

Wojciech Błażejczyk

# String Theory

for Harry Partch string instruments

2017

**String Theory** is a physics theory which says that the every object in the universe, the whole matter, is made of very small strings. These strings are so small that we cannot observe them even through the best microscopes, they are much smaller than quarks or fermions. The vibration of the strings we can observe as mass, gravity, magnetic force. So everything (creatures, stones, air, planets, and people) is made of strings. All we do is just the vibration of the strings.

The piece was commissioned by Ensemble Musikfabrik as a part of Composer Collider 2017/2018 project.

I dedicate this piece for my little daughter Lena.

date of origin of the work:  
12.2017

duration:  
ca 13'

Scoring:

The piece is written for Harry Partch instruments. Playing techniques was checked on copies of Partch instruments made for Ensemble Musikfabrik. The instruments used are:

Blue Rainbow, right canon	- Blue R
Blue Rainbow, left canon	- Blue L
Harmonic Canon I	- HC I
Chromelodic Canon	- Chrom
Poluks	- Pol
Castor	- Cast
Koto	- Koto
Adapted Guitar I and II	- Gt I, Gt II
Surrogate Kithara	- SurK
Kithara I	- Kit I
Kithara II	- Kit II

All instruments, except Koto, are used in standard Partch tuning (see below).

Left and right canons of Blue Rainbow and Castor and Poluks are used as separate instruments.

Some musicians play more than one instrument – see table below. Moving from one instrument to the other is a part of the piece.

The instruments should be amplified (especially at the beginning of the piece, „rattling superballs”). Degree of amplification depends on the hall.







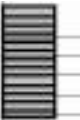

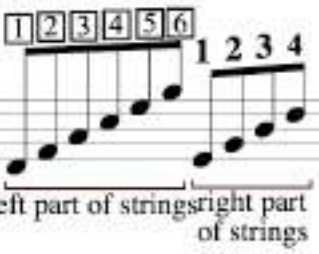
I hope you will have great pleasure playing *String Theory*.




Arkusz1

	A-D	E	F - G	H	I_1 - 1_5	I_6 - 1_9
<b>BLUE R</b>	Ulrich	Ulrich	.----	Ulrich	Ulrich	.----
<b>BLUE L</b>	Helen	Helen	.----	Helen	Helen	Helen
<b>HC I</b>	Hannah	.----	.----	.----	.----	Axel
<b>CHROM</b>	Carl	Axel	.----	Carl	Hannah	Hannah
<b>POLUKS</b>	Peter	Peter	.----	Axel	.----	.----
<b>CASTOR</b>	Axel	Carl	.----	Hannah	.----	.----
<b>----GT</b>	Benjamin	Benjamin	.----	Benjamin	Benjamin	Benjamin
<b>SURR</b>	.----	Hannah	Hannah	.----	.----	Ulrich
<b>KOTO</b>	.----	.----	Peter	.----	.----	.----
<b>KIT I</b>	Dirk	Dirk	.----	.----	Dirk	Dirk
<b>KIT I - B</b>					Peter	Peter
<b>KIT II</b>	Christine	Christine	.----	Christine	Christine	Christine
<b>KIT II - B</b>					Carl	Carl

## Clefs.

In the piece clefs indicate which part of instrument should be played. See table below.

<i>clef</i>	<i>description</i>	<i>photo</i>
	<p>Clef used for rattling superballs on harmonic canons (part A). Staff lines are used for indicate different superballs.</p>	
	<p>Clef used for playing on head of harmonic canons (string endings – fragment of the string between the nut and tuning pegs – long endings). Staff lines indicates number of head – from bottom to the top, as it is seen by a player. This clef is used also on Chromelodic canon, which has different shape of heads.</p> <p style="text-align: center;"><b>head number:</b> 1 2 3 4 5 6</p>  <p>bass strings (on Castor, Blue Rain. Left &amp; Chromelodic)      violin strings</p>	
	<p>Clef used for playing on short endings of harmonic canons' strings. Staff lines indicates string numbers, but it doesn't have to be precise – enough precision is when C4 (c') is string's 1 ending, F5 (f'') is string's 44 ending, and H4 (h') is middle string. This is not true for bars 27-30 (Blue Rainbow Left) – here string numbers are written down precisely and staff lines are only for visual clearance.</p>	
	<p>Clef used for playing on main part of strings of harmonic canons. Staff lines indicate number of group of strings (11 – or 8 on HC I – strings) having the same bridge.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>Blue Rainbow L &amp; R Castor &amp; Poluks, HC I</b></p> <p>left part of strings      right part of strings</p>  <p>only HC I</p> </div> <div style="text-align: center;"> <p><b>Harmonic Canon I:</b></p>  <p>left part of strings      right part of strings</p> </div> </div>	

	 <p>TAB (tabulatura) clef is used for all instruments except Harmonic Canons. It has the same meaning as the clef above for harmonic canons: notes indicate string number, not pitches. Sometimes there are numbers above notes – these numbers define string number (which is already defined by note position on the staff). Always string number 1 is the one closest to the player.</p>	
	<p>Whenever standard clef is used, notes indicate sounding pitches.</p>	

### Accidentals.

Harry Partch divides an octave into 43 uneven steps, defined by ratios. Whenever I use sounding pitch notation, I translate ratios into pitches using accidentals in the way shown below. Note that the quarter tone accidentals do not indicate accurate quarter tones, but ratios. This is not the same system that Caspar Johannes Walter uses.




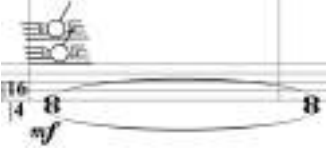







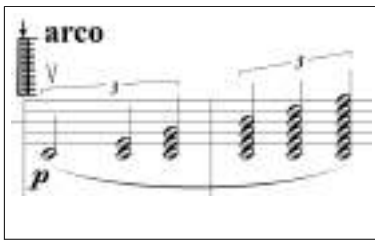


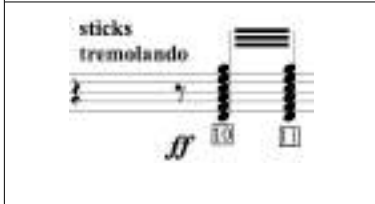

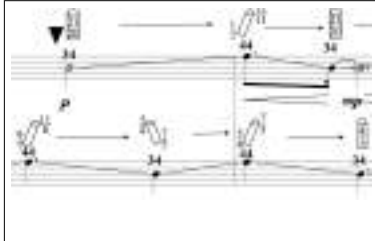
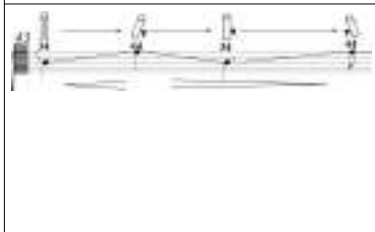
The image shows two staves of musical notation. Each staff contains 43 notes, each with a ratio in a box above it. The ratios are: 1/1, 91/80, 13/12, 21/20, 16/15, 14/11, 11/10, 10/9, 8/7, 7/6, 32/27, 5/4, 11/9, 9/8, 16/11, 19/16, 21/16, 4/3, 27/20, 11/8, 7/5, 14/11, 17/16, 11/10, 13/10, 16/13, 17/12, 22/16, 14/9, 7/4, 16/9, 9/5, 29/21, 11/6, 15/8, 40/27, 24/13, 16/8, 21/11, 21/11.

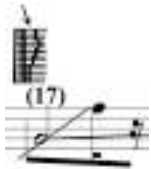
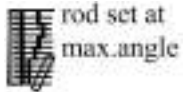






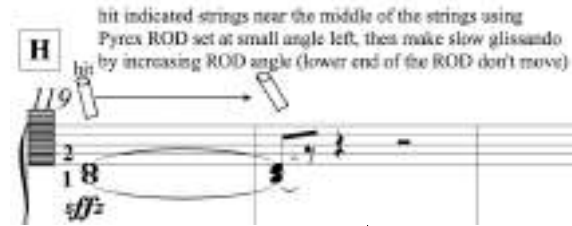
## Explanations on playing techniques

Always leave the string vibrating (do not mute them, even if there is a pause) → *laissez vibrer sempre*. Mute all vibrating strings only when indicated (eg. at the end of the piece).

Try to avoid unnecessary movements of your body (like adjusting notes etc.). There are no theatrical actions in the piece, but playing Partch instruments should be a little bit theatrical itself.

<i>symbol</i>	<i>explanation</i>
<p><b>superball rattle</b></p> 	See „Superball rattle” section of this description
	Very long fermata
	Superball mallets (glissandos perpendicularly to strings - „tremolando” sound)
	Superball mallets, move ALONG the string („whale” sound)
	Pyrex ROD used to make strings vibrate
	Pluck strings using one plectrum.
	Pluck strings using one plectrum.
	Hit strings using crooked bamboo (wooden) mallets (used by Harry Partch for playing Harmonic Canons)
	As written. Point double end of a pitchfork down, so when making tremolo on string 40, in fact you hit strings 39, 40 and 41.
LH, RH	Left hand, right hand

	Bow short endings of the strings (harmonic canons)
	Bow short endings of the strings – heads (harmonic canons)
	
<p>Pyrex ROD gravity tremolando – make glissando using Pyrex ROD, perpendicularly to strings, in defined direction (at this example – from string 44 to string 1, on short string endings). The ROD should make fast jumps, few jumps on each string, depending on the tempo of the whole movement. Try to avoid hitting wood or screws.</p>	
	(on Kitharas) Tremololando between two Hexads, using wooden mallet.
	(Guitar) Pyrex ROD angle glissandos – make glissandos through selected strings using plectrum. Place ROD in specified position, at specified angle (angle is specified by two numbers – left ratio and right ratio). Arrow indicates slow change of rod angle. When the ROD is set at an angle, typically the difference between first and last string is about quarter tone or semitone, so there are microtonal intervals in between.
	The same technique (Pyrex ROD) angle glissandos on harmonic canons – glissandos through the strings are notated less precisely. To avoid crushed sound you have to press the ROD to the strings with some force.
	Same technique, but ratios are not indicated, because the ROD is moving slowly left, while still changing the angle as indicated. The small plectrum symbol indicates whether strings should be plucked to the right of the ROD (standard, as before) or to the left of the ROD. So while the ROD moves to the left, the pitch on the right side of strings decrease, and the pitch on the right side of strings increase.

