spira mirabilis

from *Infinite Canons: an infinite collection of canonic combinations*

for player piano

2018

Clifton Callender

Notes for *spira mirabilis*

Infinite Canons is an ongoing series of canons with infinite solutions. More specifically, each canon is based on a maximally self-similar melodic line that can be combined in any number of voices, in any tempo ratios (rational or irrational), and with each voice moving either forward or backward through the line, while maintaining harmonic consistency. For *spira mirabili* I have selected a small number of these combinations, attempting to give the flavor of the infinite combinatorial possibilities within the context of a unified (and finite) series of canons. These canons are described in greater detail at http://cliftoncallender.com/research/infinite_canons/.

Canon 1 — Theme A
$4 : 2 : 1$

Canon 2 — Theme A (inversion)
$e : \phi$
$\pi : e : \phi$

Canon 3 — Theme B
$4 : 2 : 1$
Theme (retrograde)
$1 : \sqrt{e} : e$

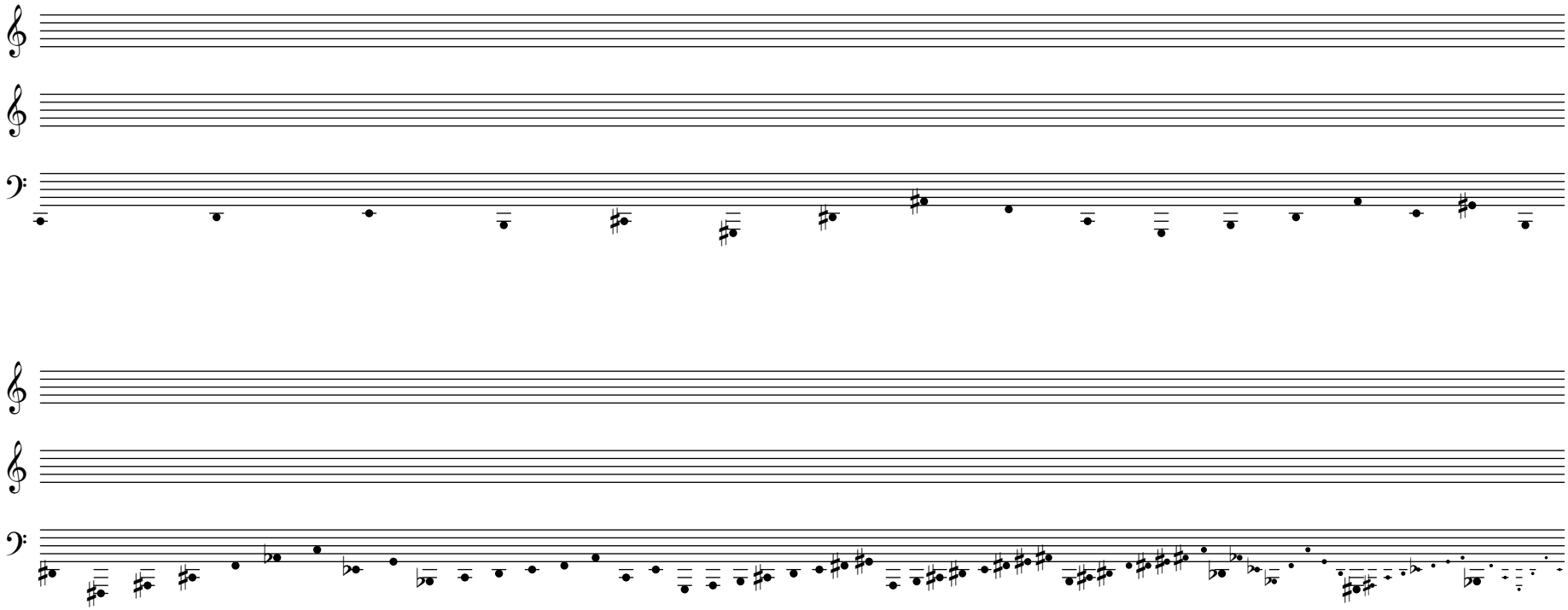
Canon 4 — Theme B, table canon
(canon by retrograde inversion)
$2^t : 2^{3/2-t}$

Canon 5 — Theme A, table canons
$2^t : 2^{-t}$
$2^t(8 : 7) : 2^{-t}(8 : 7)$
$2^t(28 : 24 : 21) : 2^{-t}(28 : 24 : 21)$

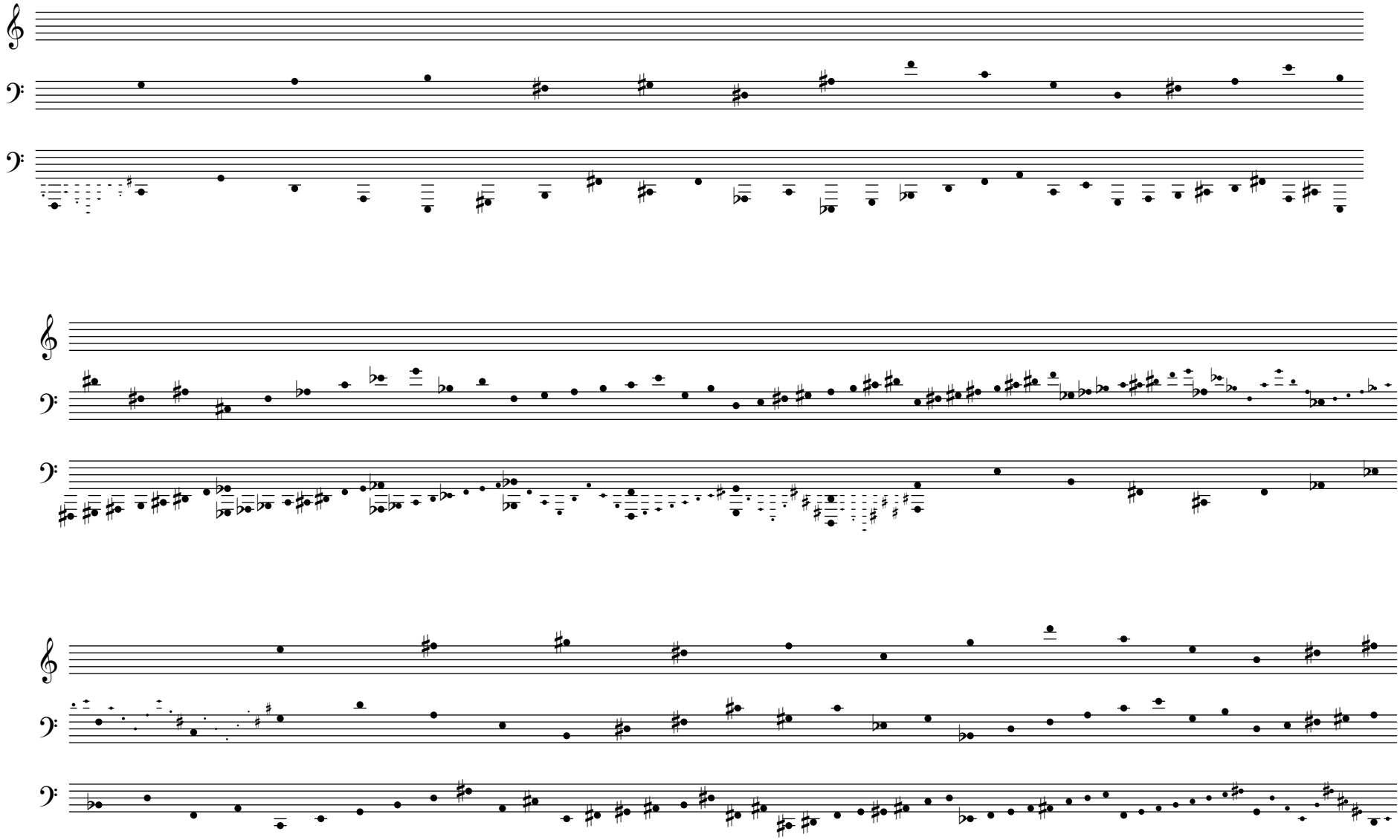
Canon 1

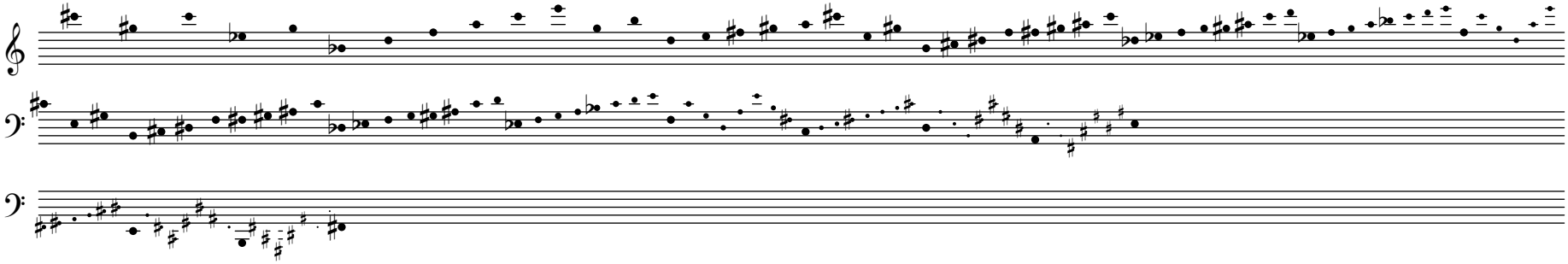
Theme A

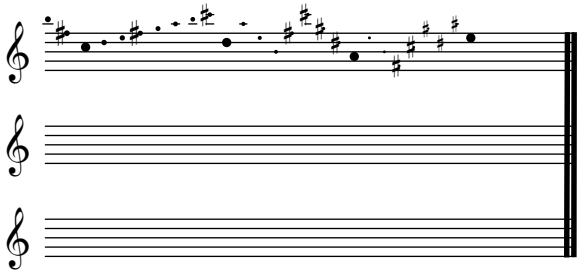
4 : 2 : 1



Score is written in piano-roll format. Time flows at a constant rate from left to right within each system. Noteheads indicate note onsets only. Size of notehead indicates the volume of the note. Accidentals apply only to the notehead they immediately precede.





