

Eskhaton

for Wind Symphony and Electronics

(Volume 1 of 2: Analysis)

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Abstract

Eskhaton is an original musical composition for large wind ensemble and electronics, with a duration of approximately eleven minutes and thirty seconds. The piece is primarily concerned with the concept of distortion, and makes extensive use of timbral, rhythmic, and formal materials adapted from extreme heavy metal music. This thesis is comprised of two volumes: the first is the present analytical paper, which provides an overview of the source materials and compositional techniques I employed in the creation of this piece; the second consists of the musical score and accompanying DVD, which contains the work's electronics.

Résumé

Eskhaton est une composition musicale originale pour grand ensemble à vent et électronique, d'une durée approximative de onze minutes et trente secondes. La pièce s'inspire principalement du concept de la distorsion et fait un usage considérable des matériaux du timbre, du rythme, et de la forme, adaptés du genre musical de métal extrême. Cette thèse se compose de deux volumes : le premier est ce document analytique, qui donne un aperçu du matériau source et des techniques de composition utilisés pendant la création de la pièce. Le deuxième volume comprend la partition musicale et un DVD accompagnateur, qui contient la partie électronique de la pièce.

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Chapter 1. Introduction

1.1. Context

Eskhaton was composed as part of the Schulich School of Music's composer-in-residence program. It is scored for an ensemble consisting of four flutes (one of which doubles on piccolo and one of which doubles on alto flute), two oboes (one of which doubles on English horn), six B♭ clarinets, B♭ bass clarinet, two alto saxophones, tenor saxophone, baritone saxophone, two bassoons (one of which doubles on contrabassoon), four French horns, four C trumpets, two tenor trombones, bass trombone, euphonium, two tubas, harp, piano, timpani, four percussion, and MIDI keyboard. The work's duration is approximately eleven minutes and thirty seconds.

1.2. Inspiration

The inspiration for *Eskhaton* arose from my ongoing interest in integrating aspects of extreme heavy metal into contemporary art music. "Extreme heavy metal" (hereafter referred to as "extreme metal") is an umbrella term for a number of subgenres of heavy metal music, including death metal, black metal, and doom metal, among others.¹

Although I have been active in the extreme metal community for many years as both a fan and performer, I did not consciously attempt to incorporate aspects of its musical features into my compositions until quite recently. My 2011 composition *Of Those Beneath* for percussion quartet was among the first of my works to explore this possibility. In it, I made extensive use of rhythmic gestures inspired by common extreme metal drumming patterns, such as the rapid alternation between bass and snare drums known in extreme

¹ Keith Kahn-Harris, *Extreme metal: music and culture on the edge* (Oxford, UK: Berg, 2007) 2-5.

metal as the blast beat. Although these gestures were far removed from their original context and modified to fit the needs of the piece, they allowed the work to evoke the strong rhythmic drive that is characteristic of the genre. In *Eskhaton*, I sought to expand my approach to include aspects of the pitch and timbral content of extreme metal, as well as transcriptions of extreme metal songs.

1.3. Title

The work's title is a transliteration of the Greek word for "last," and commonly refers to events that are believed to take place at the end of a major period of history. The subject of the apocalypse is a frequently-addressed lyrical theme in extreme metal songs. While the predicted events and outcomes differ between belief systems, the concept of the 'end of life as we know it' is fundamental to many theological and philosophical doctrines. Some view the end of an age as simply a significant change to the situational realities in which life exists, while others view it as the end of all life on Earth.

Chapter 2. Distortion

The concept of distortion, central to extreme metal, plays an important role in *Eskhaton*, and is manifested in the work's harmonic, rhythmic, and orchestrational elements. Distortion is defined as “[a twisting] out of a natural, normal, or original shape or condition.”² Several types of distortion exist within the piece and will be first defined and described here, while their specific use in *Eskhaton* will be discussed in later chapters.

2.1. Harmonic distortion

In musical applications, “distortion” specifically refers to the signal processing technique of harmonic distortion, which has been integral to the development of rock music and its stylistic derivatives, including extreme metal.³ A thorough technical discussion of distortion is not within the scope of the present essay. Generally speaking, in musical applications, distortion results in: 1) the compression of the amplitude peaks of an instrument's sound wave, 2) the excitation of harmonic overtones not easily audible in the original sound, and 3) the addition, in many cases, of inharmonic frequencies.⁴

2.2. The timbres of extreme metal

The sound of the distorted electric guitar is possibly the most salient timbral characteristic of extreme metal, a style for which timbre has been called a defining

² Merriam-Webster, Incorporated, *Distort - Definition and More from the Free Merriam-Webster Dictionary*, 1 April 2012 <<http://www.merriam-webster.com/dictionary/distort>>.

³ Robert Walser, *Running with the Devil : power, gender, and madness in heavy metal music* (Hanover, NH: University Press of New England, 1993) 41-42.

⁴ Esa Lilja, *Characteristics of Heavy Metal Chord Structures* (Helsinki: University of Helsinki, Faculty of Arts, Institute for Art Research, Department of Musicology, 2005) 10-21.

parameter.⁵ When combined with the increased sustain and volume made possible through amplification, distortion allows the guitar to function as the primary non-vocal harmonic and melodic instrument in most extreme metal bands. While the timbre of extreme metal contains far more than the sound of distorted guitars, it is this aspect that is the primary focus in *Eskhaton*.

2.2.1. Analysis of distorted electric guitar timbres

Through the use of fast Fourier transform (FFT) frequency analysis, it is possible to determine the timbral effects of distortion on the electric guitar. In order to do this, I first made a number of recordings of an Ibanez RG2228 guitar played through a Fractal Audio Systems Axe-Fx amplification modeling processor. I then used the *Institut de Recherche et Coordination Acoustique/Musique* (IRCAM) application AudioSculpt to perform spectral analyses on these recordings, as well as to determine the most prominent component frequencies of the sounds (*via* the “Chord Sequence Analysis” function), to a maximum of 30 partials. Using the IRCAM application OpenMusic, I quantized these results to the nearest eighth-tone and to a dynamic range between *pianississimo* (**ppp**) and *fortississimo* (**fff**). As will be discussed in subsequent chapters, this method of analysis not only yields insight about the frequency content of the sounds in question, but also provides a wealth of data that can be used in the compositional process.

⁵ Harris M. Berger and Cornelia Fales, “‘Heaviness’ in the Perception of Heavy Metal Guitar Timbres,” Paul Greene, *Wired for sound : engineering and technologies in sonic cultures* (Middletown, CT: Wesleyan University Press, 2005) 183 Lilja, *Characteristics*; Walser, *Running* 92.

2.3. The effect of distortion on single guitar notes

When played through amplification without distortion or other signal processing, the timbral profile of the electric guitar closely follows the harmonic series. Figure 2–1 shows the first 15 partials of the harmonic series of B1,⁶ as well as a transcription into musical notation of the frequencies of the loudest component partials (as determined through the method described in the previous paragraph) of the same note played on an unprocessed electric guitar. As can be observed, the guitar's spectrum does not significantly deviate from the harmonic series.

A) Harmonic series of B1 (15 partials)



An analysis of the same note played with a style of distortion typical of extreme metal (Figure 2–2) shows a significant increase in the number of harmonic overtones present in the sound, as well as the addition of several inharmonic partials.



Figure 2–2: Spectrum of B1 on a distorted electric guitar⁸

2.4. The effect of distortion on guitar chords

When distortion is applied to chords, highly complex timbres result. This is due, in large part, to: (1) the additional emphasis imparted by distortion on the upper frequencies of a chord's component pitches, and (2) the combination (sum and difference) tones that are produced. While Lilja presents a thorough examination of this acoustic phenomenon as it relates to the electric guitar,⁹ I will provide a brief overview and highlight its relationship to extreme metal.

2.4.1. Combination tones and power chords

A combination tone is defined as “a sound that may be heard when two loud musical tones are sounded together but is not present when either of the tones is sounded

⁸ The 15va or 15vb clef indicates that all associated pitches on that staff sound two octaves higher or lower than written, respectively.

⁹ Lilja, *Characteristics* 10-21.

separately”¹⁰ Theoretically, if given the frequencies f_1 and f_2 , the simplest resulting combination tones occur at $f_1 + f_2$ (the sum tone) and $|f_2 - f_1|$ (the difference tone).

Figure 2–3 illustrates the simplest combination tones that theoretically result from the interaction of B1 (61.74 Hz) and F#2 (92.5 Hz). When played on an electric guitar, this interval of the perfect fifth is also known as the “power chord,”¹¹ and is the most common harmonic construction in much extreme metal.¹² According to the aforementioned formulæ, the resulting sum tone is 154.24 Hz (approximately D#2) and the difference tone is 30.76 Hz (approximately B0).

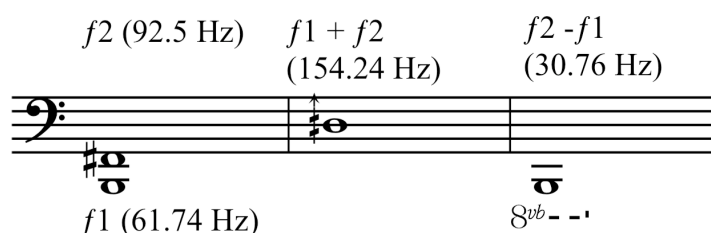


Figure 2–3: Theoretical combination tones of a B1–F#2 power chord

Spectral analysis of this power chord as played on distorted electric guitar (Figure 2–4–A) confirms the presence of both expected combination tones. Several inharmonic frequencies are also present in this sound, which are a result of combination tones that occur from the interaction of the chord’s overtones. Note also the extended upper frequency range of this distorted version of the chord. When the same chord played without processing was analyzed, employing the same minimum amplitude threshold for the detection of partials, neither of the expected combination tones were present, and

¹⁰ Clive Greated, “Combination Tone,” *Grove Music Online*, 22 March 2012 <<http://www.oxfordmusiconline.com/subscriber/article/grove/music/06170>>.

¹¹ These chords frequently include octave doublings of the bass note.

¹² Lilja, *Characteristics*; Walser, *Running 2*.

fewer partials were detected overall (Figure 2–4–B). This result confirms the importance of distortion’s role in producing combination tones.

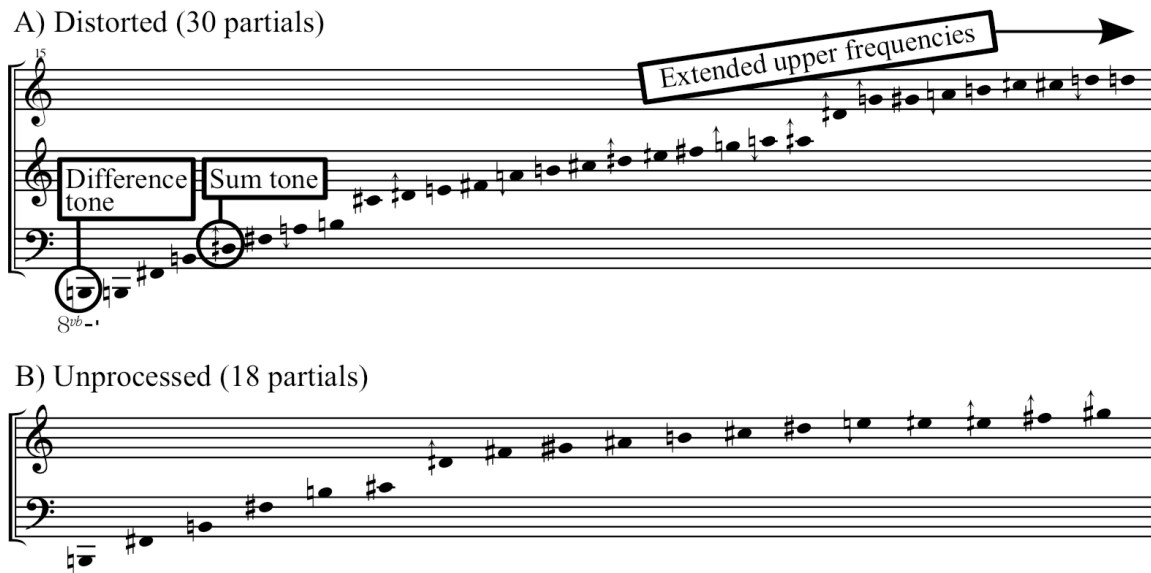


Figure 2–4: Spectra of B1–F#2 power chord on electric guitar

2.5. Other mathematical models of distortion

In addition to harmonic distortion, *Eskhaton* also employs several mathematical functions that distort the work’s harmonic materials, including frequency shifting, interpolation, and the creation of algorithmically transformed harmonic spectra. These processes and their roles in the work will be further defined and discussed in Chapters 3 and 4.

2.6. Distortion as metaphor

Other musical devices, such as the transformation of rhythmic motives through augmentation and diminution, or the manipulation of instrumental timbre *via* non–standard performance techniques and electronic augmentation, can also be thought of as forms of distortion. While they may not have the immediacy of perceptual affect offered

by harmonic distortion, they do correspond to the definition of distortion given at the beginning of this chapter. As part of *Eskhaton*'s emphasis on distortion, I have made a conscious effort to exploit the ability of these techniques to reshape the work's materials. The use of these additional distortion techniques will be highlighted and discussed in the following chapters.

Chapter 3. Pitch

The pitch material of *Eskhaton* is derived from four primary sources: (1) spectral analyses of distorted electric guitar chords, (2) emulation of the acoustic effects of amplifier feedback, (3) transcriptions of portions of extreme metal songs, and (4) mathematical distortions of harmonic spectra. This chapter describes these sources and the methods drawn upon to construct their associated pitch materials.

3.1. Instrumental additive synthesis

The most prominent technique for generating pitch material in *Eskhaton* is “instrumental additive synthesis.”¹³ This concept builds on Fourier’s postulate that any periodic sound can be recreated through the combination of sinusoidal waves whose frequencies and amplitudes are equal to the sound’s component partials. Traditional additive synthesis accomplishes this process through the electronic superimposition of large numbers of sinusoidal waves. The instrumental adaptation of this technique, however, assigns the component partials to different instruments in the ensemble.

Regarding this technique, Fineberg says:

The sound complexes built this way are fundamentally different from the models on which they are based, since each component is played by an instrument with its own complex spectrum. Thus the result is not the original model, but a new, much more complex structure inspired by that model. The sounds created in this way keep something of the coherence and quality that comes from the model while adding numerous dimensions of instrumental and timbral richness and variety.¹⁴

In *Eskhaton*, instrumental additive synthesis is frequently augmented with pre-composed electronic sound files whose intonation and timbral properties exceed practical

¹³ Joshua Fineberg, “Guide to the Basic Concepts and Techniques of Spectral Music,” *Contemporary Music Review* 19.2 (2000): 81-113.

¹⁴ Fineberg 85.

instrumental performance limitations. As noted by Fineberg, due to the nature of instrumental synthesis, a target sound cannot always be precisely reproduced, nor is reproduction necessarily the desired outcome.¹⁵ The inclusion of electronic sound files, however, greatly improves the potential to more accurately represent a target sound's original frequency content. Further discussion of the electronic component of this piece can be found in Chapter 7.

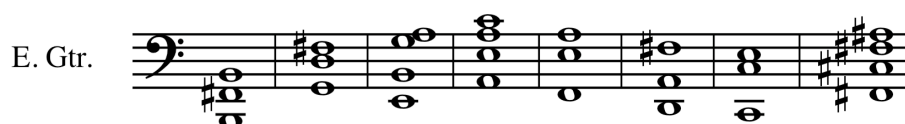


Figure 3–1: Original chord progression¹⁶

The target sound for instrumental additive synthesis in *Eskhaton* is an eight-chord harmonic progression played on a highly distorted electric guitar. This progression, shown in Figure 3–1, was extracted from an unreleased death metal song that I previously composed. It was chosen for a number of reasons: (1) its evocation of typical extreme metal harmonic progressions, (2) the frequent use of perfect fifth intervals in the lowest two voices, exploiting the acoustic effects described in Chapter 2.4, and (3) its implied tonality, which is based in the key of B minor. While many extreme metal songs employ harmonic progressions that freely modulate to accommodate the prevailing melodic material or eschew clear tonalities entirely, the use of pitch centers—often highlighted by the use of pedal tones—is a characteristic aspect of the style.

¹⁵ Fineberg 86.

¹⁶ The Ibanez RG2228 guitar used to play these chords is equipped with eight strings, rather than the six strings conventionally found on the guitar. As such, several of the analyses in the present essay contain pitches outside of the traditional guitar range.

As previously noted, harmonic distortion significantly alters the timbral character of the sound to which it is applied. The same progression, when played with distortion and subjected to the methods of analysis discussed in Chapter 2.2.1, yielded the frequency and amplitude data shown in Figure 3–2. For the remainder of the present essay, this collection of chords will be referred to as the “structural progression,” and each member will be identified as “structural chord ‘X’,” where X is the bass note of the chord in question.

Structural chord 'B'



Structural chord 'G'



Figure 3–2: Chords resulting from analysis

Structural chord 'E'

Musical score for Structural chord 'E'. The score consists of three staves (treble, middle, and bass clefs). The treble staff contains a series of notes with dynamic markings *p p p p p p p p p p p p p p p p p* below it. The middle staff contains a series of notes with dynamic markings *p p p p p p p p* below it. The bass staff contains a series of notes with dynamic markings *f mf ff p* below it.

Structural chord 'A'

Musical score for Structural chord 'A'. The score consists of three staves (treble, middle, and bass clefs). The treble staff contains a series of notes with dynamic markings *p p p p p p p p p p p p p p p p p* below it. The middle staff contains a series of notes with dynamic markings *mf mf p p p p p* below it. The bass staff contains a series of notes with dynamic markings *ff f f* below it.

Structural chord 'F'

Musical score for Structural chord 'F'. The score consists of three staves (treble, middle, and bass clefs). The treble staff contains a series of notes with dynamic markings *p p p p p p p p p p p p p p p* below it. The middle staff contains a series of notes with dynamic markings *ff p p p p p p p p p p* below it. The bass staff contains a series of notes with dynamic markings *f mp mf p* below it.