	<p>(Harmonic Canon I) Play to the left of the bridges of left side of strings (A-set) – short part of strings like strings endings. Numbers in bracket represent number of string.</p>
	<p>Place Pyrex ROD at maximum angle, maximum to the left (as on the picture). This will detune the first and second course of X-set strings.</p>
	<p>When playing on harmonic canons using bamboo crooked sticks, tremolo sign means tremolo made with ONE mallet (quasi ricochet), not two mallets.</p>
	<p>„v” sign indicates pressing the string on the other side of the bridge to increase the pitch about half tone, „R” indicates releasing the tension. When standard (violin or treble) clef is used, sounding pitch is notated. When TAB clef (for strings' numbers) clef is used, the pitch indicates the string (so it doesn't change, unlike the example). When two strings are bowed (on Koto), number indicates which string should be pressed.</p>
	<p>Vibrato made by fast pressing and releasing the string on the other side of the bridge (Koto, Surrogate Kithara).</p>
	<p>Let the bow jump on different strings (a la ricochet). Strin changes are indicated by arrows. You don't have to be very precise about number of strings played together.</p>
	<p>Fingered pitch – change pitch by pressing the string with LH finger. Find the pitch by ear. It is like playing the violin, but the string does not touch the body of the instrument. When there is „v” or „R” sign, change pitch by pressing the finger with more force, not by moving it.</p>
	<p>Scratch (or overdrive) – Koto, Surrogate Kithara. Scratch made by increasing bow pressure and bowing slowly. Scratch is very easy to achieve on Surrogate Kithara, when the string is not touched by finger above the ROD (see Surrogate Kithara description).</p>
	<p>As written. Hit rapidly, with a lot of force, and immediately press the string by the ROD with big force, to avoid unwanted scratches and noises. Keep big tension during changing of ROD angle.</p>



make quasi-harm. glissandos by sliding  
Pyrex ROD along string 1 while bowing

arco



While bowing the 1<sup>st</sup> string, make slow glissandos using Pyrex ROD (touch the string lightly by the ROD). The pictograms indicates ROD position (approximately).

## Harmonic canons

I use Harmonic Canon I, Chromelodic (chromatic) Canon, Blue Rainbow and Castor & Poluks. Left and right part of Blue Rainbow are used as separate instruments. The same applies to Castor & Poluks. I use standard tuning of harmonic canons (see table below).

### Blue Rainbow (left and right), Castor, Poluks:

### Harmonic Canon I:

## Chromelodic canon:

**RIGHT SIDE OF STRINGS**

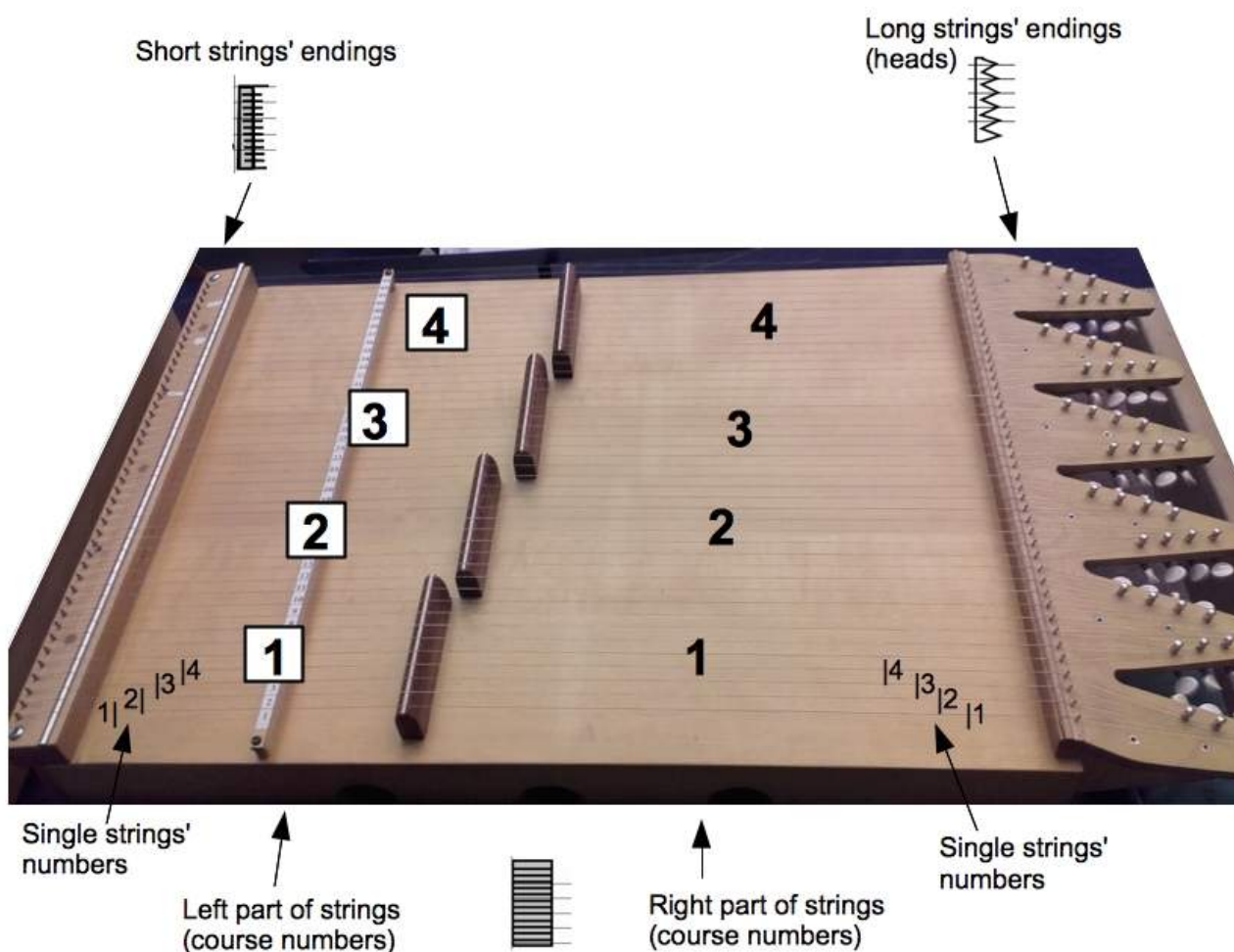
**LEFT SIDE OF STRINGS  
(approximate pitches)**

Chromelodic Canon-RIGHT

Chromelodic Canon-LEFT

Part of the instrument, which should be played in specified moment, is defined by clef (see Clefs section). The number above a note defines number of COURSE of strings, not the number of single string. Numbers in square indicates courses on the left side of instrument. Whenever single string is needed, I use symbols:

- |14 - fourteenth string (right side – the vertical line symbolize the bridge)
- 12| - twelve string (lef side)



## Kithara I and II

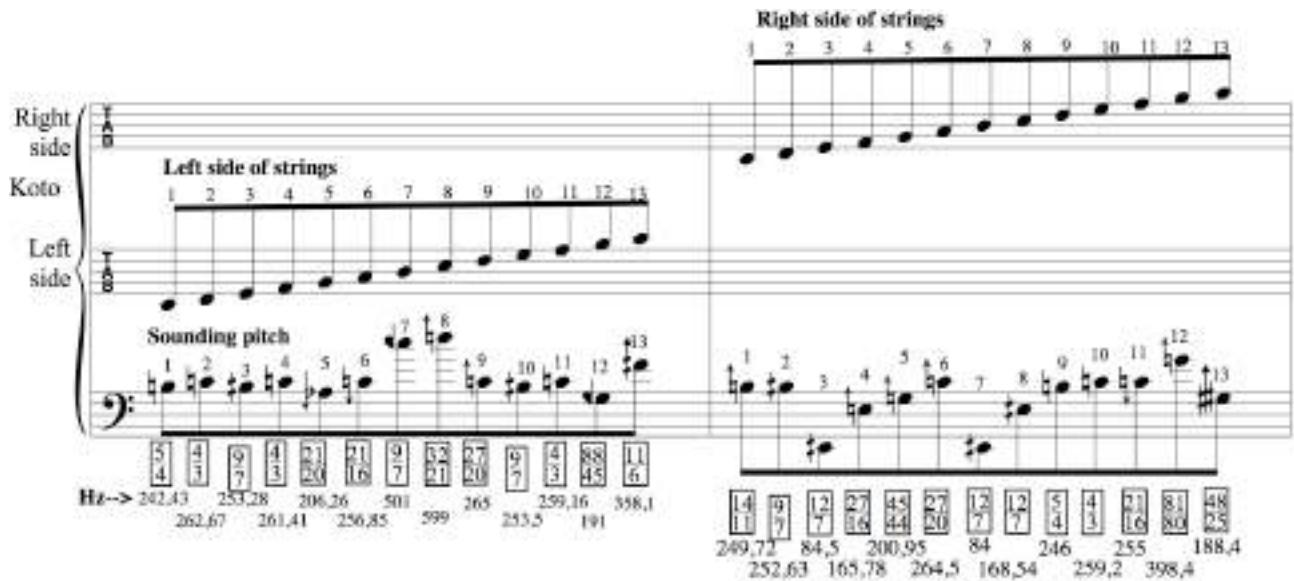
I use standard Harry Partch tuning of kitharas. Number in the square under the note indicates Hexad number. Vertical position of the note on the staff indicates string number of specified Hexad (see table in „Clefs” section). At letter „I” two musicians play each Kithara.

