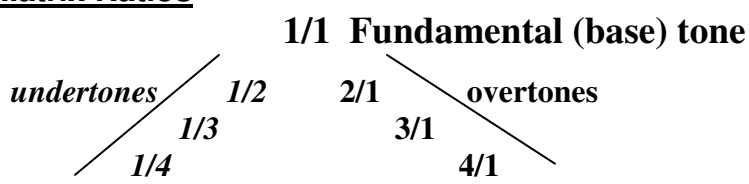
FIG 6A. Lambdoma Matrix Ratios



Simple Lambdoma matrix, named after the Greek letter lambda, **λ**

FIG 6B. The Lambdoma matrix is calculated by first numbering the columns and rows in ascending sequence from 1. The **ratios are simply the column number divided by the row number** as shown below in the matrix below. The diagonal is always unity.

		1	2	3	4	5	6	7	8
1	:	1/1	2/1	3/1	4/1	5/1	6/1	7/1	8/1
2	:	*1/2*	1/1	3/2	2/1	5/2	3/1	7/2	4/1
3	:	*1/3*	2/3	1/1	4/3	5/3	2/1	7/3	8/3
4	:	*1/4*	1/2	3/4	[1/1	5/4	3/2	7/4	2/1] ←
5	:	*1/5*	2/5	3/5	4/5	1/1	6/5	7/5	8/5
6	:	*1/6*	1/3	1/2	2/3	5/6	1/1	7/6	4/3
7	:	*1/7*	2/7	3/7	4/7	5/7	6/7	1/1	8/7
8	:	*1/8*	1/4	3/8	1/2	5/8	3/4	7/8	1/1

FIG 6C. The ratios above can also be expressed as decimal fractions:

		1	2	3	4	5	6	7	8
1	:	1.000	**2.000**	**3.000**	**4.000**	**5.000**	**6.000**	**7.000**	**8.000**
2	:	***0.500***	1.000	1.500	2.000	2.500	3.000	3.500	4.000
3	:	***0.333***	0.667	1.000	1.333	1.667	2.000	2.333	2.667
4	:	***0.250***	0.500	0.750	[1.00	1.250	1.500	1.750	2.00] ←
5	:	***0.200***	0.400	0.600	0.800	1.000	1.200	1.400	1.600
6	:	***0.167***	0.333	0.500	**0.667**	0.833	1.000	1.167	1.333
7	:	***0.143***	0.286	0.429	0.571	0.714	0.857	1.000	1.143
8	:	**0.125**	0.250	0.375	0.500	0.625	0.750	0.875	1.000

Overtones " [ ]" ← lie above the fundamental 1/1 diagonal; ratios > 1;

Undertones **" [" lie below the 1/1 diagonal; ratios < 1.**

(Prior Art)

FIG 7. Lambdoma Matrix Overtone and Undertone Harmonic Frequency Series

FIG 7A. A **harmonic overtone series** :

16/16	17/16	18/16	19/16	20/16	…	31/16

Factors corresponding to the above ratios are:

1	1.0625	1.125	1.1875	1.25	…	1.9375

FIG 7B. The harmonic overtone series for a base frequency of 22.00:

22.000	23.375	24.750	26.125	27.500	…	42.625

Calculating the equivalent frequencies within the reference octave of 16 to 32, values above 32 can be shifted down or reduced by halving the values, i.e. octave reduction.