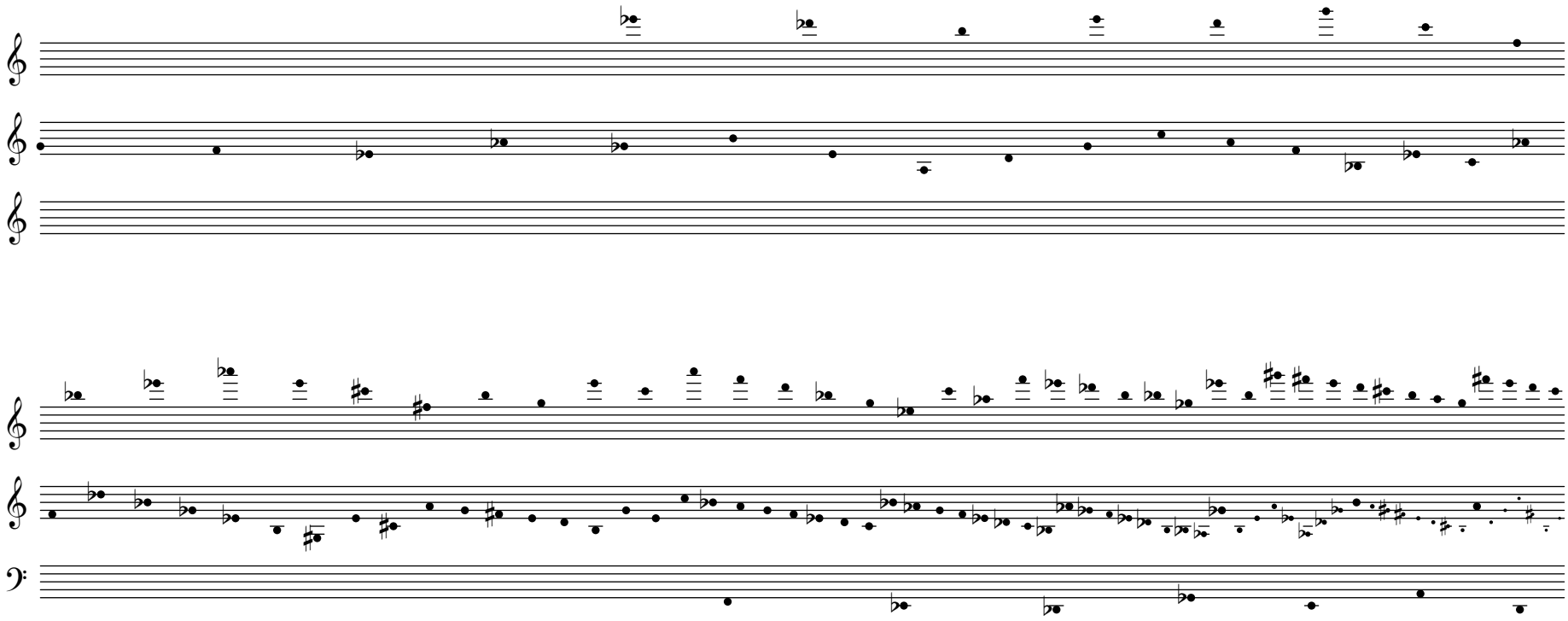


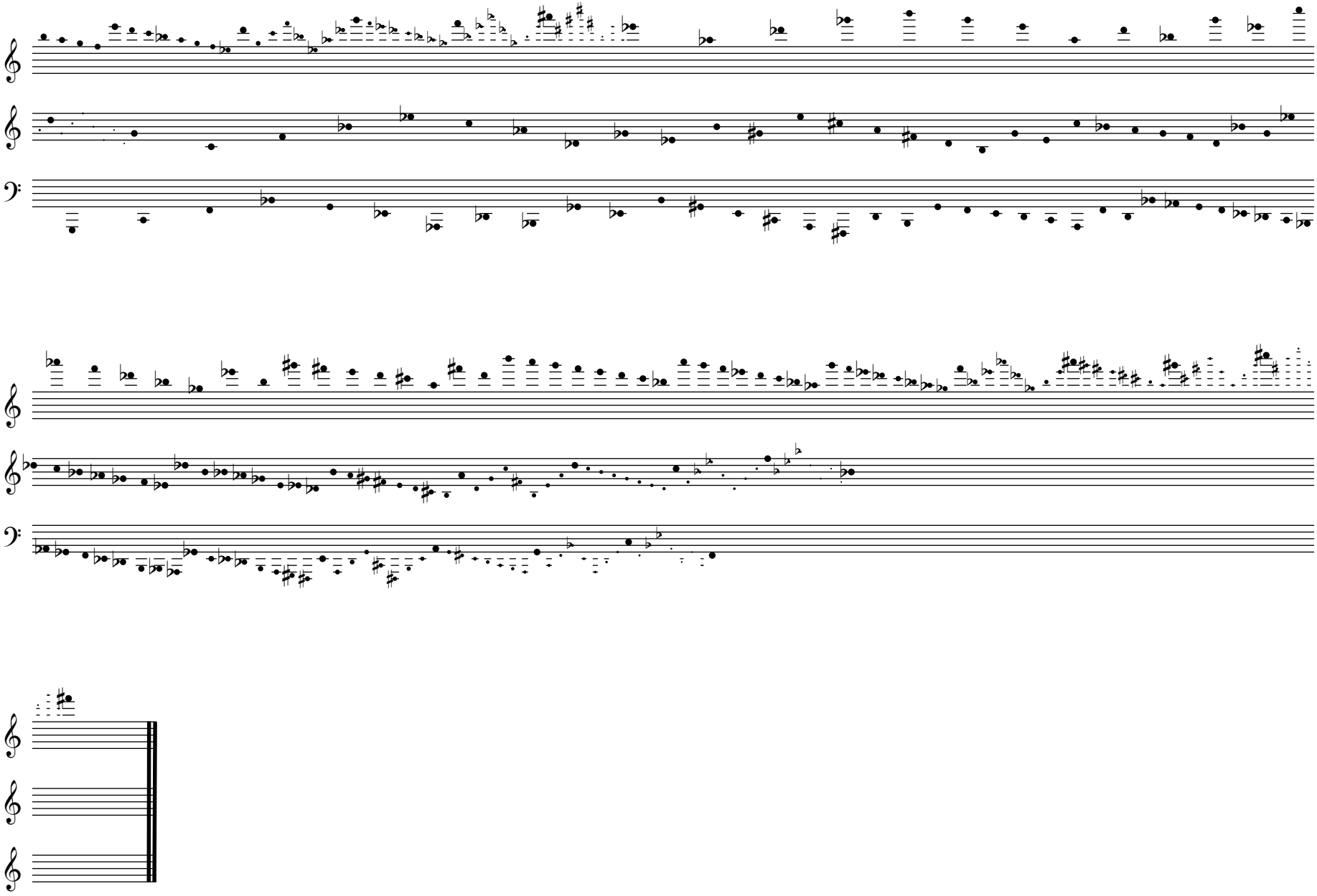
Canon 2

Theme A, inversion

$e : \phi$

$\pi : e : \phi$





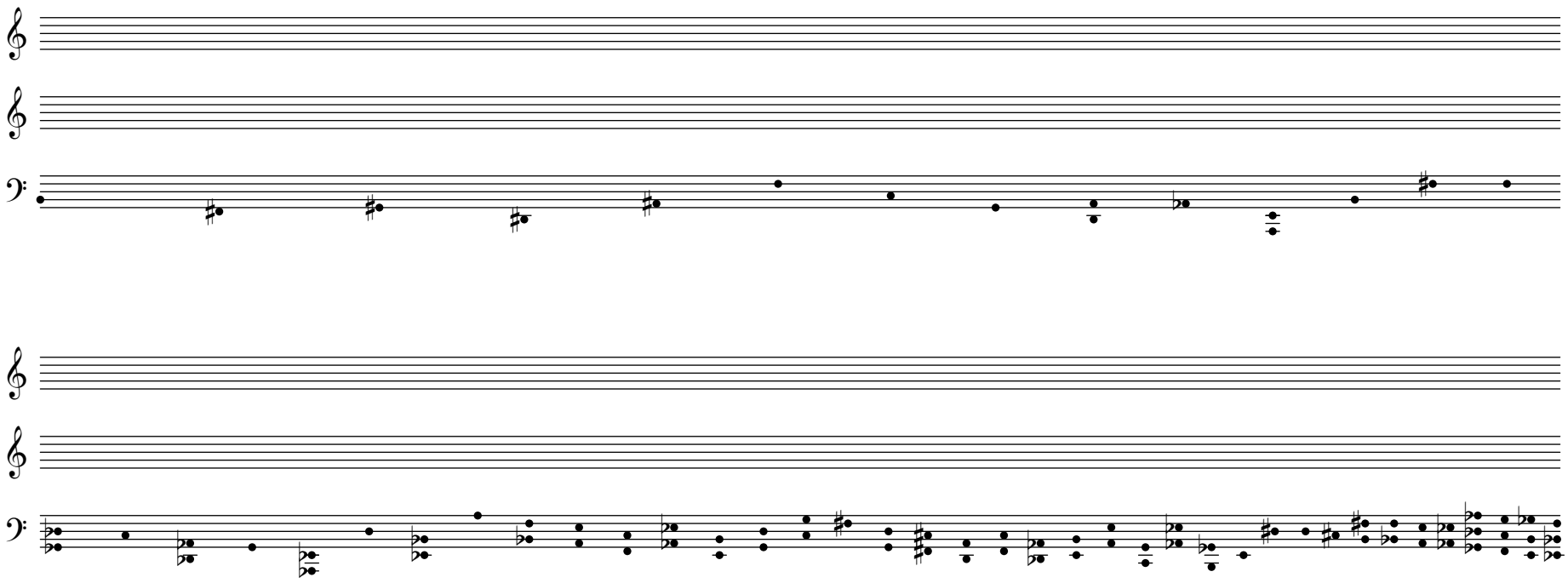
Canon 3

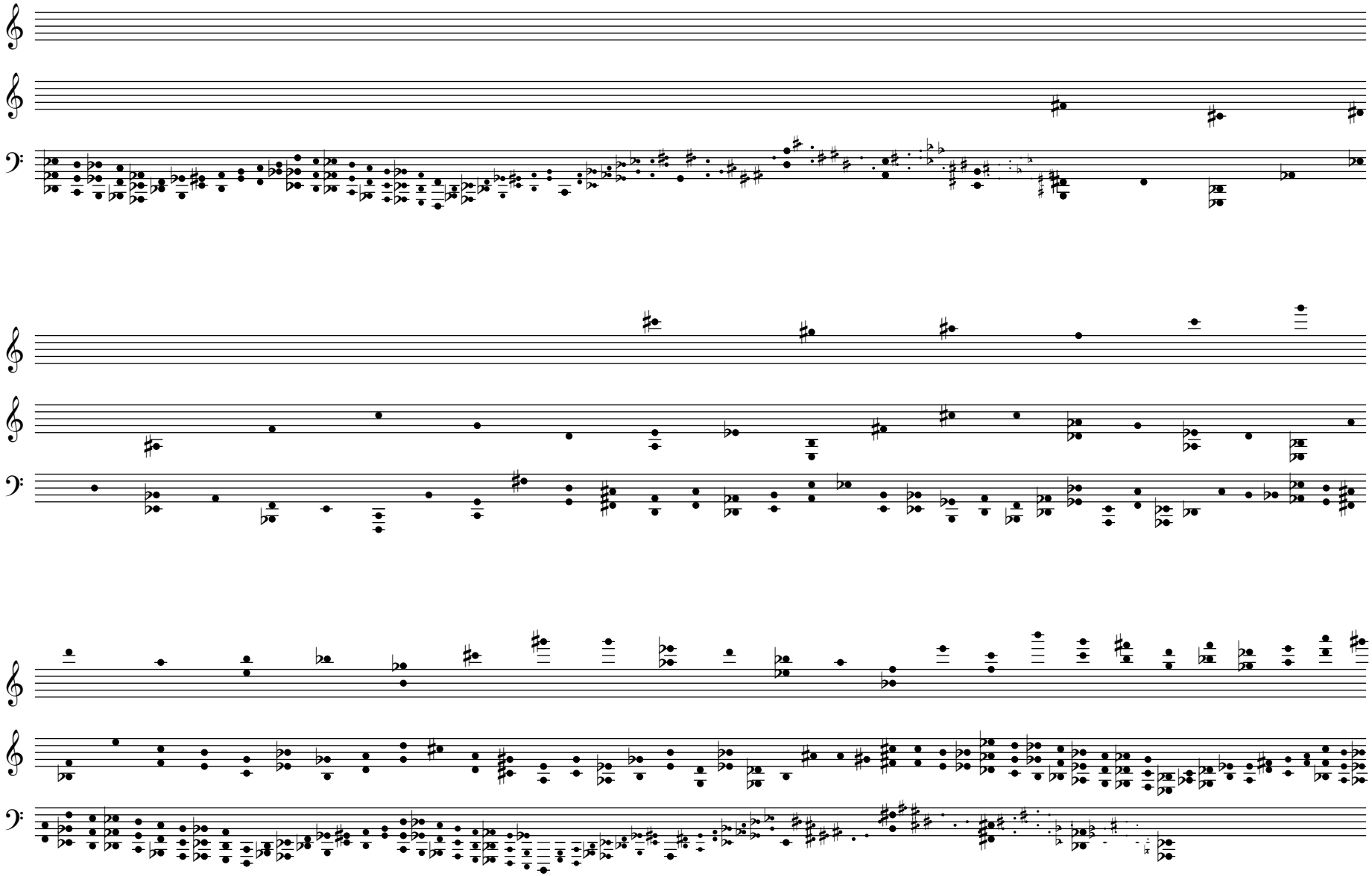
Theme B

