THE HELIXSONGS, EVANGELINA, AND A BAGPIPE SCALE

The HelixSongs are a set of structures made of the combination of two intersecting harmonic series, each spanning an octave.

Originally the HelixSongs were made into instruments using (but not limited to) 2 inch aluminum tubing. There are three rows of tubes with an upper and lower harmonic series and a middle row where the tones found in both series are placed.

This middle row also contains the starting and ending point of each series which need not start with 1 or its octave multiples. In fact, the one based on F uses harmonics 6 to 12.

Later HelixSongs show different sections of the harmonic series in combination but still beginning and ending on a shared middle row tone.

The 11-limit and 17-limit HelixSongs in this paper contain two harmonic series that intersect at points that are a 3/2 apart. Wilson also includes an example where the harmonic series intersect at a tritone (10/7).

While the HelixSongs are presented in a harmonic context and the Diaphonic Cycles (see http://anaphoria.com/diaphonicset.pdf) in a subharmonic context, both can be realized in either form. They can be considered complementary opposites of each other.
Harmonic Series of C

Harmonic Series of F

© 1976 By Erv Wilson
"Helix Song". Musical Instrument
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\[ D \rightarrow \omega \rightarrow E \rightarrow G \rightarrow C \]

Harmonic Series:

- Helix Song
- Musical Instrument

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2 Forms of the Helix Smg  E.W. 4-14-90

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Helix Song
(in the harmonic genus
where Diaphonic Cycles of 12 & 17 tones
intersect on the frequency ratio 10/7)
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Helix Song
(in the harmonic genus
where Diaphonic Cycles of 12 & 17 tones
intersect on the frequency ratio 10/7)
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* Evangelina Notes

* The Evangelina Tuning commemorates the work done by Evangelina Villegas and Surinder K. Vasal with quality Protein Maize in Mexico, Africa, India, Japan & China

1. Japanese Melody "Sakura"
Ref: Some Basic Patterns underlying Genus 12 \# 17, C. Wilson 1980

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(5-12-5) 22-Tone Tuning, "Crommelin" Tuning
A Tuning For The Highland Pipes
based on the harmonics of the drones
©1997 by McDonald Wilson

HARMONICS;
DRONES 1 & 2, on A

DRONE 3, on E

Highland Bagpipe

\( A \)

\( (9/8) \)

\( (13/12) \)

\( (57/52) \)

\( (64/57) \)

Harmonic Series

\( 32 \)

\( 33 \)

\( 34 \)

\( 35 \)

\( 36 \)

\( 37 \)

\( 38 \)

\( 39 \)

\( 40 \)

\( 41 \)

\( 42 \)

\( 43 \)

\( 44 \)

\( 45 \)

\( 46 \)

\( 47 \)

\( 48 \)

\( 49 \)

\( 50 \)

\( 51 \)

\( 52 \)

\( 53 \)

\( 54 \)

\( 55 \)

\( 56 \)

\( 57 \)

\( 58 \)

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\( 60 \)

\( 61 \)

\( 62 \)

\( 63 \)

\( 64 \)

* This is a theoretical scale. For actual measurements refer to Theodore Podnos(?) p. 37-39.

The 19/16 (at B-D and E-G) compares empirically with 32/27; \( \frac{19}{16} \times \frac{27}{32} = \frac{513}{512} = 1.0028128 \).
P3913 another Scottish Chanter

\[ \begin{align*}
32 & \quad 36 & \quad 39 & \quad \frac{5}{4} & \quad D & \quad E & \quad F & \quad 57 \\
A & \quad B & \quad C & \quad \frac{3}{4} & \quad 48 & \quad 52 & \quad 64 & \quad D
\end{align*} \]

\[ \begin{align*}
13 & \quad 32 & \quad \frac{39}{3} & \quad \frac{3}{2} & \quad 57 - 48 = 9 \\
8 & \quad 48 & \quad 33 & \quad 32 = 7 \\
4 & \quad 57 & \quad 57 + 35 = 92 (\div 2 = 48) \\
\end{align*} \]

embraced in Fibonacci rapport

\[ \begin{align*}
32 & \quad 13 & \quad 19 & \quad 32 \\
18 & \quad 39 & \quad 57 & \quad 86
\end{align*} \]

See Avicenna p. 196