FIG 7C. Lambdoma **harmonic undertone series :**

16/16	16/17	16/18	16/19	16/20	…	16/31

FIG 7D. Overtone / Undertone factors and harmonic series calculations:

Overtone Series

λ factor	#	Freq.		C-4 freq.
1	1	22.000	base	22.000
1.06250	2	23.375		23.375
1.12500	3	24.750	O2	24.750
1.18750	4	26.125		26.125
1.25000	5	27.500	O4	27.500
1.31250	6	28.875		28.875
1.37500	7	30.250		30.250
1.43750	8	31.625		31.625
1.50000	9	33.000	**O8**	**16.500**
1.56250	10	34.375		17.188
1.62500	11	35.750		17.875
1.68750	12	37.125		18.563
1.75000	13	38.500	O12	19.250
1.81250	14	39.875		19.938
1.87500	15	41.250		20.625
1.93750	16	42.625		21.313

O8 = perfect fifth

U8 = perfect fourth

Undertone series

λ factor	#	Freq.		C-4 freq.
1	1	22.000	base	22.000
0.94118	2	20.706		20.706
0.88889	3	19.556	U2	19.556
0.84211	4	18.526		18.526
0.80000	5	17.600	U4	17.600
0.76190	6	16.762		16.762
0.72727	7	16.000		16.000
0.69565	8	15.304		30.609
0.66667	9	14.667	**U8**	**29.333**
0.64000	10	14.080		28.160
0.61538	11	13.538		27.077
0.59259	12	13.037		26.074
0.57143	13	12.571	U12	25.143
0.55172	14	12.138		24.276
0.53333	15	11.733		23.467
0.51613	16	11.355		22.710

[**Overtone frequencies**] = ***base frequency*** * [**overtone factors**] **(equ. 2a)**

[**Undertone frequencies**] = ***base frequency*** * [**undertone factors**] **(equ. 2b)**

(Prior Art)

FIG 8A. Lambdoma Power Ratios for the 16x16 Beta octave subset:

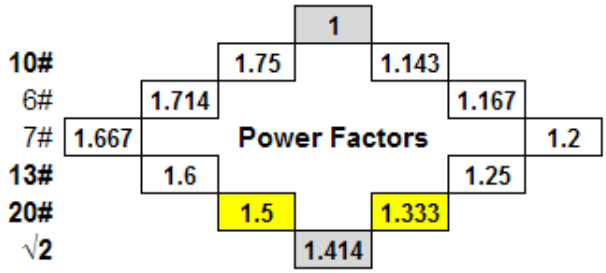
Base Frequency = 22.00

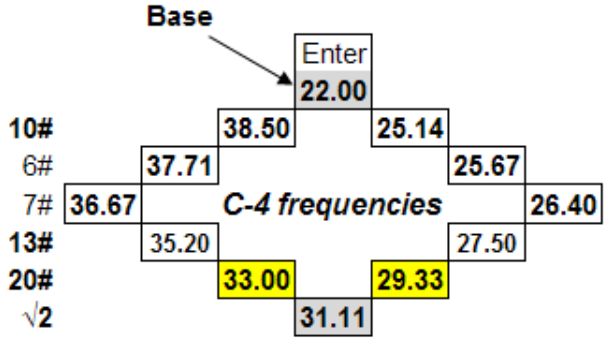
Equiv *f*	# Matches	Music Name	Factor	# Occurrences
22.000 -	16	Fundamental	**1.000**	**46**
16.500 -	5	**Perfect Fifth = R5**	**1.500**	**20**
29.333 -	5	**Perfect Fourth = R4**	**1.333**	**20**
17.600 -	3	Minor Sixth	**1.600**	**13**
27.500 -	3	Minor Third	**1.250**	**13**
19.556 -	2	Minor Seventh	1.778	5
24.750 -	2	Major Tone	1.125	5
25.143 -	2	Supermajor Second	**1.143**	**10**
19.250 -	2	Harmonic Seventh	**1.750**	**10**
18.333 -	3	Major Sixth	**1.667**	**7**
26.400 -	3	Minor Third	**1.200**	**7**

