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*Perceptions from the Highline* is a concerto for electric guitar and chamber ensemble. As a composer and a guitarist, I am constantly searching for new and compelling ways to compose for the electric guitar in conjunction with acoustic instruments. The time-based effect known as delay or echo is commonly utilized in the sonic milieu of the electric guitar. This paper will examine the process of scoring musical ideas generated by the use of electric guitar and delay for an acoustic chamber ensemble within the context of *Perceptions from the Highline*.

Many of the electric guitar sounds utilizing delay were initially observed in the context of rock and popular music. This paper will briefly examine three examples of electric guitar playing featuring the use of delay that were influential to the composition of this piece. Analyzing these delay textures generates new models for scoring and orchestration, which in turn creates a series of ensemble-wide composite textures and melodic lines.

*Perceptions From the Highline* is a one-movement concerto for electric guitar and chamber ensemble featuring electronic delay textures scored for acoustic instruments. The composition is the main focus of this thesis, while the accompanying paper further details the compositional process. The score for *Perceptions From the Highline* is presented in Appendix A.
PERCEPTIONS FROM THE HIGHLINE

by

Brian Matthew Koenig

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CHAPTER I
INTRODUCTION

It has been a long-term ambition of mine to compose a piece for chamber ensemble featuring the electric guitar as a soloist. This thesis provided the opportunity to attempt such a compositional endeavor, resulting in the creation of *Perceptions From the Highline*, a one-movement electric guitar concerto for chamber ensemble consisting of flute, Bb clarinet, violin, cello, piano and percussion.

Electric guitarists commonly employ a vast number of effects and signal processing devices for weaving unique and colorful sonic tapestries. A key element of this composition focuses on the effect “delay” and imitating the sound it creates by distributing the repeated notes and various patterns across an ensemble of acoustic instruments.

The primary concern of the thesis is this electric guitar concerto. This accompanying paper examines musical excerpts that influenced and inspired this concept, the process of extracting musical ideas from the sound of delay, and the application of these ideas to the composition of *Perceptions From the Highline*. 
CHAPTER II

PRECEDENTS FOR THE USE OF DELAY

The sounds of reverb and slapback delay became associated with the genres of rockabilly and surf music from the late 1950’s and early 1960’s. The tape-delay echo was originally applied to vocal tracks and became a signature sound of early Sun Records recordings out of Memphis.¹ A few years later, the washed out, reverb-drenched sound of Fender became synonymous with the growing surf movement in southern California.² It is important to note that these early sounds served as inspiration for guitarists to come as the technology advanced. The three guitarists discussed in this chapter fall into this category, and their inclusion in this thesis was based upon their overall impact on me as a composer and guitarist. The provided excerpts had a direct influence on the construction of the textures in Perceptions From the Highline.

Andy Summers of the Police combined a background in jazz and classical guitar with a sophisticated use of multiple effects for many songs from the Police repertoire. Their 1979 album Reggatta de Blanc features the electric guitar played through an analog tape delay device known as an Echoplex. Rock journalist Vic Garbarini describes the resulting sound by writing, “…Andy’s guitar was the orchestral web that not only

² Ibid., 145.
supported and complemented the vocals and Sting’s clever bass lines but also locked in with Stewart’s imaginative drumming.” Commonplace rock and blues rhythms become something a bit more complex when played in conjunction with the delay effects in the song “Deathwish” which “… is treated with a Bo Diddley rhythm and given a modern edge by using the Echoplex.” A short excerpt of Summers’ guitar part from “Deathwish” is transcribed in Figure 1.

![Figure 1. Rhythm guitar excerpt from “Deathwish”, 0:19 – 0:27.](image)

The top line represents the guitar part as it is played and devoid of effects, while the second line demonstrates the total sound generated when the delay is applied. The delay time is set to one-quarter note at the tempo of 180 beats per minute. The delay is not necessary in this case to complete or fill out the rhythmic texture, but it does give the impression of a double tracked guitar part. The chordal accents become doubled while the delay creates a steady stream of open D notes on the bottom of the staff. In measure 3, the phrasing is altered to begin on beat two in order to allow the single note tag to come to

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5 Following standard notational practice, all guitar excerpts in this thesis sound an octave lower than written.
a conclusion. While the texture of this riff is not specifically duplicated in *Perceptions From the Highline*, it did influence some of the more atmospheric sections of the piece.

