \text{ o} \text{ a} \text{ o} \text{ a}$	$\text{a} \text{ o} \text{ e} \text{ e}$	$\text{b} \text{ e} \text{ b} \text{ e}$	$\text{a} \text{ o} \text{ a} \text{ o}$
a.	2-2-4-4-4	4-6-6-6-6	5-7-7-7-7	---	---
b.	2-2-2-4-4	4-4-6-6-6	5-5-7-7-7	---	---
c.	2-2-2-1-1	4-4-3-3-3	5-5-4-4-4	6-6-5-5-5	7-7-6-6-6
d.	---	4-2-3-3-3	5-3-4-4-4	6-4-5-5-5	7-5-6-6-6
e.	---	4-2-1-3	5-3-2-4	6-4-3-5	7-5-4-6
f.	---	---	5-3-2-1	6-4-3-2	7-5-4-3

	$\text{a} \text{ o} \text{ e} \text{ e} \text{ e} \text{ e}$	$\text{a} \text{ o} \text{ a} \text{ o}$	$\text{a} \text{ o} \text{ e} \text{ e}$	$\text{b} \text{ e} \text{ b} \text{ e}$	$\text{a} \text{ o} \text{ a} \text{ o}$
a.	2-2-4-4-5	4-6-4-7	5-7-7-7	---	---
b.	2-4-4-4-5	4-6-4-5	5-7-7-7	---	---
c.	2-2-4-5	4-4-6-5	5-5-7-7	6-6-5-4	7-7-6-5
d.	2-2-1-5	4-4-3-5	5-5-4-6	6-4-5-7	7-7-6-5
e.	---	4-4-3-2	5-5-4-3	6-6-5-4	7-7-6-5
f.	1-2-1	4-2-3-2	5-3-4-3	6-4-3-4	7-5-4-5
g.	---	4-2-1-2	5-3-2-3	6-4-3-1	7-5-4-5

Handwritten musical notation for a piece with three parts (a, b, c, d). The notation is on a single staff with a treble clef and a key signature of one sharp (F#). The melody consists of a sequence of notes with corresponding fingerings written below. Part 'a' is the first line, 'b' is the second, 'c' is the third, and 'd' is the fourth. The piece ends with a double bar line and a repeat sign.

Part a: $3-4-5-4$ $3-2-2-2-2$ $4-5-6-6$ $4-3-3-3$ $4-3-1-3$ $5-6-1-7$ $5-4-4-4$ $5-4-2-4$ $5-4-2-1$ $6-5-5-5$ $6-5-4-5$ $6-5-3-2$ $7-6-6-6$ $7-6-5-6$ $7-6-4-3$

Part b: $3-4-5-4$ $3-2-2-2-2$ $4-5-6-6$ $4-3-3-3$ $4-3-1-3$ $5-6-1-7$ $5-4-4-4$ $5-4-2-4$ $5-4-2-1$ $6-5-5-5$ $6-5-4-5$ $6-5-3-2$ $7-6-6-6$ $7-6-5-6$ $7-6-4-3$

Part c: $3-4-5-4$ $3-2-2-2-2$ $4-5-6-6$ $4-3-3-3$ $4-3-1-3$ $5-6-1-7$ $5-4-4-4$ $5-4-2-4$ $5-4-2-1$ $6-5-5-5$ $6-5-4-5$ $6-5-3-2$ $7-6-6-6$ $7-6-5-6$ $7-6-4-3$

Part d: $3-4-5-4$ $3-2-2-2-2$ $4-5-6-6$ $4-3-3-3$ $4-3-1-3$ $5-6-1-7$ $5-4-4-4$ $5-4-2-4$ $5-4-2-1$ $6-5-5-5$ $6-5-4-5$ $6-5-3-2$ $7-6-6-6$ $7-6-5-6$ $7-6-4-3$

Handwritten musical notation for a piece with three parts (a, b, c, d). The notation is on a single staff with a treble clef and a key signature of one sharp (F#). The melody consists of a sequence of notes with corresponding fingerings written below. Part 'a' is the first line, 'b' is the second, 'c' is the third, and 'd' is the fourth. The piece ends with a double bar line and a repeat sign.

