

Harmony of the spheres

Universal musical key

(The golden ratio and the Science of harmonics)



1st part: Introduction

If you love music, take a few minutes of your time and read attentively what is following and discover one of the greatest inventions based on a new musical perception. Everything started when the inventor associate together the diatonic scale and the chromatic scale by using numbers to indicate each degree (see Fig.1). By looking at the numbers that correspond to the intervals that constitute a Perfect Major Chord, you can see appear the legendary Fibonacci sequence (the golden section - PHI - or the divine proportion). With the discovery of a “Musical Universal Key”, M. Sylvain Lalonde, the inventor, demonstrates where this revolutionary easy approach method begin.

With the research of the harmony



The golden section influences the Western vision of the harmony
The sequence of Fibonacci... 1-1-2-3-5-8-13... applies to this rule

Ex: Perfect Majeur Chords: C,E,G,C

Tonic	Tone		Second	Tone		Third	Semitone	Tone		Fourth	Tone		Fifth	Tone		Sixth	Tone		Seventh	Semitone	Octave	
	1	2		3	4		5	6	7		8	9		10	11		12	13				
1	C [#]	D ^b	2	D [#]	E ^b	3	E	F	F [#]	G ^b	4	G	G [#]	A ^b	5	A	A [#]	B ^b	6	B	7	C
C			D			E		F			G		G [#]		A		A [#]		B		C	
1	2	3	4	5	6	7	8	9	10	11	12	13										
Semitone		Semitone		Semitone		Semitone		Semitone		Semitone		Semitone		Semitone		Semitone		Semitone		Semitone		
A													B									

When $(A + B) / A = A / B$. The A / B ratio is then equal to the golden ratio.

$$8 / 5 = 1.6$$

Uclide d'Alexandrie

* For more details on natural harmonics see fig.6 & 7 section R&D
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2nd part: Diatonic scale vs Chromatic scale

12 Sounds = 12 Tones = 12 Tonalties

Let's look at the same graphics on a 360-degree platform.. The use of black and white is used to represent the notes of a piano, to help understand this new perception.

Select and print Fig. 3 (picture) cut the two discs, then cut down the 7 windows that correspond to the intervals on disc 1 (Item 32). Overlap disc 1 over the second disc (Item 30) and then position the 1st degree (“Tonic”) on C, you’ll get the “C-D-E-F-G-A-B” sequence.

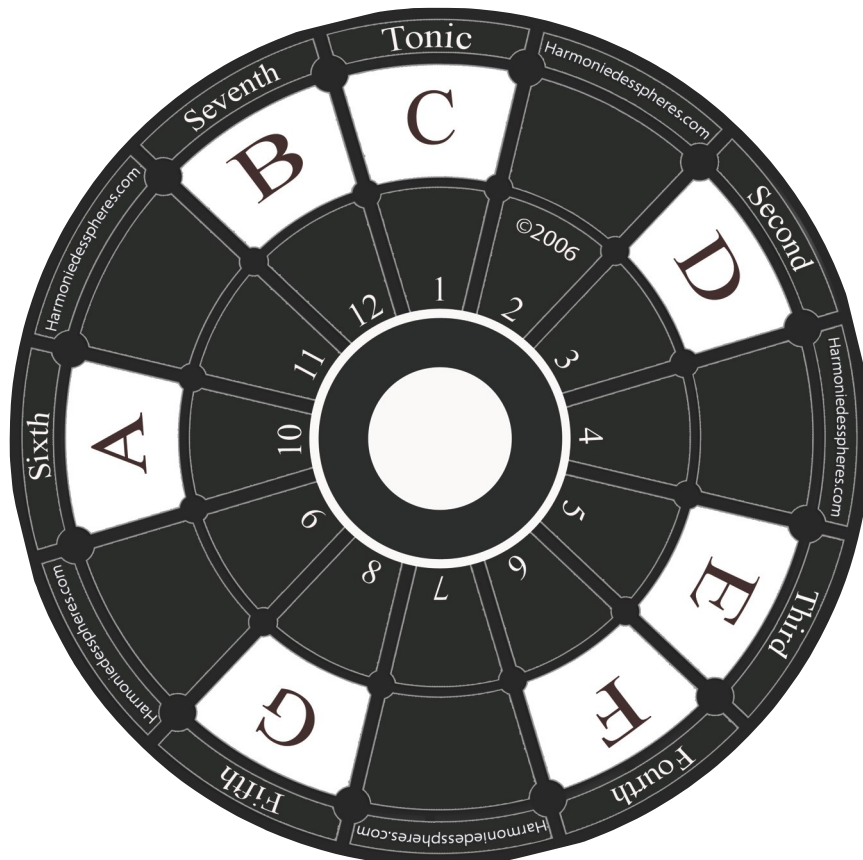
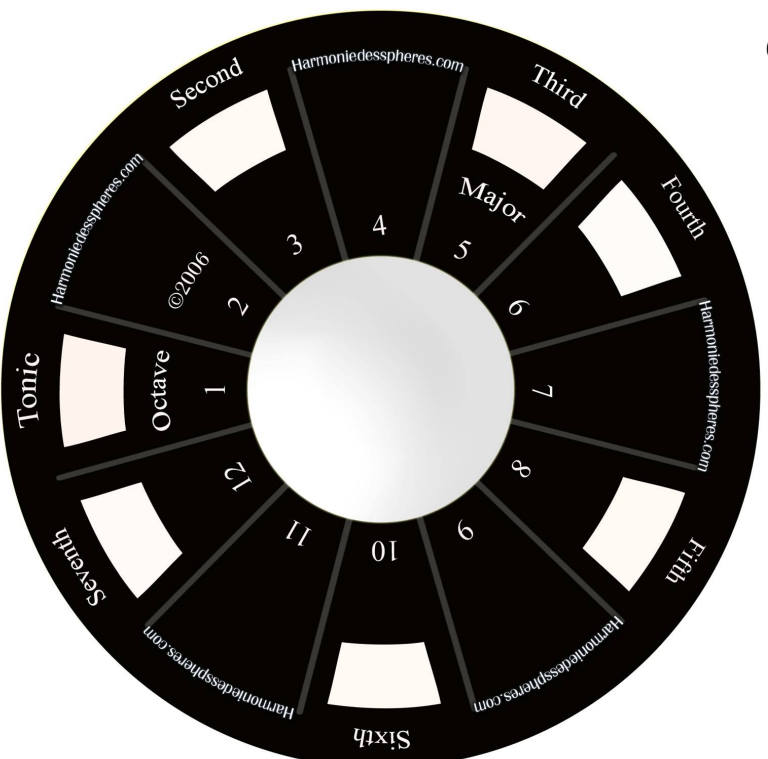