Structural chord 'D'

Musical score for Structural chord 'D'. The score consists of three staves (treble, middle, and bass clefs). The treble staff contains a series of notes with dynamic markings *p p p p p p p p p p p p p p p* below it. The middle staff contains a series of notes with dynamic markings *p f p p p p p p* below it. The bass staff contains a series of notes with dynamic markings *ff mf p mf mp p* below it.

Figure 3–2 (cont.): Chords resulting from analysis

rounds the original frequencies to the nearest eighth-tone. This version is used exclusively in the retuned instrumental samples that comprise many of the electronic sound files heard throughout the work.

The third version, an example of which is shown in Figure 3–3, is rounded to the nearest quarter-tone. This version appears occasionally in the live instrumental parts.

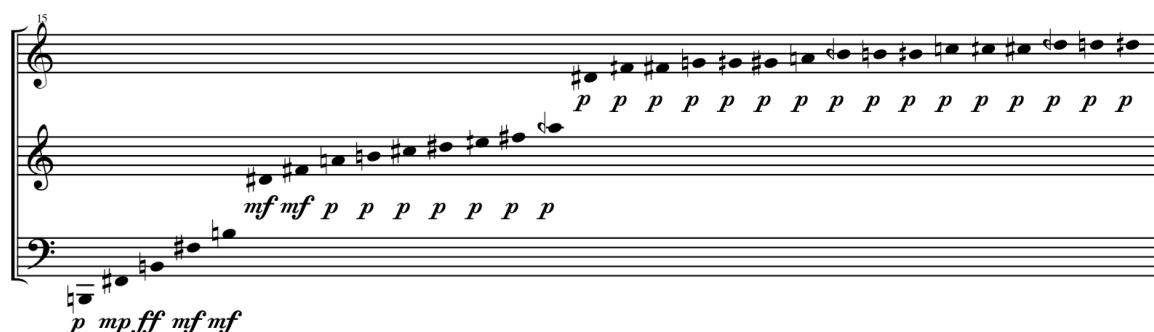


Figure 3–3: Structural chord ‘B’, rounded to the nearest quarter-tone

The fourth version, an instance of which is shown in Figure 3–4, is rounded to the nearest semitone, and all duplicate pitches are removed. Although this tuning is the least precise representation of the target sounds’ frequency content, its comparative ease of performance made it the most commonly employed version of the progression in the live instrumental parts.

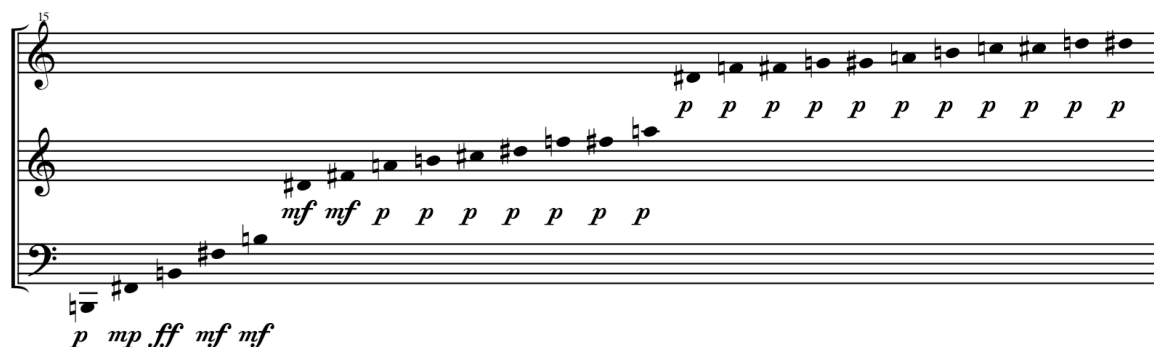


Figure 3–4: Structural chord ‘B’, rounded to the nearest semitone

3.2. Stylized amplifier feedback

In *Eskhaton*, several sections of the work evoke the sound of electric guitar feedback. When a distorted guitar is played at high volume, it is common for the output of the amplifier to excite the still-vibrating strings, which results in the creation of a feedback loop. With this effect, it is possible to indefinitely sustain a note or its harmonic overtones.

In general, the use of stylized feedback in this work occurs in response to the instrumentally synthesized guitar chords described above, much as acoustic feedback would result were these chords played on a guitar. This stylized feedback is comprised of pitches chosen from the lower overtones of each chord's bass note and transposed up several octaves. In most cases, the orchestration of the stylized feedback features piccolo and flutes, largely due to their timbral resemblance to acoustic feedback and ability to play high frequencies with dynamic nuance. Figure 3–5 contains a harmonic reduction of Mm. 28–67,¹⁷ showing the bass notes of the structural progression (without additional “difference-tone” bass notes) and the pitches of their stylized feedback.

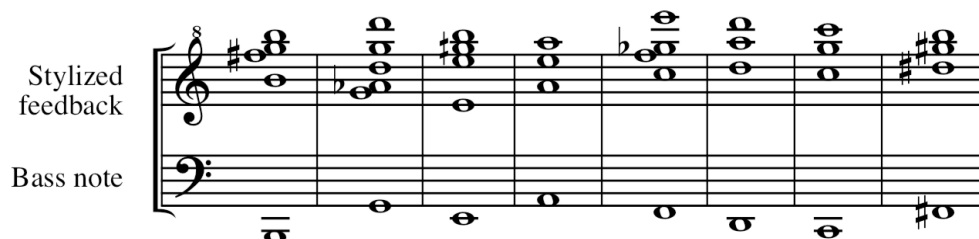


Figure 3–5: Stylized feedback of structural progression between Mm. 28–67

¹⁷ In the present essay, I refer to groups of measure numbers as Mm. first-last. I refer to specific beats within a measure as Measure.beat.

3.3. Use of frequency models as fixed–pitch harmonic fields

Beyond serving as the basis for instrumental additive synthesis, the frequency models of the structural progression are also treated as registrally–fixed harmonic fields for the derivation of melodic and harmonic materials. This allows the piece to maintain activity in the musical foreground (i.e. melodically) despite a generally slow harmonic rhythm, as well as ensuring a high degree of structural coherence even during the work’s most texturally dense moments.

A) Structural chord 'F'

Diagram A shows a structural chord 'F' across three staves. The top staff contains pitches 17, 18, 19, 20, 21, 22, and 23. The middle staff contains pitches 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16. The bottom staff contains pitches 1, 2, 3, and 4. The notation is in treble and bass clefs with various accidentals.

B) Derived harmonic progression

Diagram B shows a derived harmonic progression for piano (Pno.) in 4/4 time. The progression consists of several chords, each annotated with a number in parentheses indicating its derivation from the structural chord 'F'. The numbers are: (11), 17, (11), 17, 16, 15, 14, 13, 12, 11, 10, 8, 7, 6, 5, 4, 3, 2, 1, 5, 4, 5, 4, 3, 2, (12). The progression starts with a piano (*p*) dynamic and ends with a forte (*f*) dynamic. There are also markings for *Red.* and *f*.

Figure 3–6: Derivation of chords from fixed–pitch harmonic fields

At several points throughout the work, chord progressions are derived from harmonic fields. Figure 3–6 shows the harmonic field of structural chord ‘F’ (rounded to the nearest semitone, with duplicate pitches removed, and with each pitch numbered), and an example of a progression derived from it. Each chord in the progression is annotated

with its corresponding pitch numbers from the harmonic field. Numbers in parentheses indicate a transposed pitch.

The lowest pitches of the above progression, which is taken from the piano part between Mm. 140–141, proceed almost entirely in order through pitch field numbers 17 to 1. The majority of the three-note chords were created by grouping the first, third and fifth pitches in a series of five neighbouring tones in the harmonic field (e.g. pitch numbers <13, 15, 17>). As the intervals between pitches expand toward the lower limit of the field, the resulting chords become wider. In some cases, additional pitches were added to the derived chords, particularly those containing large intervals. These pitches were usually transposed downward from upper portions of the field. In general, this was done to mitigate the difficulty of performing wide intervals in quick succession.

The musical score consists of eight staves, each representing a different instrument or voice part. The staves are labeled on the left as Cl. 1, Cl. 2, Cl. 3, Cl. 4, Cl. 5, Cl. 6, A. Sx. 1, and A. Sx. 2. The music is written in 4/4 time. Various musical notations are present, including slurs, fingerings (e.g., 3, 3, 3, 9, 5, 7, 11, 6, 3, 5), and dynamic markings such as *ppp sub.* and *sempre ppp e legato*. The score illustrates the derivation of melodic lines from fixed-pitch harmonic fields.

Figure 3–7: Derivation of melodic lines from fixed–pitch harmonic fields¹⁸

3.3.1. Pitch ordering determined by partial amplitude

In portions of the work, the pitches within harmonic fields are presented melodically in an order corresponding to their respective amplitudes in the sound from which they originate. This was accomplished by determining the amplitude value of each partial and sorting the associated pitches in an ascending (lowest amplitude to highest) or descending order. Figure 3–8 shows the pitches of structural chord ‘A’ in order of

¹⁸ All of the musical examples in the present essay are presented at sounding pitch, with the following exceptions: piccolo sounds one octave higher; contrabassoon sounds one octave lower; glockenspiel and crotales sound two octaves higher; and contrabass sounds one octave lower.

ascending amplitude. This pitch ordering was the raw material on which the harp solo beginning at M. 246 was based.



Figure 3–8: The pitches of structural chord ‘A’ in order of ascending amplitude

3.4. Transcriptions of extreme metal (pitch)

Transcriptions of portions of extreme metal songs served as another source of *Eskhaton*’s pitch materials. All transcriptions are treated as objects whose materials may be freely distorted. This is in keeping with Busoni’s view that transcriptions, regardless of the degree to which they are modified from their original form, retain their association with the source material.¹⁹ While transcriptions also inform the rhythmic aspects of the piece, the present chapter only discusses the songs that influence the work’s pitch content. Further discussion of transcription and rhythm in *Eskhaton* can be found in Chapter 5.3.

3.4.1. Meshuggah, “Corridor of Chameleons”

Measures 86–135 are inspired by the opening portion of Swedish band Meshuggah’s song “Corridor of Chameleons” from their 1998 album *Chaosphere*.²⁰

Figure 3–9 shows the guitar part of the “riff”²¹ on which this section is based.

¹⁹ Ferruccio Busoni, *A New Esthetic of Music*, trans. Thomas Baker (New York: G. Schirmer, 1911) 17-19.

²⁰ Meshuggah, *Chaosphere*, Nuclear Blast Records, 1998.



Figure 3–9: Guitar part from the opening of Meshuggah’s “Corridor of Chameleons”

This riff forms the basis for many of the gestures played by the flutes in this section. Figure 3–10 shows an example of a close adaptation of this riff as it appears in flute 1 between Mm. 86–93.

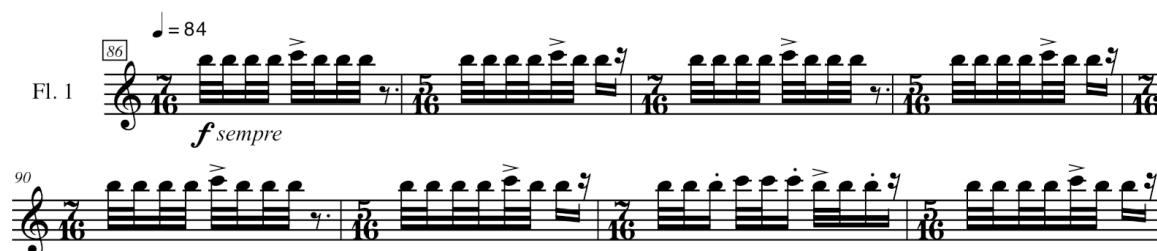


Figure 3–10: Adaptation of “Corridor of Chameleons” guitar riff

Although this riff contains only two pitch classes, its frequent restatement of the interval of the minor second reminded me of the octatonic collection, which is comprised of a succession of ascending or descending alternating minor and major seconds. Figure 3–11 shows the three possible transpositions of this collection. Because the octatonic collection is common in extreme metal, I elected to employ it frequently in the pitch material of this formal section.

²¹ “a short melodic ostinato which may be repeated either intact or varied to accommodate an underlying harmonic pattern.” J. Bradford Robinson, “Riff,” *Grove Music Online*, 12 April 2012 <<http://www.oxfordmusiconline.com/subscriber/article/grove/music/23453>>.



Figure 3-11: All possible transpositions of the octatonic collection

3.4.2. Decapitated, “Homo Sum”

The final six measures of the work (Mm. 313–318) are inspired by the closing of the Polish band Decapitated’s song “Homo Sum” from their 2011 album *Carnival is Forever*.²² Figure 3-12 shows the guitar part of this riff.



Figure 3-12: Guitar part from the closing of Decapitated’s “Homo Sum”

In *Eskhaton*, this chromatic descent is extended across a wider registral range and ultimately leads the piece to its conclusion on the pitch of B $\flat$, one semitone lower than the structural progression’s pitch center of B. It is also the only section of the piece in which power chords are presented in their basic intervallic form, rather than as a model for instrumental additive synthesis. Figure 3-13 shows a harmonic reduction of the adapted riff as it appears in the low winds and brass.



Figure 3-13: Adaptation of “Homo Sum” guitar part between Mm. 313–318

²² Decapitated, *Carnival is Forever*, Nuclear Blast Records, 2011.

3.5. Distorted harmonic spectra

The third source of pitch materials in *Eskhaton* is a collection of harmonic spectra whose overtones have been subjected to algorithmic distortion through the following equation:

$$f(r) = f_0 * r^d$$

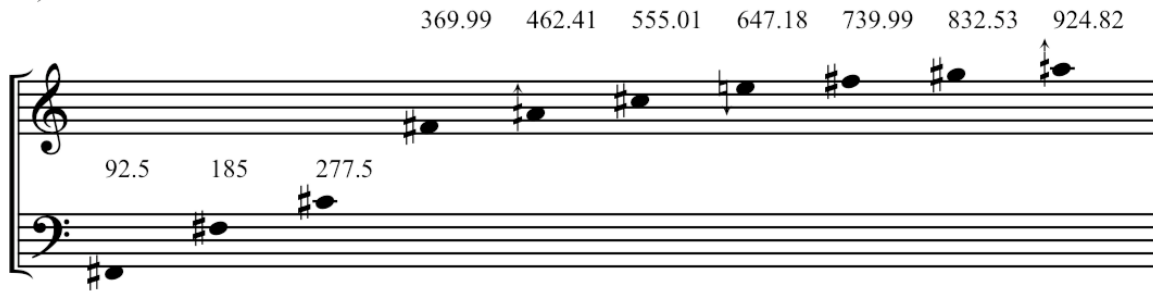
In this formula, $f(r)$ equals the distorted frequency (in Hertz) with partial rank r ; f_0 equals the fundamental frequency; r equals the partial rank; and d equals the distortion coefficient, which must be greater than zero.²³ If the exponent d is greater than one, the spectrum is expanded; if it is less than one, the spectrum is compressed. If d is equal to one, the spectrum remains unchanged.²⁴

Figure 3–14 shows a comparison of the first ten partials of a harmonic series built on F#2 and its expansion by a distortion coefficient of 1.02 (rounded to the nearest hundredth of a Hertz), which appears in the work—with a larger number of partials—at M. 145.

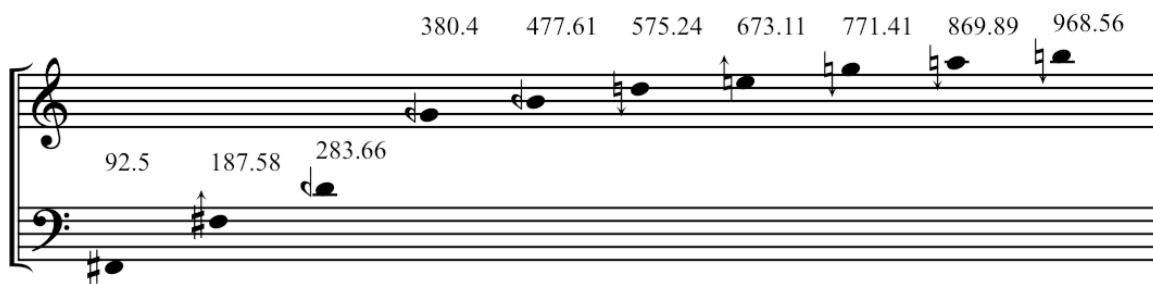
²³ Rosalie Hirs, *Contemporary Compositional Techniques and OpenMusic* (Éditions Delatour France / Ircam-Centre Pompidou, 2009) 104.

²⁴ Fineberg 93.

A) Harmonic series of F#2



B) Harmonic series of F#2 with a distortion coefficient of 1.02

**Figure 3–14: Algorithmic distortion of a harmonic series**

Chapter 4. Pitch transformations

This chapter describes the two principal transformational processes that were used to modify the pitch materials of *Eskhaton*: (1) frequency shifting, and (2) interpolation.

4.1. Frequency shifting

Frequency shifting is the addition of a fixed frequency to the partials of a sound, a technique whose roots can be traced to early electronic music using analog devices.²⁵ It results in a linear transposition of frequencies, but a non-linear transposition of intervals.²⁶ It can be contrasted with the traditional approach to transposition, in which the intervallic relationship between a sound's component partials is maintained.

