

STEVEN LAMPHEAR

QUANTUM GRAVITY

FOR ELECTRIC CELLO
AND LIVE SIGNAL PROCESSING

For Craig Hultgren

About Live Looping:

This piece makes use of "live looping" techniques in which all looped material will be recorded by the performer into a loop sampler (also known as a "phrase recorder") during the performance of the piece. This allows the audience to watch the performer record each loop and hear how the different layers of sound fit together as each phrase is recorded.

The loop station used in the composition of this piece is the Boss RC-20XL, though performers should be able to use other loop stations of equal or greater sophistication with little or no modification to the score. This loop station allows for different phrases to be assigned to different slots, which the performer can select using an additional foot-switch (such as the Boss FS-5U) plugged into the RC-20XL's "Phrase Shift" jack at the back of the unit. The loops are numbered as x/y, where "x" is the phrase indicated by the "Phrase Select" knob (which can be changed by a single press of the FS-5U foot-switch) and "y" is the loop layer being recorded (in order of performance). For example, the first loop to be recorded while the "Phrase Select" knob is set to Phrase 2 will be labeled as "Loop 2/1" (in boxed text). At times, certain loop layers may need to be removed while keeping the same phrase selected; when this occurs, only the most recently recorded phrase will need to be removed, making use of the loop station's "Undo" feature.

The first three phrases of the loop station (positions 1, 2, and 3 of the "Phrase Select" knob) should be pre-set with the following tempos and time signatures to facilitate smooth quantization of the loops (this information will stay in the loop station even when no power sources are available, so this may be done in advance of the performance):

Phrase 1: 2/4 time at 75 beats per minute.

Phrase 2: 5/4 time at 75 beats per minute.

Phrase 3: 3/4 time at 110 beats per minute.

Using Pre-Recorded Loops:

If the performer would prefer not to record the looped phrases in front of the audience, or if a separate sound engineer will be operating the pedals instead of the performer, the loops may be pre-recorded and simply triggered during their initial appearances. If this method is used, prepare by starting loops 1/1 and 1/2 with the volume pedal all the way down, then begin the performance with measure 7. Because of their mid-phrase appearances, loops 1/3, 2/2, and 3/2 may still need to be recorded live unless the loop station being used allows the performer to switch between pre-recorded phrases and continue playing. If the loop station being used allows this (as the Boss RC-20XL does), the phrases should be pre-loaded in the following order:

Phrase 1: Loops 1/1 and 1/2 (1 measure of 2/4 time at 75 beats per minute).

Phrase 2: Loops 1/1, 1/2, and 1/3 (copy data from Phrase 1 and add Loop 1/3).

Phrase 3: Loop 2/1 (two measures of 5/4 time at 75 beats per minute).

Phrase 4: Loops 2/1 and 2/2 (copy data from Phrase 3 and add Loop 2/2).

Phrase 5: Loop 2/1 (copy data from Phrase 3).

Phrase 6: Loop 3/1 (four measures of 3/4 time at 110 beats per minute).

Phrase 7: Loops 3/1 and 3/2 (copy data from Phrase 6 and add Loop 3/2).

Since these phrases will be numbered differently than the phrases used when live looping, the "pedal up" symbol (*) has been placed underneath the "Live Performance" staff at each point where the next phrase is to be triggered.

Performance Notes:

- The signal path should go, from the electric cello, through a reverb unit (configured to emulate the natural reverb of an acoustic cello) followed by a distortion pedal, then into the input jack of an A/B switcher (such as the Boss AB-2). The "A" path from the switcher should go through a loop station (such as the Boss RC-20XL), then to a volume pedal, then into the mixer. The "B" path from the switcher should go directly into another input on the mixer. These inputs should have no differences in spatial separation (panning) or volume (so that the two channels are equally loud when the volume pedal is at full volume) so that switching between paths will not be audible to the listener. Signal paths A and B will be designated in the score by either "S. P. A" or "S. P. B" respectively in boxed text. "Phrase 1," "Phrase 2," and "Phrase 3" refer to the assignment of the "Phrase Selector" knob of the Boss RC-20XL (or its equivalent on other loop stations), which are to be switched using a separate foot-switch (such as the Boss FS-5U). See the "About Live Looping" notes on the previous page for more information on this.
- The distortion pedal should be configured so that the perceived volume with the distortion pedal turned on is equal to, or only very slightly greater than, the perceived volume with the pedal off. The level of distortion should be at a medium-low level, like that of a classic rock guitar solo, so that the effect is readily perceived by the listener without sounding over-compressed.
- Any instructions related to foot-controlled pedals (with the exception of the alternate phrase selections for pre-recorded loops) are shown in boxed text.
- Dynamics will not be shown for the "Loop Station Output" staves unless the loop station's output is being altered by the volume pedal. When this is the case, crescendos and diminuendos will be accompanied by starting and terminating dynamics given as percentages (with "0%" meaning that the volume pedal is rolled all the way down and "100%" denoting full volume).
- Each phrase to be recorded into the loop station has a bracket above it and a label in boxed text. Each time this notation is used, begin recording the loop at the opening of the bracket and stop the recording at onset of the last note to fall within the bracket. Looped areas will need to be memorized so that the performer can watch the flashing LED on the loop station for the tempo without needing to hear an audible click.
- Any bracketed loop phrase may be repeated as a safety if multiple attempts are necessary to record an accurate performance, though this should only be done if necessary.
- "Z" denotes an unmeasured, rapid tremolo (similar to a buzz roll in percussion notation); "+" denotes a pitch or group of pitches plucked or strummed with a finger of the left hand; "X" noteheads denote muted strings (laying multiple fingers across the strings to prevent harmonics from sounding); Noteheads with slashes through them denote approximated pitches within a glissando.
- All glissandi (including pizz.) are to be treated as portamenti, and should occur gradually over the starting pitch's duration, with the target pitch sounding for its proper duration, and are to be re-articulated unless slurred.
- The plectrum used in Phase III may change depending upon the performer's preference, but these parts were composed with a plastic guitar pick of medium thickness in mind.

