

Rand Steiger

# Inward

(2017)

string quartet and electronics

for the JACK String Quartet

**Premiere:** JACK Quartet, November 29, 2018; Conrad Prebys Concert Hall, U.C. San Diego

**Program Note:** *Inward* is the middle work of a trilogy of pieces for string quartet and electronics. Unlike *Undone*, which musically speaks to my despair over recent political developments, I have here intentionally turned inward and attempted to block out the world around me, taking solace in pure sound. The piece deploys digital signal processing to enrich the sound of the instruments in various ways and to distribute the sound among eight speakers that encircle the audience to create a more immersive and expansive soundscape. *Inward* was written for and is dedicated to the JACK Quartet, in recognition of their inspiring musicality and adventurous artistic vision.

**Electronics:** A laptop computer running Miller Puckette's Pd software is used to signal process the sound of the instruments in a variety of ways throughout the piece. Hypercardioid microphones (preferably instrument attached) are to be used on all instruments and are routed directly to the computer audio interface. Eight channels of processed sound are then returned to the house system to be played back through eight speakers surrounding the audience. The electronic processing follows the performance, and therefore the quartet has complete interpretive freedom. The score indicates what processes are active throughout the piece. Much of the time the processing pitch and time shifts the notes played by the quartet, producing additional voices. All of the indicated pitches are generated in realtime from the sound of the live quartet.

**Dynamics:** The dynamic marking *n* is frequently used to indicate notes that begin imperceptibly and gradually fade in over the length of the indicated crescendo. Similarly, decrescendos that end at a rest without a dynamic marking indicate a complete diminuendo to silence. Please note the starting and ending points of these transitions precisely.

**Accidentals and Microtonality:** Accidentals carry through the length of the bar, but only in the octave in which they appear, although there are frequently redundant accidentals to avoid ambiguity. Microtonal tunings are indicated with numbers for cent adjustments (for example, -31.) In addition, the following microtonal accidentals are used:



31 cent flat      quartertone flat      quartertone sharp

**Other conventions:**

A square notehead indicates over-pressure, or "bow distortion" which should always produce noise and not a clear pitch.

**Contact:**

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Additional information may be found on the following web site:  
**http://rand.info**

for the JACK Quartet  
**Inward**

3 minutes

$\bullet = 60$

Violin I

Violin II

Viola

Cello

DSP

*f*

*nv*

*n*  $\rightarrow$  *mf*

*nv*

*n*  $\rightarrow$  *mf*

*nv*

*n*  $\rightarrow$  *mf*

*f*

gradually introduce resonance, pitch shifting, and then phase shifting

continues on v2, vla, and vc

continues on vla, and vc

continues on vc

5

Vln. I

Vln. II

Vla.

Vc.

*nv*

*n*  $\nabla$  *mf*

5

dsp

resonance only

J1 harmonizing, each new pitch fades in from niente

9"

9"

9"

12"

-29

-12

+41

-49

-31

9  $\text{♩} = 60$

Vln. I

Vln. II

Vla.

Vc.

9 dsp

The image shows a musical score for a string quartet and a DSP section. The score is divided into two systems. The first system contains staves for Violin I, Violin II, Viola, and Violoncello. The second system contains a DSP (Digital Signal Processing) section with two staves. The tempo is marked as quarter note = 60. The score shows a series of notes with dynamic markings and a crescendo hairpin in the DSP section.

13

Vln. I

Vln. II

Vla.

Vc.

dsp

13

7"

8"

7"

6"

*n*

*mf*

+41

+28

-31

-2

-12

-49

-29b

+6

Detailed description: This is a page of a musical score, page 4, featuring five staves. The top four staves are for Violin I (Vln. I), Violin II (Vln. II), Viola (Vla.), and Violoncello (Vc.). The bottom staff is for DSP. The score is divided into six measures. The first measure starts at measure 13. The Vln. I staff has a treble clef and a key signature of one sharp (F#). The Vln. II, Vla., and Vc. staves have treble clefs. The DSP staff has a treble clef. Dynamics are marked as *n* (piano) and *mf* (mezzo-forte). Fingerings are indicated by numbers 7, 8, and 6 in double quotes. The DSP staff includes various performance markings such as +41, +28, -31, -2, -12, -49, -29b, and +6. The DSP staff also has a measure number 13 at the beginning.

19 10" ♩ = 60

Vln. I

Vln. II

Vla.

