

Full score (sounding pitch)

OPTICK

Elliott Park

for guitar and electronics

PREFACE

Optick is a piece for guitar and electronics. It explores the musical and sonic possibilities of three sets of six pitches derived from a series of variously stable and unstable natural harmonics on the guitar. The piece's title comes from Isaac Newton's *Opticks* (1704) in which the notes of the musical scale were used as a metaphor to explain the otherwise enigmatic nature of light.

While the contents of Newton's volume has no programmatic bearing on the piece, the image of a person regarding and turning over and examining an object's inscrutable behaviour (such as a prism) was a particularly strong image in the composer's mind during the piece's composition; throughout the work, pitch material is 'reflected' through quasi-serial inversion, 'refracted' in the electronics part, and 'filtered' through the of a variety of notational and compositional schemata.

Equipment and Setup

The current edition is for classical guitar (i.e. nylon strings plucked with the fingers) and electronics. In order to provide an input for the electronics, a (matched) pair of microphones should be positioned in an A-B setup on a stereo bar in front of the player (see below).

The diagram below shows a conventional speaker setup for a concert hall. Performers are encouraged to experiment with speaker placement to emphasise a separation between the live sounds of the player and the acousmatic sounds of the electronics.

If the player is able to source an electro-classical guitar (i.e. a classical guitar equipped with some form of pickup), this may also be used, provided that the full range of techniques indicated in the score can be effectively sounded and processed.

A version for electric guitar (i.e. steel strings picked, and equipped with a piezoelectric pickup) is forthcoming.

Kitlist

2 x microphones

1 x laptop running electronics patch

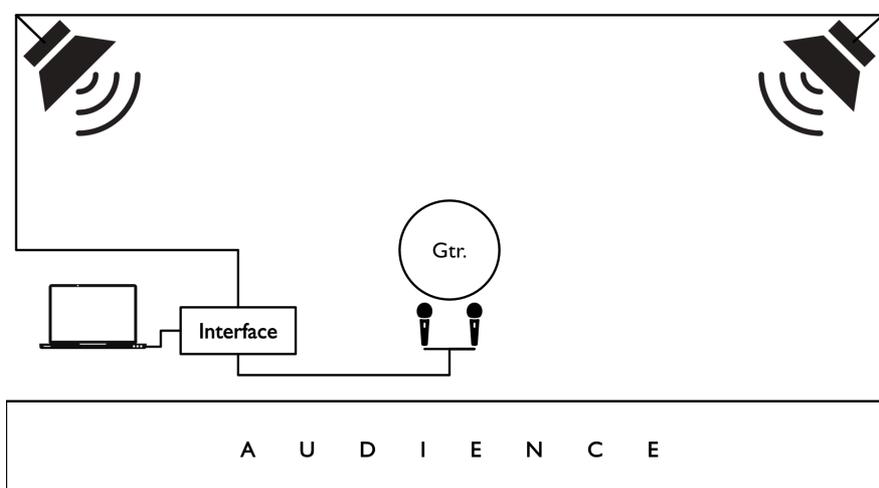
1 x audio interface

2 x monitor speakers

1 x MIDI expression pedal

1 x MIDI foot pedal with at least two buttons / switches

Diagram



Tuning

The intonation and scordatura of the guitar should be achieved using the following steps:

1. Tune the A string (5) to 220Hz
2. Tune the low E string (6) to a just fourth below the A string. This can be achieved by playing a fourth fret harmonic on the E string, and a fifth fret harmonic on the A string and tuning the E string until all acoustical beating is completely eliminated.
3. Tune the D (4) and G (3) strings in the same manner.
4. Continue to tune the top two strings (conventionally B (2) and e (1)) using the same method to produce c and f, respectively.

Tuning in just fourths will produce only a slight difference in deviation from standard equal temperament. The purpose of this is to activate the convolution reverb module in certain ways and colour the sound of the harmonics, rather than producing specific microtonal pitch content.

