

A collection of equal linear-temperament subset intonation systems from 17 through 71 tone equal-temperaments

Musicians and composers exploring the vast resources of musical instrument intonation systems, will be aware that our Western **12 tone equal temperament** was arrived at by tempering the intervals of the classical **12-note Pythagorean** parent tuning, which is formed from a cycle of acoustic **3/2 fifths at 701.955 cents**.

When the Pythagorean tuning is mapped to 12-note Halberstadt keyboards or MIDI controllers, the interval sequence is generated from three 3/2 fifths down, and eight 3/2 fifths up, which places the familiar diatonic modes on the white keys of the keyboard, and likewise with many 12-note meantone systems, where the fifths may be tempered slightly flat or sharp from 3/2, thereby improving, or otherwise, changing the tuning of other intervals, such as the thirds of such temperaments.

With this category of linear-temperaments, the sizes of these regular diatonic fifth generators will always lie between 4/7 at 685.714 cents to 3/5 at 720 cents.

Similarly, we find with equal-temperaments, that between 17 and 71 tone equal temperament, there are 32 that meet this criteria of having regular diatonic fifth generators within this range, and this SCL collection of 12-note subsets from them, use a file-naming convention where the tunings are in order of the fifth generator sizes, starting with 47 tone equal-temperament, having a fifth generator of 689.362 cents, through 42 tone equal-temperament at 714.286 cents.

This collection of 12-note subsets of these equal-temperaments was compiled, and is presented here, in a way that can be used as a device for the study of linear-temperaments, which illustrates that as the size of the tempered fifths increase from small to large, how this impacts not only on the tuning of the thirds, but all of the intervals of each tuning.

A Scala keyboard mapping file is included with the SCL collection: **Halberstadt 60-440-69.kbm**, which when used in combination with any of the SCL tables for these 12-note tunings, will map the 1/1 starting note on MIDI Note C.60, with the diapason (Reference Pitch/Reference MIDI Note) on A.69 at 440 Hz.

To use these files with any virtual-instruments that supports the complete **Scala SCL** and **KBM** microtuning table format, such as **Modartt Pianoteq**, or **Surge Synth Team**, **Surge** and **Tuning Workbench Synth**, load any combination of an SCL file with the above KBM to explore this exciting collection of temperaments on a 12-note Halberstadt keyboard controller.

Included as well, is a helpful interval-matrix PDF, showing each temperament, and the available interval patterns from any starting point of the tunings.

Jacky Ligon
2021-03-15

Further information:

Pythagorean tuning

https://en.wikipedia.org/wiki/Pythagorean_tuning

Meantone temperament

https://en.wikipedia.org/wiki/Meantone_temperament

Regular diatonic tuning

https://en.wikipedia.org/wiki/Regular_diatonic_tuning

Scala

<http://www.huygens-fokker.org/scala/downloads.html>