Aart Strootman Mmus Mmus MA

Diamond Marimba

September 22, 2022

Try out with Ensemble Academy student Porter Ellerman

Buisklokken meettabel

Weergave | 133% Zoom | Voeg categorie toe | Voeg in | Tabel | Diagram | Tekst | Vorm | Media | Opmerking

Tubing Length Calculator | Tubing Length Ratio Calculator | DATA | Music Scale | Aluminum

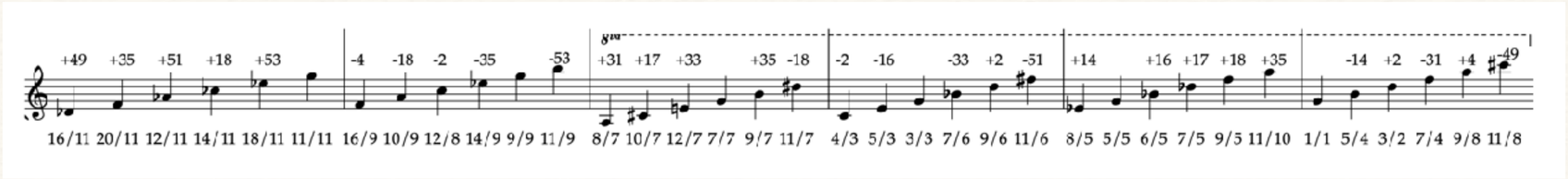
Note	Freq Hz	Length inches	Hang Point	Length mm	Hang Point
G	49,00	112 1/16	25 1/8	2.846,4	638,2
G	98,01	79 1/4	17 3/4	2.013,0	451,3
D	146,80	64 3/4	14 1/2	1.644,7	368,7
G	196,00	56	12 9/16	1.422,4	318,9
B	246,90	49 15/16	11 3/16	1.268,4	284,4
D	293,70	45 3/4	10 1/4	1.162,1	260,5
F	349,30	41 15/16	9 3/8	1.065,2	238,8
G	392,00	39 5/8	8 7/8	1.006,5	225,7
A	440,01	37 3/8	8 3/8	949,3	212,8
B	493,91	35 5/16	7 15/16	896,9	201,1
C#/Db	554,40	33 5/16	7 7/16	846,1	189,7
D	587,30	32 3/8	7 1/4	822,3	184,4
G#/Ab	103,80	77	17 1/4	1.955,8	438,5
A	110,00	74 13/16	16 3/4	1.900,2	426,0
A#/Bb	116,50	72 11/16	16 5/16	1.846,3	413,9
B	123,50	70 9/16	15 13/16	1.792,3	401,8
C3	130,81	68 9/16	15 3/8	1.741,5	390,4
C#/Db	138,60	66 5/8	14 15/16	1.692,3	379,4
D#/Eb	155,60	62 7/8	14 1/8	1.597,0	358,1
E	164,80	61 1/8	13 11/16	1.552,6	348,1
F	174,61	59 3/8	13 5/16	1.508,1	338,1
F#/Gb	185,00	57 11/16	12 15/16	1.465,3	328,5
G#/Ab	207,70	54 7/16	12 3/16	1.382,7	310,0
A	220,00	52 7/8	11 7/8	1.343,0	301,1
A#/Bb	233,10	51 3/8	11 1/2	1.304,9	292,6
C4	261,60	48 1/2	10 7/8	1.231,9	276,2
C#/Db	277,20	47 1/8	10 9/16	1.197,0	268,4
D#/Eb	311,10	44 1/2	10	1.130,3	253,4
E	329,61	43 3/16	9 11/16	1.097,0	245,9
F#/Gb	370,00	40 3/4	9 1/8	1.035,1	232,1
G#/Ab	415,30	38 1/2	8 5/8	977,9	219,2
A#/Bb	466,20	36 5/16	8 1/8	922,3	206,8

Calculate Length or Frequency for ID & OD entered above					
Enter F	963,00	25 1/4	5 11/16	641,4	143,8
		Enter L			
F=	267,59	48	10 3/4	1.219,2	273,3

