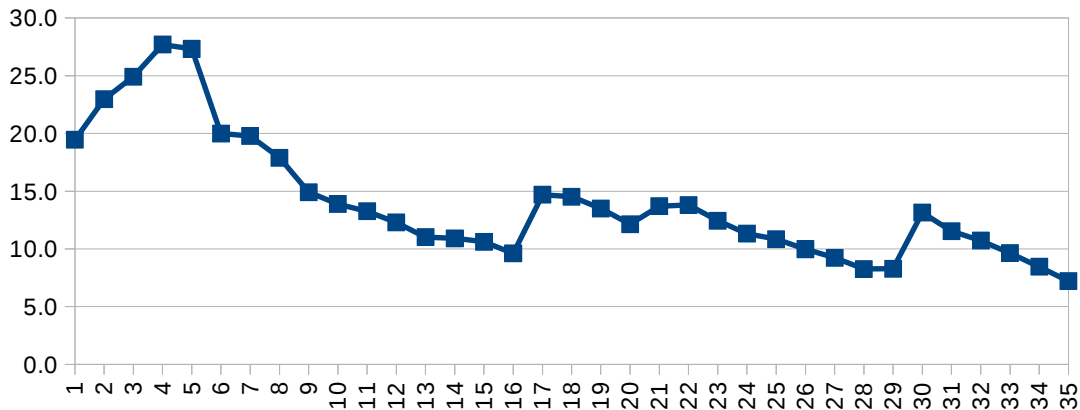


Rev. Best harp string chart



© Simon Chadwick, July 2019

Pin	Shoe	freq	Note	Length (cm)	Length (in)	Gauge (mm)	Gauge (in)	Tension	Metal
1	1	1245	e'''	9.0	3.5	0.75	0.030	19.5	Yellow brass
2	2	1107	d'''	11.0	4.3	0.75	0.030	23.0	Yellow brass
3	3	1014	c'''	12.5	4.9	0.75	0.030	24.9	Yellow brass
4	4	922	b''	14.5	5.7	0.75	0.030	27.7	Yellow brass
5	5	830	a''	16.0	6.3	0.75	0.030	27.3	Yellow brass
6	6	738	g''	16.5	6.5	0.7	0.028	20.0	Yellow brass
7	7	692	f#''	17.5	6.9	0.7	0.028	19.8	Yellow brass
8	8	623	e'	18.5	7.3	0.7	0.028	17.9	Yellow brass
9	9	553	d'	19.0	7.5	0.7	0.028	14.9	Yellow brass
10	10	507	c''	20.0	7.9	0.7	0.028	13.9	Yellow brass
11	11	461	b'	21.5	8.5	0.7	0.028	13.3	Yellow brass
12	12	415	a'	23.0	9.1	0.7	0.028	12.3	Yellow brass
13	13	369	g'	24.5	9.7	0.7	0.028	11.0	Yellow brass
14	14	346	f#'	26.0	10.2	0.7	0.028	10.9	Yellow brass
15	15	311	e'	28.5	11.2	0.7	0.028	10.6	Yellow brass
16	16	277	d'	30.5	12.0	0.7	0.028	9.6	Yellow brass
17	17	254	c'	32.0	12.6	0.9	0.035	14.7	Yellow brass
18	18	231	b	35.0	13.8	0.9	0.035	14.5	Yellow brass
19	19	208	a	37.5	14.8	0.9	0.035	13.5	Yellow brass
20	20	184	g	40.0	15.8	0.9	0.035	12.1	Yellow brass
21	21	184	g	42.5	16.7	0.9	0.035	13.7	Yellow brass
22	22	173	f#	45.5	17.9	0.9	0.035	13.8	Yellow brass
23	23	156	e	48.0	18.9	0.9	0.035	12.4	Yellow brass
24	24	138	d	51.5	20.3	0.9	0.035	11.3	Yellow brass
25	25	127	c	55.0	21.7	0.9	0.035	10.9	Yellow brass
26	26	115	B	58.0	22.9	0.9	0.035	10.0	Yellow brass
27	27	104	A	62.0	24.4	0.9	0.035	9.2	Yellow brass
28	28	92	G	66.0	26.0	0.9	0.035	8.3	Yellow brass
29	29	86	F	70.5	27.8	0.9	0.035	8.3	Yellow brass
30	30	78	E	74.0	29.2	1.2	0.047	13.1	Yellow brass
31	31	69	D	78.0	30.7	1.2	0.047	11.5	Yellow brass
32	32	63	C	82.0	32.3	1.2	0.047	10.7	Yellow brass
33	33	58	BB	85.5	33.7	1.2	0.047	9.6	Yellow brass
34	34	52	AA	89.0	35.1	1.2	0.047	8.5	Yellow brass
35	35	46	GG	92.5	36.4	1.2	0.047	7.2	Yellow brass
36								TOTAL 490.02	



