

**Peter McKenzie Armstrong**

**Patterns from the Game of Life**

**Part IV: Ostinato Polemico**

for piano 4 hands

Opus 30c

*Edition Ottaviano Petrucci*

# NOTES

## COMPOSITION

This is an addendum to my "3-volume" set of music evolved from John Horton Conway's *Game of Life* starting configurations. It is the only one based on a single source graph and realized as a single movement. The graph is "P59 Herschel Loop 2", a 1074x74 unit oscillator found in 2004, discoverer unknown. Its image and animation may be accessed online at <[https://www.conway.life.com/wiki/P59\\_Herschel-loop-2](https://www.conway.life.com/wiki/P59_Herschel-loop-2)>.

Its long dimension comprises twenty 50-unit sections, framed altogether by two of 36 units. Each section contains constant material (horizontal/vertical unit squares consistently filled) and variable material (squares unpredictably filled or not) in roughly half/half proportion.

Translating the graphic X/Y to musical Time/Pitch, I have positioned the image in two mutually perpendicular rotations, with 74 then demarking either the vertical or the horizontal. In the former case, with a keyboard-wise 74-pitch spectrum fitting standard piano range, initial mapping to musical parameters could proceed directly. In the latter case, with its implied pitch spectrum spanning fully a dozen piano widths, I opted to separate the member sections, transposing each (its span now within five octaves) independently to usable range.

In the result, rotations applied: at 0 degrees, to sections A,C,E,G,I and their variants; at 90 deg, to sections B,D,F,H,J and theirs. These groups relate as a swapping of Pitch and Time.

As it happens, the source graph's entire second half (reading in either orientation) is the horizontal and vertical mirror image of the first. I have named its sections ([A-J]) in reverse order to associate the reflections.

Throughout, I have flagged constant material by casting its noteheads in a red diamond glyph. (These are not harmonics.)

The audio file accompanying this score, initially secondary output from LilyPond processing, has been rewritten separately in Rosegarden, then realized/recorded via PianoTeq's "D4 Vintage Bosendorfer" instrument. Duration is 4'26".

## PERFORMANCE

### Accidentals

With the exception of natural-signs (all cautionary), accidentals throughout apply each exactly once. LilyPond terms this style "Forget".

### Articulation

Notes within a slur are to be connected. Notes outside a slur either before or after are to be audibly detached from it and from each other. Where, as often occurs, a slur contains immediate note-repetition, *legato* must be effected via the damper pedal (without "smoothover" between slurs). There are no ties.

### Dynamics

In the 5/8 sections (2+3 vs 3+2), metric accent must pit the stability of beat 1 (agreeing always) against the conflict of beat 2 (agreeing never). In the intervening sections they must join instead to navigate perpetually changing meter.

### Pedalling

Where damper pedal engagement immediately follows pedal release, these events must be separated sufficiently to allow articulate silence, as between slurs.

in memoriam Peter Standaart

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## Part IV: Ostinato Polemico

for piano 4 hands

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Opus 30c

With contentious metric accent

Intro. tempo-level 0 (♩ = 72)

The musical score is presented in two systems, labeled I and II. System I (measures 1-4) is in 2+3/8 time and features a complex interplay of rhythms between the four staves. The right hand (RH) staves are marked with a *pp* dynamic. System II (measures 5-8) is in 3+2/8 time and continues the intricate patterns. The score includes various musical notations such as notes, rests, accidentals, and articulation marks.

A t-level 1 (♩ = 84)

Musical score for measures 8-12. The score is written for four staves: two treble clefs and two bass clefs. The tempo is marked as ♩ = 84. A legend indicates that black notes are *p* (piano) and red notes are *á pp* (pianissimo). The notation includes various chords, melodic lines, and dynamic markings. The key signature has one sharp (F#).

Musical score for measures 13-17. The score continues from the previous system. It features complex chordal textures and melodic fragments. The notation includes various chords, melodic lines, and dynamic markings. The key signature has one sharp (F#). The piece concludes with a double bar line and a time signature of 3 + 2/8 + 2.