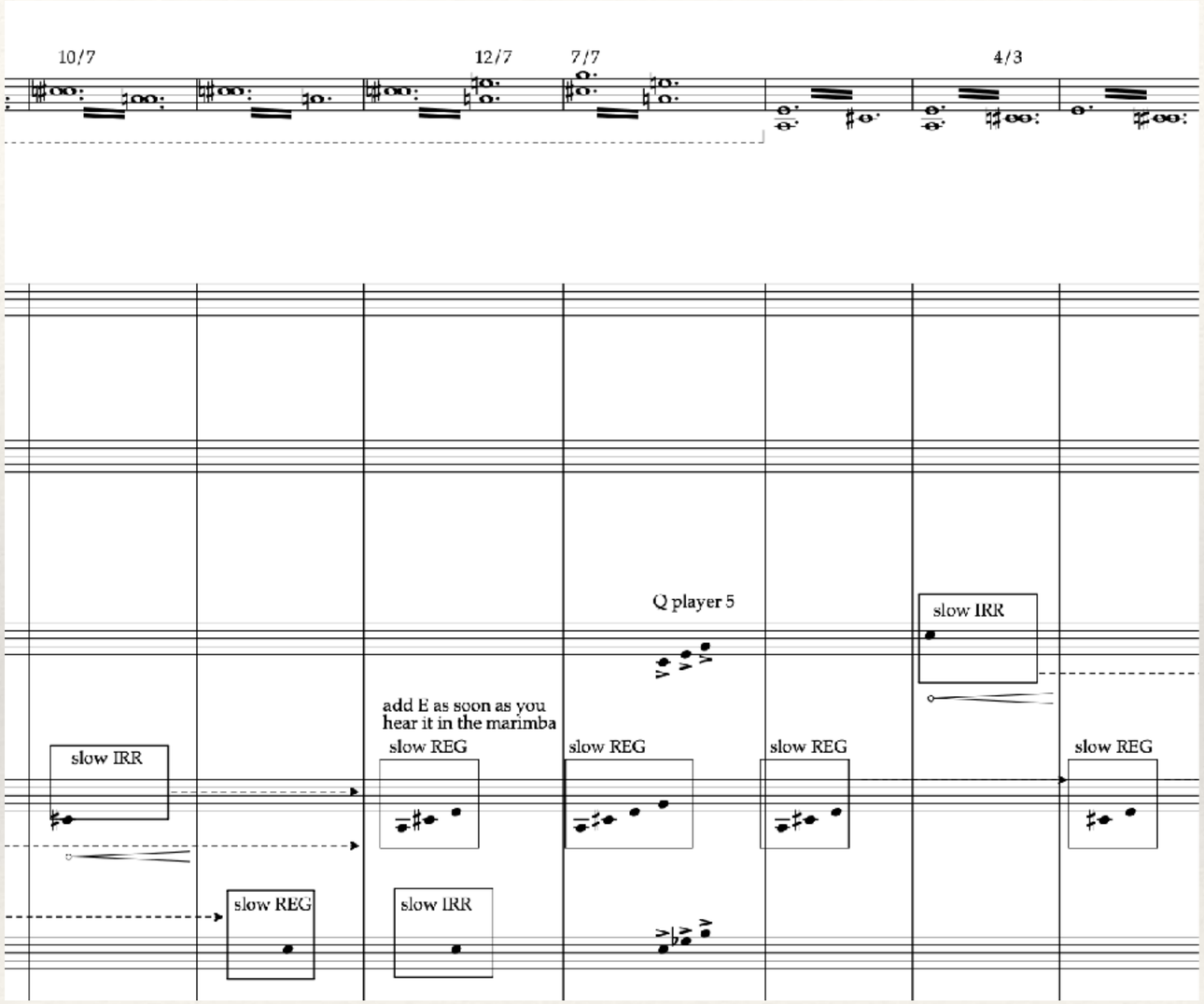
Note	Freq Hz	Length inches	Hang Point	Length mm	Hang Point
C5	523,30	34 5/16	7 11/16	871,5	195,4
D#/Eb	622,30	31 7/16	7 1/16	798,5	179,0
E	659,30	30 9/16	6 7/8	776,3	174,0
F	698,50	29 11/16	6 5/8	754,1	169,1
F#/Gb	740,00	28 13/16	6 7/16	731,8	164,1
G	784,00	28	6 1/4	711,2	159,5
G#/Ab	830,60	27 3/16	6 1/8	690,6	154,8
A	880,00	26 7/16	5 15/16	671,5	150,6
A#/Bb	932,30	25 11/16	5 3/4	652,5	146,3
B	987,80	24 15/16	5 9/16	633,4	142,0
C6	1.046,50	24 1/4	5 7/16	616,0	138,1
C#/Db	1.108,70	23 9/16	5 5/16	598,5	134,2
D	1.174,61	22 7/8	5 1/8	581,0	130,3
D#/Eb	1.244,50	22 1/4	5	565,2	126,7
E	1.318,50	21 5/8	4 7/8	549,3	123,1
F	1.397,00	21	4 11/16	533,4	119,6
F#/Gb	1.480,00	20 3/8	4 9/16	517,5	116,0
G	1.568,00	19 13/16	4 7/16	503,2	112,8
G#/Ab	1.661,20	19 1/4	4 5/16	489,0	109,6
A	1.760,00	18 11/16	4 3/16	474,7	106,4
A#/Bb	1.864,60	18 3/16	4 1/16	462,0	103,6
B	1.975,50	17 5/8	3 15/16	447,7	100,4
C7	2.093,00	17 1/8	3 13/16	435,0	97,5
C#/Db	2.217,40	16 11/16	3 3/4	423,9	95,0
D	2.349,20	16 3/16	3 5/8	411,2	92,2
D#/Eb	2.489,01	15 3/4	3 1/2	400,1	89,7
E	2.637,00	15 1/4	3 7/16	387,4	86,8
F	2.794,00	14 13/16	3 5/16	376,2	84,4
F#/Gb	2.960,00	14 7/16	3 1/4	366,7	82,2
G	3.136,00	14	3 1/8	355,6	79,7
G#/Ab	3.322,41	13 5/8	3 1/16	346,1	77,6
A	3.520,00	13 1/4	3	336,6	75,5
A#/Bb	3.729,20	12 7/8	2 7/8	327,0	73,3
B	3.951,00	12 1/2	2 13/16	317,5	71,2
C8	4.186,00	12 1/8	2 11/16	308,0	69,0
C#/Db	4.434,81	11 3/4	2 5/8	298,5	66,9
D	4.698,40	11 7/16	2 9/16	290,5	65,1
D#/Eb	4.978,00	11 1/8	2 1/2	282,6	63,4
E	5.274,00	10 13/16	2 7/16	274,6	61,6
F	5.588,00	10 1/2	2 3/8	266,7	59,8
F#/Gb	5.920,00	10 3/16	2 5/16	258,8	58,0
G	6.272,00	9 7/8	2 3/16	250,8	56,2
G#/Ab	6.644,80	9 5/8	2 3/16	244,5	54,8
A	7.040,00	9 3/8	2 1/8	238,1	53,4
A#/Bb	7.458,40	9 1/16	2 1/16	230,2	51,6
B	7.902,01	8 13/16	2	223,8	50,2
C9	8.367,01	8 9/16	1 15/16	217,5	48,8