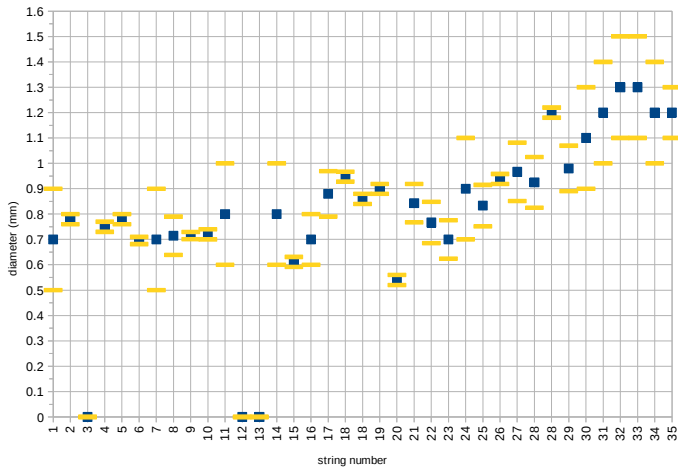
Based on measurements taken by hand from the harp in the museum

Estimated accuracy of string lengths +/- 5mm

String diameters are suggested based on the measured fragments

Rev. Best harp. Tuning pin string windings all clockwise (strings fall off backs)

pin no.	vernier mm	no. of winding/mean		%	micrometer or vernier	2 <sup>nd</sup> measure%	rms mean	+	rms error	plus error	minus error
1	0.7	1	0.7 mm + 0.2	29%	v		0.70+	0.20	29%	0.9	0.5
2			0.78 mm + 0.02	3%	m		0.78+	0.02	3%	0.8	0.76
3			wire present but unable to measure				0.00+	0.00	0%	0	0
4			0.75 mm + 0.02	3%	m		0.75+	0.02	3%	0.77	0.73
5			0.78 mm + 0.02	3%	m		0.78+	0.02	3%	0.8	0.76
6			wire present but unable to measure. But string in soundboard hole 6 measured.				0.70+	0.01	2%	0.70979919	0.681495172
7	0.7	1	0.7 mm + 0.2	29%	v		0.70+	0.20	29%	0.9	0.5
8	5	7	0.71 mm + 0.075592895	11%	v		0.71+	0.08	11%	0.789878609	0.63869282
9			0.72 mm + 0.02	3%	m	0.71 mm + 0.02	0.72+	0.01	2%	0.7292131	0.700926754
10	0.7	1	0.7 mm + 0.2	29%	v	0.72 mm + 0.02	0.72+	0.02	3%	0.739713693	0.699911761
11	0.8	1	0.8 mm + 0.2	25%	v		0.80+	0.20	25%	1	0.6
12			wire present but unable to measure				0.00+	0.00	0%	0	0
13			wire missing				0.00+	0.00	0%	0	0
14	0.8	1	0.8 mm + 0.2	25%	v		0.80+	0.20	25%	1	0.6
15	0.7	1	0.7 mm + 0.2	29%	v	0.61 mm + 0.02	0.61+	0.02	3%	0.631077465	0.591262057
16	2.8	4	0.7 mm + 0.1	14%	v		0.70+	0.10	14%	0.8	0.6
17	4.4	5	0.88 mm + 0.1	10%	v		0.88+	0.09	10%	0.969442719	0.790557281
18 coil	4.5	5	0.9 mm + 0.1	10%	v	0.95 mm + 0.02	0.95+	0.02	2%	0.967374178	0.928331019
18 loose			0.86 mm + 0.02	2%	m		0.86+	0.02	2%	0.88	0.84
19	4.4	5	0.88 mm + 0.1	10%	v	0.9 mm + 0.02	0.90+	0.02	2%	0.918606217	0.879568917
20			0.54 mm + 0.02	4%	m		0.54+	0.02	4%	0.56	0.52
21	5.9	7	0.84 mm + 0.1	9%	v		0.84+	0.08	9%	0.918450037	0.767264248
22	4.6	6	0.77 mm + 0.1	11%	v		0.77+	0.08	11%	0.848316325	0.685017009
23	4.9	7	0.70 mm + 0.1	11%	v		0.70+	0.08	11%	0.775592895	0.624407105
24	0.9	1	0.9 mm + 0.2	22%	v		0.90+	0.20	22%	1.1	0.7
25	5	6	0.83 mm + 0.1	10%	v		0.83+	0.08	10%	0.914982991	0.751683675
26	3.6	4	0.9 mm + 0.1	11%	v	0.94 mm + 0.02	0.94+	0.02	2%	0.958198691	0.918971615
27	2.9	3	0.97 mm + 0.1	12%	v		0.97+	0.12	12%	1.082136721	0.851196613
28 coil	3.7	4	0.925 mm + 0.1	11%	v		0.93+	0.10	11%	1.025	0.825
28 loose			1.2 mm + 0.02	2%	m		1.20+	0.02	2%	1.22	1.18
29	4.9	5	0.98 mm + 0.1	9%	v		0.98+	0.09	9%	1.069442719	0.890557281
30	1.1	1	1.1 mm + 0.2	18%	v		1.10+	0.20	18%	1.3	0.9
31	1.2	1	1.2 mm + 0.2	17%	v		1.20+	0.20	17%	1.4	1
32	1.3	1	1.3 mm + 0.2	15%	v		1.30+	0.20	15%	1.5	1.1
33	1.3	1	1.3 mm + 0.2	15%	v		1.30+	0.20	15%	1.5	1.1
34	1.2	1	1.2 mm + 0.2	17%	v		1.20+	0.20	17%	1.4	1
35	4.8	4	1.2 mm + 0.1	8%	v		1.20+	0.10	8%	1.3	1.1