Frequency shifting can be defined by the following equation:

$$f(r) = r * f_0 + \delta$$

In this formula, $f(r)$ equals the distorted frequency (in Hertz) with partial rank r ; f_0 equals the fundamental frequency; r equals the partial rank; and δ equals the added fixed frequency. Traditional transposition can be expressed using the same parameters as:

$$f(r) = r * (f_0 + \delta)$$

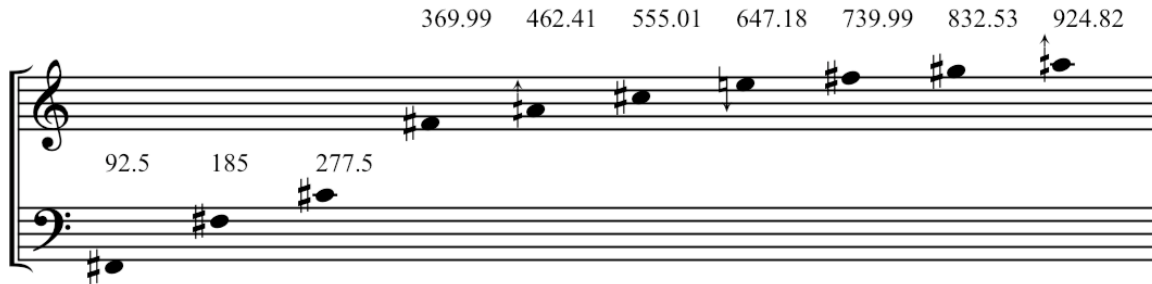
Both techniques differ from the type of algorithmic distortion (described by the equation $f(r) = f_0 * r^d$) that is discussed in Chapter 3.5. The latter rescales the overtones of a spectrum without altering its fundamental, while the two presented here also change the fundamental.

²⁵ Fineberg 94.

²⁶ Tristan Murail, "Villeneuve-lès-Avignon Conferences, Centre Acanthes, 9–11 and 13 July 1992," *Contemporary Music Review* 24.2/3 (2005): 182-267.

Figure 4–1 shows a comparison of the first ten partials of a harmonic series built on F#2 and the results of frequency shifting it by 100 Hz. These results have been rounded to the nearest hundredth of a Hertz.

A) Harmonic series of F#2



B) Harmonic series of F#2, frequency shifted +100 Hz

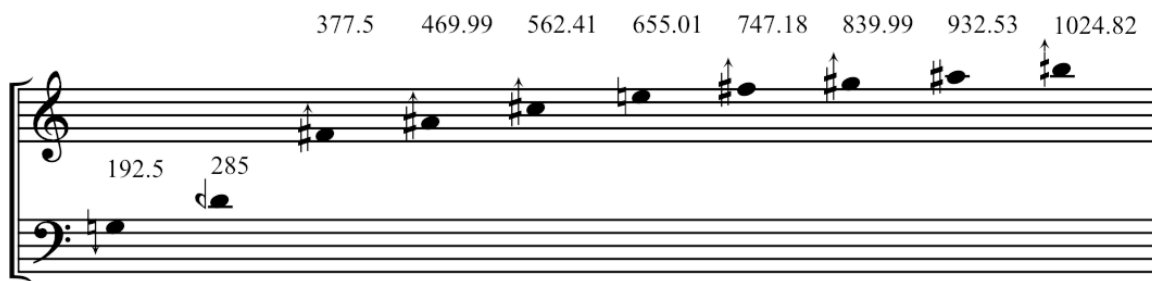


Figure 4–1: Frequency shifting of a harmonic series

Figure 4–2 shows an example of how frequency shifting is used in *Eskhaton*. From Mm. 145–146, partials 3, 5, 7, and 9 of the distorted harmonic series illustrated in Figure 3–14–B are subjected to four successive frequency shifts of -55 Hz, the results of which are rounded to the nearest semitone. In performance, the distinction between the successive chords is blurred by the use of descending glissandi within each “voice”.

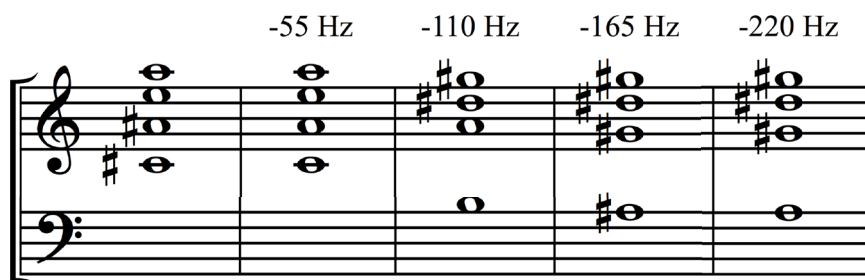


Figure 4–2: Successive frequency shifting between Mm. 145–146

4.2. Interpolation

Interpolation is a method of smoothly transitioning between states. Fineberg describes it as a process in which: “the initial and final states are placed at the two end–points of lines or curves which are then sampled at various points to generate intermediate states.”²⁷ This results in a highly distortive transformation of the affected materials, wherein it is possible to fully blur the divisions between states. Within *Eskhaton*, the use of interpolation is limited to the domain of frequency, although other composers have utilized it for parameters such as rhythm and timbre.²⁸

To give an example of a linear frequency interpolation—one in which the frequency changes equally with each step—of the type used in *Eskhaton*, one may consider the following two frequencies:

$$f(A) = 400 \text{ Hz}$$

$$f(B) = 500 \text{ Hz}$$

If n is the total number of steps in the interpolation process from A to B , with A and B

²⁷ Fineberg 108.

²⁸ See: Eric Daubresse and Philippe Hurel, “Creating Polyphonic Sequences in the Form of Rhythmic and Melodic Canons,” *The OM Composer’s Book - Vol. 2*, ed. Jean Bresson, Carlos Agon and Gérard Assayag (Éditions Delatour France / Ircam-Centre Pompidou, 2008) 55-64; Damien Pousset, “The Works of Kaija Saariaho, Philippe Hurel, and Marc-André Dalbavie,” *Contemporary Music Review* 19.3 (2000): 86-136.

themselves being counted in the number of steps, we can determine the frequency at step number x by consulting the following equation:

$$f(x) = f(A) + (x - 1) \frac{f(B) - f(A)}{n-1}$$

To find the frequency at step three in a five-step interpolation process, we then have:

$$f(3) = 400 + (3 - 1) \frac{500 - 400}{5-1} = 450$$

Figure 4–3 shows an example of interpolation’s use in *Eskhaton*. Between Mm. 218–237 a five-step interpolation process was used on 28 pairs of pitches in order to generate intermediate chords between modified versions of structural chords ‘E’ and ‘F’. The pitches of both the structural and interpolated chords were rounded to the nearest semitone. The resulting progression was then intuitively modified, both through the omission of certain pitches and the insertion of chords generated by other processes.

Structural chord 'E' (modified) Interpolation Structural chord 'F' (modified)

Figure 4–3: Five-step interpolation path between structural chords ‘E’ and ‘F’

Chapter 5. Rhythm

This chapter describes three primary sources of rhythmic inspiration used in *Eskhaton*: (1) a simple rhythmic motive that is subjected to a variety of distortions, (2) the sampling of curves generated *via* exponential functions, and (3) transcriptions of portions of extreme metal songs.

5.1. Core rhythmic motive

A single rhythmic motive establishes a degree of unity across the work. This motive, shown in Figure 5–1 was chosen for its simplicity, in hopes that it would remain easily recognizable when subjected to distortions such as augmentation and diminution.

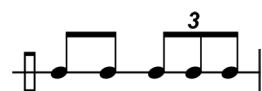


Figure 5–1: The core rhythmic motive

This motive contains a clear rhythmic directionality due to its internal acceleration, and this property is exploited in several ways throughout *Eskhaton*. For example, between Mm. 136–180, the piano plays a descending harmonic progression immediately preceding each change of harmony. These progressions are rhythmically comprised of successively accelerating diminutions of the core motive. As discussed in Chapter 2.6, these rhythmic transformations can also be interpreted as forms of distortion. An example of one such progression, taken from between Mm. 140–141, is shown in Figure 3–6–B.

Other sections of the work avoid the rhythmic motive’s directionality entirely. Figure 5–2 shows a portion of Mm. 154–155, where multiple layers of the motive are superimposed in flutes 2–4 to create a rhythmically static texture.

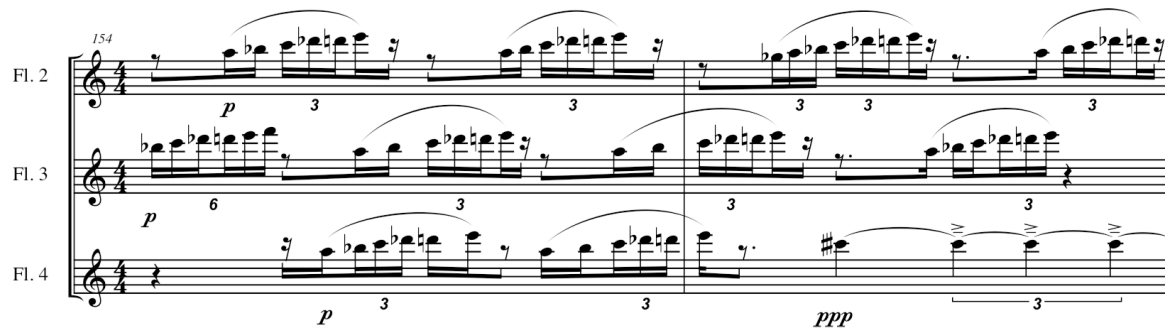


Figure 5–2: Rhythmically static texture of layered superimpositions of core rhythmic motive

5.2. Exponential curves

Several rhythmic gestures in *Eskhaton* are based on the trajectory of exponential curves. This type of curve is defined as one that continually becomes “steeper or shallower.”²⁹ Using OpenMusic, I programmed a patch that samples algorithmically generated curves and quantizes the results to notated rhythms. This process is illustrated in Figure 5–3, which shows a graph of attacks (horizontal axis) versus time between attacks (vertical axis). In this figure, events begin close together and grow exponentially farther apart as the process continues. Other increasing or decreasing curves can also be sampled with this process, generating significantly different rhythmic gestures.

²⁹ “Exponential,” 2005, *The American Heritage Science Dictionary*, Houghton Mifflin, 13 April 2012 <<http://www.credoreference.com/entry/hmsciencedict/exponential>>.

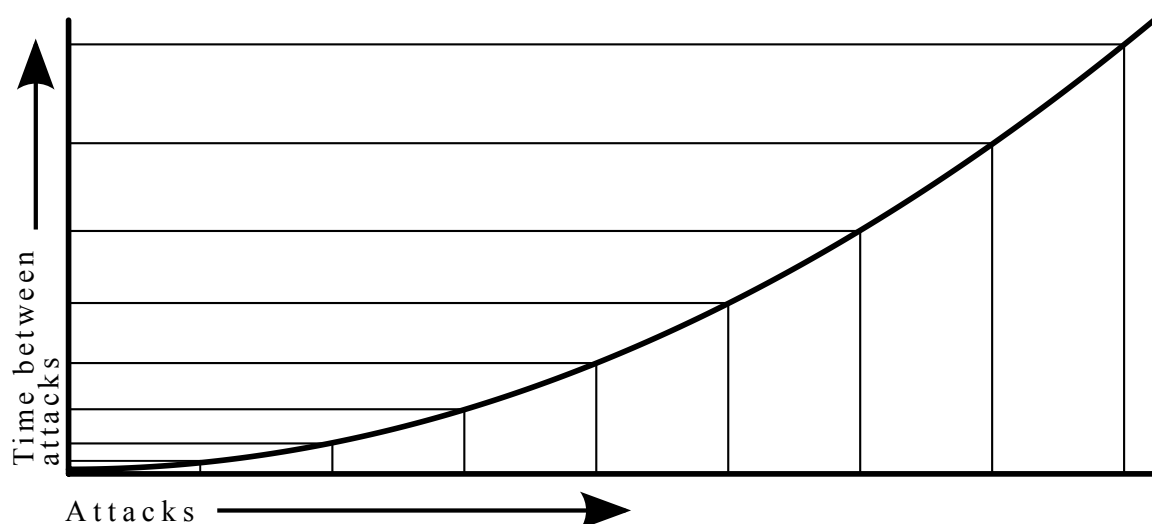


Figure 5-3: Illustration of exponential curve sampling process

Within *Eskhaton*, the most prominent application of rhythms derived from exponential curves is the harp solo, beginning at M. 246. Figure 5-4 shows a rhythmic reduction of this portion of the work.

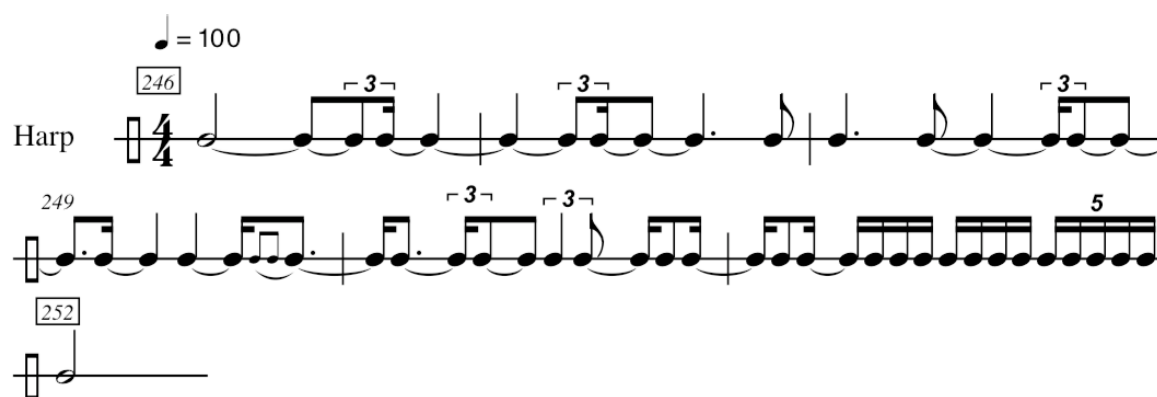


Figure 5-4: Rhythmic reduction of harp solo between Mm. 246-252

5.3. Transcriptions of extreme metal (rhythm)

As noted in Chapter 3, transcriptions of extreme metal songs play important roles in *Eskhaton*. In this section, their influence on the rhythmic elements of the piece will be discussed.

5.3.1. Origin, “Wrath of Vishnu”

The drum kit is featured prominently in *Eskhaton*, and much of its material is derived from a drum solo in Origin’s song “Wrath of Vishnu” from their 2008 album *Antithesis*.³⁰ A transcription of the original solo is shown in Figure 5–5.

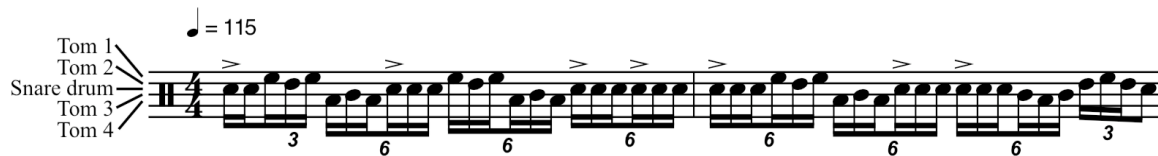


Figure 5–5: Drum solo in “Wrath of Vishnu”

In *Eskhaton*, the clearest reference to this solo is made from Mm. 200–202, as shown in Figure 5–6, where a passage played on the drum kit recalls the original’s instrumentation, rhythmic subdivision, and aggressive rhythmic drive.



Figure 5–6: Drum solo adapted from “Wrath of Vishnu”

5.3.2. Meshuggah, “Corridor of Chameleons”

In addition to its influence on the pitch material of *Eskhaton* as described in Chapter 3.4.1, the opening portion of “Corridor of Chameleons” is also a source of rhythmic inspiration. Figure 5–7 shows the guitar and drum parts of the song’s opening riff, as well as a rhythmic reduction of its first adaptation in *Eskhaton*, played by the low brass and contrabass between Mm. 86–93.

³⁰ Origin, *Antithesis*, Relapse Records, 2008.

A) Original riff

♩ = 88

Crash cymbals
Snare drum
Bass drum

E. Gtr.

Drums

E. Gtr.

Drums

E. Gtr.

B) First adaptation in *Eskhaton*

♩ = 84

86

91

Figure 5–7: Rhythmic adaptation of Meshuggah’s “Corridor of Chameleons”

Much of Meshuggah’s music is characterized by the use of polymeters, as is evident in Figure 5–7. In general, this is manifested as a 4/4 rhythm in the drummer’s hands (usually playing the cymbals and snare drum) that is superimposed on a variety of other meters played by the drummer’s feet and the other instruments of the band.³¹ This is

³¹ Jonathan R. Pieslak, “Re-casting metal: Rhythm and meter in the music of Meshuggah,” *Music theory spectrum: The journal of the Society for Music Theory* 29.2 (2007): 219-245; Eric T.

evoked in *Eskhaton* through the inclusion of a steady eighth-note pulse that is first played on a cymbal–stack by percussion 3 between Mm. 86–115, then on a Chinese cymbal played by percussion 4 between Mm. 116–130.1.

5.3.3. Meshuggah, “Bleed”

A) Original riff

♩ = 105

Chinese cymbal
Crash cymbal
Snare drum
Bass drum

E. Gtr.

Drums

E. Gtr.

Bend

B) Adaptation in *Eskhaton*

The figure displays two musical staves for comparison. The top staff, labeled 'A) Original riff', shows a complex rhythmic pattern in 4/4 time with a tempo of 105 BPM. It includes parts for Chinese cymbal, Crash cymbal, Snare drum, Bass drum, and Electric Guitar (E. Gtr.). The guitar part features a series of eighth-note pulses with bends. The bottom staff, labeled 'B) Adaptation in Eskhaton', shows a simplified version of the guitar part, consisting of a steady eighth-note pulse. The adaptation is marked with a barline at the end, indicating it continues.

Figure 5–8: Rhythmic adaptation of Meshuggah’s “Bleed”

An adaptation of a second Meshuggah riff is introduced at M. 103.3, this one from their song “Bleed” from the 2009 album *Obzen*.³² Figure 5–8 shows a portion of the original guitar and drum parts of this riff (the pattern continues beyond this excerpt, as indicated by the open barline), as well as a rhythmic reduction of its primary adaptation in

Smialek, *Rethinking metal aesthetics : Complexity, authenticity, and audience in Meshuggah’s “I” and “Catch Thirtythr33.”* (Montreal, Canada: McGill University, 2009).

³² Meshuggah, *Obzen*, Nuclear Blast Records, 2008.

Eskhaton. The adaptation appears in a variety of fluctuating meters, but its basic pattern remains largely consistent. Because Meshuggah conceptualizes many of their songs in a 4/4 metric framework,³³ it was possible to superimpose the adaptation of “Bleed” onto the adaptation of “Corridor of Chameleons” while maintaining (poly)metric coherence.