Electronics

Impulse Responses

The impulse response for the convolution reverb module is synthesised using the following:

1. Record the harmonics listed in the Appendix (allowing each harmonic to ring for the maximum possible duration) into separate tracks in a DAW.
2. Align the recordings should then be aligned on separate tracks so that all the onsets coincide.
3. The lowest notes should be panned toward the centre, as the notes get higher they should be panned further toward the extremes. However, when all notes are sounded together there should be a relatively even balance of intensities between the left and right channels.
4. The resulting sound file should then be exported and loaded into the convolution reverb module.

Live Processing

A number of live processing techniques are used during the course of the piece. These are preprogrammed into the Ableton Live performance patch and correspond to the sections of the piece denoted by the Figure marks.

Notation

Dynamics

Two types of dynamic indications are used. The first is the conventional notation, which is to be conventionally understood. Dynamics in double quotation marks (" ") should be understood as the amount of physical effort put into the note, rather than an absolute dynamic scheme of the sound produced.

Harmonics

For more unconventional harmonics, a sound pitch is provided. Otherwise, the note indicated is the fret conventionally (nat./modo ord.) used to produce that note on the indicated string.

Indeterminate notation

Unless otherwise stated (i.e. bar 64) indeterminacy arrows (e.g. bar 15) are independent of any other metrical schemes and should

Tapping

At Figure G the upper stave is used to show the notes played by the left hand. The ostinato on the lower stave is played by the right hand. This should produce a diaphonic effect whereby both sides of the string vibrate producing a mirrored 'ghost note' in addition to the notated one.

Staves

Much of the piece is scored on more than one staff. Representing the music in this way serves two functions. Firstly, to clarify textural construction, specifically highlighting melody or moving parts (for example, from Figure E, the repeated open string note is always kept on one staff). Secondly, for clarity of reading; the two scordatura strings are kept separated on the upper as much as is practically possible.

Techniques

Bottleneck slide

The bottleneck slide may be made of either glass or metal. Alternatively, (as noted in the score) the player may apply pressure to the strings behind the nut to bend the pitch.

Dyens brushing

Hold the flat hand with fingers together and brush the strings with the palm of the hand. This produces a soft, almost whispering tone with minimal onset attack. Those who know Dyen's *Aubade No. 3* will already be familiar this technique.

Golpé

It is suggested that for golpé on the fingerboard, the nails are used, and for golpé on the back of the instrument, the knuckle is used.

Open strings

For reasons of practicality and timbral resonance, *Optick* contains a more enthusiastic use of open strings than some players may be accustomed to. Where the open strings are considered essential, this is indicated either with a string number or a 0 notation next to the notehead.

Tambour

This may be performed either with the side of the fingers ('knife-hand') or with the flat of the fingers, whichever suits the player best.

Vibrato

The explicit indication of finger vibrato in the score is not to suggest that it is completely absent elsewhere in the piece. Performers are encouraged to use their good taste and judgement. In order to achieve vibrato on harmonics or open strings, the body of the guitar is braced against the body of the player and the pressure on the neck gently modulated.

to Dad
OPTICK

Elliott Park

① = f ② = c

(see preface)

Slow and spacious

With more movement
rasgueado

A Not too slow; dignified (♩ = c. 77)

poco cresc. (liberamente)

poco rall a tempo

11

13

B

fp *dolcissimo*

molto accel.

[13]

C Freely, as at the start

[13]

ff *con forza* ("ff") "f" > "p"

(A)

16

poco rall. (slower)

(*sim. come sopra*) *pp* *triste*

17

Quicker, frustrated

rasgueado (arp. rapido)

p > *f* *p* > *f* *mf* *cresc.* *fff* *violentemente (tutta la forza)*

D Melancholic (alla pavane); as if distracted (♩ = c. 92)

21 sul tasto poco vib.

p *delicato* *espress.*

24 rall. poco a poco

CIV nat. 6 ½ C II 6

E Suddenly fast and energetic (♩ = c. 140-160)

27 sul pont. → sul tasto → sul pont.

② >

pp *sf* *pp*

29 sul pont. → sul tasto → sul pont.

sf *pp*

p (poco marcato)

30 *sf* *pp*

sul pont. → sul tasto → sul pont.

[39] *pp* *sf* *pp*
sul pont. → sul tasto → sul pont.

