

Catalog of Scales used in *18 New Fuguing Tunes for Henry Cowell* - Warren Burt 2005

A listing of all 18 12 note Euler Fokker Genera scales possible with factors 3 5 and 7 arranged in the order that produces minimal change from scale to scale. The notation 3(1) 5(2) 7(1) means that 3 is taken once, 5 twice and 7 once as a factor.

Scale 1: 3(11)

0:	1/1	0.000 unison, perfect prime
1:	2187/2048	113.685 apotome
2:	9/8	203.910 major whole tone
3:	19683/16384	317.595 Pythagorean augmented second
4:	81/64	407.820 Pythagorean major third
5:	177147/131072	521.505 Pythagorean augmented third
6:	729/512	611.730 Pythagorean tritone
7:	3/2	701.955 perfect fifth
8:	6561/4096	815.640 Pythagorean augmented fifth
9:	27/16	905.865 Pythagorean major sixth
10:	59049/32768	1019.550 Pythagorean augmented sixth
11:	243/128	1109.775 Pythagorean major seventh
12:	2/1	1200.000 octave

Scale 2: 3(5) 5(1)

0:	1/1	0.000 unison, perfect prime
1:	135/128	92.179 major chroma, major limma
2:	9/8	203.910 major whole tone
3:	1215/1024	296.089 wide augmented second
4:	5/4	386.314 major third
5:	81/64	407.820 Pythagorean major third
6:	45/32	590.224 diatonic tritone
7:	3/2	701.955 perfect fifth
8:	405/256	794.134 wide augmented fifth
9:	27/16	905.865 Pythagorean major sixth
10:	15/8	1088.269 classic major seventh
11:	243/128	1109.775 Pythagorean major seventh
12:	2/1	1200.000 octave

Scale 3: 3(3) 5(2)

0:	1/1	0.000 unison, perfect prime
1:	135/128	92.179 major chroma, major limma
2:	9/8	203.910 major whole tone
3:	75/64	274.582 classic augmented second
4:	5/4	386.314 major third
5:	675/512	478.492 wide augmented third
6:	45/32	590.224 diatonic tritone
7:	3/2	701.955 perfect fifth
8:	25/16	772.627 classic augmented fifth
9:	27/16	905.865 Pythagorean major sixth
10:	225/128	976.537 augmented sixth
11:	15/8	1088.269 classic major seventh
12:	2/1	1200.000 octave

Scale 4: 3(2) 5(3)

0:	1/1	0.000 unison, perfect prime
1:	1125/1024	162.851 double augmented prime
2:	9/8	203.910 major whole tone
3:	75/64	274.582 classic augmented second
4:	5/4	386.314 major third
5:	45/32	590.224 diatonic tritone
6:	375/256	660.896 double augmented fourth
7:	3/2	701.955 perfect fifth
8:	25/16	772.627 classic augmented fifth
9:	225/128	976.537 augmented sixth
10:	15/8	1088.269 classic major seventh
11:	125/64	1158.941 classic augmented seventh, octave - minor diesis
12:	2/1	1200.000 octave

Scale 5: 3(1) 5(5)

0:	1/1	0.000 unison, perfect prime
1:	9375/8192	233.524
2:	75/64	274.582 classic augmented second
3:	625/512	345.255
4:	5/4	386.314 major third
5:	375/256	660.896 double augmented fourth
6:	3/2	701.955 perfect fifth
7:	3125/2048	731.569
8:	25/16	772.627 classic augmented fifth
9:	1875/1024	1047.210 double augmented sixth
10:	15/8	1088.269 classic major seventh
11:	125/64	1158.941 classic augmented seventh, octave - minor diesis
12:	2/1	1200.000 octave

Scale 6: 5(11)

0:	1/1	0.000 unison, perfect prime
1:	9765625/8388608	263.137
2:	78125/65536	304.196
3:	625/512	345.255
4:	5/4	386.314 major third
5:	48828125/33554432	649.451
6:	390625/262144	690.510
7:	3125/2048	731.569
8:	25/16	772.627 classic augmented fifth
9:	1953125/1048576	1076.823
10:	15625/8192	1117.882
11:	125/64	1158.941 classic augmented seventh, octave - minor diesis
12:	2/1	1200.000 octave

Scale 7: 5(5) 7(1)

0:	1/1	0.000 unison, perfect prime
1:	4375/4096	114.081
2:	35/32	155.140 septimal neutral second
3:	625/512	345.255
4:	5/4	386.314 major third
5:	21875/16384	500.394
6:	175/128	541.453
7:	3125/2048	731.569
8:	25/16	772.627 classic augmented fifth
9:	875/512	927.767
10:	7/4	968.826 harmonic seventh
11:	125/64	1158.941 classic augmented seventh, octave - minor diesis
12:	2/1	1200.000 octave

Scale 8: 5(3) 7(2)

0:	1/1	0.000 unison, perfect prime
1:	35/32	155.140 septimal neutral second
2:	1225/1024	310.279 two (septimal neutral second)
3:	5/4	386.314 major third
4:	175/128	541.453
5:	6125/4096	696.593
6:	49/32	737.652
7:	25/16	772.627 classic augmented fifth
8:	875/512	927.767
9:	7/4	968.826 harmonic seventh
10:	245/128	1123.966
11:	125/64	1158.941 classic augmented seventh, octave - minor diesis
12:	2/1	1200.000 octave

Scale 9: 5(2) 7(3)

