

A catalog of scales used in *The Animation of Lists and the Archytan Transpositions* – Warren Burt 2004

There are four scales here.

The first is the 19 note just intonation scale made for my tuning forks, designed in 1985. It's designed to be able to play Dorian modes of Enharmonic, Chromatic, and Diatonic tetrachords in original and inverted form. The two tritons in the middle are added for symmetry.

The second is the original scale transposed up a 28/27. Note the duplication of some intervals from the original at this transposition.

The third is the original scale transposed down a 28/27. Note again the duplication of some intervals from the original at this transposition.

The fourth is the composite 49 note scale made by combining the three above scales.

### **Scale 01: Original 19-note just-intonation tuning forks scale, 1985**

0:	1/1	0.000	unison, perfect prime
1:	28/27	62.961	Archytas' 1/3-tone
2:	16/15	111.731	minor diatonic semitone
3:	10/9	182.404	minor whole tone
4:	9/8	203.910	major whole tone
5:	6/5	315.641	minor third
6:	5/4	386.314	major third
7:	9/7	435.084	septimal major third, BP third
8:	4/3	498.045	perfect fourth
9:	7/5	582.512	septimal or Huygens' tritone, BP fourth
10:	10/7	617.488	Euler's tritone
11:	3/2	701.955	perfect fifth
12:	14/9	764.916	septimal minor sixth
13:	8/5	813.686	minor sixth
14:	5/3	884.359	major sixth, BP sixth
15:	16/9	996.090	Pythagorean minor seventh
16:	9/5	1017.596	just minor seventh, BP seventh
17:	15/8	1088.269	classic major seventh
18:	27/14	1137.039	septimal major seventh
19:	2/1	1200.000	octave

**Scale 02: Transposition UP by 28/27 of original scale.**

0:	1/1	0.000	unison, perfect prime
1:	28/27	62.961	Archytas' 1/3-tone
2:	784/729	125.922	two (Archytas' 1/3-tone)
3:	448/405	174.692	
4:	280/243	245.365	
5:	7/6	266.871	septimal minor third
6:	56/45	378.602	
7:	35/27	449.275	9/4-tone
8:	4/3	498.045	perfect fourth
9:	112/81	561.006	
10:	196/135	645.473	
11:	40/27	680.449	grave fifth
12:	14/9	764.916	septimal minor sixth
13:	392/243	827.877	
14:	224/135	876.647	
15:	140/81	947.320	
16:	448/243	1059.051	
17:	28/15	1080.557	grave major seventh
18:	35/18	1151.230	septimal semi-diminished octave
19:	2/1	1200.000	octave

**Scale 03: Transposition DOWN by 28/27 of original scale.**

0:	1/1	0.000	unison, perfect prime
1:	36/35	48.770	septimal diesis, 1/4-tone
2:	15/14	119.443	major diatonic semitone
3:	243/224	140.949	
4:	81/70	252.680	Al-Hwarizmi's lute middle finger
5:	135/112	323.353	
6:	243/196	372.123	
7:	9/7	435.084	septimal major third, BP third
8:	27/20	519.551	acute fourth
9:	135/98	554.527	
10:	81/56	638.994	
11:	3/2	701.955	perfect fifth
12:	54/35	750.725	septimal semi-augmented fifth
13:	45/28	821.398	
14:	12/7	933.129	septimal major sixth
15:	243/140	954.635	
16:	405/224	1025.308	
17:	729/392	1074.078	
18:	27/14	1137.039	septimal major seventh
19:	2/1	1200.000	octave

### Scale 04: 49 note scale - sum of scales 01-03

0:	1/1	0.000	unison, perfect prime
1:	36/35	48.770	septimal diesis, 1/4-tone
2:	28/27	62.961	Archytas' 1/3-tone
3:	16/15	111.731	minor diatonic semitone
4:	15/14	119.443	major diatonic semitone
5:	784/729	125.922	two (Archytas' 1/3-tone)
6:	243/224	140.949	
7:	448/405	174.692	
8:	10/9	182.404	minor whole tone
9:	9/8	203.910	major whole tone
10:	280/243	245.365	
11:	81/70	252.680	Al-Hwarizmi's lute middle finger
12:	7/6	266.871	septimal minor third
13:	6/5	315.641	minor third
14:	135/112	323.353	
15:	243/196	372.123	
16:	56/45	378.602	
17:	5/4	386.314	major third
18:	9/7	435.084	septimal major third, BP third
19:	35/27	449.275	9/4-tone, septimal semi-diminished fourth
20:	4/3	498.045	perfect fourth
21:	27/20	519.551	acute fourth
22:	135/98	554.527	
23:	112/81	561.006	
24:	7/5	582.512	septimal or Huygens' tritone, BP fourth
25:	10/7	617.488	Euler's tritone
26:	81/56	638.994	
27:	196/135	645.473	
28:	40/27	680.449	grave fifth
29:	3/2	701.955	perfect fifth
30:	54/35	750.725	septimal semi-augmented fifth
31:	14/9	764.916	septimal minor sixth
32:	8/5	813.686	minor sixth
33:	45/28	821.398	
34:	392/243	827.877	
35:	224/135	876.647	
36:	5/3	884.359	major sixth, BP sixth
37:	12/7	933.129	septimal major sixth
38:	140/81	947.320	
39:	243/140	954.635	
40:	16/9	996.090	Pythagorean minor seventh
41:	9/5	1017.596	just minor seventh, BP seventh
42:	405/224	1025.308	
43:	448/243	1059.051	
44:	729/392	1074.078	
45:	28/15	1080.557	grave major seventh
46:	15/8	1088.269	classic major seventh
47:	27/14	1137.039	septimal major seventh
48:	35/18	1151.230	septimal semi-diminished octave
49:	2/1	1200.000	octave