Part a: $3-4-6-4$ $3-4-3-3$ $5-7-7$ $4-5-4-4$ $4-3-4-4$ $4-3-2-4$ $4-3-2-1$ $5-6-5-5$ $5-4-5-5$ $5-4-3-5$ $5-4-3-2$ $6-1-6-4$ $6-5-6-4$ $6-5-4-4$ $6-5-4-3$ $7-6-5-7$ $7-6-5-4$

Part b: $3-4-6-4$ $3-4-3-3$ $5-7-7$ $4-5-4-4$ $4-3-4-4$ $4-3-2-4$ $4-3-2-1$ $5-6-5-5$ $5-4-5-5$ $5-4-3-5$ $5-4-3-2$ $6-1-6-4$ $6-5-6-4$ $6-5-4-4$ $6-5-4-3$ $7-6-5-7$ $7-6-5-4$

Part c: $3-4-6-4$ $3-4-3-3$ $5-7-7$ $4-5-4-4$ $4-3-4-4$ $4-3-2-4$ $4-3-2-1$ $5-6-5-5$ $5-4-5-5$ $5-4-3-5$ $5-4-3-2$ $6-1-6-4$ $6-5-6-4$ $6-5-4-4$ $6-5-4-3$ $7-6-5-7$ $7-6-5-4$

Part d: $3-4-6-4$ $3-4-3-3$ $5-7-7$ $4-5-4-4$ $4-3-4-4$ $4-3-2-4$ $4-3-2-1$ $5-6-5-5$ $5-4-5-5$ $5-4-3-5$ $5-4-3-2$ $6-1-6-4$ $6-5-6-4$ $6-5-4-4$ $6-5-4-3$ $7-6-5-7$ $7-6-5-4$

APPENDIX E

SLIDE POSITION PATTERNS FOR THREE NOTE INTERVAL COMBINATIONS
OF MINOR THIRDS, MAJOR THIRDS, AND PERFECT FOURTHS
(FIRST AND SECOND INVERSIONS OF TRIADS)



Handwritten musical notation on a five-line staff. The notes are: \dot{c} , \dot{e} , \dot{b} , \dot{a} , \dot{c} , \dot{e} , $\sharp\dot{f}$, \dot{a} , \dot{c} , \dot{e} , \dot{b} . Below the staff are two lines of numbers: $2\ 1-3-5$ and $2-4-6$ above the first line, and $1-3-2$ and $2-4-3$ above the second line. To the right of the staff are two lines of numbers: $3-5-7$ and $3-5-4$ above the first line, and $4-6-5$ and $5-7-6$ above the second line.

Handwritten musical notation on a five-line staff. The notes are: \dot{c} , \dot{e} , \dot{a} , \dot{c} , $\sharp\dot{f}$, \dot{c} , \dot{b} , \dot{e} , \dot{b} , \dot{a} . Below the staff are two lines of numbers: $2\ 1-2-4$ and $2-3-5$ above the first line, and $1-2-1$ and $2-3-2$ above the second line. To the right of the staff are two lines of numbers: $3-4-6$ and $3-4-3$ above the first line, and $4-5-7$ and $5-6-7$ above the second line.

Handwritten musical notation on a five-line staff. The notes are: \dot{c} , \dot{e} , $\sharp\dot{f}$, \dot{c} , \dot{c} , \dot{c} , \dot{b} , \dot{a} , \dot{b} , \dot{a} . Below the staff are two lines of numbers: $2\ 1-1-4$ and $2-2-5$ above the first line, and $1-1-1$ and $2-2-2$ above the second line. To the right of the staff are two lines of numbers: $3-3-6$ and $3-3-3$ above the first line, and $4-4-7$ and $4-4-4$ above the second line.