TUNING OF KITHARA I												
Highest 2/1	8/7		8/7			7/6	7/6				7/6	6/5
		11/10	10/9						33/32		9/8	
									1/1	1/1	1/1	
					15/8							
			16/9		20/11	7/4						
			16/9	9/5	20/11	7/4						
Middle 2/1	12/7							5/3		5/3		12/7
		11/7		3/2				3/2	8/5	8/5	3/2	3/2
	10/7	11/8	4/3		16/11	7/5						
	9/7	11/10				7/6			8/7	6/5	10/9	6/5
	1/1			1/1					1/1		1/1	1/1
	12/7	11/6		9/5								12/7
Lowest 2/1				3/2			5/3	8/5	8/5	5/3	3/2	
		11/8	4/3		16/11		4/3	4/3		10/7		
				9/7		7/6			6/5			
					12/11		1/1	1/1				
Hexads	1	2	3	4	5	6	7	8	9	10	11	12

TUNING OF KITHARA II												
Highest 2/1		11/7			20/11	7/4	5/3	8/5				
	10/7	11/8				7/5	16/11		10/7	11/8	3/2	
	9/7		11/9	9/7	14/11	7/6	7/6	8/7	6/5	5/4	6/5	
		11/10	10/9						11/10	9/8		
	1/1		1/1		1/1				1/1	1/1		1/1
	12/7			9/5			11/6	16/9	9/5	20/11		12/7
Middle 2/1		11/7	14/9	18/11	18/11	14/9				5/3		
	10/7			3/2			3/2		7/5		3/2	3/2
	8/7			9/8	12/11					5/4		6/5
						1/1	1/1	1/1			1/1	
Lowest 2/1		11/6	16/9									
				3/2					8/5	5/3	3/2	
		11/8	4/3		16/11	7/5	4/3	4/3				
Hexads	1	2	3	4	5	6	7	8	9	10	11	12

## Koto

I use my own tuning of Koto, and the player is playing both (left and right) side of strings, and both sides should be well tuned (in case of problems, the right side is more important). All bridges must be shifted. See grafics below. Note: you don't have to tune the strings in Hertz. Strings' tension may vary depending on temperature etc., so it may be impossible to tune both sides of the strings precisely. The pitch may vary a little bit (about 1/8 tone). Try to be as close as possible, but some detuning is integral element of the Koto part. I do not Partch ratio notation here, because in fact Koto fragment is written in standard tonality (E minor raised quarter tone up), so sounding pitches are more convenient. Actually, the hertz values of my tuning are not precisely equal to Partch ratios hertz values.



### KOTO BRIDGE SETUP:



Koto is played using two bows (higher staff for right hand, lower for left hand – two staves distinguish hands and bows, NOT left or right side of strings! Only in this description staves distinguish side of strings, not in the score or part). Lines on the staves indicates strings, not pitches (see table in „Clefs” section).

I use both (left and right) side of strings. To define which part of string should be bowed, I use signs which indicates bow position. In every position each string is bowed on defined side (left or right), so all you need to play is information about string number and bow position. Not all strings are being bowed in every position – it depends on the height of the string in specified bow position. The table below shows Which strings and which side of the strings (left or right) is being bowed in every bow position, as well as the pitches that are produced:

**BOW POSITIONS:**

(number of strings that are bowed in position 1 depends on distance of the bow from the nut)

The score illustrates seven bow positions for the Koto, each with its own diagram showing the number of strings bowed and the bowing direction (up/down) for each string. The positions are:

- Position 1:** 13 strings bowed on the right side.
- Position 2:** 3 strings (7, 8, 13) bowed on the left side.
- Position 3:** 4 strings (3, 7, 8, 13) bowed on the right side.
- Position 4:** 7 strings (1, 2, 4, 6, 9, 10, 11) bowed on the left side.
- Position 5:** 9 strings (1, 2, 4, 6, 9, 10, 11, 12, 13) bowed on the right side.
- Position 6:** 6 strings (1, 2, 4, 6, 12, 13) bowed on the left side.
- Position 7:** 13 strings bowed on the right side.

# BRIDGE AND BOW POSITIONS:

Middle point of the string


# KOTO

STRING NUMBER

The diagram shows 13 staves, numbered 1 to 13 from bottom to top. A vertical dashed line is drawn across the staves, labeled 'Middle point of the string' at the top. Below the staves, there are seven numbered boxes (1 to 7) containing musical notation for specific positions. The notation includes notes, stems, and bar lines, indicating the placement of the bridge and bow for each string.

String Number	Position
13	1
12	2
11	3
10	4
9	5
8	6
7	7
6	1
5	2
4	3
3	4
2	5
1	6

KOTO BOW POSITIONS:

1	 A photograph showing the bow held in the left hand, positioned vertically on the left side of the koto's soundboard. The bow is angled slightly towards the center.
2	 A photograph showing the bow held in the left hand, positioned vertically in the center of the koto's soundboard.
3	 A photograph showing the bow held in the left hand, positioned vertically on the right side of the koto's soundboard.
4	 A photograph showing the bow held in the right hand, positioned vertically on the right side of the koto's soundboard. The bow is angled towards the center.
5	 A photograph showing the bow held in the right hand, positioned vertically in the center of the koto's soundboard.
6	 A photograph showing the bow held in the right hand, positioned vertically on the left side of the koto's soundboard. The bow is angled towards the center.
7	 A photograph showing the bow held in the right hand, positioned vertically on the left side of the koto's soundboard, angled more towards the center than in position 6.



## Adapted Guitar I and II

Adapted guitars are used mostly in the way typical for Harry Partch. Keep the guitar on your knees or at a flat table. Whenever there is 8va sign over the notes, play the ratio one octave higher.

### Adapted Guitar I tuning:

All strings tuned to 1/1 (unisono).

### Adapted Guitar II tuning:

$\frac{4}{3}$	$\frac{16}{9}$	$\frac{4}{3}$	$\frac{16}{9}$	$\frac{16}{15}$	$\frac{4}{3}$	$\frac{32}{21}$	$\frac{16}{9}$	$\frac{15}{8}$	$\frac{64}{33}$
┌lowest 2/1┐		┌second 2/1┐		┌highest 2/1┐					

## Surrogate Kithara

Surrogate Kithara is tuned as in Partch's Delusion of the Fury (see graphics below, letter A). I use 4 different positions of Pyrex ROD. Here are the positions and pitches for each position (except position D):

The image shows a musical score for Surrogate Kithara, divided into two sections: A and C. Section A includes TAB, Green, Surrogate Kithara, and Orange staves. Section C includes TAB, Green, SurK, and Orange staves. The score features various rod positions (e.g., 17/21, 16/19, 7/4, 14, 11/8, 4/9) and techniques like 'angled ROD' and 'clashed line indicates the middle of the string'.

In letter F and G bow is used to play Surrogate Kithara. Here are explanations on arco techniques:

### ARCO TECHNIQUES:

Touch the string being bowed with LH finger on the rod, to make string sound at fundamental pitch. Avoid muffle sound.

Play normally (do not touch string with LH). The string should produce 2nd harmonic - an octave above fundamental pitch.

Harmonic on selected string, sounding pitch in diamond.

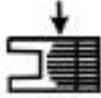

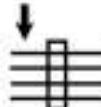
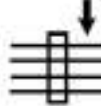


Multiphonic, any one you are able to produce. Inharmonic multiphonics will be better.

Violin-like vibrato, made by pressing and depressing the string on the other side of the rod with LH (like on Koto).

Increase pitch half tone by pressing the string on the other side of ROD (Koto technique) (sounding pitch is notated!)

The image shows a musical staff for the Green string, illustrating arco techniques. It includes notes, a vibrato symbol (wavy line), and a note marked with a checkmark and 'R'.

Other explanations:

	<p>Play on head of surrogate kithara (LEFT string endings – fragment of the string between left nut and left tuning pegs). Staff lines indicates number of strings (aproxximately) – from bottom to the top, as it is seen by a player.</p>
	<p>Play on head of surrogate kithara (RIGHT string endings – fragment of the string between right nut and right tuning pegs). Staff lines indicates number of strings (aproxximately) – from bottom to the top, as it is seen by a player.</p>
	<p>Play on left side of the string (left side of the Pyrex ROD).</p>
	<p>Play on right side of the string (left side of the Pyrex ROD). Normally, if there is no sign, play RIGHT side of the string.</p>
	<p>Play specified harmonic (standard violin technique)</p>
	<p>Play any high harmonic you get. This can be done using left hand (standard violin technique) or by appropriate bowing (see grafics below), without touching the string with left hand. In this example you should use bowing technique to get any high harmonic, and raise the pitch about semitone by increasing tension of the string on the other side of the string (Koto technique, indicated by „v” sign), legato.</p>





## Superball rattle


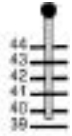














In letter A 11 superball mallets (small superballs on rigid, tiny rod) and 1 nailfile must be put between strings of Canons. Another nailfile is put between Adapted Guitar II strings in letter H. Letters in triangles indicates the action of starting the vibration of the superball, which makes long, rattling sound with 2 audible pitches. I will send you the recording of each superball rattle sound to help you find the right pitch (you find it by moving the superball left or right. Always *laissez vibrer*. Note: it is very important to put the superball between the strings in the right way (e.g. When you put superball A between right side of Harmonic Canon I strings, be carefull to put it over string 44, under 43, over 42, under 41).