At approximately the same time, Eddie Van Halen appeared with his namesake band to become widely influential in terms of electric guitar technique, tone and effects. The guitar solo piece “Cathedral” from 1982’s *Diver Down* album was my introduction to delay as a means of generating a new musical line with rhythms twice as fast as the original line. To achieve this rhythmic doubling, a delay effect is programmed to generate a single, dry repeat of equal volume to the original note. The length of the repeat, as measured in milliseconds, is set as a function of the tempo in beats per minute to sound three sixteenth notes, or a dotted eighth note after the initial attack. When a set of straight eighth notes is performed with this setting, the total result becomes a line of sixteenth notes as the delay-generated notes fall between the eighth notes. Figure 2 is an excerpt from “Cathedral”.

![Figure 2. Excerpt from “Cathedral”, 0:18 – 0:25.](image)
In performance, Van Halen hammers arpeggios on the fret board with his left hand while manipulating the volume control of the guitar with his right hand. This obscures the attack of the guitar, therefore producing a sort of synth or bowed string type effect. It is essential that this excerpt be performed with rhythmic evenness and metronomic accuracy; otherwise the desired sixteenth note effect will quickly deteriorate in terms of clarity and rhythmic stability.

The guitarist Nuno Bettencourt of the band Extreme also used this delay generated sixteenth note technique for a short composition that appears on the band’s 1990 album *Pornograffiti* entitled “Flight of the Wounded Bumblebee” as an introduction to the album track “He Man Woman Hater”. At a tempo of 200 beats per minute, the lines that are generated would be impossible to play any other way at that speed.

![Figure 3. Excerpt from “Flight of the Wounded Bumblebee”, 0:20 – 0:25.](image)

In this piece, the notes are played with a pick, and a preprogrammed drum track provides sixteenth notes to ensure metronomic evenness and precision. Bettencourt additionally employs a technique known as *palm muting* to give the notes a staccato and percussive
sound that contributes to the clarity of the overall texture. Both of these guitar solos provided a specific model that was incorporated as a starting point to creating full-ensemble textures in *Perceptions From the Highline*.

An alternative influence may be observed in compositions featuring acoustic treatments of a delay effect. *Hout* by Louis Andriessen is a quartet for tenor saxophone, marimba, electric guitar and piano. The four parts play identical or nearly identical lines, with each part being offset by one sixteenth note. The overall effect is comparable to a “slapback” echo, or a fast single-delay repeat of comparable volume.

The score order used by Andriessen matches the arrangement of entrances within the texture. The tenor saxophone leads the ensemble for the entirety of the piece due to its sharpness of attack and timbre. Harder mallets are used on the marimba to create a similarly sharp and defined sound, which is scored to immediately follow the saxophone. The piano contributes to the blending of the ensemble as the last of the four instruments to play. Interestingly enough, the guitar blends in so well in many passages that it often becomes indistinguishable. Notes played on the lower or wound strings tend to blend in, while notes on the higher plain strings are typically more noticeable in the overall texture. Being placed third in the order of entrances also contributes to the guitar blending in. It is worth noting that the piece relies entirely on this hierarchy of timbre and attack to create the delay texture. In the opening measure of the piece, all four parts are labeled “fortissimo sempre”, indicating that neither staggered dynamics nor softer echoes contribute to the delay effect. By turning the tone control on the guitar down half way and decreasing the treble in the equalization, the timbre fits more convincingly in its
assigned position of the delay structure. From a compositional perspective, the concept of timbral hierarchy became an important factor in the formation of delay passages in Perceptions From the Highline.
CHAPTER III

EXAMPLES OF DELAY SCORING IN PERCEPTIONS FROM THE HIGHLINE

Scoring delay textures generated from the electric guitar for acoustic instruments is one of the major compositional processes at work in Perceptions from the Highline. This section of the paper will examine four different delay textures as they appear in the piece.

One of the more commonly observed delay effects involves one or more repeats of the source signal with each subsequent echo getting quieter, or receding into the distance. This sound was first conceived with the process of sending a tape recorded sound back to the input of a three-head tape recorder. The length of the tape determines the length of the echo, and the volume of the original signal determines the volume of the echoes. This sound can be recreated acoustically using a combination of timbral hierarchy, as discussed in Hout from the previous chapter, and staggered dynamic markings. Figure 4 represents the passage from measures 85-88.

