

**STEVEN SNOWDEN**

**GROUND ROUND**

***FOR TROMBONE  
AND ELECTRONICS***

# GROUND ROUND

COMMISSIONED BY  
STEVEN PARKER

This piece employs live audio processing techniques via the Max/MSP programming language. The included program files can be executed with Max/MSP Runtime, which can be downloaded for free at <http://cycling74.com/downloads/>

## Required equipment:

1 microphone  
1 mic stand  
1 computer with Max/MSP Runtime installed  
1 digital audio interface with at least 1 mic preamp (either usb or firewire)  
1 pair of loudspeakers (powerful enough to compete with the live trombone at high dynamic levels)  
Cables and power supplies to connect and run all of the above items  
For technical support, feel free to contact me at [stevensnowden@gmail.com](mailto:stevensnowden@gmail.com)

## Program Notes:

For the past couple of years, I have had a bit of a fascination with the unique sound of cattle auctioneers in the United States. Their chant presents specific rhythms, pitches and cadences that serve to intensify the auction process and encourage rapid bidding. The end result is a uniquely musical and mesmerizing form of communication. After listening to and watching several auctions, I decided that this could be successfully explored by utilizing the unique voice-like characteristics of the trombone in conjunction with live electronics.

After working on this piece for a while, I couldn't help but think of how strange the auction process must be for the cows themselves. Ultimately, this dictated the form of the piece and caused me to produce something more darkly humorous than I had originally intended.

Here's one particular narrative that was running through my mind while composing this piece...

For as long as you can remember, you've done nothing but chew your cud and moo; sharing your field with dozens of other cows doing exactly the same. Then one fateful morning, you're whisked away to a strange, bustling place where everyone is focused on you for once. Is this your chance to be a star? Should you show them your new tap routine? Was that David Hasselhoff in a cowboy hat over there? Whoa, just play it cool. Ok. Focus. Just do what you do best. Just... Look... Delicious.

## Performance Notes:

Interpretation of the first two minutes of this piece is left largely up to the performer. Rhythmic and pitch elements may vary according to the style of the individual, though the time stamps at the beginning of each system should be observed in performance. I have included detailed notation of these first two minutes merely as an example of one possible interpretation.

The duration of all glissandi should occupy the entire rhythmic value of first note to which they are attached.

The chorale section on the last page uses only the audio signal of the live performer for all four contrapuntal voices. The result is a trombone choir comprised of multiple copies of the live performer. Because of this, a great deal of liberty can be taken with tempo, articulation and dynamics and all other voices will do exactly the same.

This piece utilizes a fixed audio track as well as live audio processing. These live processing techniques include:

**Reverb** – The amount of reverb (wet to dry mix) can be adjusted according to the acoustics of the performance space.

**Fixed rate delay** – Employed for much of pages 3-5 of the score. The volume of each individual delay line can be adjusted.

**Variable rate delay** – Employed for much of pages 1-2 of the score. This type of delay produces a less predictable result than the fixed rate delay and will also produce a subtle pitch-shifting effect.

**Amplitude Envelope Follower** – Tracks the amplitude of the live performer and adjusts the amplitude of a looping auctioneer chant accordingly. The end result can be described as a composite trombone/auctioneer timbre.

**Real-Time Pitch Tracker** – analyzes and tracks the live performer's pitch during performance.

**Real-Time fff Contrapuntal Harmonizer** – Receives the incoming data from the *Real-Time Pitch Tracker* and pitch shifts three additional independent contrapuntal voices according to a preprogrammed chorale. This occurs on the last page of the score. Because it is analyzing and resynthesizing the incoming audio signal, the performer can take any desired liberties with tempo, dynamics and rhythm in this section. However, it must receive the notated pitches in order to correctly resynthesize the chorale. The number of each pitch required by the Harmonizer is listed under each note on the last page of the score and the number of the note currently being harmonized is shown on the computer screen. If incoming audio signal from the mic is too low or if the performer's pitch wavers more than a quarter step from what is notated, the Pitch Tracker may not work as intended. However, if this should occur during performance (the harmonizer will only present parallel harmonies based on it's last chord) the player can simply return to the pitch listed on the screen and continue with the chorale from there.