Vc.

dsp

Jl harmonizing continues

49

29

41

31

12

This musical score page, numbered 6, features five staves: Violin I (Vln. I), Violin II (Vln. II), Viola (Vla.), Violoncello (Vc.), and DSP. The score begins at measure 26. The Violin I, II, and Viola parts are written in treble clef, while the Violoncello part is in bass clef. The DSP part is in treble clef. The music consists of sustained notes with various dynamics and articulations. Dynamics include *n* (piano) and *mf* (mezzo-forte). Articulations include accents and slurs. A specific measure in the Violin I part is marked with a circled -49. The DSP part includes fingerings (e.g., 5, 4, 3) and a circled +7. The bottom of the page is marked with a circled -31.

This musical score page features five staves: Vln. I, Vln. II, Vla., Vc., and dsp. The Vln. I, Vln. II, and Vla. staves are in treble clef, while the Vc. staff is in bass clef. The dsp staff is in treble clef. The music is in 3/4 time. The Vln. I, Vln. II, and Vla. parts consist of sustained notes with long horizontal lines above them, indicating sustained sounds. The Vc. part has a dynamic marking that changes from *n* (piano) to *mf* (mezzo-forte) with a wedge-shaped hairpin. The dsp part includes several dynamic markings: -29, -12, -27, -14, and -31, which likely represent volume levels or processing parameters. The page number 32 is written at the beginning of each staff.



43

Vln. I

Vln. II

Vla.

Vc.

43

dsp

*ff*

*ff*

*ff*

*ff*

9"

26"

8"

diminuendo al niente  
over six seconds

long resonance of previous chord  
that rises in frequency as it fades

resonance, pitch shifting, and phase shifting  
on all overpressure sounds until they fade

48

Vln. I

8''

8''

8''

diminuendo al niente over six seconds

10''

*pizz.* (fast and irregular)

*mp~mf*

Vln. II

8''

diminuendo al niente over six seconds

*pizz.* (fast and irregular)

*mp~mf*

Vla.

diminuendo al niente over six seconds

*pizz.* (fast and irregular)

*mp~mf*

Vc.

*pizz.* (fast and irregular)

*mp~mf*

48

dsp

resonance, pitch shifting, and phase shifting continue on overpressure sounds; pizz. notes are harmonized and repeated with delays

52      35 ~ 45"      ♩ = 60      arco nv -12

Vln. I

Vln. II

Vla.

Vc.

52

dsp

harmonizing and multi-tap delay

resonance processing with long decay time through the end of the piece

pizzicato texture continues then fades out and rises in pitch

*n* *p* *n* *p* *n* *p* *n* *p*

13"  $\bullet = 42$

58

Vln. I

Vln. II

Vla.

Vc.

58

dsp

+41  
-29  
(-49)

J1 harmonizing while resonance continues

The image shows a page of a musical score for five parts: Vln. I, Vln. II, Vla., Vc., and dsp. The score is in 5/4 time. At the top, there is a tempo marking of 42 and a scale marking of 13". The Vln. I part starts at measure 58 and features a melodic line with a slur over the first four measures. The Vln. II, Vla., and Vc. parts also start at measure 58 and feature a similar melodic line with a slur. The dsp part starts at measure 58 and features a series of notes with a slur. A box with the text "J1 harmonizing while resonance continues" is located in the dsp part. The score is written in black ink on a white background.

63

Vln. I

Vln. II

Vla.

Vc.

*(nv)*

*(nv)*

*(nv)*

*moderate vibrato*

*n* *mf*

63

+41  
-29  
(-49)

+41  
-29  
(-49)

63

dsp

cello note continues with looping delay

Detailed description: This page of a musical score covers measures 63 to 66. It features five staves: Vln. I, Vln. II, Vla., Vc., and dsp. The Vln. I, Vln. II, and Vla. staves play a melodic line of quarter notes with long slurs, marked with *(nv)*. The Vc. staff has a melodic line in the first two measures, then a rest, and then a melodic line starting in measure 4 with a *moderate vibrato* marking. Dynamics *n* and *mf* are indicated with hairpins. The dsp staff contains complex chordal textures with dynamic markings *+41*, *-29*, and *(-49)*. A text box at the bottom of the dsp staff states "cello note continues with looping delay".

68

Vln. I

Vln. II

Vla.

Vc.

*n* *mf* *n* *mf* *n* *mf* *n*

(-31)

68

dsp

68

+41  
-29  
(-49)

Detailed description: This page of a musical score contains six staves. The top four staves are for Violin I, Violin II, Viola, and Violoncello. The fifth staff is for DSP (Digital Signal Processing) and the bottom staff is an unlabeled staff. The Vln. I, Vln. II, and Vla. parts consist of sustained notes with long, sweeping slurs. The Vc. part features a melodic line with dynamic markings *n* (piano) and *mf* (mezzo-forte) and a performance instruction (-31) above a specific note. The DSP staff shows a complex waveform with numerical annotations: +41, -29, and (-49). The bottom staff contains a simple bass line with long slurs. The page number 14 is in the top left corner, and the measure number 68 is repeated at the beginning of each staff.

