

Tuning the Thomas Young Well Temperament 2

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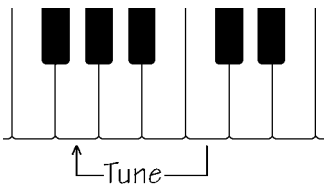
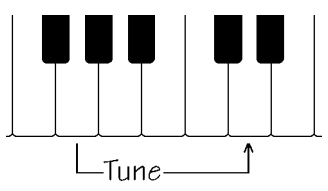
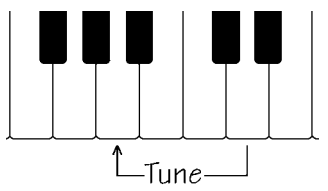
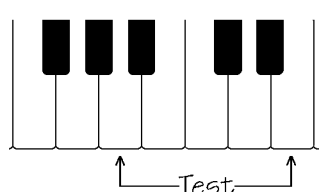
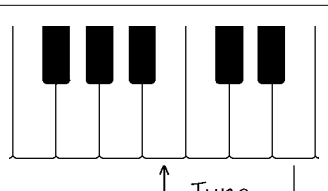
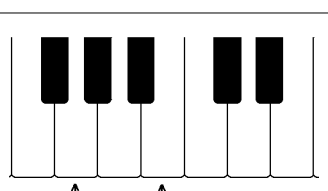
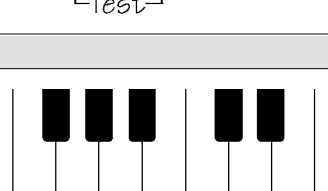
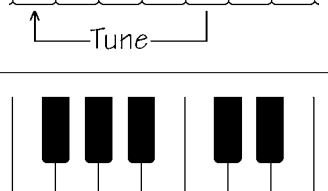
This 1/6-Pythagorean-comma temperament is moderately easy to tune. First, the C, E, G, D, B, and A of the temperament octave are tuned using tempered fifths and fourths. Then, F and the accidentals are all tuned, using perfect fifths as follows: Tune F_3 , a perfect fifth down from C_4 , $B\flat_3$ a perfect fourth up from F_3 , $E\flat_4$ a perfect fourth up from $B\flat_3$, $A\flat_3$ a perfect fifth down from $E\flat_4$, $D\flat_4$ a perfect fourth up from $B\flat_3$, and $G\flat_3$ a perfect fifth down from $D\flat_4$. The $G\flat_3$ just tuned should form a fourth widened by 1/6 comma when the interval $G\flat_3$ — B_3 is played. That is, this interval, which would be the dreaded “wolf” in Meantone Temperament, has only twice the tempering of that interval in Equal Temperament. Therefore, the Young Well Temperament 2 can be played in all keys without re-tuning.

The tuning scheme can be compactly summed up as follows:

$$G\flat^0 \leftarrow D\flat^0 \leftarrow A\flat^0 \leftarrow E\flat^0 \leftarrow B\flat^0 \leftarrow F^0 \leftarrow C^0 \rightarrow G^{-1/6 P} \rightarrow D^{-2/6 P} \rightarrow A^{-3/6 P} \rightarrow E^{-4/6 P} \rightarrow B^{-5/6 P}.$$

For the beat rates in the following scheme, the superscripts n and w stand for *narrow* and *wide*, respectively.

A Scheme for Tuning the Temperament Octave in the Thomas Young Well Temperament 2 in the Key of C			
Step	View	Beat Rate (Hz)	Comments
1		zero	Tune the C above middle C to a 523.3-Hz tuning fork.
2		1.6^n	Tune middle C to the C above middle C. This note is tuned sharp by 0.6 b/s to achieve the A440-Hz standard.
3		4.4^w	Tune the E above middle C to middle C so that C—E is sharp by 0.4.4 b/s.