#### Extended Technique Notation Key

The diagram illustrates various extended techniques for trombone on a two-staff system. The top staff includes: 'air and exaggerated tonguing sounds only' (marked with an 'x'), 'approximate pitch' (marked with a wavy line), 'rapidly wiggle slide position within a few inches of the notated pitch' (marked with a wavy line over a note), and 'rapidly move slide from 1st to 7th position while playing (ref. Berio Sequenza V)' (marked with a sequence of notes and the numbers '1 3 5 7 5 3 1...'). The bottom staff includes: 'very rapid doodle tongue' (marked with a series of rapid notes), 'plunger mute open' (marked with an 'o') and 'plunger mute closed' (marked with a '+'), 'slide glissando (lasts for full note value of 1st pitch)' (marked with a long horizontal line), and 'fall (both slide and embouchure)' (marked with a downward arrow).

# Ground Round

for Trombone and Electronics

Steven Snowden

Very free, but roughly within the provided time stamps

with plunger mute

*mp* *mp* *pp* *mf* *p*

0:16

*p* < *mp* > *p* > *ppp* *p* < *mf* > *p* > *ppp*

0:30

*p* < *mf* > *p* > *pp* *p* < *mf* > *p* > *pp*

0:40

*ftr.*

*p* < *mf* > *mp* > *pp* *f* > *mf*

0:52

*p* < *mp* > *p* > *mp*

0:58

*p* < *mp* > *p* > *mp* *p* < *mp* > *p* > *mp*

1:02

*p* < *mp* > *p* > *mp* *p* < *mp* > *p* > *mp*

1:08

*p* < *mp* > *p* > *mp* *p* < *mp* > *p* > *mp*

1:12

gradually loses pitch center and becomes only exaggerated tonguing sounds

*mp* *ppp mp* *p* *mp mf* *p*

1:16

pp mp p mp pp p mp p

Detailed description: This system shows musical notation for the time signature 1:16. It features a bass clef and a series of notes with various dynamics. Above the staff, there are several groups of notes marked with a circled plus sign (+). Below the staff, dynamic markings include *pp*, *mp*, *p*, *mp*, *pp*, *p*, *pp*, *p*, *mp*, and *p*. Slurs and hairpins indicate the phrasing and volume changes.

1:20

mf p mf mp pp mp

Detailed description: This system shows musical notation for the time signature 1:20. It features a bass clef and notes with various dynamics. Above the staff, there are several groups of notes marked with a circled plus sign (+). Below the staff, dynamic markings include *mf*, *p*, *mf*, *mp*, *pp*, and *mp*. Slurs and hairpins indicate the phrasing and volume changes.

1:28

p mp p mp

Detailed description: This system shows musical notation for the time signature 1:28. It features a bass clef and notes with various dynamics. Above the staff, there are several groups of notes marked with a circled plus sign (+). Below the staff, dynamic markings include *p*, *mp*, *p*, and *mp*. Slurs and hairpins indicate the phrasing and volume changes.

1:32

mp mf pp mf p

Detailed description: This system shows musical notation for the time signature 1:32. It features a bass clef and notes with various dynamics. Above the staff, there are several groups of notes marked with a circled plus sign (+). Below the staff, dynamic markings include *mp*, *mf*, *pp*, *mf*, and *p*. Slurs and hairpins indicate the phrasing and volume changes.

1:36

mp p mf p mp f p f p f p mf

Detailed description: This system shows musical notation for the time signature 1:36. It features a bass clef and notes with various dynamics. Above the staff, there are several groups of notes marked with a circled plus sign (+). Below the staff, dynamic markings include *mp*, *p*, *mf*, *p*, *mp*, *f*, *p*, *f*, *p*, *f*, *p*, and *mf*. Slurs and hairpins indicate the phrasing and volume changes.

