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On Fractals and Mirrors

for Amplified Clarinet in B flat, Amplified Contrabass
and DSP (Digital Signal Processor)

fractal *n.* A geometric pattern that is repeated at ever smaller scales to produce irregular shapes and surfaces that cannot be represented by classical geometry. Fractals are used especially in computer modelling of irregular patterns and structures in nature. (*The American Heritage Dictionary*, Houghton Mifflin Co., 1992, p. 719)

DIRECTIONS FOR PART I

It is advisable to use a stereo mixer with speakers located in the left and right corners of the stage, almost on the edge, in order to avoid feedback. The sound should be rather amplified, so that even the softest passages are perfectly audible.

Unless explicitly stated in the notation (by joint stems for both instruments), the parts are rhythmically quite independent of each other.

The players are free (moreover, they are urged) to impose their own perception of musical time on the score — that is, to remap the notated events according to their inner feel. Thus, the piece can be interpreted as a set of theatrical gestures and pantomime scenes. All this, however, should be done with the sole purpose of achieving and developing an atmosphere of sinister expectation and lurking danger – depressing and hectic at the same time.



gradual accelerando



repetition of the group



repetition of the boxed group



tapping on the body of the contrabass



bow behind the bridge



increasing and decreasing "randomly" the speed of the trill



random changes of all parameters of the tremolo – speed, dynamics, accentuation, registration (ponticello - tasto and vice versa), sometimes even making it off-the-string staccato, etc.



rests (shorter to longer)

[two lone souls stalking each other amidst a dark fractal]

DSP settings: Reverb Hall 5 sec., LPF 10 KHz, delay ca. 50 ms

Very freely, as if improvised, with an unsettled "agitato" quality [♩ = ca. 60]

The musical score is written for Clarinet (Cl) and Contrabass (Cb) in a 2-staff system. The key signature has one sharp (F#) and the time signature is common time (C). The tempo is marked as [♩ = ca. 60].

System 1:

- Cl:** Starts with a whole note G4 (marked *pppp*), followed by a half note A4 (marked *mf*), a quarter note B4 (marked *ppp*), and a quarter note C5 (marked *f*). It then has a half note D5 (marked *ppp*) with a 1/4 tone vibrato and an *ord.* (order) marking. This is followed by a half note E5 (marked *pont.*) and a half note F#5 (marked *tasto*).
- Cb:** Starts with a whole note G2 (marked *pppp*), followed by a half note A2 (marked *mf*), a quarter note B2 (marked *ppp*), and a quarter note C3 (marked *f*). It then has a half note D3 (marked *ppp*) with a 1/4 tone vibrato and an *ord.* marking. This is followed by a half note E3 (marked *pont.*) and a half note F#3 (marked *tasto*).

System 2:

- Cl:** Starts with a whole note G4 (marked *pppp*), followed by a half note A4 (marked *ppp*), a quarter note B4 (marked *f*), and a quarter note C5 (marked *ppp*). It then has a half note D5 (marked *pont.*) and a half note E5 (marked *tasto*).
- Cb:** Starts with a whole note G2 (marked *ppp*), followed by a half note A2 (marked *ppp*), a quarter note B2 (marked *f*), and a quarter note C3 (marked *ppp*). It then has a half note D3 (marked *pont.*) and a half note E3 (marked *tasto*).

System 3:

- Cl:** Starts with a whole note G4 (marked *pppp*), followed by a half note A4 (marked *ppp*), a quarter note B4 (marked *f*), and a quarter note C5 (marked *ppp*). It then has a half note D5 (marked *pont.*) and a half note E5 (marked *tasto*).
- Cb:** Starts with a whole note G2 (marked *ppp*), followed by a half note A2 (marked *ppp*), a quarter note B2 (marked *f*), and a quarter note C3 (marked *ppp*). It then has a half note D3 (marked *pont.*) and a half note E3 (marked *tasto*).