Convert				
	2,000	inches to	50,800	mm
	25,4	mm to	1	inches

http://leehite.org/Chimes.htm


+49 +35 +51 +18 +53
-4 -18 -2 -35 -53
8va
+31 +17 +33 +35 -18
-2 -16 -33 +2 -51
+14 +16 +17 +18 +35
-14 +2 -31 +4 -49
16/11 20/11 12/11 14/11 18/11 11/11 16/9 10/9 12/8 14/9 9/9 11/9 8/7 10/7 12/7 7/7 9/7 11/7 4/3 5/3 3/3 7/6 9/6 11/6 8/5 5/5 6/5 7/5 9/5 11/10 1/1 5/4 3/2 7/4 9/8 11/8

Just Interference



Premiere April 4, 2022

Diogo Marquez
Joey Marijs

Slagwerk Den Haag

RESONANT INTONATION

Music Theory 1
Jelle van den Brink
30-1-2022

After calculating and experimenting with a scale based on perceived resonant frequency's of the upright bass (see Assignment 3), the result turned out to be very uninteresting. Apparantly the reality didn't support the theory. Therefore a new scale was made, using the well-proven method of Alvin Lucier's piece Sitting in a room.

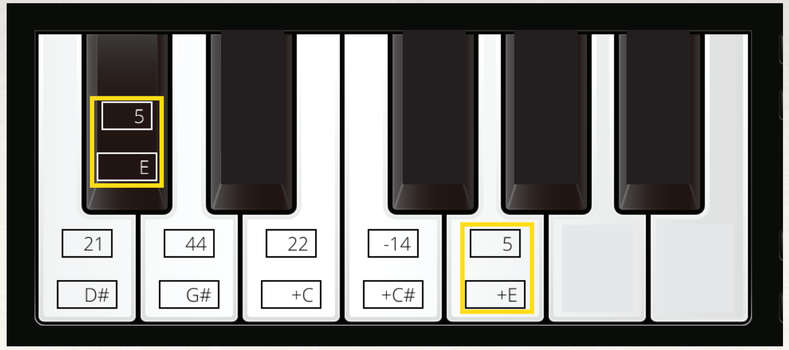
Using this technique five different resonant pitches could be picked out. The strongest of these seemed to be at 315 Hz, and 530 Hz (approximately a maj6 interval). Other pitches found where less common, but still clear.

Departing from these pitches, the tuning was applied to another instrument. Now, instead of deriving the tuning from the material qualities of an instrument, the relation between the pitches can be explored with a completely different timbre: metal instead of wood.

This tuning process was pretty laborous. A day was spent trying to hammer te metal plates in the right position. The big amount of ever changing overtones in the metal tongues, made tuning it very confusing. Even while listening to a precise tone generator, I could be completely lost in this.

The time spent with trying to get accustomed to this scale and establishing the method forms the base of the intro piece. These tuning pitches drone through whilst improvising with the scale. This was done by uploading the scale to a Korg minilogue synth, and playing it through the upright bass with a contact speaker. The end result are three pieces, focusing on the rhythmical pulsing of the different intervals.

