

Aceton (2009)

4 electric guitars, live electronics

"It happened in August 1952 on the south coast of England. The weather report predicted rain. It rained for 24 hours. Two small rivers became roaring torrents, and a flood wave swept through the coastal village of Lynmouth in the county of Devon. Thirty-four people drowned and the town was largely destroyed. The flash floods rose to 250 times the normal rainfall.

Residents of the town reported that before the flood disaster several airplanes were observed. The BBC interviewed a pilot about the incident, who confirmed that he had dispersed large amounts of salts at that time. To this day, the British Ministry of Defence denies that there were secret weather experiments. It is known that experiments had already been conducted in the 1950s using silver iodide. Rain can be artificially produced if clouds are "seeded" with silver iodide.

From an acetone solution to which silver iodide has been added, hydrophilic salts are released. These combine with ice crystals and, by increasing weight, fall. In doing so, they melt and descend as rain. On August 15, 1952, in Bedford, about 300 kilometres from Lynmouth, the countdown began for the secret weather experiment "Cumulus". The goal of the mission was carefully documented. The papers were stored in the state archives under lock and key. After nearly 50 years, the secret state files of the British Ministry of Defence were released."

The prefatory text served as the starting point of the composition *Acetone*, whose primary idea is the dissolution of instrumental structures through live electronics. The instrumental score of this piece was realized exclusively using the software *Common Music*. This tool for computer-assisted composition makes it possible to model musical structures in such a way that their musical potentials can be explored at different parametric levels even before transferring them into fixed notation. This strategy promotes a musical approach that subordinates a focused view of direct connections between individual sound events to a phenomenological view of the resulting overall sound.

The composition is based on various linear and exponential processes with differently sized, stochastically determined deviations.

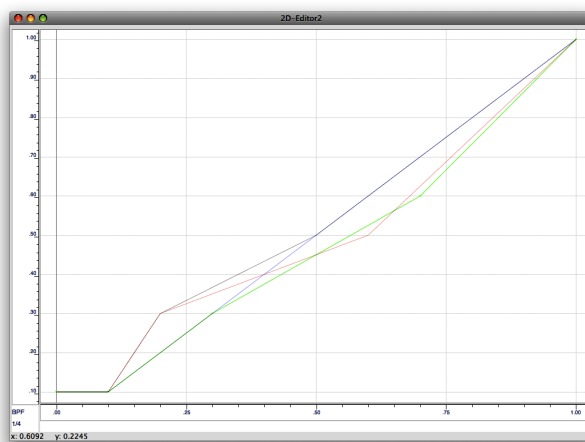


Fig. 1: linear dynamics with stochastic deviations in Section 1

For this purpose, so-called “tendency masks” were used, in which the upper and lower bounds of a random event space are determined as temporal trajectories. The size of this event space determines the process between full determination and certain degrees of randomness.

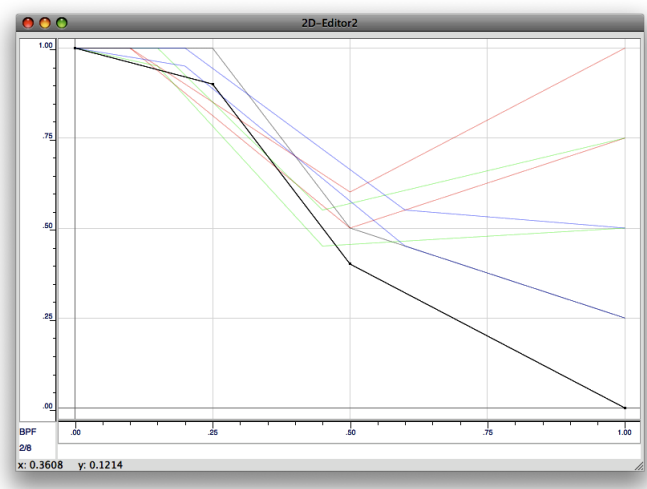


Fig. 2: tendency masks of pitch for Section 1

In this piece the maximum event space of the instruments is limited to a scale of 32 tones, in which each pitch class has 4 octave layers, which differ in their neighbouring tones. An expansion of this frequency range occurs only through the live electronics. The 4 interval neighbourhoods of these 4 octave layers are: 1-1, 1-2, 2-1, 2-2 (1 = semitone, 2 = whole tone). Through them the identity of the octave is obscured in the musical context.

Moreover, different sized chromatic, diatonic, and whole-tone fields emerge. For this piece a scale was chosen that includes the open strings of the electric guitars, to preserve the associated technical possibilities (polyphony) (see Fig. 6).

