

Douglas C. Wadle

Systema

(Cognitive Disjunction, proper)

violin, viola, cello

PLAINSOUND MUSIC EDITION

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NOTES for performers

A version of *Systema* will be generated by selecting, first, an interval that will serve as the “frame” for the realization. This frame replaces (or is) the octave as the interval of redundancy and, hence, the distance from the starting (mid)point, G4, (a perfect fifth above middle C) to the final pitches performed by the violin (upward) and cello (downward).

Seven pitch-class ratios, “P”, are to be calculated by the following formulas, where “F” is the “frame”:

$$\begin{aligned}P^1 &= (F - 1)(1/8) + 1 \\P^2 &= (F - 1)(1/5) + 1 \\P^3 &= (F - 1)(2/7) + 1 \\P^4 &= (F - 1)(1/2) + 1 \\P^5 &= (F - 1)(3/5) + 1 \\P^6 &= (F - 1)(5/7) + 1 \\P^7 &= (F - 1)(1/1) + 1 = F\end{aligned}$$

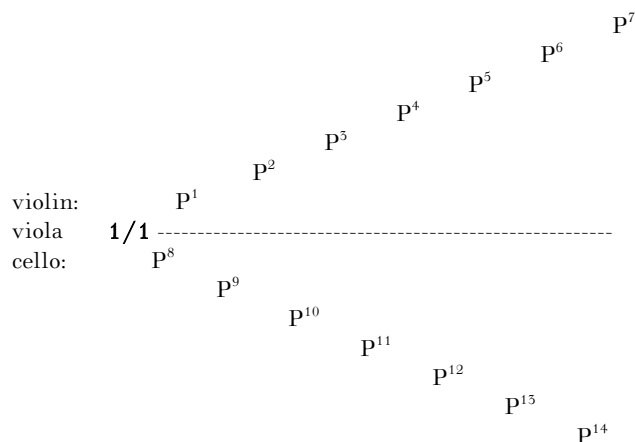
These pitch-classes will form the (primary) rising line of the violin. The pitch-classes of the (primary) descending line of the cello are to be determined by the following formulas:

$$\begin{aligned}P^8 &= P^6(1/F) \\P^9 &= P^5(1/F) \\P^{10} &= P^4(1/F) \\P^{11} &= P^3(1/F) \\P^{12} &= P^2(1/F) \\P^{13} &= P^1(1/F) \\P^{14} &= 1/F\end{aligned}$$

The distance of the resulting pitch-class ratios, in cents (1/100 of an equal-tempered semitone), from the beginning G is to be calculated by the formula:

$$1200 * \log(A) / \log(2)$$

The outline of the realization is to be constructed according to the following diagram:



The duration between successive introductions of these pitches should be approximately equal, and each pitch is to be sustained at least until the next successive pitch is established. The beginning G is to be sustained throughout the piece (primarily, though not necessarily exclusively, by the viola).

The realization should be constructed in such a way that it can be performed by ear. As such, intervening pitches (in any voice) may be required to facilitate the tuning of certain primary pitches (determined through the calculations above). Wherever possible, these intervening pitches should lie between the extremes of register then sounding in the violin and cello. The frequency relationship between two pitches may be calculated by dividing the smaller ratio into the larger. The size of the resulting interval in cents may be calculated by the formula given above. Note: As a general rule, frequency ratios involving higher numbers, and particular possessing higher prime number factors, are harder to tune¹. Where no workable solution to the tuning of some primary pitch can be found, a judicious use of scordatura may be necessary.

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A sample realization at the 3/1 “frame” is provided.

¹ A catalog of frequency ratios tunable by ear was compiled by Marc Sabat and Wolfgang von Schweinitz. The intervals included are, in order of increasing size: 1/1 (unison), 8/7, 7/6, 6/5 (just minor third), 11/9, 5/4 (just major third), 9/7, 13/10, 4/3, 11/8, 7/5, 10/7, 13/9, 16/11, 3/2 (just perfect fifth), 14/9, 11/7, 8/5 (just minor sixth), 13/8, 5/3 (just major sixth), 12/7, 7/4, 9/5, 11/6, 13/7, 15/8, 23/12, 2/1 (octave), 15/6, 11/5, 9/4 (just major ninth), 7/3, 19/8, 12/5, 17/7, 5/2, 18/7, 13/5, 8/3, 11/4, 14/5, 17/6, 20/7, 23/8, 3/1.

SYSTEMA

(Cognitive Disjunction, Proper)

Realization at the 3:1 Frame

D. C. Wadle

Musical score for Violin, Viola, and Cello. The Violin part (top staff) features a melodic line with notes marked with accidentals and intervals: $-14c$, $-2c$, $-14c$, and $-18c$. The Viola part (middle staff) includes notes marked with $+34c$ and $+34e$. The Cello part (bottom staff) has notes marked with $+31c$, $+12c$, $+63c$, and $-2c$. Roman numerals I, II, III, and IV are placed above the staves. Fingerings are indicated by numbers 1-5 in boxes, connected to notes by dotted lines. For example, the first violin note is fingered 5, and the first cello note is fingered 2.

Musical score for Violin I (Vln.), Viola (Vla.), and Violoncello (Vc.). The Violin I part (top staff) features a melodic line with notes marked with accidentals and intervals: $+31c$, $-18c$, $-18c$, and $+65c$. The Viola part (middle staff) is mostly silent. The Violoncello part (bottom staff) has notes marked with $-19c$ and $-19c$. Roman numerals I, II, and III are placed above the staves. Fingerings are indicated by numbers 1-5 in boxes, connected to notes by dotted lines. For example, the first violin note is fingered 8, and the first cello note is fingered 2.

This musical score is for Violin (Vln.), Viola (Vla.), and Violoncello (Vc.). It features several performance markings:

- Violin (Vln.):** Includes a sharp sign (\sharp) and a fermata (f) above the staff.
- Viola (Vla.):** Includes a sharp sign (\sharp) and a fermata (f) above the staff.
- Violoncello (Vc.):** Includes a sharp sign (\sharp) and a fermata (f) above the staff.

Fingerings and bowings are indicated by boxed numbers and letters:

- Violin (Vln.):** Fingerings 17/6 and 3/1. Bowings II and II.
- Viola (Vla.):** Fingerings 1/1, 3/2, 1/1, and 3/1. Bowings III, II, I, and III.
- Violoncello (Vc.):** Fingerings 1/1 and 3/1. Bowings II, III, and IV.

Additional markings include $+36c$, $+31c$, $+33c$, $-16c$, and $-4c$.