5.3.4. Decapitated, “Homo Sum”

Chapter 3.4.1 described the use of pitch material from the closing of Decapitated’s song “Homo Sum” in the final measures of *Eskhaton*. Because I wanted to evoke the abrupt, forceful endings typical of most extreme metal songs, it seemed appropriate to also adapt the rhythmic character of this material. Figure 5–9 shows the drum and guitar parts from the original riff, as well as the drum kit part from Mm. 313–318 of *Eskhaton*. This passage combines rhythmic elements of both the drum and guitar parts of the original riff, and extends their duration.

A) Original riff

♩. = 130

Snare drum
Bass drum

E. Gtr.

B) Adaptation in *Eskhaton*

♩. = 133

Tom 1
Tom 2
Snare drum
Tom 3
Tom 4
Bass drum

313

fff

Figure 5–9: Rhythmic application of Decapitated’s “Homo Sum”

³³ Fredrik Thordendal, *Meshuggah Guitarist Fredrik Thordendal Answers Reader Questions*, Brad Angle (Guitar World Magazine, 23 July 2011).

Chapter 6. Orchestration

6.1. General principles

For much of this work, each instrumental performer operates quasi-soloistically, and pitch class doublings are relatively rare. In most cases, octave doublings occur only when they are a structural component of the underlying harmony. Unison doublings are employed almost exclusively to provide additional timbral weight to the associated pitches, particularly to the loudest partials in instances of instrumental synthesis.

6.2. Instrumental groupings

This work's approach to orchestration reflects the timbral behaviour of distorted guitar chords. When observed over time, the lower partials of a sustained chord remain relatively stable in frequency and amplitude, while the upper partials are comparatively unstable and prone to rapid fluctuations of amplitude. This difference in activity level between registers can also be found in the orchestration of the piece as a whole.

On a global level, the material given to the wind and brass families is texturally stratified. In general, the music given to wind instruments (flutes [+ piccolo, alto flute], oboes [+ English horn], clarinets, saxophones, and bassoons [+ contrabassoon]) is rhythmically and melodically active, and rarely contains repeated notes. The material given to the brass instruments (horns, trumpets, trombones, euphonium, tubas, also including contrabass), however, favours sustained or rearticulated single pitches, slow melodic motion, and brief rhythmic punctuations. The harp and piano commonly share harmonic and gestural material, and typically serve the role of either foreshadowing an imminent change of harmony, or providing orchestrated resonance of chordal attacks.

The family of percussion instruments plays a central role in the piece, and no instrument is more critical to the work's formal development than the drum kit. Its level of activity, or absence thereof, often defines the overall intensity of the music at any given moment. Keyboard percussion instruments, particularly the marimba and vibraphone, tend to share material with the winds, while the timpani and unpitched percussion (save for the drum kit) most commonly add emphasis to brass materials.

Because many of the work's textures—particularly those consisting of overlapping linear figures played by wind instruments—are intended to create a single, unified timbre, homogeneity within instrumental choirs is frequently maintained. This approach to orchestration also enhances the interest generated when the focus shifts to mixed timbral groupings, such as the combination of clarinets and trumpets in their upper registers beginning at M. 181.

6.2.1. Orchestration of instrumental additive synthesis

The orchestration of instrumental additive synthesis, particularly in its first occurrences between Mm. 28–67, generally adheres to several principles. Typically, the loudest partials of a target sound, as determined by spectral analysis (see dynamics in Figure 3–2), are assigned to brass instruments with occasional unison doublings in the winds. The quieter partials of a sound are assigned primarily to the winds, alone. Because the loudest partials are frequently bass notes with wide intervallic spacing, this orchestrational configuration minimizes the roughness of sound that can occur from closely voiced brass instruments in low registers.

When unison doublings are used on prominent partials, the selected instruments are usually chosen for their ability to create transitions from “dark” to “light” timbres or

vice-versa. This was inspired, in large part, by the opening of Györgi Ligeti's *Lontano*,³⁴ in which the composer alters the timbre of a single note by successively passing it among instruments with increasingly complex spectra. Figure 6–1 shows an example of this effect as it occurs from Mm. 55–59 of *Eskhaton*.

Figure 6–1: Timbral morphing between Mm. 55–59

The pitch F#3 is initially played by bass clarinet, tenor saxophone, bassoon 1, and trombone 1. As the wind instruments are removed while the trombone remains at a *forte* (*f*) dynamic, the resulting timbre gradually shifts from one with a wide spectral range to the powerful, dark and focused brass fundamental.

While the amplitudes of a target sound's partials significantly influenced choices of orchestration, they did not necessarily determine the dynamics used in instrumental synthesis. In many cases, all of the performers attack an instrumentally synthesized chord at a *forte* (*f*) dynamic, regardless of the amplitude of each performer's partial in the target sound. This amplitude is instead reflected by the duration of the performer's part in the

³⁴ Györgi Ligeti, *Lontano, für großes Orchester* (Mainz: B. Schott's Söhne, 1969).

synthesized chord. Generally, a louder partial in the target sound corresponds to a longer duration in its synthesized version.

6.3. Distortion through performance techniques

As previously noted, the work's focus on distortion extends to its orchestration. While *Eskhaton* makes use of very few extended performance techniques, it does exploit the natural distortion present in the notes at the outer limits of an instrument's range. For example, the closing of the work brings several instruments (bass clarinet, bassoon, contrabassoon) to near their lowest naturally occurring pitches. Combined with the prevailing *fortississimo* (*fff*) dynamic, the resulting timbre from each instrument is highly distorted.

The use of brass mutes also contributes to orchestrational distortion. At several places in the work, such as between Mm. 28–46, the trumpets are asked to perform with 'pie-plate mutes', which entails holding a light, resonant aluminum pie plate against the bell of the instrument. This pie plate buzzes against the bell as notes are sounded, which adds a significant noise component to the resulting sound.

Chapter 7. Electronics

This chapter details the electronic portion of *Eskhaton*. The first section provides an overview of its role in the work. The second section discusses how the electronic sounds were created and the manner in which they are diffused in concert. The third and fourth sections offer detailed examples of how the presence of electronics enhances specific sections of the work.

7.1. Overview

The electronic component of *Eskhaton* consists exclusively of the playback of pre-recorded sound files, all of which are modeled after or are derived from acoustic sounds. No amplification of the live ensemble is used. In general, the electronics employed in *Eskhaton* serve to expand the timbral and harmonic character of the instrumental performers, rather than creating a distinct layer of musical activity.

7.2. Sound design and spatialization

The majority of the sound files were created using samples of acoustic instruments, primarily taken from the Vienna Symphonic Library and IRCAM Solo Instruments library. These samples were edited in AudioSculpt and Soundtrack Pro, and sequenced in Logic Pro. During performance, the sound files are triggered by an on-stage performer controlling a Max/MSP performance patch *via* a MIDI keyboard. Figure 7–1 shows a screenshot of the Max/MSP patch.

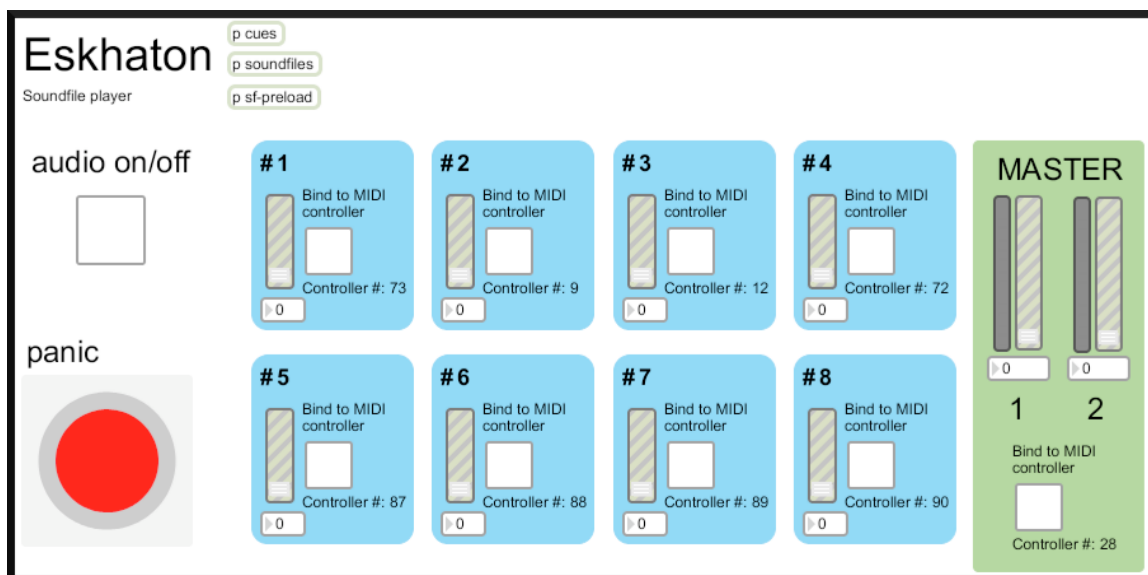


Figure 7–1: Screenshot of Max/MSP performance patch

Two loudspeakers positioned amongst the percussionists diffuse the sound files, as illustrated in Figure 7–2. By integrating the loudspeakers into the ensemble, I hope to minimize the audience’s perception of specific electronic point–sources, thereby allowing the diffused material to function as an extension of the composite sound of the ensemble.

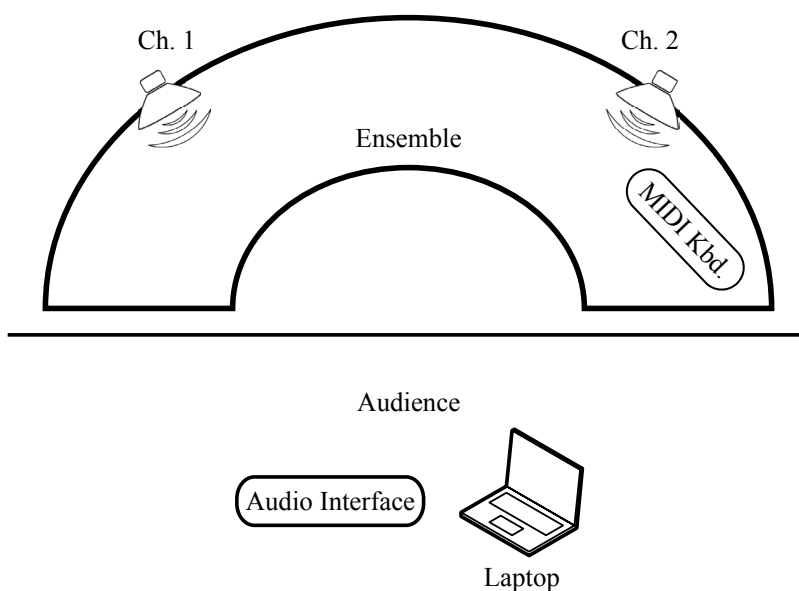


Figure 7–2: Diagram of electronic equipment configuration

7.3. Extension of instrumental additive synthesis

One of the primary roles of the electronics in *Eskhaton* is to enhance the harmonic richness and frequency range of instrumental additive synthesis. As previously discussed, the majority of the instrumental parts in this work's occurrences of instrumental synthesis use equally tempered or quarter-tone approximations of the target sounds' component frequencies. In many cases, however, large portions of a target sound's frequencies are situated above the comfortable range of the ensemble. The acoustic ensemble is thus frequently augmented by the playback of microtonally tuned instrumental samples at the desired frequencies (see Chapter 3.1). When discussing the use of microtonality to approximate a target sound, Murail states that:

one notices that the more precise the approximation the less beating occurs, and the more the notes melt into one another (creating a fused sonic image)... Thus micro-intervals do not necessarily introduce a sensation of 'out-of-tune-ness' in a musical discourse; on the contrary, they can create a greater sense of 'in-tune-ness'. They can create greater consonance, or an enhanced effect of fusion between the notes.³⁵

By using retuned instrumental samples, rather than sinusoidal waves or other electronically generated sounds, it is possible to maintain the unique character of instrumental synthesis while better reflecting the frequency content of the target sounds. This approach to instrumental additive synthesis simplifies the tuning demands placed on the performers while also creating the illusion of a considerably larger ensemble.

Measures 28–67 make extensive use of this technique. The attack of each structural chord (Mm. 28, 35, 40, 43, 48, 55, 60, 63) is accompanied by a sound file containing instrumental samples of: (1) a selection of the chord's highest partials, usually played by detuned flutes, piccolos, oboes, clarinets, glockenspiels, and celestas, and (2)

³⁵ Murail 194-195.

reinforcement of the chord's bass note. The choice of which partials to include in the sound file was made intuitively, with particular attention given to the outer voice contour of the structural progression. The bass component of each sound file is comprised of a combination of a harp sample with electronically enhanced bass frequencies and granular synthesis of the same sample. Within the work's poetic context, this portion of the sound file is intended to evoke the role of a bass guitar in a band. Figure 7–3 shows the distribution of pitches between the instrumental ensemble and electronic sound files in the structural harmonic progression in Mm. 28–67.



Figure 7–3: Distribution of pitches between electronics and instrumental performers in structural progression

7.4. Resynthesis and extension of instrumental timbre

Several of the electronic sounds in *Eskhaton* were created through the process of sinusoidal additive resynthesis (hereafter referred to as “resynthesis”). In the context of the present essay, this term refers specifically to AudioSculpt’s “Resynthesize From Partial” function. This function generates sounds by reproducing frequency information extracted from spectral analyses (or modifications thereof) using sinusoidal waveforms.

Measures 68–85 provide an example of how resynthesis is used to augment the instrumental performers. In this section, the harp, glockenspiel, and vibraphone play a rising chord progression, accompanied by electronic sound files triggered on each attack. To create these sounds, the vibraphone component of each full chord was reproduced using instrumental samples. Each vibraphone chord was then analyzed (using the “Partial Tracking Analysis” function of AudioSculpt) to determine the evolution of its ten loudest partials over time. The results of these analyses were resynthesized using parameters that caused the decay of these parts of the sound to be extended in duration. The result of each vibraphone chord’s lengthened resynthesis was then superimposed on a cross-synthesis of the full chord’s harp and glockenspiel components. Cross-synthesis is a technique in which the spectral components of two sounds (harp and glockenspiel instrumental samples, in this case) are multiplied together, resulting in a timbre that is a mix of the two sonorities. Through cross-synthesis, I thus created a “plucked glockenspiel” timbre that emphasized the amplitude envelope of the harp and the frequencies of the glockenspiel. When the sound of the instrumental performers is combined with the resynthesized vibraphone and cross-synthesized harp and glockenspiel, the timbre of the full chord is significantly altered while still retaining its primary orchestrational characteristics.

Chapter 8. Form

8.1. Poetic approach to form

While no attempt is made to adhere to typical pop song forms (verse/chorus/verse, etc.), this work seeks to evoke archetypal formal features of extreme metal songs, such as drum solos (see Mm. 1–27; Mm. 200–202), sustained power chords (see Mm. 28–67), propulsive rhythmic grooves (see Mm. 86–135), guitar solos (see Mm. 218–245), and an abrupt, forceful conclusion (see Mm. 313–318).

8.2. Global Form

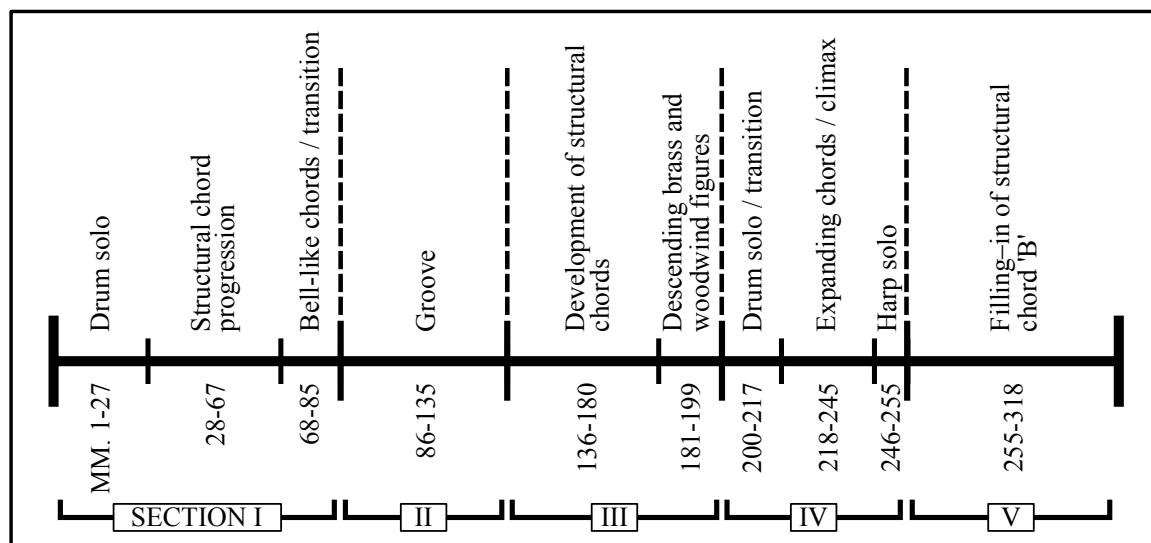


Figure 8–1: Formal overview of *Eskhaton*

Eskhaton is performed as a single, continuous movement containing five formal sections, several of which are divided into smaller formal subsections. Figure 8–1 provides an overview of the work’s formal apportionment and highlights the principal material within each section. The remainder of this chapter will briefly describe the contents of each section.

8.3. Section I

8.3.1. Measures 1–27: Drum solo

The introductory subsection evokes an extreme metal drum solo, and establishes an early focus on the importance of the drum kit in the work. In this section, three percussionists function as an extension to the drum kit. The drum kit performer primarily presents material adapted from the drum solo in Origin’s song “Wrath of Vishnu” (see Chapter 5.3.1), as well as figures adapted from my 2011 composition *Of Those Beneath* for percussion quartet. Together, the composite sound of the four percussionists is of a single drum kit played beyond the physical capabilities of one performer.