Superballs.

Table of rattling superballs:

Symbol	Instrument	Part of the string	Superball	Strings	Rattle time
△ A	Harmonic Canon I	Right side of strings (X-set)	Small superball		ca 10"
△ B	Harmonic Canon I	Unused part of X-set strings (on the right side of the bridge)	Medium superball		ca 12"
△ C	Harmonic Canon I	Right side of strings (X-set)	Nailfile		ca 8"
△ D	Blue Rainbow Right	Left side of strings	Medium superball		ca 10"

	Blue Rainbow Right	Right side of strings	Small superball		ca 8"
	Blue Rainbow Left	Right side of strings	Medium superball		ca 16"
	Blue Rainbow Left (used together with F)	Right side of strings	Small superball		
	Blue Rainbow Left	Right side of strings	Medium superball		ca 8"
	Castor	Right side of strings	Small superball		ca 8"
	Castor	Right side of strings	Medium superball		ca 30"
	Poluks	Left side of strings	Small superball		ca 12"
	Poluks	Right side of strings	Medium superball		ca 12"
P	Adapted Guitar II	(see photo below)	Nailfile		Ca 6"

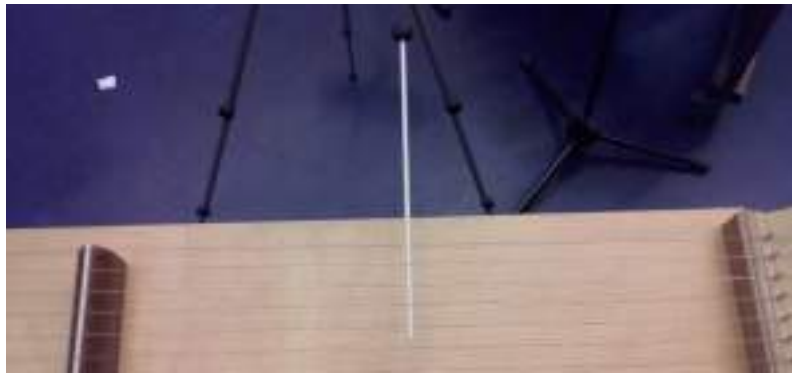
Superball rattle – photo.

<p>A</p>	
<p>B</p>	
<p>A, B</p>	
<p>C</p>	

D



E



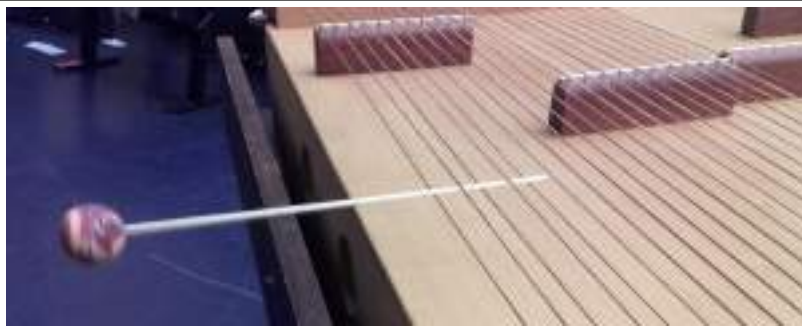
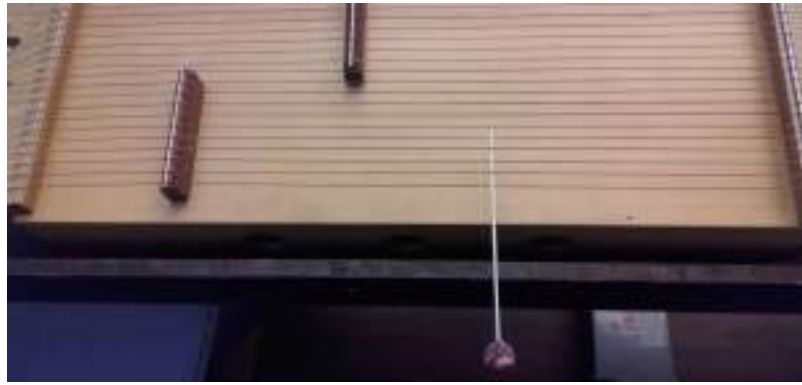
D, E



FG



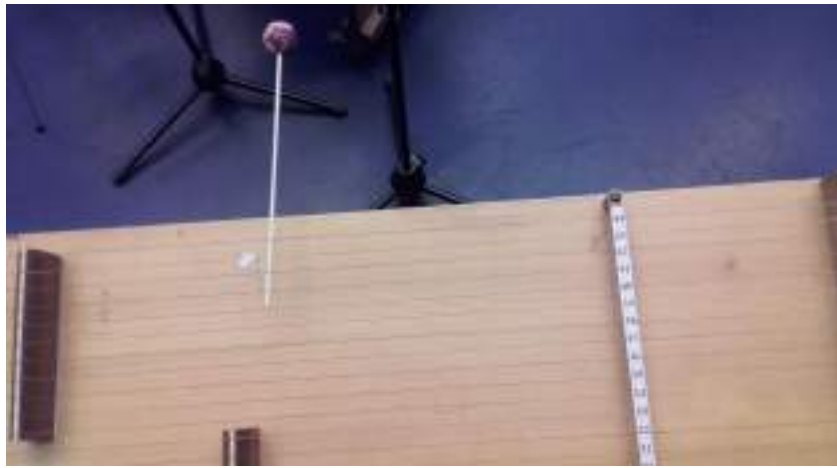
H



J



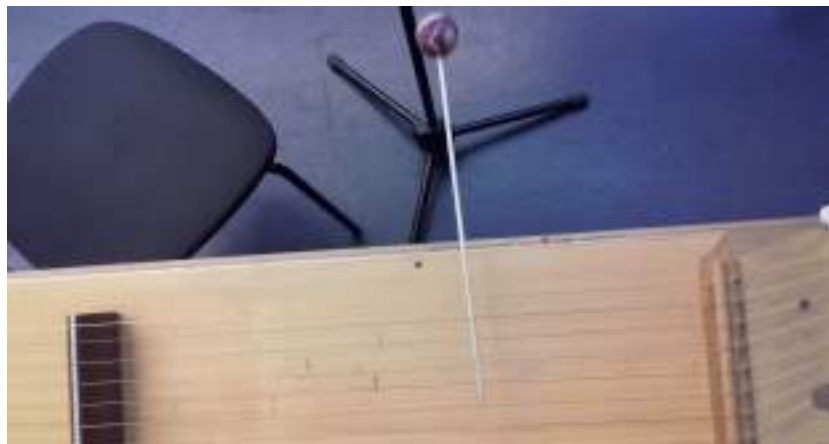




K



L



K, L



P





# String Theory

Wojciech Blazejczyk  
XII.2017

composed for Ensemble MusikFabrik  
dedicated to my little daughter Lena

$\text{♩} = 60$

The score is for a 4/4 piece in 60 bpm. It features the following parts and techniques:

- Blue Rainbow (R/L):** Right and Left hand staves. Techniques include **superball rattle** (marked with triangles A and D) and **laissez vibrer** (marked with squares).
- Harmonic Canon I:** Single staff. Techniques include **superball rattle** (marked with triangles B and A), **rod set at max. angle** (marked with a vertical bar), and **laissez vibrer** (marked with squares).
- Chromelodic Canon:** Single staff. Techniques include **superball rattle** (marked with squares).
- Poluks:** Single staff. Techniques include **superball rattle** (marked with triangles K) and **laissez vibrer** (marked with squares).
- Casto:** Single staff. Techniques include **superball rattle** (marked with triangles).
- Green (Surrogate Kithara):** Treble and Bass clef staves. Techniques include **superball rattle** (marked with squares).
- Right bow Koto / Left bow Koto:** Treble and Bass clef staves. Techniques include **superball rattle** (marked with squares).
- Adapted Guitar I:** Treble and Bass clef staves. Techniques include **superball rattle** (marked with squares).
- Kithara I / Kithara II:** Treble and Bass clef staves. Techniques include **superball rattle** (marked with squares).

# String Theory

14

The score is divided into several systems. The first system includes:

- R**: Right hand of a piano, with notes E and D, and a 'laissez vibrer' instruction.
- Blue**: A section with notes FG and D, and a 'laissez vibrer' instruction.
- L**: Left hand of a piano, with notes H and H, and a 'laissez vibrer' instruction.
- HC I**: Horns in C, with notes B and C.
- Chrom**: Chromatic line with 3/4 and 4/4 time signatures.
- Pol**: Polka section with notes L and K, and 'laissez vibrer' instructions.
- Cast**: Castanets with notes J and I, and a 'laissez vibrer' instruction.