Fig.3



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Sylvain Lalonde founding president : Harmonie des sphères inc.

To contact us: sylvain.lalonde@me.com

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Now move the “Tonic” on the “Fifth”, the G, this way you obtain the alterations that constitutes the key frame of our tonal system and so on.
We call this:

« The Cycle of Fifths »

Ascending = Sharp order = F, C, G, D, A, E, B

Descending = Flat order = B, E, A, D, G, C, F

Fig.3B

Note that the order of flats is the opposite of sharps

order of #		F	C	G	D	A	E	B	order of b	
order of #		F#	C#	G#	D#	A#	E#	B#	order of b	
order of #		F#	C#	G#	D#	A#	E#	B	order of b	
order of #		F#	C#	G#	D#	A	E	B	order of b	
order of #		F#	C#	G#	D	A	E	B	order of b	
order of #		F#	C#	G	D	A	E	B	order of b	
order of #		F#	C	G	D	A	E	B	order of b	
order of #		F	C	G	D	A	E	B	order of b	
order of #		F	C	G	D	A	E	B ^b	order of b	
order of #		F	C	G	D	A	E ^b	B ^b	order of b	
order of #		F	C	G	D ^b	A ^b	E ^b	B ^b	order of b	
order of #		F	C	G ^b	D ^b	A ^b	E ^b	B ^b	order of b	
order of #		F	C ^b	G ^b	D ^b	A ^b	E ^b	B ^b	order of b	
order of #		F ^b	C ^b	G ^b	D ^b	A ^b	E ^b	B ^b	order of b	

Major Range

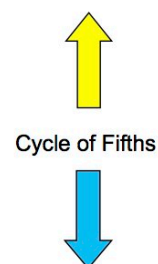
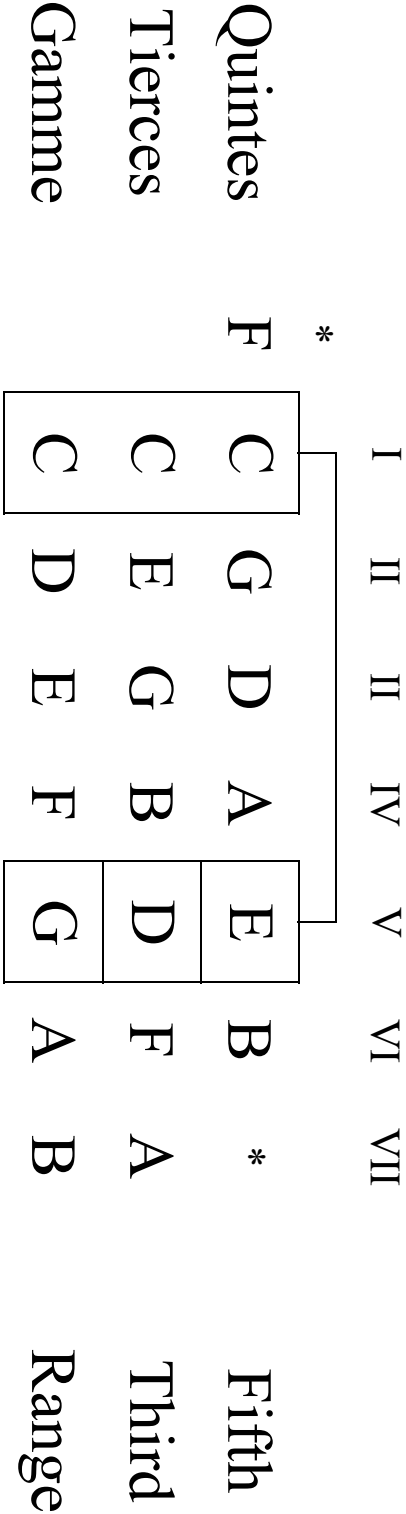