Piano mapping



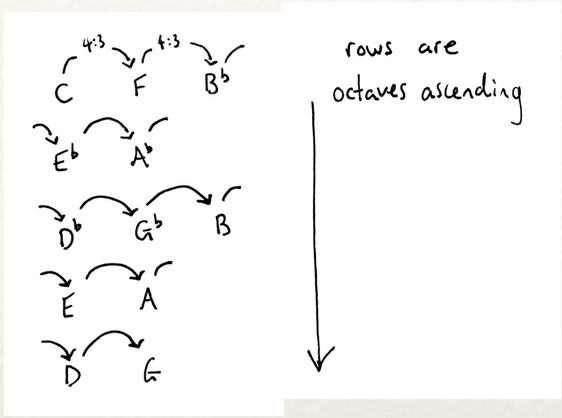
Found Pitches

315 Hz
426 Hz
530 Hz
550 Hz
1322 Hz

Compositing with Just Intonation

The tuning I used for this composition was created based on the 4:3 ratio and intervals known as perfect fourths.

Starting with 1:1 as C_4 at 262.6_{Hz}
Using the cycle of fourths as stepping-stones through all 12 tones.



For each note I calculated the frequency using the 4:3 ratio.
I had to divide accordingly to bring all the frequencies into to the range of one octave: the second row by 2, the third by 4, the fourth by 8 and the fifth by 16.
I then calculated the deviation in cents from 1:1.

Note	Freq (Hz)	cents deviation from 1:1
C	261.6	0
D♭	275.5	+89.4
D	290.3	+180
E♭	310	+293.7
E	326.6	+384
F	348.8	+497.8
G♭	367.5	+588.2
G	387.1	+678.2
A♭	413	+790.3
A	435	+880.2
B♭	465	+995.7
B	490	+1086.3

Seraina Fässler

COMPOSITION WITH THE TUNING OF TERRY RILEY

My piece

Inspired by Terry Riley's approach, my aim for this piece was to focus on Minimalism and the exploration of patterns. In particular, I wanted to create patterns in different frequency ranges and contrast low with high frequencies.

It was the very first improvisation I did with Terry Rileys tuning in the beginning of the year that inspired me to compose my piece based on this tuning. When several tones interact with each other they create this timbre that I perceived as warm and full. I noticed that especially when I compared it to my own tuning attempts, where this tension gets overwhelming and almost uncomfortable.

My instrument

For my piece, I applied the tuning of Terry Riley on an instrument rack I created from scratch in Ableton. One thing I realised when trying out different waveforms and presets within the instrument is, that the timbre of a tuning can sound completely different from one instrument to another. I came to the conclusion, that for the desired timbre of my tuning, the instrument has to consist of only sine waves. I figured that it maintains the desired quality of the tuning the best. Based on C# as my 1:1 I calculated the frequencies from the ratios and the differences in cents from one frequency to the next. To apply Rileys tuning on the scale in my instrument, which by default was equal tempered, I calculated the deviation in cents and adjusted it.

My instrument consists of sine waves and modulated sine waves. The low frequencies I wanted to have unmodulated, such that the tension that arises between them is heard more clearly. The high frequencies are modulated with slow and fast LFOs. For all the tones I have used long attacks. Furthermore, I discovered that by adding reverb, the friction between the lower tones gets more intense.