Handwritten musical notation on a five-line staff. The notes are: \dot{c} , \dot{e} , \dot{e} , \dot{c} , \dot{c} , \dot{b} , $\sharp\dot{f}$, $\sharp\dot{a}$, \dot{c} , \dot{b} . Below the staff are two lines of numbers: $2\ 1-5-5$ and $2-6-6$ above the first line, and $1-1-2$ and $2-2-3$ above the second line. To the right of the staff are two lines of numbers: $3-7-7$ and $3-3-4$ above the first line, and $4-4-5$ and $5-5-6$ above the second line.

Musical notation for the first system, showing a sequence of notes and fingerings. The notes are: b , a , b , e , c , $\sharp c$, a , b , a , b , a , $\sharp c$, e , c , b , a , b , a .

Fingerings: $2-1-2-3$, $2-3-4$, $2-3-1$, $3-4-5$, $3-4-2$, $4-5-6$, $4-5-3$, $4-5-6$, $5-6-7$, $5-6-4$, $6-7-5$.

Musical notation for the second system, showing a sequence of notes and fingerings. The notes are: f , b , c , a , e , $\sharp c$, $\sharp c$, b , c , a , c , b , a , b , a , b , a , c , e , $\sharp c$, $\sharp c$, e .

Fingerings: $2-1-4-4$, $2-2-3$, $2-5-5$, $3-6-6$, $3-3-4$, $3-3-1$, $4-7-7$, $4-4-5$, $4-4-2$, $5-5-5$, $5-5-3$, $6-6-4$, $6-6-4$, $7-7-5$.

Handwritten musical notation on a single staff, showing a sequence of notes and fingerings. The notes are: f , b , b , e , e , a , $\sharp f$, b , b , a , e , e , e , $\sharp f$, e , $\sharp f$, a , b , a , a , e , f , e .

Fingerings (a-d) are written below the notes:

a.	1-3-4	2-4-5	3-5-6	4-6-7	5-7- 8	6-5- 4	7-6-5
b.	1-3-2	2-4- 3	3-5- 4	4-6- 5	5-4- 3	6-5- 4	7-6-5
c.	_____	2-1- 3	3-2- 4	4-3- 2	5-4- 3	6-5- 4	7-6-5
d.	_____	_____	3-2-1	4-3-2	5-4-3	6-5-4	7-6-5

Handwritten musical notation on a single staff, showing a sequence of notes and fingerings. The notes are: f , b , b , e , e , a , $\sharp f$, b , b , a , e , e , e , $\sharp f$, e , $\sharp f$, a , b , a , a , e , f , e .

Fingerings (a-c) are written below the notes:

a.	1-3-5	2-4-6	3-5-7	4-6- 8	5-7- 8	6-5-5	7-6-6
b.	1-3- 3	2-4- 4	3-5- 8	4-6- 4	5-7- 7	6-5-5	7-6-6
c.	_____	2-1-1	3-2-2	4-3-3	5-4-4	6-5-5	7-6-6

f o e be | # o e a | o b o be | o e e | b o b o be | e e e | # o e c

a. 1-4-5 | 2-5-6 | 3-4-7 | 4-7-6 | 5-5-5 | 6-6-6 | 7-7-7
 b. 1-4-3 | 2-5-4 | 3-4-5 | 4-4-6 | 5-5-7 | 6-6-6 | 7-7-7
 c. 1-1-3 | 2-2-4 | 3-3-5 | 4-4-4 | 5-5-5 | 6-6-6 | 7-7-7
 d. 1-1-1 | 2-2-2 | 3-3-3 | 4-4-4 | 5-5-5 | 6-6-6 | 7-7-7

f o # o e | b o c be | o e o a | o # o e e | b o c e | o # o e | b o e c

a. 1-3-4 | 2-4-5 | 3-5-6 | 4-4-7 | 5-5-6 | 6-6-6 | 7-6-6
 b. 1-3-2 | 2-4-3 | 3-5-4 | 4-4-5 | 5-4-6 | 6-5-7 | 7-6-6
 c. 1-1-1 | 2-2-2 | 3-3-3 | 4-4-4 | 5-5-5 | 6-6-6 | 7-6-6
 d. 1-1-1 | 2-2-2 | 3-3-3 | 4-4-4 | 5-5-5 | 6-6-6 | 7-6-6

