phiTon_resonaTors
–Harmonics in Time–

To this day, there is no technique that can be universally used to successfully improve the behavior of oscillations of any kind, whether mechanical or electromagnetic.

Now the function of the devices called phiTon_resonaTors is to induce - in a variety of objects of various materials – an harmonization of the oscillation behavior, both mechanical and electromagnetic.

This is fully achieved thanks to the phiTon_resonaTors,which are predisposed by precise characteristics.

Various advantageous applications of the phiTon_resonaTors are currently being developed or prototyped and some have been already manufactured.

The basic principle behind the phiTon_resonaTors stems from the fact, that any type of movement of mechanical components induces an oscillation behavior which contains both dissonant and resonant parts and that even the electromagnetic oscillations contain in their spectrum sub-harmonics and harmonics being both resonant and dissonant compared to the fundamental frequency.

For example: the higher harmonics emitted by a musical instrument are dependent on the type of instrument, and it is for this reason that a violin has a different sound than that of a piano.
However, both a piano and a violin can act in a more or less harmonic way depending on the proportion of resonant and dissonant parts within the spectrum of oscillation and depending on the relationship between these parts.
The more the individual harmonics within the spectrum of oscillation of a musical instrument are integrated harmoniously as to the musical relationship, being this mathematical, the higher the quality of the instrument will be.

In the case of electromagnetic oscillations, the harmonization of the oscillation behavior results in a definitively better quality, or in a higher purity, of the transmitted signals.

The concepts of resonance and dissonance mentioned above can be more easily understood by referring to the Torkado model developed by the German physicist Gabi Müller (www.torkado.de).

Resonant oscillations are related to each other by means of frequency ratios defined by integers and fractions thereof (for example 1, 2, 3, 1/2, 1/3, 2/3, 3/4) and ensure an absorption of ideal energy, while the oscillations resulting from dissonant frequency ratios are defined by irrational numbers and ensure a transport of energy with little resistance. In nature occur phenomena both of resonance and dissonance which together form a harmonious unit.

In practice the oscillations, to which any object is subjected to, often include components of non-harmonic oscillation, which derive from the different resonance characteristics of the material composition used for the manufacturing of the object and that negatively influences the overall oscillation behavior of the latter.

In order to achieve harmonization of the oscillation behavior, one can try to divert these non-harmonic oscillation components, but in doing so some of the energy of the oscillation is wasted and thus the degree of effectiveness of an oscillating object is reduced.

The approach on which the PHITON_RESONATORS rely on instead, is to make sure that the components of resonant oscillation (based on relations between integers) and the components of dissonant oscillation (based on irrational numbers) have wavelengths that overlap in a harmonious way, ideally in relation to the Φ music system (i.e. based on the number Φ = phi), otherwise known as the golden ratio or golden number).

The approach of organizing harmonically dissonant and resonant components using a device whose dimensions are defined according to the fundamental mathematical model described below allows not only not to waste the energy associated to the dissonant components oscillations but to increase the degree of effectiveness of the oscillating object.
In addition to size, the materials of the PHITON_RESONATORS are appropriately chosen in such manner, that they can get into resonance and/or dissonance.
According to the scholar Frithjof Müller
(http://www.aladin24.de/elemente/compton.htm),

*the wavelength of resonance of electrons **L** of an element is given by the following equation:*
***L = Z · Ce · 2N**, where **Z** is the atomic number of the element, **Ce** is the Compton wavelength for an electron **(Ce = h / (me · c)**, where **h** is Planck's constant, **me** is the electron mass and **c** is the speed of light, and **N** is an integer. The above equation can also be used to calculate the wavelength of resonance of protons of an element, in which case instead of **Ce** the Compton wavelength for a proton **Cp = h / (c · mp)** is used, where mp is the mass of the proton.*
*For example, according to the equation of Frithjof Müller the wavelength of resonance for the electrons of copper **(Z = 29)** is **L = 29 · Ce · 231 = 151.1 mm**. At the same time, the length of **151.1 mm** is also a wavelength of resonance of protons of iron **(Z = 26)**, being **L = 26 · Cp · 242 = 151.1 mm.***
*Since the relationship between the atomic numbers **Z** of iron and copper is equal to **26/29 = 0.89655**, and the ratio between the mass of the proton and the electron mass is equal to **mp / me = 0.89655 · 211**, the wavelengths of resonance of electrons of an atom of copper are identical to those of the protons of an iron atom (as can easily be seen using different values of **N**).*

For this reason, the coupling of the materials copper and iron is resonant and therefore the PHITON_RESONATORS comprise a body (preferably the inner body) of copper and a body (preferably the outer body) of iron (or better, of steel).