0:	1/1	0.000 unison, perfect prime
1:	8575/8192	79.105
2:	35/32	155.140 septimal neutral second
3:	1225/1024	310.279 two (septimal neutral second)
4:	5/4	386.314 major third
5:	343/256	506.478
6:	175/128	541.453
7:	49/32	737.652
8:	25/16	772.627 classic augmented fifth
9:	1715/1024	892.791
10:	7/4	968.826 harmonic seventh
11:	245/128	1123.966
12:	2/1	1200.000 octave

Scale 10: 5(1) 7(5)

0:	1/1	0.000 unison, perfect prime
1:	16807/16384	44.130
2:	35/32	155.140 septimal neutral second
3:	2401/2048	275.304
4:	5/4	386.314 major third
5:	84035/65536	430.443
6:	343/256	506.478
7:	12005/8192	661.617
8:	49/32	737.652
9:	1715/1024	892.791
10:	7/4	968.826 harmonic seventh
11:	245/128	1123.966
12:	2/1	1200.000 octave

Scale 11: 7(11)

0:	1/1	0.000 unison, perfect prime
1:	16807/16384	44.130
2:	282475249/268435456	88.259
3:	2401/2048	275.304
4:	40353607/33554432	319.433
5:	343/256	506.478
6:	5764801/4194304	550.607
7:	49/32	737.652
8:	823543/524288	781.781
9:	7/4	968.826 harmonic seventh
10:	117649/65536	1012.955
11:	1977326743/1073741824	1057.085
12:	2/1	1200.000 octave

Scale 12: 3(1) 7(5)

0:	1/1	0.000 unison, perfect prime
1:	1029/1024	8.433 gamelan residue
2:	16807/16384	44.130
3:	147/128	239.607
4:	2401/2048	275.304
5:	21/16	470.781 narrow fourth
6:	343/256	506.478
7:	3/2	701.955 perfect fifth
8:	49/32	737.652
9:	50421/32768	746.085
10:	7/4	968.826 harmonic seventh
11:	7203/4096	977.259
12:	2/1	1200.000 octave

Scale 13: 3(2) 7(3)

0:	1/1	0.000 unison, perfect prime
1:	1029/1024	8.433 gamelan residue
2:	9/8	203.910 major whole tone
3:	147/128	239.607
4:	21/16	470.781 narrow fourth
5:	343/256	506.478
6:	3/2	701.955 perfect fifth
7:	3087/2048	710.388
8:	49/32	737.652
9:	441/256	941.562 two (narrow fourth)
10:	7/4	968.826 harmonic seventh
11:	63/32	1172.736 octave - septimal comma
12:	2/1	1200.000 octave

Scale 14: 3(3) 7(2)

0:	1/1	0.000 unison, perfect prime
1:	9/8	203.910 major whole tone
2:	147/128	239.607
3:	1323/1024	443.517
4:	21/16	470.781 narrow fourth
5:	189/128	674.691
6:	3/2	701.955 perfect fifth
7:	49/32	737.652
8:	27/16	905.865 Pythagorean major sixth
9:	441/256	941.562 two (narrow fourth)
10:	7/4	968.826 harmonic seventh
11:	63/32	1172.736 octave - septimal comma
12:	2/1	1200.000 octave

Scale 15: 3(5) 7(1)

0:	1/1	0.000 unison, perfect prime
1:	567/512	176.646
2:	9/8	203.910 major whole tone
3:	81/64	407.820 Pythagorean major third
4:	21/16	470.781 narrow fourth
5:	189/128	674.691
6:	3/2	701.955 perfect fifth
7:	1701/1024	878.601
8:	27/16	905.865 Pythagorean major sixth
9:	7/4	968.826 harmonic seventh
10:	243/128	1109.775 Pythagorean major seventh
11:	63/32	1172.736 octave - septimal comma
12:	2/1	1200.000 octave

Scale 16: 3(2) 5(1) 7(1)

0:	1/1	0.000 unison, perfect prime
1:	35/32	155.140 septimal neutral second
2:	9/8	203.910 major whole tone
3:	315/256	359.050
4:	5/4	386.314 major third
5:	21/16	470.781 narrow fourth
6:	45/32	590.224 diatonic tritone
7:	3/2	701.955 perfect fifth
8:	105/64	857.095 septimal neutral sixth
9:	7/4	968.826 harmonic seventh
10:	15/8	1088.269 classic major seventh
11:	63/32	1172.736 octave - septimal comma
12:	2/1	1200.000 octave

Scale 17: 3(1) 5(2) 7(1)

0:	1/1	0.000 unison, perfect prime
1:	525/512	43.408 Avicenna enharmonic diesis
2:	35/32	155.140 septimal neutral second
3:	75/64	274.582 classic augmented second
4:	5/4	386.314 major third
5:	21/16	470.781 narrow fourth
6:	175/128	541.453
7:	3/2	701.955 perfect fifth
8:	25/16	772.627 classic augmented fifth
9:	105/64	857.095 septimal neutral sixth
10:	7/4	968.826 harmonic seventh
11:	15/8	1088.269 classic major seventh
12:	2/1	1200.000 octave

Scale 18: 3(1) 5(1) 7(2)

0:	1/1	0.000 unison, perfect prime
1:	35/32	155.140 septimal neutral second
2:	147/128	239.607
3:	5/4	386.314 major third
4:	21/16	470.781 narrow fourth
5:	735/512	625.921
6:	3/2	701.955 perfect fifth
7:	49/32	737.652
8:	105/64	857.095 septimal neutral sixth
9:	7/4	968.826 harmonic seventh
10:	15/8	1088.269 classic major seventh
11:	245/128	1123.966
12:	2/1	1200.000 octave