The second system includes:

- Green**: Treble clef staff with 3/4 and 4/4 time signatures.
- SurK**: Snare drum staff.
- Orange**: Bass clef staff with 3/4 and 4/4 time signatures.
- Gt**: Guitar with TAB notation and 3/4 and 4/4 time signatures.
- Kit I**: Kit I with TAB notation and 3/4 and 4/4 time signatures.
- Kit II**: Kit II with TAB notation and 3/4 and 4/4 time signatures.

# String Theory

**B** 23

superball glissandos through string endings (on heads)

RH LH

*mp* *mf* *f*

Blue

L

laissez vibrer

HC I

Chrom

gliss. through string endings on left side (longer)

*mp* *f*

left hand

*mp* *f*

Pol

superball glissandos through string endings (on heads)

*mp* *f* *mp*

Cast

superball glissandos through string endings (on heads)

laissez vibrer

RH LH

*mp* *mf*

Green

SurK

Orange

Gt

Kit I

Kit II

The score is divided into several systems. The first system includes Blue (Right and Left hands), HC I, Chrom (Right and Left hands), Pol, and Cast. The second system includes Chrom (Right and Left hands), Pol, and Cast. The third system includes Green, SurK, Orange, Gt, Kit I, and Kit II. The score contains various musical notations including glissandos, superball glissandos, and dynamic markings such as *mp*, *mf*, and *f*. There are also performance instructions like 'laissez vibrer' and 'gliss. through string endings on left side (longer)'. The score is marked with a 'B' and the number '23'.

String Theory

27

R

Blue

L

HC I

Chrom

left hand

Pol

Cast

Green

SurK

Orange

Gt

Kit I

Kit II

*mf* *p* *mp*

tremolos (ricochet) using Pyrex ROD on single string endings of BLUE RAIN. LEFT

1 2 3 2 3 4 5 6 5 6 7 8 9 10 11 12 11 10 9 10 11 12 13 14 13 12

*mf* *laissez vibrer* *mf*

*mp* *mf*

*f* *mp* *f* *mp*

*mp* *f*

*mp* *f*

*f*

A B C

**Pyrex ROD gravity tremolando**  
(violin strings - move faster)  
(bas strings - move lower)

String Theory

31

R

Blue

L

HC I

Chrom

left hand

Pol

Cast

Green

SurK

Orange

Gt

Kit I

Kit II

C

RH

LH

A

C

fast tremolo between strings, using pitchfork

40

mf

23

mf

38

RH

LH

p

mf

p

f

mp

f

mf

remove rattling superballs

Pyrex rod angle glissandos (about semitone up & down)

8va

4/3

14/11

7/5

14/11

7/5

8va

4/3

5/7

10/7

5/7

10/7

5

mp

5

5

5

5



String Theory Pyrex ROD angle glissandos: RH - pick arpeggios LH - change ROD angle (from straight to crooked position) find pitches by ear (1/1 is in the middle of strings)

**Blue**  
 R: remove rattling superballs  
 L: remove rattling superballs  
 Pyrex ROD angle glissandos: RH - pick arpeggios LH - change ROD angle (from straight to crooked position) find pitches by ear (9/7 is in the middle of strings)  
 Dynamics: *mp*, *mf*

**Chrom**  
 left hand: 25, 41, 24

**Pol**  
 remove rattling superballs

**Cast**  
 Pyrex ROD angle glissandos: RH - pick arpeggios LH - change ROD angle (from straight to crooked position) find pitches by ear (4/3 is in the middle of strings)  
 Dynamics: *mp*, *mf*

**Green**  
**Orange**

**Gt**  
 8<sup>va</sup>, 9/7, 11/8, 9/7, 11/8, 5/4, 10/7, 5/4, 10/7, 5/4, 10/7, 4/3, 11/9, 16/11, 5/4, 10/7

**Kit I**  
**Kit II**

# String Theory

Pyrex ROD angle glissandos: RH - pick arpeggios LH - change ROD angle (from straight to crooked position) find pitches by ear (21/20 is in the middle of strings)

8<sup>va</sup> gliss. 1 octave down

Kit I T A B

Kit II T A B

# String Theory

The score is divided into several systems:

- String Section:** Includes parts for R (Right), Blue, L (Left), HC I, Chrom, left hand, Pol, and Cast. Fingerings and bowings are indicated with numbers and arrows.
- Green:** Treble clef staff.
- SurK:** Treble clef staff.
- Orange:** Bass clef staff.
- Gt (Guitar):** Treble clef staff with complex rhythmic patterns and fingerings.
- Kit I (Drum Kit I):** Treble clef staff with rhythmic notation and fingerings (e.g., 2 3 4 10).
- Kit II (Drum Kit II):** Bass clef staff with rhythmic notation and fingerings (e.g., 8 7 6 5 2 3).

Dynamic markings include *f* (forte), *mf* (mezzo-forte), and *mp* (mezzo-piano). Performance instructions like "laissez vibrer" are present.

String Theory

The score is divided into several systems:

- String Section:** Includes parts for Right (R), Blue, Left (L), HC I, Chrom, left hand, Pol, and Cast. Fingerings are indicated with numbers and diagrams. Dynamics include *mp* and *p*. Phrasing includes "laissez vibrer".
- Keyboard Section:** Includes parts for Green, SurK, and Orange.
- Guitar Section:** Includes parts for Gt, Kit I, and Kit II. Fingerings are indicated with numbers. Dynamics include *p*. Phrasing includes "laissez vibrer".

# String Theory

move ROD left little by little up to bar 48=>decrease the pitch until 10/9 in bar 48  
still change ROD angle as indicated. Pluck strings on left and right side of the ROD

**D** 43 34 44 34 44 34 44 34 44

**Blue** move ROD left little by little up to bar 48=>decrease the pitch until 10/9 in bar 48 still change ROD angle as indicated. Pluck strings on left and right side of the ROD

**L** 44 34 44 34 44 34 44

**HC I** *mf* laissez vibrer

**Chrom** *mf* *mp* (left side) 23| 44|

**left hand** *mf* *mp* (left side) 23|

**Pol** *mf*

**Cast** 34 44 34 44 34 44

**Green**

**SurK**

**Orange**

**Gt** move ROD left little by little up to bar 48=>decrease the pitch until 10/9 in bar 48 still change ROD angle as indicated. Pluck strings on left and right side of the ROD

*mp* 10 4 3 5 3 5 3 5 3 5 3

**Kit I**

**Kit II**

String Theory

The score is divided into several systems of staves:

- R:** Right hand, starting with a 45 fingering and a 34 fingering. It features a melodic line with slurs and dynamic markings.
- Blue (L):** Left hand, starting with a 34 fingering and a 44 fingering. It includes a triplet of notes and a *poco a poco crescendo* marking.
- HCI:** Harmonic Content Instrument, with notes marked with (17), (28), and (44). It starts with a *mf* dynamic.
- Chrom:** Chromatic instrument, with notes marked with 22, 1, and 44. It includes a *mf* dynamic and a *(right side)* marking.
- left hand:** Left hand, with notes marked with 44, 1, and 23. It includes a *mf* dynamic and a *(right side)* marking.
- Pol:** Polychord instrument, starting with a *mp* dynamic.
- Cast:** Cast instrument, starting with a 34 fingering and a 44 fingering. It includes a triplet and a *poco a poco crescendo* marking.
- Green, SurK, Orange:** These staves are currently empty.
- Gt:** Guitar, featuring complex rhythmic patterns with slurs, triplets, and a *poco a poco crescendo* marking.
- Kit I, Kit II:** Kit I and Kit II staves, both currently empty.

String Theory

The score is divided into several systems:

- R (Right Hand):** Fingerings 34, 44, 34, 44, 34, 44, 34, 44. Dynamics: *ff*. Instruction: *laissez vibrer*. Marking: *ca 10''*.
- Blue (Left Hand):** Fingerings 44, 34, 44, 34, 44, 34, 44, 34. Dynamics: *ff*. Instruction: *laissez vibrer*. Marking: *ca 10''*.
- HCI (Harp):** Fingerings (17), 29, (44), |36, |29, |36, |29, |36, |29, |36. Dynamics: *mf*, *fff*. Instruction: *laissez vibrer*. Marking: *ca 10''*. Note: *rod set at max. angle*.
- Chrom (Chromatic):** Fingerings |12, |34, |12, |23, |44, |12, |34, |1, |23, |1, |34, |1. Dynamics: *f*, *fff*. Instruction: *laissez vibrer*. Marking: *ca 10''*. Notes: *(left side)*, *(right side)*.
- left hand:** Fingerings |12, |34, |18, |44, |12, |34, |1, |34, |1. Dynamics: *f*, *fff*. Marking: *ca 10''*.
- Pol (Piano):** Dynamics: *crescendo*, *fff*. Marking: *ca 10''*.
- Cast (Cello):** Fingerings 34, 44, 34, 44, 34, 44, 34, 44, 34, 44. Dynamics: *fff*. Instruction: *laissez vibrer*. Marking: *ca 10''*. Note: *Go to Chromelodic Canon*.
- Green (Guitar):** Empty staff.
- SurK (Sitar):** Empty staff.
- Orange (Oud):** Empty staff.
- Gt (Guitar):** Fingerings 5, 5, 5, 5, 5, 6, 3, 3. Dynamics: *ff*. Instruction: *laissez vibrer*. Marking: *ca 10''*.
- Kit I (Kitar):** Marking: *ca 10''*.
- Kit II (Kitar):** Marking: *ca 10''*.

String Theory

**E**

R

Blue

L

*fff*

HC I

Chrom

Perc.