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The clarinet plays the immediate echo down two dynamic levels from the guitar, followed by the flute one dynamic softer than the clarinet. The use of consistent articulations as well as decrescendos in the woodwinds contributes to the impression of a delayed signal getting quieter. In a fashion similar to the opening unison passage, the sixteenth notes of the guitar part in measure 88 are strictly picked as opposed to the slur-two, tongue-two patterns of articulation in the flute and clarinet. Not only does this change provide rhythmic clarity, but also allows the guitar to crescendo more effectively to the top of the run.

An obvious deviation from the delay procedure appears immediately with the consideration of pitch. By design, the delay has limitations due to its inherent inflexibility when used with the guitar. The delay time, as well as other parameters, is usually static and unable to be adjusted mid-phrase without a break in the playing or switching to a new preprogrammed sound. An advantage of scoring delay patterns and textures for acoustic

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7 All Bb Clarinet excerpts appearing in this paper are notated at concert pitch.
instruments involves being able to manipulate pitch, rhythm and length of delay all in real time as needed. An independent processor for pitch shifting is necessary in the signal chain of the guitar if such an effect is desired, and most pitch shifting units effect the entire signal (source and resultant delay) by a set parameter or interval. The scoring throughout this piece takes advantage of the ability to freely manipulate pitch that would be difficult to duplicate with traditional effects pedals alone.

A similar effect is achieved starting in measure 126. The delay is given a staccato articulation and passed across the cello and violin with pizzicato attacks. In this instance, the octave displacement of the violin pizzicato helps the third echo to be audible and distinct. While the woodwind passage maintains the rhythm of the delay pattern, the pizzicato section purposefully accelerates the rhythm to temporarily invoke a sense of chaos and disorder. As the cello and violin attempt to follow the gesture of the guitar, the passage is abruptly cut off, as if the delay pedal had suddenly been disengaged.

![Figure 5. Strings delay section, mm. 126-129.](image)
The process of converting an unaffected eighth note line on the guitar to an ensemble-wide composite sixteenth note texture will be described thoroughly in this next section. The first step, the same process used in “Cathedral” and “Flight of the Wounded Bumblebee” is outlined in Figure 6. To reiterate, the crucial elements necessary to create this sound involve a single repeat of equal volume and a delay length of three sixteenth notes at the given tempo in beats per minute.

![Figure 6. Eighth note to sixteenth note delay process.](image)

The two passages of *Perceptions From the Highline* based on this process were originally conceived by playing the parts on the electric guitar with a digital delay. Once a suitable eighth note pattern was devised, the entire texture was recorded with a looping pedal. After listening for many minutes, melodic fragments began to emerge from the overall texture. The fragments used to reconstruct the texture are listed in Figure 7.
Figure 7. Melodic fragments derived from the delay texture.

From here, the fragments are assigned to different parts of the ensemble. The electric guitar provides the skeletal framework of the texture with staccato eighth notes, while the ensemble assumes the role of the delay effect. Articulations are added to mimic the staccato attack of the guitar as well as emphasize the sixteenth notes on the “e” and “a” of each beat that complete the texture. As this passage continues, the pitch of the melodic fragments is shifted from the original pattern. The diatonic arrangement of these passages lends itself to multiple possibilities for transposition that flesh out the implied chords without compromising the general harmonic character.
The clarinet is given what I consider to be the primary melodic gesture to emerge from this texture. The flute and violin are assigned gestures that are more accentual. These accents are reinforced in the treble staff of the piano part in a way that combines the two different accent patterns. The cello and the bass staff of the piano account for the
harmonic foundation of the passage and reinforce the motion of the texture with a syncopated rhythm. Both of these passages set up the statement of the main guitar theme.

When a delay is set to an extended number of repeats without decreasing in volume, the individual lines eventually accumulate into a hazy, atmospheric texture. In mm. 70-79, the electric guitar temporarily takes an accompanying role by playing four note chords with a combination of the pick and fingers, also known as hybrid picking. The resulting dyads are passed to and from the lower registers of the clarinet and flute as a way to emulate a longer and slowly building delay texture with gradual shifts in notes and harmony. This process still provides a harmonic and rhythmic background to the cello theme while blurring the individual gestures.

Figure 9. Atmospheric delay texture, mm. 71-73.