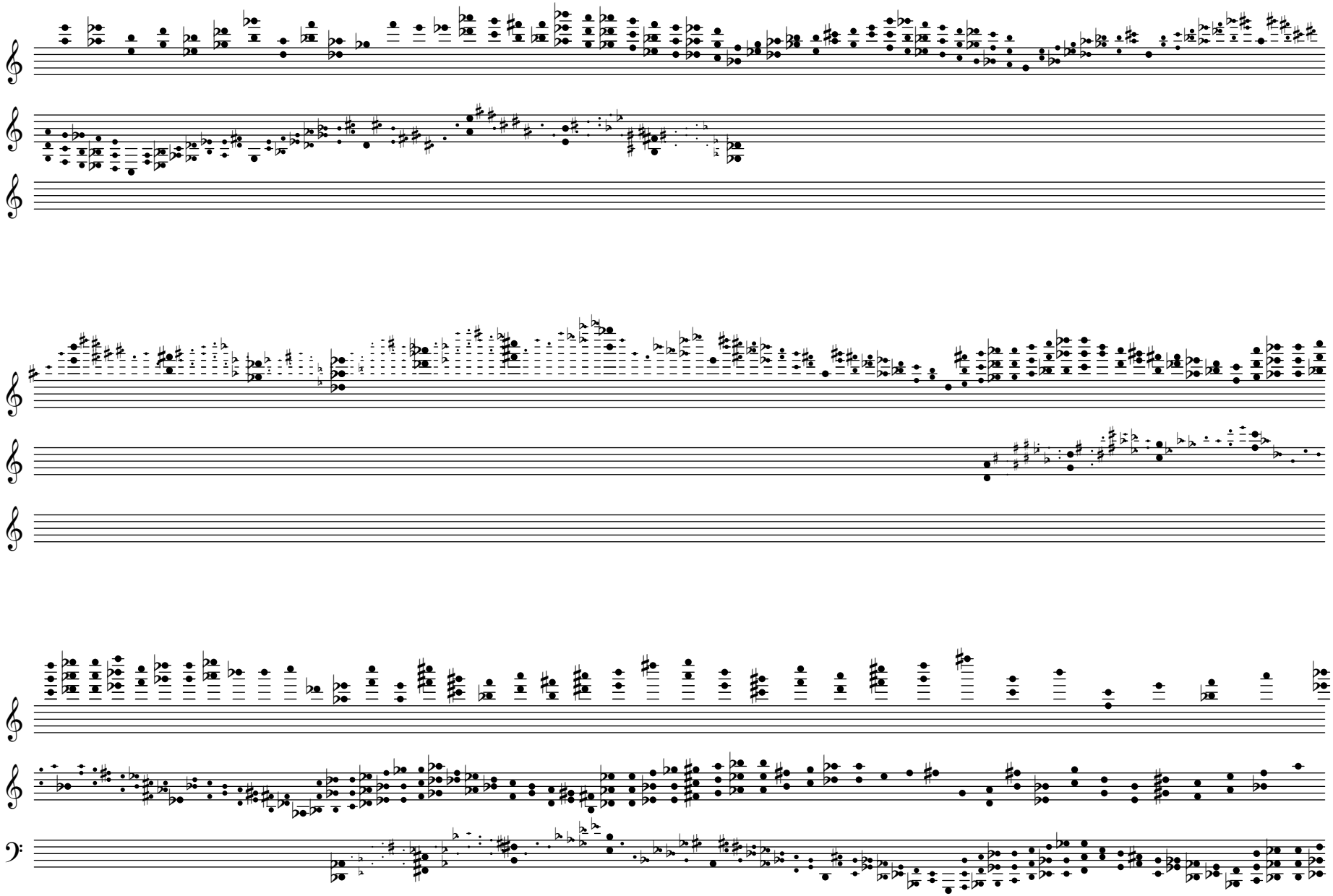
4 : 2 : 1

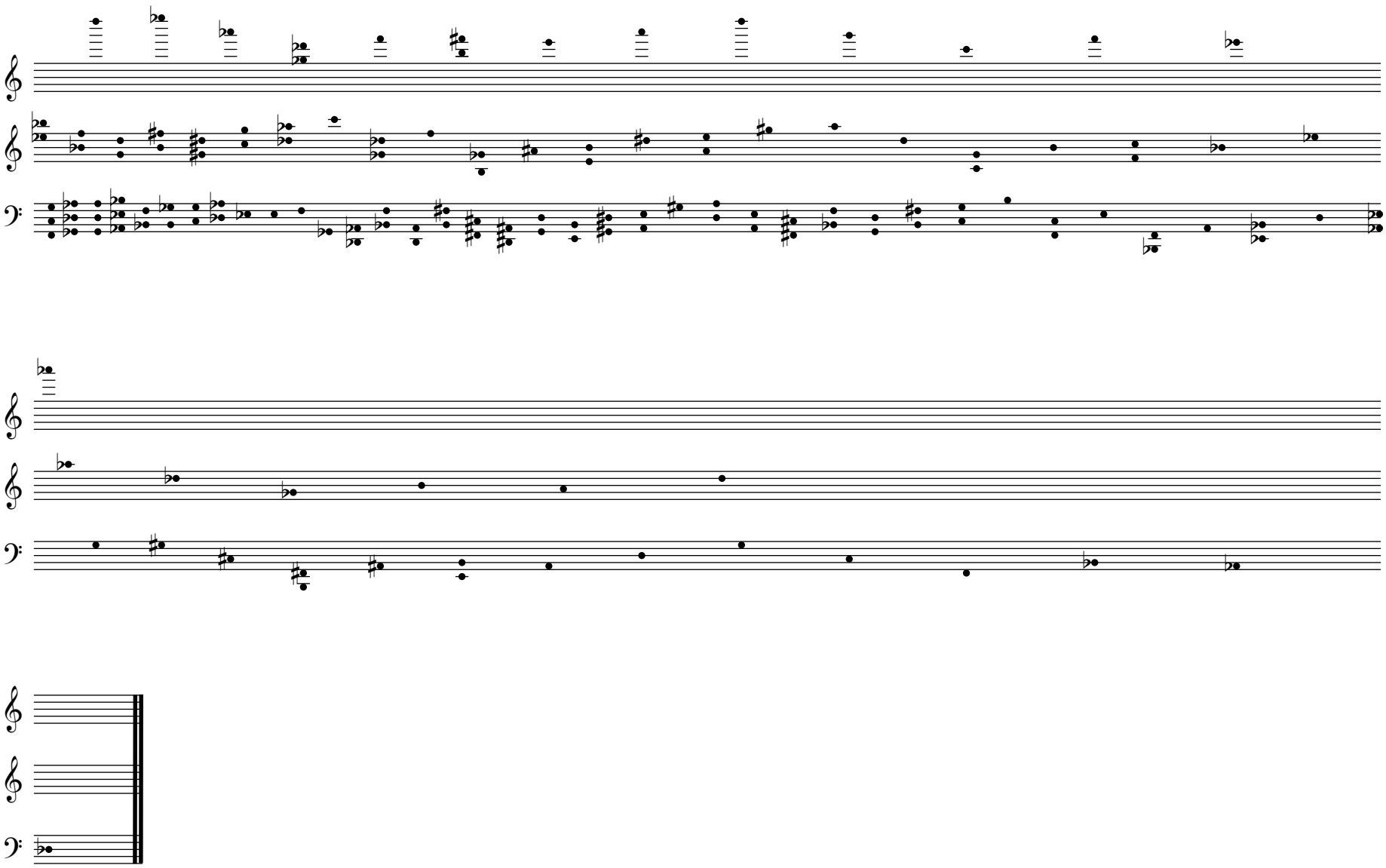
Theme B, retrograde

$1 : \sqrt{e} : e$







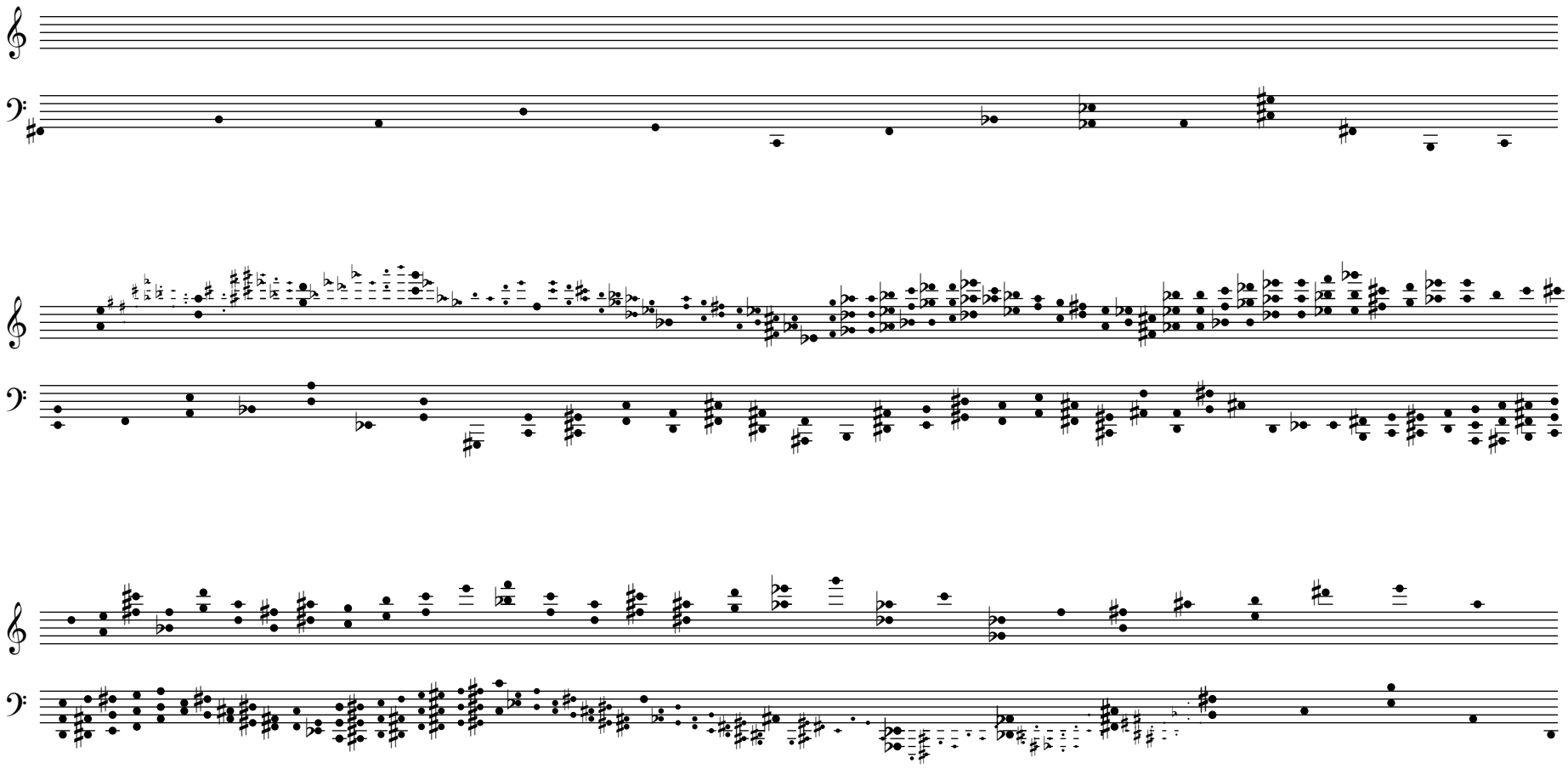


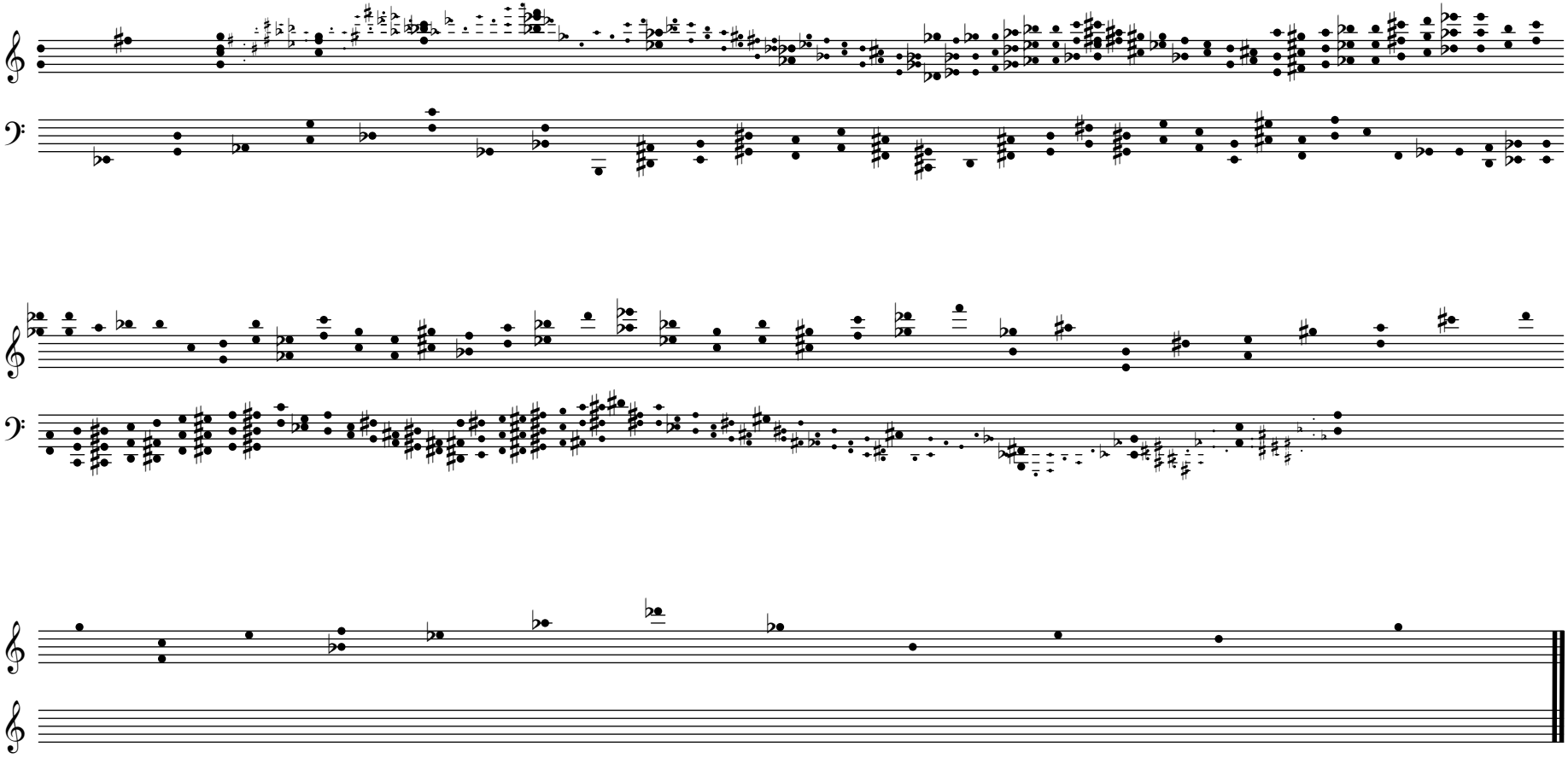
Canon 4

Theme B, table canon

(canon by retrograde inversion)