FIG 8B. Lambdoma Factors table

#	Factor_1	Avg.	Factor_2	#
46	1	1.50000	2	
5	1.06667	1.47083	1.875	5
2	1.07143	1.46905	1.86667	2
2	1.07692	1.46703	1.85714	2
3	1.08333	•	1.84615	3
3	1.09091	•	1.83333	3
2	1.1	•	1.81818	2
2	1.11111	•	1.8	2
5	1.125	1.45139	1.77778	5
10	1.142857	1.44643	1.75	10
1	1.15385	•	1.73333	1
6	1.166667	1.44048	1.714286	6
1	1.18182	•	1.69231	1
7	1.2	1.43333	1.666667	7
1	1.22222	•	1.63636	1
5	1.23077	1.42788	1.625	5
13	1.25	1.42500	1.6	13
2	1.27273	•	1.57143	2
2	1.28571	•	1.55556	2
2	1.3	•	1.53846	2
20	1.333333	1.41667	1.5	20
1	1.36364	•	1.46667	1
5	1.375	1.41477	1.45455	5
1	1.38462	1.41453	1.44444	1
4	1.4	1.41429	1.42857	4
		Average		
		1.41428571		

very close √2





Key Info for WLM Patent	This section summarizes Key Facts in file "**PTO Facts.xls**" and presents extended information on individual elements of the patent application

File "a_**Lambdoma matrix PTO.doc"** contains the paragraphs in the patent showing the Prior Art and WLM discoveries, which document the fact that the ***public domain*** **Lambdoma matrix and its concepts form the backbone of various calculations** in the "Method and System for Detecting Biological Energy Markers" patent application by W.L. Meyer. *Key portions of the .. PRO.doc are included below*

The key legal implications are as follows:

(1) The Lambdoma matrix and its concepts are truly ***public domain*** information which is neither owned by nor proprietary to any individual;

(2) Describing the Lambdoma matrix and relating it to major facets of life are a major part of the life work of researcher Barbara Hero and her Lambdoma keyboard;

(3) The use of the Lambdoma matrix calculations and concepts is not incorporated in other sound therapy modalities, and it appears to be unknown / unacknowledged other than by B. Hero and the current patent application of W.L. Meyer.

Summary of WLM thoughts as of October 2006.

→**IF** there's a **correlation between a VP and the state of health** of a client, **THEN** there should be **some relationship between the anomalous frequency points on the FFT plot,** through harmonics and/or musical principles. The Lambdoma matrix provides one basis to calculate simple harmonics for biometric data that can relate anomalous frequencies.

→ The bioenergetics of the mind – body system may be showing what the body is **currently doing to compensate** for the underlying issues affecting health. These bodily processes may mask the underlying health issue similar to the layers of an onion masking the core.

Corollary: what we see in the anomalous points of a FFT plot *MAY NOT* show the underlying issue, only the current dynamic state of bioenergetic mind – body processes running in the compensation (adaptation) phase. Any set of measurements of body energetics are likely subject to this dynamic and uncertain nature.

Lambdoma matrix PTO	This public domain concept forms the backbone of calculations in the "Method and System for Detecting Biological Energy Markers" patent application of W.L. Meyer

The Lambdoma was first described by Pythagoras 500 B.C. (but much older); see B. Hero's decades of work on the Lambdoma including the Lambdoma keyboard.

Selected patent paragraphs:

[0027] The concept of the Lambdoma Matrix and its musical scales was attributed to the philosopher Pythagoras, though it was probably known before his time. The Lambdoma was relatively unknown in the last century, and is not cited in most dictionaries. On a first look, it appears to be little more than a mathematical multiplication and division table. On a closer look however, it bears a one-to-one relationship to musical intervals in very specific harmonic series. Its numerical framework of simple, whole-number ratios can be translated into frequencies of audible sound or a reference octave, as shown in FIGS. 6 and 7.

a) an overtone pattern is based on multiplication - a series of tones produced from the fundamental tone; overtones lie above the 1/1 diagonal in the Lambdoma Matrix. Overtones incorporate the musical interval of the perfect fifth, which is also referred to as the dominant scale degree in relation to the tonic (fundamental or note considered to be most important).