The coupling of steel and copper, characteristic of the PHITON_RESONATORS, not only has the particularity of being a coupling of elementary resonance, but also, thanks to the ratio between the densities of these two materials, the particularity to simultaneously satisfy the condition for which the weights of the two parts of the device are in an integer ratio, while the volumes of the two parts of the device are in the ratio Φ.
The result is a synergistic effect of resonant (3) and dissonant (Φ2) relations.
Ultimately, thanks to their density values and their wavelengths of resonance, copper and steel contain at the same time resonant and dissonant characteristics and therefore constitute the preferred combination of materials.

Our devices are also configured in such a way that the relationship between its characteristic dimensions are both whole numbers and/or fractions of integers, producing a resonant behavior, and irrational numbers corresponding to powers of Φ, producing a dissonant behavior.

It is well known that combining the powers of Φ all the integers can be obtained, such as the following examples show:

Φ-1 + Φ-2 = 1

Φ + Φ-2 = 2

Φ2 + Φ-2 = 3

Φ2 + Φ-2 + Φ0 = 4

Thus, by using the powers of Φ we have obtained dimensional ratios equal both to whole numbers or fractions thereof (ideal resonance, that is ideal transport of energy) or irrational numbers (ideal dissonance, that is ideal energy absorption).

The number Φ is also linked to another famous irrational number, i.e. π (pi), according to the following relationship based on a factor of 1.2 = 6/5: Φ2 · 1.2 = 3.14164 = π.
The relations between the characteristic dimensions of the PHITON_RESONATORS were/are therefore advantageously defined not only based on the number Φ, and/or its powers or combinations, but also on the basis of the number π.

With regard to the resonant ratios (i.e. the relationship expressed by integers or by fractions of integers), it is advantageous that these are chosen with as much as possible typical musical relationships, such as 4/3, 3/2, 5/3, 2 , 3, etc..
From a constructive point of view, for the PHITON_RESONATOR, whose characteristic dimensions are relative to one another in the relationships defined above, was used a series of numbers containing the largest possible number of resonant and dissonant connections, as well as that of having connections with the number π.
For this the music system Φ previously mentioned was used to advantage.

In recent years various systems based on the musical number Φ have been developed.

The system presented in 2008 by Christian Lange, Michael Nardelli and Giuseppe Bini:

"Sistema Musicale Aureo Phi(n/7) e connessioni matematiche tra numeri primi e "Paesaggio"dellaTeoria delle Stringhe"

already comprehended significant connections.

The above system has been extended by introducing additional connections. The connection with π was obtained thanks to the introduction of the concept of the semitone in the same system.

Christian Lange and Michael Nardelli :"On some applications of the Eisenstein series in String Theory. Mathematical connections with some sectors of Number Theory and with Φ and π. ".

In recent work (February 2012):

"On some equations Concerning the Casimir Effect Between World-Branes in Heterotic M-Theory and the Casimir effect in spaces with non-trivial topology. Mathematical connections with some sectors of Number Theory",

Michael Nardelli and Francesco Di Noto discuss some connections between numbers belonging to the last version of the musical based on Φ and π, which was developed by Christian Lange using a different basic function and that contains even more connections with Φ, with π and harmonic numbers.

To create a numerical musical code based on Φ interconnected with π, we use the following mathematical function with base Φ : $f(x) = \Phi \cdot (n / x)$, where x is the total number of notes in the interval of Φ and is not an integer.
For example, choosing $x = 7$, we obtain the following table :