a.	2-1-2-4	2-3-5	3-4-6	4-5-7	5-6-8	6-7-9	7-8-10
b.	1-2-2	2-3-3	3-4-4	4-5-5	5-6-6	6-7-7	7-8-8
c.	---	2-3-1	3-4-2	4-5-3	5-6-4	6-7-5	7-8-4
d.	---	---	3-1-2	4-2-3	5-3-4	6-4-5	7-5-4
e.	---	---	---	---	5-3-2	6-4-3	7-5-4

a	1-2-3	2-3-4	3-4-5	4-5-6	5-6-7	6-7-8	7-8-9
b	1-2-1	2-3-3	3-4-3	4-5-4	5-6-5	6-7-6	7-8-7
c	---	2-3-2	3-4-3	4-5-4	5-6-5	6-7-6	7-8-7
d	---	---	3-1-3	4-2-4	5-3-5	6-4-6	7-5-7

a. 1-3-5 2-4-6 3-5-7 4-6-5 5-7-6 6-8-6 6-8-5
 b. 1-3-2 2-4-3 3-5-4 4-4-5 5-8-6 6-8-6 6-8-5
 c. 2-2-1 2-2-3 3-3-2 4-4-3 5-5-4 6-6-4 7-7-6

a. 1-2-4 2-3-5 3-4-6 4-5-7 5-6-5 4-7-6 7-8-7
 b. 1-2-1 2-3-2 3-4-3 4-5-4 5-4-5 6-8-6 7-8-5
 c. 2-2-1 2-2-3 3-2-1 4-2-2 5-4-3 6-8-4 7-8-5

Handwritten musical notation for a scale exercise. The notation is written on a single staff with a treble clef and a key signature of one sharp (F#). The scale consists of the notes: C, D, E, F#, G, A, B, C, D, E, F#, G, A, B, C. The exercise is divided into four measures, each containing a sequence of notes and their corresponding fingerings (numbers 1-5).

Measure	Notes	Fingerings
1	C, D, E, F#, G, A, B, C	2-4-5, 3-5-6, 4-6-7, 4-6-7, 4-6-6, 4-6-6, 4-6-6, 4-6-6
2	D, E, F#, G, A, B, C, D	3-5-6, 3-5-8, 4-6-7, 4-6-4, 4-6-4, 4-6-4, 4-6-4, 4-6-4
3	E, F#, G, A, B, C, D, E	3-5-3, 3-5-3, 4-6-7, 4-6-4, 4-6-4, 4-6-4, 4-6-4, 4-6-4
4	F#, G, A, B, C, D, E, F#	3-3-3, 3-3-3, 4-6-7, 4-6-4, 4-6-4, 4-6-4, 4-6-4, 4-6-4

Handwritten musical notation for a scale exercise. The notation is written on a single staff with a treble clef and a key signature of one sharp (F#). The scale consists of the notes: C, D, E, F#, G, A, B, C, D, E, F#, G, A, B, C. The exercise is divided into four measures, each containing a sequence of notes and their corresponding fingerings (numbers 1-5).

Measure	Notes	Fingerings
1	C, D, E, F#, G, A, B, C	2-4-6, 3-5-7, 4-6-5, 4-4-5, 4-4-5, 4-4-5, 4-4-5
2	D, E, F#, G, A, B, C, D	2-4-3, 3-5-4, 4-6-5, 4-4-5, 4-4-5, 4-4-5, 4-4-5
3	E, F#, G, A, B, C, D, E	2-2-3, 3-3-4, 4-6-5, 4-4-5, 4-4-5, 4-4-5, 4-4-5
4	F#, G, A, B, C, D, E, F#	2-2-1, 3-3-2, 4-6-5, 4-4-5, 4-4-5, 4-4-5, 4-4-5

Handwritten musical notation on a five-line staff. The notation consists of several measures of music with notes and rests. Below the staff, there are three rows of numbers corresponding to the notes above them.

