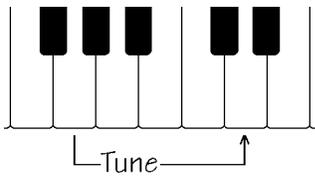
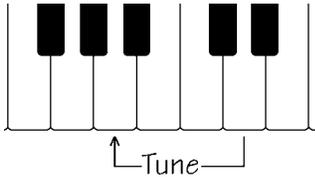
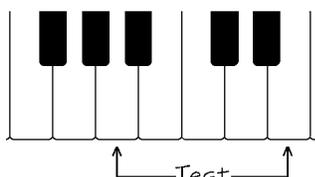
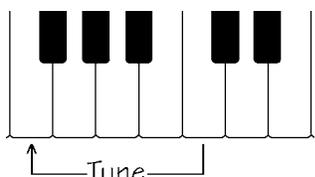
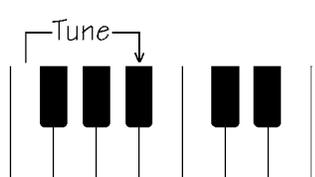
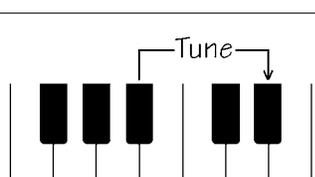
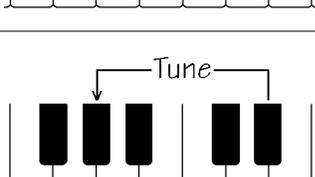


From Robert Chuckrow, *Historical Tuning of Keyboard Instruments: Theory and Practice*, Rising Mist Publications, Briarcliff Manor, NY, 1999, 2006, pp. 51–54.

8.3. Tuning the Aron-Neidhardt 1/4-Syntonic-Comma Well Temperament

This temperament is extremely easy to tune. First tune C, E, G, D, and A of the temperament octave exactly as in tuning meantone. Then 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 $B\flat_3$, $G\flat_3$ a perfect fifth down from $D\flat_4$, and $C\flat_3$ a perfect fourth up from $G\flat_3$. The $C\flat_3$ just tuned should form a slightly widened fourth when the interval $C\flat_3$ — E_4 is played. That is, $C\flat_3$ differs from B_3 by about 2ϕ . This difference is the schisma. Similarly all such pairs will differ by only a schisma and can be considered to be enharmonic to within one schisma, which is essentially negligible. Therefore this temperament can be played in all keys without re-tuning. 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 1/4-Syntonic-Comma Aron-Neidhardt Well Temperament 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 1.6 b/s to achieve the A440-Hz standard.
3		zero	Tune the E above middle C to middle C so that C—E is a perfect (beatless) third.
4		2.4^w	Tune the G below middle C to middle C so that G—C is a fourth, widened by 2.4 b/s.

5		1.8 ⁿ	Tune the D above middle C to the G below middle C so that G—D is a fifth, narrowed by 1.8 b/s.
6		2.7 ^w	Tune the A below middle C to the D above middle C so that A—D is a fourth, widened by 2.7 b/s.
7		2.0 ⁿ	Test the fifth A—E. It should be 2.0 b/s narrow. If not, adjust the tuning in steps 4–6 above.
8		zero	Tune the F below middle C to middle C so that F—C is a perfect (beatless) fifth.
9		zero	Tune the B \flat below middle C to the F below middle C so that F—B \flat is a perfect (beatless) fourth.
10		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.
11		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.

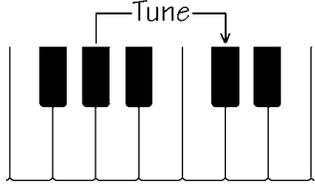
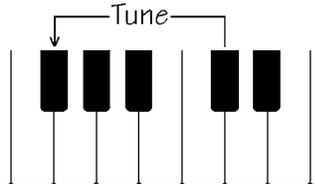
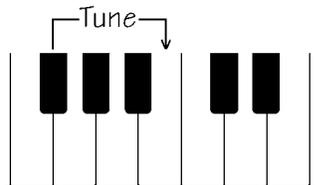
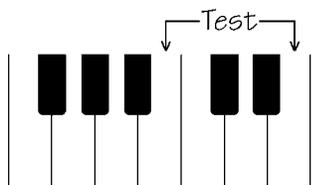
12		zero	Tune the D♯ above middle C to the A♭ below middle C so that A♭—D♯ is a perfect (beatless) fourth.
13		zero	Tune the G♭ below middle C to the D♯ above middle C so that G♭—D♯ is a perfect (beatless) fifth.
14		zero	Tune the C♭ below middle C to the G♭ below middle C so that G♭—D♯ is a perfect (beatless) fourth.
15		1.1 ^w	Test the interval C♭—E. It should be a widened “fourth,” beating at 1.1 Hz. If not, repeat steps 8–14. Note that this interval would be a “wolf” in meantone but is no problem here.

Fig. 8.1. *The procedure for tuning the twelve notes of the temperament octave in the 1/4-syntonic-comma Aron-Neidhardt well temperament.*

Note that tuning the above temperament is a bit harder than tuning meantone because any error in tuning the fifths is cumulative, and correcting an error requires revisiting the whole sequence of perfect fifths. On the other hand, tuning the perfect intervals that occur in both meantone and the above well temperament is much easier than tuning the intervals of equal temperament, all of which are tempered. Moreover, the tuning of equal temperament is much more critical and exacting because the beat rates of the fifths are so slow that errors are hard to hear. Precise tuning requires the use of numerous tests.