Cast

*fff*

Green

SurK

Orange

*fff*

Mute strings 1, 4, 7, 8 with LH

3

3

7

3

7

3

Gt

Kit I

Kit II

50

1

3

3

5

3

5

1

5

7

7

3

3

16/15 | 9/8

10/9

1

3/2

3

3

7

3

7

3

TAB

TAB

TAB



String Theory

The musical score is arranged in a vertical staff format. The instruments and their parts are as follows:

- R:** Right hand, starting with a 53-measure rest, then playing a melodic line with triplets and sixteenth notes, marked *ff*.
- Blue:** A section of the score, likely for a blue instrument, with a 53-measure rest.
- L:** Left hand, playing a melodic line with triplets and sixteenth notes.
- HCI:** Horns in C, 1st instrument, with a 3/4 time signature.
- Chrom:** Chromatic instrument, with a 3/4 time signature.
- Perc.:** Percussion, playing a rhythmic pattern with triplets and sixteenth notes, marked *ff*.
- Cast:** Castanets, playing a rhythmic pattern with triplets and sixteenth notes, marked *ff*.
- Green:** A section of the score, likely for a green instrument, with a 3/4 time signature.
- SurK:** Surbahar, with a 3/4 time signature.
- Orange:** Orange instrument, playing a melodic line with triplets and sixteenth notes.
- Gt:** Guitar, playing a melodic line with triplets and sixteenth notes, marked *f*.
- Kit I:** Kit I, with a 3/4 time signature.
- Kit II:** Kit II, with a 3/4 time signature.

String Theory

The score is for a piece titled "String Theory" and is arranged for a large ensemble of string instruments and guitar. The instruments are color-coded and labeled as follows:

- R** (Right Violin)
- Blue** (Violin section)
- L** (Left Violin)
- HC I** (Harp/Contra Bass I)
- Chrom** (Chromatic Bass)
- Pol** (Polaris)
- Cast** (Castanets)
- Green** (Green Violin)
- SurK** (Surround Keyboard)
- Orange** (Orange Violin)
- Gt** (Guitar)
- Kit I** (Kit I)
- Kit II** (Kit II)

The score is divided into three measures with changing time signatures: 2/4, 4/4, and 3/4. The first measure (2/4) features a *ff* dynamic and includes fingerings (1, 6, 3) and a 55 measure marker. The second measure (4/4) features a *ff* dynamic and includes fingerings (1, 2, 3, 4, 3, 4, 3, 2, 3, 1, 2, 3, 2, 4, 3, 1, 2, 3, 4) and a 6 measure marker. The third measure (3/4) features a *ff* dynamic and includes fingerings (3, 2, 3, 4, 3, 2, 3, 2, 3, 4, 3, 4, 2, 2, 3, 4) and a 3 measure marker. The Orange Violin part has a *fff* dynamic and includes fingerings (7, 3, 3, 3, 7). The Guitar part includes the instruction "laissez vibrer" and a *f* dynamic. The score also includes various musical notations such as slurs, accents, and dynamic markings.

String Theory

58

R  $\frac{3}{4}$   $\frac{4}{4}$

Blue

hit only strings 1 and 2. Make tension glissandos (a la KOTO) on string 1

L  $\frac{3}{4}$   $\frac{4}{4}$

gliss. gliss. 3 R 5 3 gliss. 7 gliss. R

*fff*

HCI  $\frac{3}{4}$   $\frac{4}{4}$

Chrom  $\frac{3}{4}$   $\frac{4}{4}$

*f* 5 5 5 *f* 5

Pol  $\frac{3}{4}$   $\frac{4}{4}$

Go to Koto

Cast  $\frac{3}{4}$   $\frac{4}{4}$

hit only strings 1 and 2. Make tension glissandos (a la KOTO) on string 1

1 2 5 gliss. 3 gliss. R gliss. 3 gliss. 6 gliss. gliss. R

*fff*

Green  $\frac{3}{4}$   $\frac{4}{4}$

SurK  $\frac{3}{4}$   $\frac{4}{4}$

Orange  $\frac{3}{4}$   $\frac{4}{4}$

*fff* 7 5 3 5 3

Gt  $\frac{3}{4}$   $\frac{4}{4}$

mute strings!  $8^{va}$   $\frac{10}{9}$   $\frac{6}{5}$  *ff* 5 5

Kit I  $\frac{3}{4}$   $\frac{4}{4}$

Kit II  $\frac{3}{4}$   $\frac{4}{4}$

String Theory

**arco** *laissez vibrer sempre*

60 44 | *laissez vibrer sempre*

R *3* *3*

Blue *play the whole 1st course do NOT laissez vibrare! mute strings 1 - 11 using LH*

L *secco!* 1 7 7 7 7 *7 7 7* *mf*

HCI 4/4 3/4 4/4

Chrom *mute strings!*

Pol 4/4 3/4 4/4

Cast *play the whole 1st course do NOT laissez vibrare! mute strings 1 - 11 using LH* *secco!* 1 6 6 6 *ff* *6 3 6* *mf*

Green *do NOT laissez vibrare! mute strings 1 - 11 using LH* *secco!* 5 5 5 *ff* *5 5 5* *mf*

SurK

Orange

Gt *mute strings!* *ff*

Kit I *laissez vibrer sempre* *f* *f* *simile* 3 12 11 2 5 3 2

Kit II *arco* *laissez vibrer sempre* 3 9 3 3 3 9

String Theory

The musical score is for a piece titled "String Theory" and is written in 4/4 time. It features several instrumental parts:

- R (Right Hand):** Starts at measure 63 with a forte (*ff*) dynamic. The melody consists of eighth and sixteenth notes with various fingering patterns (e.g., 4, 3 4 3 4 3, 4, 3, 4 3 4 3 4 3 4). It includes a triplet of eighth notes and a 7-measure rest.
- Blue (Left Hand):** Labeled "unmute strings". It begins with a forte (*ff*) dynamic and features a complex rhythmic pattern of eighth notes with triplets and sixteenth notes. It includes a 6-measure rest.
- HC I (Harp/Chamberlain I):** Shows a 4/4 time signature.
- Chrom (Chromatic):** Shows a bass clef and a 4/4 time signature.
- Pol (Piano):** Shows a 4/4 time signature.
- Cast (Cello):** Labeled "unmute strings". It starts with a forte (*ff*) dynamic and features a melodic line with eighth notes and triplets. It includes a 7-measure rest.
- Green (Guitar):** Labeled "unmute strings". It features a melodic line with eighth notes and triplets.
- SurK (Surround Keyboard):** Features a melodic line with eighth notes and triplets.
- Orange (Organ):** Features a melodic line with eighth notes and triplets.
- Gt (Guitar):** Features a melodic line with eighth notes and triplets.
- Kit I (Kit I):** Shows a 4/4 time signature.
- Kit II (Kit II):** Shows a 4/4 time signature.

String Theory

The musical score is titled "String Theory" and is arranged for a large ensemble. The instruments and their parts are as follows:

- R (Right Hand):** Features a melodic line with fingerings 4, 3, 4, 3, 4, 3, 4, 3, 4, 3, 6. It includes a *ff* dynamic marking.
- Blue:** A section encompassing the R and L staves.
- L (Left Hand):** Features a melodic line with fingerings 3, 6, 3, 5. It includes a *ff* dynamic marking.
- HCI (Harp/Clarinete I):** A woodwind part with a 2/4 time signature.
- Chrom (Chromola):** A keyboard part with a bass clef and a 2/4 time signature.
- Pol (Polka):** A woodwind part with a 2/4 time signature.
- Cast (Castanets):** Features a rhythmic pattern with fingerings 5, 3, 3. It includes a *ff* dynamic marking.
- Green (Green Harp):** A harp part with a 2/4 time signature.
- SurK (Surcorder):** A woodwind part with a 2/4 time signature.
- Orange (Orange Harp):** A harp part with a 2/4 time signature, including the instruction "laissez vibrer".
- Gt (Guitar):** Features a melodic line with fingerings 5, 5, 8<sup>va</sup>, 5/4, 4/3, 5. It includes the instruction "ROD gliss." and a *ff* dynamic marking.
- Kit I (Kit I):** A drum part with a 2/4 time signature.
- Kit II (Kit II):** A drum part with a 2/4 time signature.

String Theory

**F**

**R** *mf* *mf* *pp*

**Blue**

**L** *mf* *p* *mp*

**HC I**  $\frac{4}{4}$

**Chrom**  $\frac{4}{4}$

**Pol**  $\frac{4}{4}$

**Cast** *mf* *p* *mp*

**Green**  $\frac{4}{4}$

**SurK**

**Orange**  $\frac{4}{4}$

**R**  $\frac{4}{4}$

**Koto** *pp* *mf*

**L**  $\frac{4}{4}$

**Gt** *mf* laissez vibrer

**Kit I**  $\frac{4}{4}$

**Kit II**  $\frac{4}{4}$

*molto espressivo*

*arco6*

*R*

String Theory

**Blue** (R/L): **finger plucking (a la harp)** pluck randomly strings 34 - 44. Dynamics: *p*, *mp*, *pp*. Fingerings: 5, 3, 6, 5, 3. Includes a box: **Go to Polux**.

**Cast**: **finger plucking (a la harp)** pluck randomly strings 34 - 44. Dynamics: *p*, *mp*, *pp*. Fingerings: 5, 6, 3, 5, 3. Includes a box: **Go to Chromelodic Canon**.