The large-scale form of the piece is based on a set of overlaid arithmetic series:

4	8	12		20			32			52			84			136	
1	2	3		5			8			13			21			34	
4		12	16				28			44			72			116	
1		3	4				7			11			18			29	
	8		16		24			40			64			104			
	2		4		6			10			16			26			
			16	20	24	28	32	40	44	52	64	72	84	104	116		700

Fig. 3
13 durations = sections (in quarter notes); total duration = 700 quarter notes

Selected durations of these series are used, according to musical necessity, for the different processes (sections) of the piece.

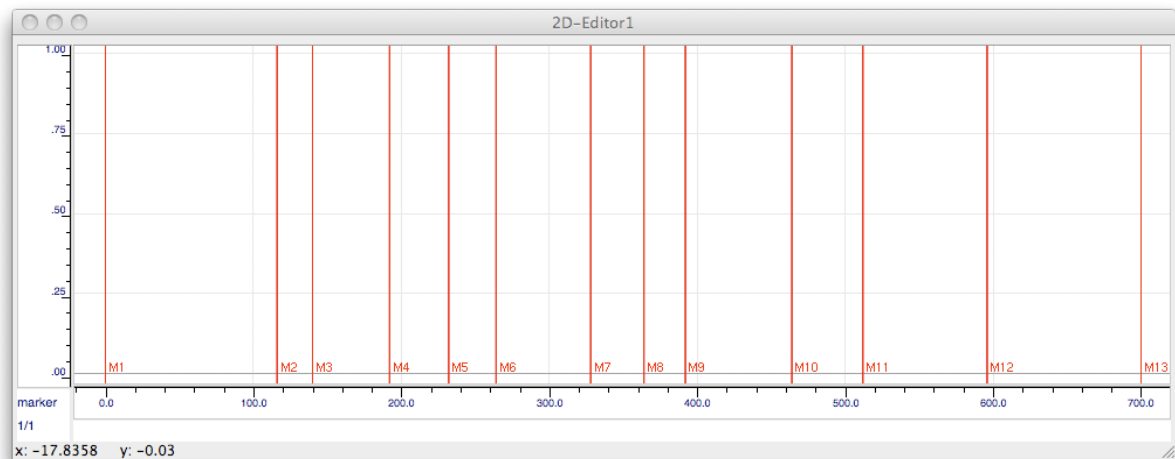


Fig. 4
Overview of the 13 sections

- Section 1: 116 sec (8 + 100 + 8)
- Section 2: 24 sec
- Section 3: 52 sec
- Section 4: 40 sec
- Section 5: 32 sec
- Section 6: 64 sec
- Section 7: 36 (16 + 20)
- Section 8: 28 sec
- Section 9: 72 sec
- Section 10: 44 sec
- Section 11: 84 sec
- Section 12: 104 sec

The live electronics of the piece consists of 4 identical channels for sound processing, which are individually controlled by the musicians via a foot pedal (see Fig. 7). Each of these channels has the following functionalities, which can be linked together as separate modules. Analogous to score-synthesis, these modules have envelopes for linear crossfading between different settings of individual parameters. In addition, these transitions can be modulated with different degrees of random deviation.

Matrix:

- all modules are connected via a matrix with inputs and outputs
- through recursion multiple reuse of the modules is possible

Sound modules:

- 5-fold pitch shifter (± 2 octaves)
- Freezer (when a certain dynamic threshold is exceeded, the incoming sound is recorded into an audio buffer for between 50 milliseconds and 4 seconds; this buffer can be read by other modules)

- 2 modulated delays between 1 millisecond and 5 seconds (the length of the delay can be varied continuously)
- Granulator (synchronous and asynchronous granular synthesis)

Space:

- Spatialization control (4-channel)

(Each player is assigned a fixed output position i.e. a loudspeaker. By switching one can dissolve this fixed sound location and the respective instrument moves, depending on pitch (x-axis) and amplitude (y-axis), in the 4-channel space. This mode is used primarily to render compositional structures of dissolution visible.)