$2^t : 2^{3/2-t}$





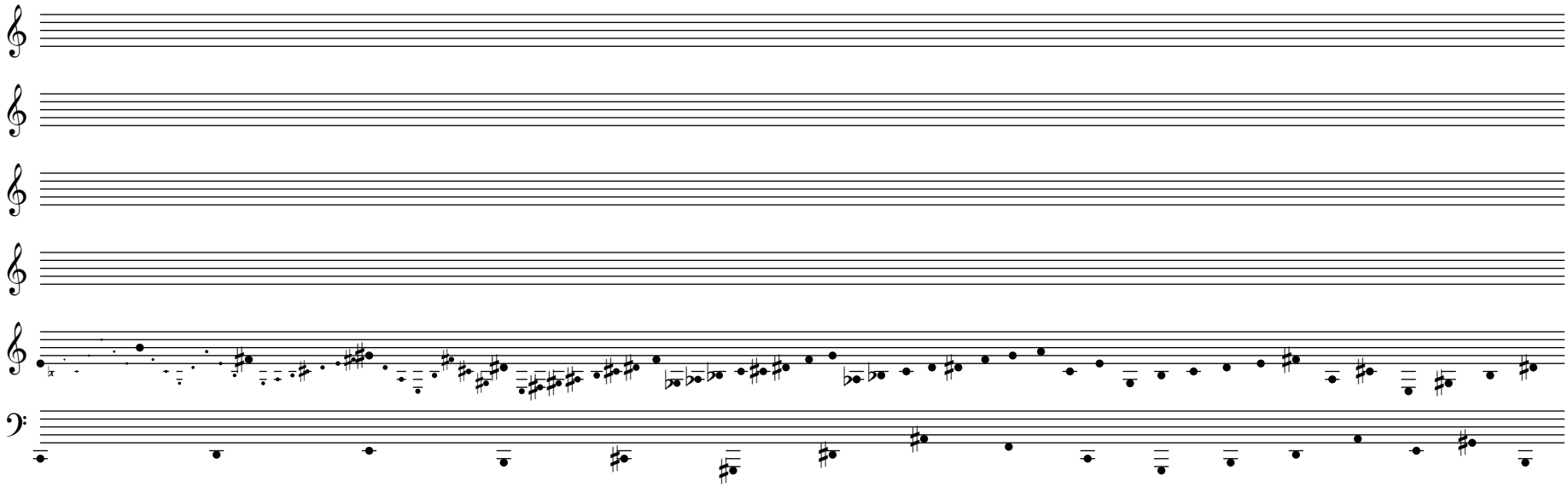
Canon 5

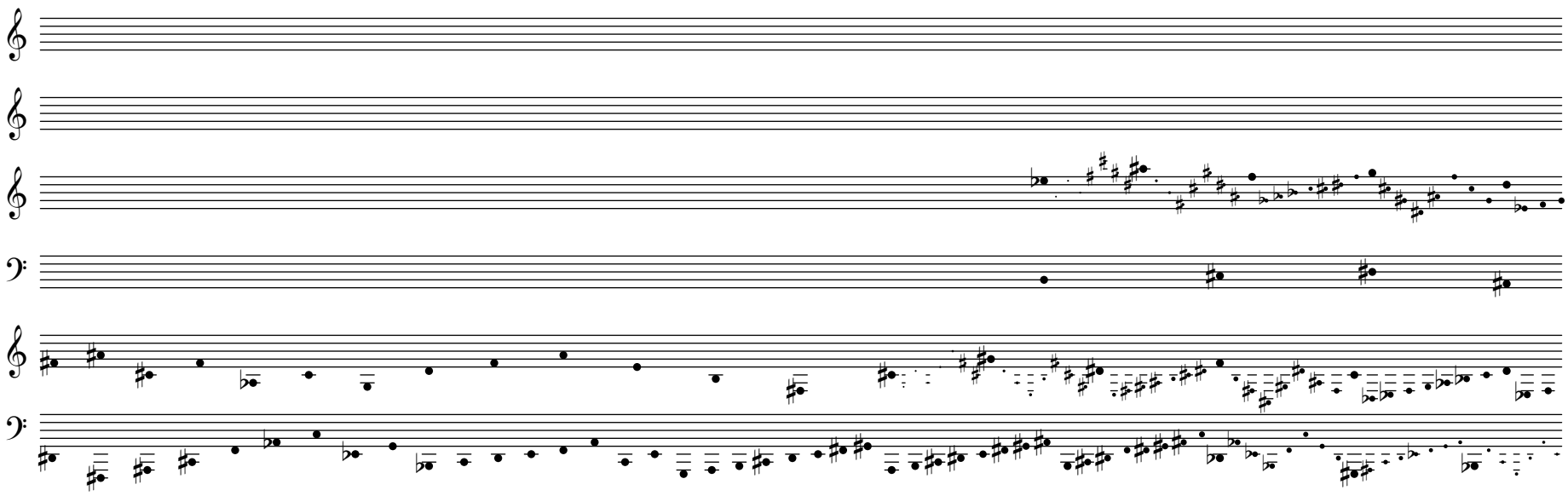
Theme A, table canons

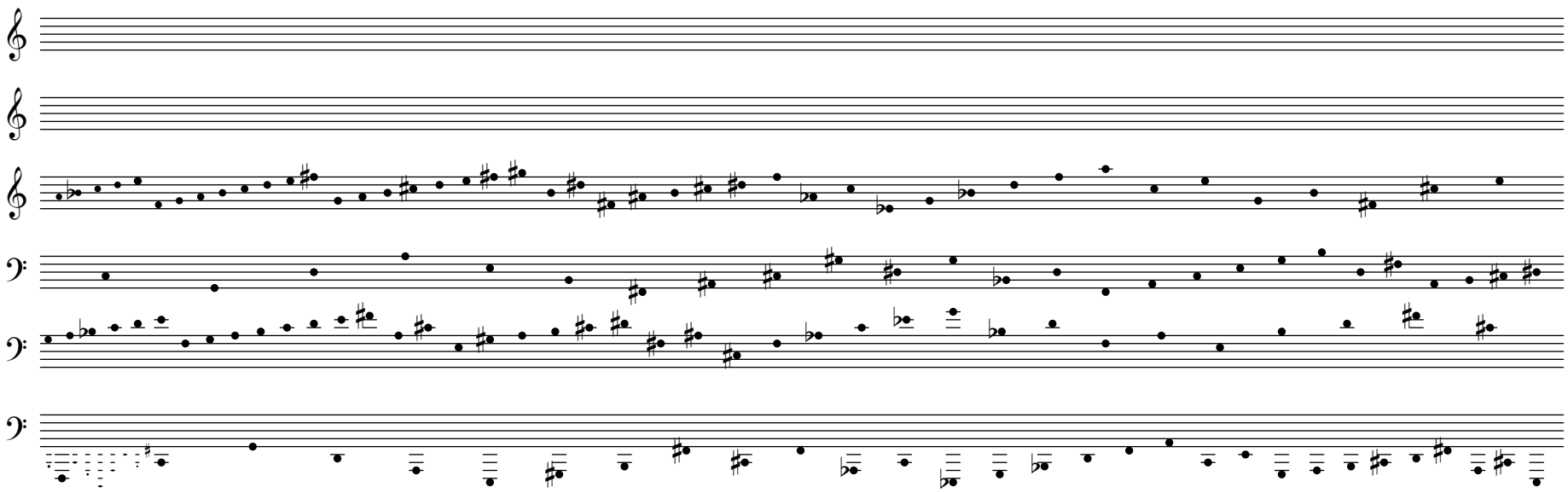
$2^t : 2^{-t}$

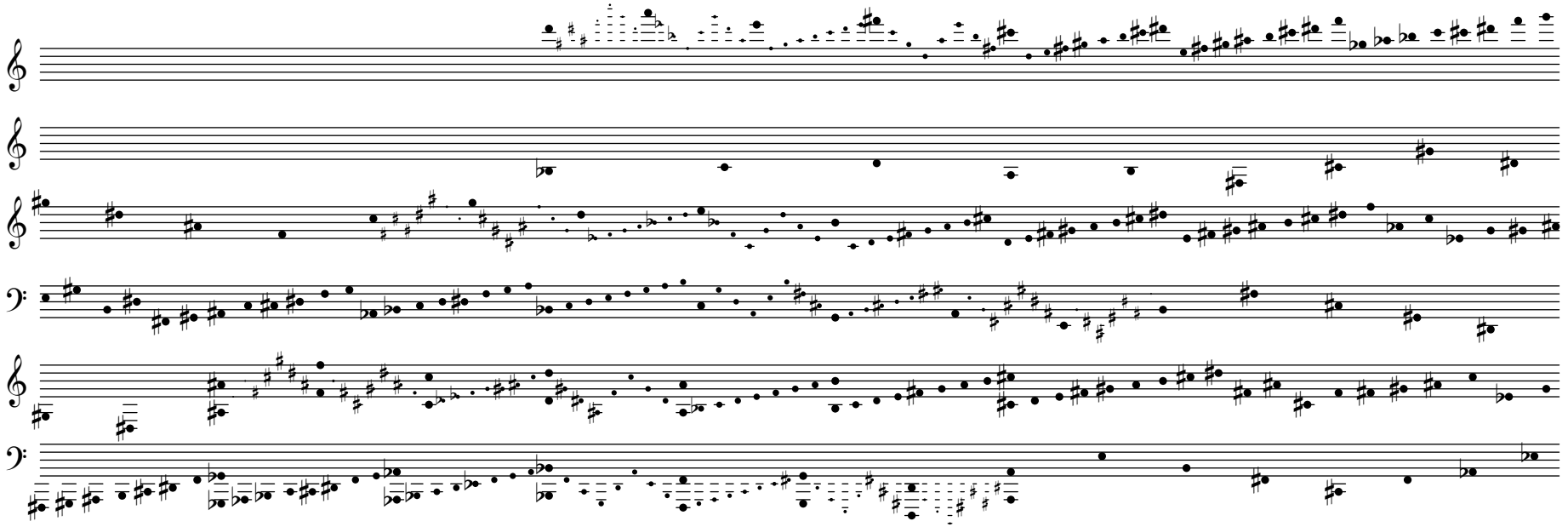