**Green**: *molto espressivo*. ROD POSITION: 12/7.

**SurK**: **arco** bowing on 1st string. ROD POSITION: 9/7. Includes **octava harmonics**.

**Orange**: Dynamics: *p*, *mf*, *mp*, *p*, *f*, *f*. Includes **fifth harmonic**.

**R**: Dynamics: *p*, *mp*, *mf*, *p*, *p*, *mf*.

**Koto** (R/L): Dynamics: *p*, *mp*, *mf*, *p*, *p*, *mf*.

**Gt**, **Kit I**, **Kit II**: TAB notation.



# String Theory

74

Green

SurK

Orange

R

Koto

L

## G *Rubato*

extremely high  
multiphonic

78

Green

SurK

Orange

R

Koto

L

*Rubato*

controlled ricochet

let the bow jump on different strings, string changes indicated by an arrow

controlled ricochet

String Theory

81

Green

SurK

Orange

R

Koto

L

83

Green

SurK

Orange

R

Koto

L

real ricochet

controlled ricochet

# String Theory

85

Green

SurK

Orange

R

Koto

L

*molto molto espressivo*

*molto molto espressivo*

ordinario

bowing on open string 1 sempre

mute string 4 & 5 with LH

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

*mp*

5

3

1

R

R

(1) vibr.

(1)

3R

5

6

3

88

Green

SurK

Orange

R

Koto

L

ROD POSITION: 

2
7

fingered pitch

gliss.

*mf*

*mf* *p*

6

10

9

unmute strings 4 & 5

5

controlled ricochet

3

ord.

*p*

String Theory

90 **bowing on open string 1 sempre**

Green

SurK

Orange

R

Koto

L

93

Green

SurK

Orange

R

Koto

L

# String Theory

96

**Green**  
subito *p*  
harm.  
fingered pitch  
harm. 3  
fingered pitch  
3 R  
3

**Koto**  
subito *p*  
harm. 3  
harm.  
fingered pitch  
3 R  
fingered pitch  
gliss.  
gliss.  
gliss. 3  
R

**L**  
T  
A  
B

Change pitches by PRESSING string 1 (right side) in adequate place using LH fingers.  
DO NOT play harmonics, unless it is notated. Notes are notated in REAL PITCH

Detailed description: This block contains the musical notation for measures 96 to 98. It features two staves: Green (top) and Koto (middle). The Green staff uses a treble clef and a key signature of one sharp (F#). It begins with a *subito p* dynamic and a *harm.* marking. The notation includes eighth and sixteenth notes with various articulations such as *fingered pitch*, *harm. 3*, and *R* (release). The Koto staff also begins with *subito p* and includes markings for *harm. 3*, *harm.*, *fingered pitch*, *gliss.*, and *R*. The bottom staff is labeled 'L' and contains a tablature system with lines 'T', 'A', and 'B'. A large double bar line is positioned below the Koto staff.

99

**Green**  
5  
R  
R  
R  
R  
R  
R  
R  
R  
R  
R  
R  
R  
R  
R

**Koto**  
R  
R  
R  
gliss.  
3 gliss.  
3 gliss.  
3 gliss.  
gliss.  
gliss.  
gliss.

**L**  
T  
A  
B

Detailed description: This block contains the musical notation for measures 99 to 101. It features two staves: Green (top) and Koto (middle). The Green staff uses a treble clef and a key signature of one sharp (F#). It begins with a *subito p* dynamic and a *harm.* marking. The notation includes eighth and sixteenth notes with various articulations such as *fingered pitch*, *harm. 3*, *fingered pitch*, *gliss.*, and *R*. The Koto staff also begins with *subito p* and includes markings for *harm. 3*, *harm.*, *fingered pitch*, *gliss.*, and *R*. The bottom staff is labeled 'L' and contains a tablature system with lines 'T', 'A', and 'B'. A large double bar line is positioned below the Koto staff.

String Theory

102

Green *ff* all open strings controlled ricochet ord. all open strings real ricochet ord.

SurK ord. R

Orange

R *ff* √R

Koto

L *p* < *ff* <

105

Green

SurK ROD POSITION: 

7
4

 (sounding pitch)

Orange *fff* move pyrex ROD left to 7/4 position, making glissando

R *fff* √ R

Koto

L *fff*

# String Theory

108 **play Green & Orange using one bow** (probably Green will make out of control scratch)

Green *fff*

SurK

Orange *fff*

R

Koto

L

SCRATCH

SCRATCH

*fff*

*fff*

111 **OVERDRIVE** multiphonic

Green *mf*

SurK

Orange

R

Koto

L

SCRATCH

ord. → multiphonic

SCRATCH

ord. → multiphonic

*mf*

*mf*

115 multiphonic multiphonic

Green *p*

SurK *pp*

Orange

R

Koto

L

molto sul ponticello

molto sul ponticello

molto sul ponticello (close to the bridge)

col legno

*p*

*pp*

*pp*

*pp*

# String Theory

hit indicated strings near the middle of the strings using Pyrex ROD set at small angle left, then make slow glissando by increasing ROD angle (lower end of the ROD don't move)

**Blue**  
 R: 119 hit, *ffz*, 2/4, 4/4  
 L: *p*, arco harm. glissando using LH finger (diamonds represent approximate finger position)

**Chrom**  
 left hand: 40|, *p*, fast tremolo between strings, using pitchfork; 23|, *p*, fast tremolo between strings, using pitchfork; 42|

**Pol**  
 R: hit, *ffz*, 2/4, 4/4  
 L: *p*, arco harm. glissando using LH finger (diamonds represent approximate finger position)

**Cast**  
 L: *p*, arco harm. glissando using LH finger (diamonds represent approximate finger position)

**Green**  
 SurK: Go to Castor

**Orange**  
 R: Go to Kithara I (performer II)

**Koto**  
 R: T A B, L: T A B

**Gt**  
 T A B

**Kit I**  
 T A B

**Kit II**  
 T A B



String Theory

126

R Blue

L Blue

HC I

Chrom left hand

Pol

Cast

Green

SurK

Orange

R Koto

L Koto

Gt

Kit I

Kit II

hit

*sfz*

hit indicated strings near the middle of the strings using Pyrex ROD set at small angle left, then make slow glissando by increasing ROD angle (lower end of the ROD don't move)

hit

*mf*

43|

25|

41|

28|

hit

*sfz*

Pyrex ROD ricochet

make ROD jump, semitone off the centre of the string (sounding pitch: ca. 5/4)

*mf*

*mf*

*mf*

6|

# String Theory

**Blue R**: *130*, *sffz*. Includes technical diagrams of bowing techniques with arrows and 'hit' labels.

**Blue L**: *sffz*. Includes technical diagrams of bowing techniques.

**HC I**: *3/4*. Includes instruction: "make quasi-harm. glissandos by sliding Pyrex ROD along string 1 while bowing".

**Chrom**: *arco*, *p*, *mp*, *mf*. Includes technical diagrams of left hand positions (L, C, R) and a triplet.

**left hand**: *3/4*.

**Pol**: *sffz*. Includes technical diagrams of bowing techniques.

**Cast**: *3/4*.

**Green**: *3/4*.

**SurK**: *3/4*.

**Orange**: *3/4*.

**Koto**: *3/4*. Includes tablature (TAB) for Right (R) and Left (L) hands.

**Gt**: *3/4*. Includes tablature (TAB).

**Kit I**: *3/4*. Includes tablature (TAB).

**Kit II**: *3/4*. Includes tablature (TAB).

# String Theory

134

R

Blue

L

HC I

Chrom

left hand

Pol

Cast

Green

SurK

Orange

R

Koto

L

Gt

Kit I

Kit II

Pyrex ROD ricochet

make ROD jump, semitone off the centre of the string (sounding pitch: ca. 5/4)

hit

*sfz*

*mf*

*mp*

*f*

*mf*

*pp*

*mf*

*sfz*

*sfz*

*sfz*

*sfz*

arco

harm. glissando using LH finger (diamonds represent approximate finger position)

mute strings!

fast tremolo between strings, using pitchfork

nailfile rattle

# String Theory

**138**

**R**  $\frac{4}{4}$

**Blue**

**L**  $\frac{4}{4}$

**HC I**  $\frac{4}{4}$

**Chrom**  $\frac{4}{4}$

**left hand**  $\frac{4}{4}$

**Pol**  $\frac{4}{4}$

**Cast**  $\frac{4}{4}$

**Green**  $\frac{4}{4}$

**SurK**

**Orange**  $\frac{4}{4}$

**R**  $\frac{4}{4}$

**Koto**

**L**  $\frac{4}{4}$

**Gt**  $\frac{4}{4}$

**Kit I**  $\frac{4}{4}$

**Kit II**  $\frac{4}{4}$

**arco**

**hit**

hit indicated strings near the middle of the strings using Pyrex ROD set at small angle left, then make slow glissando by increasing ROD angle (lower end of the ROD don't move)

**1** **2** **8** **8** **16** **8** **8**

**ffz** **mf** **p** **mp** **mf** **p** **mp**

**Go to Kithara II (performer II)**

**arco** **fingered pitch** **slow glissando using LH finger**

**mute strings!**

String Theory

I ①

The score is divided into two systems. The top system includes staves for R, Blue, L, HC I, Chrom, Pol, and Cast. The bottom system includes staves for Green, SurK, Orange, Gt, Perf. 1, Kit I, Perf. 2, Perf. 1, Kit II, and Perf. 2. The score contains various musical notations such as rests, notes, and dynamic markings. Performance techniques like 'arco spiccato' and 'laissez vibrer' are indicated. Boxed text instructions are present in the Pol and Cast staves.