Fig.3d

Cycles des quintes

Cycles of fifths



* Selon l'ordre des dièses / orders of sharps

3rd part: the natural harmonics vs temperate

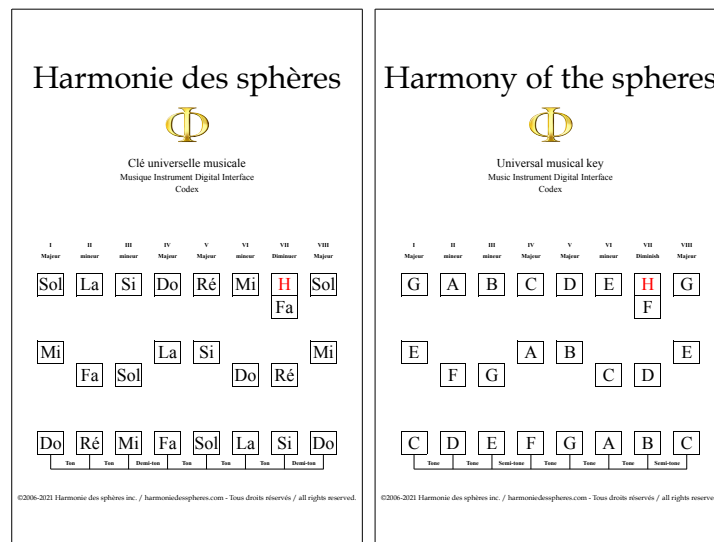
Each note is made of natural multiples called harmonics

At each degree of the scale, there is a three fundamental sound chord

The chords of three sounds consists of a fundamental
a third party (major or minor) and a fifth just.

« THE THIRD CYCLE »

« C, E, G, B, D, F, A »



The notes of a chord can be duplicated at the octave or arpeggiated without altering the identity of the chord.

You can select and print Fig.3c (Codex) in legal format.

Cut the two parts (A and B) according to the language you want.

Also cut the twenty-four (24) windows (Part A) that correspond to the

« Music intervals »

I degree	C, E, G
II degree	D, F, A
III degree	E, G, B
IV degree	F, A, C
V degree	G, B, D
VI degree	A, C, E
VII degree	B, D, F
VIII degree	C, E, G

Then superimpose part A on part B and position the 1st degree on the C, you will obtain at each degree the notes of all the chords.

You can change the tone as you wish,

The results will be the same.

P.S. You can also use an ABS tube with a diameter of 1.5 inch or 3.81 cm to make it circular shape.

Fig.3c (Codex)

P
A
R
T
I
E
A

Harmonie des sphères



Clé universelle musicale
Musique Instrument Digital Interface
Codex

I	II	III	IV	V	VI	VII	VIII
Majeur	mineur	mineur	Majeur	Majeur	mineur	Diminuer	Majeur
Sol	La	Si	Do	Ré	Mi	H Fa	Sol
Mi	Fa	Sol	La	Si	Do	Ré	Mi
Do	Ré	Mi	Fa	Sol	La	Si	Do
Ton		Ton	Demi-ton	Ton	Ton	Ton	Demi-ton

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Harmony of the spheres



Universal musical key
Music Instrument Digital Interface
Codex

I	II	III	IV	V	VI	VII	VIII
Majeur	mineur	mineur	Majeur	Majeur	mineur	Diminish	Majeur
G	A	B	C	D	E	H F	G
E	F	G	A	B	C	D	E
C	D	E	F	G	A	B	C
Tone		Tone	Semi-tone	Tone	Tone	Tone	Semi-tone

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P
A
R
T
I
E
B

Do	Ré	Mi	Fa	Sol	La	Si	Do
Si	Ré ^b	Mi ^b	Fa ^b	Sol ^b	La ^b	Si ^b	Do
La	Do	Ré	Mi	Fa	Sol	La	Si
Sol	Si	Do	Ré	Mi	Fa	Sol	La
Fa	La	Si	Do	Ré	Mi	Fa	Sol
Mi	Sol	La	Si	Do	Ré	Mi	Fa
Ré	Fa	Sol	La	Si	Do	Ré	Mi
Do	Ré	Mi	Fa	Sol	La	Si	Do
Si	Do	Ré	Mi	Fa	Sol	La	Si
La	Si	Do	Ré	Mi	Fa	Sol	La
Sol	La	Si	Do	Ré	Mi	Fa	Sol
Fa	Sol	La	Si	Do	Ré	Mi	Fa
Mi	Sol	La	Si	Do	Ré	Mi	Fa
Ré	Mi	Sol	La	Si	Do	Ré	Mi
Do	Ré	Mi	Fa	Sol	La	Si	Do

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C	D	E	F	G	A	B	C
B	D ^b	E ^b	F ^b	G ^b	A ^b	B ^b	C
A	C	D	E	F	G	A	B
G	A	B	C	D	E	F	G
F	G	A	B	C	D	E	F
E	F	G	A	B	C	D	E
D	E	F	G	A	B	C	D
C	D	E	F	G	A	B	C
B	D ^b	E ^b	F ^b	G ^b	A ^b	B ^b	C
A	C	D	E	F	G	A	B
G	A	B	C	D	E	F	G
F	G	A	B	C	D	E	F
E	F	G	A	B	C	D	E
D	E	F	G	A	B	C	D
C	D	E	F	G	A	B	C