System 4:

- Cl:** Starts with a whole note G4 (marked *pppp*), followed by a half note A4 (marked *ppp*), a quarter note B4 (marked *f*), and a quarter note C5 (marked *ppp*). It then has a half note D5 (marked *pont.*) and a half note E5 (marked *tasto*).
- Cb:** Starts with a whole note G2 (marked *ppp*), followed by a half note A2 (marked *ppp*), a quarter note B2 (marked *f*), and a quarter note C3 (marked *ppp*). It then has a half note D3 (marked *pont.*) and a half note E3 (marked *tasto*).

System 5:

- Cl:** Starts with a whole note G4 (marked *pppp*), followed by a half note A4 (marked *ppp*), a quarter note B4 (marked *f*), and a quarter note C5 (marked *ppp*). It then has a half note D5 (marked *pont.*) and a half note E5 (marked *tasto*).
- Cb:** Starts with a whole note G2 (marked *ppp*), followed by a half note A2 (marked *ppp*), a quarter note B2 (marked *f*), and a quarter note C3 (marked *ppp*). It then has a half note D3 (marked *pont.*) and a half note E3 (marked *tasto*).

System 6:

- Cl:** Starts with a whole note G4 (marked *pppp*), followed by a half note A4 (marked *ppp*), a quarter note B4 (marked *f*), and a quarter note C5 (marked *ppp*). It then has a half note D5 (marked *pont.*) and a half note E5 (marked *tasto*).
- Cb:** Starts with a whole note G2 (marked *ppp*), followed by a half note A2 (marked *ppp*), a quarter note B2 (marked *f*), and a quarter note C3 (marked *ppp*). It then has a half note D3 (marked *pont.*) and a half note E3 (marked *tasto*).

System 7:

- Cl:** Starts with a whole note G4 (marked *pppp*), followed by a half note A4 (marked *ppp*), a quarter note B4 (marked *f*), and a quarter note C5 (marked *ppp*). It then has a half note D5 (marked *pont.*) and a half note E5 (marked *tasto*).
- Cb:** Starts with a whole note G2 (marked *ppp*), followed by a half note A2 (marked *ppp*), a quarter note B2 (marked *f*), and a quarter note C3 (marked *ppp*). It then has a half note D3 (marked *pont.*) and a half note E3 (marked *tasto*).

System 8:

- Cl:** Starts with a whole note G4 (marked *pppp*), followed by a half note A4 (marked *ppp*), a quarter note B4 (marked *f*), and a quarter note C5 (marked *ppp*). It then has a half note D5 (marked *pont.*) and a half note E5 (marked *tasto*).
- Cb:** Starts with a whole note G2 (marked *ppp*), followed by a half note A2 (marked *ppp*), a quarter note B2 (marked *f*), and a quarter note C3 (marked *ppp*). It then has a half note D3 (marked *pont.*) and a half note E3 (marked *tasto*).

System 9:

- Cl:** Starts with a whole note G4 (marked *pppp*), followed by a half note A4 (marked *ppp*), a quarter note B4 (marked *f*), and a quarter note C5 (marked *ppp*). It then has a half note D5 (marked *pont.*) and a half note E5 (marked *tasto*).
- Cb:** Starts with a whole note G2 (marked *ppp*), followed by a half note A2 (marked *ppp*), a quarter note B2 (marked *f*), and a quarter note C3 (marked *ppp*). It then has a half note D3 (marked *pont.*) and a half note E3 (marked *tasto*).

System 10:

- Cl:** Starts with a whole note G4 (marked *pppp*), followed by a half note A4 (marked *ppp*), a quarter note B4 (marked *f*), and a quarter note C5 (marked *ppp*). It then has a half note D5 (marked *pont.*) and a half note E5 (marked *tasto*).
- Cb:** Starts with a whole note G2 (marked *ppp*), followed by a half note A2 (marked *ppp*), a quarter note B2 (marked *f*), and a quarter note C3 (marked *ppp*). It then has a half note D3 (marked *pont.*) and a half note E3 (marked *tasto*).