Notes: e b g b a e | f a c f | a b c b a e | e e e e | f a c f e | a c a b e

Numbers:
 a. 2-2-3-3 | 2-4-4 | 4-5-5 | 5-4-6 | 4-7-7 |
 b. 2-1-3 | 2-2-4 | 4-3-5 | 5-4-6 | 4-5-7 |
 c. | 3-2-1 | 3-2-2 | 4-3-2 | 5-4-3 | 4-5-4 | 4-6-5

Handwritten musical notation on a five-line staff. The notation consists of several measures of music with notes and rests. Below the staff, there are four rows of numbers corresponding to the notes above them.

Notes: e e e e | b c b a e | a c a e | e f a f a | b c a e | a f a e

Numbers:
 a. 2-2-4-2 | 3-5-3 | 4-4-4 | 5-7-5 | 4-6-6 | 4-7-1 |
 b. 2-2-2 | 3-3-3 | 4-4-4 | 5-5-5 | 4-4-4 | 4-5-7 |
 c. | | 3-1-3 | 5-3-5 | 4-4-3 | 4-5-7 |
 d. | | | 5-3-2 | 4-4-3 | 4-5-4

b₂ e₂ b₂ e₂ b₂ e₂ c₃ a₃ e₃ e₃ #f₃ e₃ e₃ b₃ e₃ b₃ e₃ #f₃ c₃ e₃ b₃ e₃ b₃ e₃ c₃ a₃ e₃ a₃
 a. 1-2-3 2-3-4 3-4-2 3-2-2 4-5-4 4-5-3 5-6-7 6-7-5 7-6-6
 b. 1-1-1 2-3-1 3-4-2 4-3-3 5-4-4 6-7-5
 c. 2-1-1 3-2-2 4-3-3 5-4-4 6-7-5 7-6-6

b₂ e₂ b₂ e₂ b₂ a₂ e₂ e₂ b₂ e₂ c₃ e₃ b₃ e₃ b₃ e₃ c₃ e₃ c₃ #f₃ e₃ a₃ #f₃ a₃
 a. 1-4-4 2-5-5 3-6-6 4-7-7 5-5-5 6-6-7 7-5-5
 b. 1-1-7 2-2-7 3-3-4 4-4-2 5-5-3 6-6-4 7-5-5
 c. 3-3-1 4-4-2 5-5-3 6-4-4 7-5-5
 d. 3-1-1 4-2-2 5-3-3 6-4-4 7-5-5

Handwritten musical notation on a five-line staff, showing chord diagrams and fingerings for various chords. The notation includes notes on the staff and corresponding finger numbers below.

b_2	b_1	a_2	a_1	e_2	e_1	$\sharp e_2$	$\sharp e_1$	b_2	b_1	e_2	e_1	$\sharp e_2$	$\sharp e_1$
a_1-3-4	b_1-3-4	c_1-	d_1-	$2-4-5$	$2-4-5$	$2-4-5$	$2-4-5$	$3-5-6$	$3-5-6$	$3-5-6$	$3-5-6$	$3-5-6$	$3-5-6$
$2-4-5$	$2-4-5$	$2-1-3$		$3-5-6$	$3-5-6$	$3-5-6$	$3-5-6$	$4-6-7$	$4-6-7$	$4-6-7$	$4-6-7$	$4-6-7$	$4-6-7$
$3-5-6$	$3-5-6$	$3-2-1$		$4-6-7$	$4-6-7$	$4-6-7$	$4-6-7$	$5-7-8$	$5-7-8$	$5-7-8$	$5-7-8$	$5-7-8$	$5-7-8$
$3-2-1$	$3-2-1$			$4-3-2$	$4-3-2$	$4-3-2$	$4-3-2$	$5-4-3$	$5-4-3$	$5-4-3$	$5-4-3$	$5-4-3$	$5-4-3$
$4-6-7$	$4-6-7$			$5-7-8$	$5-7-8$	$5-7-8$	$5-7-8$	$6-5-4$	$6-5-4$	$6-5-4$	$6-5-4$	$6-5-4$	$6-5-4$
$6-5-4$	$6-5-4$			$6-5-4$	$6-5-4$	$6-5-4$	$6-5-4$	$7-6-5$	$7-6-5$	$7-6-5$	$7-6-5$	$7-6-5$	$7-6-5$