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P
A
R
T
A

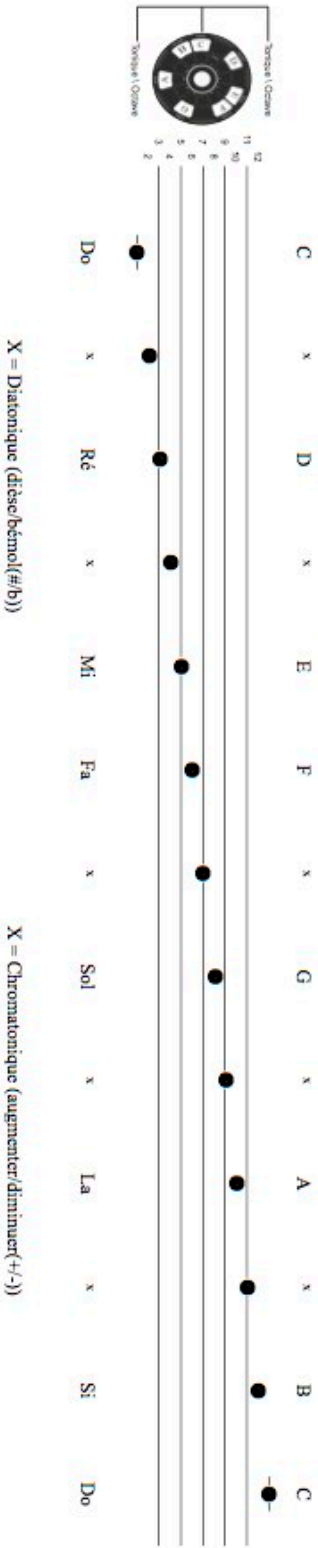
P
A
R
T
B

Harmony of the spheres



Fig.4

Musical universal key
Musical Instrument Digital Interface



Select and print at legal format the Fig.4b (image) then cut the two rulers along the lines shown and also cut the eight (8) windows that correspond to the intervals of music.

Then superimpose the part of the center on the top of the rule that suits you and position the 1st degree (Tonic) on the C, you will obtain the sequence

“ C-D-E-F-G-A-B-C ”

You can repeat the exercise in fig.3
or simply move the ruler by tone or semitone.

What is important here is that no matter the tone (tonal height) in which you play, the intervals will always be the same :

Major (which constitute the key frame of our tonal system) or minor.



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Cut

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To fold

C

B

B^b_{A[#]}

A^b_{G[#]}

G^b_{F[#]}

F

E

E^b_{D[#]}

D^b_{C[#]}

C

B

B^b_{A[#]}

A^b_{G[#]}

G^b_{F[#]}

F

E

E^b_{D[#]}

D^b_{C[#]}

C

↓

To fold

C

B

B^b_{A[#]}

A^b_{G[#]}

G^b_{F[#]}

F

E

E^b_{D[#]}

D^b_{C[#]}

C

B

B^b_{A[#]}

A^b_{G[#]}

G^b_{F[#]}

F

E

E^b_{D[#]}

D^b_{C[#]}

C

↑

Use a plastic ruler as a support print the sheet in legal size

Cut

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Fig.4b

Clé universelle musicale

Octave

Couper

Couper

Septième

Couper

Sixième

Quinte

Couper

Couper

Quarte

Tierce

Couper

Seconde

Couper

Tonique

Couper

Solfège

Universal musical Key

Octave

Cut

Cut

Seventh

Cut

Sixth

Fifth

Cut

Cut

Fourth

Third

Cut

Second

Cut

Tonic

Cut

Solfège

Dessus de la règle

Couper

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Plier

Do

Si

Si^b_{La[#]}

La^b_{Sol[#]}

Sol^b_{Fa[#]}

Fa

Mi

Mi^b_{Ré[#]}

Ré^b_{Do[#]}

Do

Si

Si^b_{La[#]}

La^b_{Sol[#]}

Sol^b_{Fa[#]}

Fa

Mi

Mi^b_{Ré[#]}

Ré^b_{Do[#]}

Do

↓

Plier

Do

Si

Si^b_{La[#]}

La^b_{Sol[#]}

Sol^b_{Fa[#]}

Fa

Mi

Mi^b_{Ré[#]}

Ré^b_{Do[#]}

Do

Si

Si^b_{La[#]}

La^b_{Sol[#]}

Sol^b_{Fa[#]}

Fa

Mi

Mi^b_{Ré[#]}

Ré^b_{Do[#]}

Do

↑

Utiliser une règle en plastique comme support imprimer la feuille en format légal

Couper

« HDS Tempered scale in Hz and guitar fretboard »