Cl flutter-----

arco ord. 5-----> pont. pont. tasto pont. *pp* ricochet 1/4 tone vibrato

pp ricochet *mf* *sfz* *pp* 5

Cl *sfz* *mp* 5 *tr ±*

Cb *sfz* *ff*

Cl rit. accel. rit. *ff* *mf* accel. rit. accel. 3

Cb pont. 3 tasto pont. *mp*

Cl 5 7

Cb 5 *mp*

Cl *mp* *rit.* *fff* arco

Cb *fff*

Cl *quasi cantabile* *mf* *accel.* *tr ±* *pppp* *mp*

Cb *quasi cantabile* *mp* *tr ±*

Cl *accel.* *sfz* *ff* *p* *ff* *p*

Cb *tr* *ppp* *ff*

Cl *fff* *pppp* *morendo* *fff*

Cb *arco* *ppp* *morendo* *pp* *fp* *fff*

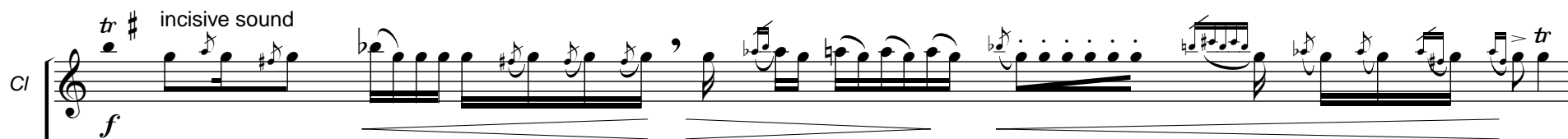
pont. overpressure *palm* *knuckle* *palm* *pont. overpressure*

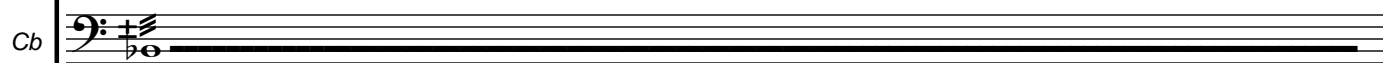
Fast, in a frenzy

Cl 

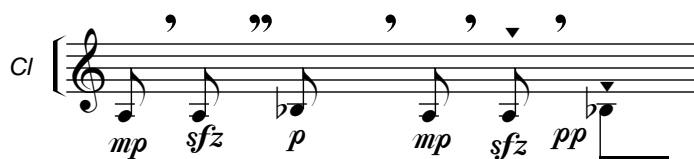


Cb 

Cl 

Cb 

Cb 

Cl 

Cb 



Slow and anxiously

Cl *jaw vibrato* ----- " *jaw vibrato* ----- " "

ppp *mf* *mp* *pp* *sfz*

Cb *pont.*

pppp *ppp* < >

Cb *ricochet*

pp

Cl " " " " " " "

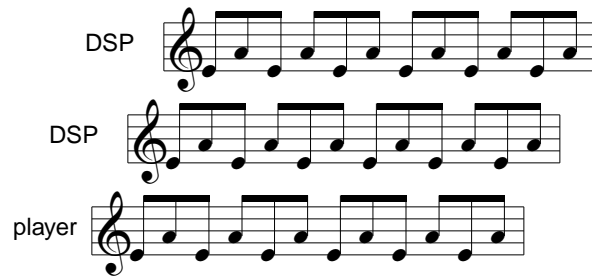
p *sfz* *p* *pp* *p* *fff*

Cb " " " " " " "

pp *fff*


DIRECTIONS FOR PART II

The tempo should be kept very precisely throughout the piece. It is predestined by the particular DSP settings which cause each and every tone to be repeated by the delay 150 ms later – in the prescribed tempo this equals an eighth note in a triplet. In other words, the DSP will generate a continuing canonic imitation (or, rather, an entire row of canonic imitations – see example below), the distance between the leading voice (the real instrument) and the imitating voice (the processed sound) being equal to a tripleted eighth note. Since the delay time cannot be adjusted in the course of the piece, any increase or decrease of the tempo would cause undesirable repercussions in the processed sound which may lead to confusion and loss of rhythmic clarity.



The image shows three musical staves. The top two staves are labeled 'DSP' and the bottom staff is labeled 'player'. Each staff contains a sequence of eighth notes in a triplet pattern, illustrating the canonic imitation.