18 **B** t-level 3 (♩ = 112)

black=*mp*, red=*á p*

23

28 **C** t-level 1

3+2/8

black=*p*, red=*á pp*

3+2/8

2+3/8

2+3/8

33

3+2+2/8

3+2+2/8

3+2+2/8

3+2+2/8

38 **D** t-level 3

black= *mf*, red=á *mp*

43

43

t-level 2 (♩ = 96)

48

black = *mp*, red = *á p*

53

The musical score is written for piano and bass. It consists of two systems of staves. The first system (measures 48-52) features a piano staff with a treble clef and a 2+3/8 time signature, and a bass staff with a bass clef and a 3+2/8 time signature. The piano part includes complex rhythmic patterns with many beamed notes and rests. The bass part has a more melodic line with some rests. The second system (measures 53-57) continues the piano part with similar complex rhythms and includes a final measure with a 3+2+2/8 time signature. Dynamic markings include *mp* (mezzo-piano) for black notes and *á p* (fortissimo) for red notes. The score is marked with measure numbers 48 and 53. A tempo marking 't-level 2 (♩ = 96)' is at the top left. A key signature of one sharp (F#) is indicated by a sharp sign on the first line of the piano staff in measure 48.



58 **F** t-level 4 (♩ = 126)

black = *f*, red = *mf*

63

68 **G** t-level 2

3+2 3+2 2+3 2+3

black=*mp*, red=*á p*

73

3+2+2 3+2+2 3+2+2 3+2+2

78 **H** t-level 4

black=*f*, red=*á mf*

Measures 78-82: This system contains five measures. The first measure is marked with a box 'H' and 't-level 4'. The music is written in a complex, multi-measure rhythmic structure. The notation includes various accidentals (sharps, flats, double flats) and dynamic markings. A legend indicates that black notes represent *f* (forte) and red notes represent *á mf* (mezzo-forte). The piece concludes with a double bar line.

83

Measures 83-87: This system contains five measures. The music continues with complex rhythmic patterns and chromatic scales. The notation includes various accidentals and dynamic markings. The piece concludes with a double bar line.

t-level 3 (♩. = 112)

88

I

black = *mf*; red = *á mp*

93

98 **J** t-level 5 (♩ = 144)

black=*ff*, red=*af*

103

108 **J'** (t-level 5)

black=*ff*, red=*á f*

This system contains five measures of music. The notation is spread across four staves: two for the right hand (treble clef) and two for the left hand (bass clef). The time signature is 3+2+2. Measure 108 starts with a whole rest in the right hand and a bass line of quarter notes. Measure 109 features a complex chordal texture with many notes. Measure 110 continues with similar complexity. Measure 111 has a 2+2+3 time signature. Measure 112 returns to 3+2+2. Red diamonds and black dots are used to highlight specific notes throughout the piece.

113

This system contains five measures of music, continuing from the previous system. It uses the same four-staff layout and 3+2+2 time signature. Measure 113 has a whole rest in the right hand. Measure 114 features a complex chordal texture. Measure 115 continues with similar complexity. Measure 116 has a 2+2+3 time signature. Measure 117 returns to 3+2+2. Red diamonds and black dots are used to highlight specific notes throughout the piece.

118 **t-level 3**

black = *mf*, red = *á mp*

123

3+2+2/8

128 **H** t-level 4 (♩. = 126)

black = *f*, red = *mf*

133



138  $G'$  t-level 2 ( $\bullet = 96$ )

black=mp, red=a p

143

$3+2/8+2$

148 **F'** t-level 4

black=*f*, red=*á mf*

153

158 **t-level 2** **E'**

black=mp, red=á p

163

3+2+2/8

168 **D'** t-level 3 (♩. = 112)

black = *mf*; red = *á mp*

173

178  $\text{C}'$  t-level 1 ( $\text{♩} = 84$ )

black=*p*, red=*á pp*

183

188 **B'** t-level 3

black = *mf*, red = *a mp*

193

193

198 **A'** t-level 1

black=*p*, red=*a pp*

203

208 **Coda** t-level 0 (♩. = 72)

212



