

About the Tuning

This tuning was originally devised by Lou Harrison and Bill Slye for the National Reso-Phonic Just Intonation Guitar, used in *Scenes from Nek Chand*, Lou's last completed composition before his death in 2003. I originally composed these three movements for that same guitar. The guitar tuning is in D, but I have transposed it to G for these keyboard arrangements. The tuning comprises a twelve-tone-per-octave scale in 11-limit Just Intonation. In particular, it features two harmonic series segments (1–3–5–7–9–11)—what Harry Partch termed otonality hexads—on fundamentals separated by a perfect fifth (3:2), C and G. Two additional tones needed to complete a twelve-tone scale, A \flat and E \flat , are not part of either harmonic series, but were added by chaining fifths below B \flat , the seventh harmonic of C. Although the harmonics of G are themselves harmonics of C (3–9–15–21–27–33), I have named G 1/1 in the diagrams on this and the following page because of the primary role it plays in these pieces. (Those interested in a detailed explanation of the Just Intonation terminology used here should consult my *Just Intonation Primer*.)

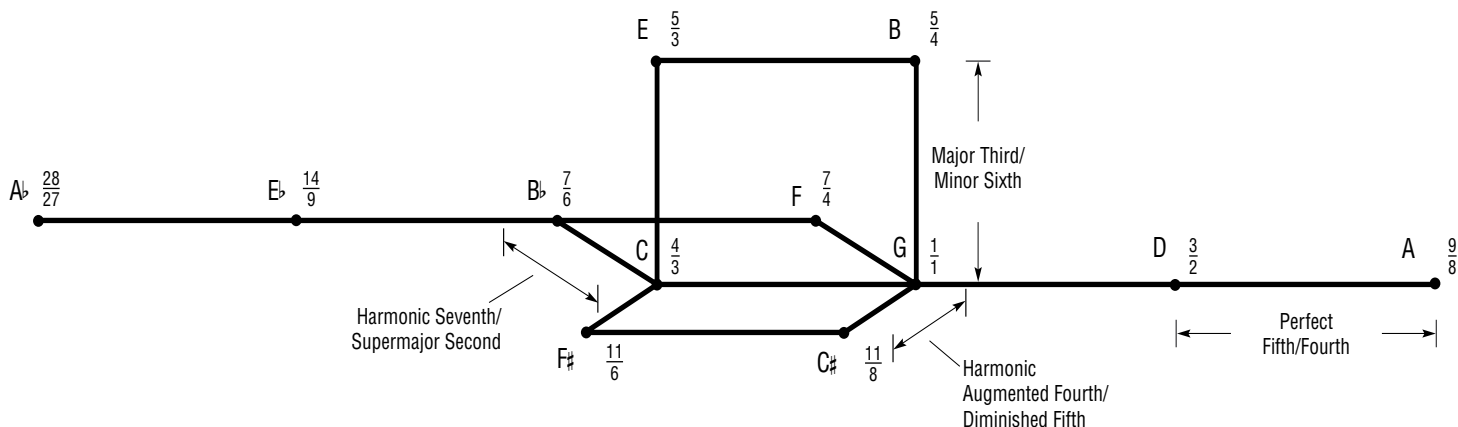
Although the scale has twelve tones per octave, it bears little resemblance to an equally tempered chromatic scale. Step sizes between adjacent tones vary from as little as 53 cents (slightly larger than a tempered quartertone) to as much as 151 cents (more than a tone and one-half), with many other sizes in between. The scale provides a great variety of modal possibilities, both historical and novel, but if one desires consonant harmony, one is limited mainly to structures centered on C and G.

Most of the intervals in the scale can be easily tuned by ear by an experienced tuner, though the seventh and especially the eleventh harmonic may prove difficult for those unfamiliar with these intervals. The harmonic seventh, 7:4, can be tuned by zero beating. It is 27 cents flatter than a Pythagorean minor seventh. Probably the best procedure is to start from the Pythagorean interval and then lower the pitch until the desired beat-free position is found. The harmonic tritone, 11:8, is harder to tune by ear, as the eleventh harmonic may be too weak for its beating to be easily detected. The 11:8 tritone has a width of approximately 551 cents, almost exactly the midpoint between the 12-equal perfect fourth and augmented fourth. It is probably best to use a programmable electronic tuner to set this interval until it becomes familiar to the ear. **The composer will provide a CD with reference tones on request.**

