David Stephen Grant

Bånsull

(Lullaby)

version for violoncello and live electronics

2012/2015

Version: May 8, 2015

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Bånsull is also available in the original version for Viola and Live Electronics.
Please visit `www.davidgrant.no` for more information.

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The original version for Viola and Live electronics was first performed at NOTAM, Oslo, October 24th 2012 by Einar Kyvik Bauge (Viola) and David Stephen Grant (Electronics) as part of the *Music Technology Days 2012* festival.

This version for Violoncello and Live Electronics was first performed at nyMusikk, Oslo, May 19th 2015 by Gregor Riddell (Violoncello) and David Stephen Grant (Electronics).

Durata

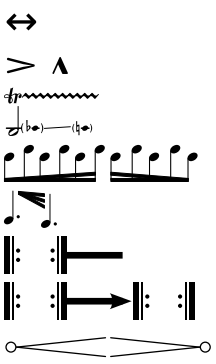
Approx. 9 minutes

Notation and performance

Accidentals apply to the following note only, though cautionary accidentals are used to avoid ambiguity.

Full sized slashed notes are un–metered, but should not necessarily be performed as fast as possible. The current tempo should be observed.

Transitions between techniques are indicated with arrows.



Free bowing.

Sharp/weighted attack.

Trill note glissando.

Feathered beams: accel./rit. through figure.

Feathered tremolo: accel.(/rit.) through figure.

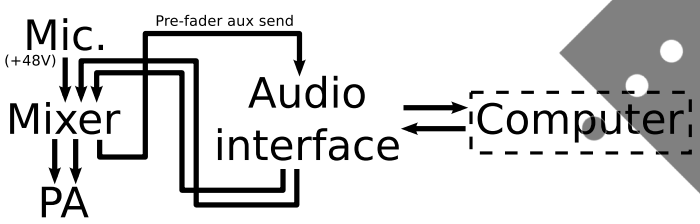
Repeat figure as indicated by extension beam.

Repeat and gradually morph into new figure.

Dal/al niente.

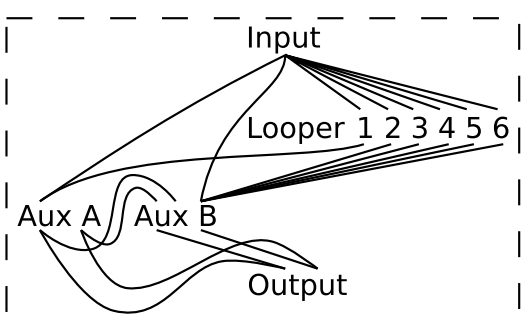
Electronic requirements and setup

PA setup



The instrument should be mic'ed with a high quality clip–on microphone (such as DPA 4099), and connected to the FOH mixer, which also provides phantom power. This signal is sent pre–fader to the audio interface running the processing software (see below). Depending on the venue a certain amount of the instrument signal (with EQ, reverb etc.) should be mixed in with the returned processed signal from the computer before being sent to the PA.

Computer setup



The electronics may be controlled either by a technician with a MIDI controller, or by the performer with a MIDI foot controller. In the full score circled numbers represent faders, whereas in the performance part they represent button presses on the foot controller (the actual programming and setup of this functionality must be made so as to approximate the MIDI control that would have been performed by a technician, as described in the full score).

The processing on the computer centres around 6 loopers, a delay plug–in and a spectral processing plug–in. Live control of the software should be managed by a dedicated MIDI–controller with rotary encoders, faders and buttons. Previous performances have been performed with an *Ableton Live* set with custom *Max for Live* plug–ins, and *GRM Tools Evolution* for the spectral processing, with a *Novation ZeRO SL MkII* MIDI–controller (or a *Behringer FCB1010* MIDI foot controller). Also an example setup in SuperCollider is included as an appendix.

All channels are send–only. Please ensure that no unprocessed instrument signal is returned to the mixer.

Loopers 1–6[1]

Required controls: `Rec./Play/Agitate/Stop/Clear`.

Looper agitation: Random modulations of the playback speed, affecting pitch. Interpolate gradually between new values approx. every 5", resulting in pitch drift of approx. 1 semitone. Agitation must be independent for each looper.