soundboard string fragments

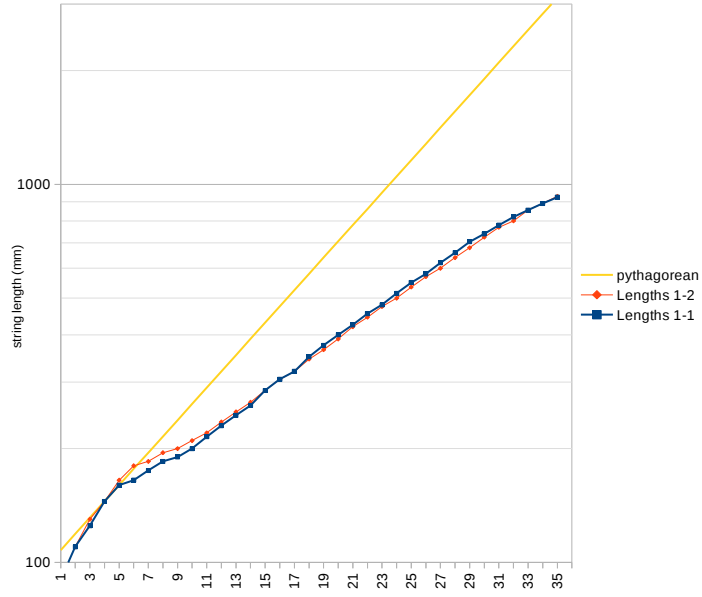
string hole	mm	micrometer or vernier 2 <sup>nd</sup> measurement
1	wire present but unable to measure	
2	wire present but unable to measure	
3	wire present but unable to measure	
4		
5	wire present but unable to measure	
6	0.68 mm +- 0.02 3% m	0.71 mm +- 0.02 3% m
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17	wire present but unable to measure	
18	wire present but unable to measure	
19	wire present but unable to measure	
20		
21		
22		
23		
24		
25		
26	wire present but unable to measure	
27		
28		
29		
30		
31	wire present but unable to measure	
32		
33		
34		
35		
36		

Toggle description

string attached to broken winding loops, tight against soundboard interior
string attached to broken winding loops, tight against soundboard interior
string attached to broken winding loops, tight against soundboard interior
string attached to broken winding loops, tight against soundboard interior
iron screw, a 0.70 +- 0.01 2%
0.70979919 0.681495172
wooden toggle, tight against soundboard interior
Iron screw, tight against soundboard interior
wooden toggle, tight against soundboard interior
wooden toggle, tight against soundboard interior
wooden toggle, a long length of wire from stringhole inside soundbox to toggle

pin	Lengths 1-1		Lengths 1-2	
	to shoe	mm +/- 5	to shoe	mm +/- 5
1		1 90		
2		2 110		2 110
3		3 125		3 130
4		4 145		4 145
5		5 160		5 165
6		6 165		6 180
7		7 175		7 185
8		8 185		8 195
9		9 190		9 200
10		10 200		10 210
11		11 215		11 220
12		12 230		12 235
13		13 245		13 250
14		14 260		14 265
15		15 285		15 285
16		16 305		16 305
17		17 320		17 320
18		18 350		18 345
19		19 375		19 365
20		20 400		20 390
21		21 425		21 420
22		22 455		22 445
23		23 480		23 475
24		24 515		24 500
25		25 550		25 535
26		26 580		26 570
27		27 620		27 600
28		28 660		28 640
29		29 705		29 680
30		30 740		30 725
31		31 780		31 770
32		32 820		32 800
33		33 855		33 855
34		34 890		34 890
35		35 925		35 930
36				36 One measurement missing!

I think 1-1 is the likely original configuration



pythagorean
107.6720154
118.8795431
131.253657
144.9157863
160
176.6543222
195.0421847
215.3440308
237.7590863
262.5073139
289.8315726
320
353.3086444
390.0843693
430.6880616
475.5181725
525.0146278
579.6631451
640
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780.1687386
861.3761232
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3120.674954