Handwritten musical notation on a five-line staff, showing chord diagrams and fingerings for various chords. The notation includes notes on the staff and corresponding finger numbers below.

b_2	b_1	a_2	a_1	e_2	e_1	$\sharp e_2$	$\sharp e_1$	b_2	b_1	e_2	e_1	$\sharp e_2$	$\sharp e_1$
a_1-3-5	b_1-3-5	c_1-	d_1-	$2-4-6$	$2-4-6$	$2-4-6$	$2-4-6$	$3-5-7$	$3-5-7$	$3-5-7$	$3-5-7$	$3-5-7$	$3-5-7$
$2-4-6$	$2-4-6$	$2-1-1$		$3-5-7$	$3-5-7$	$3-5-7$	$3-5-7$	$4-6-8$	$4-6-8$	$4-6-8$	$4-6-8$	$4-6-8$	$4-6-8$
$3-5-7$	$3-5-7$	$3-2-2$		$4-6-8$	$4-6-8$	$4-6-8$	$4-6-8$	$5-7-9$	$5-7-9$	$5-7-9$	$5-7-9$	$5-7-9$	$5-7-9$
$3-2-2$	$3-2-2$			$5-7-9$	$5-7-9$	$5-7-9$	$5-7-9$	$6-5-5$	$6-5-5$	$6-5-5$	$6-5-5$	$6-5-5$	$6-5-5$
$4-6-8$	$4-6-8$			$6-5-5$	$6-5-5$	$6-5-5$	$6-5-5$	$7-6-6$	$7-6-6$	$7-6-6$	$7-6-6$	$7-6-6$	$7-6-6$
$6-5-5$	$6-5-5$			$7-6-6$	$7-6-6$	$7-6-6$	$7-6-6$						

APPENDIX F

SLIDE POSITION PATTERNS FOR FOUR NOTE INTERVAL COMBINATIONS
OF MAJOR SECONDS, MINOR THIRDS, AND MAJOR THIRDS
(FIRST, SECOND, AND THIRD INVERSIONS OF THE MAJOR-MINOR
SEVENTH CHORD)

Handwritten musical notation on a five-line staff, featuring rhythmic patterns and letter sequences. The notation is organized into three main sections, each with a treble clef and a key signature of one sharp (F#).