146

R

Blue

L

HC I

Chrom

Pol

Cast

Green

SurK

Orange

Gt

Perf. 1

Kit I

Perf. 2

Perf. 1

Kit II

Perf. 2

finger:

Go to Harmonic Canon I

Go to Chromelodic Canon

arco spiccato

*p* [4] laissez vibrer

arco spiccato

*p* [10]

arco spiccato

3<sub>v</sub> 6 3<sub>v</sub> 13 3<sub>v</sub> 6 3<sub>v</sub>

String Theory

150

R

Blue

L

HC I

Chrom

Pol

Cast

Green

SurK

Orange

Gt

Kit I

Kit I

Perf. 2

Kit II

Kit II

Perf. 2

arco spiccato

$p$  laissez vibrer

The score is divided into four measures. The first measure is marked with a rehearsal mark '150'. The second measure begins with the instruction 'arco spiccato'. The third measure contains the instruction ' $p$  laissez vibrer'. The fourth measure shows a change in time signature from 3/4 to 4/4.

String Theory

②  
154

R 4/4  
Blue 4/4  
L 4/4

HC I 4/4

Chrom 4/4

Pol 4/4  
Cast 4/4

Green 4/4  
SurK 4/4  
Orange 4/4

Gt T 4/4  
A 4/4  
B 4/4

Kit I 4/4

Perf. 2 4/4

Perf. 1 4/4

Kit II 4/4

Perf. 2 4/4

make quasi-harm. glissandos by sliding Pyrex ROD along string 1 while bowing

arco

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

16 8 8

*mf*

simile

*mp* [12]

simile

*mp* [8]

simile

*mp* [3]

# String Theory

158

R

Blue

L

3

hit

laissez vibrer

*ffz*

arco harm. glissando using LH finger (diamonds represent aproximate finger position)

*mf*

HCI

1/2R

L

R

L

1/2R

3

harm. glissando using LH finger (diamonds represent aproximate finger position)

144

*mf*

arco

Pol

Cast

Green

SurK

Orange

Gt

TAB

6

11

16

6

5

*p*

5

Kit I

Kit I

Perf. 2

*mf*

*mf*

*p*

*p*

Kit II

Kit II

Perf. 2

*mf*

*mf*

*p*

*p*

5

*mp*

5

5

5

5

5

5





String Theory

166

R

Blue

L

HCI

Chrom

Pol

Cast

Green

SurK

Orange

Gt

PICKUP

Muta in Adapted Guitar I

Kit I

Kit I

Perf. 2

Kit II

Kit II

Perf. 2

*mp* [0]

*f*

*pp*

*f*

*p*

*f* [8]

*pp*

*f* [5]

*pp*

String Theory

5 Pyrex ROD  
170 gravity tremolando

R

mp

arco fingered  
pitch

7 7  
finger gliss. -->  
(NOT harmonics)

max R ↓

L

f

HC I

Chrom

octava harmonics (single strings)

5 5 5 5 | 5 4 | 5 4 | 5 4 | 5 4 | 5 4 3 | 5 4 3 | 5 4 3 | 5 4 3

p

Pol

Cast

Green

SurK

Orange

Gt

pp

ordinario  
bowing

Kit I

mp

Perf. 2

Perf. 1

ordinario  
bowing

3

mp

Kit II

Perf. 2

String Theory

173

R

Blue

L

HC I

Chrom

Pol

Cast

Green

SurK

Orange

Gt

Kit I

Kit I

Perf. 2

Kit II

Kit II

Perf. 2

arco

fingered pitch

finger gliss. --> (NOT harmonics)

*f*

*mp*

*poco a poco crescendo*

*p*

*crescendo*

ordinario bowing

*mp*

ordinario bowing

*mf*

String Theory

175

R

Blue

L

HCI

Chrom

Pol

Cast

Green

SurK

Orange

Gt

Kit I

Kit I

Perf. 2

Kit II

Kit II

Perf. 2

*mf*

*crescendo*

*crescendo*

*crescendo*

String Theory

5 B

177

The score is divided into two systems. The first system includes staves for R, Blue, L, HCI, Chrom, Pol, Cast, Green, SurK, Orange, and Gt. The second system includes staves for Kit I, Kit I, Perf. 2, Kit II, Kit II, and Perf. 2. The Chrom and Gt staves have specific fingering and articulation markings. The Gt staff includes a 'slide ROD down' instruction and a 'gliss.' marking. The Kit I and Perf. 2 staves have a 'crescendo' marking. The Kit II and Perf. 2 staves have a 'mf' marking. The Chrom staff has a 'f' marking. The Gt staff has 'mp' and 'mf' markings. The Kit I and Perf. 2 staves have 'ff' markings. The Kit II and Perf. 2 staves have 'f' markings. The Chrom staff has fingering numbers: |5 4 3 2|, |5 4 3|2|, |5 4 3|2|, |5 4 3|2|, |5 4 3 2|, |5 4 3|2|, |35 34 33|, |35 34 33|. The Gt staff has fingering numbers: 5, 5, 6, 6, 3, 3, 9, 8, 5. The Kit I and Perf. 2 staves have fingering numbers: 5, 5, 5, 5, 5. The Kit II and Perf. 2 staves have fingering numbers: 8, 3, 6, 6.

String Theory

179

R

Blue

L

HCI

Chrom

Pol

Cast

Green

SurK

Orange

Gt

Kit I

Kit I

Perf. 2

Kit II

Kit II

Perf. 2

*muted (damp strings)*

*p*

*pp*

*ff*

*diminuendo*

*crescendo*

*take plectrum*

String Theory

⑥  
182

**Go to Surrogate Kithara**

R  
Blue  
L

play grace note before beat

*mf*

HC I

Chrom

take bow

arco

*mf*

Pol

Cast

Green

SurK

Orange

**Muta in Adapted Guitar II**

Gt

Kit I

take plectrum

*mf*

Kit I

spiccato

take plectrum

*mp* *pp* *mf*

Perf. 2

Kit II

take plectrum

*mf*

Kit II

*mf*

Perf. 2

*mf*



String Theory

7  
186

**Blue**  
R  
L  
*crescendo*

**HCI**  
RH - bamboo stick  
LH - plectrum  
LH - fast arpeggios  
pluck middle part of strings, not X-set nor A-set (between the bridges)  
37 | 44  
37 | 44 | *f*

**Chrom**  
*f*  
2 | 1 | *f*

**Green**  
**SurK**  
**Orange**  
hit left or right part of strings (chord between lines - RIGHT chord on lines - LEFT)  
ROD POSITION: 14 | 11  
1 | 8 | 4 | 9 | *f*  
3 | 3 | 3 | 6 | 6

**Gt**  
start arpeggio before beat  
open strings  
laissez vibrer sempre  
3 | 3 | 3 | 3 | 3 | 3 | 3 | 3

**Kit I**  
5 | 5 | 5 | 5 | 5 | 5 | 5 | 5

**Perf. 2**  
3 | 6 | 3 | 3 | 6 | 3 | 3 | 6 | 3 | 3 | 6

**Kit II**  
T A B

**Perf. 2**  
T A B

String Theory

189

8

R

Blue

L

*ff*

HCI

Chrom

Pol

Cast

Green

SurK

Orange

Gt

sticks tremolando

take wooden stick

Kit I

Kit I

Perf. 2

*ff* 7 8 9 10 4 5

sticks tremolando

Kit II

Kit II

Perf. 2

*ff* 10 11 9 10

4

String Theory

192

R

Blue

L

*crescendo*

HC I

Chrom

left hand

Pol

Cast

Green

SurK

Orange

Gt

Kit I

Kit I

Perf. 2

Kit II

Kit II

Perf. 2

take bamboo sticks

tremolandos on group of ca. 6 strings start from 39-44, then descend to 1-5 (lower the pitch -> lower strings numbers)

*mp*

*mf*

start arpeggio ON beat!

*fff*

String Theory

9

195

The musical score is arranged in a multi-stem format. At the top, the Right (R) and Left (L) channels of a Blue synthesizer are shown, with a tremolo effect. The L channel includes a dynamic marking of *fff* and a performance instruction: "play first grace note on beat!". Below this, the Chromium (Chrom) section includes a left hand part with a dynamic marking of *f* and a right hand part with a dynamic marking of *fff*. The Chromium right hand part includes a performance instruction: "move the stick from 10-15 to 1-5 during tremolo" and specific fingering notations like |10 15|5 and |10 15|5. The Percussion (Perf. 2) section includes two parts, Kit I and Kit II, with dynamic markings of *fff* and various rhythmic patterns. The Percussion parts include performance instructions like "6" and "3" and specific rhythmic notations like [10 11] and [8 9]. The Green and Orange sections are represented by vertical stems with dots, indicating sustained notes or effects. The Gt (Guitar) section is represented by vertical stems with wavy lines, indicating tremolo or other effects. The Pol and Cast sections are represented by vertical stems with dots, indicating sustained notes or effects.

String Theory

198

The score is divided into several systems of staves. The first system includes Blue (Right and Left), HCI, Chrom (with fingerings 10, 15, 15), and left hand. The second system includes Pol, Cast, Green, SurK, Orange, and Gt (with TAB notation). The third system includes Kit I (with TAB notation and fingerings 10, 11), Kit I (with fingerings 6), Perf. 2 (with TAB notation), Kit II (with TAB notation and fingerings 8, 9), Kit II (with fingerings 6), and Perf. 2 (with TAB notation). Performance instructions include 'mute strings!' at the end of the piece for multiple instruments, and specific playing techniques like 'non tremolo!', 'non arpeggio!', and 'non tremollando!'.