8.3.2. Measures 28–67: Structural chord progression

This subsection exposes the structural progression, from which the majority of the piece’s subsequent pitch structure is derived. Initially, each chord is comprised of two textually contrasting layers: (1) the winds, brass, contrabass, timpani, and electronics presenting the frequency models of the chord in instrumental additive synthesis, usually in conjunction with stylized feedback, and (2) the harp and piano playing descending chords derived from the prevailing structural chord’s harmonic field. The layer of instrumental synthesis is rhythmically static, while the layer of harp and piano provides momentum through its continuously accelerating harmonic rhythm based on adaptations and diminutions of the core rhythmic motive. The end of each harp and piano progression—which occurs once its descending chords have reached the lower limit of the harmonic field—always coincides with the change of the prevailing structural chord. As well, each change of harmony is anticipated by a forceful gesture on the drum kit,

followed by a cymbal strike on the subsequent downbeat. This musical device is common in extreme metal songs to add emphasis to important chordal attacks.

Beginning at M. 36, a third layer comprised of quiet, descending melodic figures derived from the prevailing harmonic field emerges in clarinet 1 and marimba (See Chapter 3.3). Initially, this layer only becomes easily audible as the instrumentally synthesized chords decay. Throughout the course of this section, however, the third layer becomes increasingly prominent as more instruments (including flutes, oboes, clarinets, alto saxophones, and vibraphone) join the texture.

8.3.3. Measures 68–85: Bell-like chords / transition

The textural layer of linear melodic strands is abruptly exposed following the presentation of the final structural chord, and is now performed at a *pianississimo* (*ppp*) dynamic by the clarinets and alto saxophones. A rising chordal progression, also derived from the prevailing harmonic field, begins at M. 70 in the third horn, first trumpet, and first trombone. The dynamic apex of each chord is punctuated by a bell-like sonority in the harp, vibraphone, glockenspiel, and electronics (See Chapter 7.4). Tension is created toward the end of this section by the combination of a gradual *accelerando*, global dynamic crescendo, an increase in rhythmic pulsation in the clarinets and saxophones, and the introduction of a rising bass figure.

8.4. Section II (Measures 86–135): Groove

As discussed in Chapters 3.4.1 and 5.3.2, this section is primarily based on the opening riff of Meshuggah's song "Corridor of Chameleons." At the outset of this section, two textural layers are present: (1) an adaptation of the Meshuggah riff, played by

the flutes, low brass, contrabass and drum kit, and (2) a contrapuntal ostinato played by the oboes, clarinets, and piano. Both of these layers are subjected to a similar rhythmic distortion, wherein single or multiple eighth-note values are added to the ends of their internal motives, which results in increasing syncopation. Figure 8–2 shows a rhythmic reduction of the bass portion of the adapted Meshuggah riff as it is heard between Mm. 97–133. The reduction has been annotated to identify the internal motives (labeled ‘A’, and ‘B’) and to mark where eighth-notes have been added to the original adaptation (see Figure 5–7–B).



Figure 8–2: Rhythmic reduction of additive process between Mm. 97–133

A third textural layer containing a rhythmic adaptation of the opening riff of Meshuggah’s song “Bleed” is introduced by the marimba at M. 103.3. Finally, a fourth layer of rhythmic punctuation is introduced in the harp and piano at M. 116. At the end of

this section, additional instruments and octave doublings are added to the ostinato of the second layer, which propels it to the foreground before it is abruptly interrupted by the next formal section.

8.5. Section III

8.5.1. Measures 136–180: Development of structural chords

The third section further develops the materials presented in Section I, and contains two formal subsections. The first subsection opens with a return to the instrumental synthesis of structural chord ‘F’, coupled with a resynthesized, filtered and time–stretched version of the same chord in the electronics. The upper partials of the chord are played by the piano, glockenspiel and crotales, the latter two of which employ notated decelerandi generated from exponential curves (see Chapter 5.2). This subsection introduces the first uses of frequency shifting and interpolation in the work (see Chapter 4), and presents many of its chords using inversions of the decay process employed between Mm. 28–67. Whereas chords in Section I decayed until only their lowest frequencies remained, the present section favours a process in which lower frequencies decay more quickly than higher ones. The electronics assist the perceptibility of this effect by accompanying most chordal attacks with resynthesized and time–stretched versions of the chord’s most prominent pitches. This results in the occurrence of two simultaneous “upward decay” processes, one instrumental and one electronic. A further connection is made with Section I by the resumption of an accelerating and registrally descending piano gesture before each change of harmony.

The flutes begin a sustained cluster of tremoli at M. 164, which functions as a registral target for the large–scale application of the upward decay process used in this

section. Between this point and the end of the subsection, many other instruments ascend in register and gradually exit the texture until only the flutes, oboes, clarinets, and glockenspiel remain.

8.5.2. Measures 181–199: Descending brass and woodwind figures

Once the previous subsection reaches the culmination of its upward decay process, the trumpets re-join the texture and initiate a registral descent. This process makes extensive use of the core rhythmic motive and its distortions, and its harmonic material is derived from a single harmonic field based on structural chord ‘B’ (see Chapter 3.3). One can consider this process to be a large-scale projection of the descending piano gestures heard in the previous subsection. Rather than preceding a change of harmony, however, this process functions as an antecedent to the following formal section.

It is notable that the drum kit, a dominant instrument in the first two formal sections, is absent for virtually all of Section III. Beginning at M. 191, the timpanist and percussionists 1, 2, and 4 re-establish the presence of drums in the work through a cumulative process, played on tom-toms. As this gesture increases in dynamic intensity, it gradually overshadows the registral descent in the musical foreground, and closes this formal section with a significant reserve of potential energy.

8.6. Section IV

8.6.1. Measures 200–217: Drum solo / transition

In a response to the calls made by the other percussionists at the end of the previous formal section, the drum kit re-enters the piece at M. 200. This response consists of an adaptation of the drum solo from Origin’s song “Wrath of Vishnu.” The

remainder of this subsection contains of a series of declamatory chords alternating with rising melodic gestures distributed across the ensemble. Its primary formal function is to develop tension before the following subsection drives the work to its climax.

8.6.2. Measures 218–245: Expanding chords / climax

Two processes are initiated in this subsection. The first process, which is based on an interpolation between structural chords ‘E’ and ‘F’ (see Chapter 4.2), continues the alternation of chordal and melodic materials established in the previous subsection. The outer voices of the chords in this progression successively expand in contrary motion, and the number of inner voices increases. Each chord is comprised of two layers: (1) a homophonic *crescendo* played by the winds, and (2) repeated notes in the brass. The electronics mark the end of each chord with a subtle prolongation of the chord’s highest brass notes.

The second process consists of a gradual accumulation of wave-like melodic figures, beginning in the ensemble’s upper register and gradually expanding outward as more instruments join the texture. These figures are unique to this subsection, as virtually all of the previous melodic motion in the piece has been unidirectional. Gradually, the registral ambituses of the two processes become increasingly overlapped until they culminate at M.237 in the work’s climax, which again draws the drum kit into the musical foreground. The development of the processes preceding the climax is illustrated in Figure 8–3, where the vertical axis represents register and the horizontal axis represents the passage of time.

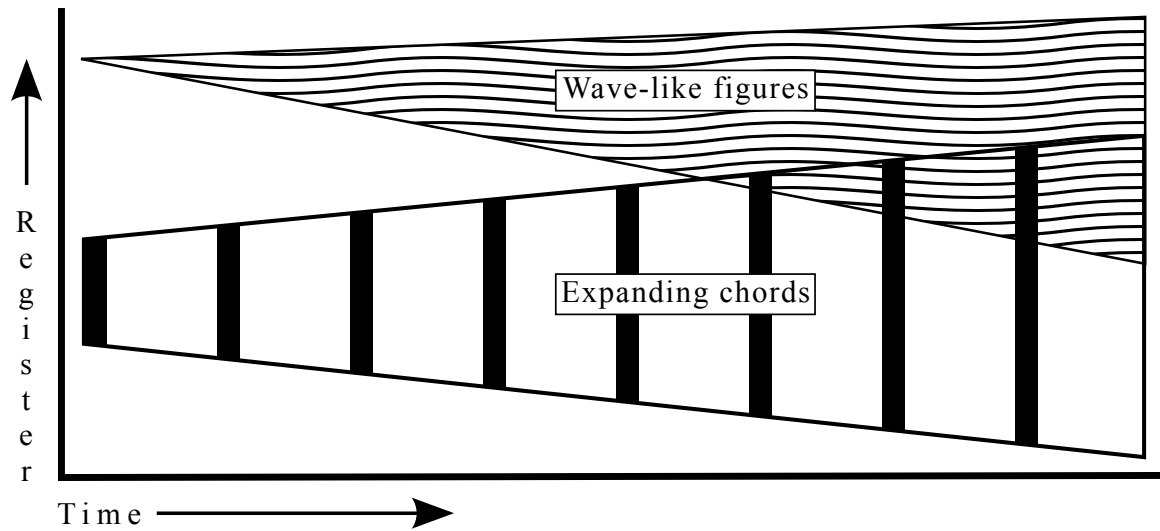


Figure 8-3: Graphical representation of processes between Mm. 218–245

Within the work’s poetic context, these two processual elements are intended to evoke the sound of an extreme metal guitar solo. The wave-like figuration represents the “sweep-picked” arpeggiation that is common among many solos of the genre, and the rearticulated brass notes represent the driving rhythms that typically underpin these moments in songs.

8.6.3. Measures 246–255: Harp solo

The harp emerges from the dense texture of the work’s climax for a brief moment of repose. Accompanied by the vibraphone and muted trumpets, it presents a solo based on the harmonic field of structural chord ‘A’ (see Chapters 3.3.1 and 5.2).

From this point until the end of the work, the electronics are absent. This is due, in large part, to the dense orchestration which does not require additional support.

8.7. Section V (Measures 256–318): Filling-in of structural chord ‘B’

Following the momentary calm of the previous subsection, a rapid, energetic clarinet solo begins at M.256 and eventually stabilizes on the pitch B5, where it is subsequently reinforced by other high woodwinds. Pitch B5 serves as the focal point for the work’s final section, which primarily involves a variation of the converging processes used between Mm. 218–245. Unlike the harmonic movement that characterized the aforementioned subsection, the present section gradually fills in a single harmonic field—that of structural chord ‘B’—from its outer registral limits.

The first process, which begins in M. 263, is characterized by cascading downward melodic gestures played by the winds. The second process, which is initiated in M. 265, is characterized by homophonic brass chords accompanied by the piano, drum kit, and timpani. Each iteration of the brass process expands its registral ambitus upward from B1 and increases its instrumentation by adding one performer until the complete section is engaged. This is mirrored by the process in the winds, whose iterations generally occur in response to, and with less frequency than, attacks in the brass. Each iteration of this process in the winds adds additional instruments to the heterophonic texture, expands its registral ambitus downward from B5, and increases both the global woodwind dynamic and the prevailing speed of each instrument’s linear motion. Above these processes, a rhythmically static layer of stylized feedback sustains B5 and its closely related overtones. This provides the woodwind process with a stable pedal point from which its melodic figures emerge and reinforces the work’s return to its functional pitch center of B.

Once both processes have reached their registral maxima in M. 287, the global tempo begins to accelerate, the woodwind figures sequentially exit the texture in

approximately their order of entrance, and the layer of stylized feedback gradually dissipates. This decay of the woodwind process echoes the downward spectral decay processes of Mm. 28–67. This development is illustrated in Figure 8–4, where the vertical axis represents register and the horizontal axis represents the passage of time.

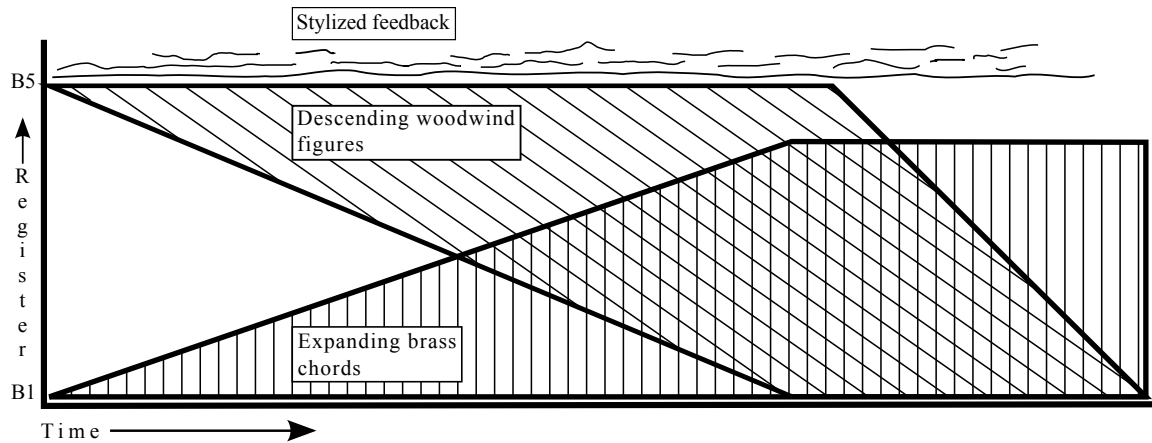


Figure 8–4: Graphical representation of processes between Mm. 256–306

When only the lowest woodwinds remain, the brass instruments proceed to their final declamations of the core rhythmic motive before being interrupted by clarinet 1 playing an inversion of the solo that opened this section. An adaptation of the closing riff of Decapitated’s song “Homo Sum” then brings the work to an abrupt conclusion.

Chapter 9. Conclusion and future considerations

The composition of this work was a significant departure from much of my past creative output. As discussed in Chapter 1.2, I had long avoided the intentional incorporation of extreme metal influences in my art music compositions. In writing this piece, I found myself inspired not only by the results of my spectral analyses of distorted electric guitar chords, but also by the idea of distortion as a broader concept. This provided the impetus for the exploration of other distortive processes, as applied to the work's source material.

Eskhaton represents my first use of transcriptions as source material in an art music context. When composing metal songs, I have always felt free to recontextualize and reinterpret other musics, but had never extended this freedom to my classical works. By working with extreme metal, the genre with which I have developed the greatest personal relationship as a performer, I was able to exploit my experience in both the metal and classical idioms when using transcriptions as departure points for further development.

One difficulty that I encountered in the creative process was that of adequately evoking the rhythmic intensity characteristic of extreme metal. This is due, in large part, to the rapid onset of electric guitar attacks and to the ubiquity of rapid bass drum passages. For example, during Section II of the work's form, I underestimated the amount of time necessary for brass instruments to perform staccato attacks. As a result, the interplay between different rhythmic layers was not as clear as I had hoped. Additionally, I often found myself scaling back the complexity of the drum kit part in deference to the fact that extreme metal drummers employ techniques in which classical percussionists are not typically trained.

For a number of reasons, I feel that extreme metal remains a viable source of future inspiration for my art music compositions. As I chose not to simply write metal for classical instruments, but instead to analyze and adapt the musical materials of the genre, the techniques that I used in the creation of *Eskhaton* have the potential to produce a diverse variety of musical results.

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ESKHATON

for wind symphony and electronics

Volume 2 of 2: Musical score

DUNCAN SCHOUTEN

2011-2012

Eskhaton

for wind symphony and electronics

Instrumentation:

4 Flutes (Flute 1 doubling Piccolo,
Flute 4 doubling Alto Flute)
2 Oboes (Oboe 2 doubling English
Horn)
6 B♭ Clarinets
1 B♭ Bass Clarinet
2 E♭ Alto Saxophones
1 B♭ Tenor Saxophone
1 E♭ Baritone Saxophone
2 Bassoons (Bassoon 2 doubling
Contrabassoon)

4 F Horns
4 C Trumpets
2 Trombones
1 Bass Trombone
1 Euphonium
2 Tubas
1 String Contrabass

Harp
Piano

Timpani (& Tom-tom 1 – tuned lower
than Perc. 1’s Tom-tom)

All instruments are written at sounding
pitch, with the following exceptions:

- Piccolo—sounding 1 octave higher
- Contrabassoon—sounding 1 octave lower
- Crotales & Glockenspiel—sounding 2 octaves higher
- Contrabass—sounding 1 octave lower

Approximate duration: 11’30’’

Percussion (4 Players)

Percussion 1

- Vibraphone (shared with P.2 and P.3)
- Glockenspiel (shared with P.2)
- Crotales (2 Octaves, shared with P.4)
- 2 cymbals (medium Chinese, medium/high sizzle; shared with Timp.)
- Snare drum (shared with P.2)
- Brake drum
- Whip
- Tam-tam (large; shared with P.4)
- Tom-tom 4 (highest tuned of the four)

Percussion 2

- Marimba
- Vibraphone (shared with P.1 and P.3)
- Glockenspiel (shared with P.1)
- Snare drum (shared with P.1)
- Tom-tom 2 (tuned lower than timp.’s Tom-tom)
- 2 Wood blocks (high and low)