b) an undertone pattern is based on division - undertone in music is simply the inversion of the overtone or 1/n; undertones lie below the 1/1 diagonal in the Lambdoma. Undertones incorporate the musical interval of the perfect fourth, which is also referred to as the subdominant scale degree in relation to the tonic.

c) harmonic overtone series or simply the harmonic series of the present invention are based primarily on dividing the octave into sixteen equal spaced divisions, and the calculations are:
[harmonic overtone series] = fundamental_frequency * [16^{th} overtone factors]
where the brackets [ ] indicate a 1 x 16 matrix or vector. FIG. 7D defines these factors.

d) The inventor has extensively researched the Lambdoma matrix and associated musical intervals, and has made certain discoveries which are incorporated in the present invention.

[0028] The most common harmonic progression (or chord in music) is based on the first, fourth (4:3), and fifth (3:2) scale degrees (i.e., the fundamental, subdominant and dominant). The scale degree is the note of a scale in relation to the fundamental or tonic that is considered the most important and its corresponding frequency that has special significance in bioanalysis. See also PHILLIPS, S.N; "Pythagorean Aspects of Music", pp. 1-9, incorporated herein by reference.

[0083] FIGS. **6A-6C** illustrate the concepts of the Lambdoma Matrix of integer ratios; this matrix is one basis of various discoveries disclosed in the present invention.

[0084] FIGS. **7A-7D** define the Lambdoma matrix harmonic overtone and undertone calculations that are the primary basis of harmonic series incorporated of the present invention;

[0085] FIG. **8A** summarizes the Lambdoma power ratios showing the prominence of the perfect fifth and forth plus other ratios which form a key element in the methodology of the present invention; FIG. **8B** defines a table of Lambdoma factors with paired overtones-undertones which forms a series of approximations for the √2;

[0112] The basic concepts of the Lambdoma matrix are shown in FIGS. **6A-6C**. FIG. **7A** shows the Lambdoma matrix ratios and corresponding factors for calculating a harmonic overtone series, which is a 1 X 16 array (row vector) from column 16 to column 31 of the Lambdoma. FIG. **7B** shows an example harmonic series overtones calculated by multiplying the base frequency by the array of overtone factors. FIG. **7C** shows the Lambdoma matrix ratios and corresponding factors for calculating a harmonic undertone series, which is a 1 X 16 array (column vector) from row 16 to row 31 of the Lambdoma.

a. [Overtone frequencies] = base frequency * [overtone factors] (equ. 2a)

b. [Undertone frequencies] = base frequency * [undertone factors] (equ. 2b)
where the brackets [ ] indicate a 1x16 matrix or vector of values.

c. FIG. **7D** shows an example of both overtone and undertone series calculations.

d. Lambdoma ratios provide the factors used in harmonic calculations that are integral to the method used in the present invention. The inventor has extensively researched the Lambdoma matrix, and the method disclosed in this invention uses a normalized form of the Lambdoma ratios, wherein ratios are converted into unit range between 1 and 2 by octave calculations.

[0113] The Lambdoma power ratios (factors) shown in FIG. **8A** were summarized from the normalized Lambdoma matrix using ratios in the range from 1 to 2. These power ratios represent the ten most frequently occurring ratios in this matrix. This example uses a Base Frequency of 22.00 to determine the number of exact Matches and the number of occurrences within tolerance in the C-4 (Beta) Octave of the Lambdoma Matrix.

a. FIG. **8B** shows the Lambdoma Factors table for all ratios arranged in a paired, numeric order so that Factor_1 multiplied by Factor_2 equals two for all pairs. Each pair of factors contains both an overtone and an undertone, e.g., the perfect fourth and fifth ratios at 1.333 & 1.50 respectively.

b. The table of Factors in FIG. **8B** also shows that the average of Factor_1 and Factor_2 for each pair forms a progressively better approximation of $\sqrt{2}$ (square root of two)