My approach

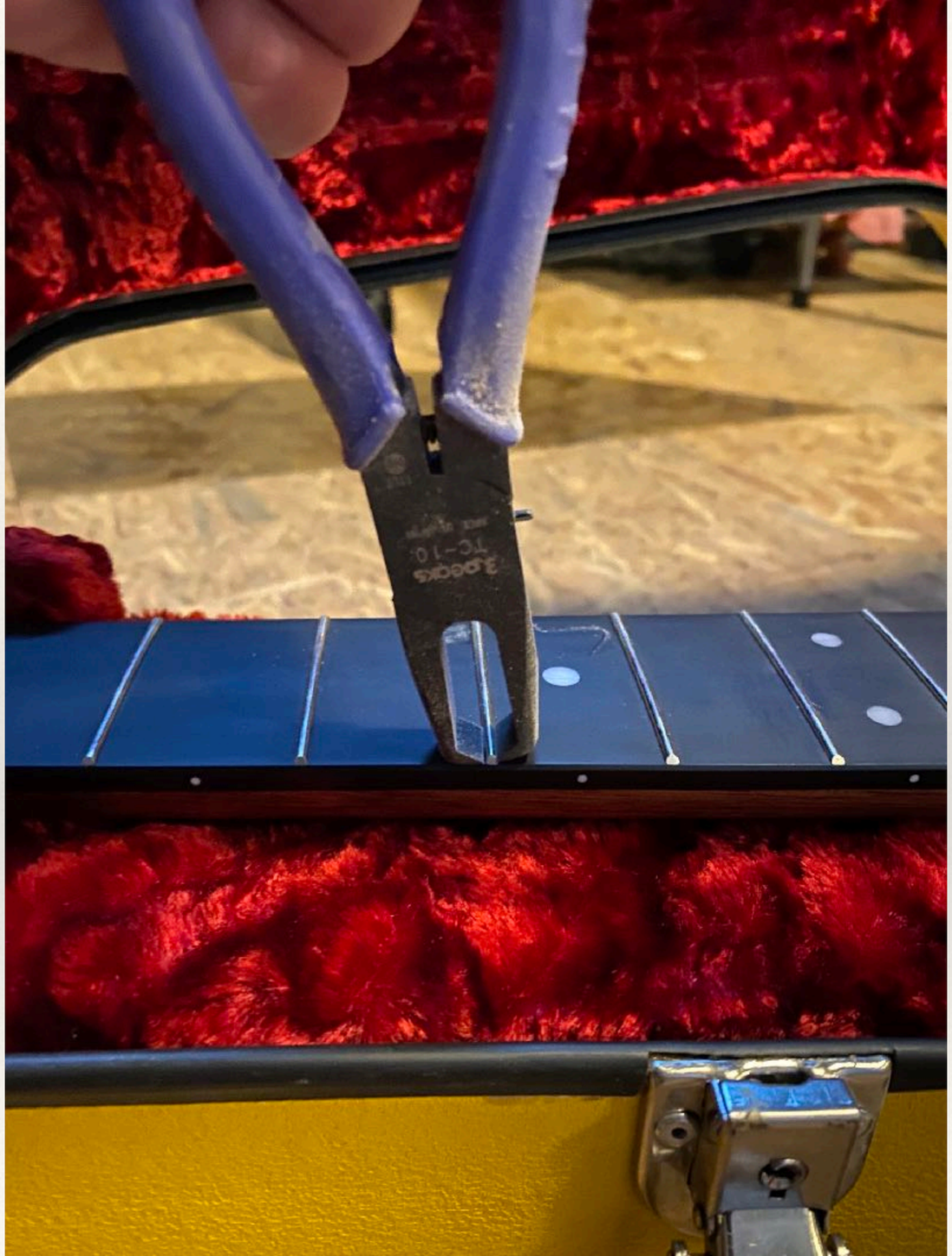
For the first attempt of my composition, the focus was too much on the structure and the melody, as well as on all the softwares I wanted to try out. Listening to my first results, I realised that I lost the actual characteristics that I was aiming for with this tuning.
For my second attempt I created four different patterns with my instrument and let the tones of the patterns interact with each other. My aim was to, on the one hand, have the low frequencies interact with each other and, on the other hand, to let the low and high frequencies collide.
I was very fascinated by the timbre of the low frequencies when they interact with each other. They create this very warm, humming and almost deafening sound.

Discoveries and challenges

The frequencies occurring in my piece can be quite demanding for the ear. There are certain parts in my piece that almost create a certain deafness when listening, not because of the sound level but because of the phasing of the sine waves, the distortion that comes with the friction of the frequencies and also the broad frequency spectrum.

It was challenging to find an interaction that will not distort the sound too much. I had to adapt the decay of each tone in order to reduce the intensities of the sound. I discovered, that the more