Loopers 3–6 should also feature (individual) random panning across the whole stereo field and volume fades. Interpolate gradually between new values approx. every 5". Note that these loopers return a stereo signal, despite the single patch cord in the figure above.

Aux A: Delays

4–8 delays (no feedback) ranging from approx. 200 ms–5,5". The delays should be uneven, so multiples of delay time should be avoided[2]. Eg. 200 ms, 924 ms, ... 5,1". All delays should feature random panning and volume fades as described for the loopers.

Aux B: Spectral processing

The desired effect should create a rich ever–evolving bed of sound around the solo instrument. For previous performances the plug–in *GRM Tools Evolution* has been used.[3] The plug–in responds to local level peaks which trigger a "snapshot" to be taken of the current frequency spectrum, which then morphs into the next analyzed spectrum at a rate set by the *Speed* parameter.

Other important parametres include *Purity* (a higher setting causes frequencies of lower amplitude to be filtered out) and *Grain* (introducing some random frequency and amplitude variations to the output signal, resulting in a "noiser" spectrum).

This effect may be recreated in DSP environments such as *Max*, *Pure Data* or *SuperCollider*. Below is a table of the parameter values set in Evolution, which may be translated into other environments.

Bands	8192
Speed	5,00"
Purity	Controlled by Rot.1[a]
Grain	Controlled by Rot.2
Mix	100%
Interpolation mode	Auto[b]

[a] See subsection on MIDI control below.
[b] Interpolation triggered by level peak.

MIDI control

A MIDI–controller with faders, rotary encoders and buttons should be used for live control of the software. Here follows a table with details, and initial MIDI values that should be set pre–performance. Buttons for control of the loopers should also be set up.

	Parameter	**Scale** (0–127)	**Init.**
Rot.1	Purity	0%–100%	127
Rot.2	Grain	0%–100%	0
Fader 1	Send level Looper 1 → Aux A	÷inf–0 dB	127
Fader 2	Send level Looper 2 → Aux B	÷inf–0 dB	127
Fader 3	Send level Loopers 3–6 → Aux B	÷inf–0 dB	0
Fader 4	*N/A*		
Fader 5[c]	Output level Aux A	÷inf–0 dB	127
	Send level[d] Aux A → Aux B	0 dB–÷inf	
Fader 6	Output level Aux B	÷inf–0 dB	127
Fader 7	Send level Input → Aux A	÷inf–0 dB	0
Fader 8	Send level Input → Aux B	÷inf–0 dB	0

[c] Please note dual function and partly inverse scale of Fader 5.
[d] Post–fader.

[1] Looper 2 plays back at half speed, so the output pitch is one octave deeper than the input.
[2] Such as 200 ms, 800 ms etc.
[3] At the time of writing more information may be found at `http://www.inagrm.com/mots-cles-associes/evolution`

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senza misura (♩ = 144)

Violoncello

ff furioso

fff

127
Electronics
0

Initialize electronics

7

ff

fff

ff

fff

ff

fff

ff

fff

ff dim. poco a poco

p

dim.

pp

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mp ff

Loop 1 rec.

3x–4x

dim. poco a poco al niente

(1st x)

Loop 1 play

7

ca. 10"

A molto rubato (♩ = 48)

p dolce (legato)

mp

3 3

Loop 1 stop; clear

5 8

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B

mf p mf 5 p p dolce

Purity 127 76

Grain 0

5:4 3:2 5:4

mp mf f p (gliss.)

52

C

♩ = 144

(gliss.)

f mp f

5 + 7

rit.

♩ = 48

dim.

mp 3 f mp 3

5 + 7

f p 3 3 f 3:2 3 p mf

fp cresc. ff < fff

D

mp 3

76

Purity

3 3 6:4 3

32

5:4 5:4 mf 5:4 cresc. 3:2 rit. f

Loop 2 rec.