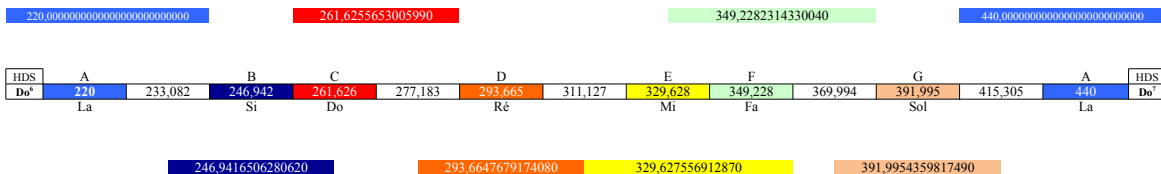
Fig.5

HARMONY OF THE SPHERES

Universal musical Key



HDS tempered scale Hz	440
Progression %	5,94630943592953

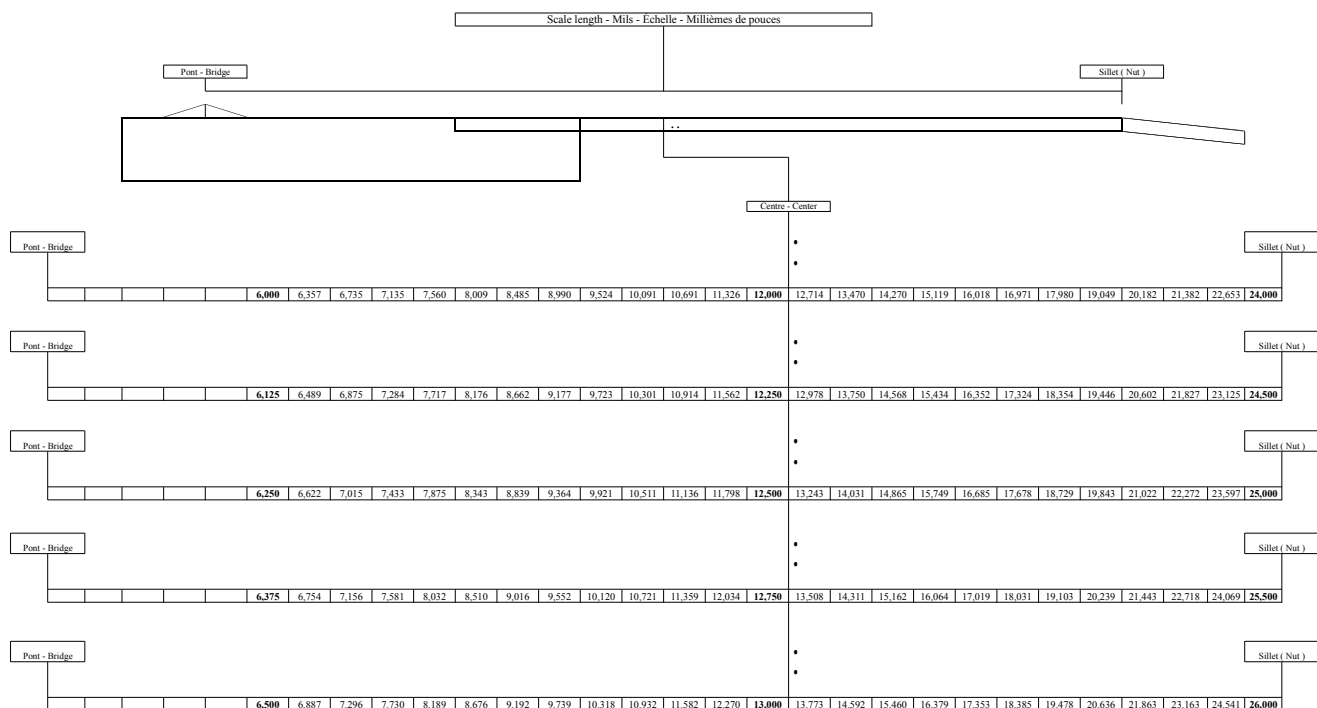


Guitar Fretboard



Two opposites in perfect harmony

Progression %	5,94630943592953
---------------	------------------



Tempered scale and various frequency of A

Fig.5b



HDS temperate scale Hz															
Progression %										5,94630943592953					
HDS	C	D			E	F		G		A		B		C	HDS
Do ¹²	16744	17739,688	18794,545	19912,127	21096,164	22350,607	23679,643	25087,708	26579,501	28160	29834,481	31608,531	33488	Do ¹³	
Do ¹¹	8372	8869,844	9397,273	9956,063	10548,082	11175,303	11839,822	12543,854	13289,750	14080	14917,240	15804,266	16744	Do ¹²	
Do ¹⁰	4186	4434,922	4698,636	4978,032	5274,041	5587,652	5919,911	6271,927	6644,875	7040	7458,620	7902,133	8372	Do ¹¹	
Do ⁹	2093	2217,461	2349,318	2489,016	2637,020	2793,826	2959,955	3135,963	3322,438	3520	3729,310	3951,066	4186	Do ¹⁰	
Do ⁸	1046,50	1108,731	1174,659	1244,508	1318,510	1396,913	1479,978	1567,982	1661,219	1760	1864,655	1975,533	2093	Do ⁹	
Do ⁷	523,25	554,365	587,330	622,254	659,255	698,456	739,989	783,991	830,609	880	932,328	987,767	1046,50	Do ⁸	
Do ⁶	261,63	277,1826	293,66	311,13	329,63	349,23	369,99	392,00	415,30	440	466,16	493,88	523,25	Do ⁷	
Do ⁵	130,81	138,59	146,83	155,56	164,81	174,61	185,00	196,00	207,65	220,00	233,08	246,94	261,63	Do ⁶	
Do ⁴	65,41	69,30	73,42	77,78	82,41	87,31	92,50	98,00	103,83	110,00	116,54	123,47	130,81	Do ⁵	
Do ³	32,70	34,65	36,71	38,89	41,20	43,65	46,25	49,00	51,91	55,00	58,27	61,74	65,41	Do ⁴	
Do ²	16,35	17,32	18,35	19,45	20,60	21,83	23,12	24,50	25,96	27,50	29,14	30,87	32,70	Do ³	
Do ¹	8,18	8,66	9,18	9,72	10,30	10,91	11,56	12,25	12,98	13,75	14,57	15,43	16,35	Do ²	