SIGMA
SIGMA


Jaegks
TC-10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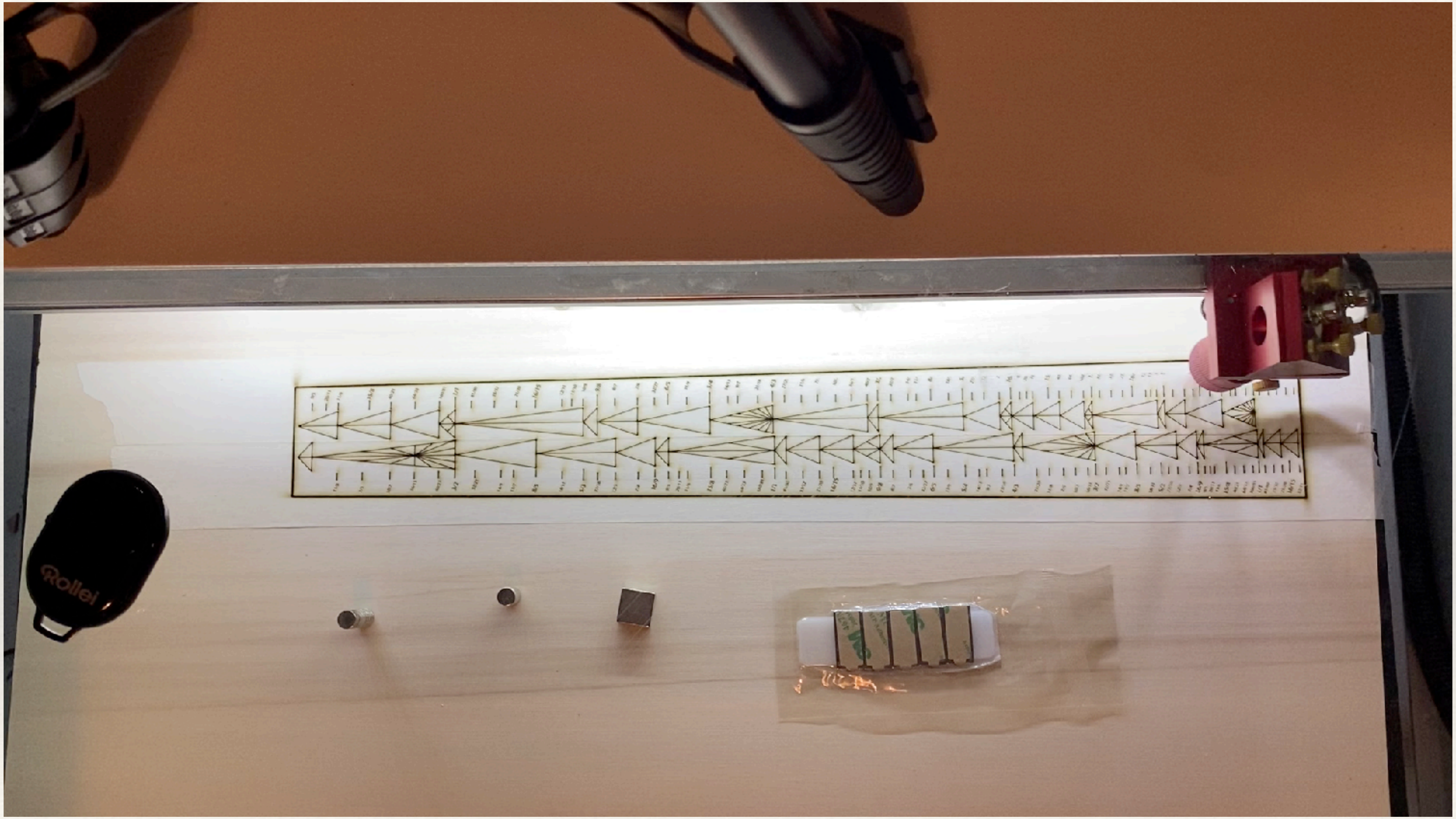
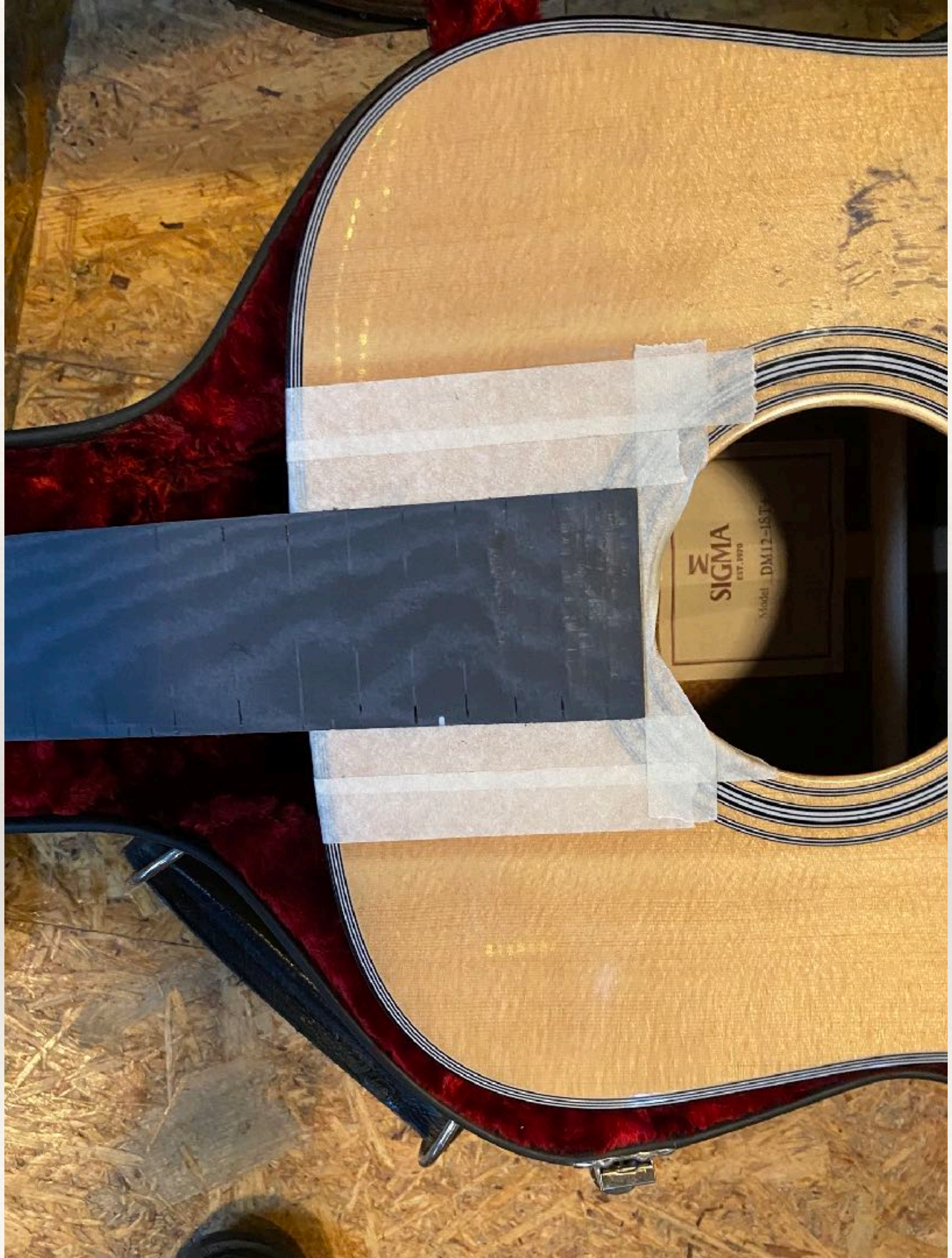
EST. 1970