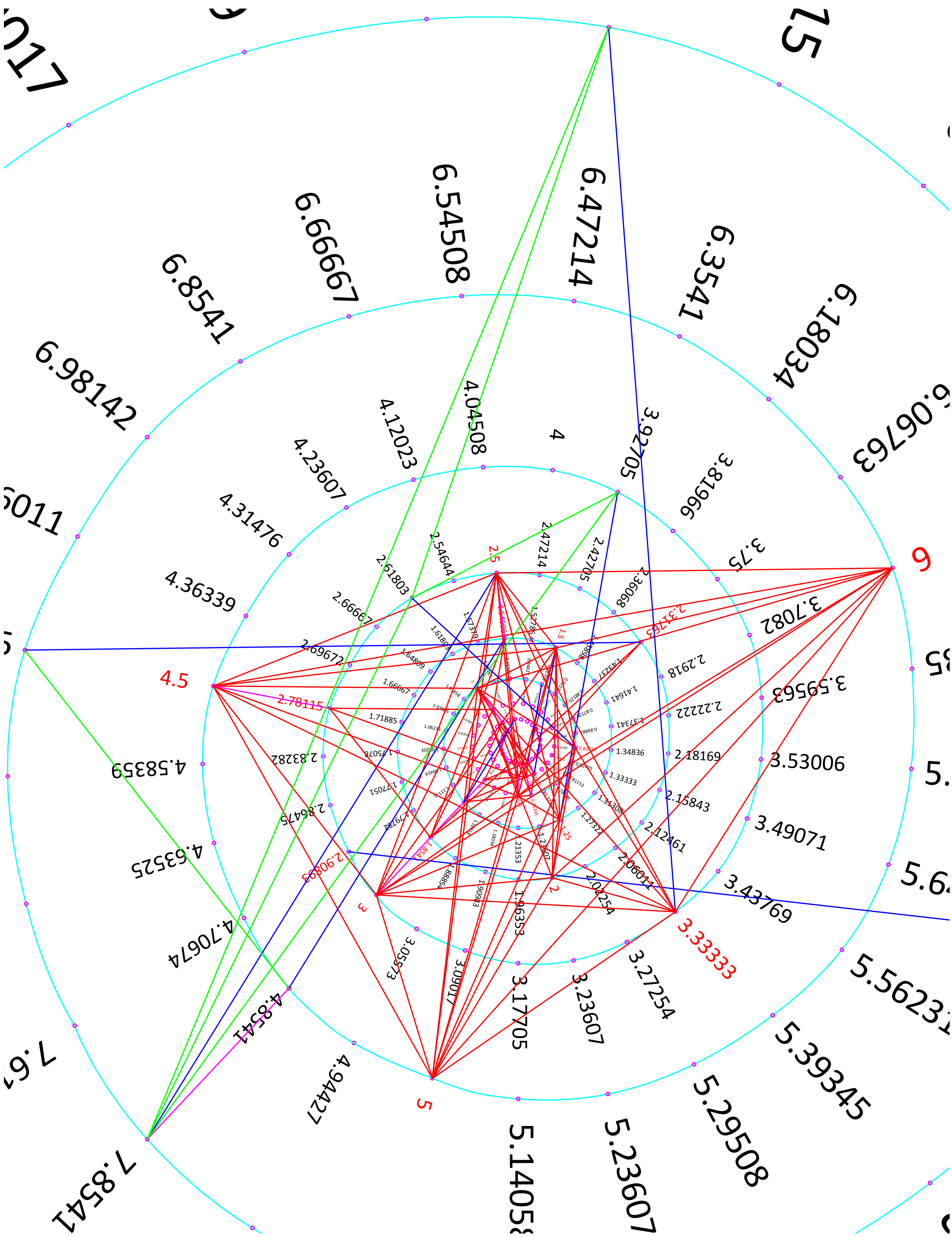
n x f(x)

0	7	1,000000
1	7	1,071163
2	7	1,147389
3	7	1,229040
4	7	1,316502
5	7	1,410188
6	7	1,510540
7	7	1,618034
8	7	1,733177
9	7	1,856515
10	7	1,988629
11	7	2,130145
12	7	2,281731
13	7	2,444105
14	7	2,618034
15	7	2,804340
16	7	3,003904
17	7	3,217669
18	7	3,446647
19	7	3,691919
20	7	3,954645
21	7	4,236068

In addition to containing the powers of Φ for n = 0, n = 7, n = 14 and n = 21 (intrinsic condition within the function itself, having chosen x = 7), for n = 16 the value of 3.0039 is obtained, which is almost equal to 3.

This approximate value can be corrected (microintoned) using sums of powers of Φ: Φ-Φ2 + 2 = 3.0000.
Similarly, the value of 1.988629 which is obtained with n = 10 can be corrected with: Φ + Φ-2 = 2.0000.

The basic function, with which these microintonations are carried out, must contain values per se that are good approximations of integer values. The more integers contains the desired function, the easier it will be to get as many harmonious relationships with those represented by powers of Φ.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4.31476
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