72

Vln. I

Vln. II

Vla.

Vc.

*mf* *n* *mf* *n* *mf* *n* *mf* *n*

72

72

72

dsp

72

The musical score consists of six staves. The top five staves are for Vln. I, Vln. II, Vla., and Vc. The bottom staff is labeled 'dsp'. The Vc. staff includes fingerings (-49), (+41), and (-31). Dynamic markings *mf*, *n*, and *p* are present. Measure numbers 72, 73, 74, and 75 are indicated. The Vln. I staff has a *p* marking in measure 75. The dsp staff has a key signature change to B-flat major in measure 75, with fingerings +41, -29, and -49.

76

Vln. I

Vln. II

Vla.

Vc.

dsp

76

(-29)

*n* *p*

*moderate vibrato*

*n* *mf*

*n* *p*

*mf* *n* *mf*

*n* *p*

*nv*

(-49)

-29  
-12

+41  
-31

Detailed description: This page of a musical score covers measures 76 to 79. It features five staves: Violin I (Vln. I), Violin II (Vln. II), Viola (Vla.), Violoncello (Vc.), and Double Bass (dsp). The Violin I part begins with a dynamic marking of *n* (pianissimo) in measure 76, which transitions to *p* (piano) in measure 77. The Violin II part starts with a *moderate vibrato* instruction in measure 77, with dynamics of *n* and *mf*. The Viola part has dynamics of *n* and *p*. The Violoncello part starts with *mf* (mezzo-forte) in measure 76, then *n* and *mf* in measure 77, and *n* and *p* in measure 79. The Double Bass part includes dynamic markings of *nv* (non vibrato) and *p*. Performance instructions include hairpins for dynamics and specific fingering or breath marks such as (-29), (-49), -29, -12, +41, and -31. The score is written in treble clef for the violins and bass clef for the lower strings.

81

Vln. I

Vln. II

Vla.

Vc.

81

dsp

81

-25

-49

*mf*

*p*

*mf*

*p*

*n*

*p*

*n*

*p*

*n*

*p*

29

41

31

41

29

12

41

81

(-49)

87

Vln. I

Vln. II

Vla.

Vc.

87

dsp

87

*mf*

*nv*

*p*

*p*

This musical score page, numbered 18, contains measures 87 through 91. It features five staves: Violin I (Vln. I), Violin II (Vln. II), Viola (Vla.), Violoncello (Vc.), and DSP. The Vln. I staff begins with a treble clef and a key signature of one flat. The Vln. II staff includes dynamic markings *mf* and *p*, and a hairpin crescendo leading to *nv*. The Vla. staff uses an alto clef. The Vc. staff uses a bass clef and includes dynamic markings *mf* and *p*. The DSP section consists of two staves with treble clefs. The score includes various musical notations such as slurs, ties, and dynamic hairpins. Time signatures of 4/4 and 5/4 are indicated at the beginning of measures 89 and 90.

92

Vln. I

Vln. II

Vla.

Vc.

92

dsp

resonance only  
through to the end

*mp*

3

Detailed description: This is a page of a musical score, page 19, starting at measure 92. It features five staves: Vln. I, Vln. II, Vla., Vc., and dsp. The Vln. I and Vln. II staves are in treble clef and play a melodic line of eighth notes with a slur over each pair. The Vla. staff is in alto clef (C4) and plays a more complex melodic line with slurs and a triplet. The Vc. staff is in bass clef and plays a simple melodic line of eighth notes with a slur over each pair. The dsp staff consists of two empty staves with a text box indicating 'resonance only through to the end'. A dynamic marking of *mp* is present in the Vla. staff, and a triplet marking of '3' is also present.

96

Vln. I

Vln. II

Vla.

Vc.

96

dsp

*p*

allow resonance to decay completely

**FINE**

14.8.17.10.17.26.13

Detailed description: This is a page of a musical score for five staves. The top four staves are for Violin I, Violin II, Viola, and Violoncello. The bottom staff is for DSP (Digital Signal Processing). The score begins at measure 96. The Violin I and II parts play a melodic line of quarter notes with slurs. The Viola part plays a similar melodic line, starting with a piano (*p*) dynamic. The Violoncello part plays a lower melodic line. The DSP staff is mostly empty, with a text box in the final measure that says 'allow resonance to decay completely' followed by a dashed line. The page ends with the word 'FINE' and a sequence of numbers: 14.8.17.10.17.26.13.