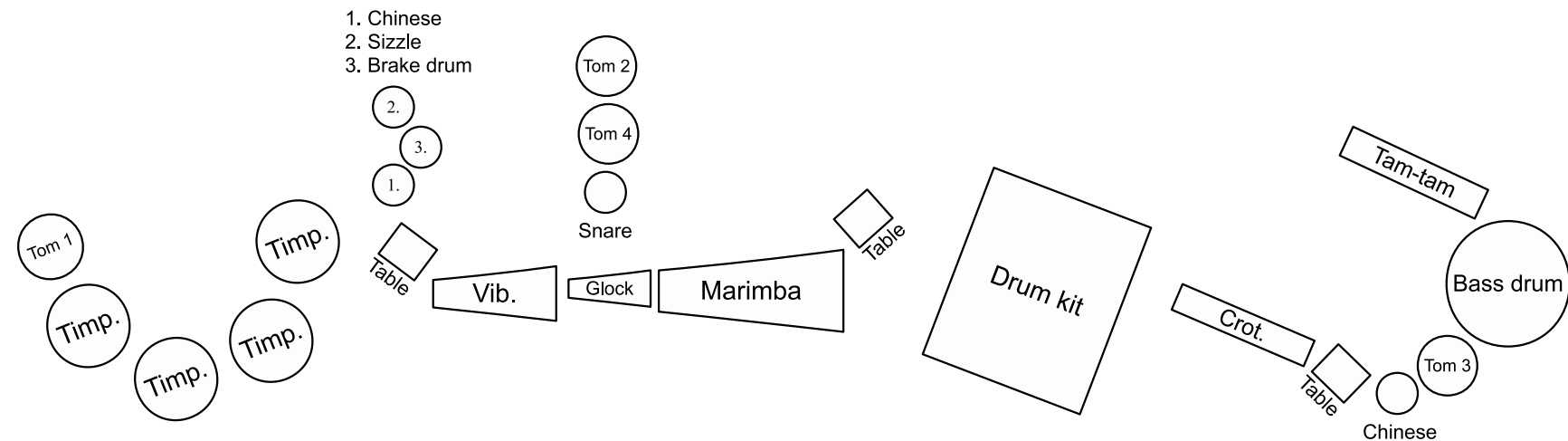
Percussion 3 (Drum kit)

- 3 Cymbals (small and large crashes, two small cymbals stacked on top of each other [but not a hi-hat!])
- Snare drum
- 4 graduated tom-toms
- Kick drum
- Vibraphone (shared with P.1 and P.2)

Percussion 4

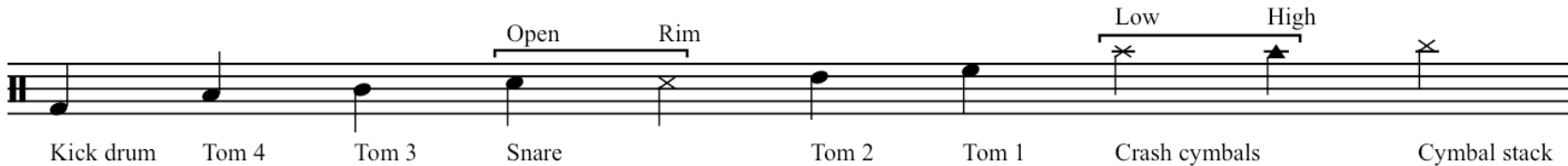
- Crotales (2 octaves; shared with P.1)
- Tam-tam (large; shared with P.1)
- Small Chinese cymbal
- Triangle
- Bass drum
- Tom-tom 3 (tuned lower than P.2’s Tom-tom; lowest tuned of the four)

Suggested percussion layout:

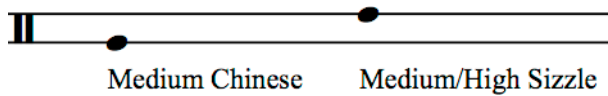


The following notational systems are used for pairs or groups of unpitched percussion instruments:

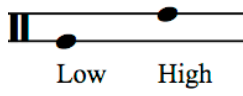
1. Drum kit



2. Cymbals



3. Wood blocks

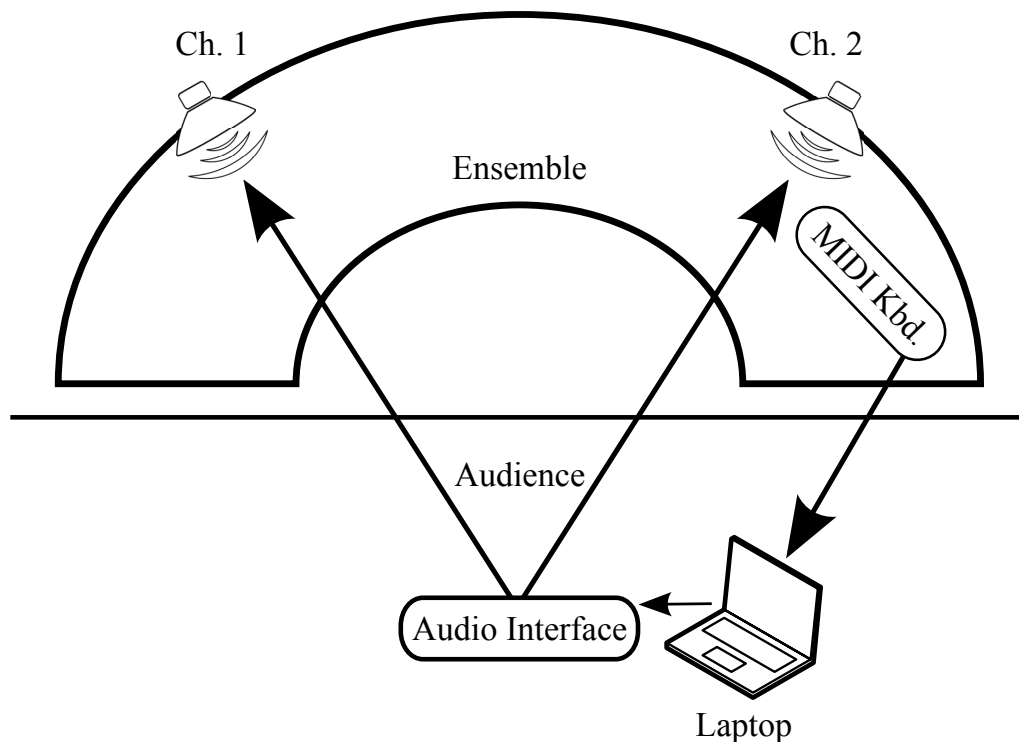


Electronics

Technical requirements:

- Two (2) Loudspeakers, with stands of a height sufficient to raise them above the ensemble
- Two (2) XLR cables (for the loudspeakers)
- One (1) MIDI Keyboard (minimum of 61 keys)
- One (1) MIDI Cable (or wireless MIDI device)
- One (1) Digital audio interface with a minimum of two outputs w/ MIDI input (or other MIDI input device)
- One (1) Apple computer (necessary for the patch; this patch has been tested on OSX 10.5.8)
- Optional: One (1) MIDI control interface (containing sliders, knobs, etc.)

Diagram of electronic equipment configuration (arrows represent signal path):



Operating the patch:

Installation

- Copy the folder “Schouten – Eskhaton” to your local hard drive.
- Once copied to your hard drive, simply open “Schouten – Eskhaton Patch.app”. All of the necessary components for the use of the patch have been bundled in this application.

Loading and running the piece

- Prior to beginning a performance, the on-stage performer initializes the patch and preloads the necessary soundfiles by pressing C3:



- The note C7 [] functions as an audio kill-switch that will immediately stop all playback. This can also be achieved by pressing the “panic” button in the patch. Note one distinction between these options, however: unlike the killswitch, audio is turned off when the “panic” button is pressed, and must be turned back on in the patch before resuming the piece.

Navigating the patch

- Each cue in the piece has been given a preset playback volume. The technician, however, can manually control these settings, by adjusting the gain sliders in the main window of the patch. There are individual gain sliders for each of the eight sound file players (contained within the blue boxes), as well as for output channels one and two (contained in the green box). Additionally, these sliders can be controlled *via* a MIDI control surface. In order to do so:
 1. Connect the MIDI control surface of your choice to the computer and ensure that it is correctly recognized in the “MIDI Setup” window of the patch.
 2. In the box containing the slider that you would like to associate with a MIDI controller, click inside the white square below the words “Bind to MIDI controller” so that an X appears.
 3. Move the MIDI controller you wish to associate with that slider. The “Controller #.” indicator below the white square should now display the number of the chosen MIDI controller, and the virtual slider in the blue box should move.
 4. Once you are satisfied with your assignment of the controller, uncheck the white square.
 5. Repeat steps 2 through 4 for all sliders that you would like to associate with a MIDI controller.
- The technician can ensure that the patch is fully functioning by using the virtual keyboard contained in the “p playback-tester” window. To access this feature, simply double click on the corresponding button in the main patch.

Performance Notes

General comments and notation for all instruments:

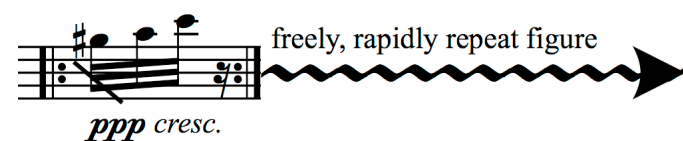
Accidentals only affect the octave in which they occur, and are carried throughout the measure or boxed repeated figure.

Grace notes are to be played as fast as possible, before, and at the same dynamic level as, the note they precede.

All trills are upward to the nearest semitone unless otherwise indicated. Trills should last for the full duration of the note.

Vibrato is to be used expressively, but not exaggeratedly. The notation “s.v.” indicates notes or passages to be played *senza vibrato*.

	:	Indicates a gradual transition between methods of articulation
	:	<i>Al Niente</i> dynamic or as close as possible. If at the start of a phrase, begin with no perceptible attack.
ord.	:	Play normally. This indication cancels all previous timbral changes.



Passages notated with repeat signs followed by a wavy line indicate that players should continue the specified material for the duration of the graphic, then follow the instructions given in their parts.

As many microtones as possible should be performed as fingered pitches. The following microtonal accidentals are used:

: Three quarter-tones sharp

: One quarter-tone sharp

 : One quarter-tone flat

 : Three quarter-tones flat

Special techniques and notation for the winds:

As many glissandi as possible are to be performed through lip manipulation. Fingered bends are acceptable, but attempt to minimize breaking between pitches.

T.T. : Timbre trill—trill between alternate fingerings of the same note

Special techniques and notation for the trumpets:

The trumpets are asked to play with a “pie plate mute”. This is simply a light, disposable aluminum pie plate that is held against the bell to create a buzzing, distorted sound.

Special techniques and notation for the contrabass:

	:	Bow the string with a greater amount of pressure than normal; the resulting sound should contain approximately an equal proportion of the original pitch and a noisy roughness or grain.
	:	Normal bow pressure.

Special techniques and notation for the piano:

The δ^{vb} and δ^{va} signs affect only the staves on which they are placed, and do not affect both staves during a cross-staffed passage.

All dynamics affect both staves unless otherwise indicated.

 $\frac{1}{2}$: Release sustain pedal enough that the resonating sound softly continues, but not so much as with the pedal fully depressed.

 + : Mute the indicated string inside the piano with the tip of the finger

Written for the McGill Wind Symphony

Score in C

Eskhaton

for wind symphony and electronics

Duncan Schouten
2011-2012

Flutes 1-4
Oboes 1-2
Clarinets 1-6
Bass Clarinet
Alto Sax. 1-2
Tenor Sax.
Baritone Sax.
Contrabassoon

Horns 1-4
Trumpets 1-4
Trombones 1-2
Bass Trombone
Euphonium
Tubas 1-2
Contrabass

Harp
Piano

Percussion 1 CYMBALS
Percussion 2 SNARE DRUM
Percussion 3 DRUM KIT
Percussion 4 TAM-TAM

MIDI Keyboard

Tempo: ♩ = 100

Measure Numbers: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

Rehearsal Markings: (2+3)

Performance Instructions:

- sticks (catch)
- soft mallets
- Take BASS DRUM
- BASS DRUM
- Con sord
- Scrape edge w/ triangle beater
- Cue 01
- Cue 02

14

Perc. 1
Perc. 2
Perc. 3
Perc. 4

MIDI Kbd.

Measure Numbers: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

Rehearsal Markings: 2, 3, 4

Performance Instructions:

- Take MARIMBA
- do not allow the sound to fully decay

Picc. *flz.* *ppp*

Fl. 2 *f* *ppp*

Fl. 3 *f* *ppp*

Fl. 4 *f* *ppp*

Ob. 1 *f* *ppp*

Ob. 2 *f* *ppp*

Cl. 1 *f* *ppp*

Cl. 2 *f* *ppp*

Cl. 3 *f* *ppp*

Cl. 4 *f* *ppp*

Cl. 5 *f* *ppp*

Cl. 6 *f* *ppp*

B. Cl. *f* *ppp*

A. Sx. 1 *f* *ppp*

A. Sx. 2 *f* *ppp*

T. Sx. *f* *p* *f* *ppp*

B. Sx. *f* *p* *f*

Bsn. 1 *f* *p* *f*

C. Bn. *f* *p* *f* *p* *f*

Hn. 1 *f* *ppp* *p* *f*

Hn. 2 *f* *ppp*

Hn. 3 *f* *p* *f* *ppp*

Hn. 4 *f* *p* *f* *ppp*

Tpt. 1 *Pic plate mute* *f* *ppp*

Tpt. 2 *Pic plate mute* *f* *ppp*

Tpt. 3 *Pic plate mute* *f* *ppp*

Tpt. 4 *Pic plate mute* *f* *ppp*

Tbn. 1 *f* *ppp*

Tbn. 2 *f* *p* *f*

B. Tbn. *f* *p* *f* *p*

Euph. *f* *p* *f* *p*

Tuba 1 *f* *p* *f* *p* *f*

Tuba 2 *f* *p* *f* *p* *f*

Cb. *f* *Decel. trem.*

Hp. *sempre non arp.* *f* *sempre*

Pno. *f* *sempre*

Timp. *f* *p*

Perc. 3 *f* *ppp*

Perc. 4 *f* *Senza sord.*

MIDI Kbd. *Cuc 03*

40

Cue 05

42

Picc.

42

Fl. 2

42

Fl. 3

42

Fl. 4

42

Ob. 1

42

Ob. 2

42

Cl. 1

42

Cl. 2

42

Cl. 3

42

Cl. 4

42

Cl. 5

42

Cl. 6

42

B. Cl.

42

A. Sx. 1

42

A. Sx. 2

42

T. Sx.

42

B. Sx.

42

Bsn. 1

42

C. Bn.

42

Hn. 1

42

Hn. 2

42

Hn. 3

42

Hn. 4

42

Tpt. 1

42

Tpt. 2

42

Tpt. 3

42

Tpt. 4

42

Tbn. 1

42

Tbn. 2

42

B. Tbn.

42

Euph.

42

Tuba 1

42

Tuba 2

42

Cb.

42

Hp.

42

Pno.

42

Timp.

42

Perc. 1

42

Perc. 2

42

Perc. 3

42

MIDI Kbd.

Cue 06

Cue 07

[illegible]

MIDI Kbd.

Cue 09

62

Picc.

63

62

Fl. 2

63

62

Fl. 3

63

62

Fl. 4

63

62

Ob. 1

63

62

Ob. 2

63

62

Cl. 1

63

62

Cl. 2

63

62

Cl. 3

63

62

Cl. 4

63

62

Cl. 5

63

62

Cl. 6

63

62

B. Cl.

63

62

A. Sx. 1

63

62

A. Sx. 2

63

62

T. Sx.

63

62

B. Sx.

63

62

Bsn. 1

63

62

C. Bn.

63

62

Hn. 1

63

62

Hn. 2

63

62

Hn. 3

63

62

Hn. 4

63

62

Tpt. 1

63

62

Tpt. 2

63

62

Tpt. 3

63

62

Tpt. 4

63

62

Tbn. 1

63

62

Tbn. 2

63

62

B. Tbn.

63

62

Euph.

63

62

Tuba 1

63

62

Tuba 2

63

62

Cb.

63

62

Hp.

63

62

Pno.

63

62

Timp.

63

62

Perc. 1

63

62

Perc. 2

63

62

Perc. 3

63

62

MIDI Kbd.

63

[illegible]

70

Fl. 2

p

senza vibrato (s.v.)

ppp

4

Fl. 3

ppp

p

ppp

4

Fl. 4

ppp

Cl. 1

ppp

Cl. 2

Cl. 3

Cl. 4

10

5

Cl. 5

7

Cl. 6

11

11

B. Cl.

ppp

A. Sx. 1

6

3

A. Sx. 2

5

5

T. Sx.

ppp

B. Sx.

Bsn. 1

ppp

C. Bn.

13

70

Hn. 2

4

Hn. 3

ppp

Tpt. 1

Cup mute

ppp

4

Tpt. 2

Tbn. 1

ppp

Tbn. 2

70

Hp.

4

70

Perc. 1

4

Perc. 2

MIDI Kbd.

[illegible]

74

Ob. 1

3

4

2

4

3

4

Cl. 1

3

4

2

4

3

4

Cl. 2

3

4

2

4

3

4

Cl. 3

3

4

2

4

3

4

Cl. 4

3

4

2

4

3

4

Cl. 5

3

4

2

4

3

4

Cl. 6

3

4

2

4

3

4

B. Cl.

3

4

2

4

3

4

A. Sx. 1

3

4

2

4

3

4

A. Sx. 2

3

4

2

4

3

4

T. Sx.

3

4

2

4

3

4

B. Sx.

3

4

2

4

3

4

Hn. 2

3

4

2

4

3

4

Hn. 3

3

4

2

4

3

4

Tpt. 1

3

4

2

4

3

4

Tpt. 2

3

4

2

4

3

4

Tbn. 1

3

4

2

4

3

4

Tbn. 2

3

4

2

4

3

4

Tuba 1

3

4

2

4

3

4

Cb.

3

4

2

4

3

4

Hp.

3

4

2

4

3

4

Perc. 1

3

4

2

4

3

4

Perc. 2

3

4

2

4

3

4

MIDI Kbd.

3

4

2

4

3

4

Cue 12

76

Ob. 1

2

Cl. 1

4

Cl. 2

Cl. 3

Cl. 4

Cl. 5

Cl. 6

B. Cl.

A. Sx. 1

A. Sx. 2

T. Sx.

B. Sx.

ppp

76

Hn. 2

2

Hn. 3

4

Tpt. 1

Tpt. 2

Tbn. 1

Tbn. 2

Tuba 1

Cb.

76

Hp.

2

Perc. 1

2

Perc. 2

4

MIDI Kbd.