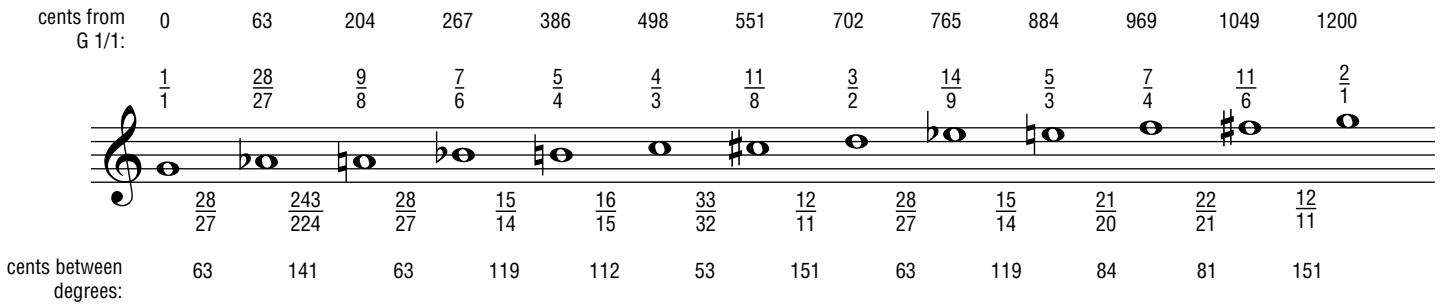
The absolute pitch of the tuning is not crucial; the scale may be tuned based on A 440 or on any other historical A that your instrument may be accustomed to.

Cents deviation from 12-equal			
G 1/1 = 0		Normalized to A	
G	±0.00	G	-3.91
A \flat	-37.04	A \flat	-40.95
A	+3.91	A	±0.00
B \flat	-33.13	B \flat	-37.04
B	-13.69	B	-17.6
C	-1.96	C	-5.87
C \sharp	-48.68	C \sharp	-52.59
D	+1.95	D	-1.96
E \flat	-35.08	E \flat	-38.99
E	-15.64	E	-19.55
F	-31.17	F	-35.08
F \sharp	+49.36	F \sharp	+45.45
G	0.00	G	-3.91

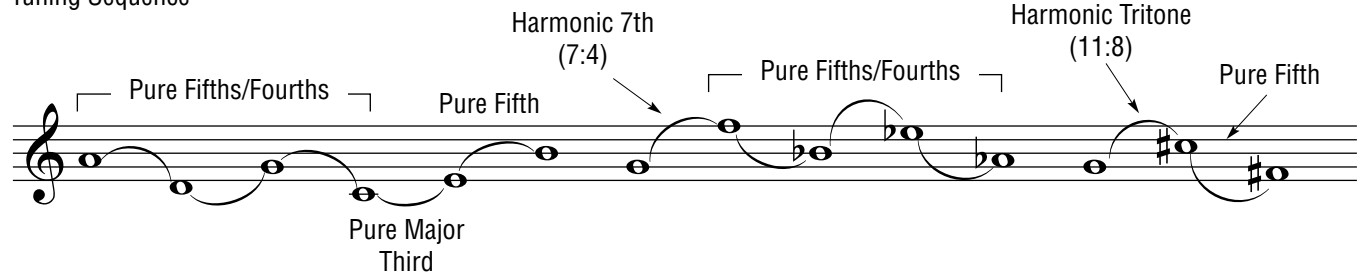
The Tuning Represented as a Lattice



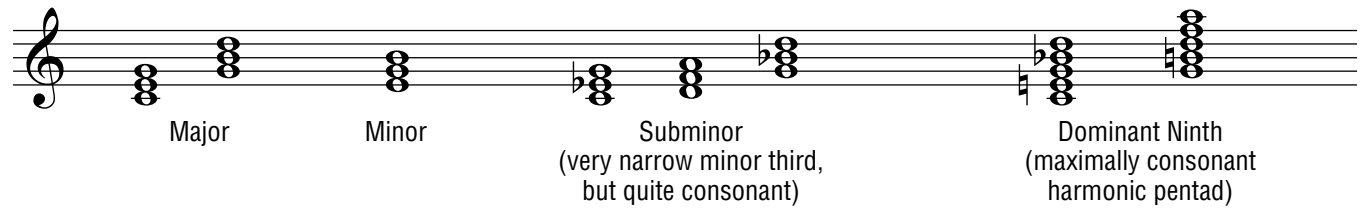
Keyboard Suite Tuning



Tuning Sequence



Checks (Consonant Chords)



As Harmonic Series Degrees