$2^t(8:7) : 2^{-t}(8:7)$

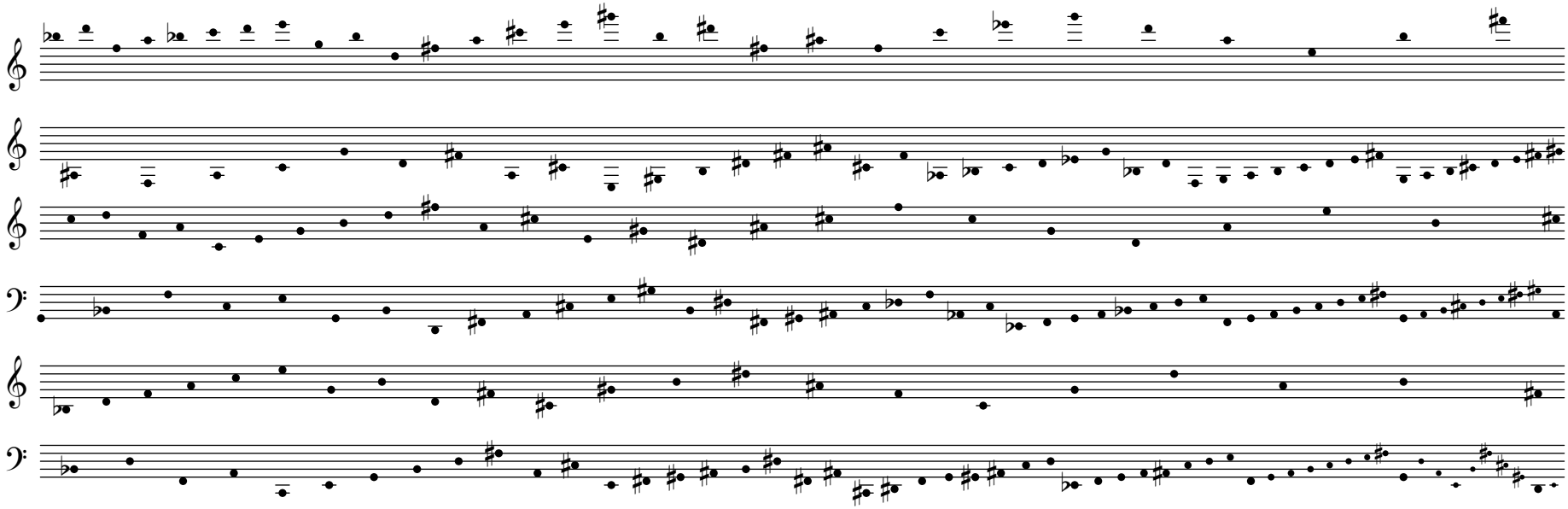
$2^t(28:24:21) : 2^{-t}(28:24:21)$

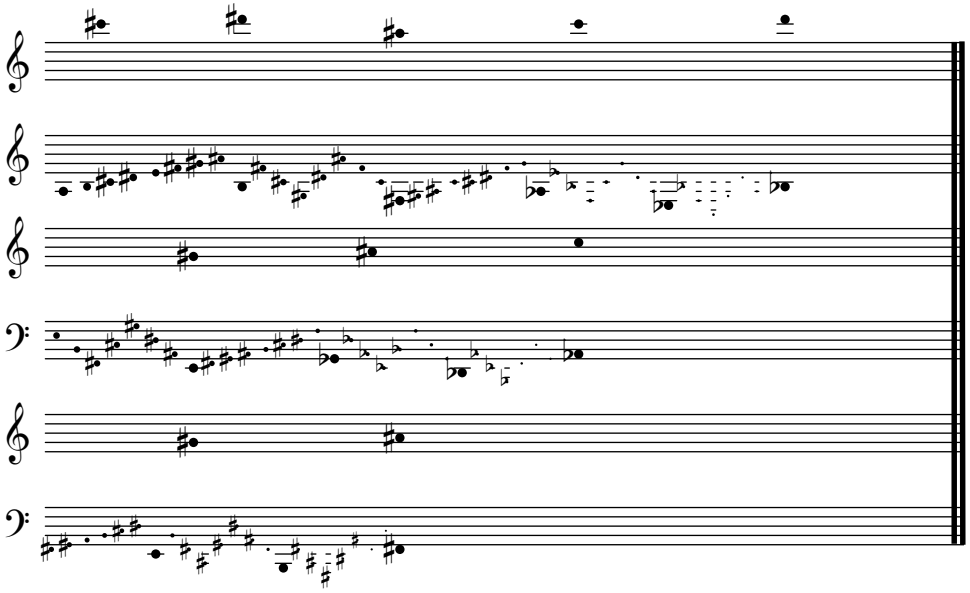












Canon 6

Theme C

$3 : 1$