Cue 13

78 *accel.*

Fl. 3 *tr* *p*

Fl. 4 *tr* *mp*

Ob. 1

Ob. 2 *mp*

Cl. 1 *(cresc.)* 6

Cl. 2 *(cresc.)*

Cl. 3 *(cresc.)*

Cl. 4 *(cresc.)* 10 5

Cl. 5 *(cresc.)* 7

Cl. 6 *(cresc.)* 11

A. Sx. 1 *(cresc.)* 3

A. Sx. 2 *(cresc.)* 5

T. Sx. *p* *ppp*

78 *accel.*

Hn. 2 *mp*

Tpt. 1 *Senza sord.* *ppp* *mf*

Tpt. 2 *mp* *ppp*

Tpt. 3 *ppp* *mf*

Tpt. 4 *ppp*

Tbn. 1 *ppp* *mf*

Tbn. 2 *mp* *ppp*

Tuba 1 3 *mp*

Tuba 2 *p*

Cb. 3 *mp* *p* 3 *mf*

78 *accel.*

Hp. *mf*

78 *accel.*

Timp. *ppp cresc.*

Perc. 1

Perc. 2

MIDI Kbd. Cue 14 Cue 15

(*accel.*)

83

Fl. 1

Fl. 2

Fl. 3

Ob. 1

Ob. 2

Cl. 1

Cl. 2

Cl. 3

Cl. 4

Cl. 5

Cl. 6

A. Sx. 1

(*accel.*)

83

Tpt. 1

Tpt. 2

Tpt. 3

Tpt. 4

Tbn. 1

Tbn. 2

B. Tbn.

Euph.

Tuba 1

Tuba 2

Cb.

(*accel.*)

83

Hp.

Pno.

(*cresc.*)

(*dec.*)

SNARE DRUM

BASS DRUM

MIDI Kbd.

86

(2+2+3)

FLUTE

Fl. 1

Fl. 2

Fl. 3

Ob. 1

Ob. 2

Cl. 1

Cl. 2

Cl. 3

Cl. 4

Cl. 5

Cl. 6

A. Sx. 1

86

(2+2+3)

(3+2)

(2+2+3)

(3+2)

(2+2+3)

(3+2)

(2+2+3)

Tpt. 1

Tpt. 2

Tpt. 3

Tpt. 4

Tbn. 1

Tbn. 2

B. Tbn.

Euph.

Tuba 1

Tuba 2

Cb.

86

(2+2+3)

(3+2)

(2+2+3)

(3+2)

(2+2+3)

(3+2)

(2+2+3)

Hp.

Pno.

86

(2+2+3)

(3+2)

(2+2+3)

(3+2)

(2+2+3)

(3+2)

(2+2+3)

Timp.

Perc. 1

Perc. 2

Perc. 3

Perc. 4

MIDI Kbd.

Take SNARE DRUM

Take MARIMBA

(stack)

Take TAM-TAM

24

93 (3+2) 94 97 $\text{♩}^3 = \text{♩}, \text{♩} = 126$ $\text{♩} = 84$ (2+2+3)

Fl. 1 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Fl. 2 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Fl. 3 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Fl. 4 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Ob. 1 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Ob. 2 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Cl. 4 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Cl. 5 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Cl. 6 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

B. Cl. $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

A. Sx. 1 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

A. Sx. 2 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Bsn. 1 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Bsn. 2 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Tpt. 1 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Tpt. 2 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Tpt. 3 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Tpt. 4 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Tbn. 1 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Tbn. 2 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

B. Tbn. $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Euph. $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Tuba 1 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Tuba 2 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Cb. $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Pno. $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Perc. 1 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Perc. 3 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

Perc. 4 $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

MIDI Kbd. $\frac{5}{16}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{7}{16}$ f sempre

The image displays a page of a musical score, likely for a large orchestra and percussion ensemble. The score is organized into three systems, each containing multiple staves for different instruments.

System 1 (Top): Includes staves for Flutes 1-4, Oboes 1-2, Clarinets 1-6, Bass Clarinet, Saxophones 1-2, Trumpets 1-4, Trombones 1-3, Euphonium, Tubas 1-2, and Cymbals. The first staff (Flute 1) has a rehearsal mark at 103. The score includes dynamic markings such as *f* sempre, *mp*, and *ff*. There are also markings for *mf* and *mf* 3.

System 2 (Middle): Includes staves for Horns 3-4, Trumpets 1-4, Trombones 1-3, Euphonium, Tubas 1-2, and Cymbals. The first staff (Horn 3) has a rehearsal mark at 103. The score includes dynamic markings such as *f* sempre, *mp*, and *ff*. There are also markings for *mf* and *mf* 3.

System 3 (Bottom): Includes staves for Piano, Percussion 1-3, and MIDI Keyboard. The first staff (Piano) has a rehearsal mark at 103. The score includes dynamic markings such as *f* sempre, *mp*, and *ff*. There are also markings for *mf* and *mf* 3.

The score is written in a complex rhythmic style, featuring many triplets and sixteenth notes. The percussion section includes a Marimba and a Vibraphone. The score is marked with rehearsal numbers 103 and 107.

The image displays a page of a musical score for a large orchestra, featuring woodwinds, brass, strings, and percussion. The score is divided into five measures, each with a specific time signature (5/16, 2/8, 7/16, 5/16). The music includes various instruments like Flutes, Oboes, Clarinets, Bassoons, Saxophones, Trumpets, Trombones, Euphonium, Tuba, Cymbal, Piano, and Percussion. The score is marked with dynamics like *f*, *mf*, and *ff*, and includes a section labeled "III".

The image displays a page from a musical score, likely for a symphony or concert band, featuring a large ensemble of instruments and percussion. The score is organized into three systems, each with multiple staves for different instruments.

System 1 (Top): Includes Flutes 1-4, Oboes 1-2, Clarinets 1-6, Bassoons 1-2, Trumpets 1-4, Trombones 1-3, Euphonium, Tubas 1-2, and Contrabass. The music is written in 5/16, 7/16, 5/16, 2/8, and 5/16 time signatures. Rehearsal mark 113 is indicated. The score includes various musical notations such as slurs, ties, and dynamic markings (f, ff).

System 2 (Middle): Includes Horns (Harp and Piano), and the third system includes four types of Percussion (Perc. 1-4) and MIDI Keyboard. The music is written in 5/16, 7/16, 5/16, 2/8, and 5/16 time signatures. Rehearsal mark 116 is indicated. The score includes various musical notations such as slurs, ties, and dynamic markings (f, ff).

System 3 (Bottom): Includes Percussion 1-4 and MIDI Keyboard. The music is written in 5/16, 7/16, 5/16, 2/8, and 5/16 time signatures. Rehearsal mark 116 is indicated. The score includes various musical notations such as slurs, ties, and dynamic markings (f, ff).

118 (3+2) (2+3) (3+2)

Fl. 1 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Fl. 2 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Fl. 3 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Fl. 4 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Ob. 1 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Ob. 2 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Cl. 1 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Cl. 2 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Cl. 3 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Cl. 4 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Cl. 5 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Cl. 6 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Bsn. 1 5/16 3/8 5/16 3/8 5/16 4/8 5/16

C. Bn. 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Tpt. 1 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Tpt. 2 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Tpt. 3 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Tpt. 4 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Tbn. 1 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Tbn. 2 5/16 3/8 5/16 3/8 5/16 4/8 5/16

B. Tbn. 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Euph. 5/16 3/8 5/16 3/8 5/16 4/8 5/16

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

Tuba 2 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Cb. 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Hp. 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Pno. 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Perc. 1 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Perc. 2 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Perc. 3 5/16 3/8 5/16 3/8 5/16 4/8 5/16

Perc. 4 5/16 3/8 5/16 3/8 5/16 4/8 5/16

MIDI Kbd. 5/16 3/8 5/16 3/8 5/16 4/8 5/16

This page of the musical score is divided into measures with various time signatures and dynamic markings. The instruments are arranged in a standard orchestral layout, with woodwinds and strings in the upper staves, brass in the middle, and percussion at the bottom. The score includes a variety of musical notation, including notes, rests, and dynamic markings such as *f* and *f* sempre. The time signatures change throughout the page, including 5/16, 4/8, 5/16, 5/8, 7/16, 5/16, and 4/8. The percussion section includes Timp., Perc. 2, Perc. 3, Perc. 4, and MIDI Kbd.

130

Fl. 1

Fl. 2

Fl. 3

Fl. 4

Ob. 1

Ob. 2

Cl. 1

Cl. 2

Cl. 3

Cl. 4

Cl. 5

Cl. 6

B. Cl.

A. Sx. 1

A. Sx. 2

T. Sx.

B. Sx.

Bsn. 1

C. Bn.

Take BASSOON

130

Tpt. 1

Tpt. 2

Tpt. 3

Tpt. 4

Tbn. 1

Tbn. 2

B. Tbn.

Euph.

Tuba 1

Tuba 2

Cb.

130

Hp.

Pno.

130

Timp.

Perc. 2

Perc. 3

Perc. 4

MIDI Kbd.

Take CROTALES

[illegible]

[illegible]

149 ♩ = 80 *accel.*

Fl. 1 *mf*

Fl. 2 *f*

Fl. 3 *f*

Fl. 4 *f* *ppp*

Ob. 1 *f*

Ob. 2 *fp* *ppp*

Cl. 1 *mf* *p*

Cl. 2 *f*

Cl. 3 *f*

Cl. 4 *fp* *ppp*

Cl. 5 *fp*

Cl. 6 *fp*

B. Cl.

A. Sax. 1

A. Sax. 2 (T.T.) *p*

T. Sax. *p*

B. Sax. *p*

Bsn. 1 *p*

Bsn. 2 *p*

Hn. 2

Hn. 3 *f*

Hn. 4 *f* Senza sord.

Tpt. 1 Senza sord.

Tpt. 2 *p*

Tpt. 3 Straight mute *ppp* *f* *ppp* *f*

Tpt. 4 Straight mute *ppp* *f*

Tbn. 1 Senza sord. *Gtss.* *p*

Cb. *mf*

Hp. 149 ♩ = 80 *accel.* *mf* *p*

Pno. *p*

149 ♩ = 80 *accel.*

Timp. [TIMPANI] *ppp*

Perc. 1

Perc. 2

Perc. 3 *f* *mf* *p*

Perc. 4 *f*

MIDI Kbd.

152



152



152



Cue 21

155

Fl. 1

ppp

p

3

4

4

Fl. 2

3

3

3

3

3

Fl. 3

3

3

3

3

3

Fl. 4

ppp

3

3

f

3

Ob. 1

ppp *mf*

ppp

3

3

7

mp

7

3

3

Ob. 2

ppp *mf*

ppp

f

3

ppp

f

3

ppp

f

Cl. 1

mf

3

mf

f

3

mf

mp

Cl. 2

mf

3

mf

f

3

mf

mp

Cl. 3

mf

3

mf

f

3

mf

mp

Cl. 4

mf

3

mf

f

3

mf

mp

Cl. 5

p

5

mf

ppp

mf

f

f

mf

Cl. 6

f

3

3

f

3

3

B. Cl.

f

3

3

A. Sx. 1

ppp

f

5

ppp

A. Sx. 2

ppp

f

5

ppp

T. Sx.

ppp

B. Sx.

ppp

Bsn. 1

ppp

Bsn. 2

ppp

Hn. 1

155

3

4

4

ppp

mp

ppp

Hn. 3

ppp

ppp

Tpt. 1

p

f

p

f

6

5

p

Tpt. 2

f

p

f

p

Tpt. 3

f

6

5

p

Tpt. 4

ppp

Tbn. 1

ppp

Tbn. 2

ppp

Hp.

155

3

4

4

mp

B#

5

D#

3

3

Pno.

ppp

Timp.

155

3

4

4

Perc. 1

ppp

Perc. 2

ppp

f

SNARE DRUM

p

Perc. 3

ppp

f

Perc. 4

ppp

MIDI Kbd.

ppp

Cue 22

160

158

Fl. 1

Fl. 2

Fl. 3

Fl. 4

Ob. 1

Ob. 2

Cl. 1

Cl. 2

Cl. 3

Cl. 4

Cl. 5

Cl. 6

B. Cl.

A. Sx. 1

A. Sx. 2

T. Sx.

B. Sx.

Bsn. 1

Bsn. 2

158

Hn. 1

Hn. 3

Tpt. 1

Tpt. 2

Tpt. 3

Tpt. 4

Tbn. 1

Tbn. 2

158

Hp.

Pno.

158

Timp.

Perc. 1

Perc. 2

Perc. 3

Perc. 4

MIDI Kbd.

160

Finger F3, gradually pull out hand

Senza sord.

Senza sord.

Take DRUM KIT

Cue 23

165

165

165

Cue 25

170

Fl. 1

Fl. 2

Fl. 3

Fl. 4

Ob. 1

Ob. 2

Cl. 1

Cl. 2

Cl. 3

Cl. 4

Cl. 5

Cl. 6

B. Cl.

A. Sx. 1

A. Sx. 2

T. Sx.

B. Sx.

Bsn. 1

Bsn. 2

Hn. 1

Hn. 2

Hn. 3

Hn. 4

Tpt. 1

Tpt. 2

Tpt. 3

Tpt. 4

Tbn. 1

Tbn. 2

B. Tbn.

Euph.

Tuba 1

Pno.

Timp.

Perc. 1

Perc. 2

Perc. 3

Perc. 4

MIDI Kbd.

Cue 27

[illegible]

180 (rit.) ----- ♩ = 76

Fl. 1

Fl. 2

Fl. 3

Fl. 4

Ob. 1

Ob. 2

Cl. 1

Cl. 2

Cl. 3

Cl. 4

Cl. 5

Cl. 6

B. Cl.

B. Sx.

Bsn. 1

Bsn. 2

freely, rapidly repeat figure (breathe as necessary)

p

Finish the current figure, then rest

Finish the current figure, then rest

Finish the current figure, then rest

f sempre

180 (rit.) ----- ♩ = 76

Hn. 1

Hn. 2

Hn. 3

Hn. 4

Tpt. 1

Tpt. 2

Tpt. 3

Tpt. 4

Tbn. 1

Tbn. 2

B. Tbn.

Euph.

Tuba 1

Tuba 2

f sempre

f sempre

f sempre

f sempre

Cup mute

p *f* Cup mute

fp

p *f*

fp

180 (rit.) ----- ♩ = 76

Timp.

Perc. 1

MIDI Kbd.

$$accel.$$

187

(4+3) (2+3)

Fl. 1

Fl. 2

Fl. 3

Fl. 4

Ob. 1

Ob. 2

Cl. 1

Cl. 2

Cl. 3

Cl. 4

Cl. 5

Cl. 6

B. Cl.

B. Sx.

Bsn. 1

Bsn. 2

continue repeating

Finish the current figure, then rest

f

f sempre

191

accel.

191

$$accel.$$

187

Timp.

Perc. 1

MIDI Kbd.

4

7 (4+3)

3

5 (2+3)

3

4

ppp

TOM-TOM 1

cresc.

193

$\bullet = 90$

196

Fl. 1

Fl. 2

Fl. 3

Fl. 4

Ob. 1

Ob. 2

Cl. 1

Cl. 2

B. Cl.

B. Sx.

Bsn. 1

Bsn. 2

Hn. 1

Hn. 2

Hn. 4

Tpt. 1

Tpt. 2

Tpt. 3

Tpt. 4

Tbn. 1

Tbn. 2

B. Tbn.

Euph.

Tuba 1

Tuba 2

Cb.

Hp.

Timp.

Perc. 1

Perc. 2

Perc. 3

Perc. 4

MIDI Kbd.

3

4

3

4

3

4

3

4

Senza sord.

p

f

p

Senza sord.

p

f

ppp

f

p

ff

p

ff

p

ff

p

ff

ppp

f

TOM-TOM 2

TOM-TOM 3

TOM-TOM 4

Take TIMPANI

Take CYMBALS

Take MARIMBA

Take BASS DRUM

[illegible]

[illegible]

215

[illegible]

218♩ = 88(2+3)

Picc.

5

4

3

5

3

mp

f

mp

sempre legato

Fl. 2

4

4

4

4

4

p

f

mp

Fl. 3

4

4

4

4

4

p

f

mp

Fl. 4

4

4

4

4

4

p

f

mp

Ob. 1

4

4

4

4

4

p

f

mp

Ob. 2

4

4

4

4

4

p

f

mp

Cl. 1

4

4

4

4

4

p

f

mp

sempre legato

Cl. 2

4

4

4

4

4

p

f

mp

Cl. 3

4

4

4

4

4

p

f

mp

Cl. 4

4

4

4

4

4

p

f

mp

Cl. 5

4

4

4

4

4

p

f

mp

Cl. 6

4

4

4

4

4

p

f

mp

B. Cl.

4

4

4

4

4

p

f

mp

A. Sx. 1

4

4

4

4

4

p

f

ffp

A. Sx. 2

4

4

4

4

4

p

f

ff

T. Sx.

4

4

4

4

4

p

f

ff

B. Sx.

4

4

4

4

4

p

f

ff

Bsn. 1

4

4

4

4

4

p

f

ff

218♩ = 88(2+3)

Hn. 1

5

4

3

5

3

f

f

f

Hn. 2

4

4

4

4

4

f

f

f

Tpt. 1

4

4

4

4

4

ffp

f

f

Tpt. 2

4

4

4

4

4

ffp

f

f

Tpt. 3

4

4

4

4

4

f

f

f

Tpt. 4

4

4

4

4

4

f

f

f

Tbn. 1

4

4

4

4

4

ff

f

ff

Tbn. 2

4

4

4

4

4

ff

f

ff

Euph.

4

4

4

4

4

ff

f

ff

Tuba 1

4

4

4

4

4

ff

f

ff

Tuba 2

4

4

4

4

4

ff

f

ff

Cb.

4

4

4

4

4

ff

f

ff

218♩ = 88(2+3)

Hp.

5

4

3

5

3

f

f

f

Pno.

4

4

4

4

4

f

f

f

Timp.

5

4

3

5

3

ff

f

f

Perc. 1

5

4

3

5

3

f

f

f

Perc. 2

4

4

4

4

4

f

f

f

Perc. 3

4

4

4

4

4

f

f

f

Perc. 4

4

4

4

4

4

f

f

f

MIDI Kbd.

4

4

4

4

4

f

f

f

Cue 28

222

222

222

229

Picc.