Champ auditif

440,000000000000000000000000000000

HDS temperate scale Hz																
Progression %										5,94630943592953						
HDS	C	D			E		F		G		A		B		C	HDS
Do ¹²	16820,15	17820,32	18879,97	20002,64	21192,06	22452,20	23787,28	25201,74	26700,32	28288,00	29970,09	31752,21	33640,29	Do ¹³		
Do ¹¹	8410,07	8910,16	9439,99	10001,32	10596,03	11226,10	11893,64	12600,87	13350,16	14144,00	14985,05	15876,10	16820,15	Do ¹²		
Do ¹⁰	4205,04	4455,08	4719,99	5000,66	5298,01	5613,05	5946,82	6300,44	6675,08	7072,00	7492,52	7938,05	8410,07	Do ¹¹		
Do ⁹	2102,52	2227,54	2360,00	2500,33	2649,01	2806,53	2973,41	3150,22	3337,54	3536,00	3746,26	3969,03	4205,04	Do ¹⁰		
Do ⁸	1051,26	1113,77	1180,00	1250,16	1324,50	1403,26	1486,70	1575,11	1668,77	1768,00	1873,13	1984,51	2102,52	Do ⁹		
Do ⁷	525,630	556,89	590,00	625,08	662,25	701,63	743,35	787,55	834,38	884,00	936,57	992,26	1051,26	Do ⁸		
Do ⁶	262,815	278,44	295,00	312,54	331,13	350,82	371,68	393,78	417,19	442	468,28	496,13	525,630	Do ⁷		
Do ⁵	131,41	139,22	147,50	156,27	165,56	175,41	185,84	196,89	208,60	221,00	234,14	248,06	262,815	Do ⁶		
Do ⁴	65,70	69,61	73,75	78,14	82,78	87,70	92,92	98,44	104,30	110,50	117,07	124,03	131,41	Do ⁵		
Do ³	32,85	34,81	36,87	39,07	41,39	43,85	46,46	49,22	52,15	55,25	58,54	62,02	65,70	Do ⁴		
Do ²	16,43	17,40	18,44	19,53	20,70	21,93	23,23	24,61	26,07	27,63	29,27	31,01	32,85	Do ³		
Do ¹	8,213	8,70	9,22	9,77	10,35	10,96	11,61	12,31	13,04	13,81	14,63	15,50	16,43	Do ²		

Champ auditif

442,000000000000000000000000000000

HDS temperate scale Hz															
Progression %										5,94630943592953					
HDS	C	D		E		F		G		A		B		C	HDS
Do ¹²	16896	17900,96	18965,40	20093,15	21287,95	22553,79	23894,91	25315,78	26821,13	28416	30105,70	31895,88	33793	Do ¹³	
Do ¹¹	8448	8950,48	9482,70	10046,57	10643,97	11276,90	11947,46	12657,89	13410,57	14208	15052,85	15947,94	16896	Do ¹²	
Do ¹⁰	4224	4475,24	4741,35	5023,29	5321,99	5638,45	5973,73	6328,94	6705,28	7104	7526,43	7973,97	8448	Do ¹¹	
Do ⁹	2112	2237,62	2370,68	2511,64	2660,99	2819,22	2986,86	3164,47	3352,64	3552	3763,21	3986,99	4224	Do ¹⁰	
Do ⁸	1056	1118,81	1185,34	1255,82	1330,50	1409,61	1493,43	1582,24	1676,32	1776	1881,61	1993,49	2112	Do ⁹	
Do ⁷	528	559,40	592,67	627,91	665,25	704,81	746,72	791,12	838,16	888	940,80	996,75	1056	Do ⁸	
Do ⁶	264	279,70	296,33	313,96	332,62	352,40	373,36	395,56	419,08	444	470,40	498,37	528	Do ⁷	
Do ⁵	132	139,85	148,17	156,98	166,31	176,20	186,68	197,78	209,54	222	235,20	249,19	264	Do ⁶	
Do ⁴	66	69,93	74,08	78,49	83,16	88,10	93,34	98,89	104,77	111	117,60	124,59	132	Do ⁵	
Do ³	33	34,96	37,04	39,24	41,58	44,05	46,67	49,44	52,39	55,50	58,80	62,30	66	Do ⁴	
Do ²	16,50	17,48	18,52	19,62	20,79	22,03	23,33	24,72	26,19	27,75	29,40	31,15	33	Do ³	
Do ¹	8,25	8,74	9,26	9,81	10,39	11,01	11,67	12,36	13,10	13,88	14,70	15,57	16,50	Do ²	