Section 1: bababe

Staff 1: bababe e-be #c-a-e o-ba-be #c-o-e-o

Staff 2: $2-1-5-8-5$ $2-6-4-6$ $3-1-4-1$ $3-1-4-1$ $3-1-4-1$

Staff 3: $6-1-2-8-5$ $2-3-6-6$ $3-4-4-1$ $3-4-4-1$ $3-4-4-1$

Staff 4: $3-1-2-2-8$ $2-3-3-4$ $3-4-4-4$ $4-5-5-6$ $5-6-6-4$

Section 2: ba-be

Staff 5: ba-be e-a-#c be-ba-o c-o-e #c-a-e

Staff 6: $2-1-2-3-4$ $2-3-4-5$ $3-4-5-6$ $4-5-6-7$ $5-6-7-6$

Staff 7: $6-1-2-2-3-7$ $2-3-4-8$ $3-4-5-4$ $4-5-6-8$ $5-6-7-6$

Section 3: ho-e-e

Staff 8: ho-e-e e-o-#c-a-e be-be-o c-o-e-e #c-o-e

Staff 9: $2-1-3-8-6$ $2-4-4-7$ $3-5-4-6$ $4-6-5-6$ $5-7-6-7$

Staff 10: $6-1-3-8-4$ $2-4-6-5$ $3-5-4-5$ $4-6-5-6$ $5-7-6-7$

Staff 11: $3-1-3-2-4$ $2-4-3-4$ $3-5-4-5$ $4-6-5-6$ $5-7-6-7$

Staff 12: $2-1-3-2-2$ $2-4-3-8$ $3-5-4-4$ $4-6-5-8$ $5-7-6-6$

b-e-c-o-o-o
 a-e-t-e-t-e
 b-a-b-e-e-e
 e-o-f-a-o
 b-o-b-o-b-o
 o-f-f-a-t-t-a

a. 1-3-5-6
 2-4-6-7
 3-5-7-6
 4-4-6-5
 2-4-3-5
 3-5-4-6
 2-4-3-2
 3-5-4-4
 2-2-3-2
 3-3-4-4
 4-4-5-5
 5-5-6-6
 6-6-7-7
 7-7-6-5

b-e-b-e-o-o
 a-e-t-e-t-e
 b-a-b-a-b-e-e
 o-b-e-a-o
 b-a-b-e-e
 e-e-t-e
 b-e-o-o-o
 a-e-t-e-t-e
 b-a-b-a-b-o
 o-f-f-a-t-t-a

a. 1-2-3-4
 2-3-4-5
 2-1-1-2
 3-4-5-6
 4-5-6-7
 4-5-6-7
 5-6-7-8
 5-4-4-3
 3-2-2-1
 4-5-6-7
 4-5-6-7
 4-3-3-2
 3-4-5-6
 4-5-6-7
 5-6-7-8
 5-4-4-3
 3-5-4-4
 4-4-5-6
 4-4-2-1
 3-5-4-4
 3-3-4-4
 3-3-1-1
 2-4-3-2
 2-2-3-2
 3-5-4-4
 3-3-4-4
 3-3-1-1
 2-4-3-2
 2-2-3-2
 3-5-4-4
 5-6-6-6
 6-4-7-7
 6-4-6-5
 7-7-6-6

ETUDES FOR THE TENOR TROMBONE DESIGNED TO FACILITATE
LEGATO TECHNIQUE THROUGH THE USE OF
ALTERNATE POSITIONS

by

EUGENE I. HOLDSWORTH

B. M., Bethany College, 1958

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Music

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1966

The full potential of the slide trombone is not realized until the student is exposed to the advantages offered to the legato style by the use of alternate positions.

The concepts of the possibilities of the slide trombone have been extended through the virtuosity exhibited by improvisation-oriented performers. The possession of improvisatory ability implies technical agility, control of the legato style, and a thorough knowledge of the alternate positions.

In a survey of trombone methods and etudes, the treatment of alternate positions was found to be fragmentary. With few exceptions, the approach was limited to non-slurred passages or to exercises using notes within a single overtone series. The apparent lack of systematically organized information about alternate positions, an indispensable aspect of the trombone technique, was the factor which prompted this study.

An organization of slide movement possibilities for selected combinations of intervals was undertaken in order to provide a body of systematically arranged information about alternate positions.

The interval combinations selected were minor seconds, major seconds, minor thirds, major thirds and perfect fourths. These were grouped into six categories according to the number and order of intervals in each combination. The categories were as follows:

1. Three note combinations of minor seconds and major seconds.
2. Four note combinations of minor seconds and major

seconds.

3. Three note combinations of minor thirds and major thirds (root position triads).

4. Four note combinations of minor thirds and major thirds (root position seventh chords).

5. Three note combinations of minor thirds, major thirds, and perfect fourths (first and second inversions of major and minor triads).

6. Four note combinations of major seconds, minor thirds, and major thirds (first, second, and third inversions of the major-minor seventh chord).

The slide movement possibilities for the six categories of interval combinations were assembled into appendixes which serve as a source of material for the construction of etudes, as reference for existing literature, and as a catalogue of possibilities for performers, composers, and arrangers.

Etudes were constructed to illustrate the application to the legato style of the information acquired in the slide movement study.

If the etudes were successfully constructed, practice of them should lead to increased knowledge of the location of alternate and regular positions, more efficient slide movements in combining the regular and alternate positions, increased control of the legato style, and more accurate intonation through the use of parallel position patterns.