4		1.8 ^w	Tune the G below middle C to middle C so that G—C is a fourth, widened by 1.8 b/s.
5		1.3 ⁿ	Tune the D above middle C to the G below middle C so that G—D is a fifth, narrowed by 1.3 b/s.
6		2.0 ^w	Tune the A below middle C to the D above middle C so that A—D is a fourth, widened by 2.0 b/s.
7		1.5 ⁿ	Test the fifth A—E. It should be 1.5 b/s narrow. If not, adjust the tuning in steps 4–6 above.
8		2.2 ^w	Tune the B below middle C to the E above middle C so that B—E is a fourth, widened by 2.2 b/s.
9		3.3 ^w	Test the third G—B. It should be 3.3 b/s wide. If not, adjust the tuning in the steps above.
10		zero	Tune the F below middle C to middle C so that F—C is a perfect (beatless) fifth.
11		4.9 ^w	Test the third F—A. It should be 4.9 b/s wide. If not, adjust the tuning in the steps above.

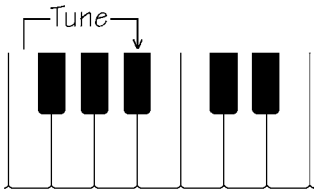
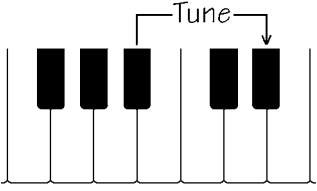
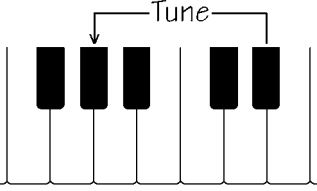
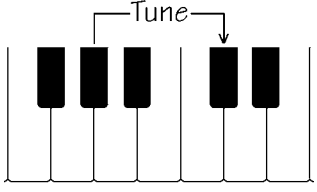
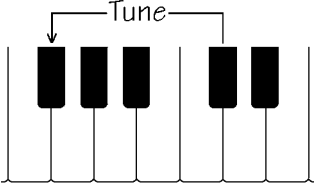
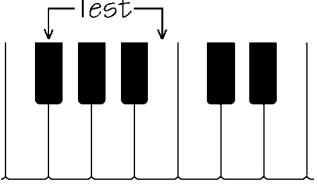
12		zero	Tune the B \flat below middle C to the F below middle C so that F—B \flat is a perfect (beatless) fourth.
13		zero	Tune the E \flat above middle C to the B \flat below middle C so that B \flat —E \flat is a perfect (beatless) fourth.
14		zero	Tune the A \flat above middle C to the E \flat above middle C so that A \flat —E \flat is a perfect (beatless) fifth.
15		zero	Tune the D \flat above middle C to the A \flat below middle C so that A \flat —D \flat is a perfect (beatless) fourth.
16		zero	Tune the G \flat below middle C to the D \flat above middle C so that G \flat —D \flat is a perfect (beatless) fifth.
17		2.2 ^w	Test the interval G \flat —B. It should be a widened “fourth,” beating at 2.2 Hz. If not, repeat steps 10–16. Note that this interval would be a “wolf” in meantone but is no problem here.

Fig. 1. The procedure for tuning the twelve notes of the temperament octave in the 1/6-Pythagorean-comma Thomas Young Well Temperament 2.

See Fig. 2 on next page for the C216.63 and A220 frequencies of the temperament octave of this temperament.

Note	Young W.T. 2 C261.63	Young W.T. 2 A440
F ₃	174.420	175.009
G \flat ₃	183.751	184.372
F \sharp ₃	183.751	184.372
G ₃	195.780	196.441
A \flat ₃	206.720	207.418
G \sharp ₃	206.720	207.418
A ₃	219.260	220.000
B \flat ₃	232.560	233.345
A \sharp ₃	232.560	233.345
B ₃	245.555	246.384
C ₄	261.630	262.513
D \flat ₄	275.627	276.557
C \sharp ₄	275.627	276.557
D ₄	293.007	293.996
E \flat ₄	310.080	311.127
D \sharp ₄	310.080	311.127
E ₄	328.148	329.256

Fig. 2. *The C216.63 and A220 frequencies of the temperament octave of the 1/6-Pythagorean-comma Thomas Young Well Temperament 2.*