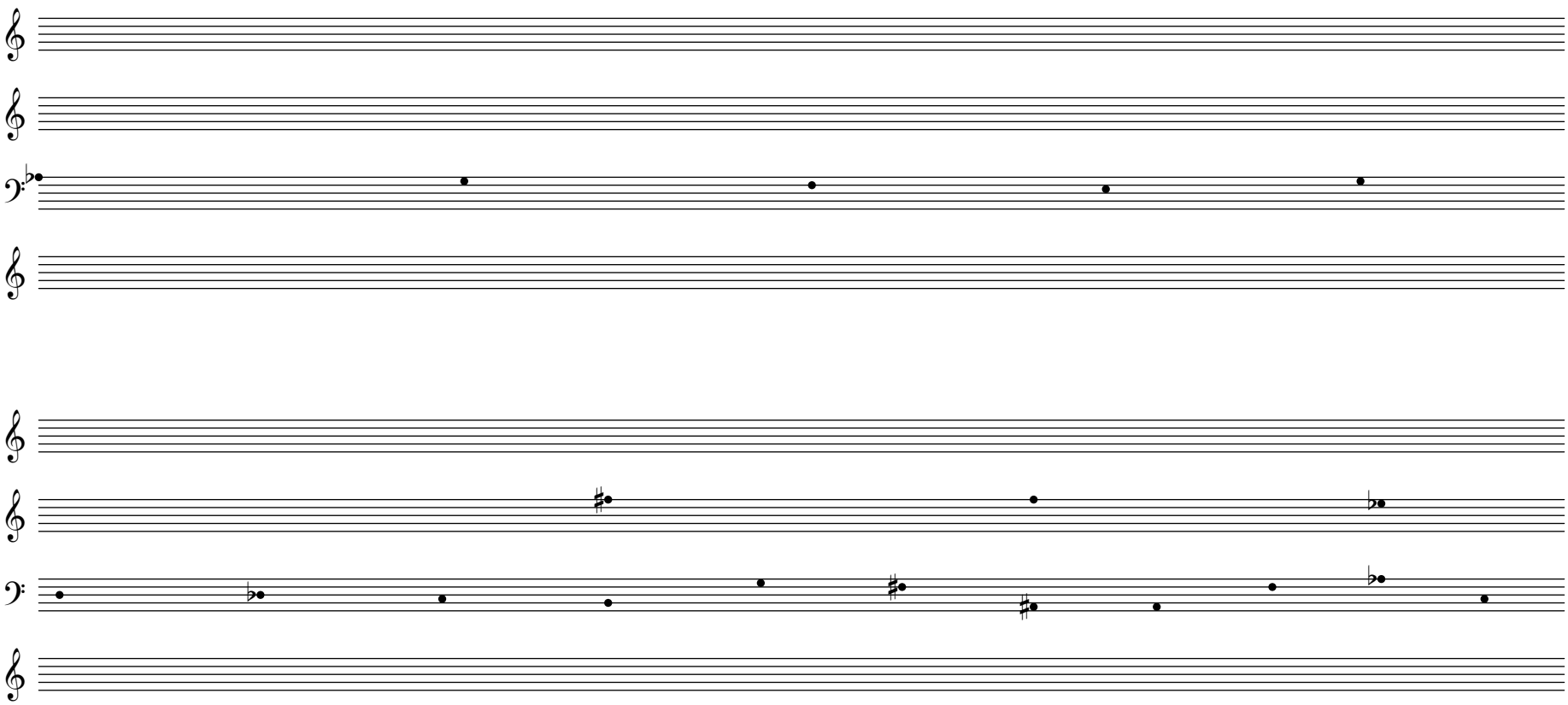
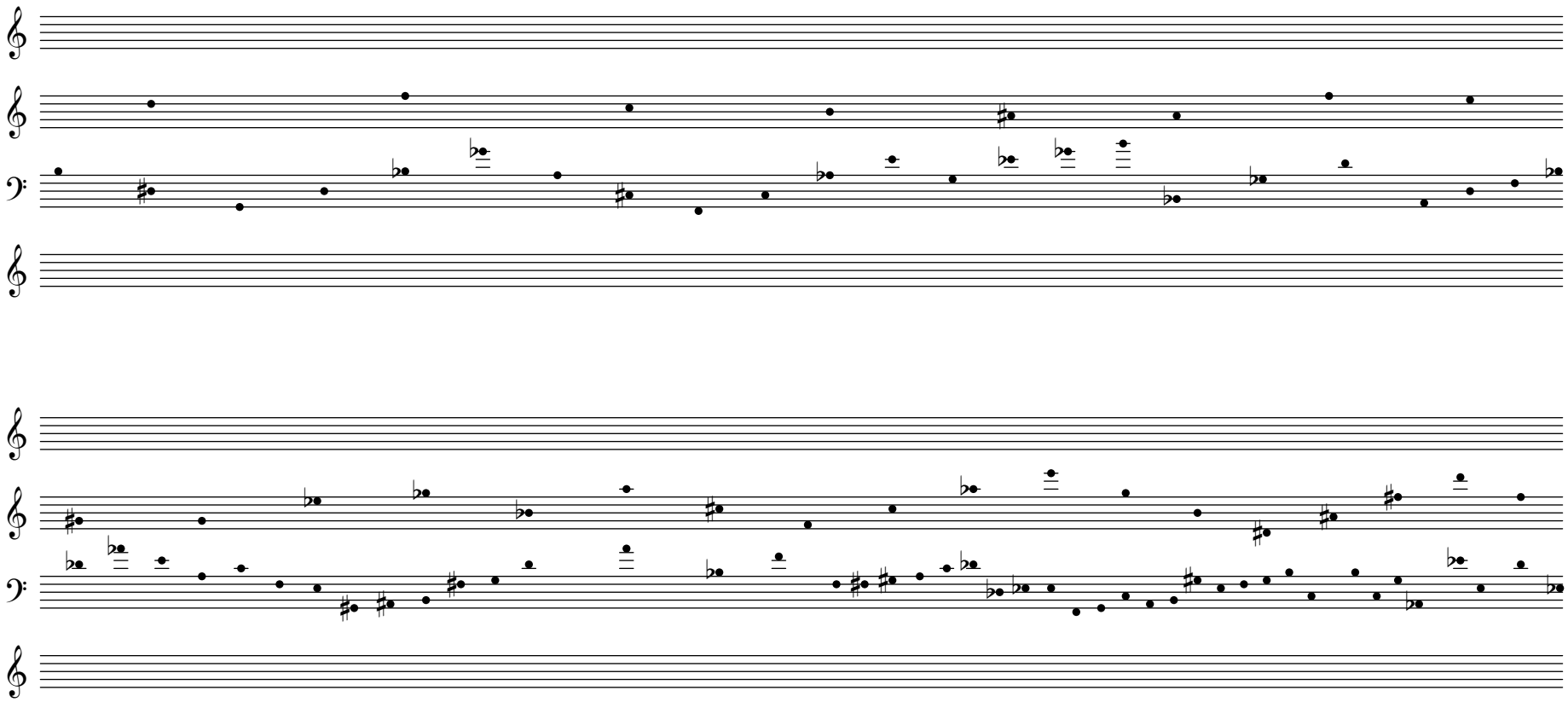
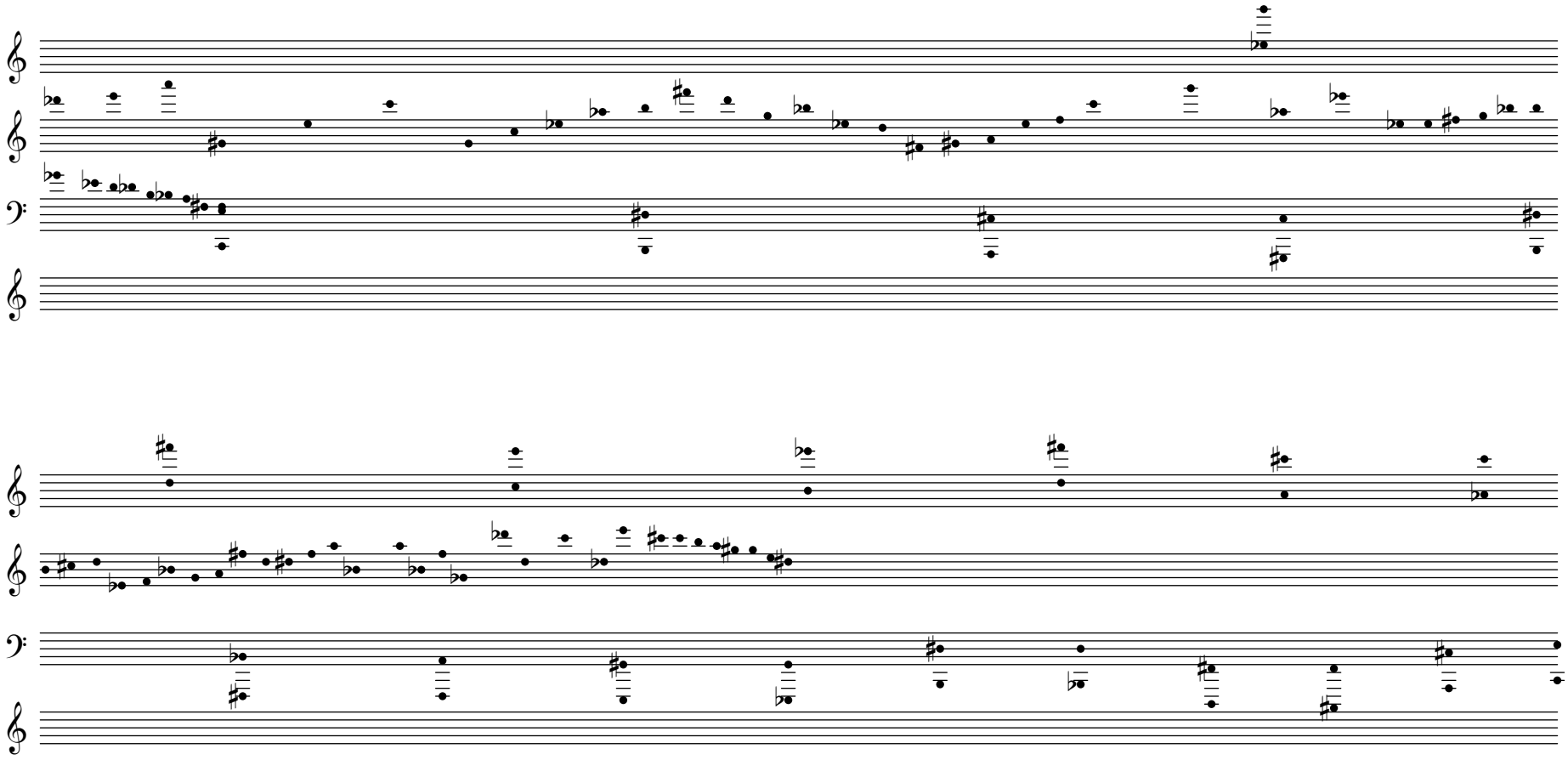
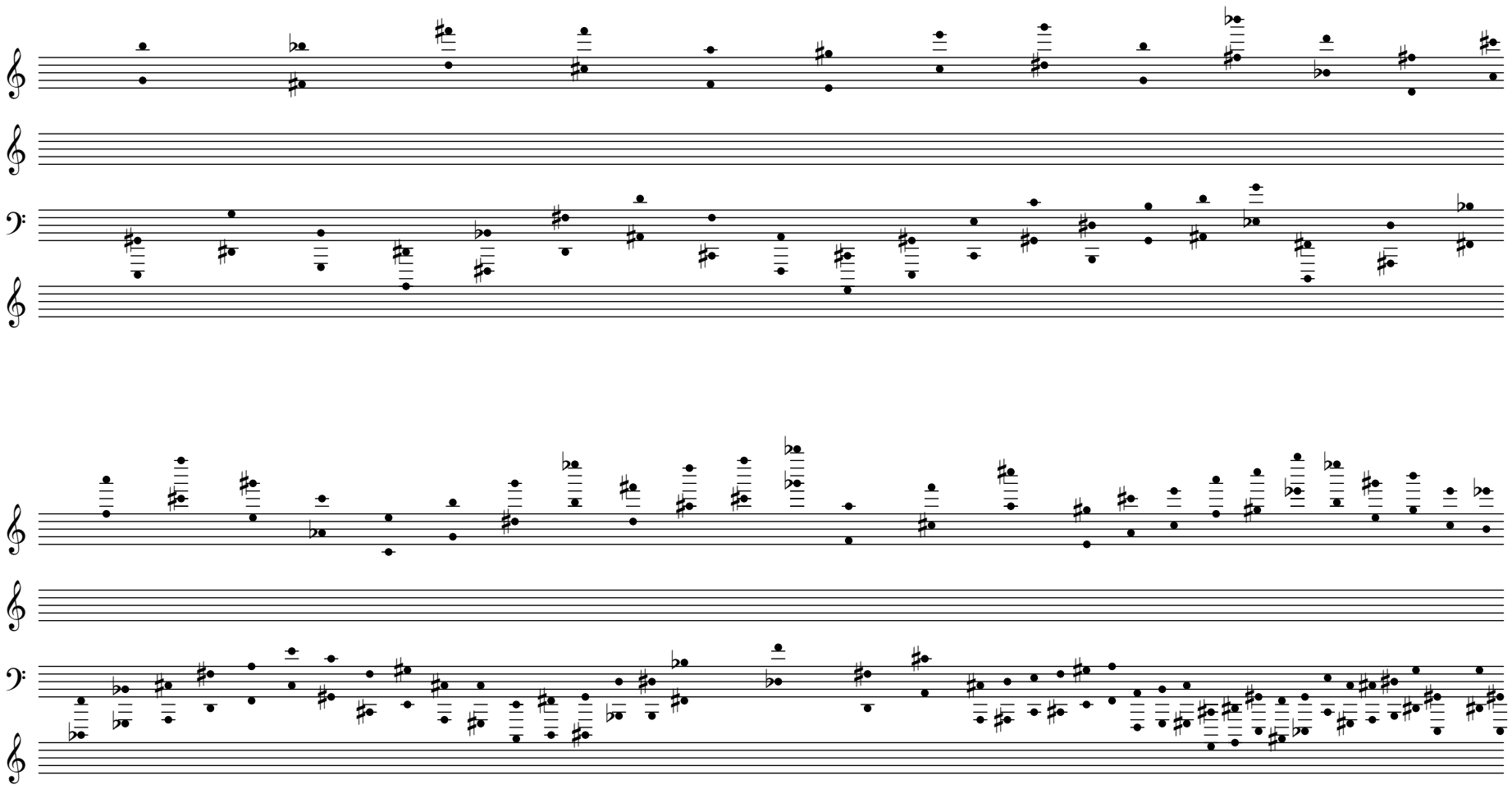
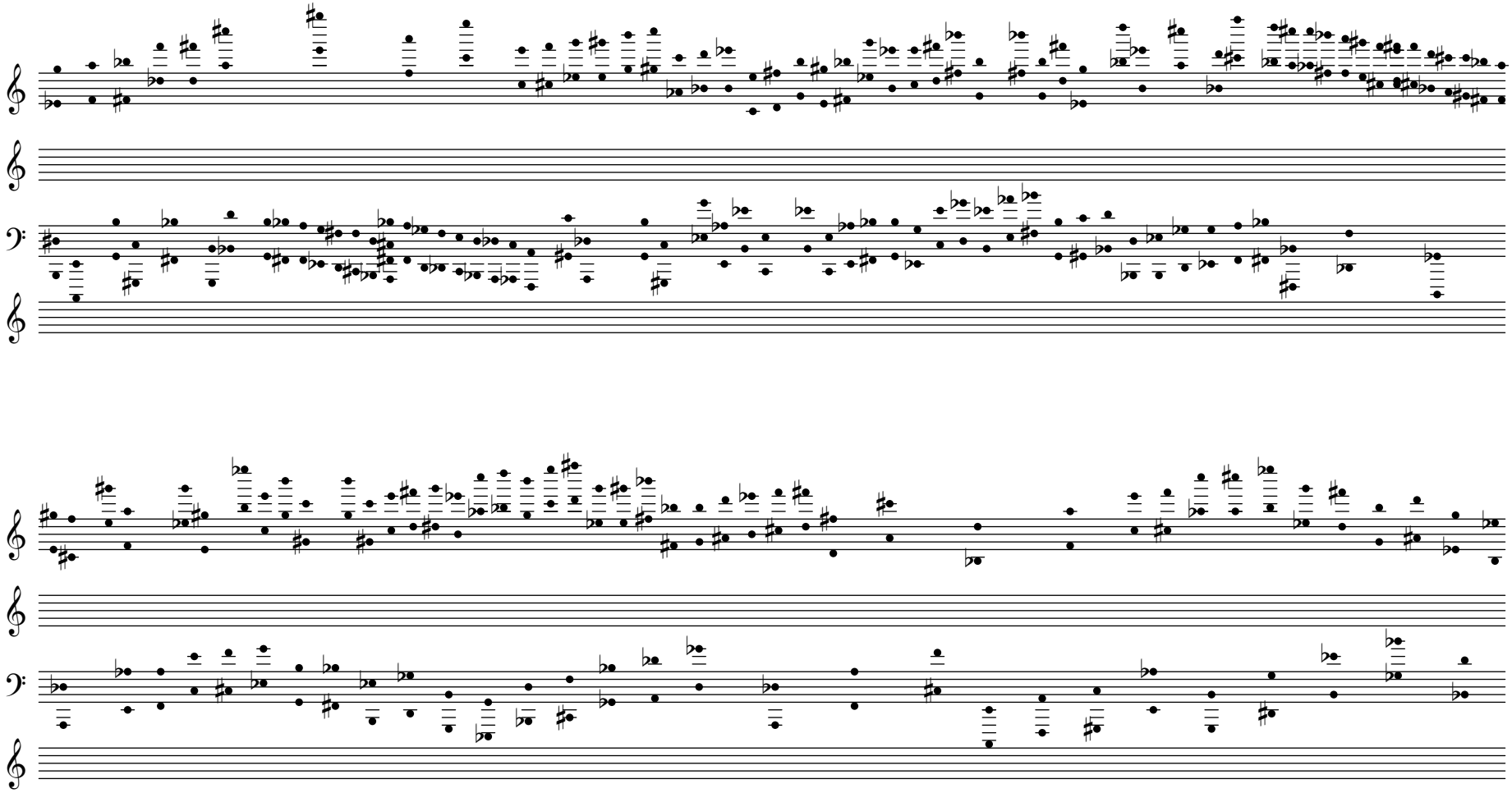
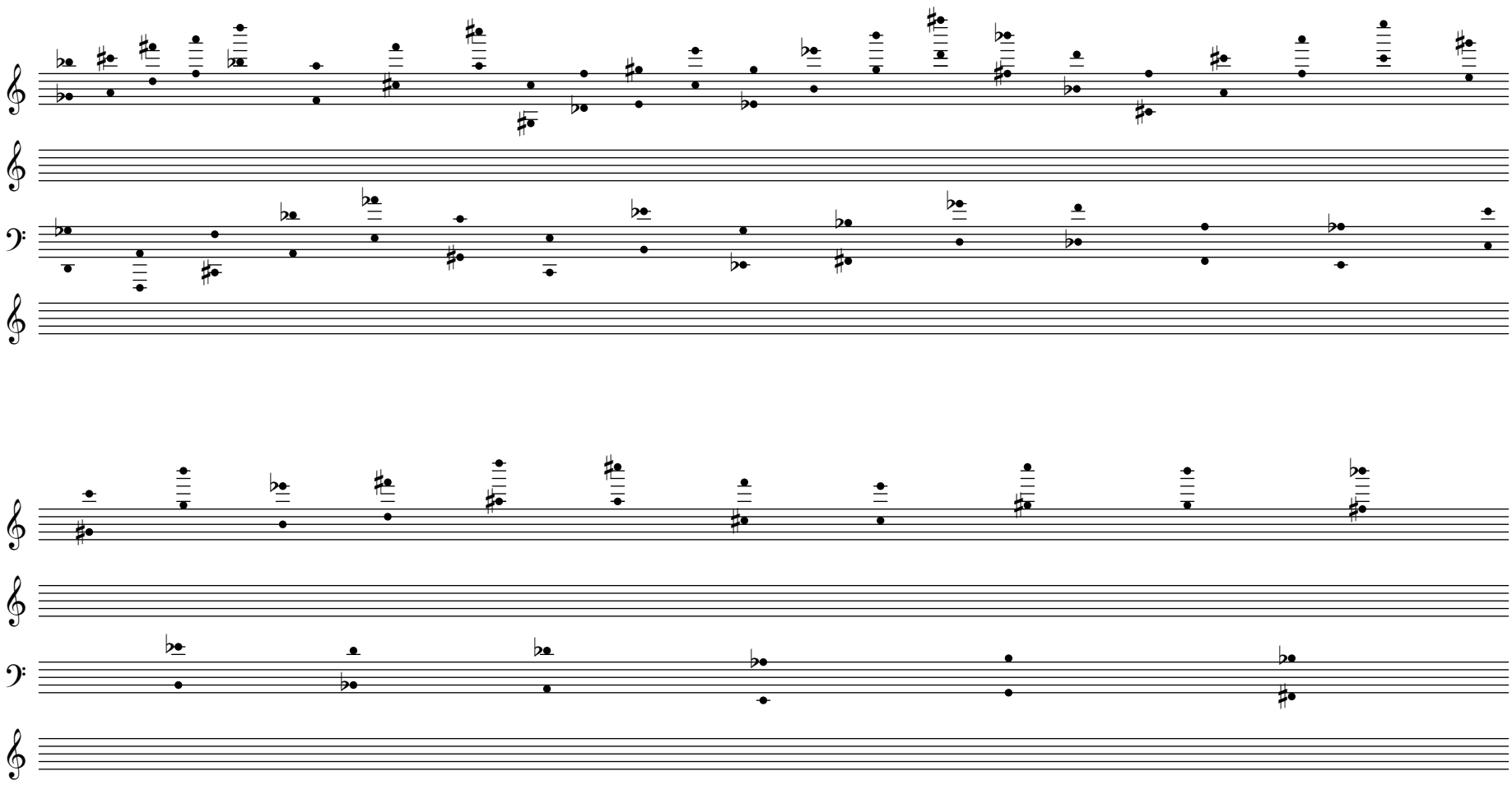