1:42

f p mp ff mp f p mp

Detailed description: This system shows musical notation for the time signature 1:42. It features a bass clef and notes with various dynamics. Above the staff, there are several groups of notes marked with a circled plus sign (+). Below the staff, dynamic markings include *f*, *p*, *mp*, *ff*, *mp*, *f*, *p*, and *mp*. Slurs and hairpins indicate the phrasing and volume changes.

1:46

55 = 120 Metronome Starts Here

ff p mp f mp p

Detailed description: This system shows musical notation for the time signature 1:46. It features a bass clef and notes with various dynamics. Above the staff, there are several groups of notes marked with a circled plus sign (+). Below the staff, dynamic markings include *ff*, *p*, *mp*, *f*, *mp*, and *p*. Slurs and hairpins indicate the phrasing and volume changes.

1:50

set down plunger mute

mf mp ppp

Detailed description: This system shows musical notation for the time signature 1:50. It features a bass clef and notes with various dynamics. Above the staff, there are several groups of notes marked with a circled plus sign (+). Below the staff, dynamic markings include *mf*, *mp*, and *ppp*. Slurs and hairpins indicate the phrasing and volume changes.

♩ = 120

Gavel **strictly in tempo**

59 *p* < *mp* *pp* *f* *mf* *pp* < *mf* *f* *mf* *pp*

63 *f* *pp* *f* *pp* < *f* *mp* < *mp* <

65 *f* *p* < *mf* < *f* *p* < *f* *mf* < *f* *mf* < *f*

68 *mp* *f* *ff* *p* *f*

Elec. *f*

granulated texture sweeping upward

71 *pp*

74 *ppp* *mf* *f*

Elec. *ppp* *mf* *f*

Musical notation system 1: Bass clef, 6/4 time signature. Main staff contains melodic lines with dynamics *mf*, *ff*, *f*, and *mf*. A triplet of eighth notes is marked with a '3' and a bracket. The 'Elec.' staff below shows a bass line with sustained notes.

Musical notation system 2: Bass clef, 6/4 time signature. Main staff contains melodic lines with dynamics *mp*, *mf*, *f*, *p*, *mf*, *mf*, *p*, and *f*. The 'Elec.' staff below shows a bass line with sustained notes.

Musical notation system 3: Bass clef, 6/4 time signature. Main staff contains melodic lines with dynamics *p*, *mf*, and *sf*. A triplet of eighth notes is marked with a '3' and a bracket. The 'Elec.' staff below shows a bass line with sustained notes.

Musical notation system 4: Bass clef, 6/4 time signature. Main staff contains melodic lines with dynamics *p*, *mp*, *mf*, *mp*, and *p*. The 'Elec.' staff below shows a bass line with sustained notes.

Musical notation system 5: Bass clef, 6/4 time signature. Main staff contains melodic lines with dynamics *mp*, *mf*, *pp*, *ff*, and *pp*. The 'Elec.' staff below shows a bass line with sustained notes and a 'gritty pulse' of sixteenth notes in the treble clef.

Musical notation system 6: Bass clef, 6/4 time signature. Main staff contains melodic lines with dynamics *ff*, *mp*, *f*, and *mp*. Triplet markings are present. The 'Elec.' staff below shows a bass line with sustained notes and a treble clef staff with sixteenth notes.

5

*mf* <sup>3</sup> *mf* *f* *p* *p*

Elec.

100

*f* *mp* *sf*

Elec.

105

*p*

Elec.

109

13575313575 ...

auctioneer chorale ♩ = 120

*ff* *mf* *fff* *p*

Elec.

112

*ff* multi auctioneer chants  
repitched to chorale

Elec.

117



fft harmonizer begins tracking pitch

1 *p* 2 3 4 5 6 7 8 *mp* 9 10 11 *p*

Chorale shifts from repitched auctioneer samples to the real-time fft harmonizer

12 *mp* 13 14 15 16 17 18 19 20 21 22 23 24

*Tempo Rubato*

25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

*mf* *mp* *pp*

43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58

*mp* *mf* *p*

59 60 61 62 63 64 65 66 67 68 69 70 71 72

*mp* *mf* *mp*