Rollei


SIGMA


Snelspanner
EcoTools.nl
6"/150mm


SIGMA


SIGMA
EST. 1970
Model DM12-1ST+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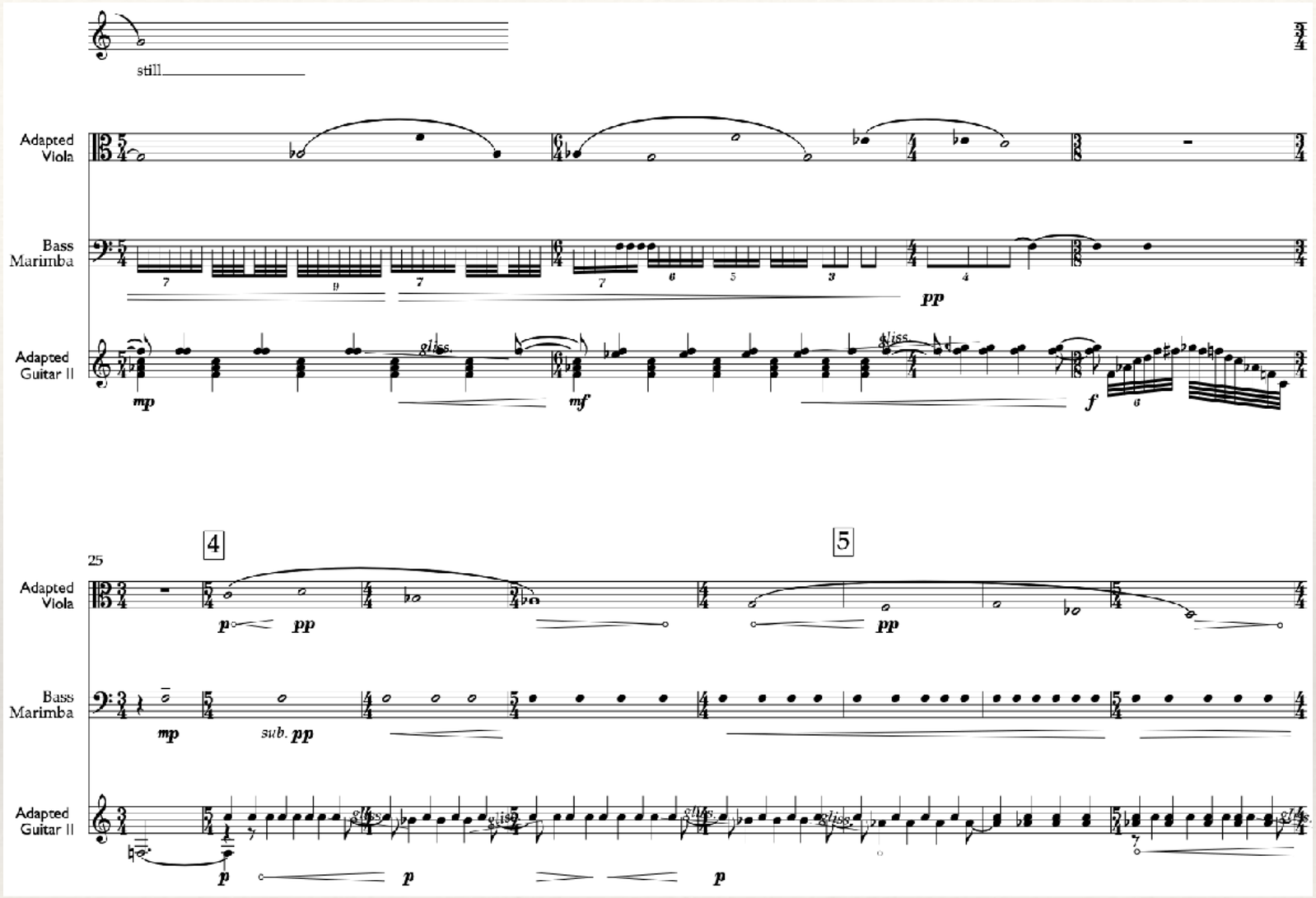
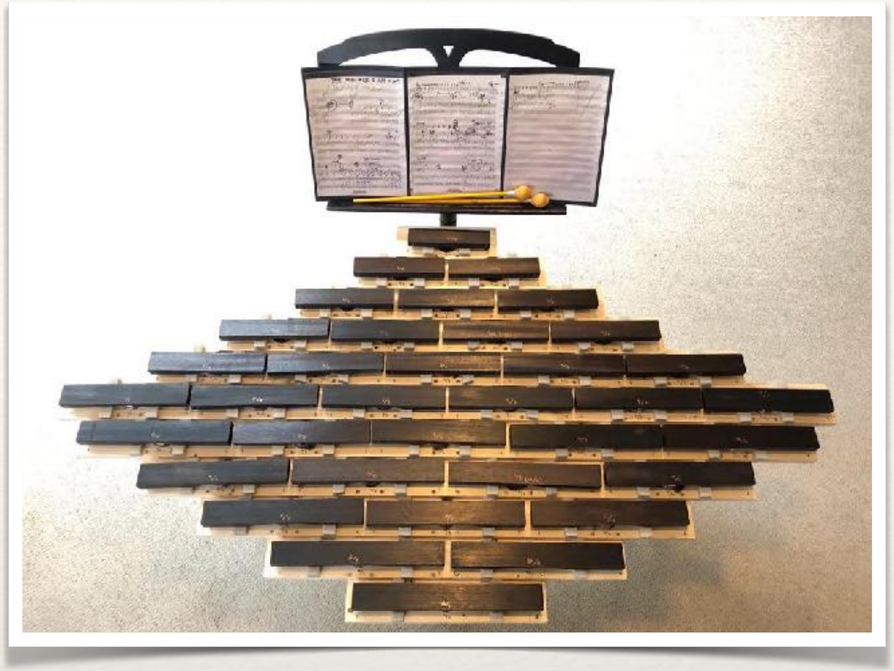