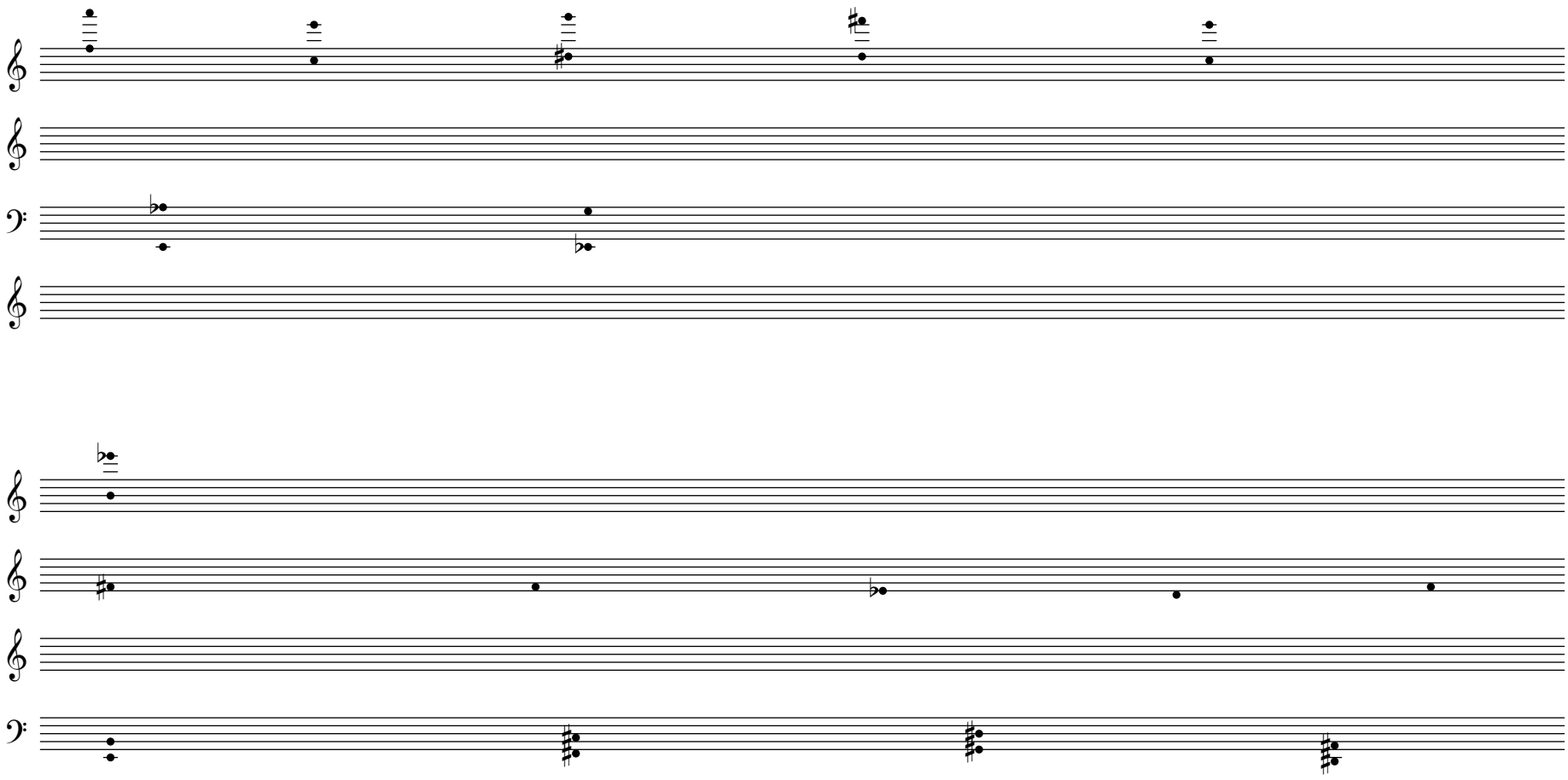
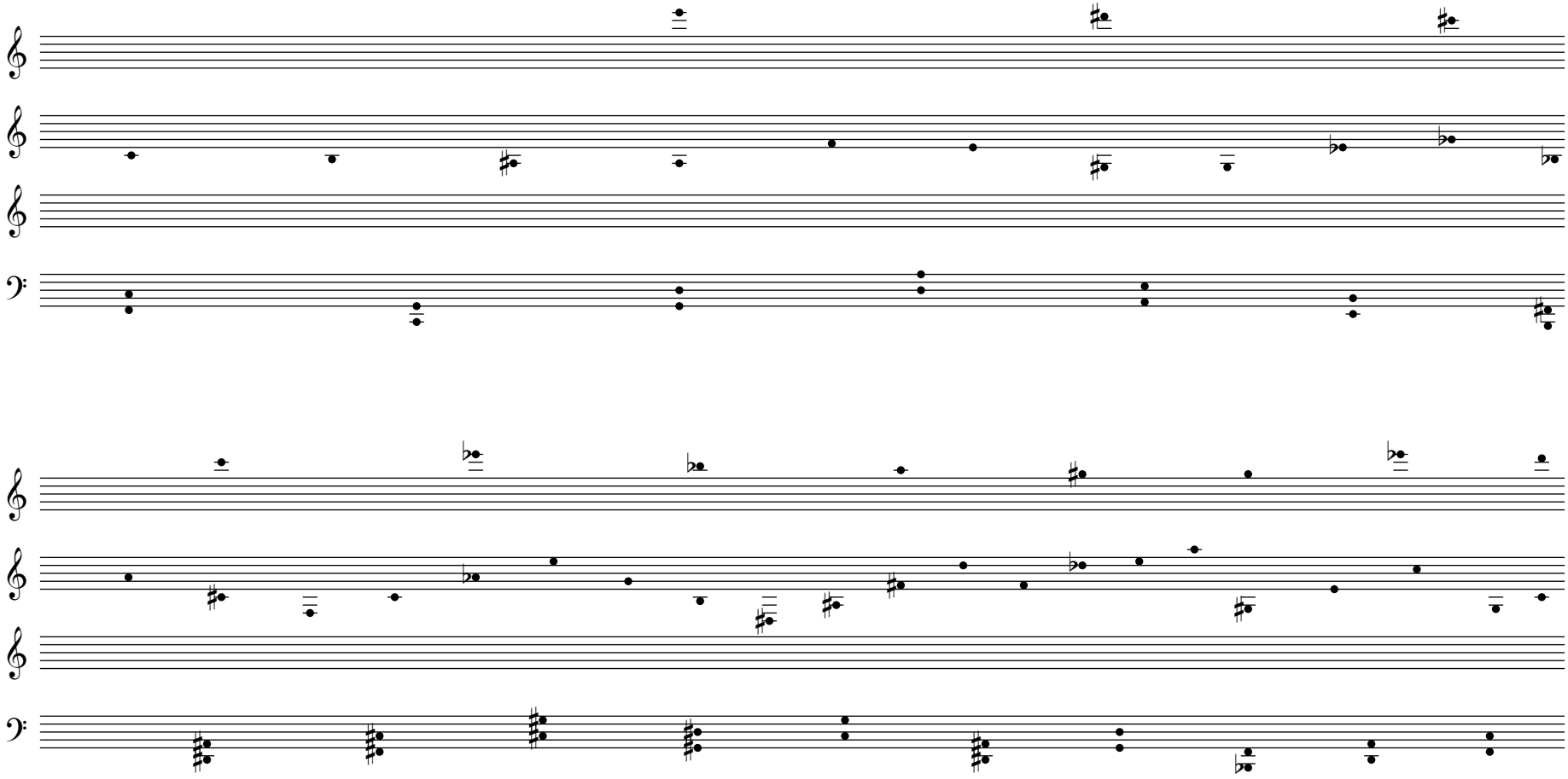
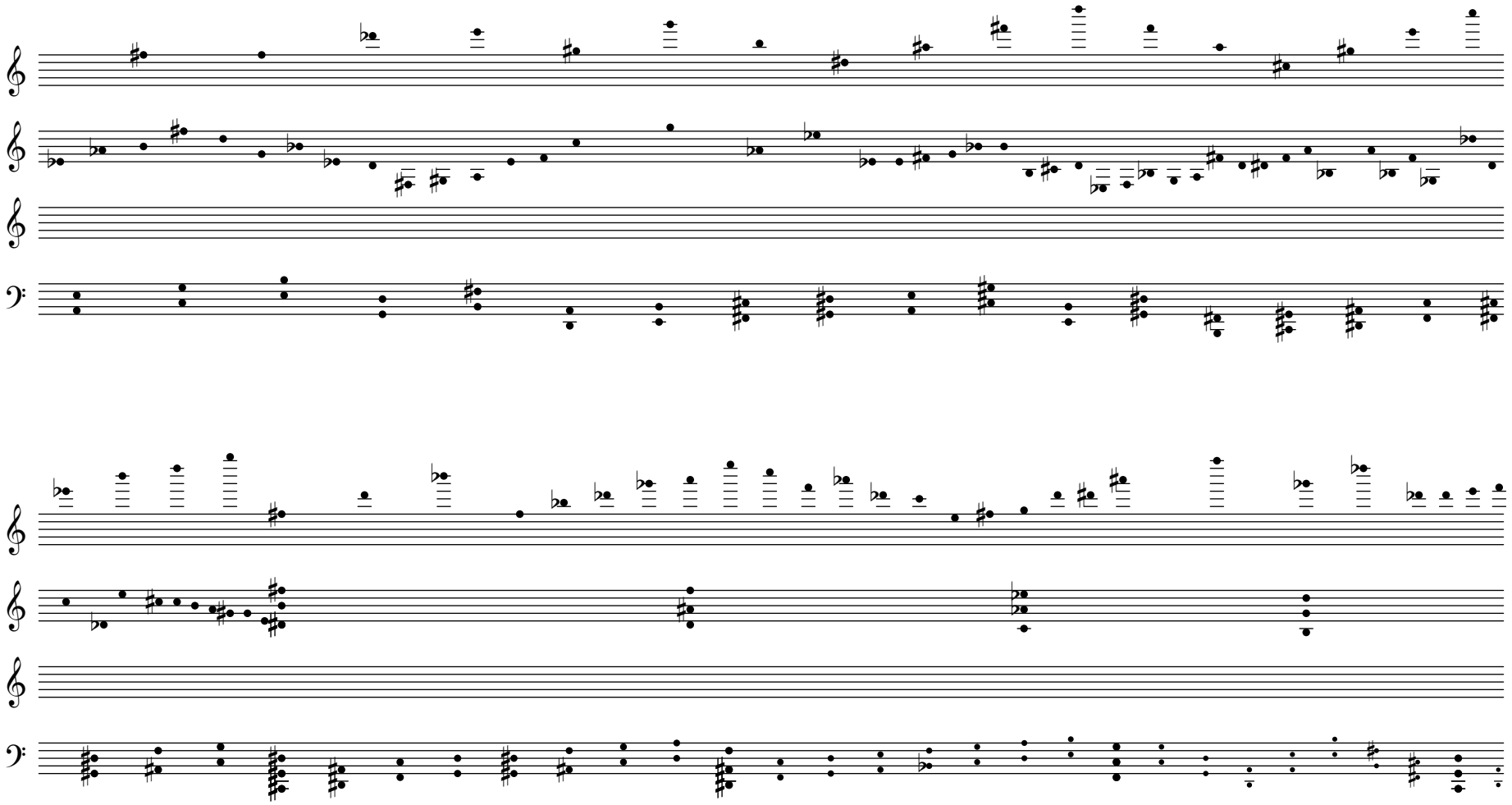
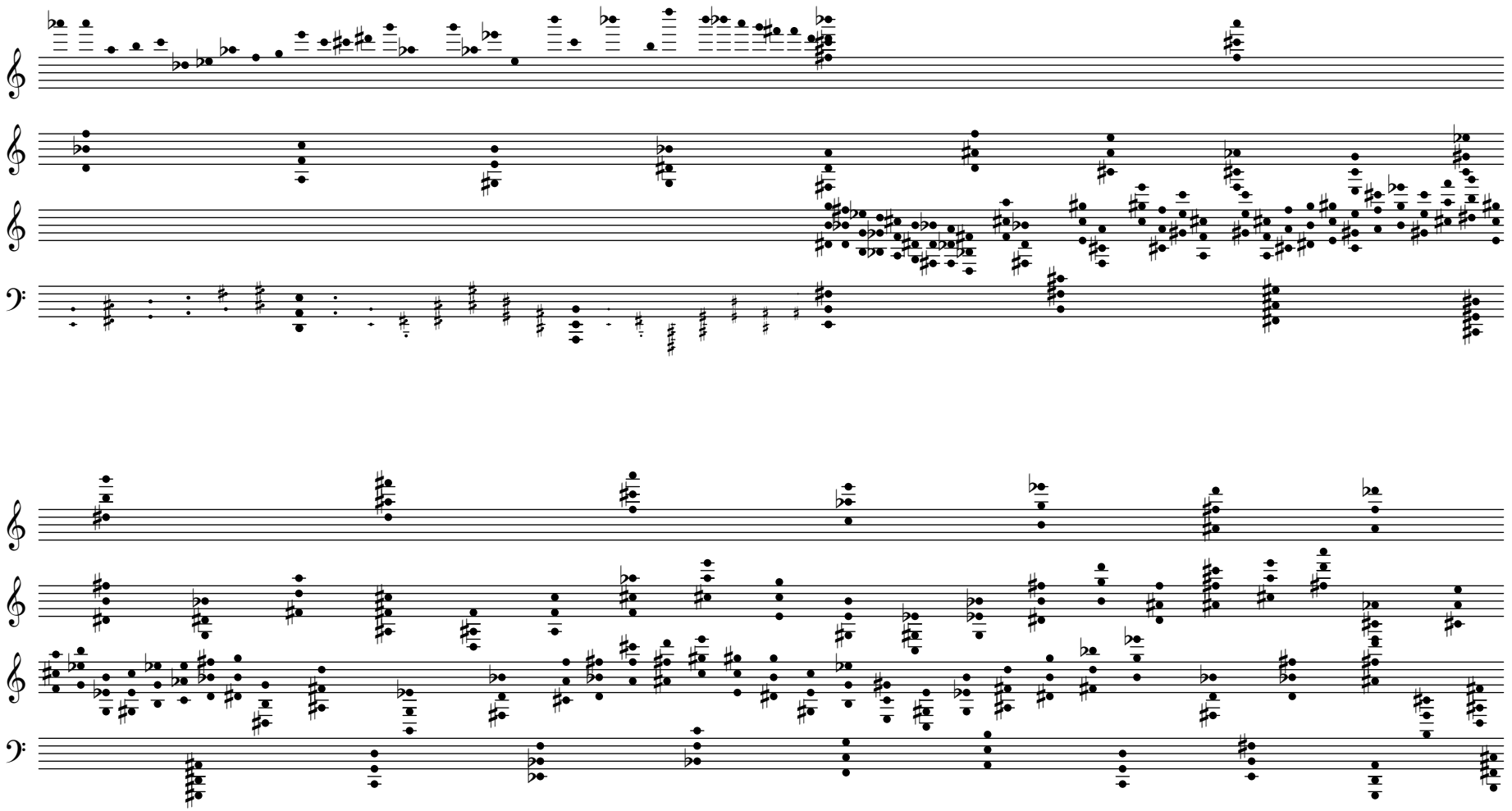
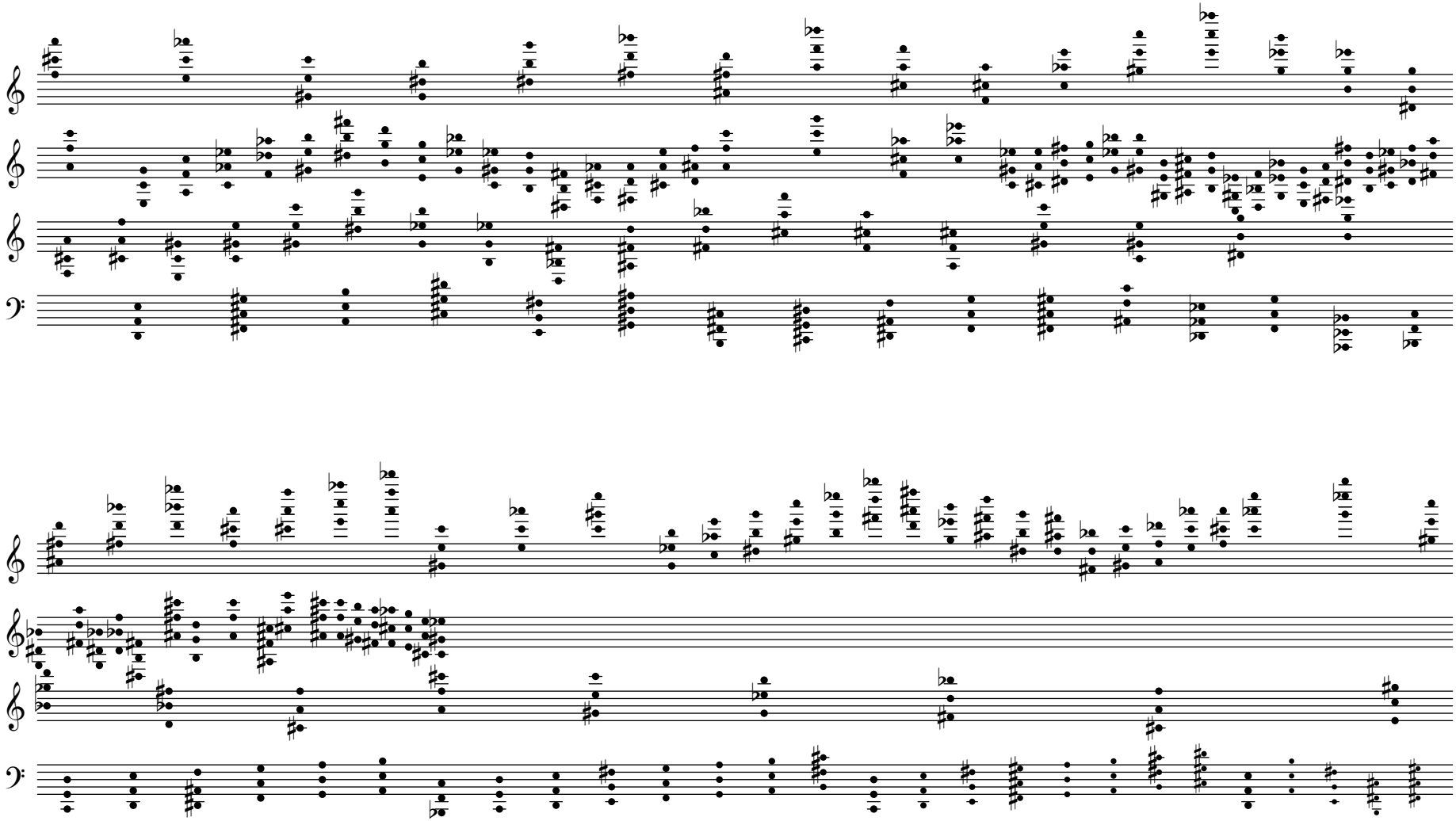