Approximate duration: 6 minutes, 30 seconds

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Phase I: Stasis

♩ = 75

Fade S. P. A volume all the way down with volume pedal after recording Loop 1/2.

Live Performance

Loop Station Output

S. P. A; Phrase 1 sul pont. Loop 1/1 Loop 1/2

7 S. P. B Ord.

11 Return S. P. A to full volume using volume pedal, then switch to S.P. A before beginning trem. Loop 1/3 S. P. B; with distortion.

♩ = 180

16

21

Musical score for measures 21-24. The bass line features triplet eighth notes. The piano accompaniment consists of sustained chords with a rhythmic pattern of eighth notes.

25

Musical score for measures 25-30. The bass line has a melodic line with a triplet. The piano accompaniment includes a 'ff' dynamic marking.

31

Musical score for measures 31-36. The bass line features a melodic line with accents. The piano accompaniment includes 'ffp' and 'ff' dynamic markings.

Stop loops immediately as the last pitches of m. 36 are played and turn distortion off. Switch to Phrase 2, switch to S. P. A, and proceed to Loop 2/1 as quickly as possible.

35

Musical score for measure 35. The bass line has a melodic line with accents and a 'ffff' dynamic marking. The piano accompaniment is mostly empty.

Phase II: Fractals

Calm and meditative; ♩ = 75

36 pizz. Loop 2/1

mp *

mf

39

42

45 sul G

48 sul A

51

sul G

54

57

arco

f

60

63

On beat three, begin to hold left pedal of Loop Station to undo Loop 2/2, leaving loop 2/1.

65

sul A

67

69

Stop Loop Playback

71

sul A; Gliss downward gradually while slowing down tremolo.

Switch to Phrase 3.

With suppressed tension

♩ = 60

sul tasto

74

78

83

ord.

Phase III: Entropy

Propulsive and vigorous; ♩ = 110

Loop 3/1

87 (With thumb) Switch to plectrum.

90

93

Loop 3/2

Musical score for measures 93-97. The score is written for a double bass and piano. The double bass part features a melodic line with various articulations, including accents and slurs. The piano accompaniment consists of rhythmic patterns in the left hand and chords in the right hand. A bracket labeled "Loop 3/2" spans measures 95-97. A dynamic marking of *f* with an asterisk is present in measure 95.

98

Switch to bow.

S. P. B

Musical score for measures 98-101. The score continues from the previous system. The double bass part shows a transition to a bowed technique, indicated by the instruction "Switch to bow." and the marking "S. P. B". The piano accompaniment remains consistent with the previous system.

102

With distortion

arco

ff

Musical score for measures 102-105. The score continues with a change in the double bass part, marked "With distortion arco". The dynamic marking *ff* is present in measure 103. The piano accompaniment continues with its rhythmic and harmonic support.

106

Musical score for measures 106-109. The score continues with further melodic and harmonic development in both the double bass and piano parts.

109

Musical score for measures 109-111. The score is in 12/8 time and features a treble and bass clef. The treble clef part includes a triplet of eighth notes in measure 110. The bass clef part includes a complex rhythmic pattern with many 'x' marks, likely indicating fingerings or specific techniques. The piece concludes with a fermata over a chord in measure 111.

112

Musical score for measures 112-114. The score is in 12/8 time and features a treble and bass clef. The treble clef part includes a sextuplet of eighth notes in measure 114. The bass clef part includes a complex rhythmic pattern with many 'x' marks. The piece concludes with a fermata over a chord in measure 114.

115

Musical score for measures 115-116. The score is in 12/8 time and features a treble and bass clef. The treble clef part includes a long note with a fermata in measure 115 and a natural sign in measure 116. The bass clef part includes a complex rhythmic pattern with many 'x' marks. The piece concludes with a fermata over a chord in measure 116.

117

Musical score for measures 117-118. The score is in 12/8 time and features a treble and bass clef. The treble clef part includes a long note with a fermata in measure 118. The bass clef part includes a complex rhythmic pattern with many 'x' marks. The piece concludes with a fermata over a chord in measure 118. The dynamic marking *fff* is present in measure 118, and the instruction *sul pont.* is written above the treble clef staff.

119

Very coarse.

123

(Alternate pitches and bow strokes with as much speed and force as possible.)

ord.

Turn off distortion at rest, then immediately begin to fade S. P. A with volume pedal.

Stop Loop Playback

126

Slowly (♩ = 98)

sul tasto

132

(With thumb)

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