Champ auditif

444,000000000000000000000000000000

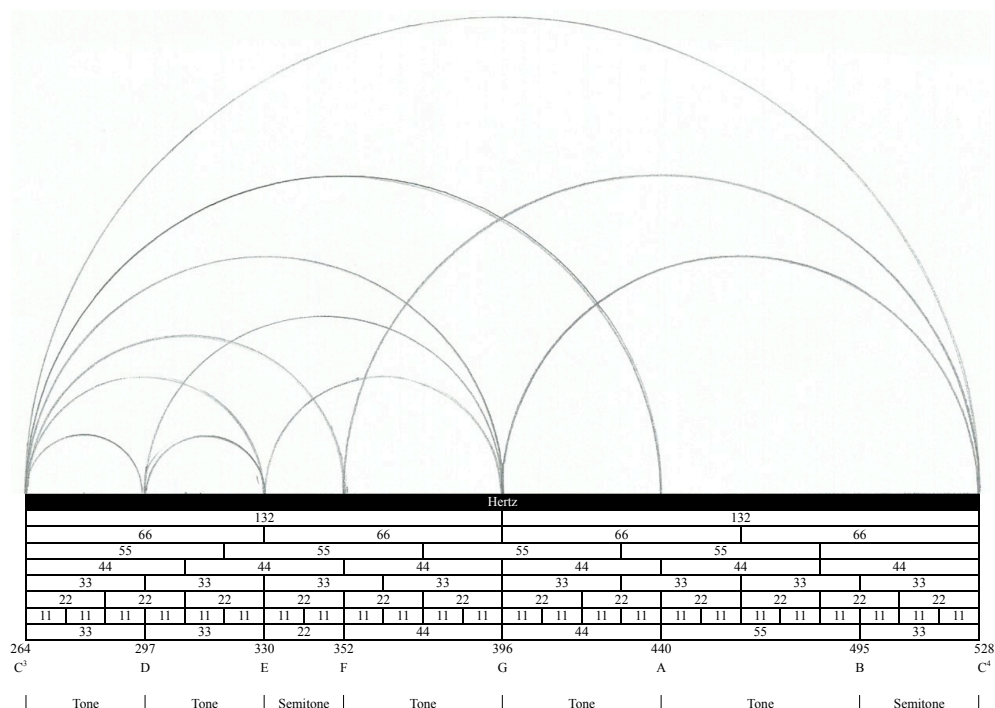
*** For more details on temperate scale see the section R/D

Pythagore and the harmony of the spheres

Fig.7

HARMONY OF THE SPHERES

MUSICAL UNIVERSAL KEY



HDS Universal Proportion

1,125	1,111	1,06666667	1,125	1,111	1,125	1,06666667
1,250	1,250	1,250				
1,500	1,33333333	1,66666667	1,2	1,500	1,6	1,875
1,33333333	1,500	1,6	1,875	1,06666667		

HDS Fraction Pythagorean

1 1/8	1 1/4	1 1/3	1 1/2	1 2/3	1 7/8	2
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For more details on natural harmonics see the section R/D

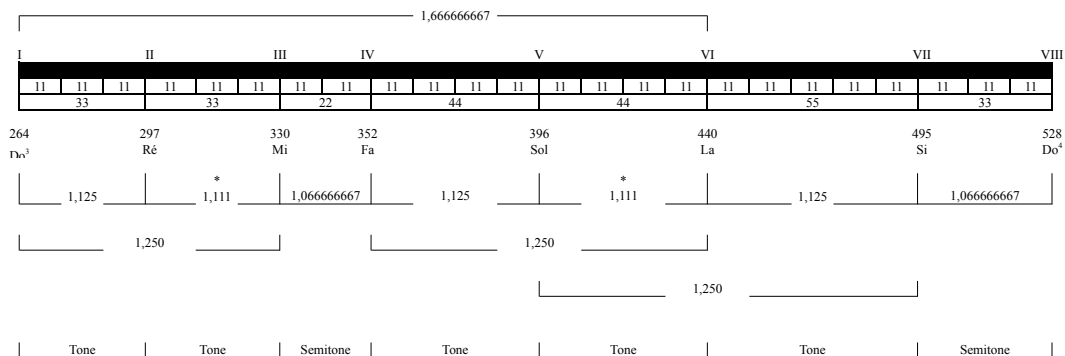
« Natural Harmonics »

Fig.7a



NATURAL HARMONICS

Starting from the fact that the natural resonance (harmonics) of each note are relatively all multiples of each of them and the frequency (Hz) is given by the simple arithmetic operation of fundamental sound F^0 multiplication by the rank number of it



II	X	=
11	1	11
11	2	22
11	3	33
11	4	44
11	5	55
11	6	66
11	7	77
11	8	88
11	9	99
11	10	110
11	11	121
11	12	132
11	13	143
11	14	154
11	15	165
11	16	176
11	17	187
11	18	198
11	19	209
11	20	220
11	21	231
11	22	242
11	23	253

Octave	11	24	264	C	1
	11	25	275		2
	11	26	286		3
Second	11	27	297	D	4
	11	28	308		5
	11	29	319		6
Third	11	30	330	E	7
	11	31	341		8
Fourth	11	32	352	F	9
	11	33	363		10
	11	34	374		11
	11	35	385		12
Fifth	11	36	396	G	13
	11	37	407		14
	11	38	418		15
	11	39	429		16
Sixth	11	40	440	A	17
	11	41	451		18
	11	42	462		19
	11	43	473		20
	11	44	484		21
Seventh	11	45	495	B	22
	11	46	506		23
	11	47	517		24
Octave	11	48	528	C	25

For more details on natural harmonics see figures 6 and 7 section R/D

Note that the ratio between A 440 Hz and C 264 Hz has a proportion of

$$1.66666666666667$$

$$\text{either: } 440/264 = 1.66666666666667$$

this proportion will never change ... whatever the frequency chosen:

$$\dots 328 - 426,7 - 432 - 440 - 442 - 444 \dots$$

it's a good way to find your C

then divide it by 24 to get what I call the unit of measure.