Fl. 2

Fl. 3

Fl. 4

Ob. 1

Ob. 2

Cl. 1

Cl. 2

Cl. 3

Cl. 4

Cl. 5

Cl. 6

B. Cl.

A. Sx. 1

A. Sx. 2

T. Sx.

B. Sx.

Bsn. 1

C. Bn.

3

8

mf

p

ff

3

4

f

mp

ff

2

4

3

4

ff

ff

p

229

Hn. 1

Hn. 2

Hns. 3, 4

Tpt. 1

Tpt. 2

Tpts. 3, 4

Tbn. 1

Tbn. 2

B. Tbn.

Euph.

Tba 1, 2

Cb.

3

8

3

4

ff

ff

ff

2

4

3

4

229

Pno.

3

8

ff

3

4

(loco)

mp

2

4

3

4

229

Timp.

Perc. 2

Perc. 3

Perc. 4

MIDI Kbd.

3

8

Gliss.

3

4

ff

ff

f

ff

2

4

3

4

Gliss.

p

f

p

Cue 33

233

Picc. *mp* *ff* *p*

Fl. 2 *p*

Fl. 3 *ff* *p*

Fl. 4 *sempre legato* *p*

Ob. 1 *mp* *p*

Ob. 2 *sempre legato* *p*

Cl. 1 *p*

Cl. 2 *p*

Cl. 3 *p*

Cl. 4 *p* *ff* *p*

Cl. 5 *ff*

Cl. 6

B. Cl. *ffp* *f* *ffp*

A. Sx. 1 *ff* *ff*

A. Sx. 2 *ff* *p*

T. Sx. *f* *ffp*

B. Sx. *ffp* *ff* *f* *ffp*

Bsn. 1 *ffp* *ff* *f* *ffp*

C. Bn. *ff* *ff*

accel. -----

233

Hn. 1 *ff* *mf* *ff*

Hn. 2 *ff* *mf* *ff*

Hns. 3, 4 *ff*

Tpt. 1 *ff*

Tpt. 2 *ff*

Tpts. 3, 4 *ff*

Tbn. 1 *ff* *flz.* *p* *ff*

Tbn. 2 *ff* *flz.* *p* *ff*

B. Tbn. *ff* *flz.* *p* *ff*

Euph. *ff* *ff*

Tba 1, 2 *ff*

Cb. *ff* *fff* *ff*

accel. -----

233

Pno. *ff* *f* *fff* *f*

233

Timp. *ff* *ff*

Perc. 2 *ff* *ff*

Perc. 3

Perc. 4 *ff* *ff* *p*

MIDI Kbd.

accel. -----

Cue 34

Picc. *f* *ffp*

Fl. 2 *f* *ffp*

Fl. 3 *f* *ff*

Fl. 4 *ff* *sempre legato*

Ob. 1 *ff* *Take ENGLISH HORN*

Ob. 2 *ff*

Cl. 1 *ff* *sempre legato*

Cl. 2 *ff* *sempre legato*

Cl. 3 *ff* *sempre legato*

Cl. 4 *sempre legato*

Cl. 5 *f* *sempre legato*

Cl. 6 *f* *sempre legato*

B. Cl. *ff*

A. Sx. 1 *ff* *sempre legato*

A. Sx. 2 *ff* *f*

T. Sx. *ff*

B. Sx. *ff*

Bsn. 1 *ff*

C. Bn. *ff*

Hns. 1, 2 *ff*

Hns. 3, 4 *ff*

Tpts. 1, 2 *ff*

Tpts. 3, 4 *ff*

Tbn. 1 *ff* *Gliss.*

Tbn. 2 *ff* *Gliss.*

B. Tbn. *Gliss.*

Euph. *Gliss.*

Tba 1, 2 *Gliss.*

Cb. *Gliss.*

Hp. *ff*

Pno. *ff*

Timp. *f* *ff*

Perc. 1 *f* *CROTALES*

Perc. 2 *ffp* (catch)

Perc. 3 *p* *ff* *mp* *ff*

Perc. 4 *ff*

MIDI Kbd.

239

Picc. *fff*

Fl. 2 *fff*

Fl. 3

Fl. 4

Ob. 1

Ob. 2

Cl. 1

Cl. 2

Cl. 3

Cl. 4

Cl. 5

Cl. 6

B. Cl.

A. Sx. 1

A. Sx. 2

T. Sx.

B. Sx.

Bsn. 1

C. Bn.

239

Hns. 1, 2

Hns. 3, 4

Tpts. 1, 2

Tpts. 3, 4

Tbn. 1

Tbn. 2

B. Tbn.

Euph.

Tba 1, 2

Cb.

239

Hp.

Pno.

239

Timp.

Perc. 1

Perc. 2

Perc. 3

Perc. 4

MIDI Kbd.

242

Fl. 3 *mp*

Fl. 4 *mp*

Cl. 6 *legato* *p* *cresc.*

B. Cl. *legato* *mp*

T. Sx. *legato* *mp*

246

Take ALTO FLUTE

ff

ff

ff

242

Hn. 1 *f*

Hn. 2 *f*

Hn. 3 *f*

Hn. 4 *f*

Tpt. 3

Tpt. 4

Tbn. 2

B. Tbn.

Euph.

Tuba 1

246

p

ff

p Cup mute

p Cup mute

p

ff

ff

ff

ff

242

Hp. *ff* *sim.*

Pno. *ff* *sim.*

246

mf

242

Timp. *ppp*

Perc. 1 *ppp* TAM-TAM

Take VIBRAPHONE

Perc. 2 *ppp* VIBRAPHONE

Perc. 3 *mp*

Perc. 4 *ppp*

246

ff

ff

sempre p e fada.

f

f

MIDI Kbd.

[illegible]

252

♩ = ♪, ♩ = 76

$$accel.$$

256 ♩ = ♩, ♩ = 152

♩ = ♪, ♩ = 76

$$accel.$$

256 ♩ = ♩, ♩ = 152

♩ = ♩, ♩ = 76

Cup mute flz.

ppp

p

Cup mute

p

Straight mute

p

Straight mute

p

B. Tbn.

Tuba 1

256 ♩ = ♩, ♩ = 152

♩ = ♪, ♩ = 76

$$accel.$$

256 ♩ = ♩, ♩ = 152

Perc. 1 3/4

Perc. 2 4/4

Perc. 3 3/4

Perc. 4 3/4

MIDI Kbd. 3/4

Motor ON
Speed SLOW

GLOCKENSPIEL

TRIANGLE

L.V.

Take BASS DRUM

Decel. trem.

ppp

f

mf

pp

sed. sempre

(accel.)

♩ = 100 *rit.*

263 senza vibrato (s.v.)

Picc. *ppp* *p* *mf* s.v.

Fl. 2

Fl. 3 *ppp*

Fl. 4 *mp* *ppp* *mf* *p*

Ob. 1 (T.T.) *f*

Ob. 2 *mp* *ppp* senza vibrato (s.v.) *f* *p* *p non-dim.*

Cl. 1

Cl. 2 (T.T.) *ppp*

Cl. 3 *mf* *p* *p non-dim.* 3 3

Cl. 4 *f* 6 *p*

Cl. 5 *ppp* *f* *p*

Cl. 6 *mp* *p* *f* *p*

A. Sx. 1 *ppp*

A. Sx. 2

T. Sx.

(accel.)

♩ = 100 *rit.*

263

Tpt. 1 7 *ppp*

Tpt. 2 3 3 3 3 *ppp*

Tpt. 3 *ppp*

Tpt. 4 *ppp*

B. Tbn. *ppp* *p* *ff* *pizz.*

Tuba 1 1. *p* *ff* *pizz.*

(accel.)

♩ = 100 *rit.*

263 (Decel. trem.)

Perc. 1 Take SNARE DRUM

Perc. 2 *ppp* *mf*

Perc. 3 *ppp* *f*

Perc. 4

MIDI Kbd.

266 (rit.)----- a tempo rit. ----- a tempo 269

Hp.

266 (rit.)----- a tempo rit. ----- a tempo 269

Timp.

Perc. 2

Perc. 3

MIDI Kbd.

ppp < f

ppp

ff

Take MARIMBA

The image displays a page of a musical score, likely for a symphony or concert band, featuring a large ensemble of instruments. The score is organized into three systems, each with a tempo change indicated by "rit." (ritardando) and "a tempo".

System 1 (Measures 270-273):

- Woodwinds:** Picc., Fl. 1-4, Ob. 1-2, Cl. 1-6, B. Cl., A. Sx. 1-2, Bsn. 1.
- Brass:** Hn. 4, Tbn. 2, B. Tbn., Euph., Tba 1, 2, Cb.
- Strings:** Hp., Timp., Perc. 2, Perc. 3, MIDI Kbd.

System 2 (Measures 270-273):

- Woodwinds:** Fl. 1-4, Ob. 1-2, Cl. 1-6, B. Cl., A. Sx. 1-2, Bsn. 1.
- Brass:** Hn. 4, Tbn. 2, B. Tbn., Euph., Tba 1, 2, Cb.
- Strings:** Hp., Timp., Perc. 2, Perc. 3, MIDI Kbd.

System 3 (Measures 270-273):

- Woodwinds:** Fl. 1-4, Ob. 1-2, Cl. 1-6, B. Cl., A. Sx. 1-2, Bsn. 1.
- Brass:** Hn. 4, Tbn. 2, B. Tbn., Euph., Tba 1, 2, Cb.
- Strings:** Hp., Timp., Perc. 2, Perc. 3, MIDI Kbd.

The score includes various musical notations, including notes, rests, dynamics (ppp, mp, mf, f, p, non-dim.), articulation (accents, slurs), and fingerings. The percussion parts include a Marimba part starting at measure 273.

MIDI Kbd.

The image displays a page from a musical score, likely for a symphony or concert band. The score is written for a large ensemble, including woodwinds, brass, strings, and percussion. The page is divided into two systems, each with a 5/4 time signature. The first system includes staves for Piccolo, Flutes 2-4, Oboes 1-2, Clarinets 1-6, Bass Clarinet, Saxophones 1-2, Tenor Saxophone, Baritone Saxophone, Bassoon 1, Contrabassoon, Horns 1-4, Trumpets 1-4, Trombones 1-2, Baritone Trombone, Euphonium, Tuba 1 & 2, and Cymbals. The second system includes Harp, Piano, Timpani, and four types of Percussion (1-4). The score features complex rhythmic patterns, including triplets and sixteenth notes, and includes dynamic markings such as ppp, ff, mp, mf, and f. Performance instructions like 'freely repeat with individual rubato' and 'a tempo (2+3)' are present. The score is for a piece in 5/4 time, with a key signature of one sharp (F#).

285

Picc. *ppp* *flz.*

Fl. 2 *ppp* *f*

Fl. 3 *ppp*

Fl. 4

Ob. 1 *ppp* *f*

Ob. 2

Cl. 1 *ppp* *f*

Cl. 2 *ppp* *f*

Cl. 3

Cl. 4

Cl. 5

Cl. 6

B. Cl.

A. Sax. 1

A. Sax. 2

T. Sax.

B. Sax.

Bsn. 1

C. Bn.

Hn. 1 *f* *flz.* *ppp* *sim.*

Hn. 2 *f* *flz.* *ppp* *sim.*

Hn. 3 *f* *flz.* *ppp* *sim.*

Hn. 4 *f* *flz.* *ppp* *sim.*

Tpt. 1 *Senza sord.* *ppp* *sim.*

Tpt. 2 *Senza sord.* *ppp* *flz.* *sim.*

Tpt. 3 *f* *ppp* *flz.* *sim.*

Tpt. 4 *f* *ppp* *flz.* *sim.*

Tbn. 1 *f* *ppp* *flz.* *sim.*

Tbn. 2 *f* *ppp* *flz.* *sim.*

B. Tbn. *f* *ppp* *flz.* *sim.*

Euph. *f* *ppp* *flz.* *sim.*

Tba 1, 2 *f* *ppp* *flz.* *sim.*

Cb. *f* *ppp* *flz.* *sim.*

Hp. *ff* *ppp* *simile*

Pno. *ff* *ppp* *simile*

Timp. *f* *p* *f* *ppp* *ff* *ppp*

Perc. 1 *f* *ppp* *p* *f* *ppp* *ff* *ppp*

Perc. 2 *f* *ppp* *p* *f* *ppp* *ff* *ppp*

Perc. 3 *f* *ppp* *p* *f* *ppp* *ff* *ppp*

Perc. 4 *f* *ppp* *p* *f* *ppp* *ff* *ppp*

MIDI Kbd.

[illegible]

[illegible]

299 *(accel.)* $\text{♩} = 200$

Score for measures 299-308, marked *(accel.)* with a tempo of $\text{♩} = 200$. The score includes parts for Horns 1-4, Trumpets 1-4, Trombones 1-2, Baritone Trombone, Euphonium, Tuba 1, and Cymbal. The key signature has one sharp (F#). The score shows various dynamics (f, p, pp, ppp, ff) and articulations (flz., ord., sim.). Measure 308 ends with a double bar line and a large '4' indicating the start of a new section.

299 (*accel.*) ♩ = 200

Hp. Finish the current figure, then rest

Pno.

299 (*accel.*) ♩ = 200

Timp.

Perc. 2

Perc. 3

MIDI Kbd.

Gliss.

fp

$\text{♩} = \text{♩}$, $\text{♩} = 100$
accel.

(4+3)

$\text{♩} = 130$

Picc. *ppp cresc.*

Fl. 2 *ppp cresc.*

Fl. 3 *ppp cresc.* freely, rapidly repeat figure

Fl. 4 *ppp cresc.* freely, rapidly repeat figure

Ob. 1 *ppp cresc.*

Ob. 2 *ppp cresc.* freely, rapidly repeat figure

Cl. 1 *ppp cresc.*

Cl. 2 *ppp cresc.*

Cl. 3 *ppp cresc.* freely, rapidly repeat figure

Cl. 4 *ppp cresc.* freely, rapidly repeat figure

Cl. 5 *ppp cresc.* freely, rapidly repeat figure

Cl. 6 *ppp cresc.* freely, rapidly repeat figure

B. Cl.

A. Sx. 1

A. Sx. 2

T. Sx.

B. Sx.

Bsn. 1 Stop at cue, no matter where you are in the repeated material

C. Bn. Stop at cue, no matter where you are in the repeated material

$\text{♩} = \text{♩}$, $\text{♩} = 100$
accel.

(4+3)

$\text{♩} = 130$

Hns. 1, 2 *ff*

Hns. 3, 4 *ff*

Tpts. 1, 2 *ff*

Tpts. 3, 4 *ff*

Tbn. 1 *fp* *fff*

Tbn. 2 *fp* *fff*

B. Tbn. *ff*

Euph. *fp* *fff*

Tuba 1 *fp* *fff*

Tuba 2 *fff*

Cb. *ff* *fff* *ff* *fff*

$\text{♩} = \text{♩}$, $\text{♩} = 100$
accel.

(4+3)

$\text{♩} = 130$

Hp.

Pno. *ffp*

Hand-slap cluster L.V.

D# C B# Eb F# G# A

$\text{♩} = \text{♩}$, $\text{♩} = 100$
accel.

(4+3)

$\text{♩} = 130$

Timp. *f* *ff* *fff*

Perc. 1 WHIP *fff*

Perc. 2

Perc. 3 *ff*

Perc. 4 Wooden beaters *ff* *p* *ff* TAM-TAM Ordinary beater *f* BASS DRUM Wooden beaters *fff* *p*

MIDI Kbd.

310 *rit.* ----- $\text{♩} = 100$ $\text{♩} = 133$

Picc. $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$

Fl. 2 $\frac{4}{4}$ Stop at cue, no matter where you are in the repeated material

Fl. 3 $\frac{4}{4}$ Stop at cue, no matter where you are in the repeated material

Fl. 4 $\frac{4}{4}$ Stop at cue, no matter where you are in the repeated material

Ob. 1 $\frac{4}{4}$ Stop at cue, no matter where you are in the repeated material

Ob. 2 $\frac{4}{4}$ Stop at cue, no matter where you are in the repeated material

Cl. 1 *solo* *ff*

Cl. 2 $\frac{4}{4}$ Stop at cue, no matter where you are in the repeated material

Cl. 3 $\frac{4}{4}$ Stop at cue, no matter where you are in the repeated material

Cl. 4 $\frac{4}{4}$ Stop at cue, no matter where you are in the repeated material

Cl. 5 $\frac{4}{4}$ Stop at cue, no matter where you are in the repeated material

Cl. 6 $\frac{4}{4}$ Stop at cue, no matter where you are in the repeated material

B. Cl. *ff* tongue slap *ff* ord.

A. Sax. 1 *ff*

A. Sax. 2 *ff*

T. Sax. *ff*

B. Sax. *ff* tongue slap *ff* ord.

Bsn. 1 *ff*

C. Bn. *ff*

Hns. 1, 2 $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$

Hns. 3, 4 $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$

Tpts. 1, 2 $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ Pie plate mute *f* *ff*

Tpts. 3, 4 $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ Pie plate mute *f* *ff*

Tbn. 1 $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ *ff* *ppp* *ff*

Tbn. 2 $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ *ff* *ppp* *ff*

B. Tbn. $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ *ff* *ppp* *ff*

Euph. $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ *ff* *ppp* *ff*

Tuba 1 $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ *ff* *ppp* *ff*

Tuba 2 $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ *ff* *ppp* *ff*

Cb. $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ *ff* *ppp* *ff* pizz.

Hp. $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$

Pno. $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ 15th *ff*

310 *rit.* ----- $\text{♩} = 100$ $\text{♩} = 133$

Temp. $\frac{4}{4}$ $\frac{2}{4}$ $\frac{9}{16}$ $\frac{6}{16}$ *ff* *ppp* *ff*

Perc. 1 $\frac{4}{4}$ Take CYMBALS & BRAKE DRUM *ff* CYMBALS Sticks *f* *ff*

Perc. 2 $\frac{4}{4}$ BRAKE DRUM *ff* WOOD BLOCKS *ff*

Perc. 3 $\frac{4}{4}$ *f* *mp* *ff*

Perc. 4 $\frac{4}{4}$ *ff* $\oplus$ *ff*

MIDI Kbd. $\frac{4}{4}$