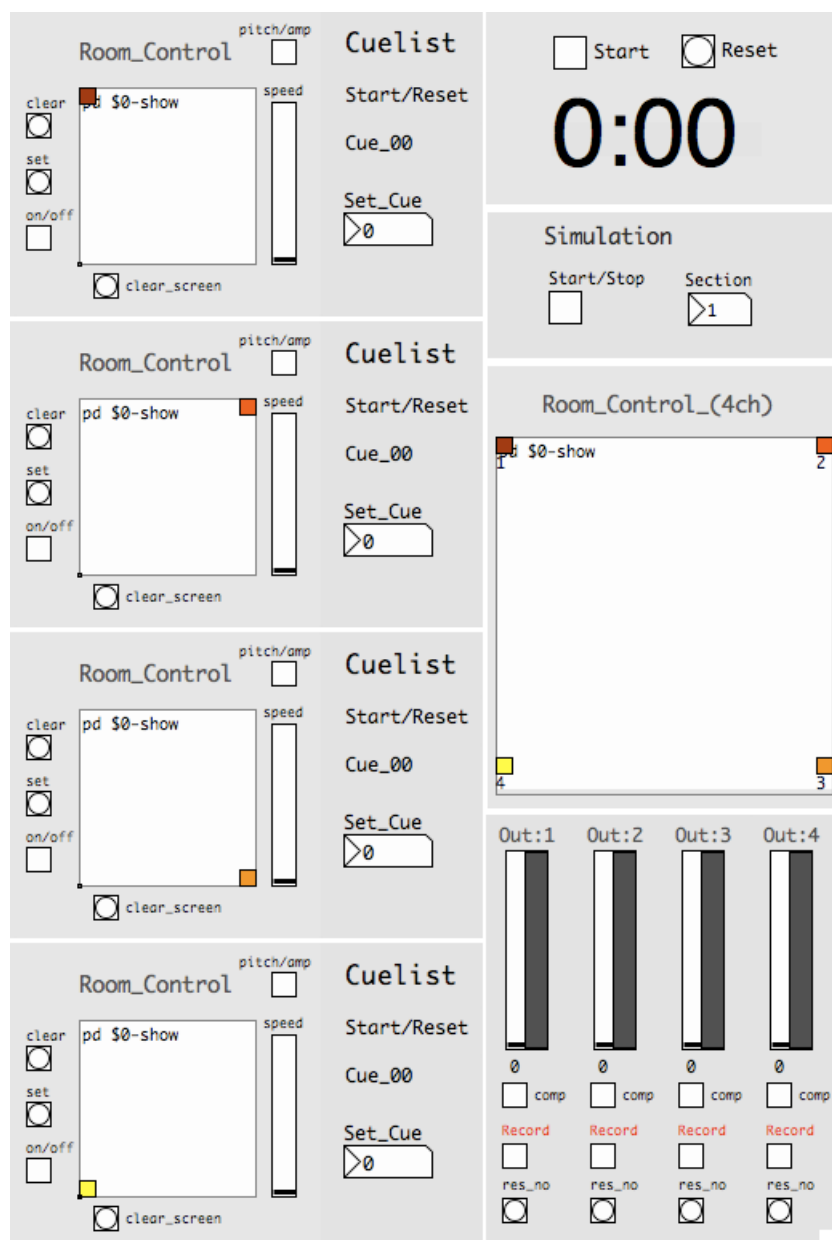


Fig. 5
Spatial control

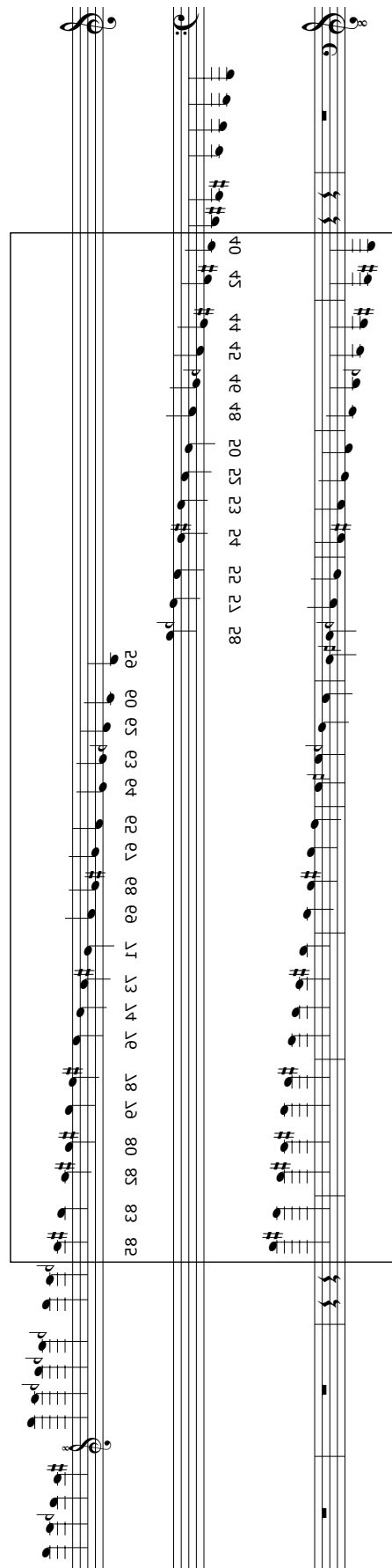


Fig. 6:
 Lowest system: 32 used tones from a 48-tone scale (upper systems);
 numbers = MIDI notes