Life, and Death and Giants (2022), may 2022

Harry Partch

Diamond Marimba



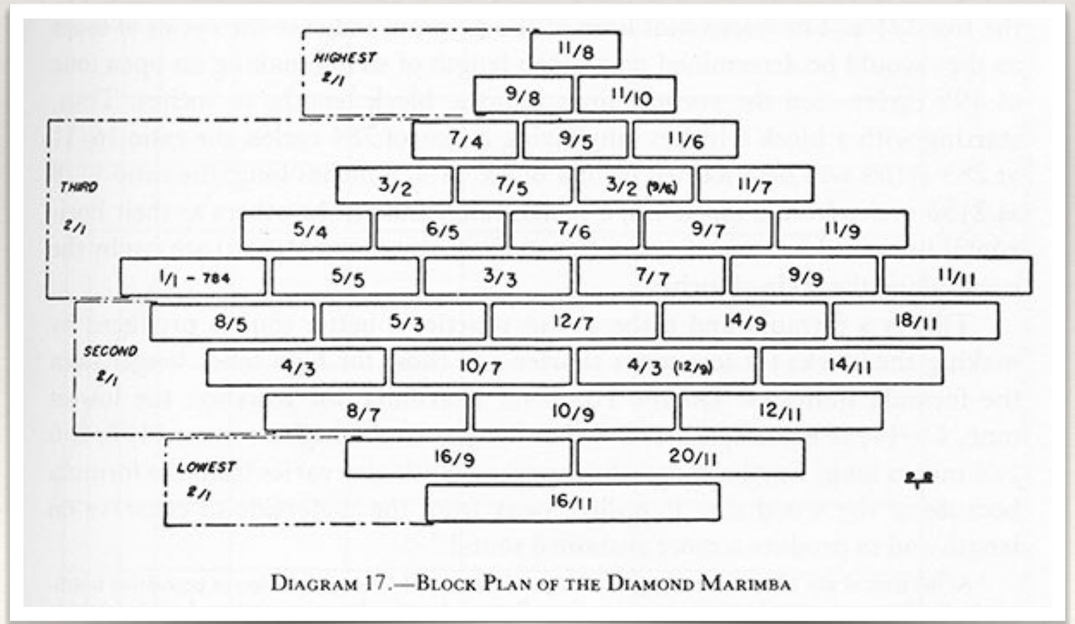


DIAGRAM 17.—BLOCK PLAN OF THE DIAMOND MARIMBA

Aart Strootman Mmus Mmus MA

Diamond Marimba

September 22, 2022