An additional way of manipulating the sound of delay is with a parameter known as ducking. Ducking controls the level of delay based upon the activity of the source signal. Therefore, the delay is only activated where there is space for it to be audibly noticed. This helps the original line maintain clarity and distinction when the delay might
not necessarily be desired. This approach is manifested in the clarinet during the final statement of the theme at measure 200. An exact duplication of this theme offset by any rhythmic value would produce a line that is perceived as separated, like a round or fugue entry, rather than a controlled facet of the original line. The result would also be largely dissonant both in terms of harmony and rhythm. By applying a ducking technique to the clarinet, the delay effect is present enough to be noticed without infringing upon the melodic and harmonic progression. The acoustic reproduction of these delay textures is one of the main unifying compositional concepts in *Perceptions From the Highline.*
BIBLIOGRAPHY


APPENDIX A

SCORE OF PERCEPTIONS FROM THE HIGHLINE
Perceptions From the Highline

For Electric Guitar and Chamber Ensemble

Brian Koenig

2013
Perceptions From the Highline

Program Notes

The Highline is an old above ground railway on the lower west side of Manhattan that has been converted into a nature walk abounding with flower beds, sculptures and art instillations. The contrasting sections of this electric guitar concerto for chamber ensemble depict the juxtaposition of the Highline with the bustling city below.

Performance Notes

The electric guitar part should be performed with a semi-hollow body guitar outfitted with humbucking pickups. It is encouraged that the soloist set the tone control on the guitar ¼ to ½ way down, but adjust as necessary according to taste. If a different guitar is used, the goal should be to make the overall tone blend in with the ensemble as much as possible.

A tube amplifier is ideal for this piece to generate a sound that is warm and reminiscent of traditional jazz guitar tones. Otherwise the goal should be to get a clean sound that blends with the ensemble with no added effects.

With the designation in the parts of “echoing the guitar”, all attempts should be made to match the nuances of the guitar part at the designated dynamic level.

The percussion part is written for cajon using the following key:
Perceptions from the Highline
for Electric Guitar and Chamber Ensemble

Electric Guitar

Flute

Clarinet in B♭

Violin

Cello

Piano

Percussion

Transposed Score

©
Perceptions from the Highline
Perceptions from the Highline
Perceptions from the Highline
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

Bb Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline
Perceptions from the Highline
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.

with pedal
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

B.s Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

B Cl.

Vln.

Vlc.

Pno.

Perc.

Lay back slightly

With pedal
Perceptions from the Highline
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

B. Cl.

Vln.

Vlc.

Pno.

Perc.

\(\text{legato}\)
Perceptions from the Highline

E.Gtr.

With Pick and Fingers
Let Ring

Fl.

pp

Bb Cl.

pp

Vln.

pp espress.

Vlc.

p

Pno.

p

molto legato

Perc.

ppp

* with pedal
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.

a la Lenny Breau
let ring

mp

mf

pp
delicately

Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.

echoing the guitar

f

p

mp
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

With Restrained Energy

Fl.

B. Cl.

With Restrained Energy

Vln.

f

pp

Vlc.

p

Pno.

p

Perc.

With Restrained Energy
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

Mysterious

E.Gtr.

Fl.

Bb Cl.

Vln.

Vlc.

Pno.

Perc.

Mysterious with pedal

molto legato
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

tongue stop

B. Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

With Pick and Fingers
Let Ring

accel.

E.Gtr.

Fl.

B♭ Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

B♭ Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

Free Time

E.Gtr.

Fl.

Bb Cl.

Free Time

Vln.

Vlc.

Pno.

Free Time

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bb Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

arco

mp

Vlc.

mp

Pno.

Perc.
Perceptions from the Highline
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

Bb Cl.

Vln.

Vlc.

Pno.

Perc.

\( \frac{1}{110} \)

let ring

\( \frac{1}{110} \)

\( \frac{1}{110} \)

\( \frac{1}{110} \)
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.

203
Perceptions from the Highline

Lay back slightly

E.Gtr.

Fl.

Bb Cl.

echoing the guitar

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline
Perceptions from the Highline

E.Gtr.

226

Fl.

B Cl.

Vln.

Vlc.

Pno.

Perc.
Perceptions from the Highline

E.Gtr.

Fl.

Bs Cl.

Vln.

Vlc.

Pno.

Perc.