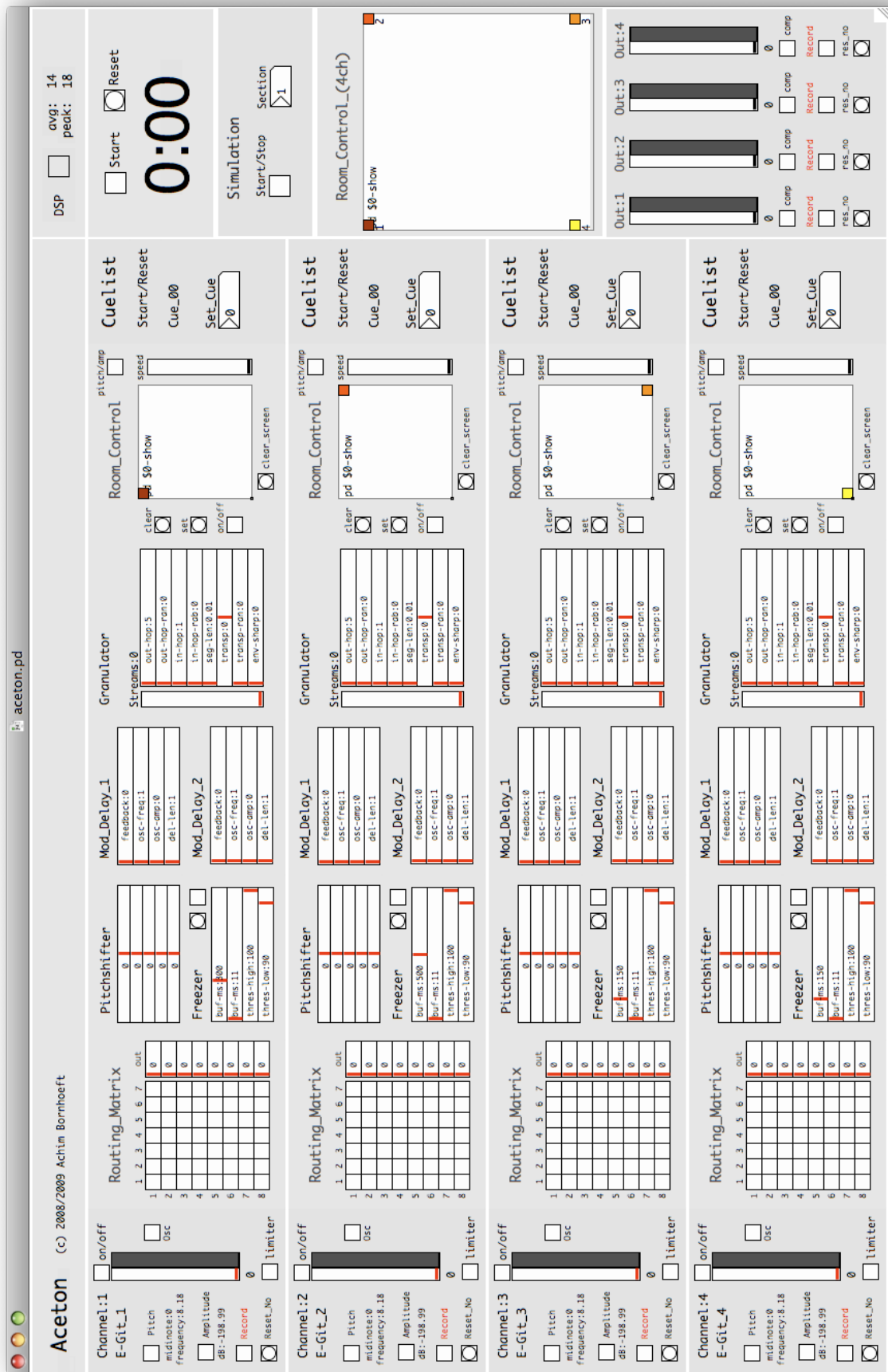


Fig. 7:
Interface of the live electronics (PureData)