P: S. The tuning frequency of A at 426.7 Hz also called Scientific range
or Range of physicists, with a Do at 256 Hz

$$\text{either : } 426.666666666667 / 256 = 1.66666666666667.$$

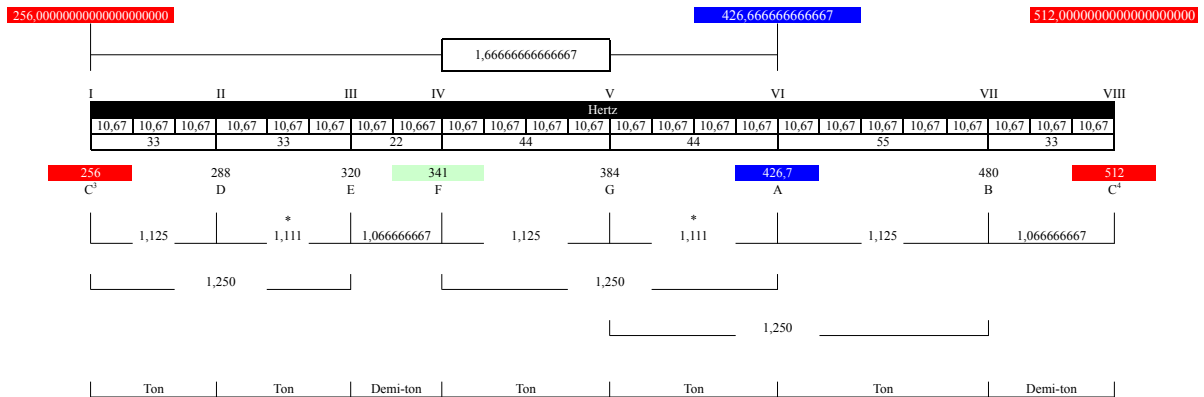
Fig.7f



NATURAL HARMONICS

426,7 Hz

Starting from the fact that the natural resonance (harmonics) of each note are relatively all multiples of each of them and the frequency (Hz) is given by the simple arithmetic operation of fundamental sound F0 multiplication by the rank number of it



10,666666666667					
10,67		X	=		
10,67	1	10,67			
10,67	2	21,33			
10,67	3	32			
10,67	4	42,67			
10,67	5	53,33			
10,67	6	64			
10,67	7	74,67			
10,67	8	85,33			
10,67	9	96			
10,67	10	106,7			
10,67	11	117,3			
10,67	12	128			
10,67	13	138,7			
10,67	14	149,3			
10,67	15	160			
10,67	16	170,7			
10,67	17	181,3			
10,67	18	192			
10,67	19	202,7			
10,67	20	213,3			
10,67	21	224			
10,67	22	234,7			
10,67	23	245,3			
Octave	10,67	24	256	C	1
	10,67	25	266,7		2
	10,67	26	277,3		3
Seconde	10,67	27	288	D	4
	10,67	28	298,7		5
Tierce	10,67	29	309,3		6
	10,67	30	320	E	7
Quarte	10,67	31	330,7		8
	10,67	32	341,3	F	9
Quinte	10,67	33	352		10
	10,67	34	362,7		11
	10,67	35	373,3		12
Sixième	10,67	36	384	G	13
	10,67	37	394,7		14
	10,67	38	405,3		15
Septième	10,67	39	416		16
	10,67	40	426,7	A	17
	10,67	41	437,3		18
Octave	10,67	42	448		19
	10,67	43	458,7		20
	10,67	44	469,3		21
Septième	10,67	45	480	B	22
	10,67	46	490,7		23
	10,67	47	501,3		24
Octave	10,67	48	512	C	25

341,33333333334

426,66666666667

For more details on natural harmonics see figures 6 and 7 section R/D

Fig.7H



LES HARMONIQUES NATURELS - NATURAL HARMONICS

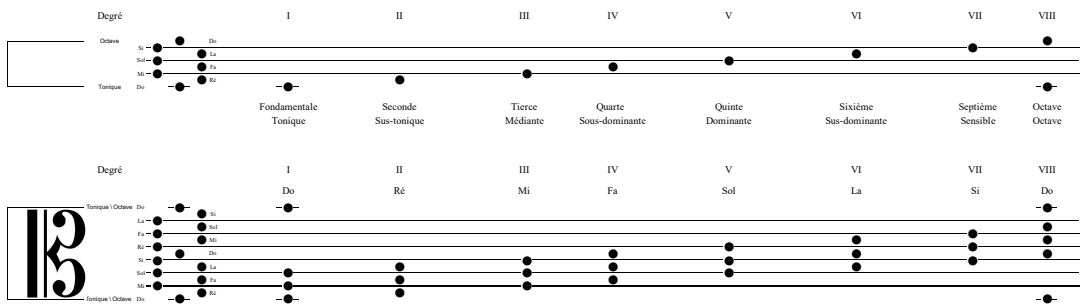
[illegible]

Fig.8

Harmonie des sphères



Clé universelle musicale
Le Diatonisme



Harmonie des sphères inc.

Mission

Promote the universal musical key throughout the world,
research and develop simple and accessible applications
to all, in order to facilitate the understanding of musical notions.

« Everything is a matter of perception »

Sylvain Lalonde founding president : Harmonie des sphères inc.

To contact us : sylvain.lalonde@me.com

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In memory of an exceptional mind

« Life is not a mystery but a science undisclosed »

« The Genesis of reality, Bernard de Montréal »

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