All notes on strong and relatively strong beats have to be properly emphasized. Once the bouncing rhythmic pulsation is achieved, the players are encouraged to interpret the sections in a rather free manner. They are given full discretion as to the number of repetitions (the total duration of the piece, however, should not go beyond a reasonable limit of five to seven minutes). Notes in parentheses may be omitted during some of the repeats; furthermore, beats and even entire measures may be skipped over. The clarinet player may take rests between the groups as long as the next entry is on the beat (see example below).



clarinet – possible points of entry after a rest

The image shows a musical staff for a Clarinet (Cb). The staff contains a sequence of eighth notes in a triplet pattern. Four downward arrows point to the first, second, third, and fourth notes of the sequence, indicating possible points of entry after a rest.

[gazing into a fractal mirror]

DSP settings: Stereo Delay, L=150 ms, R=300 ms, Gain - 43%

With an almost "mechanical" precision [$\bullet = 132$]

staccatissimo sempre

Cb

mf

Cl

repeat *mf*

Cl

repeat

Cb

Cl




in sync


Cb

detache

Cl

Cb

Cl  Cl  Cl 

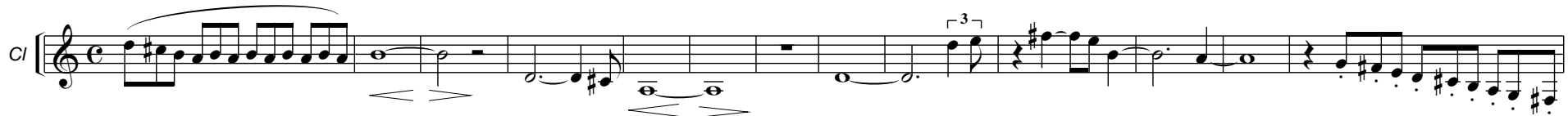
Cb 

staccatissimo sempre


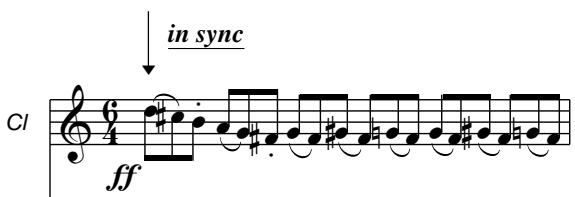
Cl  Cl  Cl 

(8^{va}-----)

Cb 

Cl 



Cb 

Cl  Cl 


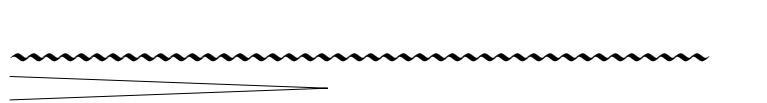
in sync

ff

detache

Cb  Cb 

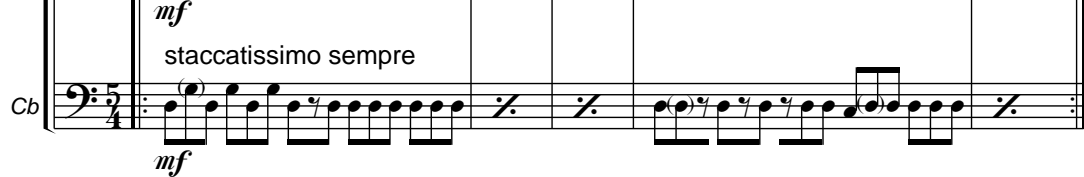
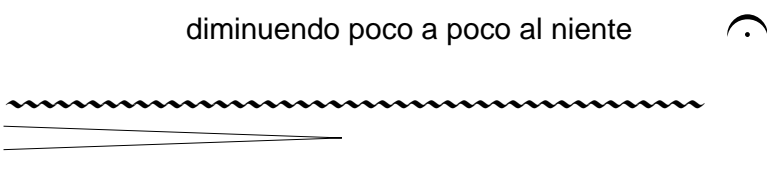
ff

Cl  

mf

staccatissimo sempre

diminuendo poco a poco al niente

Cb  

mf