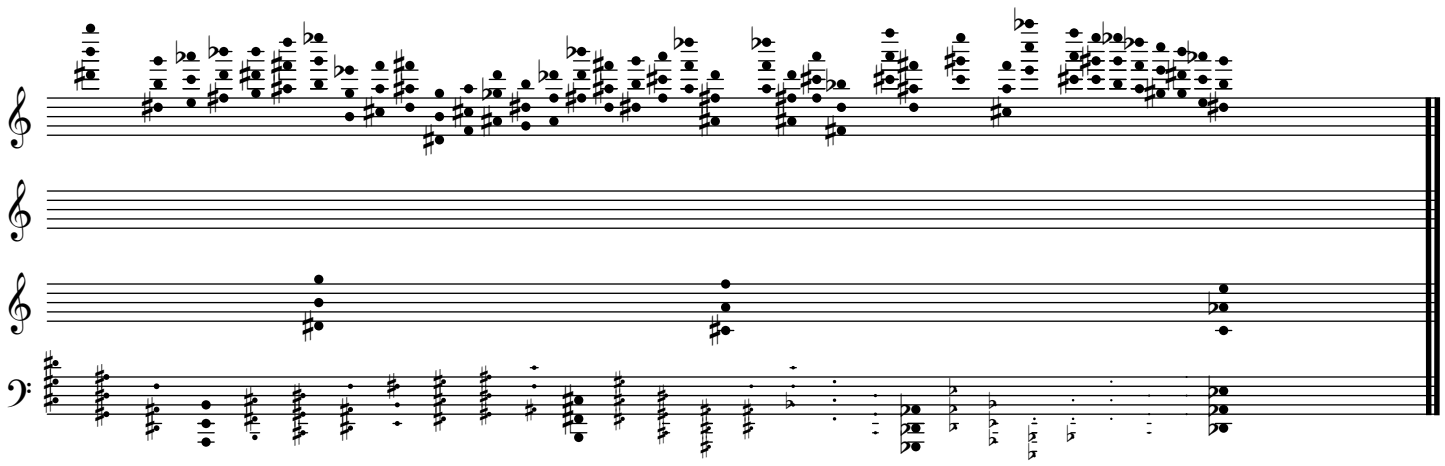
$\sqrt{3} : 1$

Theme C, retrograde inversion

$\sqrt{3} : 1$

Double canon, Themes A and C

$2^t : 3^t : 3^{t-1}$

Theme A and table canon on theme C

$2^t : 3^t : 3^{t-1} : 3^{-(t-1)}$