

Peter McKenzie Armstrong

**Patterns from the Game of Life
Part IV: Ostinato Polemico**

for piano 4 hands

2019

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>.

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.

– PMA

in memoriam Peter Standaart

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With contentious metric accent

[Intro.] tempo-level 0 ($\text{♩} = 72$)

With contentious metric accent

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I

II

pp

f

4

ff

A t-level 1 (♩ = 84)

black = *p*, red = *pp*

8

13

$3+2+2$

$3+2+2$

$3+2+2$

$3+2+2$

Musical score for piano, page 10, measures 23-24. The score consists of four staves (treble, alto, bass, and right hand) with a common key signature of one sharp. Measure 23 starts with a 3+2+2 time signature. The first two measures feature complex patterns of eighth and sixteenth notes with various accidentals (sharps and flats). Measures 24-25 begin with a 9/8 time signature, followed by 2+2+3, and then 3+2 time signatures. The bass staff shows a continuous pattern of eighth and sixteenth notes. The right hand staff continues the intricate rhythmic and harmonic patterns established in measure 23.

28 C t-level 1

black=*p*, red=*á pp*

33

$3+2 \frac{2}{8}$

$3+2 \frac{2}{8}$

$3+2 \frac{2}{8}$

$3+2 \frac{2}{8}$

D t-level 3

black = *mf*, red = *á mp*

48 **E** t-level 2 (♩ = 96)

black = *mp*, red = *p*

53

F t-level 4 ($\text{♩} = 126$)

This section of the score begins at measure 58. The key signature is F major (no sharps or flats). The time signature is indicated as $3+2+2$. The music consists of four staves. The first two staves have black stems; the second staff includes red stems. The third and fourth staves have black stems. Measure 58 starts with a rest followed by a sixteenth-note rest. Measures 59-60 show eighth-note patterns with various dynamics. Measure 61 features a complex sixteenth-note pattern with a dynamic marking "black = **f**, red = **á mf**". Measures 62-63 continue with similar rhythmic complexity, including eighth-note and sixteenth-note patterns across the staves.

This section of the score begins at measure 63. The key signature changes to G major (one sharp). The time signature is indicated as $3+2+2$. The music consists of four staves. The first two staves have black stems; the second staff includes red stems. The third and fourth staves have black stems. Measure 63 starts with a sixteenth-note rest followed by a eighth-note rest. Measures 64-65 show eighth-note patterns with various dynamics. Measures 66-67 continue with similar rhythmic complexity, including eighth-note and sixteenth-note patterns across the staves.

68 **G t-level 2**

black=*mp*, red=*á p*

black=*mp*, red=*á p*

73

t-level 4

H

78

black=*f*, red=á *mf*

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

83

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

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

t-level 3 (♩ = 112)

I

88

black = *mf*, red = *á mp*

93

$3+2+2$ $3+2+2$ $3+2+2$ $3+2+2$

J t-level 5 (d. = 144)

black=ff, red=áf

J' (t-level 5)

108

black = *ff*, red = *f*

113

t-level 3

118

$2\frac{1}{3}$

$2\frac{1}{3}$

$3\frac{1}{2}$

$3\frac{1}{2}$

black = *mf*, red = *á mp*

123

$3+2+2$

$3+2+2$

$3+2+2$

$3+2+2$

128 [H] t-level 4 (♩ = 126)

black=*f*, red=á *mf*

133

138 **G** t-level 2 (d. = 96)

black = *mp*, red = *p*

143

$3+2+2$

$3+2+2$

$3+2+2$

$3+2+2$

148 F' t-level 4

black = *f*, red = *á mf*

153

158 t-level 2

E 2+3 2+3 3+2 3+2

black = *mp*, red = *á p*

163 3+2+2 3+2+2 3+2+2 3+2+2

168 D t-level 3 (♩ = 112)

black = *mf*, red = *mp*

173

178 C t-level 1 (♩ = 84)

black = *p*, red = *pp*

183

$3+2+2$

$3+2+2$

$3+2+2$

$3+2+2$

B' t-level 3

188

black = *mf*, red = *á mp*

193

198 A' t-level 1

black=p, red=pp

203

[Coda] t-level 0 ($\text{d} = 72$)

The musical score consists of two staves. The top staff has a treble clef, a key signature of one sharp, and a time signature of common time. The bottom staff has a bass clef, a key signature of one sharp, and a time signature of common time. Measure 208 starts with a rest followed by a dotted half note. The next measure begins with a forte dynamic (indicated by a large 'pp') and a sixteenth-note pattern. Measure 212 starts with a half note followed by a quarter note. The music continues with various patterns of eighth and sixteenth notes, including some grace notes indicated by small dots above the stems.