41 *pp* *sf* *pp* *pp* *sf* *pp*
sul pont. → sul tasto → sul pont. sul pont. → sul tasto → sul pont.

43 *pp* *sf* *pp* *pp* *sf* *pp*
sul pont. → sul tasto → sul pont. sul pont. → sul tasto → sul pont.

45 *sf* *pp* *pp* *sf* *pp*

47 *f* *p* (*quasi echo*)
sul tasto

(Repeat *ad lib.* and take bottleneck slide)
(last time)

49 *f* sul pont. *pp* (*quasi echo*)
sul tasto

liberamente

alternative: push string down behind nut

52 *nat.* *molto* *ff*

poco sf

55 *ff* *pp* sul pont. → sul tasto

③

ffz

④

[56] *pp* sul pont. → sul tasto

③

f

ffz

④

8

(Repeat/take bottleneck as before)

pp \longleftarrow *sf* \longrightarrow *pp*
 sul pont. \rightarrow sul tasto \rightarrow sul pont. *f*

come sopra

61

pp (quasi echo)
sul tasto

f
sul pont.

63

p (quasi echo)
sul tasto

Repeat a note or series of notes from the upper staff in the given semiquaver rhythm, punctuated with notes from the lower staff as in the previous section. Gradually introduce pitches from the lower staff until none of the upper staff notes remain. An exemplar score is provided in the appendix.

64

molto rall. poco a poco

Freely (as before)

pp dolce

F $\hat{\text{vib.}}$

69 *f* *pp* *espress. e delicato* *vib.*

70 **G** *Steadily, but not laboured* (♩ = c. 140) *poco vib.* *mp molto cantabile*

76 *mp* *p* *poco f* *mp*

82 *p agitato < f* *sim.* *mp dolce*

87 *poco f* *mp* *p triste* *p* *poco f*

93 *mp* *pp* *mp* *p* *poco f* *pp*

Start with the cell to the right ('Dyens brushing'), and alternate this with each of the cells in the box below. Any individual cell may be repeated after itself, but those in the box below should not be returned to after they are played. Dynamics and tempi may be varied according to the player's taste. The piece ends with the final cell being played. A first and last cell are suggested, but this is not to be considered binding.

H

Dyens brushing

golpé (fingerboard)

slow vib.

C XII

mute with R.H.

on bridge (heel of hand)

golpé (back)

Brush R.H. up and down strings (as if cleaning)

C 'XXIV'

nail scrape over soundhole

⑥

rasgueado behind nut

mute with L.H. (C^{XII})

"FIRST"

Any two strings

C XII

"LAST"

C XII

tambour

APPENDIX

MATERIAL FOR IMPULSE RESPONSE

Musical notation for impulse response material. The first staff contains notes with circled numbers 1 through 6 above them, indicating specific points of interest. The second staff continues the notation, starting with a measure number of 10. The notes are primarily quarter notes and eighth notes, with some rests and accidentals.

EXEMPLAR MATERIAL FOR FIGURE F

Piano score for exemplar material for Figure F. The score is written for two staves (treble and bass clef) in 3/8 time. The first staff begins with a dynamic marking of *fp* (fortissimo piano). The music consists of a series of eighth-note patterns in the right hand and quarter-note patterns in the left hand. The score is divided into three systems, with measure numbers 2 and 4 indicated at the beginning of the first and second systems respectively. The piece concludes with a double bar line and a final chord.

12

7

Musical notation for measures 7 and 8. Measure 7 features a treble clef with a 12/8 time signature and a bass clef. The treble staff contains a series of eighth notes, while the bass staff has a bass line with accents. Measure 8 continues the treble staff with eighth notes and the bass staff with a bass line and accents.

9

Musical notation for measures 9 and 10. Measure 9 shows a treble staff with eighth notes and a bass staff with a bass line and accents. Measure 10 features a treble staff with eighth notes and a bass staff with a bass line, including a slur over the final notes.

11

Musical notation for measure 11. The treble staff contains a single eighth note, and the bass staff has a bass line with a series of eighth notes.

music continues as written...