A tempo (♩ = 48)

f con forza più f 3 ff 3 3:2

8

52

Loop 2 play

Grain

Loop 2: Agitate ON

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E

(8va)

lunga

mf

2

3

Loop 3 rec. | Loop 3 play | Loop 4 rec. | Loop 4 play | Loop 5 rec. | Loop 5 play | Loop 6 rec. | Loop 6 play

mp cresc. *f* *mp cresc.* *f*

32

Purity

ff *mp* *mf*

127

F

Loop 3: Agitate ON

Loop 2 stop; clear Agitate OFF

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mp *mf* *p* *mp*

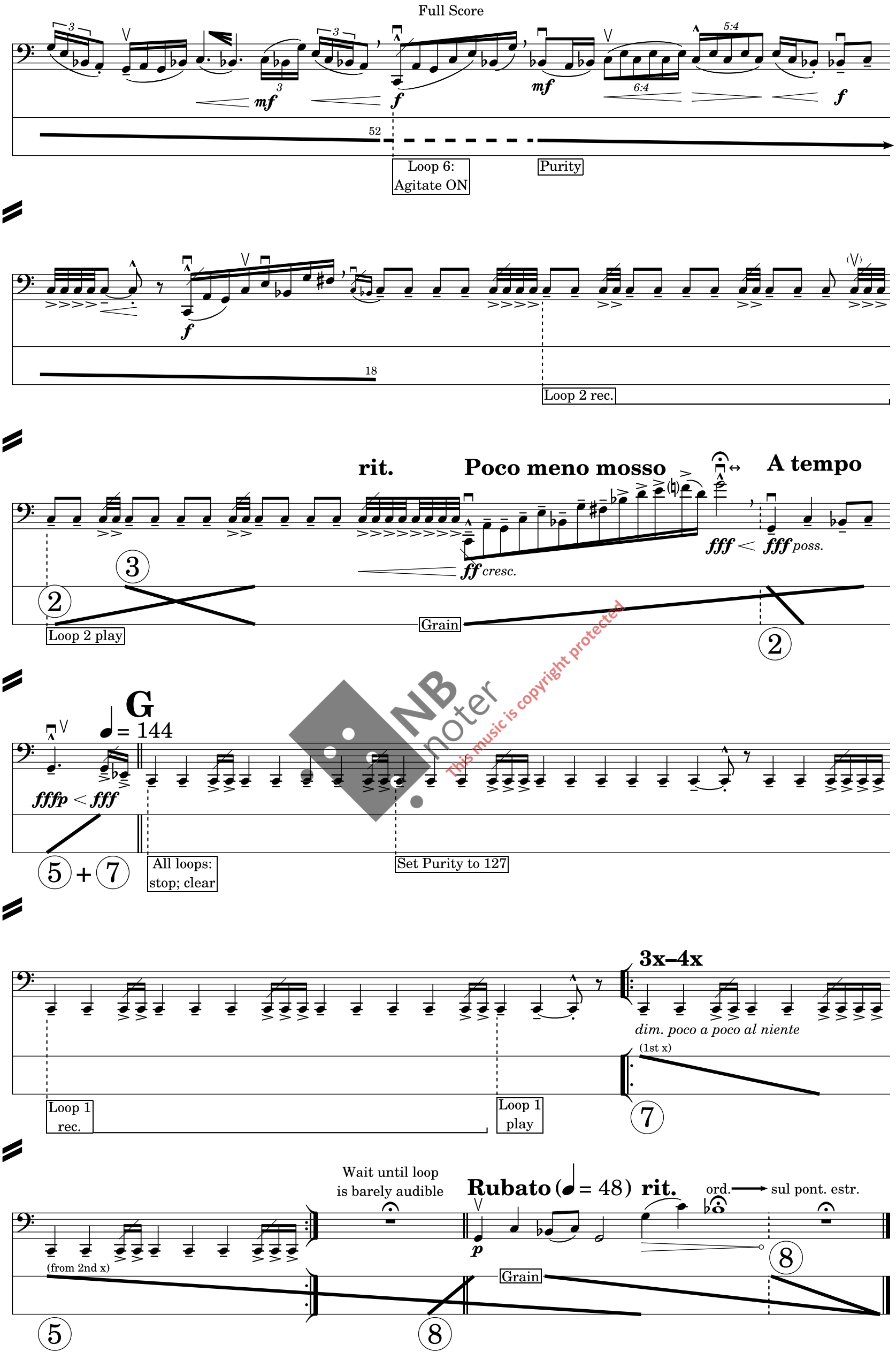
127

Purity

Loop 4: Agitate ON

mf *p* *mp*

Loop 5: Agitate ON



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